

Chornobyl Chronology

Last update: December 2008

This annotated chronology is based on the data sources that follow each entry. Public sources often provide conflicting information on classified military programs. In some cases we are unable to resolve these discrepancies, in others we have deliberately refrained from doing so to highlight the potential influence of false or misleading information as it appeared over time. In many cases, we are unable to independently verify claims. Hence in reviewing this chronology, readers should take into account the credibility of the sources employed here.

Inclusion in this chronology does not necessarily indicate that a particular development is of direct or indirect proliferation significance. Some entries provide international or domestic context for technological development and national policymaking. Moreover, some entries may refer to developments with positive consequences for nonproliferation.

Nuclear Waste: 2008-1995

OVERVIEW

Spent fuel is generally stored on site in cooling ponds at the nuclear power plants at which the fuel assemblies were used. Ukraine previously sent its spent fuel to Russia to be reprocessed, but this course became a contentious issue after Russia passed a law in 1992 prohibiting the import of radioactive material into Russia. This action resulted in storage crisis at Ukrainian power plants. In 6/93, however, Russia passed a new law that allows Ukrainian spent fuel to be reprocessed, but not stored, in Russia. The law does not allow the import of nuclear waste into Russia, but allows the import of Russian-origin spent fuel as long as the resulting waste is returned to the territory of the state which delivered it.

Temporary Storage Agreement

Reportedly, Russia and Ukraine have signed an unpublicized agreement in which Ukraine may continue to store its spent fuel and waste in Russia for two years. This agreement was based on two prior agreements signed by Russia and Ukraine in 1/93 and Ukraine's pledge to place all of its peaceful nuclear activities under IAEA safeguards. The agreement stipulates that the spent fuel and radioactive waste can be temporarily stored in Russia, after which the waste is to be returned to Ukraine. In 5/95 Ukraine again began shipping its spent fuel to Russia for reprocessing. Approximately 265 tons of spent fuel are produced each year at all of the NPPs in Ukraine.

Spent Fuel and Radioactive Waste Storage Sites

There are six spent fuel storage sites and many low-level radioactive waste storage sites, including the Chornobyl zone, in Ukraine. On 6/30/95 a Law on the Handling of Radioactive Waste was passed by the Supreme Rada which establishes the Ministry of Chornobyl Affairs (now a part of the Ministry for Emergency Situations) as the state

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agency responsible for licensing storage of radioactive waste. The law also determines the liability of individuals found guilty of violating the newly established radioactive waste management norms and establishes the public's right for compensation in the case of improper handling of nuclear waste by the state or its licensee. Article 4 of the Law states that financing for the handling of radioactive materials comes from a special State Fund for the Handling of Radioactive Waste. According to the Law, enterprises contribute to the Fund in proportion to the amount of waste they produce. Until the Fund is set up, the government will finance the handling of radioactive waste from resources allocated for RADON and Chornobyl management.

State Program

The Ukrainian government in 1996 approved a state program for radioactive waste management through 2005 which will be under the direction of the Ministry of Chornobyl Affairs (now the Ministry for Emergency Situations). This program will establish a national accounting system for nuclear waste and will provide for the construction of radioactive waste repositories and the reconstruction of existing radioactive waste management facilities. According to the program, spent fuel will continue to be stored in on-site pools until 2005. A central geological repository for spent fuel and high-level waste will be sought in 1996-97. By 2000, a draft project will be ready for an underground storage facility, which will be built between 2008 and 2020. The program also envisages the decontamination of 1500 hectares of land containing over 150,000 curies of activity at mining and milling sites. The chief of the information and analysis center for waste integration at the state association RADON will coordinate these tasks.

—"Russia to Receive Used Nuclear Fuel from Ukraine," ITAR-TASS, July 19, 1995. "Ukrainian Shipments Lift Threat of Plant Closures," *Nuclear Fuel*, July 31, 1995, p. 16. A. F. Linyov, "Shcho Robyty Z Yadernymy Vidkhodamy?," *Zeleny Svit*, April 1995, p. 4. "On the Handling of Radioactive Waste," *Holos Ukrainy*, August 30, 1995, pp. 6-8; in FBIS-TEN-95-015, "Environment and World Health," August 30, 1995. Alex Brall, "Ukraine Passes Law on Radioactive Waste Management," *Nucleonics Week*, July 20, 1995, pp. 14-15. *UI News Briefing*, 4/30/96. Peter Coryn, "Ukraine Government Passes Waste Plan, But Hitch Delays Implementation," *Nuclear Fuel*, June 3, 1996.

DEVELOPMENTS

17 September 2008

HOLTEC TO COMPLETE CHORNOBYL DRY STORAGE PROJECT

The Ukrainian government and the U.S. company Holtec International have finalized the implementation terms of the Chornobyl dry storage project, *SpentFUEL* reported in September. The new dry storage facility is intended for spent fuel assemblies from the shutdown Chornobyl units 1, 2, and 3, which are presently stored in a wet storage facility. This dry storage facility, reportedly the largest in the world, might eventually provide storage for spent fuel from Ukraine's operational nuclear power reactors, the publication quoted Holtec president Dr. Kris Singh as saying. According to *SpentFUEL*, the company is also assisting Ukraine with back-end management capacity development.

—"Ukrainian government ratifies contract with Holtec for Chernobyl dry storage project," *SpentFUEL*, 21 September 2008.

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31 July 2008

CENTRAL FUEL STORAGE PROJECT IMPLEMENTATION FACES DELAYS

Yuriy Nedashkovskiy, head of Ukraine's Enerhoatom announced on 31 July that Ukraine's centralized fuel storage facility might not be commissioned until 2012, two years later than was originally anticipated. The U.S. company Holtec International is set to design and construct the facility, which would provide dry storage for 2,500 VVER-1000 and 1,100 VVER-440 spent fuel assemblies from the Rivne, South Ukraine, and Khmelnytsky nuclear power plants. The location and design of the facility, however, are yet to be approved by Ukraine's parliament.

—"Ukraine postpones commissioning of nuclear waste storage facility in 2012," Interfax, 31 July 2008. Alexei Breus, Maureen Conley, "Energoatom hires Holtec to prepare three plants for transport casks," *NuclearFuel*, 7 April 2008.

23 June 2008

VEKTOR WASTE DISPOSAL UNIT AT CHORNOBYL LAUNCHED

The first stage of Ukraine's radioactive waste management complex Vektor, a project begun in 1998 and financed by the government of Ukraine, was commissioned on 23 April. The facility is expected to have the capacity to process 19,000 metric tons of radioactive waste and will chiefly be used for the waste currently at Chernobyl. Approximately 10 percent of this capacity, however, might be used for waste from other facilities in Ukraine. Completion of the second stage of the project and hiring of personnel is expected to be completed soon.

—Alexei Breus, "Chernobyl 22 years later: Reactors defueled, sarcophagus stabilized," *Nucleonics Week*, 1 May 2008. "Ukraine launches first nuclear waste disposal unit," RIA Novosti, 23 April 2008.

24 February 2006

OFFICIALS ADDRESS CONCERNS ON PLANNED NUCLEAR WASTE STORAGE FACILITY

On 24 February 2006, Ukraine's Prime Minister Yuriy Yekhanurov provided assurances that the nuclear waste storage facility, slated for construction by the U.S. company Holtec in the Chernobyl area would only be used to store waste from Ukrainian NPPs. Yekhanurov's comments came in light of criticism of the planned facility by Ukrainian politicians — Speaker Vladimir Litvin as well as Ex-Premier Yuliya Tymoshenko. American officials have rushed to explain that the facility would not be used for American spent fuel. Moreover, a fact sheet by the U.S. Embassy in Kiev stressed that conclusion of an agreement with Holtec did not imply that construction would commence, as there was yet a need to complete a feasibility study and an environmental impact study, discuss the issue a local referendum, provide notification to Ukraine's neighbors, and gain the agreement of Ukraine's Parliament, the Verkhovna Rada.

—"Premier says Chernobyl storage facility to accept only Ukrainian waste," ITAR-TASS, 24 February 2006, OSC Document CEOP20060224027100. "Ukraine Central Spent Nuclear Fuel Storage Facility," U.S. Embassy in Kiev Fact Sheet, 23 February 2006, <http://kiev.usembassy.gov>.

26 December 2005

U.S. COMPANY WINS TENDER TO CONSTRUCT NUCLEAR WASTE STORAGE FACILITY IN CHORNOBYL

On 26 December 2005, Energoatom announced that Holtec International won an international tender to construct a solid nuclear waste storage facility for storing spent fuel from the Rivne, South Ukraine, and Khmelnytsky nuclear power plants. According to the signed agreement between the two, Holtec will design, construct, and

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commission the Central Spent Nuclear Fuel Storage Facility, as well as supply used nuclear fuel transport and storage equipment. The tender for construction of the facility was first announced in 2003, and Holtec was chosen amid fervent competition between Russia's Atomstroyexport, France's Framatome, and a Ukrainian firm. The construction of a central repository would allow Ukraine to forego shipping spent fuel from to Russia.

—"Energoatom, Holtec sign contract for construction of nuclear waste storage facility," Interfax, 26 December 2005. "Energoatom and Holtec International Formalize the Contract to Build a Central Storage Facility in Ukraine," Business Wire, 30 December 2005.

28 October 2004

U.S. TO HELP UKRAINE CREATE REGISTER OF RADIOACTIVE SOURCES

On 28 October 2004, Sheila Gwaltney, Deputy Chief of the U.S. Mission to Ukraine, and Vadym Gryshchenko, head of the Ukrainian State Nuclear Regulatory Committee (SNRC), signed a Memorandum of Understanding between the SNRC and the U.S. Department of State on safety and security of radiation sources in Ukraine. The document is based on the *Agreement Between the Government of the United States of America and the Government of Ukraine Regarding Humanitarian and Technical Economic Cooperation* signed on 7 May 1992, and the *Agreement for Cooperation Between the United States of America and Ukraine Concerning Peaceful Uses of Nuclear Energy* signed on 6 May 1998. Under the memorandum, the United States will provide \$250,000, through its Nonproliferation and Disarmament Fund, to help Ukraine further develop the existing State Register for Radiation Sources to track radioactive materials throughout the country. This effort aims to prevent terrorists from acquiring dangerous materials for possible use in so-called dirty bombs. Ukraine inherited a considerable number of radiation sources from the Soviet Union, including sources intended for medical, industrial, and other technical purposes, most of which are still unregistered. According to SNRC spokeswoman Tetyana Kutuzova, each year Ukrainian border guards prevent a number of people from crossing the border with radiation sources that could be used in dirty bombs. Gwaltney believes the register will "play a critical role in consolidating and securing radiological sources." The U.S. funds will be used to strengthen the Ukrainian regulatory infrastructure governing safety and security of radiation sources by:

- supporting the State Register for Radiation Sources, including the creation and support of the Main Registration Center and network of registration centers;
- training personnel in the safety and security of radiation sources; and
- providing other support necessary to implement activities within Ukraine to ensure safety and security of radiation sources and any related activities.

—"Memorandum of Understanding Between the State Nuclear Regulatory Committee of Ukraine and the United States Department of State regarding safety and security of radiation sources in Ukraine was signed on October 28, 2004 in Kiev," State Nuclear Regulatory Committee of Ukraine Web Site, <http://snrcu.gov.ua>. Natasha Lisova, "Ukraine to set up register with U.S. funds to track radioactive material," Associated Press; in CBC News, www.cbc.ca. Anton Vodyanoy, "SShA namereny predostavit Ukraine \$250 tys. na obespecheniye bezopasnosti istochnikov radiatsii," Ukrainski Novini news agency, 4 November 2004, www.ukranews.com. "Goskomitet yadernogo regulirovaniya Ukrainy i Gosdepartament SShA podpisali Memorandum o vzaimoponimani," *Unian* news agency, 4 November 2004; in Integrum Techno, www.integrum.com.

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24 September 2003

RADIOACTIVE MATERIALS INTERCEPTED AT KIEV AIRPORT

Officials at Borispol airport in Kiev seized a package on 23 September 2003 after it was found to be emitting radiation in excess of acceptable norms. The 1.5 kg package, which was addressed to the United States, was emitting radiation measuring 36 microrentgen/hour at a distance of one meter. However, regional Emergencies Ministry officials later told Reuters that the radiation emitted was thousands of times the norm in Kiev, which is reportedly 0.05 milliroentgen/hr. Mykola Karabet of the Emergencies Ministry, meanwhile, said that the package did not present a threat to human health or life. According to another source, customs officials at Borispol airport determined that the package had been sent by a Ukrainian citizen. The seized package is being held in a radioactive materials warehouse at the Borispol airport. An investigation into the incident is underway. [The available information does not clarify the type of radioactive material involved.

—"V aeroportu "Borispol" zaderzhan radioaktivnyy bagazh, adresovanny v SShA," *Obozrevatel*, 24 September 2003; in Integrum Techno, <http://afnet.integrum.ru>. "Iz Ukrainy v SShA pytalis otpravit radioaktivnyuyu posylku," *Fakty i Kommentarii*, 25 September 2003; in Integrum Techno, <http://afnet.integrum.ru>. "Radioactive Parcel Bound for U.S. Seized in Ukraine," Reuters.com, 24 September 2003, www.reuters.com.

7 August 2003

ARREST OF MEN WITH AMERICIUM

A package containing radioactive americium-241 was confiscated by police in Kiev, Ukraine, *ForUm* reported on 7 August 2003. Three suspects were also arrested in connection with the incident. One of the three had been charged in the past with a similar crime. The suspects were stopped in front of a Kiev hotel after police noted their "suspicious behavior." The container with the americium source was in the hands of one of the suspects at the time of the arrest. The radiation inside the container measured 4,500 microrentgen/hr, or 1000 times the norm according to *ForUm*. [The report did not specify the amount of americium-241 involved.] The Ukrainian Interior Ministry, meanwhile, said the radiation emitted from the container itself did not exceed accepted norms. The radioactive source was sent for storage to Kiev's Radon Special Combine. Police are working to determine the origin of the material and what the suspects intended to do with it.

—"Konteyner s ameritsiyem izyatyy v Kieve fonit v 1000 raz bolshe normy," *ForUm*, 7 August 2003; in Integrum Techno database, www.integrum.com. "Ukrainian Police Seize Radioactive Container," *Unian* news agency, 7 August 2003; in Lexis-Nexis Academic Universe, web.lexis-nexis.com.

1 August 2003

KRASNOYARSK ADMINISTRATION WILL NOT ALLOW IMPORT OF UKRAINE'S SPENT FUEL UNTIL DEBT PAID

On 1 August 2003, *Unian* reported that, according to Yuriy Lebedev, head of Russia's International Fuel and Energy Company, which is managing the import of spent nuclear fuel to Krasnoyarsk Kray for storage, the Krasnoyarsk administration will not allow new shipments of spent fuel from Ukraine for storage until Ukraine pays its \$11.76 million debt for 2002 deliveries.

—"Krasnoyarskiy kray otkazhetsya prinitat otrabotannoye yadernoye toplivo iz Ukrainy v sluchaye nepogasheniya 11.76 mln. dollarov dolga," *Unian*, 1 August 2003; in Integrum Techno, www.integrum.com.

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26 July 2003

CESIUM SOURCE DISCOVERED IN LUGANSKAYA OBLAST

Police in Luganskaya Oblast found a sealed container with cesium-137 on the side of a road near the village of Uralo-Kavkaz. Ukraine's Ministry of Emergency Situations reported on 26 July 2003 that the container bore the serial number BGI-90AP1V2, 51 and was manufactured in 1984. Police removed the container, and say it poses no threat to the population or environment. An investigation into the incident is underway.

—"V Luganskoy oblasti na obochine dorogi nayden konteyner s tseziyem," Regions.ru, 26 July 2003; in Integrum Techno, www.integrum.com.

23 June 2003

MEN ARRESTED IN CHERKASSY FOR TRANSPORTING CESIUM

Ukrainian police arrested two men in Cherkassy in June 2003 while checking documents on a road, Pravda.ru reported on 23 June 2003. The article did not specify the date of the incident. The police decided to search the car after noting the nervous behavior of its two occupants. The search yielded a small cylinder, which was marked with a radiation hazard sign and was factory-made. The cylinder was emitting radiation and suspected to contain cesium. Pravda.ru reported that specialists from the Ministry of Emergency Situations (MES) and the Kiev firm Rodon were called to the scene, where they determined that the radioactive container was emitting 4200 microrentgen/hr. The radioactive object was turned over to MES, where it will undergo analysis. The two suspects remain in custody and charges have been filed against them.

—Andrey Lubenskiy, "Ukrainskiye gaishniki poymali...radioaktivnoe taksi," Pravda.ru, 25 June 2003; in Integrum Techno, www.integrum.com.

18 April 2003

ENERHOATOM FORMS COMMITTEE ON CONSTRUCTING SPENT FUEL STORAGE FACILITY

LIGA Online reported on 18 April 2003 that Enerhoatom established a committee to deal with issues related to the construction of a spent fuel storage facility for the South Ukraine, Rivne, and Khmelnytsky nuclear power plants. The committee is headed by Enerhoatom Vice President Yuriy Kovrizhkin and includes representatives of Enerhoatom, Ministry of Fuel and Energy, State Nuclear Regulatory Committee, and the Committee on the Use of Atomic Energy.

—"V NAEK 'Energoatom' sozdan Tendernyy komitet po voprosam stroitelstva KhOYaT dlya Yuzho-Ukrainskoy, Rivnenskoy, i Khmelnitskoy AES," LIGA online, 18 April 2003; in Integrum Techno, www.integrum.com.

20-21 March 2003

UKRAINE TO DEVELOP NUCLEAR WASTE HANDLING PROCEDURES

During a meeting held at the South Ukraine Nuclear Power Plant (NPP) on 20-21 March 2003, representatives of the Ministry of Fuel and Energy, Enerhoatom, the State Nuclear Regulatory Committee, and energy design institutes in Kiev and Kharkiv agreed to develop a unified set of guidelines for handling nuclear waste. According to the Enerhoatom press service, working groups incorporating NPP representatives are to offer proposals on processing and storing radioactive waste, creating a special fund, changing the organizational structure, and coordinating the content of regulatory documents.

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—"V Ukraine vyrabotayut yedinuyu kontseptsiyu obrashcheniya s radioaktivnymi otkhodami," *Obozrevatel*, 21 March 2003; in Integrum Techno, www.integrum.com.

11 April 2002

PRODUCTION OF SPENT FUEL CONTAINERS MAY START IN 2003

The director of the Non-Standard Equipment and Pipeline Plant (NSOIT) at the Zaporizhzhya NPP, Grigoriy Gorodner, announced on 11 April 2002 that his plant may commence production of spent fuel containers as early as 2003. According to Gorodner, Enerhoatom has already made the decision to start production. Although NSOIT, in cooperation with the US firm Duke Engineering and Services will produce 11 such containers in 2002, NSOIT will only manufacture the internal components of the containers, and the complete containers will be produced by the US firm.

—"Ukraina nachinayet stroit otechestvennyye konteynery dlya OYaT," Interfax, 11 April 2002.

1 March 2002

ZAPORIZHZHYA TO STOP SPENT FUEL SHIPMENTS TO RUSSIA IN 2003

Enerhoatom president Yuriy Nedashkovskiy announced on 1 March 2002 that the Zaporizhzhya NPP will start storing all of its spent nuclear fuel at an on-site dry storage facility in 2003. According to Nedashkovskiy, this will permit Ukraine to halve its shipments of spent fuel to Russia and save Ukraine \$40 million annually. Nedashkovskiy also said that Ukraine is considering building a spent fuel storage facility at each Ukrainian NPP, or constructing a storage facility in the Chernobyl NPP zone. Reportedly Enerhoatom is favoring the latter project.

—"Zaporozhskaya AES v 2003 godu otkazhetsya ot vyvoza otrabotannogo yadernogo topliva v Rossiyu," Interfax, 1 March 2002.

18 August 2001

LOADING OF ZAPORIZHZHYA DRY STORAGE CONTAINERS BEGINS, TESTING PERIOD TO BEGIN 6 SEPTEMBER 2001

Loading operations began on 18 August 2001 to fill three dry storage containers with spent fuel. Each container will be loaded with 22 spent fuel assemblies and will have an overall weight of 20t. Loading operations are expected to be completed on 6 September 2001, when a one-year testing period for the containers will begin. A total of 380 containers are planned to be completed with a service life of 50 years, after which the fuel will either be processed or buried. According to local administration sources, the new containers will reduce expenses for fuel storage by a factor of 10, and will save Ukraine up to \$10 million a year. Currently, spent fuel storage costs \$350/kg to transport it to Russia. Costs for transporting spent fuel to Russia in 2001 alone are expected to be \$64.2 million. Onsite storage at Zaporizhzhya will reduce the cost to \$32/kg and save the six operating nuclear power units in Ukraine up to \$40 million a year.

—"Na Zaporozhskoy AES nachalas zagruzka pervogo konteynera sukhogo khranilishcha otrabotannogo yadernogo topliva," *Unian*, No. 34, 18 August 2001. "Na Ukraine vvedena v ekspluatatsiyu pervaya ochered khranilishcha yadernogo topliva na Zaporozhskoy AES," Interfax, 21 August 2001.

23 March 2001

CABINET OF MINISTERS APPROVES CHORNOBYL LIQUID RADIOACTIVE WASTE PROCESSING PROJECT

The Cabinet of Ministers approved plans to construct a liquid radioactive waste processing plant at the Chernobyl

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NPP site. For more information, see the March, 23, 2001 entry in the Chernobyl Spent Fuel And Radioactive Waste Developments file.

20 March 2001

TEST OPERATION OF DRY STORAGE CONTAINERS AT ZAPORIZHZHYA MAY START BY END OF JUNE 2001

Interfax reported on 20 March 2001 that three dry storage containers for spent nuclear fuel, located at the Zaporizhzhya NPP, may begin test operation by the end of the first half of 2001. The announcement was made by Enerhoatom Executive Director Viktor Stovbun. Test operation is to last one year, during which time 66 spent fuel assemblies will be stored in three dry storage containers. While the spent fuel containers were originally scheduled for experimental operation in July 2000, local authorities have blocked the issue of necessary permits, although the facility has already received its operating license for test use. As of March 2001, the first three containers had been manufactured by the US firm Duke Engineering and Services, 11 more were being manufactured in the United States and Ukraine, and all additional containers were to be produced in Ukraine. The Zaporizhzhya NPP dry storage facility can accommodate up to 380 dry storage containers, reportedly enough to store all spent fuel generated by the NPP during its service life. Dry storage containers will be used to store spent fuel for up to 50 years.

—"Topливо v sukhiye khranilishcha na Zaporozhskoy AES, vozmozhno, budet zagruzheno v I polugodii," Interfax, 20 March 2001.

5 March 2001

ENERHOATOM AND GERMAN FIRM NUKEM SIGN CONTRACT TO CONSTRUCT WASTE TREATMENT FACILITY AT CHORNOBYL NPP

On 5 March 2001, Enerhoatom and the German firm *Nukem* Nuklear GmbH signed a contract to construct a radioactive waste treatment facility at the Chernobyl NPP.

26 January 2001

NUCLEAR WASTE TREATMENT FIRM TO BE FORMED

Unian reported on 26 January 2001 that a state enterprise is being established in Dniprodzerzhynsk in order to treat nuclear waste created in the process of uranium enrichment activities. Called Baryer, the new enterprise is being created out of assets belonging to the Dnipro Basin Chemical Plant, which is undergoing restructurization. Baryer's responsibilities will include land recultivation, radiation monitoring, and radioactive decontamination of production facilities used for uranium enrichment. The new enterprise is expected to begin its operations in 2002, in cooperation with the Promtekhnologiya Scientific Research Institute in Zhovti Vody. It will be headed by Dnipro Basin Chemical Plant's former Chief Radiologist and Ecologist, Viktor Lebedev. The amount of nuclear waste accumulated at the Dnipro Basin Chemical Plant is estimated at 36 million tons.

—"V Dneprodzerzhynske stvayetsya gospredpriyatiye dlya rekultivatsii otvalov byvshego proizvodstva obogashchennogo urana," *Unian*, 26 February 2001; in Integrum-Techno, www.integrum.ru. "V Ukraine 7 tys. 541 obekt potentsialno opasen dlya zhizni i deyatelnosti lyudey," *Unian*, 26 February 2001; in Integrum-Techno, www.integrum.ru.

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1 August 2000

UKRAINE TO DELIVER SPENT NUCLEAR WASTE TO RUSSIA

Ukraine will deliver \$79.8 million worth of spent nuclear fuel to Russia in 2000. Spent fuel from Ukraine's 11 VVER-1000 reactors will be sent to the Mining and Chemical Combine in Zheleznogorsk (Krasnoyarsk-26) while fuel from Rivne NPP's VVER-440 reactors will be transported to the Mayak Chemical Combine. Only waste from the Chernobyl NPP RMBK-1000 reactors will remain in Ukraine and will be stored locally. Enerhoatom, which is implementing the spent fuel deliveries, has already paid Russia \$14.7 million for transporting the spent fuel. —"Ukraina gotova platit za yadernyye otkhody," *Vremya MN*, <http://news.mosinfo.ru>, 1 August 2000. Raisa Stetsyura, ITAR-TASS, 31 July 2000; in "Ukraine to deliver USD80 m worth of spent nuke fuel to RF," Lexis Nexis Academic Universe, web.lexis-nexis.com.

5 June 2000

UKRAINIAN GREEN PARTY PROTESTS AGAINST NUCLEAR WASTE STORAGE AT ZAPORIZHZHYA NPP

The Nikopol organization of the Green Party of Ukraine issued a statement on 5 June 2000 protesting against the plan to store spent nuclear fuel at the Zaporizhzhya NPP. The statement expressed concerns that the storage facilities are located in a potential flood zone in a densely populated region of Ukraine. Moreover, according to the statement, Zaporizhzhya NPP already has the second largest accumulation of nuclear waste in Ukraine, after Chernobyl, with 14,000 cubic meters of radioactive waste.

—"Partiya zelenykh Ukrainy protestuyet protiv vvedeniya v ekspluatatsiyu khranilishch yadernykh otkhodov na Zaporozhskoy AES," Interfax, No.3, 5 June 2000.

22 May 2000

GOVERNMENT COMMISSION APPROVES TESTING OF DRY STORAGE CONTAINERS AT ZAPORIZHZHYA NPP

ITAR-TASS reported on 22 May 2000 that a government commission headed by Enerhoatom president Volodymyr Bronnykov approved the testing of dry storage containers for spent nuclear fuel at the Zaporizhzhya NPP. As of May 2000 there were three containers at Zaporizhzhya; another 11 are to be completed before the end of 2000. —ITAR-TASS, 22 May 2000; in "Ukrainian Spent Nuclear Fuel Storage Ready for Testing," FBIS Document CEP200005233000045.

7 May 2000

ENERHOATOM CONFIDENT THAT GOVERNMENT WILL APPROVE DRY STORAGE SITES AT ZAPORIZHZHYA NPP

30 March 2000

US FUNDING AIDS JOINT UKRAINE-RUSSIA CLEANUP PROJECT AT CHERNOBYL

On 30 March 2000, Georgiy Manelis, the deputy director of the Institute of Chemical Physics of the Russian Academy of Sciences, stated that Russia and Ukraine would cooperate in a cleanup project at the Chernobyl NPP. The project will focus on storage and burial of combustible radioactive waste in the Chernobyl area. Russian scientists have raised doubts as to the safety of simply burying the waste and have suggested incinerating the waste and then burying the remains as the only safe alternative. Scientists from the United States are assisting their Ukrainian and Russian counterparts. The US government has already donated \$300,000 to the Russians and

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\$325,000 to the Ukrainians for the development of the project.

—"Rossiya i Ukraina razrabotali proyekt likvidatsii posledstviy chernobylskoy avarii," Interfax, 30 March 2000.

14 March 2000

UKRAINE SUGGESTS SENDING RUSSIAN SPENT IONIZING RADIATION SOURCES BACK TO RUSSIA

On 14 March 2000, *Unian* reported that the Ukrainian Nuclear Regulatory Administration (NRA) suggested that spent Russian-made sources of ionizing radiation should be sent back to Russia. The origin of the spent materials, whether from civilian or research facilities, was not made clear in the article. The NRA presented its proposal to Russia's Ministry of Atomic Energy (Minatom), which is responsible for overseeing the transfer and storage of radioactive sources.

—"Ukraina predlagayet vozvrashchat k Rossii otrabotannyye istochniki ioniziruyushchego izlucheniya rossiyskogo proizvodstva," *Unian*, 13-19 March 2000, No. 11.

March 2000

LICENSING OF DRY STORAGE SITE PUT ON INDEFINITE HOLD

Vladimir Shidlovskiy, head of the nuclear fuel cycle department of Russia's Ministry of Atomic Energy, stated in a March 2000 *Unian* article that dry storage containers meant to temporarily hold spent nuclear fuel had not been licensed by the Nuclear Regulatory Administration of Ukraine. Three containers have already been commissioned at the Zaporizhzhya NPP. Fourteen are to be constructed there by the end of 2000. Each container has the capacity to store 24 fuel assemblies. The 64,186 square meter concrete storage platform being built at Zaporizhzhya is designed to accommodate 380 containers. According to Enerhoatom President Volodymyr Bronnykov, the dry storage containers would allow Ukraine to store waste onsite at its NPPs temporarily while deciding what to do with the waste. One Ukrainian nuclear expert questioned the incentives of politicians who find it more profitable to pay up to \$100 million a year to Russia than to build dry storehouses for nuclear waste in Ukraine. The Zaporizhzhya NPP plans to build a total of 380 waste containers at an overall cost of \$85 million. Shidlovskiy also noted that rumors about an agreement between Ukraine, Russia, and Kazakhstan concerning the construction of a storage facility in Ukraine were untrue.

—"Obretneniya Ukrainoy nezavisimosti vyvoz otrabotannogo yadernogo topliva v RF proizvoditsya na kommercheskoy osnove," *Unian*, 13-19 March 2000, No. 11. "Decision on licensing operation of storage facilities for nuclear fuel wastes in Ukraine put off for uncertain period," Interfax-Ukraine Business Panorama, 28 February-6 March 2000, Issue 371; in "Ukraine Business Panorama for 6 March 2000," 7 March 2000, FBIS Document CEP20000307000053.

November 1999

UKRAINE AGREES TO ALLOW SPENT FUEL FROM BULGARIA TO TRANSIT UKRAINE

—Ann MacLachlan, "Bulgaria Exploring Spent Fuel Options If Shipments Through Moldova Delayed," *NuclearFuel*, Vol. 24, No. 22, 1 November 1999.

8 September 1999

NEWS REPORT ALLEGES THAT BLACK SEA FLEET BURIED RADIOACTIVE WASTE IN SEVASTOPOL

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June 1999

UKRAINE EXAMINES RADIOACTIVE WASTE DISPOSAL OPTIONS

Ukrainian experts are examining various disposal options for the large quantities of radioactive waste, spent nuclear fuel, and waste from the Chornobyl sarcophagus and restricted zone that have accumulated in Ukraine. Through examination of Ukraine's territory, geological formations suitable for underground storage have been identified. Temporary storage solutions and cost effectiveness are also being considered. The long-term solutions being investigated include locating a deep storage facility in crystalline masses within the boundaries of the Chornobyl restricted zone, burying the waste in deep boreholes, and using natural or man-made subsurface caves. Although the first option does not present any socio-political complications, it does not meet IAEA environmental and geological criteria. The second option does not take into consideration horizontal tectonic movements that could damage the storage shafts. Of the natural subsurface caves, salt mines in Donbass are the most acceptable location for an underground radioactive waste storage due to their capacity, composition, geomechanical properties, socio-political factors, and low cost.

—Oleksandr Hudyma, Volodymyr Pinchuk, and Dmytro Khrushchov, "What To Do With Radioactive Wastes? — A Program for the Burial of Wastes From Nuclear Power Plants and Nuclear Fuel is Being Developed," *Holos Ukrainy*, 16 June 1999, p. 7; in "Nuclear Waste Disposal Options Viewed," FBIS Document FTS19990629001861.

12 February 1999

UKRAINE PLANS CONSTRUCTION OF SECOND FUEL STORAGE FACILITY

A tender is scheduled to take place in March 1999 for the construction of a second storage facility for processed nuclear fuel from the Chornobyl (Chernobyl) nuclear power plant (SVYAP-2). Planning for the project will be financed by an ECU 118 million (\$133 million) grant from the European Bank for Reconstruction and Development (EBRD). The storage facility is planned to be built by 2001. The site has not yet been determined, but four potential sites are being considered. Ukraine's Energy Ministry and Enerhoatom suggest building SVYAP-2 near the already existing storage site at Chornobyl. The nuclear control commission, however, objects to this proposal due to high pollution, dust dispersion, and radiation risks associated with the Chornobyl sarcophagus. Instead, the commission proposes that the storage facility be built near the partially constructed fifth and sixth reactor units of the Chornobyl nuclear power plant. The commission experts view this location as economically and technically feasible.

—*Unian*, 12 February 1999; in "Tender to Be Held for Construction of Nuclear Storage Facility," Lexis-Nexis Academic Universe, web.lexis-nexis.com.

February 1999

RUSSIA RESUMES ACCEPTANCE OF UKRAINE'S SPENT NUCLEAR WASTE

Russia resumed accepting spent nuclear fuel shipments for processing from Ukraine after a dispute over a price for the service. The administration of Krasnoyarsk Krai agreed that the Mining and Chemical Combine in Zheleznogorsk will accept Ukraine's nuclear waste at \$330 per kilogram. Although this price is \$45 per kilogram higher than last year, it is still below the world price of \$700-1000 per kilogram and below Krasnoyarsk Krai Governor Aleksandr Lebed's proposal of \$500 per kilogram.

— Oleksiy Breus, "Wastes... On Reserve," *Vecherniy Kyiv*, p. 5, 24 February 1999; in "Nuclear Waste Disposal

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Alternatives Eyed," FBIS Document FTS19990314000400. "Ukraine Owes Russia \$12.4 Mln For Storing Used Nuclear Fuel," Interfax, 27 January 1999.

6 January 1999

KRASNOYARSK DECISION PROMPTS UKRAINE TO ACCELERATE PLANS FOR SPENT NUCLEAR FUEL STORAGE FACILITY

The announcement by the administration of Krasnoyarsk Kray in Russia that it will no longer accept spent nuclear fuel for storage has spurred Ukrainian officials to announce that Ukraine will build a domestic nuclear fuel storage facility by the year 2000. The storage facility will be built at the Zaporizhzhya nuclear power plant. According to officials, both the transportation infrastructure and the necessary storage technologies have long been in place, but insufficient funding prevented completion of a storage facility by 1999. The cost of finishing the facility at Zaporizhzhya is comparable to what Ukraine would have had to pay Krasnoyarsk's Mining and Chemical Combine (GKhK for storage and reprocessing, approximately \$91 million. Russia's Minister of Atomic Energy and the management of GKhK have argued that Ukraine's price was more or less competitive, and that Russia would endure a major setback in the spent nuclear fuel storage and reprocessing business if it blocked fuel from Ukraine. Underlying this reasoning is not only the need for revenue, but also the desire to keep Ukraine's nuclear industry dependent on Russia.

—ITAR-TASS, 6 January 1999; in "Ukraine to Build Spent Nuclear Fuel Storage Facility," FBIS-SOV-99-006. "Lebed Pressures Ukraine's Nuclear Power Industry," *Jamestown Monitor*, 7 January 1999.

5 January 1999

RUSSIAN MINISTER OF ATOMIC ENERGY TRAVELS TO KRASNOYARSK TO INVESTIGATE SPENT NUCLEAR FUEL DISPUTE

Russian Minister of Atomic Energy Yevgeniy Adamov traveled to Krasnoyarsk Kray on 5 January 1999 to urge the region's governor, Aleksandr Lebed, to accept Ukrainian spent nuclear fuel. Adamov stressed that in not doing so, Krasnoyarsk was endangering Russia's position in the spent nuclear fuel storage and reprocessing market. He said that the low price Ukraine was paying for nuclear fuel storage and reprocessing was part of a temporary agreement and that the fee would be increased later. Ukraine currently pays less than \$300 per kilogram to have its spent nuclear fuel stored and reprocessed in Russia.

—"Russian Nuclear Chief Argues for Accepting Nuclear Waste" Associated Press, 5 January 1999 in Lexis-Nexis Academic Universe, web.lexis-nexis.com. "Adamov Says Russia Should Expand Reprocessing of Spent Nuclear Fuel," BBC Summary of World Broadcasts, 6 January 1999; in Lexis-Nexis Academic Universe, web.lexis-nexis.com.

17 November 1998

RUSSIA ANNOUNCES IT WILL NO LONGER ACCEPT UKRAINIAN SPENT FUEL FOR STORAGE

As a result of the announcement on 17 November 1998 by the administration of Krasnoyarsk Kray that it will no longer accept spent nuclear fuel for storage, the Leningrad, Balakovo, Kalinin, Kursk, and Smolensk nuclear power plants in Russia and the Zaporizhzhya nuclear power plant in Ukraine must halt the transport of RBMK spent nuclear fuel to Krasnoyarsk's Mining and Chemical Combine (GKhK). The kray administration is upset with the fact that it only receives \$275 per kilogram of waste while the international rate is \$800-\$1000 per kilogram. The administration has also called for an independent evaluation of the facilities at GKhK, due to fears that the storage facilities may be overfilled. As a result of the decision not to accept the nuclear fuel, the territory will lose about

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200 million rubles (approximately \$10.7 million) in revenue. GKKh Managing Director Valeriy Lebedev fears that Ukrainian nuclear authorities would be unwilling to agree to pay twice as much for storage, and West European enterprises involved in storage and reprocessing of spent nuclear fuel might be willing to offer Ukraine more advantageous terms. According to *Segodnya*, Deputy Governor of Krasnoyarsk Krai for Ecology Aleksandra Kulenkova announced that three conditions must be met by the Russian and Ukrainian governments before additional nuclear waste is accepted: 1) fees for storing and reprocessing the spent nuclear fuel must be pre-paid in dollars; 2) the price per kilogram must be no lower than \$500; and 3) Krasnoyarsk must be able to participate in negotiating all intergovernmental agreements between Kiev and Moscow on the question of nuclear fuel storage and reprocessing. Since the Ministry of Atomic Energy (Minatom) does not want to consider the krai's opinion in this matter, the krai has begun proceedings in the Constitutional Court against Minatom. The situation has become so heated that the Minister of Atomic Energy Yevgeniy Adamov is planning a visit to the region in an attempt to meet with the Governor of Krasnoyarsk Krai Aleksandr Lebed and settle the dispute.

—Tatyana Golubovich, "Krasnoyarsk Krai Has Declared Boycott on Nuclear Waste," *Kommersant*, 18 November 1998, p. 4; in "Krasnoyarsk Krai Refuses Nuclear Waste," FBIS Document FTS19981119000338. Yuriy Khots, ITAR-TASS, 1 December 1998; in "Russian Plant Unable to Accept Ukraine's Spent Nuclear Fuel," FBIS-TAC-98-335. Igor Saskov, "V Krasnoyarskom kraie mozhet poyavitsya Chernobyl na kolesakh," *Segodnya*, www.ipres.ru, 28 November 1998.

June 1998

US PROVIDES AID FOR DISPOSAL OF NUCLEAR WASTE

As a result of material and technical aid provided by the United States, Ukraine is now able to manufacture containers for its spent nuclear fuel. The containers, made of concrete, are hermetically sealed and measure approximately three meters in diameter. Once the new containers are filled with spent fuel, they will be stored at specially constructed concrete sites located near nuclear power plants. The first three containers, designed by the US companies Duke Engineering and Services and Sierra Nuclear Corporation, will be manufactured at the Zaporizhzhya nuclear power plant, and will contain spent fuel from that facility. It is hoped that the use of such containers will be extended to Ukraine's other nuclear power plants in the future. The Pacific Northwest National Laboratory took part in the technology transfer under terms of the US Department of Energy's International Nuclear Safety Program.

—"Ecosafety: Sarcophagi—For Soviet Technology. From the US..." *Vecherniy Kyiv*, 17 June 1998; in "US Provides Nuclear Waste Disposal Aid," FBIS-SOV-98-204. "Improving Safety Through Dry Storage of Spent Fuel," Pacific Northwest National Laboratory Press Release, www.insp.pnl.gov. AP Worldstream, 4 November 1998; in "Official: Ukraine May Stop Sending Spent Nuclear Fuel to Russia," Lexis-Nexis Academic Universe, web.lexis-nexis.com.

January 1997

KHARKIV AND US NATIONAL LABORATORIES COLLABORATE ON NEW FORM OF RADIOACTIVE WASTE PROCESSING

The US Los Alamos National Laboratory and Ukraine's Kharkiv Institute of Physics and Technology are collaborating on a project involving a reactor that would transmute radioactive waste into short-living or safe isotopes, which would, in turn, quickly decay into non-radioactive compounds. Nuclear research centers in Russia, Sweden, and the Czech Republic will also participate. In a separate project, Ukraine's Kharkiv Institute of Physics and Technology

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and the US Lawrence Livermore National Laboratory are cooperating on the development of an automatic, "absolutely safe," underground nuclear reactor, which will operate at a depth of 150 meters and produce very little waste.

—Vladimir Fomenko, ITAR-TASS, 14 January 1997; in "Former Weapons Center Cooperating with US Laboratories," FBIS-SOV-97-010.

6 June 1996

UKRAINE NEGOTIATES WITH G-7 ON STORAGE FACILITY

Negotiators for Ukraine and the G7 reported that assistance agreements will be signed in 7/96 to build a storage facility for spent nuclear fuel and recycling plants.

—INTERFAX, July 6, 1996; in "Ukraine: G-7, Ukrainian Experts Disagree Over Chornobyl Shutdown," FBIS-SOV-96-111, July 6, 1996.

June 1996

MINISTER KHOLOSHA ANNOUNCES CRITICAL STATE OF RADIOACTIVE WASTE MANAGEMENT

After working with Duke Engineering on procurement of dry storage casks at Zaporizhzhya, Derzhkomatom is considering storage option for the other nuclear power plants through its engineering institute in Kiev, ENERGOPROYEKT. According to the Minister of Chornobyl Affairs, Volodymyr Kholosha, the state of radioactive waste management in Ukraine is critical. Waste often accumulates in places not suitable for storage. Radioactive materials are being moved illegally, ionizing sources are being misused, documented dates do not match real situations, sources are being stolen or lost, and radiation accidents are taking place.

—Peter Coryn, "Ukraine Government Passes Waste Plan, but Hitch Delays Implementation," *Nuclear Fuel*, July 3, 1996.

24 May 1996

TACIS WILL FINANCE UKRAINIAN WASTE DEPOSITORY

Environmental Minister Yuriy Kostenko announced that Ukraine will possess its own radioactive waste depository in 30 to 50 years. Its construction will be partially financed by the TACIS organization.

—INTELNEWS, May 26, 1996; in "Ukraine: Problems of Disposal of Nuclear Fuel Waste Viewed," FBIS-TEN-96-006, May 24, 1996.

28 April 1996

G-7 AID FOR IMPROVEMENT OF RADIOACTIVE WASTE MANAGEMENT

The G7 is providing \$11 million for improvement of radioactive waste management in Ukraine. This aid will be used for waste management training, radiation monitoring and detection equipment, and nuclear power plant liquid waste treatment.

—"Summary of G-7 Efforts On Nuclear Safety," *The Ukrainian Weekly*, April 28, 1996, p. 3.

23 April 1996

STATE PROGRAM TO HANDLE RADIOACTIVE WASTES IN UKRAINE IS APPROVED

The Presidium of the Cabinet of Ministers of Ukraine approved a state program to handle radioactive wastes in

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Ukraine from 1996-2005. According to the program, the Ministry of Chornobyl Affairs will be in charge of this project. The program includes measures to transform the sarcophagus surrounding Chornobyl Unit 4 into an ecologically safe facility. The program also includes plans to form a state fund for the handling of radioactive waste. This fund will be developed based on the resources of all organizations which produce radioactive wastes.
—CISNP Communications with Volodymyr Chumak, May 1996.

7 March 1996

ONLY ONE COMPANY LICENSED TO HANDLE RADIOACTIVE WASTE IN UKRAINE

Radon Facilities and Waste Management is the only company in Ukraine licensed to deal with radioactive waste from industry and science. The company does not accept radioactive waste from nuclear power plants.

—CISNP Discussions with Ukrainian nuclear official, March 7, 1996.

January 1996

UKRAINE HAS TECHNOLOGICAL CAPABILITY TO REPROCESS NUCLEAR MATERIALS

According to a recent study, Ukraine has the technological capabilities necessary to reprocess nuclear materials should it decide to do so in the future.

—Valentin Zakharov, Andrey Sviridov, and Ildar Akchurin, "Sostoyaniye Oruzheynogo Kompleksa V Stranakh Blizhnego Zarubezhya," *Yadernyy Kontrol*, January 1996, p. 15-23.

November 1995

CONFERENCE ON REMOVING AND STORING RADIOACTIVE WASTE

Derzhkomatom, the Ministry of Environmental Protection and Nuclear Safety, the Academy of Sciences, the State Committee for Geology, and the Institute of Geologic Sciences held a conference on ways to remove and store radioactive waste. During the conference, the results of regional studies were considered.

—"Vydalennya Radioaktyvnykh I Toksichnykh Vidkhodiv," *Zeleni Svit*, November 1995, No. 11(90), p. 2.

November 1995

US NUCLEAR REGULATORY COMMISSION ESTABLISHES CONTROLS OVER RADIOACTIVE MATERIALS

About two-thirds of Norway's nuclear assistance (expected to be \$20 million for all countries in 1995) is focused on nuclear waste management and radiation protection. In addition, the US Nuclear Regulatory Commission is providing Ukrainian and Russian personnel with assistance to establish regulatory controls over nuclear waste, spent fuel, and other radioactive materials.

—"Nuclear Safety: Concerns with Nuclear Facilities and Other Sources of Radiation in The Former Soviet Union," *GAO Report to the Honorable Bob Graham*, US Senate, November 1995, p. 29.

2 October 1995

UKRAINE INTENDS TO BUILD REPROCESSING PLANT

Mykhailo Umanets reported at a news conference that Ukraine intends to build a nuclear reprocessing plant. This announcement came soon after news that the G-7 had rejected the Ukrainian proposal to build a gas-fired power station in Slavutych. According to Umanets, without a reprocessing plant, Chornobyl can not be closed. This revised plan was presented to the Verkhovna Rada on 10/11/95 by Yevhen Marchuk, who said that financing had

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to be settled by December.

—"Ukraine Asks Canada to Press G7 on Chornobyl," *Reuter*, 10/2/95. "Ukraine, G7 In New Talks To Close Chornobyl," *Reuter*, October 11, 1995.

October 1995

NUCLEAR WASTE WILL BE STORED AT 12 SITES

Ukraine has selected 12 possible sites (four in the north and eight in the central Dnieper basin) for storage of nuclear waste. According to Dmitro Khrushchov, head of the Institute of Geological Sciences at the Academy of Sciences, a proposed 100,000 cubic meter repository will be capable of holding all NPP waste plus that arising from Chornobyl clean-up and decommissioning.

—"Repository Sites," *Nuclear Engineering International*, p. 12.

August 1995

UKRAINE NEEDS TO DEVELOP OWN NUCLEAR WASTE STORAGE

One of two environmental laws now in effect in Ukraine deals with the problem of processing spent fuel. Russia came to a temporary decision to allow processing of spent fuel assemblies from Ukrainian NPPs and to allow limited long-term fuel storage. However, according to the General Director of the Eastern Mining and Conversion Combine, Mykhailo Babak, for the long-term Ukraine will need to develop nuclear waste storage of its own.

—Interview with Mykhailo Babak, "The General Director Speaks," *Nukem*, August 1995, p. 16.

20 July 1995

GREAT AMOUNT OF WASTE PRODUCED BY UKRAINIAN ENTERPRISES

Ukrainian nuclear power plants have amassed more than 60 million cubic meters of waste and the uranium industry has produced another 50 million cu. m. Approximately 8,000 hectares of productive land near uranium mines and mills have been exposed to contamination. Around 5,000 Ukrainian enterprises outside the nuclear industry use radioactive materials.

—Alex Brall, "Ukrainian Parliament Passes Law on Radioactive Waste Management," *Nucleonics Week*, July 20, 1995, pp. 14-15.

19 July 1995

UKRAINIAN SPENT NUCLEAR FUEL WILL BE REPROCESSED AT KRASNOYARSK FACILITY

Spent nuclear fuel from Ukrainian reactors will be reprocessed at a facility (the RT-2 reprocessing plant) to be built near Krasnoyarsk and solidified reprocessing wastes will be returned to Ukraine. More than 4,000 spent nuclear fuel assemblies are currently being stored at Ukraine's nuclear power stations. The first truckloads of spent fuel destined for Russia have been sent from the Zaporizhzhya and South Ukraine nuclear power stations. According to Nur Nihatullin, First Deputy Chairman of the Derzhkomatom, shipping the first 144 spent nuclear fuel assemblies by rail to Russia was more expensive than storing them on its own territory. To this end, SCUEA has begun a project with the Duke Engineering and Services, Inc. to increase storage capacity in existing pools. Duke will also help design and build casks for dry storage. They are currently "re-racking" storage pools to use space more effectively. Zaporizhzhya, Rivne, and South Ukraine NPPs will soon send a second batch of spent nuclear fuel to Krasnoyarsk-26 to be processed and glazed.

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—*Unian* (KIEV), July 8, 1995; in "Transfer of Exhausted Nuclear Fuel to Russia Resumes," FBIS-SOV-95-131, July 8, 1995. "Ukraine Restarts Spent N-Fuel Shipments to Russia," *Nucnet*, July 17, 1995.

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Western Aid: 2001-1994

5 March 2001

ENERHOATOM AND GERMAN FIRM NUKEM SIGN CONTRACT TO CONSTRUCT WASTE TREATMENT FACILITY AT CHORNOBYL NPP

On 5 March 2001, Enerhoatom and the German firm NUKEM Nuclear GmbH signed a contract to construct a radioactive waste treatment facility at the Chornobyl NPP.

15 December 2000

UKRAINE SHUTS DOWN FINAL REACTOR AT CHORNOBYL, SEEKS COMPENSATION

On 15 December 2000, Unit 3, the last operating reactor at the Chornobyl nuclear power station, was officially shut down permanently by the head engineer in front of news cameras.

24 July 1997

FRENCH-BRITISH-GERMAN TEAM WINS CHORNOBYL CONTRACT

The European Commission has awarded a contract to manage decommissioning and solid waste cleanup at the Chornobyl nuclear power plant (NPP) to a consortium headed by SGN-Eurisys. Funded by TACIS, the project initiates an "on-site assistance team" (OSAT) to begin working for an initial three-year period, renewable for a subsequent two-year term. The other OSAT winners who will work with SGN include AEA-Technology and Energiewerke Nord GmbH. The contract signifies the first time, after years of performing off-site studies, that the companies will work on location, as stated by Henri Zaccai, director of international nuclear business for SGN. The consortium will focus its efforts on three main goals: development of specifications for facilities and equipment for decommissioning; oversight of design and construction of TACIS program waste treatment and other facilities; and preparation for the shutdown and cleanup of Units 1, 2, and 3. According to Zaccai, the consortium will also assist in compiling licensing documents for Chornobyl decommissioning. The \$5.4 million OSAT project is the second part of a greater plan envisioned by the G-7, the European Commission, and Ukraine for the proposed closure in 2000. The first, funded by the Nuclear Safety Account and awarded to Westinghouse and subcontractors NNC and Kievenergoprojekt, addresses interim spent fuel storage, effluent treatment, and short-term safety upgrades. In June 1997, the G-7 allocated \$300 million towards the third part of the plan, which concerns stabilization of the sarcophagus.

—Ann Maclachlan, "SGN-Eurisys Consortium Wins Bid for EC Aid to Chernobyl Shutdown," *Nucleonics Week*, 24 July 1997, pp. 13-14.

21 July 1997

LAST REACTOR AT CHORNOBYL SHUT DOWN FOR REPAIR

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Unit 3, the last operating 1,000 MW reactor at the Chernobyl nuclear power station, was shut down on 21 July 1997 for intermediate overhaul and routine maintenance. Originally expected to be out of commission for only 70 days, Unit 3 may now stay idle for months. Borys Kutsenko, responsible for the centralized repair and maintenance facility at Chernobyl, asserts that maintenance may take longer than expected because of "weak logistical support" and the unavailability of vital Russian-made spare parts and equipment. Presently the station has only 25 percent of the replacement materials it needs to complete the overhaul. The most important tasks, according to Kutsenko, involve the replacement of pipelines, thermal equipment, and fuel channels. This present closure of Unit 3, however, undermines Ukraine's negotiating position with respect to postponing the closure of the entire Chernobyl facility if foreign aid for shut down does not materialize.

—Unian, 21 July 1997, in "Ukraine: Sole Operational Chernobyl Reactor Shut Down for Overhaul," FBIS-SOV-97-202, 21 July 1997. Sander Thoenes, "Last reactor shut for repair," *Financial Times*, 23 July 1997, p. 2.

4 July 1997

EBRD AGREES TO NEW STUDIES

Despite the February 1997 release of an EBRD independent study critical of the feasibility of completing Khmelnytsky-2 and Rivne-4 as part of the overall Chernobyl shutdown scheme, G-7 nations continue to push the EBRD towards releasing \$370 million to Ukraine for the project. While the G-7 is eager for both the closure of Chernobyl and prevention of increased Ukrainian dependence on Russian gas, the EBRD has specific least-cost guidelines that the Chernobyl project does not meet and is hesitant to release what would be its largest loan to date. Adding further pressure on the EBRD are engineering companies in the US, Germany, and France, who are anxious for contracts to build the new Ukrainian reactors to compensate for decreasing demand in their own countries. The bank's reluctance continues to be controversial, as the G-7 and the European Commission dismissed the 'least-cost study' as incomplete. Still, the EBRD contends that the study shows unrealistic assumptions about demand for electricity in Ukraine by failing to acknowledge that many of the country's largest energy consumers, specifically defense and heavy industry, are now defunct. One alternative raised at an EBRD shareholder meeting was to ease or waive the bank's least-cost requirement. Mr. Jacques de Larosiere, the bank president, afraid of destroying the EBRD's triple-A credit rating, opposed this option. Mr. Heiner Luschin, EBRD director for Austria, asserts that funding a non-least-cost project would mean a change of policy and he would prefer the bank not diverge from its guidelines. Instead, the member states have agreed for the EBRD to conduct new feasibility studies concentrating on funding for one substitute plant and on alternative fossil fuel or conservation options. It is unlikely that new conclusions will support plans for both nuclear plants.

—Sander Thoenes, "Risk of delay in Chernobyl shut-down," *Financial Times*, 4 July 1997, p. 3. Sander Thoenes, "EBRD pressed over nuclear loan," *Financial Times*, 27 June 1997, p. 3.

27 June 1997

CHORNOBYL UNIT 1 FORMALLY CLOSED

On 27 June 1997 the Ukrainian government decreed that Chernobyl-1 be permanently shut down and placed the Ministry of Energy [sic] [Ministry of Atomic Energy] in charge of the decommissioning project. Unit 1 closed temporarily for a detailed inspection on 30 November 1996. Ukraine ultimately determined that the several million dollars of repairs necessary to secure safety at the reactor would exceed the amount of revenue from its operation

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until 2000, when Ukraine is obligated under the December 1995 Memorandum of Understanding (MOU) to shut down Chernobyl permanently. Investigation of the fuel channels revealed a gap at the top between zirconium alloy pressure tubes and graphite sleeves, which would require six months of extensive retubing. Preparations for final closure will be completed in the next three months. Minister of Environmental Protection and Nuclear Safety Yuri Kostenko expressed concern over Ukraine's ability to meet obligations to shut down Chernobyl completely without more money for the \$700 million sarcophagus project, above and beyond the \$300 million committed by the G-7, and without the release of EBRD loans to finish Khmelnytsky-2 and Rivne-4.

—"Chernobyl-1 formally closed, to be commissioned," *Nuclear News*, August 1997, p. 31. "Chernobyl to Shut Down Ahead of Schedule," *Izvestiya-Ukraina*, 1 July 1997, p. 1; in "Ukraine: Chernobyl's No. 1 Power Unit to Close Ahead of Schedule," FBIS-SOV-97-182.

22-24 April 1997

UKRAINE, G-7 HOLD LATEST ROUND OF TALKS ON CHORNOBYL IN SLAVUTYCH

Ukrainian and G-7 representatives met in Slavutyich on 22-24 April 1997 to discuss implementing the December 1995 Memorandum of Understanding on closing Chernobyl. Minister of Environmental Protection and Nuclear Safety Yuriy Kostenko said that Ukraine has met "practically all" of the EBRD's requirements for granting credits to close Chernobyl, including the demonopolization of Ukraine's energy market, an increase in national energy tariffs, the cancellation of budgetary subsidies, the closure of Chernobyl-1 (on 30 November 1996), and the regulation of energy distribution and funds collection and allocation by the National Controller Center. Hence, Kostenko stated, there was no reason why the EBRD should not finance the completion of the Khmelnytsky-2 and Rivne-4 reactors. He added that the EBRD independent study of 19 February 1997 failed to take into account the true state of Ukraine's energy sector. Carol Kessler, head of the Western delegation to the talks, said the meeting was "very successful," in that the two sides agreed on a plan to stabilize the Unit-4 sarcophagus and remove the nuclear fuel from inside it. Commenting after the negotiations, Kostenko was also positive and noted that "for the first time" Ukraine and the G-7 countries agreed on the execution of a program for decommissioning Chernobyl. Beginning in May 1997, the \$900 million for the program will start to arrive in Ukraine, and G-7 experts hope for complete closure by 2005. The funds will finance Chernobyl shutdown as well as the development of the national energy market. The two sides have not yet come to an agreement regarding the completion of Khmelnytsky-2 and Rivne-4.

—Interfax, 21 April 1997; in "Ukraine: Talks On Chernobyl Nuclear Power Plant to Be Held 22 Apr," FBIS-SOV-97-111, 21 April 1997. Interfax, 21 April 1997; in "Ukraine: Kiev Has Met 'Practically All' Terms For Chernobyl Credit," FBIS-SOV-97-111, 21 April 1997. UNIAN, 22 April 1997; in "Ukraine: All Requirements Met For EBRD Loan For Power Plants," FBIS-SOV-97-112, 22 April 1997. "Ukrainian, Western Experts Agree On Chernobyl Measures," RFE/RL Newsline, Vol. 1, No. 17, part II, 23 April 1997. UNIAR, 25 April 1997; in "Ukraine: G7 Grants \$900 Million Loan to Assist In Chernobyl Shutdown," FBIS-SOV-97-115, 25 April 1997.

20 April 1997

WESTINGHOUSE SAFETY PROJECT BEGINS

The Westinghouse project management team began nuclear safety improvements on 20 April 1997 at the Chernobyl NPP, in accordance with the January 1997 contract signed by Westinghouse and Chernobyl. The ECU 8.7

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million contract with Westinghouse and subcontractors Energoprojekt of Ukraine and NNC of Britain comes from a ECU 118 million Chernobyl aid grant initially agreed upon by Ukraine and the EBRD in November 1996, and later ratified on 18 March 1997 by the Ukrainian parliament. The grant, funded through the EBRD's Nuclear Safety Account (NSA), represents the first part of a greater \$350 million assistance package for the decommissioning of Chernobyl. The funding will go towards obtaining bids for Unit 3 safety improvements and construction of nuclear waste storage and liquid nuclear waste processing facilities.

—Interfax, 21 April 1997, in "Ukraine: Chernobyl Safety Improvement Project Begins 20 April," FBIS-TEN-97-005. "An Agreement Between the EBRD and Ukraine...," Nuclear News, December 1996, pp. 17-18.

13 April 1997

VERKHOVNA RADA APPROVES RESOLUTION ON CHORNOBYL, NUCLEAR POWER

Unsatisfied with the Cabinet of Ministers' work on financial and safety concerns at Chernobyl, the Verkhovna Rada (Ukraine's parliament) passed a resolution on closing Chernobyl, the future of nuclear power in Ukraine, and safety issues at Ukrainian NPPs. The resolution gives the government two months to submit to the Rada a comprehensive program to take Chernobyl off line and solve social problems related to displaced Chernobyl employees, who largely reside in the town of Slavutych near the Chernobyl plant. The resolution also foresees the possibility of keeping Chernobyl NPP on line after 2000 if the G-7 fails to meet its obligations under the December 1995 Memorandum of Understanding.[1,2] Chernobyl Plant Manager Serhiy Parashin reportedly stated that the EBRD suspended its ECU 118 million grant because the resolution leaves open the possibility of keeping Chernobyl in operation after 2000.[3]

—Intelnews, 13 April 1997; in "Ukraine: Government Ordered to Submit Chernobyl Shutdown Plans," FBIS-SOV-97-103, 13 April 1997. Interfax, 8 April 1997; in "Ukraine: Deputies Plan to Discuss Possible Closing Of Chernobyl," FBIS-TAC-97-098, 8 April 1997. Intelnews, 11 April 1997; in Ukraine: EBRD Withholds Financial Aid Worth \$150 Million," FBIS-SOV-97-101, 11 April 1997.

18 March 1997

VERKHOVNA RADA RATIFIES ECU 118 MILLION GRANT FROM EBRD

The Verkhovna Rada (Ukraine's Parliament) ratified an ECU 118 million grant, allocated by the European Bank for Reconstruction and Development for improving safety conditions and building a modern, underground waste storage facility at Chernobyl. EBRD first approved the grant, funded through its Nuclear Safety Account (NSA), on 14 November 1996. In the week preceding the parliamentary decision, Minister for Environmental Protection and Nuclear Safety Yuriy Kostenko the Rada to ratify the grant, saying that it represented the first part of the G-7's financial assistance toward shutting down the Chernobyl NPP. Without accepting this grant, Kostenko added, further talks between Ukraine and the G-7 on decommissioning Chernobyl would be futile.

—Pearl Marshall and Ariane Sains, "Leadership Change Will Refocus NSA On Ex-USSR Reactor Shutdown," *Nucleonics Week*, 27 March 1997, pp. 1, 12-13. Pearl Marshall, "Chernobyl Safety, Radwaste Grant, NSA's Biggest Yet, Is Signed," *Nucleonics Week*, 14 November 1996, p. 14. "Kostenko Lobbying For Chernobyl Grant," *Eastern Economist Daily*, No. 500, 28 February 1997. "We Could Be Left Without Grants," *Izvestiya Ukraina*, 4 March 1997, p. 1; in "Grant Rejection Seen Jeopardizing Chernobyl Closure," FBIS-SOV-97-063, 4 March 1997.

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13 March 1997

WESTINGHOUSE CAPTURES ECU 7.9 MILLION CONTRACT FOR PMU AT CHORNOBYL

Westinghouse Electric Corp. and subcontractors NNC (UK) and Kievenergoproekt won the bid to run the project management unit (PMU) at Chernobyl NPP which will direct decommissioning work at the facility. The contract, worth ECU 7.9 million, is part of the ECU 118 million grant for Chernobyl closure, funded by the Nuclear Safety Account (NSA) of the European Bank of Reconstruction and Development (EBRD). Westinghouse won out over four other consortia to get the bid; this is the first time the corporation has been involved in an NSA-funded PMU project. The agreement still awaits approval by the Verkhovna Rada, and the Ukrainian Minister of Justice must verify that the contract is in accord with Ukrainian legal procedures. Bringing together specialists at Chernobyl as well as outside nuclear experts, the PMU will manage such operations as engineering, design, procurement, supervision, and the contracting and commissioning of items needed for the NSA project. Auguste Fesler, former director of Westinghouse Energy Systems Europe (WESE), will head the PMU and Vyacheslav Fomin, ChNPP's deputy chief engineer, will be the deputy project manager. Westinghouse representative Phil Evison said the PMU team is ready to begin its work, directly after the Rada ratifies the agreement, in order to keep with the PMU's tight schedule.

—Pearl Marshall, "Chernobyl PMU Contract Goes to Westinghouse, NNC, Kiev Firm," *Nucleonics Week*, 13 March 1997, p. 7. Ann MacLachlan, "Bids Sought on Work to Close Chernobyl, but Date Uncertain," *Nucleonics Week*, 19 September 1996, pp. 10-11.

10-12 February 1997

G-7, UKRAINE HOLD TALKS IN WASHINGTON, D.C.

Ukrainian and G-7 delegations met in Washington, D.C. for three days to continue negotiations related to the closure of Chernobyl NPP. The G-7 confirmed Ukraine's proposal to remove nuclear fuel from the Unit 4 sarcophagus, and both sides plan to reconcile the issue of credits to Ukraine for completing reactors at Khmelnytsky-4 and Rivne-2 [sic] [should be Khmelnytsky-2 and Rivne-4].

—Intelnews, 11 February 1997; in "Ukraine: Talks Begin With G-7 On Chernobyl Shutdown," FBIS-TEN-97-002, 11 February 1997.

February 1997

EBRD'S INDEPENDENT STUDY ON CHORNOBYL CLOSURE PUBLISHED

On 19 February 1997, the European Bank for Reconstruction and Development (EBRD) officially published an independent study that evaluates the granting of \$1 billion to Ukraine for completion of reactors at Khmelnytsky-2 and Rivne-4 in light of EBRD's "least cost" lending requirements. The report concluded that the project was not economically feasible. Sussex University Professor John Surrey, along with five others, headed the expert panel which prepared the report. Surrey explained the findings, saying, "Ukraine is probably one of only a few countries in the world where electricity is being used so inefficiently. In order to produce £1,000 worth of GDP, Ukraine uses more energy than any other EBRD country." The report recommended a long term (20-30 years) energy conservation program for Ukraine and enhancement of safety conditions at Ukrainian NPPs; less down time for reactor repairs would markedly improve power output. The report also recommended that the West extend money to Ukraine in grants, rather than loans, in order to restructure the electricity market and develop

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"economically attractive projects in the Ukrainian energy sector". The authors believe that liberalization and full-fledged market reform would enable Ukraine to attract more private investment. The study was delayed somewhat in December 1996 by Derzhkatom, which was slow to provide key cost data needed for the report.

Ukrainian and G-7 representatives responded negatively to the EBRD report. Ukrainian Minister for Environmental Protection and Nuclear Safety Yuriy Kostenko called the findings "superficial," emphasizing that the report does not take into account the true state of Ukraine's energy sector. According to Kostenko, the experts overestimated the generating capacity presently available in Ukraine and failed to consider the age of the existing facilities, which will require an annual input of \$2-3 million over a ten-year period to achieve modern standards. Kostenko also noted that the G-7 has a "political obligation" to fulfill the terms of the Memorandum of Understanding signed by Ukraine and the G-7 in Ottawa in December 1995. Nevertheless, despite his criticisms, Kostenko pointed out that the report is only a recommendation; EBRD officials, rather than the report's authors, will make the final decision on financing additional power reactors in July 1997. Accordingly, Kostenko added, Ukraine will decide whether to shut down Chernobyl by 2000 only after the EBRD's decision in July 1997. Viktor Parkhomenko, head of the energy department of the Ukrainian Ministry of the Economy, also reportedly harshly criticised the study's findings. According to Parkhomenko, Khmelnytsky-2 and Rivne-4 are 70 percent complete, and Ukraine will find a way to finance their completion if the EBRD will not.

—Leyla Boulton and Simon Holberton, "West's policies on eastern nuclear plants 'misguided'," *Financial Times*, 10 February 1997, p. 2. Vladimir Skosyrev, "Zapad ne znayet, chto delat c Chernobylem," *Izvestiya*, 12 February 1997, p. 3. "EBRD told Ukraine nuclear plans too costly," *Nuclear Engineering International*, March 1997, p. 3. S. Rudenko and O. Burda, "More Than Enough Reactors? EBRD changes its tune," *Eastern Economist Daily*, 24 February 1997, pp. 1,4. Leyla Boulton and Matthew Kaminski, "Ukraine threatens to keep Chernobyl open after 2000," *Financial Times*, 20 February 1997, p. 12. Ann MacLachlan, "G-7-Ukraine Cooperation Now Said to Be Progressing Extremely Well," *Nucleonics Week*, 2 January 1997, p. 3. "Ukraine: Talks On Chernobyl Shutdown Progressing," *Russia Today*, www.russiatoday.com, 18 February 1997. ITAR-TASS, 20 February 1997; in "Ukraine: Minister—Chernobyl Operations 'May Be Prolonged'," FBIS-SOV-97-035, 20 February 1997. Vladimir Skosyrev, "Zapad ne znayet chto delat' c Chernobilyem," *Izvestiya*, 12 February 1997, p. 3. UNIAN, 13 February 1997; in "Ukraine: Nuclear Minister Unhappy With EBRD Experts' Opinions," FBIS-TAC-97-007.

30 January 1997

CHIRAC, KUCHMA DISCUSS CHORNOBYL SHUTDOWN

French President Jacques Chirac and Ukrainian President Leonid Kuchma met in Paris on 30 January 1997 to discuss the European security structure and the shutdown of the Chernobyl NPP. After the meeting, Kuchma expressed confidence "that, together with France—the year 2000 will be the year when the Chernobyl station is closed." Chirac noted that France will honor its commitments under the December 1995 MoU between Ukraine and the G-7 and added that France is pressing for the finalization of G-7 funding for completion of Khmelnytsky-2 and Rivne-4.

—AFP, 30 January 1997; in "France, Ukraine: Chirac, Kuchma Agree to Establish Joint Economic Committee," FBIS-WEU-97-021, 30 January 1997.

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17 December 1996

G-7, UKRAINE — TALKS ON SARCOPHAGUS AND NEW REACTORS

Ukraine and the G-7 agreed to conduct "complementary studies" on stabilization of the damaged sarcophagus and discussed completion of Khmelnytsky-2 and Rivne-4.[1] Ukraine contended that it needs \$1.2 billion by June 1997 to complete and launch the two generating sets and that without them, the Chernobyl NPP would not likely be shut down by 2000.[2]

—Ann MacLachlan, "G-7-Ukraine Cooperation Now Said to Be Progressing Extremely Well," *Nucleonics Week*, 2 January 1997, p. 3. UNIAN, 18 December 1996, in "Ukraine: Officials Say Lack Of Funding to Delay Chernobyl's Closure," FBIS-SOV-96-245, 18 December 1996.

30 November 1996

UKRAINE SHUTS DOWN CHORNOBYL-1, BUT MAY RESTART UNIT 1 OR 2

Ukraine shut down Chernobyl-1 at 10:00 p.m. local time on 30 November 1996. The move fulfilled a vow by Ukrainian President Kuchma, made at the April 1996 Nuclear Safety Summit in Moscow, to take the unit off line by 2000. With Unit 1 down, Ukraine loses approximately 4.8 billion kW/hr per year of energy output as well as 1600 jobs in the Slavutych region. Some observers have wondered whether the decision was strictly political, since the safe life of Unit 1 ended in early 1997. After that time, either the management would have taken the reactor off-line anyway or replaced and modernized the reactor's channels—an expensive procedure, the funds for which Kiev lacked. In its official application to shut down Unit 1, the ChNPP management cited the need for a comprehensive engineering assessment, especially of the fuel channels, as the reason for the move. According to Chernobyl plant manager Serhiy Parashyn, no document prohibiting the future operation of Chernobyl-1 exists. Speculation that the unit may be restarted has arisen due to the plan to keep 1600 fuel assemblies inside Chernobyl-1 for two years. In fact, both Derzhkomatom (State Committee for Use of Atomic Energy) and Parashyn have reportedly said that Chernobyl-1 will be maintained and, perhaps, restarted if energy is lacking during the cold Ukrainian winter. Nevertheless, Kuchma announced that restarting No. 1 was not economic at a cost of \$225 to \$450 million — nearly as much as completing Khmelnytsky-2 or Rivne-4 at the high end. At an estimated cost of \$85 to \$280 million, bringing Unit 2 back on-line for continued service presents a more likely alternative for immediate power replacement. Shortly before shutting down Unit 1, Derzhkomatom passed a decree sanctioning such a measure. If Unit 2 refurbishment money is allocated, it would probably go towards safety backfits, replacement of isolation valves on the inlets to the fuel channels below the reactor, and borrowing turbines and fuel from Unit 1. A recent article, however, expressed some pessimism about restarting Unit 2, placing the earliest possible on-line date in the second quarter of 1998. Thus, only Unit 3 remains in operation at ChNPP.

—Ann MacLachlan, "Ukraine Shuts Chernobyl-1, Fulfilling Promise to West," *Nucleonics Week*, 5 December 1996, p. 14. Peter Coryn, "Chernobyl-1 Is Shut But Ukraine Keeps Units 1,2 Restart Option," *Nucleonics Week*, 2 January 1997, p. 14. Yanina Sokovskaya, "Shutdown of Chernobyl Nuclear Power Station, First Unit. Technical Necessity or Political Gesture?," *Izvestiya Ukraina*, 30 November 1996, p. 1; in "Ukraine: 'All the Rules Broken' in Shutdown of Chernobyl No. 1 Unit," FBIS-TEN-96-011, 30 November 1996. NTV, 30 November 1996; in "Chernobyl Director Says Shutdown Decision May Not Be Final," FBIS-SOV-96-232, 30 November 1996. UNIAN, 29 November 1996; in "Kuchma: No Plans to Restart Chernobyl's Generating Set," FBIS-SOV-96-232, 29 November 1996. Ann MacLachlan, "Chernobyl Managers Want to Reopen Unit 2 to Offset Unit Shutdown," *Nucleonics Week*, 21 November 1996,

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p.16. UNIAN, 26 March 1997; in "Ukraine: Second Reactor At Chernobyl May Not Be Reconnected," FBIS-SOV-97-085, 26 March 1997. "Chernobyl-1 shut down, Unit 2 may restart in 1997," *Nuclear News*, January 1997, pp. 33-34.

14 November 1996

ECU 118 MILLION GRANT FOR CHORNOBYL SIGNED IN LONDON

Ukraine and the European Bank for Reconstruction and Development (EBRD) signed an ECU 118 million (\$147 million) grant agreement to begin decommissioning work on the Chornobyl NPP. This grant is part of a larger \$350 million aid package to be drawn from the Nuclear Safety Account (NSA), administered by the EBRD to help fund the closure of unsafe reactors in Eastern Europe and the CIS. The grant agreement, signed at EBRD headquarters in London, partly fulfills the December 1995 Memorandum of Understanding (MoU) between the G-7 and Ukraine and will enable decommissioning to commence as early as January 1997. Of the ECU 118 million grant, ECU 13.5 million will go towards short-term safety improvements at Chornobyl-3 and ECU 85.8 million will finance construction of an interim spent fuel storage facility and a liquid radioactive waste treatment facility to immobilize stockpiles of operational waste. According to EBRD Deputy Vice-President Joachim Jahnke, the division of the ECU 85.8 million between the two storage facilities will "depend on the bidding process." At least half of the remaining ECU 18.7 million will finance the creation of a project management unit (PMU) to steer decommissioning activities at the plant, and the rest will go towards a number of smaller tasks as needed. Jahnke mentioned that the signatories to the agreement are "under a tight schedule" to close the plant by 2000. Equipment procurement will be done via open tendering and will include both Western and Eastern European companies. The Verkhovna Rada must still ratify the agreement.

—Pearl Marshall, "Chernobyl Safety, Radwaste Grant, NSA's Biggest Yet, Is Signed," *Nucleonics Week*, 14 November 1996, p. 14. "An Agreement between the EBRD and Ukraine...," *Nuclear News*, December 1996, pp. 17-18. Reuters, "Chernobyl Receives \$150 Million in Safety Aid," www.russiatoday.com.

31 October 1996

ECU 118 MILLION NSA GRANT TO UKRAINE DELAYED

According to head of the G-7 nuclear safety working group Claude Mandil, a \$118 million [sic] [ECU 118 million] grant to Ukraine, drawn from the Nuclear Safety Account (NSA) should have been agreed upon and approved in mid-October 1996. Intended for safety improvements and waste management programs at Chornobyl, the grant has been delayed for at least four reasons. First, some NSA contributors have refused to back the grant until Ukraine sets a firm date for taking Chornobyl Units 1 and 3 off line. Second, Ukraine refuses to establish a deadline for Chornobyl's closure until the West begins advancing the necessary funds, including money for completing reactors at Khmelnytsky-2 and Rivne-4. Third, the Verkhovna Rada is currently occupied with constitutional reforms and, therefore, unable to address necessary legislation for the project, e.g. a liability bill and one affording tax-exempt status to companies participating in the Chornobyl program. Fourth, according to French officials, there is a strong lobby in the Verkhovna Rada opposed to Chornobyl shutdown, given the possibility of power outages in the coming winter due to coal miner strikes and low hydro reserves. According to Mandil, \$500 million in grants and loans have been approved, and \$700 should become available in the next six months.

—Ann MacLachlan, "Ukraine Hints Delay in Closing Chernobyl If Money Doesn't Come," *Nucleonics Week*, 31 October 1996, pp. 16-17.

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24 October 1996

CANADA PROVIDES \$7.5 MILLION TO CLOSE CHORNOBYL

According to Canadian Foreign Minister Lloyd Axworthy, Canada provided \$7.5 million to Ukraine to help shut down Chernobyl. Axworthy called upon other members of the G-7 to release funds for Chernobyl as per the December 1995 Memorandum of Understanding (MoU). He said that Canada will speak on Ukraine's behalf concerning Chernobyl funds during the next G-7 meeting.

—"Canada Grants \$7.5 Million to Help Shut Chernobyl," Reuters 24 October 1996.

14 October 1996

G-7, UKRAINE DISCUSS CHORNOBYL CLOSURE IN PARIS

During their 11-14 October meeting in Paris, Ukrainian and G-7 experts drafted an agreement, stipulating that Ukraine is to receive ECU 118 million (\$147 million) grant from the European Bank for Reconstruction and Development (EBRD) to finance preparatory work to close Chernobyl NPP. The grant is separate from the \$3.1 billion aid package, agreed in the December 1995 Memorandum of Understanding (MoU). The money will come from the Nuclear Safety Account, created by 14 Western donor countries and the European Union (EU) and administered by the EBRD. According to Ukrainian Minister of Environmental Protection and Nuclear Safety Yuriy Kostenko, who headed the Ukrainian delegation at the negotiations, the EBRD is providing the funds specifically for constructing spent fuel and solid waste storage facilities at Chernobyl. The delegations drew up a schedule for funding the completion of the Khmelnytsky-2 and Rivne-4 nuclear reactors. Upon the adoption of a special plan by the EBRD Board, Ukraine is to receive \$600-700 million in aid for 1997. The two sides also considered the Alliance International report on reconstructing the Unit-4 sarcophagus and agreed that work on the project is in its final stage. The Ukrainian delegation reported on the September '96 neutron flux in the Unit-4 sarcophagus and expressed hope that a plan to remove nuclear fuel and radioactive water (nearly 3000 cubic meters) therefrom will be included in the final version of a feasibility report on the sarcophagus.

—Interfax, 14 October 1996; in "G-7 Countries Reach Compromise On Chernobyl Finance Accord," FBIS-SOV-96-200, 14 October 1996. "Ukraine: Progress Reported In Chernobyl Shutdown Project," BBC Monitoring Service, 18 October 1996. Kevin Done, "Ukraine to Get \$150m to Help Shut Chernobyl," *Financial Times*, 21 November 1996, p. 3. AFP (Paris), 9 October 1996; in "Kiev Urges G-7 to Provide Funding For Chernobyl Closure, FBIS-SOV-96-198, 9 October 1996.

9 October 1996

UKRAINIAN, G-7 OFFICIALS MEET TO DISCUSS FUNDING FOR CHORNOBYL CLOSURE

Before their upcoming round of talks on 11-14 October, Ukrainian and G-7 representatives held a preliminary meeting in Paris on 9 October to discuss funding Chernobyl closure. Nuclear experts from both sides discussed a recent study, which deemed the construction of a second sarcophagus at Unit-4 over the first expensive and environmentally unsafe, while the Ukrainian delegation called upon G-7 countries to speed up the release of \$3.1 billion in aid as per the December 1995 Memorandum of Understanding. Ukrainian Minister of Energy Viktor Dobrev reiterated his country's position that the EBRD's ongoing independent study could ultimately delay the decommissioning process and may force Ukraine to restart Chernobyl-2 in 1997.

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—AFP (Paris), 9 October 1996; in "Kiev Urges G-7 to Provide Funding for Chernobyl Closure," FBIS-SOV-96-198, 9 October 1996. *NucNet*, 470/96, 7 October 1996; in UI News Briefing 96.40, 2-8 October 1996.

October 1996

UKRAINE SETS UP NEW BODY FOR NUCLEAR INDUSTRY, UKRENERGOATOM

Ukrainian President Leonid Kuchma created a new reactor-operating concern in October 1996, called Ukrenergoatom. According to Khmelnytsky plant manager Viktor Saponov, the new concern "will allow us to organize cooperation in relation to the energy market in the best way." Saponov said Ukrenergoatom will address a number of matters, including energy rate policies, safety issues, fuel and waste management, rules for using nuclear power, and the development of advanced reactor design, while Derzhkomatom (the state nuclear energy committee) will cover "general management of the nuclear industry," including industry development, decommissioning of nuclear installations, etc. Western financial institutions reportedly required the establishment of the new concern, so that there would be an identified Ukrainian borrower, if and when funding for completing Khmelnytsky-2 and Rivne-4, a condition for shutting down Chernobyl, is approved. (For more information on these bodies see the Ukraine: Government Bodies section.)

—Ann MacLachlan, "Ukraine Hints Delay In Closing Chernobyl If Money Doesn't Come," *Nucleonics Week*, 31 October 1996, pp. 16-17. Ann MacLachlan, "Khmelnitski-2 Could Come On Line Without Western Aid Or Backfits," *Nucleonics Week*, 31 October 1996, p. 16.

18 September 1996

DEADLINE FOR SUBMITTING LETTER TO BID ON CHORNOBYL PMU

According to the December 1995 MoU between Ukraine and the West on Chernobyl closure, the Nuclear Safety Account (NSA), managed by the European Bank for Reconstruction and Development, is responsible for financing work to decommission Chernobyl-1 and -3 and for handling related tasks, such as radioactive waste management. to organize its activities at Chernobyl NPP, the NSA requested bids to establish a Project Management Unit (PMU), which would direct efforts to close the plant in the near future. First letters of interest from those intending to bid on the PMU project were due on 18 September 1996. According to EBRD officials, the short list will include six semifinalists, with final bids due 6 December 1996. The PMU, a requisite part of all NSA grants to date, may begin its activities as soon as January 1997.

—Ann MacLachlan, "Bids Sought on Work to Close Chernobyl, but Date Uncertain," *Nucleonics Week*, 19 September 1996, pp. 10-11.

16-20 September 1996

KOSTENKO CALLS FOR AID FOR CHORNOBYL AT THE IAEA GENERAL CONFERENCE

During his speech at the 40th session of the IAEA General Conference, Ukrainian Minister for Environmental Protection and Nuclear Safety Yuriy Kostenko called upon G-7 countries not to postpone financial support for the first stage projects to decommission the Chernobyl NPP. Kostenko stressed that failure to implement the December 1995 Memorandum of Understanding (MoU) signed by the G-7 and Ukraine will "significantly discredit the political agreements reached through a strong and long lasting negotiation process" and eventually halt the decommissioning of Chernobyl.

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—Statement by Y.I. Kostenko, Minister for Environmental Protection and Nuclear Safety, Head of the Ukrainian Delegation to the 40th Session of the IAEA General Conference, 16-20 September 1996.

13 September 1996

VAN DER BROEK CONCLUDES HIS VISIT TO KIEV, PROMISES CREDITS AND GRANTS FOR CHORNOBYL CLOSURE

In a press conference after visiting Kiev, European Union (EU) Commissioner for Foreign Policy Hans van der Broek said that the Commission understands the complexity of the Chernobyl issue and will do its utmost to help Ukraine financially and technologically to close Chernobyl. Van der Broek stated that the EU will allocate \$600 million (\$120 million in grants) specifically for this purpose. Van der Broek and Head of the Ukrainian Reconstruction and Development Agency Roman Shpek reportedly concluded an aid program for 1996-1999, providing \$700 million to Ukraine under TACIS (the EU's Technical Assistance to the CIS). The TACIS program for Ukraine includes a financial protocol to the December 1995 Memorandum of Understanding (MoU). According to the protocol, approximately ECU 22.5 million will be devoted to purchasing equipment for Chernobyl shutdown. ECU 9 million will be channeled to Ukrainian nuclear authorities for completing VVER reactors at Rivne-4 and Khmelnytsky-2 to compensate for the loss in energy generating capacity, resulting from the closure. ECU 6 million will be granted to financing nuclear projects in Ukraine. During a meeting between van der Broek and Kuchma, the latter pointed out that Ukraine is interested in receiving loans, rather than grants, for upgrading its nuclear reactors and is dissatisfied with Western procrastination in providing financial credits for the Chernobyl shutdown and other nuclear energy projects.

—Interfax, 13 September 1996; in "European Union to Develop Cooperation with Kiev," FBIS-SOV-96-180, 13 September 1996. Interfax, 19 September 1996; in "Accord Reached with EU on Funding Chernobyl Shutdown," FBIS-SOV-96-184, 19 September 1996. Interfax, 12 September 1996; in FBIS-SOV-96-179, 12 September 1996. Nikolay Zherebtsov et al, Interfax, 12 September 1996; in "Kuchma Wants Deeper Contacts with EU Countries," FBIS-SOV-96-179, 12 September 1996.

12 September 1996

UDOVENKO CRITICIZES WEST DURING STOCKHOLM VISIT

During an official visit to Stockholm, Ukrainian Foreign Minister Hennadiy Udovenko said "There has not been a penny given to us for assistance," despite the December 1995 Memorandum of Understanding. Udovenko added that the plant's closure depends on Western financial assistance, but added that contrary to opinion in some Scandinavian political circles, Ukraine has not been using the Chernobyl problem to bargain for money. In conjunction with Udovenko's visit, the government of Sweden granted \$3.3 million to research institutes in Kiev and Moscow — apparently to the ISTC and ISTCU respectively.

—Ariane Sains, "No Money, No Chernobyl Closure, Ukrainian Foreign Minister Says," *Nucleonics Week*, 12 September 1996, pp. 14-15.

2 September 1996

UKRAINE, EBRD TO SIGN AGREEMENT ON CHORNOBYL SHUTDOWN

According to resident representative of the European Bank for Reconstruction and Development (EBRD) Yaroslav Kinach, Ukraine is close to signing a deal with the EBRD to fund Chernobyl shutdown. Money will come from the EBRD's Nuclear Safety Account, created to help decommission unsafe reactors in the CIS. Kinach said, "The

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agreement will be signed imminently." According to a senior official at the State Committee on the Use of Nuclear Energy (Derzhkomatom), the EBRD and Ukrainian nuclear authorities will offer joint tenders in January 1997 to attract foreign investment for the project.

—"Ukraine, EBRD to Agree Payment to Shut Chernobyl," Reuters 2 September 1996.

29 July 1996

EUROPEAN PARLIAMENT ON CHORNOBYL ACCIDENT

The European Parliament issued a resolution calling for increased financial and technical aid to Ukraine for Chernobyl safety improvements and environmental cleanup in areas affected by the 1986 disaster, including those in Russia and Belarus.

—"Resolution of the European Parliament on the 10th anniversary of the Chernobyl accident", in INFIRC/519 29 July 1996 Received from the Permanent Mission of Belarus to the International Atomic Energy Agency.

26 July 1996

U.S. SENATE APPROVES AID TO UKRAINE, CHORNOBYL

The U.S. Senate approved the Foreign Assistance Appropriations Act for FY 1997, which includes \$225 million in financial aid to Ukraine. Of the \$225 million, \$25 million is for decommissioning the Chernobyl NPP, \$5 million for health-related consequences of the Chernobyl disaster, and \$50 million for safety at Ukrainian nuclear reactors.

—Eugene Iwanciw, "Senate Approves \$225 Million for Ukraine," *Ukrainian Weekly*, 18 August 1996, pp. 1-2.

1 July 1996

JAPANESE FOREIGN MINISTER VISITS UKRAINE

Japanese Foreign Minister Yukihiko Ikeda arrived in Ukraine and met with President Kuchma, Prime Minister Petro Lazarenko, and Foreign Minister Hennadiy Udovenko. Ikeda welcomed Ukraine's decisions to close the Chernobyl NPP and to shut down Chernobyl-1 by 30 November 1996. He offered \$55 million in new credits to Ukraine.

—Ustina Markus, "Japanese Foreign Minister In Ukraine," OMRI Daily Digest, 2 July 1996. AFP (Paris), 1 July 1996; in "Japan Promises Help in Shutting Down Chernobyl," FBIS-TEN-96-007, 1 July 1996.

27 June 1996

PAVLOVSKYY SPEAKS ON CHORNOBYL CLOSURE

According to Mykhailo Pavlovskyy, Chairman of the Verkhovna Rada (Ukrainian parliament) Commission for Issues of Nuclear Policy and Nuclear Safety, Chernobyl has become one of the world's 10 safest NPPs. The West's insistence on closing Chernobyl NPP is designed to help industrialized countries take over the Ukrainian energy market by selling electricity to Kiev in exchange for closing the plant. Pavlovskyy restated Ukraine's official position that the Chernobyl NPP will be closed as soon as Ukraine receives sufficient funds for decommissioning the plant, solving the problem the Unit-4 sarcophagus problem, constructing alternative reactors at Khmelnytsky-2 and Rivne-4, and employing Chernobyl's specialists and workers. Otherwise, Pavlovskyy said, the plant will remain in operation.

—Ivan Dmytrenko, "Chernobyl as a Means of Struggling for Our Market," *Holos Ukrainy*, 27 June 1996, p. 3; in "Official Claims West Competing for Country's Energy Market," FBIS-SOV-96-131, 27 June 1996.

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25 June 1996

OFFICIALS PLAN TO DISMANTLE REACTOR

The Chernobyl management announced that Unit 1 is to be shut down on 30 November 1996 and dismantled over the next 5-6 years. Only Unit 3 will be operational by 1997.

—Chrystyna Lapychak, "Ukraine to Shut Down Aging Chernobyl Reactor," OMRI Daily Digest, 25 June 1996.

21 June 1996

KOSTENKO ON VISITING THE UNITED STATES, CHORNOBYL CLOSURE

Ukrainian Minister of Environmental Protection and Nuclear Safety Yuriy Kostenko held a press conference regarding his 10-18 June 1996 visit to the United States. Kostenko pronounced the visit a success following a U.S. Department of Energy (DOE) decision to draft legislation for funding Chernobyl shutdown. Kostenko hopes that other members of the G-7 will follow suit. In talking with U.S. State Department coordinator of cooperation with Newly Independent States (NIS) John Collins, Kostenko stressed that Ukraine is spending \$800 million annually to deal with the Chernobyl disaster. He called upon U.S. partners to participate in for-profit projects worth \$2.6 billion and non-profit projects worth \$500 million connected to closing Chernobyl and building reactors at Rivne and Khmelnytsky. The Ukrainian delegation asked DOE to work with Congress and develop a time table for financing the closure. Kostenko suggested that \$289 million in U.S. financial aid to Ukraine would be best spent on shutting down Chernobyl. Kostenko also emphasized that the schedule of credits offered by the World Bank and the European Bank of Reconstruction and Development (EBRD) to decommission Chernobyl does not give Ukraine enough time to bring Khmelnytsky-2 and Rivne-4 on-line by 1997 and is therefore unacceptable. The United States stressed the need to reform Ukraine's energy sector rather than to shut down the plant.

—InfoBank (Lviv), 24 June 1996; in "Minister: United States Not Ready to Finance Chernobyl Closure," FBIS-SOV-96-122, 24 June 1996. "Ukraine neobkhodim mekhanizm finansirovaniya zakrytiya Chernobylskoy AES, zayavlyayet ministr okhrany sredy respubliki," Interfax, 21 June 1996. UNIAN (Kiev), 21 June 1996; in BBC Monitoring Service/Reuter Insurance Briefing, 26 June 1996.

14 June 1996

20-YEAR PROGRAM TO SHUT DOWN CHORNOBYL NPP

An international consortium of nuclear engineering companies proposed a 20-year program to shut down and clean up the Chernobyl NPP.

—David Lascelles, "Chernobyl Clean-up Plan," *Financial Times*, 14 June 1996, p. 2.

6 June 1996

UKRAINE, G-7 — CRUCIAL ISSUES OF CHORNOBYL SHUTDOWN UNRESOLVED

According to Ukrainian Minister of Environmental Protection and Nuclear Safety Yuriy Kostenko, Ukrainian and G-7 negotiators were unable to agree on crucial issues concerning Chernobyl shutdown. Ukraine needs \$840 million immediately to complete the Khmelnytsky-2 and Rivne-4 reactors. Kostenko said that if a mutually acceptable solution is not found, Ukraine would be forced to revise the schedule for shutdown. Kostenko also noted that due to delays in G-7 funding, Ukrainian nuclear authorities may have to restart Chernobyl-2. The head of the G-7 delegation reported that an agreement was reached to disburse \$1.4 billion over 10 years for the closure of Chernobyl NPP. Both sides also agreed to a \$170 million grant to build storage and processing facilities. It was

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reported that on 30 May '96 Ukrainian President Leonid Kuchma had a conversation with Kostenko and Foreign Minister Hennadiy Udovenko devoted to elaborating the Ukrainian position for the 6 June 1996 meeting. Ukrainian officials expected that this expert meeting should develop a clear procedure for financing the closure of Chornobyl which would specifically include restoring the collapsing sarcophagus over Unit 4 and reliable social assistance for Chornobyl NPP personnel.

—Interfax, 6 June 1996; in "Ukraine: G-7, Ukrainian Experts Disagree Over Chernobyl Shutdown," FBIS-SOV-96-111, 6 June 1996. "Financial Problems with Chornobyl Closure", OMRI, 7 June 1996. Olga Musafirova, "Bitva 'kitov' v stepyakh Ukrainy," *Komsomolskaya Pravda*, 9 July 1996, p. 3. UNIAN, 30 May 1996; in "President Kuchma Discusses Chernobyl Closure with Environment Minister," *BBC Monitoring Service*, 4 June 1996. UNIAN (Kiev), 21 June 1996; in BBC Monitoring Service/Reuter Insurance Briefing, 26 June 1996.

27 April 1996

YABLOKOV — UKRAINE SEEKS NUCLEAR WEAPONS

According to Professor Aleksey Yablokov, Russian ecologist and Chairman of the Russian Center for Ecological Policy, Ukraine is accelerating the development of its peaceful nuclear facilities, including Chornobyl NPP, to "get access to military nuclear technologies, to create an experimental base for creating nuclear weapons." Yablokov suggested that Ukraine has exaggerated the cost of Chornobyl shutdown and the consequent loss of nuclear energy production in order to extract additional financial aid from the West for peaceful and military nuclear developments.

—Aleksandr Annin, "Aleksey Yablokov: 'Chernobyl Is Forever'", *Kuranty*, 27 April 1996, p. 5; in "Russia: Yablokov Faults Nuclear Summit," FBIS-SOV-96-133-S, 27 April 1996.

26 April 1996

CANADA TO HELP UPGRADE KRYVY RIH POWER PLANT

Canada reportedly promised \$3.5 million in aid to upgrade the Kryvyy Rih power plant and compensate for lost energy capacity upon Chornobyl's closure.

—"Canada, United States Promise Aid to Ukraine," OMRI Daily Digest, by Ustina Markus, 29 April 1996.

18 April 1996

KUCHMA, MAJOR ON STEPS TO SHUT CHORNOBYL

Ukrainian President Leonid Kuchma and British Prime Minister John Major signed bilateral documents, which reportedly worked out the practical measures necessary to shut down the Chornobyl nuclear power plant.

—"Premyer Velikobritanii podtverzhdaet gotovnost Londona pomoch Ukraine v reshenii problemy zakrytie ChAES," Interfax, 18 April 1996.

14 April 1996

PROPER WESTERN FINANCING CAN CLOSE CHORNOBYL

Prime Minister Yevhen Marchuk reiterated Ukraine's "political decision" to close Chornobyl NPP. At this point proper financing from the West is needed.

—Andrew Nagorski and Marta Kolomayets, "Interview: Yevhen Marchuk on Integration, Chornobyl," *Ukrainian Weekly*, 14 April 1996, pp. 1, 8.

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12 April 1996

VIENNA INTERNATIONAL CONFERENCE ON CONSEQUENCES OF CHORNOBYL ACCIDENT

At the Vienna International Conference on the Consequences of the Chernobyl Accident, participants concluded that it was too early for a full evaluation of the Chernobyl disaster. Prime Minister Yevhen Marchuk confirmed Ukraine's intention to close Chernobyl NPP. However, no solution was found for shutting down Chernobyl or replacing the Unit-4 sarcophagus. Given the disparity between Ukraine's available hard currency and the large price tag for closing Chernobyl's, experts think that projects related to shutdown will be difficult to implement. European Commission specialists estimate the cost of building a second hermetic cover over the sarcophagus at \$1.5 billion.

—"Chernobyl Conference Sums Up Known Consequences," *NucNet*, 15 April 1996. Interfax, 9 April 1996; in "Ukraine: Premier Marchuk Confirms Intentions to Close Chernobyl Power Plant," BBC Monitoring Service, 11 April 1996. Bart Stam, "Chernobyl Conference Supplies No Specific Solution," *Technisch Weekblad*, 17 April 1996, p. 2; in "Expert Analyzes Results of Chernobyl Conference," FBIS-TEN-96-006, 17 April 1996.

10 April 1996

KOSTENKO SPEAKS AT IAEA CONFERENCE ON CHORNOBYL ACCIDENT

During the 8-12 April '96 Vienna International Conference on the Consequences of the Chernobyl Accident, sponsored by the IAEA with the participation of other UN agencies, Ukrainian Minister of Environmental Protection and Nuclear Safety Yuriy Kostenko said that Ukraine must receive financial aid for closing Chernobyl soon. Otherwise, Kiev will be forced to consider modernizing the two operating units at Chernobyl. According to a 3 April 1996 decree of the Cabinet of Ministers, the Ukrainian government allocated \$1 million for the closure of Unit 1 and approximately \$4.2 million for reconstructing the destroyed Unit-4. Kostenko explained, the government will renovate or close Unit 1 in 1996, and Unit 3 after 2000.

—Interfax, 10 April 1996.

2 April 1996

G-7 WORKING GROUP VISITS KIEV

The G-7 working group headed by French representative Mandil met in Kiev with the Ukrainian delegation headed by Ukrainian Minister of Environmental Protection and Nuclear Safety Yuriy Kostenko to discuss decommissioning Chernobyl. Both sides discussed implementing the December 1995 Memorandum of Understanding (MoU) between Ukraine and the G-7, which extends a \$3.1 billion aid package for the shutdown of Chernobyl. Other issues on the agenda were eliminating the aftermath of the Chernobyl disaster, fixing the Unit-4 sarcophagus, and reforming the Ukrainian power industry.

—"Simku tsikavliat Chornobylski problemy. Nas—groshi na yikh vyrishennya," *Holos Ukrainy*, 3 April 1996, p. 1.

1 April 1996

UNITED STATES GIVES \$10 MILLION FOR CHORNOBYL CLOSURE

U.S. Secretary of State Warren Christopher announced that the United States will give another \$10 million in aid to Ukraine for closing Chernobyl. The assistance will be earmarked for hospitals and public health authorities.

—Khristina Lew, "Interview: Nicholas Burns on Evolving U.S.-Ukrainian Relations," *Ukrainian Weekly*, 7 April 1996, p. 3.

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7 March 1996

MINISTRY OF CHORNOBYL, DERZHKOMATOM MAY BE CLOSED

Ukrainian nuclear officials asserted that constant repairs have kept the Unit-4 sarcophagus in good shape and replacing it is not necessary. Steinberg added that the Ministry of Chornobyl is a dying ministry and will likely be abolished after April 1996. He noted that Derzhkomatom may be eliminated in the near future as well. Glukhov guessed that decommissioning Chornobyl will take from one to ten years, although it could be done immediately given sufficient funds.

—CISNP Communications with Ukrainian Nuclear Officials, 7 March 1996.

5 February 1996

CHORNOBYL WORKERS WILL GET RAISE

Prime Minister Yevhen Marchuk signed a decree to double salaries at Chornobyl during 1996.

—"Povtorennya katastrofy nemozhlyve?," *Holos Ukrainy*, 5 March 1996, pp. 1, 12.

21 February 1996

KUCHMA INVITES GORE TO KIEV

At the U.S. White House, Ukrainian President Kuchma proposed creating a joint U.S.-Ukrainian commission on energy to be chaired by Kuchma and U.S. Vice President Gore. Kuchma invited Gore to Kiev on the tenth anniversary of the Chornobyl disaster and requested that the Chornobyl issue be raised at the April '96 G-7 summit in Moscow.

—Khristina Lew, "Kuchma Completes Whirlwind Working Visit to Washington," *Ukrainian Weekly*, 25 February 1996. "Khto ne khoche zakrytyta ChAES?," *Holos Ukrainy*, 20 February 1996, p. 5.

15 February 1996

CHORNOBYL NOT TO BE CLOSED 'TIL 2007

Serhiy Parashin, the Chornobyl plant manager, told German officials that Chornobyl will not be closed until at least 2007; the MoU signed by Ukraine and the G-7 did not set a deadline for Chornobyl's closure.

—Mark Hibbs, "Chornobyl Management Tell BMU It Will Resist Closure In 2000," *Nucleonics Week*, 15 February 1996, pp. 5-6.

13 February 1996

DEADLINES FOR DECOMMISSIONING CHORNOBYL MAY SHIFT

Minister of Environmental Protection and Nuclear Safety Yuriy Kostenko announced that as soon as the West simplifies procedures for extending financial assistance and gives Ukraine credits it can begin the 30-month process of closing down the Chornobyl reactors. If the credits do not come until 1997, Kostenko warned that all deadlines for decommissioning Chornobyl will shift.

—"Ukraine Needs Funds Soon to Shut Chornobyl by 2000," Executive News Service, 13 February 1996. "Kiev Says Chornobyl Repair Leaves Danger Unchecked," Reuters 7 February 1996.

13 February 1996

LAWMAKERS APPEAL TO KUCHMA, KEEP CHORNOBYL OPEN

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Fifty-nine Ukrainian lawmakers appealed in an open letter to President Leonid Kuchma to reconsider his decision on closing Chornobyl NPP. They demanded the removal of Minister of Environmental Protection and Nuclear Safety Yuriy Kostenko as the head of ongoing talks with the G-7 on the plant's closure. They cited experts' claims that Chornobyl is the safest and most efficient Ukrainian NPP and that by 2007 it could produce \$5.2 billion in electricity exports, after which it could be closed without hurting Ukraine's economy.

—"Vidkryty lyst Prezydentu Ukrainy L. Kuchmi," *Holos Ukrainy*, 14 February 1996, p. 2. Chrystyna Lapychak, "Ukrainian Deputies to Reconsider Chornobyl Shutdown," *OMRI Daily Digest*, 13 February 1996.

3 February 1996

RUSSIAN CONCERN ENERGIYA TO CONSTRUCT ALTERNATIVE POWER PLANTS

According to a draft presidential decree, the Russian concern Energiya will be in charge of constructing alternative energy sources to replace the Chornobyl NPP. It will finance the program (an estimated \$15.7 billion through 2010) with its own resources and the help of domestic and foreign investors. Energiya will reportedly increase natural gas extraction in Ukraine to 10 billion cubic meters a year. It was also reported that Chornobyl will be transferred to the concern's management and privatized in 1996 (51% of the stock will belong to the state.)

—Intelnews, 5 February 1996; in "Conglomerate to Help Finance Chornobyl Closure," FBIS-SOV-96-024, 5 February 1996.

19 January 1996

KOROVKIN — CLOSING CHORNOBYL UNNECESSARY

Volodymyr Korovkin, manager of the Rivne NPP, said that closing Chornobyl NPP before schedule is unnecessary. He believes that the Ukrainian government has now adopted a "realistic attitude" about keeping the reactors running.

—Viktor Mazany, "The Rivne Nuclear Plant Director: 'Before Closing Down The Chornobyl AES, It Is Necessary to Consider Everything In The Minutest Detail,'" *Molod Ukrainy*, 19 January 1996, p. 1; in FBIS-SOV-96-015, 19 January 1996.

18 January 1996

SWITZERLAND GIVES Fr40 MILLION TO CLOSE CHORNOBYL

Switzerland gave Ukraine 40 million francs for closing Chornobyl and renovating Ukraine's hydroelectric system.

—"Rezultaty vizytu: chek na 40 milyon frankiv i nyzka uhod," *Holos Ukrainy*, 18 January 1996, pp. 1-2.

17 January 1996

CHORNOBYL CLOSURE WILL RUIN UKRAINE'S NATIONAL ENERGY SYSTEM

Oleksandr Moroz, the Chairman of the Verkhovna Rada, said that the government has not made a final decision about closing Chornobyl, for closing the plant would ruin Ukraine's national energy system. He suggested that Chornobyl's closure would end financial aid from the West.

—"Notatky z pres-konferentsii," *Holos Ukrainy*, pp. 1-2.

4 January 1996

MOROZ — PRESS WESTERN NATIONS FOR FULL FUNDING

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Chairman of the Rada Oleksandr Moroz wrote to President Kuchma encouraging him to press Western nations to fund fully Chernobyl's closure, including social benefits, job training, and safe storage of nuclear materials.

—UNIAN, 1/5/96; in "Moroz on Chernobyl," *Eastern Economist*, 15 January 1996, p. 20.

4 January 1996

WESTERN FUNDING FIRST, THEN CHORNOBYL CLOSURE

The Verkhovna Rada (Ukrainian Parliament) advised President Kuchma to secure Western funding before taking concrete steps to decommission Chernobyl. In late December '95, it postponed voting on a bill entitled "On the program for closure of the Chernobyl Nuclear Power Plant and principles for its financing." Parliament insiders reportedly are sure that the Chernobyl decommissioning bill will be passed.

—Peter Coryn, "Ukrainian Parliament Warns Kuchma on Premature Chernobyl Closure," *Nucleonics Week*, 11 January 1996, pp. 1, 8-9.

January 1996

CHORNOBYL CLOSURE REQUIRES THREE STAGES

According to Ukrainian and IAEA nuclear specialists, Chernobyl's closure requires three stages. 1) Five years to build storage and reprocessing facilities to store spent fuel and nuclear waste from the plant, as well as to provide energy supply for the on-site work and subsequent maintenance of the Chernobyl NPP after closure. 2) Five years to reprocess Chernobyl spent nuclear fuel and radioactive waste. 3) Five-ten years to dismantle and decommission all facilities and buildings on site. Specialists have emphasized that after the Chernobyl NPP is closed, the plant's maintenance will require large amounts of energy to meet safety requirements.

—Valeriy Kukhar, Petro Shmarin, "U koli politychnykh rishen'," *Polityka i Chas*, January 1996, pp. 25-29.

13 December 1995

G-7 ASSISTANCE FOR DECOMMISSIONING CHORNOBYL

The United States and the European Union issued a New Transatlantic Agenda, which commits both sides to provide G-7 assistance for decommissioning Chernobyl NPP.

—"US-EU Expand Joint Support for Programs in Post-Soviet States," *Post-Soviet Nuclear & Defense Monitor*, 31 January 1996, p. 6.

5 December 1995

MEMORANDUM OF COOPERATION BETWEEN UKRAINE AND EU

Yuriy Kostenko and a representative of the European Union signed a memorandum of cooperation on addressing problems associated with Chernobyl. According to this article, this was the first meeting at which all angles of the issue had been addressed.

—"Posly pidtrymuyut nashu pozitsiyu," *Holos Ukrainy*, 5 December 1995, p. 2.

December 1995

APRIL 26 IS INTERNATIONAL CHORNOBYL DAY

The U.N. General Assembly proclaimed 26 April 1996 "International Day of Chernobyl," calling on countries to continue and increase assistance. The resolution called on the world community to participate in creating an

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International Research and Technological Center.

—"UN Has Proclaimed April 26, 1996 International Day of Chernobyl," *News from Ukraine*, December 1995, pp. 1-2.

December 1995

PARASHIN, UMANETS — PLANS TO CLOSE CHORNOBYL

Serhiy Parashin and Mikhailo Umanets both questioned the validity of the G-7 plan to close Chernobyl. They offered alternative plans aimed at keeping the plant in operation after 2000.

—"Chernobyl Manager Question G-7 Plan," *Nuclear Engineering International*, December 1995, p. 6. "G-7, Ukraine Close in on Chernobyl Closure Plan," *Nuclear News*, December 1995, p. 27.

30 November 1995

KOSTENKO — KIEV TO SHUT CHORNOBYL 2000; UNIT 4 EMISSIONS LEAK

Ukraine and the G-7 reportedly agreed on a memorandum outlining steps to shutdown Chernobyl NPP by 2000. Given proper funding, Yuriy Kostenko said that Ukraine has a "strict political obligation" to close the plant by 2000. The agreement has yet to be considered at the Ukrainian government and parliament level, however. In related news, an international conference in Slavutych revealed that radiation emission above Unit 4 reached 46 roentgen per hour — the same level recorded in April 1986.

—"Draft Agreement Reached on Chernobyl Closure," *Nuclear News*, January 1996, pp. 38-39. Chrystyna Lapychak, "Update on Chernobyl Shutdown," OMRI Daily Digest, 1 December 1995.

30 November 1995

WHY THE PUSH TO KEEP CHORNOBYL ON LINE?

Volodymyr Usatenko, a nuclear physicist and former parliamentarian, asserted that Ukrainian citizens are being taken "for a ride"; power shortage is not the reason for Ukraine's drive to keep Chernobyl on-line. The Ministry of Statistics reported that in 1994 Ukraine exported \$18 million worth of electricity, while in the first nine months of 1995 electricity exports reached \$60 million.

—Victor Tkachuk, "Closing Down Chernobyl Power Station. History. Facts. Comments," UPRESA, 30 November 1995.

30 November 1995

UKRAINIAN LEGISLATION ON CLOSING CHORNOBYL NPP

Chairman of the Verkhovna Rada Oleksandr Moroz asserted that Ukraine never made a final decision to decommission the Chernobyl nuclear power plant. However, Ukrainian legislation proves Moroz false. Decommissioning the Chernobyl NPP was stipulated in Rada Resolution No. 1726-XII, "On Urgent Measures In Connection With Decommissioning the Chernobyl Nuclear Power Plant," 29 October 1991. This document required the power plant to cease operations by 1993. The article further reports that \$304 million (by the National Bank exchange rate at that time) was allocated in the 1992 Ukrainian state budget for Chernobyl decommissioning. On 25 March 1992, Ukrainian state resolution No. 152 was passed, outlining procedures for Chernobyl's shutdown. These activities were discontinued in 1993. In 1992 the Kurchatov Research Institute in St. Petersburg (which designed the Soviet RBMK reactor) also suggested that for safety reasons the term of operation for RBMK reactors

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should be 20 years instead of the earlier designated 30 years.

—"Parliament Chairman Denies Decision to Stop Chernobyl NPP," UPRESA, 30 November 1995.

29 November 1995

REFURBISH CHORNOBYL NPP, KEEP ON LINE

Prime Minister Yevhen Marchuk stated that the Chernobyl nuclear power plant needs to be refurbished and kept on-line.

—"Parliament Chairman Denies Decision to Stop Chernobyl NPP," UPRESA, 30 November 1995.

29 November 1995

CHORNOBYL SHUTDOWN REQUIRES \$3 BILLION

Mikhailo Umanets, Chairman of Derzhkomatom, reported that shutting down Chernobyl NPP requires \$1.4 billion for decommissioning Units 1-3, \$1.6 billion to build a replacement sarcophagus, \$400 million to build a high-voltage substation for Kiev, and additional costs for replacement power. Current plans have to take into account whether to build a new sarcophagus over Unit 3 and the auxiliary building or just over Unit 4. Serhiy Parashin, the plant manager, said that the auxiliary building is built on a platform, separate from Unit 3, and is not at risk.

—"Chernobyl Manager Questions G-7 Plan," IDPR, 29 November 1995, p. 13.

25 November 1995

KUCHMA THREATENS NOT TO CLOSE CHORNOBYL

President Leonid Kuchma said that Ukraine would reconsider Chernobyl's closure if the G-7 does not help Ukraine with the storage of nuclear waste and the maintenance of the buried fourth unit.

—Interfax, 25 November 1995; in "Kuchma Says Chernobyl Closure Depends on G-7 Funds," in FBIS-SOV-95-227, 25 November 1995.

24 November 1995

CHORNOBYL CLOSURE BY 2000 DOUBTFUL

President Leonid Kuchma and Prime Minister Yevhen Marchuk said that the G-7 offer of \$2.2 billion in loans and grants was not sufficient to finance Chernobyl's closure. Both politicians doubted that the plant could be closed by the 2000 deadline. Kuchma said that the latest offer would not cover the costs of building the new shelter to cover Units 3 and 4 ("Ukritiye-2"). Marchuk said the G-7's offer absolutely does not meet their needs and as it stands Ukraine will be forced to modernize at least two of Chernobyl's units.

—Volodymyr Skachko, "Zakrytie Chernobylskoy AES pod voprosom," *Segodnya*, 24 November 1995, p. 7. Chrystyna Lapychak, "Ukrainian Leaders Say G-7 Aid Offer Is Insufficient to Close Chernobyl," OMRI Daily Digest, 27 November 1995.

22 November 1995

UKRAINE UNABLE TO FINANCE CHORNOBYL SHUTDOWN

The National Security Council issued a proposal to continue commercial operation of Chernobyl NPP if the G-7 does not grant financial aid for its decommissioning. Prime Minister Yevhen Marchuk supported the proposal citing Ukraine's inability to finance Chernobyl's closure. It was also reported that in the first 10 months of 1995 Ukraine

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exported \$75 million worth of electricity, compared to \$18 million in 1994.

—"Security Council Decides to Continue Chornobyl Operation," UPRESA, 22 November 1995.

18 November 1995

\$2.72 BILLION PROFIT FOR RUNNING CHORNOBYL NPP LONGER

The Chornobyl leadership reportedly said running the plant until 2010 would generate \$2.72 billion in revenue. This money could be used, it argues, for building the new sarcophagus for Unit 4, reconstructing the plant, the social needs of Chornobyl workers, and contributions to the budget.

—Yevhen Perehuda, "Chornobyl," *Uryadovyy Kuryer*, 18 November 1995, p. 5.

16 November 1995

CHORNOBYL CLOSURE COSTS — WHOSE ESTIMATE IS HIGHEST?

Diplomatic discussions between Ukraine, G-7 countries, and various international organizations are slated for 20 November '95 to review the progress of various projects connected to Chornobyl's closure. According to G-7 representative and Canadian Vice-Premier Sheila Copps, the closure date, Western guarantees of Chornobyl decommissioning financing, and evaluation of Ukraine's contributions to the program still remain uncoordinated. G-7 negotiators reportedly cited \$349 million in loans and grants to prepare for Chornobyl decommissioning. Russian experts reportedly estimated the cost of decommissioning an RBMK unit at \$586 million. Yuriy Kostenko, meanwhile, estimated all closure costs would add up to more than \$10 billion (see 11/5/95). Ukrainian negotiators in Kiev insisted on western compensation to cover Ukraine's projected loss from closing Chornobyl prior to its slated 30 year lifetime.

—Peter Coryn, "Ukraine In No Hurry to Pledge Chornobyl Closure By 2000," *Nucleonics Week*, 16 November 1995. Marta Kolomayets, "Money, Once Again, Is Subject of Controversy Over Chornobyl Shutdown," *Ukrainian Weekly*, 12 November 1995, pp. 17-18.

15 November 1995

PAVLOVSKYY REPORTS ON CHORNOBYL SHUTDOWN

Mikhailo Pavlovskyy, the Chairman of the Rada Standing Commission for Nuclear Policies and Nuclear Security, warned that the Chornobyl NPP would be kept in operation if the West does not finance its closure. He also reportedly expressed support for the Ukrainian State Committee for the Use of Atomic Energy proposal to construct two new nuclear reactors at Chornobyl.

—Interfax, 16 November 1995; in "Chornobyl Plant Likely to Remain in Operation," FBIS-SOV-95-222, 16 November 1995.

12 November 1995

PARASHIN TO MODERNIZE CHORNOBYL NPP

Serhiy Parashin, the director of the Chornobyl NPP, reportedly announced that he intends to continue modernization of the plant until the last moment of its operation.

—Marta Kolomayets, "Money, Once Again, Is Subject of Controversy Over Chornobyl," *Ukrainian Weekly*, 12 November 1995, pp. 17-18.

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11 November 1995

MARCHUK AGAINST CHORNOBYL CLOSURE

Prime Minister Yevhen Marchuk, in an interview with *Nezavisimaya Gazeta*, stated that the Ukrainian leadership never stated that Ukraine is ready to close the Chornobyl NPP before 2000. He stressed the high cost of the closure and the need for the G-7 and the Council of Europe to assist with financing.

—Aleksandr Bangerskiy, "Ukraina Uzhe V Evrope," *Nezavisimaya Gazeta*, , 11 November 1995, p. 1.

1-2 November 1995

NEGOTIATIONS TO CLOSE CHORNOBYL AND COMPLETE KHMELNYTSKYI-2, RIVNE-4

Negotiations were held on a draft Memorandum of Understanding (MoU) on western support for Chornobyl's closure. Ukrainian and Western negotiators broke off talks before reaching agreement. The MoU is to be signed in December 1995. The estimated cost for 20 projects to shut the two units still functioning is \$3.2 billion. The projects include decommissioning the reactors, improving safety at Unit 3 (which will continue to operate until 2000), building a long-term shelter over Unit 4, and managing accumulated waste. G-7 proposals provide \$1.8 billion in credits and \$450 million in grants to Ukraine. Ukraine is expected to provide approximately \$900 million. The \$3.2 billion figure is subject to change. Ukrainian negotiators seek funding to complete Khmelnytskyi-2 and Rivne-4.

—"Ukraine, G-7 Close Gap But No Chornobyl Deal," Reuters 2 November 1995. Peter Coryn, "Ukraine Agrees with G-7, Expects \$3.2 Billion for Chornobyl Action," *Nucleonics Week*, 26 October 1995, pp. 12-13. Marta Kolomayets, "Ukraine and G-7 Close to Deal on Chornobyl Shutdown Package," *Ukrainian Weekly*, 5 November 1995, p. 1.

"Ukraine Could Delay Chornobyl Shutdown," Reuters 3 November 1995.

12 October 1995

G-7 WILL DISCUSS SUM AFTER CONCRETE PLANS ON CHORNOBYL'S CLOSURE

Prime Minister Yevhen Marchuk regretted that \$4 billion was demanded for Chornobyl closure, since this sum prohibits dialogue with international financial institutions. Marchuk said that the G-7 will discuss specific figures only when concrete plans and schedules for the closure have been submitted.

—"Ukraine to Blame for Chornobyl Delay," *Ukrainian Weekly*, 22 October 1995, p. 2. "Ukrainian Prime Minister on Economic Reform," *OMRI Daily Digest*, No. 200, Part II, 13 October 1995.

11 October 1995

UKRAINE ABANDONS PLAN TO BUILD GAS-FIRED PLANT

President Kuchma announced that Ukraine has abandoned the plan to build a gas fired-plant to replace a decommissioned Chornobyl NPP. The Ukrainian government now intends to build a recycling plant. Kuchma announced on 12 October 1995 that the final program to decommission Chornobyl should be ready by the end of the year. However, Chornobyl's closure is only guaranteed if Ukraine feels that it has the resources to do so. No resolution is yet apparent in this arena, according to a Chornobyl spokesman who reported that the G-7 had promised \$207 million in assistance for the plant's closure but had not delivered any money.

—"Ukraine, G-7 In Talks to Close Chornobyl," Reuters 11 October 1995. "Ukraine Draws Plan to Close Chornobyl," Executive News Service, 13 October 1995.

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2 October 1995

FRANCE, GERMANY, JAPAN PRESSURED TO FINANCE CHORNOBYL CLOSURE

Prime Minister Yevhen Marchuk asked Canada to pressure France, Germany and Japan to provide financing to close Chornobyl by 2000. Marchuk was reported to have said that the United States and Canada have a constructive, understanding view on Chornobyl's closure.

—"Ukraine Asks Canada to Press G-7 on Chornobyl," Reuters 2 October 1995.

28 September 1995

ASSISTANCE TO SHUTDOWN CHORNOBYL NPP: \$1.44 OR \$4 BILLION?

Yuriy Kostenko announced at a press conference that he had agreed to the G-7 plan for Chornobyl's closure and the generation of replacement power at a cost of \$1.44 billion. He said a plan of action would be ready by mid-October. On 29 September 1995 President Kuchma announced that Ukraine will still require \$4 billion in assistance to shutdown the Chornobyl NPP.

—"G-7 Balks at Chornobyl Shutdown Costs," *Ukrainian Weekly*, 8 October 1995, p. 2. "G-7 Offers \$1.4 Bil for Nuclear Units to Replace Chornobyl Power Plant," *Post-Soviet Nuclear & Defense Monitor*, 13 October 1995, p. 6.

27 September 1995

UKRAINE, G-7 — PARTIAL AGREEMENT ON CHORNOBYL

Yuriy Kostenko, the Minister of Environmental Protection and Nuclear Safety, and Alan Culhan, the Canadian Chairman of the G-7, were satisfied with the general principles they reached on Chornobyl closure and both hoped that an agreement on closure would be signed in late November. At the meeting, Kostenko reiterated his dissatisfaction that the G-7 did not meet the Ukrainian demand of \$4 billion for Chornobyl's closure. Kostenko did say, however, that the possibility of a gas combine in Slavutych is not out of the question because it has support in the U.S. DOE and in Canada. Officially, the G-7 sees the priority as completing two VVER-1000 units at Rivne-4 and Khmelnytsky-2, reconstructing Ukraine's hydropower plants, and modernizing thermal power plants. For the first time, G-7 and Ukrainian negotiators included funding for the sarcophagus in the overall plan for Chornobyl's closure.

—Ron Popeski, "West Rejects Ukraine's Chornobyl Plan," Reuters 27 September 1995. Peter Coryn, "G-7 Rejects Ukrainian Plan for Chornobyl Plant Closure," *Nucleonics Week*, 12 October 1995, pp. 9-10. "Still No Breakthrough In Chornobyl Closure Talks," *NucNet*, 29 September 1995.

30 August 1995

KUCHMA ASKS BRITAIN FOR ASSISTANCE

President Kuchma asked Britain to help shut down the Chornobyl NPP. British Prime Minister Bonsor said his country intends to provide political, technological and financial assistance to Ukraine and noted the importance of a scheduled visit to Ukraine by Foreign Secretary Malcolm Rifkind.

—Valeriy Druzhenko, "Kuchma Seeks Britain's Help to Shut Down Chornobyl," Intelnews, 30 August 1995.

28 August 1995

PARASHIN — WEST MUST MATCH COST DIFFERENCE BETWEEN NUCLEAR FUEL AND GAS

According to Serhiy Parashin, Director of the Chornobyl NPP(ChNPP), plant shutdown would lead to direct losses of

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\$4.4 billion. Plans for construction of a steam-gas power plant at Slavutych, designed to replace ChNPP, will require three years and \$2 billion to complete. His "final offer" is that the West not only fund construction of this plant, but also cover the difference in cost between nuclear fuel and gas for the next ten years — measures totaling \$4 billion. Parashin foresees the 15 EU members, the three non-EU members of the G-7 and Ukraine each contributing \$200 million to construct a replacement power plant.

—"Interview with Serhiy Parashyn, Director of The Chornobyl Nuclear Power Plant," Intelnews, 28 August 1995. Konstantin Parushkura and Roman Vershillo, "Chornobyl Atomic Power Station to Be Closed Down for \$4.4 Billion," *Segodnya*, 14 April 1995, p. 1.

23 August 1995

CHORNOBYL NPP CANNOT CLOSE BEFORE ITS EMPLOYEES GET NEW JOBS

Prime Minister Yevhen Marchuk announced that the Chornobyl NPP will stay in operation until its employees secure new jobs. Ukraine has pressured the G-7 to provide the funds to create those jobs.

—"Ukrainian Prime Minister on Chornobyl Closure," by Chrystyna Lapychak, OMRI Daily Digest, no. 194, Part II, 23 August 1995, p. 1.

15 August 1995

PROPOSAL TO SAVE 100,000 JOBS

Oleksandr Dupak, Vice President of the Association of Energy and Electric Engineers, proposed developing nuclear and thermal power plants, instead of a steam-gas one, to replace Ukraine's energy needs when Chornobyl goes off-line. The Association hopes to utilize domestic power sources, improve the condition of the environment, and create or save 100,000 jobs. This requires \$2 billion plus Western technical assistance.

—"Thermal Plant Proposed to Replace Chornobyl," InfoBank, 15 August 1995.

8 August 1995

SEPTEMBER MEETING TO DISCUSS CHORNOBYL CLOSURE?

President Kuchma reportedly wrote to Canadian Prime Minister Jean Chretien requesting a meeting in September to discuss plans to close Chornobyl. Kuchma said Kiev has the "legal and moral right to alter its decision" to close the reactors. The Presidential Commission on Nuclear Policy and Ecological Safety recommended that Chornobyl undergo major reconstruction and continue operation for 10 years.

—OMRI Daily Digest, part II, no. 154, vol.1, p. 6; see also 6 August 1995.

8 August 1995

SIEMENS SHOWS INTEREST IN SLAVUTYCH PLANT

Yuriy Kostenko discussed with Siemens constructing power units near Slavutych to replace the electricity lost if Chornobyl is closed.

—"Ministry, Foreign Firm Examine Chornobyl Closure Options," Intelnews, 9 August 1995.

7 July 1995

G-7 — AN EXTRA \$2 BILLION FOR CHORNOBYL SHUTDOWN

The G-7 welcomed Ukraine's decision to shut down completely Chornobyl by 2000 and said its member states

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would encourage the EBRD and the World Bank to provide an additional \$2 billion for the task.

—"G-7 Members Agree to Hold Nuclear Safety Summit in Moscow," *Post-Soviet Nuclear & Defense Monitor*, 7 July 1995, p. 4.

6 July 1995

PROPOSALS FOR CHORNOBYL POWER REPLACEMENT

Shutting Chernobyl within three years is possible. President Kuchma responded positively on 6 June '95 to a Siemens proposal to reconstruct the country's outdated coal-fired power stations. The first phase would provide 6,000 megawatts of power and would cost \$1 billion. Siemens expects funding from the EBRD and private sector banks. This is an alternative to the ABB proposal for a combined cycle gas-turbine plant. The Siemens proposal employs Ukrainian coal rather than relying on Russian imported gas. Another advantage for Ukraine is that the proposal calls for Chernobyl to be used to train nuclear personnel and serve as a fuel assembly production plant. Serhiy Parashin, the Chernobyl Director, supports the gas replacement because it would employ former Chernobyl workers rather than move resources and jobs to Rivne and Khmelnytsky. ABB argues that a \$2 billion gas plant would be more efficient and would account for 5 percent of Ukraine's yearly gas consumption at a cost of \$350 million a year.

—Allison Eadie, "Siemens proposal to shut down Chernobyl," *Daily Telegraph*, 7 July 1995, p. 4. "Chernobyl Closure, New Plants Remain Uncertain," *Post-Soviet Nuclear & Defense Monitor*, 7 August 1995, p. 2. "A Rival Proposal for Chernobyl Replacement," *Nuclear News*, August 1995, p. 78.

28 June 1995

G-7 — ALL WANT CHORNOBYL CLOSED BUT NO ONE WANTS TO PAY

President Kuchma submitted plans for the Chernobyl closure which would free up \$700 million in aid from the European Union (EU). However, EU External Affairs Commissioner Hans Van Der Broek indicated that new funds for Chernobyl's closure would not be available until the EU Commission had completed further studies regarding the types of resources required for the closure of the plant. German Chancellor Helmut Kohl stated that Germany will press for Western financial support for the closure, but noted that Germany could do nothing on its own.

—G-7 Countries Offer Sympathy, but No Money," *Nuclear News*, August 1995, pp. 75-76. "Little Progress in Ukraine-EU Talks on Chernobyl," Reuters 28 June 1995.

20 June 1995

KUCHMA HAGGLES FOR STEAM-GAS PLANT, SARCOPHAGUS

President Leonid Kuchma has promised to close the facility by 2000 if Western countries finance a steam-gas power generator and new sarcophagus.

—"Ukrainian Atomic Energy Committee Says Chernobyl Is Safest Plant," OMRI Daily Digest, part II, no. 141, vol. 1, 21 July 1995.

16 June 1995

CHORNOBYL — TO BE CLOSED?

Volodymyr Horbulyn, presidential advisor and member of the Security Council, said that if the G-7 does not increase assistance for closing Chernobyl, Ukraine might reconsider decommissioning the plant. Ukraine's position,

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Horbulyan said, is neither a "threat nor an ultimatum." We simply have no other options." The G-7 has pledged \$2 million but Ukraine says it needs more than \$4 billion, preferably in grants.

—Chrystyna Lapychak, "Ukraine Warns Chornobyl Shutdown Hinges on G-7 Financing," *OMRI Daily Digest*, Vol. 1, No. 117, 16 June 1995. Konstantyn Parishkura, "Ukraina Mozhet Otkazatsya Ot Zakrytiya ChAES," *Segodnya*, 16 June 1995, p. 8.

23 May 1995

EU PROMISES ECU 200 MILLION TO UKRAINE

The EU promised to give Ukraine credits worth ECU 200 million (\$254 million) in addition to a previous EU credit promise of 85 million ECU. This credit is extended, provided that Ukraine closes Chornobyl by 2000.

—Ustina Markus, "...And Agree on Aid to Ukraine," *OMRI Daily Digest*, Vol. 1, No. 99, 23 May 1995.

21 May 1995

UKRAINE TO RECEIVE \$500 MILLION IN AID BY 1996

According to the timetable drawn up for the closure of Chornobyl, Ukraine should receive \$500 million in aid by 1996 and an additional \$3.5 billion between 1996 and 1999. Unit 3 is slated to be decommissioned by 1999 and it is only after that point that work on the sarcophagus can begin.

—Marta Kolomayets, "Ukraine, G-7 Discuss Chornobyl," *Ukrainian Weekly*, 21 May 1995, pp. 2, 6.

17 May 1995

G-7 OFFER TO UKRAINE — \$400-500 MILLION IN GRANTS, \$1.5 BILLION IN LOANS

Representatives from the G-7, the EBRD, and the World Bank met in Kiev to discuss the details of closing Chornobyl. Environmental Protection and Nuclear Safety Minister Yuriy Kostenko provided the delegations with a list of expenses and timetable for decommissioning Units 1,3. The G-7 delegation offered Ukraine \$400-500 million in grants and \$1.5 billion in loans. The timetable states that Unit 1 is to be shut in 1997 and Unit 3 by the end of 1999. Unit 2 (currently off-line following a 1991 fire) is to be permanently closed in 1996.

—Chrystyna Lapychak, "Ukraine Holds Talks with G-7 on Chornobyl Shutdown," *OMRI Daily Digest*, No.95, Part II, 17 May 1995. "A Plan for Closing Chornobyl," *Nuclear News*, July 1995, p. 50. "Chornobyl: Closure by 2000?," *Engineering International*, July 1995, p. 15.

27 April 1995

UKRAINIAN, WESTERN EXPERTS DISAGREE OVER CHORNOBYL CLOSURE COST

Ukrainian experts place that the cost of closing Chornobyl and building new power plants at \$6-7 billion; Western estimates are much lower. Some Ukrainians speculate that the West cares less about ecological and safety issues at Chornobyl and more about shutting down all nuclear facilities in Ukraine to prevent potential plutonium production for weapons. These experts argue that Russia hopes to make Ukraine more dependent on Russian fossil fuels.

—Serhiy Tikhy, "Will Ukraine Close Chornobyl?" *Moscow News*, No. 15, 21-27 April 1995, p. 1.

24 April 1995

KUCHMA WANTS TO ATTEND G-7 MEETING

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President Kuchma asked to attend the next G-7 summit in Halifax, Canada, where participants will discuss issues related to Chornobyl shutdown. He wants to provide the G-7 with first-hand information on the subject.

—Interfax, 4/24/95; in "Udovenko on Giving G-7 Information on Chornobyl." FBIS-SOV-95-079, 24 April 1995.

20 April 1994

KUCHMA LINKS SHUTDOWN TO OTHER ISSUES

President Kuchma tied Chornobyl's closure to fixing the Unit-4 sarcophagus and employing Chornobyl workers.

—"Ukraine," *Nucleonics Week*, 20 April 1995, p. 13.

14 April 1995

CHORNOBYL CLOSURE DEPENDS ON WESTERN AID

Ukraine has reportedly assured international agencies that it will shut down Chornobyl fully by 2000, as long as it receives \$4.4 billion in Western aid. This aid would finance a gas-fired combined cycle power plant, the construction of a new sarcophagus, and social programs to assist the 5,000 workers who will lose their jobs at Chornobyl. Without this aid, Ukraine plans to keep Chornobyl operational until 2011. Constructing a gas-fired power plant allows Ukraine to receive World Bank financing; the World Bank does not finance nuclear projects. The Verkhovna Rada supported President Kuchma's plan to create an international research and technological center at Chornobyl. A draft of the requisite international agreement will be drafted by September '95. Despite the decision to decommission Chornobyl by 2000, Serhiy Parashin has initiated Unit-2 repairs.

—Ustina Markus, "Ukraine to Close Chornobyl by 2000," OMRI Daily Digest, No. 75, Part II, 14 April 1995. Alex Brall, "Kuchma Announces Decision to Stop Chornobyl Units by 2000," *Nucleonics Week*, 20 April 1995. "Ukraine Determined to Close Chornobyl AES by 2000," FBIS-SOV-95-077, 20 April 1995. "Kuchma: Aid Needed to Close Chornobyl AES," FBIS-SOV-95-079, 24 April 1995. Chrystyna Lapychak, "Ukrainian Experts Devise Plan for Chornobyl Shutdown," OMRI Daily Digest, 16 May 1995.

13 April 1995

KUCHMA CONFIRMS CHORNOBYL'S SHUTDOWN BY 2000

President Kuchma, the EU and G-7 concluded that Chornobyl will be shut down by 2000. Secretary of the Ukrainian National Security Council Volodymyr Horbulyn said that the EU's ECU 85 million loan has been delinked from the shutdown of Units 1 and 3. Ukraine is to draw up the required documents by 15 May, after which the next session between Ukraine and the G-7 will be held.

—Interfax, 4/13/95; in "Kuchma, EU, G-7 Agree on Chornobyl AES Closure Date," FBIS-SOV-95-072, 13 April 1995.

13 April 1995

PARASHIN — SLAVUTYCH POWER STATION BUYS ChNPP CLOSURE

According to plant manager Serhiy Parashin, Chornobyl can be shut down as long as the West compensates for the losses Ukraine will incur as well as build a 3,000 MW steam gas power station in Slavutych. He estimates that Ukraine will require \$4.4 billion in order to deal with such problems as unemployment, power generation, and safety issues. The construction of a steam gas power plant can be built in 40 months and would only cost \$2 billion; the G-7 already rejected the idea of building a new 1,000 MWe nuclear reactor because of the high costs and the fact that it would take 96 months to complete. The remaining \$2.4 billion will be used to build a stockpile of

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natural gas, which is three times more costly than nuclear fuel. Parashin also mentioned that an additional possibility has been proposed by the joint-stock firm "Energy" for the construction of an underground nuclear power plant in Chornobyl's place.

—UNIAN, 4/13/95; in "Director: Plant Closure to Cost \$4.4 Billion," FBIS-SOV-95-072, 13 April 1995.

April 1995

PROJECTS ON CLOSURE AND REMEDIATION OF CHORNOBYL

AEA Technology of the UK is involved in several projects related to the closure and remediation of Chornobyl. One project's goal is to develop technologies to rehabilitate the 30 km exclusion zone around Chornobyl. This contract is worth \$380,000 (300,000 ECU). A final study is due to be released in a year-and-a-half but if and how the recommendations are used depends on Ukraine's ability to exempt contractors from third-party liability. The second project, in conjunction with KAB, its German partner, is preparing a plan to decommission Units 1,3 and identify alternative energy sources; the funds for this program are provided by TACIS. AEA is also a member of the Alliance consortium that is working to solve the problems posed by the sarcophagus.

—"Other Contracts," *Nuclear Engineering International*, April 1995, p. 10. Ann MacLachlan, "SSN-AEA Group Wins EC Contract on Chornobyl Contamination Zones," *Nucleonics Week*, 16 March 1995, p. 8.

31 March 1995

UKRAINIAN OFFICIALS DIFFER OVER CHORNOBYL FUTURE

Luis Moreno, the EC Ambassador in Kiev, has stated that the EU loan of 85 million ECU would not be provided until Ukraine pledges to close down Chornobyl. Given this, President Kuchma directed Derzhkomatom, the Ministry of Environmental Protection and Nuclear Safety (Minekobebezpeky), Minenergo, Minekonomik, the Ministry for Foreign Affairs, and the National Academy of Science to prepare a unified government position by 15 March 1995; these ministries failed to provide him with such a plan by the deadline. Kuchma then instructed them to draw up a plan by 10 April 1995. Mikhailo Umanets, chairman of Derzhkomatom, and Serhiy Parashin, director of Chornobyl, are firmly committed to the position that Chornobyl should remain in operation; they are supported by Viktor Baryakhtar, the Vice President of the Academy of Science and freelance advisor on nuclear problems to the President. Yuriy Kostenko, head of the Ministry of Environmental Protection and Nuclear Safety, has taken the position that Chornobyl should be shut down when the "clearances in the graphite technological canals are used up;" his position is based primarily on environmental concerns. Kostenko believes that money would be better spent on completing Zaporizhzhya-6, Rivne-4, and Khmelnytsky-2.

—"European Commission Ambassador Issues Warning; Ukraine Ministries Fail to Reach Consensus on Plan," *Post-Soviet Nuclear & Defense Monitor*, 31 March 1995, p. 7.

30 March 1995

OFFICIAL GOVERNMENT POSITION WILL BE IDENTIFIED BY EU DELEGATION'S VISIT

The EU plans to visit Kiev in April 1995 to convince President Kuchma of the necessity of closing Chornobyl permanently. In the past, negotiations were conducted by Derzhkomatom officials, whose main mission was to prevent the plant's closure. The visit is part of ongoing negotiations regarding the G-7 offer of \$800 million in "energy-related assistance" in return for Ukraine's pledge to shut down Units 1 and 3 before the end of their operating life. President Kuchma instructed his government to identify an official government position by 10 April.

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—Ann MacLachlan, "EU Wants Meeting with Kuchma over Chornobyl Closure Commitment," *Nucleonics Week*, 30 March 1995, pp. 7-8.

29 March 1995

CLOSING CHORNOBYL — A POLITICAL, TECHNICAL PROBLEM

During Belarusian President Lukashenka's visit to Chornobyl, Ukrainian President Kuchma stated that the closure of Chornobyl was a political problem, but Ukraine was willing to close the plant as long as all issues related to the closure, such as Western financial assistance, are dealt with by the time of closure. Kuchma also stated that technical problems stand in the way of Chornobyl's closure.

—Ustina Markus, "Belarusian President Visits Chornobyl," OMRI Daily Digest, No. 63, Part II, 29 March 1995.
"Vzryvoopasny Chornobyl Prodolzhit Rabotu," *Krasnaya Zvezda*, 30 March 1995, p. 1.

22 March 1995

\$200 MILLION FROM JAPAN FOR CHORNOBYL SHUTDOWN

Ukraine will receive \$200 million from Japan through Export-Import bank for the shut-down of the Chornobyl power plant and renovation of equipment at the other nuclear power plants.

—"On the Eve of Negotiations Japan Gave Ukraine a Present," *Kommersant Daily*, 22 March 1995, p. 3. "Japan Will Give Money to Ukraine to Shut Down Chornobyl Nuclear Power Plant," *Izvestiya*, 22 March 1995, p. 1.

14 March 1995

FINAL DECISION ON THE FATE OF THE PLANT WILL BE TAKEN SOON

President Kuchma was at Chornobyl on a fact-finding visit. He told plant personnel that a final decision on the fate of the plant would be taken in the near future. This plant generates seven percent of the country's energy and Kuchma currently opposes the closure because of Ukraine's energy crisis.

—Chrystyna Lapychak, "And Visits Chornobyl," OMRI Daily Digest, No. 53, Part II, 15 March 1995.

9 March 1995

UPCOMING NEGOTIATIONS ON CHORNOBYL CLOSURE; ELECTRICITE DE FRANCE ESTIMATE OF CLOSURE COSTS

The EC is expected to hold a final round of negotiations regarding the closure of Chornobyl in Kiev 14-16 March 1995. They plan to establish a timetable for the plant's shutdown and to identify options for the creation of a safer, more permanent sarcophagus for destroyed Unit 4. Since negotiations began in July 1994, Ukraine has repeatedly "upped the ante" and requested increased foreign assistance for the completion of VVER-1000 units at other nuclear power plants as well as new reactors near Chornobyl, in Slavutych. Electricite de France, a major player in the negotiations, estimates that Unit-1 should be shut down in 1995, Unit-3 should be closed by the end of 1997, and Unit-2 should not be restarted. The estimated cost of a new sarcophagus and cleanup is \$3 billion, including \$1 billion alone for the new covering; these funds are to be provided by the European Bank for Reconstruction and Development (EBRD) and the EU.

—Ann MacLachlan, Peter Coryn, and Alex Brall, "G-7 Resumes Talks to Shut Chornobyl Over Ukrainian Protests," *Nucleonics Week*, 9 March 1995, p. 12.

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6 March 1995

UNIT-2 TO GO ON-LINE, CHORNOBYL TO STAY OPEN

After three days of negotiations with G-7 officials, Ukraine is now refusing to close down Chernobyl. Kiev still maintains that it cannot decommission the two units in operation until alternative energy sources are secured; additionally, it has stated that the \$800 million in aid from the EU is insufficient. Reportedly, Ukraine still plans to bring Unit 2 back into service in 1996.

—Ustina Markus, "Ukraine Resists G-7 Pressure on Chernobyl," OMRI Daily Digest, No. 46, Part II, 6 March 1995.

2-3 February 1995

UPGRADING CHORNOBYL UNITS 1,2,3 CHEAPER THAN CLOSING ENTIRE PLANT

At a conference with G-7 officials in Kiev, Ukrainian representatives maintained that upgrading Chernobyl Units 1,2,3 costs less than closing the entire plant permanently, building new reactors, and completing unfinished units. The meeting established neither a timetable for closing the plant nor the conditions necessary for decommissioning. Ukraine refused to shut down Chernobyl in the 1996-1999 time frame; a more lenient time frame of 1998-2000, suggested at the February 1995 G-7 meeting, was rejected as well, unless there is explicit G-7 direction. The basic Ukraine's position seems to include operation of Unit-3 until the end of its scheduled life (not less than 30 years from the initial start-up date). Units 1 and 2 could be decommissioned as long as new units are constructed in Slavutych prior to the actual closure of the old units.

—Ann MacLachlan, Peter Coryn, and Alex Brall, "G-7 Team Resumes Talks to Shut Chernobyl Over Ukrainian Protests," *Nucleonics Week*, 9 March 1995, p. 12. "Ukraine, G-7 Fail to Agree on Chernobyl Shutdown," *Post-Soviet Nuclear & Defense Monitor*, 31 March 1995, p. 7.

5 January 1995

UKRAINE WANTS G-7 FINANCIAL AID FOR CONSTRUCTION OF PLANT AT SLAVUTYCH

Nur Nihatullin, first deputy chairman of Derzhkomatom, stated at the latest round of negotiations between Ukraine and the G-7 Task Force that Ukraine has no intention of shutting down Chernobyl in exchange for international assistance in completing three VVER reactors at Rivne-4, Zaporizhzhya-6, and Khmelnytsky-2. Instead, Ukraine wants G-7 financial aid for the construction of a new two-unit plant near the town of Slavutych, populated entirely by Chernobyl plant workers. In June 1994, the G-7 pledged \$800 million to Ukraine if it would close Chernobyl permanently.

—Ann MacLachlan, "Ukraine Nuclear Committee Says It Won't Close Chernobyl Soon," *Nucleonics Week*, 5 January 1995, pp. 13-14.

January 1995

UKRAINE COULD FIND ITSELF IN INTERNATIONAL ISOLATION

Volodymyr Shcherbina, the Deputy Director of the Academy of Science's Interdisciplinary Scientific and Technical Center, reported that the continued operation of the Chernobyl NPP and the reassuring announcements by various Ukrainian government agencies are raising concerns among foreign organizations and foreign government officials, which could lead to international isolation for Ukraine. He suggested raising the level of safety to international standards, accepting the G-7's proposal on the closure of the Chernobyl NPP, and relying on regional and state referendums to decide principal questions related to atomic energy.

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—Volodymyr Shcherbina, "Yadernaya Energetika Ukrainy PostChornobyl Ili MezChornobyl," *Vestnik Chornobylya*, January 1995, p. 1.

24 November 1994

UKRAINE REQUIRES \$10 BILLION TO CLOSE CHORNOBYL

The Ukrainian nuclear industry has repeatedly criticized the G-7 deal to close Chornobyl, saying the West does not comprehend the complexity of Ukraine's situation. Reportedly, Ukraine requires \$10 billion to completely close Chornobyl. Chairman of the Parliamentary Committee on the Problems of the Chornobyl Accident, Volodymyr Yatsenko, said that the European Parliament and the EU seek to close Chornobyl regardless of the consequences. The EU pledged to reexamine the situation more broadly, taking into account the inevitable unemployment and electricity crisis once Chornobyl has been shut down. Nikolai Steinberg said that three Ukrainian reactors under construction need not be built, since the decline in Ukraine's industrial production lowered energy demand and created a power surplus. He stressed that the units being built should be retrofitted with more modern equipment prior to being brought on line.

—Peter Coryn, "Ukrainians Resume Criticism of G-7 Chornobyl Closure Deal," *Nucleonics Week*, 24 November 1994, pp. 8-9.

21 November 1994

KUCHMA — CONSTRUCT WESTERN-STYLE REACTORS

President Kuchma plans to propose a new plan for the closure of Chornobyl during his visit to Washington, D.C. Kuchma will seek \$1.49 billion for plant decommissioning, \$2 billion for completing three other Soviet era reactors in Ukraine, and \$3 billion for the construction of two Western style reactors in the immediate Chornobyl region. Ukraine would spend up to \$6 billion to cover other associated costs related to the plant's closure. This plan does not appear to fulfill G-7 requirements that Ukraine immediately close one of the two operating reactors at Chornobyl and set a timetable for closing the second. Ukrainian officials maintain that the two units at Chornobyl cannot be closed until the Western type reactors are operational and can replace the power that Chornobyl generates.

—Matthew Kaminski, "Kuchma to Discuss Chornobyl Closure," *Financial Times*, 21 November 1994, p. 3.

20 November 1994

PAVLOVSKYY: WESTERN TERMS FOR CHORNOBYL CLOSURE UNACCEPTABLE

Chairman of the Rada Committee for Nuclear Policy and Nuclear Safety Mykhailo Pavlovsky said Western terms for Chornobyl's closure are unacceptable. He perceives Western insistence to shut Chornobyl as a way to force Ukraine to fulfill its energy needs by buying from Europe.

—Radio Ukraine World Service, 20 November 1994, in "Pavlovsky Opposes Chornobyl Closure Terms," FBIS-SOV-94-224, 20 November 1994.

18 November 1994

UDOVENKO — CHORNOBYL MUST BE CLOSED DOWN

Ukrainian Minister of Foreign Affairs Hennadiy Udoenko said that his country realizes the need for Chornobyl shutdown and could do so even without Western pressure. But, financial and technical problems are preventing

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Ukraine from decommissioning the plant in the near future — a \$10-12 billion project, he estimated.

—Roma Ihnatowycz, "Ukraine Wants Payback for Passing Non-Nuke Treaty," UPI, 18 November 1994.

20 October 1994

UKRAINE AGREED TO CLOSE CHORNOBYL IN PRINCIPLE BUT HAS NO DATES

The Ukrainian government has agreed to close Chernobyl, but has not yet set a firm date, commenting that the process should take into consideration "the technical realities of reactor decommissioning as well as the financial capabilities of Ukraine." The G-7 wants Unit 1 to be shut down by 1996, Unit 3 by 1997, and insists that Unit 2, which is in the process of being recommissioned, should not be restarted. In exchange for closing Chernobyl, Derzhkomatom wants G-7 assistance in completing the construction of Zaporizhzhya-6 by 1996, Khmelnytsky-2 by 1997, and Rivne-4 by 1998.

—Ann MacLachlan and Alex Brall, "Ukraine Accepts Chernobyl Close but Doesn't Commit to Schedule," *Nucleonics Week*, 10 November 1994, pp. 14-15.

4 October 1994

UKRAINE — NO TIME FRAME FOR PLANT CLOSURE

EU representatives reported that Ukraine has agreed in principle to an international proposal to shut down Chernobyl but stressed that no time frame has been set. Ukraine places the costs of closing Chernobyl range between \$1.4 to \$14 billion. There is a wide variety of estimates among Western experts as well. The G-7 disagrees with the Ukrainian proposal to build an entirely new plant near Chernobyl in order to prevent widespread unemployment after the closure of Chernobyl.

—"Ukraine Agrees to Close Chernobyl Nuclear...," Reuters 4 October 1994. Stan Markotich, "Kiev to Close Chernobyl," RFE/RL Daily Report No. 189, 5 October 1994. Ann MacLachlan, "Ukraine Accepts G-7 Chernobyl Aid but Time, Price Remain Uncertain," *Nucleonics Week*, 20 October 1994, pp. 7-8.

October 1994

LIFE SPAN OF CHORNOBYL 1,2,3 ENDS IN 2011

Chernobyl's General Director, Serhiy Parashin, repudiated calls for closure of the plant. He said that it would take six to ten years to decommission the reactors, yet the life span of the three units would run out by 2011.

—"Chernobyl Director Rejects Shutdown," *Ukrainian Weekly*, 9 October 1994, p. 2.

October 1994

U.S.-UKRAINIAN JOINT STUDY ESTIMATES COST OF CHORNOBYL CLOSURE

A joint US Department of Energy (DOE)-Ukrainian study, completed in June 1994, determined that it would cost Ukraine \$1.396 billion to close down Units 1-3 at Chernobyl; preparatory work would cost \$410 million, plant shutdown and 10 years of maintenance work would cost \$376 million, and retraining, job creation, and other social service activities would cost \$610 million. This estimate did not consider long-term measures to address the disaster at Unit-4. This study also evaluated possible replacement sources of energy, including fossil fuels, hydro, wind and nuclear power, while noting the significance of reducing the demand for electricity in.

—"Options for Replacing Chernobyl," *Nuclear Engineering International*, October 1994, p. 20.

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28 September 1994

MASOL: IMPOSSIBLE TO CLOSE CHORNOBYL

Prime Minister Vitaliy Masol commented on the deal to close Chornobyl NPP, if Ukraine receives Western funding. Masol did not disagree with the idea of closing the plant, but said that it would be impossible to do so now given Ukraine's poor economic situation and the possibility of a winter fuel shortage.

—Radio Ukraine World Service, 28 September 1994; in "G-7 Experts Discuss Phasing Out Chornobyl," FBIS-SOV-94-189, 29 September 1994.

15 September 1994

PARASHIN ON WEST'S EFFORTS TO CLOSE CHORNOBYL

Serhiy Parashin noted two likely reasons for the Western preoccupation with closing ChNPP. (1) There are only two operational units in Ukraine equipped with RBMK reactors — compared with two units in Lithuania and 11 in Russia — making Chornobyl an easier target for closure. (2) RBMK reactors can be used to make weapons-grade plutonium. He said the \$200 million offered by the G-7 for closing Chornobyl was not sufficient to compensate for Ukraine's loss of power production. He estimated the cost to close the plant to be \$1.3 billion, plus at least \$700 million to compensate Chornobyl workers and an additional \$1.2-1.4 billion to construct a new sarcophagus. \$1.4 billion would be needed to finish the Zaporizhzhya-6, Khmelnytsky-2, and Rivne-4 reactors. Both Parashin and Nur Nihatullin have mentioned a Ukrainian proposal to build two new, Western-style nuclear power units at Slavutych to make up for lost power production if Chornobyl is closed.

—*Kyyivska Pravda*, 6 September 1994 pp. 1-2; in "Chornobyl Station Chief on Safety, Shutdown," FBIS-SOV-94-179, 15 September 1994, p. 41. *Kyyivska Pravda*, 6 September 1994. *Der Standard*, 3-4 September 1994.

4 September 1994

NIHMATULLIN — WEST'S POSITION ON CHORNOBYL CLOSURE INCONSISTENT

Nur Nihatullin, First Deputy Chairman of Derzhkomatom, stated that the position of the West with regard to the Chornobyl closure is very inconsistent. He maintains that there is a reactor identical to Chornobyl in St. Petersburg that is being redeveloped with Western aid, yet Western experts insist that Chornobyl be shut down as soon as possible. He added that the G-7's \$200 million for closing Chornobyl only covers the technological costs of shutdown and does not account for completing unfinished reactor blocs.

—*Der Standard*, 3-4 September 1994, p. 28, in JPRS-TEN-94-022, 20 September 1994, pp. 50-51. *Der Standard*, 3-4 September 1994, p. 28, in "Official Cited on G-7 Aid for Chornobyl," FBIS-SOV-94-172, 6 September 1994, p. 57.

11 July 1994

ALTERNATIVE ENERGY OPTIONS

The United States and Ukraine are trying to identify alternative energy options in order to facilitate the closure of Chornobyl as soon as possible. Suggestions include the completion of 5 VVER-1000 units, which would cost between \$34 million-\$1.27 billion per unit and includes safety upgrades prior to and after start-up. Upgrading fossil fuel plants is another possibility and is estimated to cost between \$275 million-\$1.2 billion. Wind power generation improvements might cost \$150-300 million.

—"Options to Replace Chornobyl Include New Nuclear Generation," *Nuclear Energy Overview*, 11 July 1994.

Related content is available on the website for the Nuclear Threat Initiative, www.nti.org.



June 1994

CLOSE CHORNOBYL NPP, BUILD SLAVUTYCH REACTORS

Financial assistance for closing the Chornobyl NPP offered by the EC at its June meeting, has been called insufficient by Mikhail Pavlovsky, Chairman of Ukraine's Parliamentary Committee on Nuclear Policy and Safety. Both Pavlovsky and Mykhailo Umanets, Chairman of the State Committee on the Use of Atomic Energy, said that closing the plant would be only the first step. It would have to be followed by providing other jobs for Chornobyl workers, including building two new reactors near the town of Slavutych where Chornobyl workers currently reside. An estimated \$2 billion would be needed to build these new units.

—Alex Brall, Ann MacLachlan, "Ukrainians Say Proposed EU Aid Is 'Obviously Insufficient'," *Nucleonics Week*, 7 July 1994, p. 6.

8 April 1994

UKRAINE TO SHUT DOWN CHORNOBYL ONCE ALTERNATIVE RESOURCES IDENTIFIED

US Assistant Secretary of Energy William White and Ukrainian Deputy Premier Valeriy Shmarov discussed how the Chornobyl NPP could be shut down ahead of schedule. Ukraine reportedly agreed to shut down Chornobyl once alternative resources are identified. Ukrainian power engineering specialists will hold consultations with their American counterparts regarding the completion of Khmelnytsky-2 and Rivne-4 nuclear reactors by 1998. This measure would enable Ukraine to close down the Chornobyl plant without any losses in total electricity generated.

—*El Pais*, 11 April 1994; in "Ucrania Pone Condiciones Para Fijar La Fecha De Cierre De La Central Nuclear De Chernobil," FBIS-SOV-94-069, 11 April 1994, p. 33. ITAR-TASS (Moscow), 8 April 1994; in "United States Experts Ready to Help Shut Down Chornobyl Plant," FBIS-SOV-94-069, 11 April 1994, p. 33.

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Research Centers

Chornobyl Research Center

11 December 2000

FRANCE, GERMANY SIGN MEMORANDUM WITH UKRAINE TO PROVIDE SUPPORT TO CHORNOBYL CENTER

Ukraine, Germany, and France signed a memorandum of support for and participation in Chornobyl Center activities concerning problems of nuclear safety, radioactive waste, and the environment. Each nation is committed under the memorandum to provide support to the center in the form of financing, resources, and personnel. The memorandum defines activities of the Center, including increasing security at nuclear facilities, measures for nuclear waste and spent fuel handling, and reducing the effects of the Chornobyl disaster. Chornobyl Center Director Valeriy Glygalo said that a fundamental goal of the center is to establish a computer database to provide information on these issues.

—"Pravitelstva Ukrainy, FRG i Frantsii podpisali memorandum o podderzhke tsentra po problemam yadernoy bezopasnosti," UNIAN, No. 50, 11-17 December 2000.; "Nauchnyy potentsial Mezhdunarodnogo chornobylskogo

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tsentra pozvol'yayet reshit voprosy bezopasnosti ukrainskikh atomnykh stantsiy," UNIAN, No. 50, 11-17 December 2000.

September 1998

UNITED STATES FUNDS CHORNOBYL CENTER PROJECTS

By the end of 1997, the United States had provided a total of \$5.4 million to the Chernobyl Center. Several projects were funded with this money, including the installation of a satellite-based communications system at the Slavutych facility. In addition, three joint technical projects were completed by US and Ukrainian specialists. The first project involved a risk analysis of hazards posed by the Unit Four sarcophagus to the still-operational reactor in Unit 3. The second project provided an assessment of robotics technology needs. The third project assessed computer modeling needs for the sarcophagus. These projects were coordinated by the Pacific Northwest National Laboratory, which acted on behalf of the US Department of Energy.

—"U.S.-Ukrainian Accomplishments at Ukraine's Nuclear Power Plants, "Office of Nuclear Energy, Science and Technology, US Department of Energy, May 1998"; Chernobyl Center for Nuclear Safety, Radioactive Waste and Radioecology," Center Brochure, undated, circa 1998.; "Chernobyl Improving Safety," Office of Nuclear Energy, Science and Technology, US Department of Energy, January 1998.

17 May 1996

UNITED STATES AND WESTERN EUROPE PROVIDE FINANCIAL AID TO SUPPORT CHORNOBYL CENTER

The US Department of Energy (DOE) Office of Nuclear Energy has provided \$3 million for the Chernobyl Center and involved the US Pacific Northwest Laboratory in the creation of the Center. The Laboratory is providing technical support, but is particularly interested in evaluating the safety threat to Chernobyl's Unit 3 from possible collapse of the sarcophagus. DOE officials, however, emphasized that funds for the Center will be awarded on a project-only basis and will be fully accountable. The United States also called for broad international support for the Center. Germany and Italy expressed interest in the project, and France agreed to provide roughly \$200,000.

—"Ukrainian Nuclear Safety Center Finally Created After US 'Prodding'," *Post-Soviet Nuclear & Defense Monitor*, 17 May 1996, pp. 6-7.

15 January 1995

TOKAREVSKIY DISCUSSES "UKRITIYE" SCIENCE AND TECHNICAL CENTER AT CHORNOBYL

According to Volodymyr Tokarevskiy, head of the "Ukritye" Science and Technical Center at Chernobyl, there are four departments within this center. The first department is responsible for the nuclear, radiological, and ecological safety of the sarcophagus. The second department is responsible for the design and development of plans to ensure the stability of the sarcophagus. The third section deals with radiation technology; the basis for this department is the Institute of Nuclear Radiation, which examines the materials at the site, including metals, concrete, and graphite. The fourth department is responsible for dealing with the ecological problems within a 30 km radius of Chernobyl. This center employs 650 people; 500 of them work at Chernobyl and the rest work at offices in Kiev, Kharkiv, and Moscow. "On Research and Development at Chernobyl... Volodymyr Tokarevsky," *Post-Soviet Nuclear & Defense Monitor*, 15 January 1995.

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Kharkiv Institute of Physics and Technology

26 December 2002

IRAQI INTEREST IN KIPT HEU REPORTED

The Globe and Mail reported on 26 December 2002 that Iraq has shown interest in KIPT, raising concerns that it is seeking to acquire the institute's 75kg of highly enriched uranium (HEU). The government of Iraq established a diplomatic office in Kharkiv, and appointed Yuriy Orshanskiy, a Ukrainian businessman who had made up to 40 trips to Iraq, as its honorary consul to Kharkiv. Between 2000 and 2002 Orshanskiy was also accredited by Ukraine as Iraq's representative to Kharkiv. However, the accreditation was revoked after a scandal surrounding possible Ukrainian arms shipments to Iraq broke out. Iraq also sent three delegations to the city since 1998. One delegation received an official tour of KIPT. The poor financial situation at the institute causes worries that some KIPT specialists will enter into cooperation with the Iraqi government.

—Mark MacKinnon, "Iraq showing unusual interest in Ukraine's nuclear laboratory," *The Globe and Mail*, www.globeandmail.com, 26 December 2002.

11 October 2002

KIPT WANTS TO RETAIN HEU

Global Security Newswire reported on 11 October 2002 that KIPT had declined to give up its HEU stockpile, rejecting a US offer to purchase its 75kg of 90% HEU to remove the risk of it falling into the hands of rogue states. KIPT director Volodymyr Lapshyn said that the institute needed the HEU for research and could not sell the uranium since it is state-owned, and is under IAEA oversight, and therefore cannot be removed without appropriate clearances. Lapshyn also said that there had been no direct contacts between Iraq and KIPT concerning the HEU.

—"Ukraine: Research Institute Clings to Uranium Stocks," Global Security Newswire, 11 October 2002; in Nuclear Threat Initiative Web Site, www.nti.org.

5 June 2000

CENTER FOR REACTOR CORE DESIGN TO RECEIVE US TECHNOLOGIES

Kharkiv Institute of Physics and Technology's Center for Reactor Core Design is to receive nuclear fuel and reactor core design technologies from the US Department of Energy. The Center for Reactor Core Design is being established as part of the Ukraine Nuclear Fuel Qualification Project, whose implementation agreement was signed during President Bill Clinton's visit to Ukraine on 5 July 2000.

29 October 1999

US FUEL TO BE TESTED AT SOUTH UKRAINE NPP IN 2001

UNIAN reported on 29 October that the Kharkiv Institute of Physics and Technology won a tender from the Ukrainian Energy Ministry to begin the introduction of US nuclear fuel at Ukrainian NPPs. The institute will create a design group to re-equip the Soviet-designed VVER-1000 reactors to handle the test samples of US fuel. The US company Westinghouse has been contracted by the US Department of Energy to design and produce the fuel. The South Ukraine NPP is expected to receive the fuel in 2001.

Related content is available on the website for the Nuclear Threat Initiative, www.nti.org.



—UNIAN, 29 October 1999; in "Ukraine to Try US Pilot Fuel at Nuclear Power Plants in 2001," FBIS Document FTS19991029001500.

28 January 1999

KHARKIV INSTITUTE OF PHYSICS AND TECHNOLOGY INTRODUCES NEW MPC&A SYSTEM

As of January 1999, the Kharkiv Institute of Physics and Technology had established a new MPC&A system. The system was established with assistance from the US Department of Energy's MPC&A program. According to Oleksandr Volobuyev, the institute's academic secretary, the new system meets international standards. Most of the equipment for the system realization is being provided by the US company Advantcor Corporation. The commissioning ceremony for the new system was attended by US and IAEA officials.

—"V natsionalnom nauchnom tsentre 'Kharkovskiy fizikotekhnicheskii institut' ustanovlena novaya sistema ucheta, kontrolya i fizicheskoy zashchity yadernykh materialov," UNIAN, 24 - 30 January 1999, No. 4.

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Kiev Institute for Nuclear Research

11 July 2002

KINR RECEIVES REACTOR OPERATION LICENSE

Interfax reported on 11 July 2002 that KINR received a license to operate its experimental reactor from the Ukrainian State Nuclear Regulatory Committee. The license will be valid until 2005. The reactor has had only a provisional license since 1998, and its operation was suspended between 1993 and 1998. In order to receive the new license, KINR had to undertake several measures required by SNRC, including the installation of a physical protection system, a computerized nuclear material accounting system, an automatic fire alarm, and an emergency power supply system. "Kievskiy uchenyye poluchili litsenziyu na ekspluatatsiyu reaktora," Interfax, 11 July 2002.

27 November 2000

RESEARCH REACTOR EXPECTED TO RESUME OPERATION IN NEAR FUTURE

The research reactor at KINR is soon expected to resume operation, after two years of inactivity. Chief Engineer Vladimir Makarovskiy stated that work to increase the safety of the reactor is being carried out, and KINR is awaiting permission from the Ministry of Environmental Protection and Nuclear Safety to activate the reactor. The Nuclear Regulatory Administration of the Ministry of Environmental Protection and Nuclear Safety has already granted KINR a license to operate the reactor until the end of the year. KINR has also received permission from agencies of the sanitary and fire inspectorate. The reactor is expected to be in operation for approximately a month to conduct research.

—"V Kiyevskom institute yadernykh issledovaniy gotovitsya pusk opytnogo yadernogo reaktora," UNIAN, No. 48, 27 November-3 December 2000.

28 May 1999

US ENERGY OFFICIALS VISIT TRAINING CENTER AT THE INSTITUTE OF NUCLEAR RESEARCH IN KIEV

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During their visit to Kiev, US Deputy Secretary of Energy T.J. Glauthier and Assistant Secretary of Energy Rose Gottemoeller toured the upgraded MPC&A system at the VVR-M research reactor and the George Kuzmycz Training Center for Physical Protection and Control of Nuclear Materials at the Institute of Nuclear Research. Glauthier was satisfied with the functioning of the Training Center and recognized its contribution to prevention of smuggling of nuclear materials. According to the Training Center's Director, Viktor Havrylyuk, since its creation in October 1998, the facility has trained over 500 specialists from the Ukrainian Ministry of Internal Affairs, the Security Service, the State Export Control Service of Ukraine, scientific research facilities, and the energy sector. The US DOE allocated \$4 million for the MPC&A upgrades and the training center.

—"Sredstva, predostavlenyye Ukraine po programe Nanna-Lugara, ispolzuyutsya po naznacheniyu, schitayut amerikanskiye chinovniki," UNIAN, 24 - 30 May 1999, No. 21.

9 October 1998

TRAINING CENTER OPENED AT THE INSTITUTE OF NUCLEAR RESEARCH

As part of an agreement between the US Defense Department and Ukraine's Ministry of the Environment and Nuclear Safety, a center for training specialists in the area of nuclear material control and accounting was established at the Institute of Nuclear Research in Kiev. The center, funded by the US government, the Ministry of Environmental Protection and Nuclear Safety of Ukraine, and the National Academy of Sciences of Ukraine, is part of an effort to build a state system to prevent proliferation. It offers training in safeguarding weapons-usable nuclear material, assessment of vulnerabilities at nuclear material storage sites, and tracking and accounting stored nuclear materials using a computerized accounting system. The trainees will consist of experts from various Ukrainian ministries, Enerhoatom, the Security Service, nuclear power stations, and research centers.

—UNIAN, 9 October 1998; in "Training Center for Monitoring of Nuclear Materials Opens," Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>.; "The George Kuzmycz Training Center," undated brochure, US Department of Energy.

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Reactor Safety: 2003-1994

21 February 2003

SOUTH UKRAINE NPP RECEIVES TACIS-FUNDED SAFETY EQUIPMENT

Unian reported on 21 February 2003 that the South Ukraine Nuclear Power Plant (NPP) received instruments for automatic monitoring of water quality. The equipment is scheduled to be installed by the end of the first quarter of 2003 on Unit 3, and will be used to measure water quality in the turbine section and the steam generators. The instruments were produced by the French firm ELTA, and were provided via European Union's TACIS program.

—"V ramkakh programmy TACIS na Yuzhno-ukrainskuyu AES postupili priborydlya avtomaticheskogo kontrolya kachestvavody v tekhnologicheskikh sistemakh," *Unian*, No 8 (250), 17-23 February 2003.

14 February 2003

US SPECIALISTS ASSIST ZAPORIZHZHYA NPP

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From 10 to 14 February 2003, safety experts from the US firm Westinghouse studied a project to develop and implement comprehensive emergency procedures at the Zaporizhzhya NPP, whose Unit 5 has been chosen as a pilot VVER-type reactor to introduce such procedures. The procedures are to be fully implemented by the end of 2004, and will then be applied at other units of the NPP. Westinghouse experts also plan to visit other Ukrainian NPPs. Prior to their visit to Zaporizhzhya NPP, Westinghouse specialists, together with representatives of the Pacific Northwest National Laboratory and the Argonne National Laboratory, held talks with specialists from Enerhoatom and Ukraine's NPPs on the emergency procedures project.

—"Amerikantsy izuchili proyekt po razrabotke i vnedreniyu sistemno-orienirovannykh instruktsiy na Zaporozhskoy AES," *Liga*, 14 February 2003; in Integrum Techn, www.integrum.com.

10 February 2003

JAPANESE SPECIALISTS TRAIN UKRAINIAN REACTOR PERSONNEL

Unian reported on 10 February 2003 that a delegation of specialists from the Japan Electric Power Information Center (JEPIC) visited the South Ukraine nuclear power plant (NPP). The visit was part of a program of international cooperation on NPP safety. The Japanese experts remarked that South Ukraine NPP personnel left a positive impression, and that they intend to continue cooperation in this area. Three South Ukraine NPP specialists visited Japan in 2002 where they received instruction in NPP safety procedures.

—"Yaponskiye eksperty obuchayut spetsialistov ukrainskikh AES," *Unian*, No. 7 (249), 10-16 February 2003.

2 April 2003

GERMAN SPECIALISTS UPGRADE FIRE SAFETY OF SOUTH UKRAINE NPP

Podrobnosti reported on 2 April 2003 that, according to Enerhoatom, specialists from the German firm Brandschutz were working at the South Ukraine NPP to improve its fire safety. German specialists will also train NPP personnel to use the new equipment. South Ukraine NPP has been using Brandschutz equipment since 1999.

—"Nemetskiye spetsialisty povyshayut protivopozharnuyu bezopasnost Yuzhno-Ukrainskoi AES," *Podrobnosti*, 2 April 2003; in Integrum Techno, www.integrum.com.

5 December 2002

GERMAN DELEGATION CITES INADEQUATE REACTOR SAFETY EFFORTS

Interfax reported on 5 December 2002 that a German delegation of the Federal Ministry for Environment, Nature Conservation, and Nuclear Safety, headed by Director General of the Department of Nuclear Safety and Radiation Protection Wolfgang Renneberg, spent three days familiarizing itself with the work on the closing of the Chornobyl NPP. According to the German experts, Ukraine is not spending enough on nuclear safety. Wolfgang Renneberg also said that if Ukraine were to perform a risk-benefit analysis of its nuclear energy program, the risks would most likely outweigh the benefits.

—"Nemetskiye eksperty polagayut, chto Ukraine sleduyet tratit bolshe sredstv na podderzhaniye yadernoy bezopasnosti," Interfax, 5 December 2002.

4 October 2002

QUALITY OF NPP OPERATORS QUESTIONED

Rivne vechirne reported on 4 October 2002 that over 10 employees of the Rivne NPP had false higher education

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diplomas that they had purchased for \$500-600. The holders of false Odessa National Polytechnic University diplomas were employed in administrative and engineering positions at the NPP. The revelation has prompted an investigation by the oblast prosecutor's office and anti-organized crime directorate. An Enerhoatom commission was dispatched to investigate. Individuals accused of purchasing university diplomas remained at their jobs, however. NPP management stated this was justified because none of the individuals in question worked in positions affecting reactor safety. According to the head of the department for public relations at Rivne NPP, Oleksiy Kiskiy, the licensing process for reactor operators is so strict that it excludes the possibility of unqualified personnel occupying such positions. However, the Ukrainian nuclear power industry is experiencing a problem retaining qualified cadres. Only 40% of reactor operators are willing to remain at their jobs; 280 left Ukraine in the last three years. Enerhoatom is attempting to stem the outflow of expensively trained specialists by introducing new social programs. However, funding of these programs would require the tripling of electricity tariffs. —Zhanna Pinchuk, "Atomnykiv iz falshyvymy dyplomamy vyvavly na Rivnenskiy AES," *Rivne vechirne*, www.rivnepost.rovno.ua, 4 October 2002.; Volodymyr Krushelnysky, "Vlasnyky dyplomiv prodovzhuyut pratsyuvaty," *Rivne vechirne*, www.rivnepost.rovno.ua, 11 October 2002.; ITAR-TASS, 4 October 2002; in "Ukrainian nuclear power industry faces threat of staff shortages," FBIS Document CEP20021005000022.

15 August 2002

TULUB ON CONDITION OF UKRAINIAN REACTORS

Izvestiya reported on 15 August 2002 that during a visit to the city of Slavutych, Enerhoatom president Serhiy Tulub assessed the depreciation of Ukrainian power reactors' thermomechanical equipment at 56%, and electrical and control systems at 60%. Only major financial investments can improve the situation, according to the article. —"The likelihood of a New Nuclear Disaster in Ukraine is 60%," *Izvestiya*, 15 August 2002.; in "Tulub States Possibility of Another Nuclear Disaster 60 Percent," FBIS Document CEP20020816000355.

21 June 2002

EUROPEAN UNION ASSISTS WITH EMERGENCY RESPONSE SYSTEM

Kyiv Post reported on 21 June 2002 that the European Union will provide assistance in establishing an emergency response system to help prevent and manage future nuclear accidents. According to Norbert Jousten, the head of the European Commission in Ukraine, and Ukrainian Minister of the Environment Serhiy Kurykin, the system, called RODOS, has already been tested and will become operational in the near future. Seven other countries already use the system, and tests have been conducted in Slovakia, Poland, and Hungary. —"EU sponsors emergency response system for Ukrainian nuclear plants," *Kyiv Post*, www.thepost.kiev.ua, 21 June 2002.

10 May 2002

REACTOR MALFUNCTIONS ON THE INCREASE

Interfax reported on 10 May 2002 that a State Nuclear Regulatory Committee report on the state of nuclear and radiation safety in Ukraine shows a trend toward the decreasing safety of Ukrainian nuclear reactors. According to the report, none of Ukraine's 13 active power reactors operated flawlessly in 2001. There were 57 incidents that were rated as "0" on the International Nuclear Event Scale (INES), and 17 that were rated as "1." In comparison, in

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1996 there were 12 INES 1 events, in 1997 five, in 1998 seven, in 1999 eight, and in 2000 10 INES 1 events. The largest number of incidents was noted at Knmelnytsky Unit 1 (15 events), followed by Rivne Unit 2 (seven events).
—"V proshlom godu na AES Ukrainy bez narusheniy ne rabotal ni odin energoblok," Interfax, 10 May 2002.

7 May 2002

US COMPANY HELPS IMPROVE REACTOR SAFETY

The *Kyiv Post* reported on 7 May 2002 that the Verkhovna rada praised the US firm GSE Systems for its efforts in assisting Khmelnytsky NPP operators in detecting minor reactor malfunctions. The firm is working with Russian and Ukrainian subcontractors on a project organized by the US Department of Energy to improve the safety of all Ukrainian NPPs.

—"Ukrainian lawmakers praise U.S. nuclear safety project," *Kyiv Post*, www.kpnews.com, 7 May 2002.

6 December 1999

UKRAINIAN PREPARATIONS FOR Y2K QUESTIONED

US Secretary of Energy Bill Richardson told ITAR-TASS news service on 6 December that US specialists are somewhat worried by the level of preparedness at the Ukrainian nuclear power plants for dealing with the Y2K problem. He also said that two US experts would travel to Ukraine in December to ensure no serious problems would develop at Ukrainian NPPs. Mohammad El-Baradei, IAEA director general, identified the Chernobyl NPP as one of three facilities lagging behind in preparing for Y2K. The other two are the Metsamor NPP in Armenia and the Ignalina NPP in Lithuania.

—Anna Bazhenova, ITAR-TASS, 6 December 1999; in "Russia, US Disagree on Ukrainian Power Plant Safety," FBIS Document FTS19991206000400.; Roger Boyes, "Chernobyl 'is millennial time bomb'," *The Times*, 15 December 1999, www.the-times.co.uk.

30 November 1999

UKRAINIAN OFFICIALS BELIEVE NPPs READY FOR YEAR 2000

On 23 November, Enerhoatom executive director for production Viktor Stovbun told reporters that all of Ukraine's NPPs are prepared for the year 2000. He said that control, protection, and safety systems will not be affected by Y2K. Enerhoatom's President, Mykola Dudchenko, said that Y2K-associated problems are possible in management and bookkeeping. In a 9 December interview with UT-2 television network, Vasyl Durdynets, acting minister for emergency situations, stated he is not worried about Y2K and its implications for Ukrainian NPPs. Durdynets was concerned, however, that government officials do not often attend Y2K staff meetings. Oleg Osheka, Zaporizhzhya NPP spokesman, told ITAR-TASS on 10 December that the Zaporizhzhya facility is prepared for Y2K.

—Interfax Ukraine Business Panorama, Issue 357, 30 November 1999; in "Ukraine Business Panorama for 2-29 Nov 99," FBIS Document FTS19991130000873.; UT-2 Television Network, 9 December 1999; in "Y2K: Ukrainian Officials to Work Overnight 1 Jan," FBIS Document FTS19991210001513.; Anatoly Gordeyev, ITAR-TASS, 10 December 1999; in "Y2K: No Threat to Zaporozhye Nuclear Power Plant," FBIS Document FTS199912110001516.

19 May 1999

SIGNATORIES MAINTAIN SUPPORT FOR UKRAINE AT CONFERENCE

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14 May 1999

IAEA FINDS MOST UKRAINIAN NUCLEAR POWER PLANTS SAFE

Based on the Ukrainian Ministry of Energy's annual report on safety conditions at Ukrainian nuclear power plants, the IAEA found Ukrainian nuclear power reactors to be safe, expressing only minor concern over the safety of the Chernobyl nuclear facility, Interfax reported on 14 May 1999. Oleksandr Smyshlyayev, head of the Ukrainian Nuclear Regulatory Administration, however, pointed out in July 1999 that Ukraine should improve safety measures at Units 1 and 2 (VVER-440 reactors) at the Rivne nuclear power plant. He indicated that Ukraine allocates only \$6-7 million annually for safety measures at each reactor, which is insufficient. Smyshlyayev said underfunding is hampering safety analysis at Ukrainian power plants, which is needed to improve the security and reliability of the reactors, avoid unplanned shutdowns, and replace outdated equipment.

—"MAGATE pozitivno otsenivayet uroven bezopasnosti ukrainskikh AES," Interfax, 14 May 1999.; *Unian*, 3 July 1999; in "Ukraine Failing To Improve Safety Of Nuclear Reactors," FBIS Document FTS19990705001071.

8 April 1999

MINISTRY ORDERS PRE-Y2K COMPUTER CHECK

To prevent potential nuclear accidents arising from the so-called Y2K bug, the Nuclear Regulatory Administration of the Ukrainian Ministry of Environmental Protection and Nuclear Safety has ordered that computer software at every Ukrainian nuclear power plant be checked. Unit 6 at the Zaporizhzhya nuclear power plant will be the first to undergo a check-up, scheduled for 22 April 1999. In January, Chernobyl Director Vitaliy Tovstonohov stated that a simulation conducted on a Chernobyl-type reactor had showed that the reactor is safe. Former Chernobyl Director Serhiy Parashin, however, noted that several unknowns remain. Westron, a joint venture between Khartron and Westinghouse, announced in March that it has designed a "simple and inexpensive" computer program that may solve the Y2K problem in Ukrainian nuclear power plant control systems. Eight Western countries have extended help to Ukraine for dealing with the technical and financial aspects of the Y2K computer problem. According to Parashin, Ukraine's costs for ameliorating the Y2K problem are unofficially estimated at \$50 million.

—Intelnews, 9 April 1999; in "Ukraine to Test Nuclear Plants for Y2K Problems," FBIS Document FTS19990410000010.; Christopher Price, "Planning for the Worst, Hoping for the Best: Year 2000: Focus on the Nuclear Industry," *Financial Times*, 13 January 1999, p. 14; in Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>. DINAU, 10 March 1999; in "Ukraine Experts Find Y2K Solution for Nuclear Plants," FBIS Document FTS19990315001211.; AFP, 4 March 1999; in "Ex-Director Warns of Millennium Bug Chernobyl Accident," FBIS Document FTS19990304001277.; "The Computer Needs Money," *Vechirniy Kiev*, 23 January 1999, p.4; in "Ukraine Needs \$50 Million to Deal with Y2K Bug Problem," FBIS Document FTS19990127000302.

21-25 September 1998

UKRAINE AND SLOVAKIA SIGN AGREEMENT ON NUCLEAR SAFETY, EARLY WARNING COOPERATION

At the 42nd General Conference of the IAEA on 21-25 September 1998, Ukraine and Slovakia signed an agreement on the timely announcement of nuclear accidents, information exchange, and cooperation in nuclear safety and radiation protection.

—TASR, 29 September 1998; in "Nuclear Safety, Early Warning Accord Signed with Ukraine," FBIS-EEU-98-272.

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23 October 1996

WORLD BANK APPROVES CREDIT TO UPGRADE UKRAINIAN NUCLEAR REACTORS

Taking into account the future closure of Chernobyl, the World Bank's Board of Directors approved a \$317 million credit for upgrading 14 nuclear reactors in Ukraine. Approximately one-third of this credit will be in cash, enabling Ukraine to purchase nuclear fuel from Russia for the coming winter. The credit is part of a \$900 million financial aid program, provided by the World Bank to Ukraine for 1996-1998. However, Minister of Environmental Protection and Nuclear Safety Yuriy Kostenko has said that the loan will not help Ukraine modernize its reactors, adding "We are just burning money in inefficient plans." Kostenko emphasized that Kiev's priority is completing the two reactors at Khmelnytsky-2 and Rivne-4.

—*Jamestown Foundation Monitor*, October 23, 1996.; "Ukraine Near to Agreeing to Shut Down Chernobyl #1," *Post-Soviet Nuclear & Defense Monitor*, 28 October 1996, p. 1.; Ann MacLachlan, "Ukraine Hints Delay in Closing Chernobyl If Money Doesn't Come," *Nucleonics Week*, 31 October 1996, pp. 16-17.

16 November-7 December 1995

THE SCIENCE AND TECHNOLOGY AGENCY OF JAPAN WILL HOLD THREE UKRAINIAN-JAPANESE SEMINARS ON NUCLEAR SAFETY

The Science and Technology Agency of Japan sponsored the first Ukraine-Japan seminar on nuclear safety. Three additional seminars, one on the former Soviet Union and the countries of Eastern Europe, another on Asian countries, and the third on radioactive waste and spent fuel management, will be commissioned yearly by the Japan Atomic Energy Research Institute.

—"Ukraine-Japan Seminar On Nuclear Safety," *Atoms in Japan*, p. 26.

September 1995

UKRAINE AND BELARUS WORK ON EARLY WARNING SYSTEM

The Executive Committee on Hydrometeorology in coordination with the Belarusian Security Council has begun work on an early warning system for accidents at nuclear power stations located near the Belarusian border. This system was referred to earlier as the "Gamma-1" system (see 5-6/95). The system located across from Ignalina is expected to be on-line by 4/96. Monitoring systems at the Belarusian borders by Smolensk (Russia), Rivne (Ukraine), and Chernobyl are anticipated to be in place by 2005. Ukraine is expected to cooperate in the development of an interstate system which will be capable of monitoring all accidents on Belarusian and Ukrainian territory.

—CISNP Discussions with Ukrainian official, October 1995. "Radiation Early Warning System to Be Set Up Near Border With Lithuania," *BBC Monitoring Service*, October 18, 1995. Minsk Radio, 9/18/95; in FBIS-SOV-95-181, Daily Report, 9/18/95.

May-June 1995

MONITORING SYSTEMS WILL BE DEVELOPED IN BELARUS AND UKRAINE

A 3.5 million ECU contract within the framework of the TACIS program was signed by the German firm Hormann Systemtechnik to develop the "Gamma-1" system in Ukraine and Belarus. This system will monitor the Rivne and Zaporizhzhya nuclear power plants (NPPs) in Ukraine and the Ignalina NPP in Lithuania. The system will have 47 units to monitor gamma radiation, one unit to monitor concentrations of alpha and beta aerosols, and two units to

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monitor gamma activity in the water. In addition, there will be 5 mobile stations, 3 local stations, and 2 national monitoring centers.

—*Nucnet News*, No. 46, 1995; in *Byulleten Tsentra Obshchecstvennoy Informatisii Po Atomnoy Energii*, May-June 1995, p. 61.

18 April 1995

UKRAINIAN NUCLEAR LAW ENTERS INTO FORCE

Ukraine's nuclear law "On the Use of Atomic Energy" passed by the Verkhovna Rada on 2/8/95 has entered into force by decree of President Kuchma. The Rada has approved a resolution that relieves foreign firms from civil responsibility in the case of a nuclear accident. This resolution, which will only be legally binding once the corresponding legislation is adopted, should clear the way for Western companies to become more involved in safety improvement work in Ukraine. Mykhailo Pavlovskiy, Chairman of the Rada Standing Commission for Nuclear Policies and Nuclear Security, said that the Verkhovna Rada laid the basis for the ratification of the Vienna Convention when it passed the law "On the Use of Atomic Energy and Radiation Safety." The Supreme Rada intends to pass additional "by-laws" specifying how the law "On the Use of Atomic Energy" will be implemented, especially in terms of state liability. The current Ukrainian law does not channel liability for nuclear damage to the installation operator. It does, however, channel "complete responsibility" to the NPP owner, with no evidence needed except the mere fact of an accident's occurrence.

—"Ukraine's New Nuclear Law in Force," *Nucnet News*, No. 192-193, May 5, 1995.; Ann MacLachlan, "Ukraine Lawmakers Say 1995 Goal Is Vienna Convention Ratification," *Nucleonics Week*, July 6, 1995, p. 18. Ann MacLachlan, "Russian, Ukraine Nuclear Laws Continue in Slow Revision Process," *Nucleonics Week*, September 14, 1995, pp. 10-11.; "Ukraine," by Nikolai Kurilchik and Alexei Breus, *Nuclear Europe Worldscan*, July-August 1995, p. 76.

24 October 1994

RADA CONSIDERS DRAFT LAW

The draft law on "Nuclear Energy Utilization and Radiation Safety" was submitted to the Supreme Rada of Ukraine. —Correspondence with Ukrainian nuclear official, January 1995.

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Nuclear Power: 2004-1990

5 April 2004

THEVES OF NUCLEAR PLANT EQUIPMENT ARRESTED IN UKRAINE

At a 5 April 2004 press-conference, Mykola Tomilovych, department head at the Rivne Oblast Prosecutor's Office, announced that the police directorate for fighting organized crime in Kuznetsovsk arrested five men on suspicion of stealing equipment from the Rivne nuclear power plant. According to Tomilovych, four employees of the Rivne NPP bribed a security officer working at the plant's checkpoint to pass through security and stole a piece of the plant's equipment—the reactor's evaporator heating chamber. [It is likely that the piece of stolen equipment, which the Ukrainian press and media identifies as "the reactor's evaporator heating chamber" is actually the spare

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evaporator from the condensate treatment system of the VVER-440 reactor. The evaporator, which in the condensate treatment system is linked with the reactor coolant and can be described as a heating chamber, is relatively small and portable. Because the evaporator was a spare, it was not contaminated with radioactivity and therefore could have been stolen without exposing the thieves to harmful radiation.] The perpetrators paid the security officer 400 hryvnias (\$77 as of April 2004) for the service. Initial reports suggested that the bribed checkpoint worker was a warrant officer serving at a military unit guarding the Rivne NPP, but the Ukrainian Ministry of Defense later stated that the warrant officer had no relation to the military because NPPs in Ukraine are guarded by units from the Ministry of Internal Affairs. The thieves sold the stolen piece of equipment to a local scrap metal collection station for a mere 1,600 hryvnias (\$309 as of April 2004), while experts estimated its cost at 800,000 hryvnias (\$154,000 as of April 2004). The device was not in service at the time of the theft, so operations at the Rivne NPP were not affected. The four plant workers were charged under Article 185, part 5 (Large-Scale Theft) of the Criminal Code of Ukraine and Article 369 (Bribery). The security officer was charged under Article 368 (Bribe taking).

—"Rovenskuyu AES obvorovali," Infa news agency; in *Tribuna* electronic newspaper, 5 April 2004, <http://tribuna.com.ua>.; "Praporshchik pomog ukrast agregat s Rovenskoy AES za vzyatku v 400 griven," Interfax; in *Gazeta.ru*, 5 April 2004, www.gazeta.ru.; "Razvorovyvat RAES pomogal militseyskiy praporshchik, a ne voyenny," *Tribuna* electronic newspaper, 5 April 2004, <http://tribuna.com.ua>.; CNS communication with and commentary by officials from the Pacific Northwest National Laboratory, 21 May 2004., adapted from article published in *NIS Export Control Observer*, May 2004.

2 April 2003

GERMAN SPECIALISTS UPGRADE FIRE SAFETY OF SOUTH UKRAINE NPP

Podrobnosti reported on 2 April 2003 that, according to Enerhoatom, specialists from the German firm Brandschutz were working at the South Ukraine NPP to improve its fire safety. German specialists will also train NPP personnel to use the new equipment. South Ukraine NPP has been using Brandschutz equipment since 1999.

—"Nemetskiye spetsialisty povyshayut protivopozharnuyu bezopasnost Yuzhno-Ukrainskoi AES," *Podrobnosti*, 2 April 2003; in *Integrum Techno*, <http://www.integrum.com>.

21 February 2003

SOUTH UKRAINE NPP RECEIVES TACIS-FUNDED SAFETY EQUIPMENT

Unian reported on 21 February 2003 that the South Ukraine Nuclear Power Plant (NPP) received instruments for automatic monitoring of water quality. The equipment is scheduled to be installed by the end of the first quarter of 2003 on Unit 3, and will be used to measure water quality in the turbine section and the steam generators. The instruments were produced by the French firm ELTA, and were provided via European Union's TACIS program.

—"V ramkakh programmy TACIS na Yuzhno-ukrainskuyu AES postupili priborydlya avtomaticheskogo kontrolya kachestvavody v tekhnologicheskikh sistemakh," *Unian*, No 8 (250), 17-23 February 2003.

14 February 2003

US SPECIALISTS ASSIST ZAPORIZHZHYA NPP

From 10 to 14 February 2003, safety experts from the US firm Westinghouse studied a project to develop and implement comprehensive emergency procedures at the Zaporizhzhya NPP, whose Unit 5 has been chosen as a

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pilot VVER-type reactor to introduce such procedures. The procedures are to be fully implemented by the end of 2004, and will then be applied at other units of the NPP. Westinghouse experts also plan to visit other Ukrainian NPPs. Prior to their visit to Zaporizhzhya NPP, Westinghouse specialists, together with representatives of the Pacific Northwest National Laboratory and the Argonne National Laboratory, held talks with specialists from Enerhoatom and Ukraine's NPPs on the emergency procedures project.

—"Amerikantsy izuchili proyekt po razrabotke I vnedreniyu sistemno-orienirovannykh instruktsiy na Zaporozhskoy AES," LIGA online, 14 February 2003; in Integrum Techn, <http://www.integrum.com> .

10 February 2003

JAPANESE SPECIALISTS TRAIN UKRAINIAN REACTOR PERSONNEL

Unian reported on 10 February 2003 that a delegation of specialists from the Japan Electric Power Information Center (JEPIC) visited the South Ukraine nuclear power plant (NPP). The visit was part of a program of international cooperation on NPP safety. The Japanese experts remarked that South Ukraine NPP personnel left a positive impression, and that they intend to continue cooperation in this area. Three South Ukraine NPP specialists visited Japan in 2002 where they received instruction in NPP safety procedures.

—"Yaponskiye eksperty obuchayut spetsialistov ukrainskikh AES," Unian, No. 7 (249), 10-16 February 2003.

5 December 2002

GERMAN DELEGATION CITES INADEQUATE REACTOR SAFETY EFFORTS

Interfax reported on 5 December 2002 that a German delegation of the Federal Ministry for Environment, Nature Conservation, and Nuclear Safety, headed by the Director General of the Department of Nuclear Safety and Radiation Protection Wolfgang Renneberg, spent three days familiarizing itself with the work on the closing of the Chernobyl NPP. According to the German experts, Ukraine is not spending enough on nuclear safety. Wolfgang Renneberg also said that if Ukraine were to perform a risk-benefit analysis of its nuclear energy program, the risks would most likely outweigh the benefits.

—"Nemetskiye eksperty polagayut, chto Ukraine sleduyet tratit bolshe sredstv na podderzhaniye yadernoy bezopasnosti," Interfax, 5 December 2002.

4 October 2002

QUALITY OF NPP OPERATORS QUESTIONED

Rivne vechirne reported on 4 October 2002 that over 10 employees of the Rivne NPP had false higher education diplomas that they had purchased for \$500-600. The holders of false Odessa National Polytechnic University diplomas were employed in administrative and engineering positions at the NPP. The revelation has prompted an investigation by the oblast prosecutor's office and anti-organized crime directorate. An Enerhoatom commission was dispatched to investigate. Individuals accused of purchasing university diplomas remained at their jobs, however. NPP management stated this was justified because none of the individuals in question worked in positions affecting reactor safety. According to the head of the department for public relations at Rivne NPP, Oleksiy Kiskiy, the licensing process for reactor operators is so strict that it excludes the possibility of unqualified personnel occupying such positions. However, the Ukrainian nuclear power industry is experiencing a problem retaining qualified cadres. Only 40% of reactor operators are willing to remain at their jobs; 280 left Ukraine in the last three years. Enerhoatom is attempting to stem the outflow of expensively trained specialists by introducing

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new social programs. However, funding of these programs would require the tripling of electricity tariffs.
—Zhanna Pinchuk, "Atomnykiv iz falshyvymy dyplomamy vvyavlyly na Rivenskiy AES," *Rivne vechirne* online edition, www.rivnepost.rovno.ua, 4 October 2002.; Volodymyr Krushelnytsky, "Vlasnyky dyplomiv prodovzhuyut pratsyuvaty," *Rivne vechirne* online edition, www.rivnepost.rovno.ua, 11 October 2002.; ITAR-TASS, 4 October 2002; in "Ukrainian nuclear power industry faces threat of staff shortages," FBIS Document CEP20021005000022.

15 August 2002

TULUB ON CONDITION OF UKRAINIAN REACTORS

Izvestiya reported on 15 August 2002 that during a visit to the city of Slavutych, Enerhoatom president Serhiy Tulub assessed the depreciation of Ukrainian power reactors' thermomechanical equipment at 56%, and electrical and control systems at 60%. Only major financial investments can improve the situation, according to the article.
—"The likelihood of a New Nuclear Disaster in Ukraine is 60%," *Izvestiya*, 15 August 2002.; in "Tulub States Possibility of Another Nuclear Disaster 60 Percent," FBIS Document CEP20020816000355.

6 August 2002

RIVNE, KHMELNYTSKY NPP CONSTRUCTION ACCELERATED

Interfax Ukraine reported on 6 August 2002 that the funding rate for the construction of new reactors at Rivne and Khmelnytsky NPPs has been doubled, from 700,000 hryvnias (about \$126,000) per day to 1.4 million hryvnias (about \$252,000) per day. The reactors are to become operational in 2004. While Enerhoatom is funding the project using its own resources, it is also planning to continue negotiations with the European Bank for Reconstruction and Development (EBRD) concerning financial assistance for the project. Enerhoatom is also ignoring the suit against the construction of the two reactors brought by Serhiy Konyukhov of the Public Committee for State Security of Ukraine, a Ukrainian non-governmental environmental organization (for more information, see the 5/25/2002 entry, below). Although a district court in Kiev agreed to consider the suit, as of 19 August 2002 Enerhoatom had not received an official notice to stop construction.
—Interfax Ukraine, 6 August 2002; in "Ukraine speeds up financing of new reactors," FBIS Document CEP20020806000215.; "Ukrainian nuclear company defies NGO suit to stop reactors construction," Unian, 19 August 2002; in "Ukrainian Nuclear Company Defies NGO Suit To Stop Reactors Construction," FBIS Document CEP20020819000213.

25 May 2002

PROTESTS AGAINST NEW REACTOR CONSTRUCTION

The Public Committee for State Security of Ukraine has called upon Russia to refuse financial support for the construction of additional reactors at Rivne and Khmelnytsky NPPs. The committee's message to the Russian State Duma claims such involvement is not advantageous to either country, may incur financial risks, and damage relations. Moreover, according to the committee, there are safety-related concerns over the construction of the two reactors, and the design documentation is obsolete, placing even the legality of their construction in doubt. Russia has offered assistance of up to \$500 million, including \$140 million in the form of credits for manufactured products, but the Ukrainian government has made it clear that it does not need Russian products worth that amount, since all necessary Russian equipment has already been purchased. On 20 June 2002, protest rallies were held in Kharkiv against the signing by Ukrainian Prime Minister Anatoliy Kinakh and Russian Prime Minister Mikhail

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Kasyanov of an agreement on joint completion of the two reactors. The protesters demanded that reactor construction be halted and called on the two prime ministers to focus on modernizing already existing reactors. —"Obshchestvennyy komitet natsionalnoy bezopasnosti Ukrainy prizyvayet Rossiyu otkazatsya ot dostroyki energoblokov na KhaES i RAES," Interfax, 25 May 2002.; "Protest in Kharkiv against completion of Khmelnytsky, Rivne nuclear power plants," Interfax, 20 June 2002.

10 April 2002

RUSSIA TO FINANCE REACTOR CONSTRUCTION

On 10 April 2002, following talks with Ukrainian Prime Minister Anatoliy Kinakh, Russian Prime Minister Mikhail Kasyanov announced that Russia will loan Ukraine \$45 million to finance the construction of new reactors at the Rivne and Khmelnytsky NPPs. The loans will finance the final stages of construction and final equipment supplies. —ITAR-TASS, 10 April 2002; in "Russia to loan \$45 million to Ukraine for construction of nuclear power plants," FBIS Document CEP20020410000237.

9 April 2002

UKRAINE AND EBRD MAKE PROGRESS ON REACTOR CREDITS

Ukrainian Prime Minister Anatoliy Kinakh announced on 9 April 2002 that Ukraine and the European Bank for Reconstruction and Development (EBRD) had made progress on the details of financing the construction of additional reactors at the Rivne and Khmelnytsky NPPs. According to the Ukrainian Ministry of Foreign Affairs, Ukraine is to determine how to address the issue of electricity tariffs to ensure the project is profitable by the end of June 2002. This announcement follows the January 2002 agreement between Ukraine and the EBRD to reduce the cost of the two reactors, and to change some of the EBRD's conditions.

—"Ukraine i EBRR dostigli progressa na peregovorakh o finansirovanii dostroyki dvukh blokov AES," Interfax, 9 April 2002.

20 March 2002

UKRAINE PREPARED TO HIRE IGNALINA NPP WORKERS

Ukrainian Prime Minister Anatoliy Kinakh announced on 20 March 2002 that Ukraine is ready to offer specialists working at Lithuania's Ignalina NPP employment at the new reactors at Rivne and Khmelnytsky NPPs. Kinakh made the statement following high-level talks between the governments of Ukraine and Lithuania. Ignalina NPP is to be shut down by 2009 as part of Lithuania's efforts to join the European Union. Kinakh also offered Lithuania assistance in shutting down its nuclear reactors.

—"Ukraina mozhet prigrasit na rabotu litovskikh atomshchikov posle zakrytiya Ignalinskoy AES," Interfax, 20 March 2002.

29 November 2001

UKRAINE REJECTS EBRD REQUIREMENTS, LOOKS TO RUSSIA

On 29 November 2001, the government of Ukraine rejected the requirements put forth by the European Bank for Reconstruction and Development (EBRD) to grant \$1.5 billion in credit for the construction of two reactors at Rivne and Khmelnytsky NPPs. Ukraine decided to seek funding from Russia instead, and on 4 December 2001 Ukrainian Prime Minister Anatoliy Kinakh and Russian Prime Minister Mikhail Kasyanov reached a preliminary agreement on

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a loan for Ukraine of over \$200 million, beginning with \$60 million in 2002. Although the total value of Russian funding is considerably less than the EBRD credit, Ukrainian President Leonid Kuchma has called the original EBRD cost estimate "overblown," and said Ukrainian experts assured him the entire project could be completed for just \$600 million. Kuchma also complained that whereas initially EBRD only required Ukraine to close the Chornobyl NPP as a condition for the credits, the list of demands later grew to the point that it became unacceptable to Ukraine.

—Roman Woronowycz, "Kyiv rejects EBRD's requirements for loan to complete two reactors," *Ukrainian Weekly*, 9 December 2001, p.p 2, 23.

23 July 2001

UKRAINE TO BUILD TWO NEW POWER REACTORS

Unian reported that during a meeting with US Nuclear Regulatory Commission Chairman Richard Meserve, Ukrainian Prime Minister Anatoliy Kinakh announced that Ukraine intends to construct two new power reactors. Kinakh also stressed the need for Western financial assistance for the realization of this project. Kinakh believes that this aid will ensure safety of Ukrainian atomic energy.

—"Ukraina namerena postroit dva novykh yadernykh reaktora," Unian, No. 30, 23-29 July 2001.

15 December 2000

UKRAINE SHUTS DOWN FINAL REACTOR AT CHORNOBYL, SEEKS COMPENSATION

On 15 December 2000, Unit 3, the last operating reactor at the Chornobyl nuclear power station, was officially shut down by its chief engineer in front of news cameras. In a Memorandum signed in 1995, Ukraine had committed itself to shut down the Chornobyl nuclear power station no later than 2000. In exchange for the shutdown, the Memorandum promises international aid to Ukraine to finance decommissioning operations at Chornobyl and compensate for the loss in energy production. Ukraine plans to replace the lost power by completing two reactors in Khmelnytskyi and Rivne, pending loans from the EBRD and Euroatom. President Kuchma stressed the need for this aid and also stated that questions remain concerning the economic and social effects of the power plant closure on the residents near the Chornobyl power station.

—"15 dekabrya v 13.15 ostanovlen reaktor tretogo energobloka ChAES," Unian, No. 50, 11-17 December 2000.; Kirill Razumovskiy, "Dlya etogo atomnuyu stantsiyu nado snova otkryt," *Kommersant*, 14 December 2000.; Toni Feder, "Chornobyl Nuclear Power Plant Closing," *Physics Today*, December 2000, p. 62.; "Mirovoye soobshchestvo ne speshit s vypolneniyem obyazatelstv po resheniyu problem zakrytiya Chernobylskoy AES, utverzhdayet Kuchma," Interfax, No. 1, 5 December 2000.

26 June 2000

REFORMS PLANNED FOR ENERHOATOM

The government of Ukraine is planning to create a state joint stock company uniting all of its nuclear power plants. This process is part of the restructuring of Enerhoatom, which was begun in June 2000 on instructions from the Fuel and Energy Ministry to convert all energy sector enterprises into corporations. According to Enerhoatom's acting president Volodymyr Bronnykov, the government will issue a resolution on corporatizing Enerhoatom by the end of 2000. Nuclear power plants will form detached subdivisions of the new joint stock company.

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—Natalya Kozlova, ITAR-TASS, 26 June 2000; in "Ukraine to Merge All Nuclear Plants Into Single Company," FBIS Document CEP20000626000178.

22 June 2000

ENERHOATOM CHARGED WITH TAX EVASION

On 22 June 2000, *Nucleonics Week* reported that the government of Ukraine has brought criminal charges of tax evasion against Enerhoatom. The charges resulted from an audit by a special investigative group established within Ukraine's State Tax Administration. In remarks made after President Clinton's visit to Kiev, President Leonid Kuchma blamed the crisis in Ukraine's nuclear sector on "unscrupulous officials and businessmen," including former managers of Enerhoatom, and accused them of attempting to destroy the company. Kuchma also indicated that some nuclear power plants needed to be investigated as well. Experts, however, noted that Enerhoatom's tax liability is caused by flaws in Ukrainian tax legislation. While Enerhoatom is receiving payments for only a portion of delivered electricity, NPP taxes are calculated on the basis of generated power, rather than revenues from electricity sales. Adding to the controversy surrounding Enerhoatom, Deputy Prime Minister for Fuel Yulia Tymoshenko accused Peoples' Deputy Hryhoriy Surkis of saddling Enerhoatom with a \$1.2 billion debt. Surkis, who has major investments in Ukrainian energy companies and reportedly has good relations with Leonid Kuchma, denies the charges.

—Alexei Breus, "Energoatom Charged With Evading Taxes on Nuclear Power Generation," *Nucleonics Week*, <http://mhenergy.com>, Vol.41, No.25, 22 June 2000.; Alexei Breus, "Kuchma Excoriates Management Over Ukraine's Nuclear Ills," *Nucleonics Week*, online edition, <http://mhenergy.com>, Vol. 41, No.25, 22 June 2000.; Olga Gubenko, "Crossing the Woman's Path," *Izvestiya*, 13 July 2000, p. 5; in "Tymoshenko Maneuvering for Energy Minister Post Eyed," FBIS Document CEP20000713000321.

13 June 2000

CRIMEA NPP CANCELLED

The government of Ukraine decided to stop construction of the incomplete Crimea NPP, according to a statement by the Ukrainian governmental press service. Construction of Crimea NPP began in 1976 but no progress has been made since 1989. Part of the equipment used on the construction site has been moved to other NPPs.

—"Ukraine's unfinished Crimean nuclear power plant will be closed," ITAR-TASS, 13 June 2000, in "Crimean Nuclear Power Plant Project To be Wound up," FBIS Document CEP20000613000008.

16 May 2000

UKRAINE MAY HOLD NEW TENDER FOR RIVNE AND KHMELNYTSKY NPP CONSTRUCTION PROJECTS

Yulia Tymoshenko, Deputy Prime Minister of Ukraine, told Interfax on 16 May 2000 that the government may hold a new tender for the Rivne and Khmelnytsky NPP construction projects if the present contractor [not named in report] does not lower its price. The original tender was for the amount of \$1.4 billion, however the contractor then presented a figure of \$2 billion to complete the work. Tymoshenko said that if the contractor does not lower its price to the original figure, Ukraine can legally hold a new tender for the contract.

—"Ukraine may call new tender to complete nuclear reactors," *Interfax*, 16 May 2000, Vol. V, Issue 89; in FBIS Document CEP20000516000182.

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26 April 2000

ENERHOATOM VICE-PRESIDENT PAINTS BLEAK PICTURE OF NUCLEAR ENERGY INDUSTRY

In a 26 April 2000 interview in *Holos Ukrayiny*, Mykola Steynberg, vice-president of Enerhoatom, stated that the Ukrainian nuclear energy industry was on the verge of collapse. According to Steynberg, the biggest problem facing the industry is the lack of payment by energy customers. Enerhoatom is attempting to collect revenue by signing six-month futures contracts with Ukrainian businesses and industries. In addition, Steynberg noted that cut-backs in repairs at NPPs, a disregard for safety regulations, and the movement of skilled personnel to profitable sectors of the economy had become serious problems.

—Olesya Menzhulina, "We Have A Real Chance To Change Our Lifestyle," *Holos Ukrayiny*, 26 April 2000; in "Energy Official on Chernobyl Closure," FBIS Document CEP20000427000163.

14 April 2000

ALBRIGHT REAFFIRMS US COMMITMENT TO KHARKIV INITIATIVE

During her April 2000 visit to Ukraine, US Secretary of State Madeleine Albright reaffirmed US commitment to the Kharkiv Initiative. On 14 April 2000, she highlighted several previous and ongoing programs the United States has supported in Kharkiv Oblast since the initiative began in June 1998. Programs include the provision of \$18 million in aid to regional hospitals, training for local businessmen, and support for small and medium businesses. Albright emphasized that other areas of the Ukrainian economy have been positively affected by the programs. She cited the US-funded nuclear fuel diversification program, \$7 million in US aid to support Ukrainian science, and support for Ukraine's membership in the Missile Technology Control Regime (MTCR). US Ambassador to Ukraine Stephen Pifer will coordinate further US efforts, Albright stated.

—UT-2 Television, 14 April, 2000; in "Albright Answers Questions From Viewers," FBIS Document CEP20000415000073.

14 February 2000

ENERHOATOM HEAD FIRED AMID REPORTS OF ALLEGED CORRUPTION

Mykola Dudchenko, the head of Ukraine's state owned energy company Enerhoatom, and Enerhoatom first vice-president Tetyana Amosova were fired February 14 amid corruption allegations. Management problems at Enerhoatom are long-standing. An August 1998 report, which was recently released to the press, details several instances of mismanagement, corruption, and improper business practices. In particular, the report stated that the company's management expenses in 1998-1999 were 190 times higher than permitted. Dudchenko, who headed Enerhoatom since 1999, has been replaced by Volodymyr Bronnykov, the former director of the Zaporizhzhya NPP. —Katya Gorchinskaya, "Damning report costs Energoatom boss job," *The Kiev Post* online edition, www.thepost.kiev.ua, 17 February 2000.

February 2000

US TO AID NUCLEAR REGULATORY ADMINISTRATION

The US Nuclear Regulatory Commission (NRC) and Ukraine's Nuclear Regulatory Administration (NRA) signed an agreement whereby the US will fund research on nuclear safety in Ukraine. According to NRA head Oleksandr Smyshlyayev, the NRC has embarked on a four- to five-year program to improve the effectiveness of the NRA, through the provision of consultants and financing. The NRC has already been providing the NRA with technical

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equipment for the past seven years. Future NRC assistance will focus on the same areas as US DOE aid: analyzing the safety of nuclear reactors (required for licensing), licensing work on alternative nuclear fuel for Ukrainian NPPs, adopting new criteria for spent fuel storage, completing a new automated reactor control system, and decreasing radiation received by NPP personnel. Smyshlyayev noted that the NRC program was flexible, so its focus might change in future. He noted that this was particularly important as the NRA did not receive sufficient funding from the Ukrainian budget: in 1999 it received only half the funds it was promised.

—"SShA budut finansirovat raboty po analizu yadernoy bezopasnosti v Ukraine," Unian, 4 February 2000.

27 December 1999

ENERHOATOM HEIGHTENS SECURITY AT ALL NUCLEAR POWER PLANTS AFTER INCIDENT AT SOUTH UKRAINE NPP

26 November 1999

KUCHMA CREATES NUCLEAR ENERGY DIRECTORATE

President Kuchma signed a decree on 26 November 1999 entitled *On the State Directorate for Nuclear Energy*. The Directorate is a central executive body subordinate to the Ukrainian Ministry of Energy. Its responsibilities include managing nuclear energy use, handling radioactive waste, developing and implementing state policies for the nuclear sector, and creating a domestic nuclear fuel cycle.

—Unian, 26 November 1999; in "Kuchma Signs Decree on Nuclear Energy Directorate," FBIS Document FTS19991127000229.

31 October 1999

UKRAINE WILL NOT CHANGE DECISION CONCERNING WITHDRAWAL FROM BUSHEHR DEAL

Ukrainian President Leonid Kuchma told reporters on 30 October 1999 that Ukraine has no plans to withdraw from its decision not to build turbines for the Bushehr NPP. "We have made a definitive decision and are not going to change it," Kuchma stated.

—Interfax, 30 October 1999; in BBC Summary of World Broadcasts, 2 November 1999; in "Kuchma Confirms Withdrawal From Iranian Nuclear Power Plant Project," Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>.

October 1999

UKRAINE HOPES TO TRADE RUSSIAN BLACK SEA FLEET DEBTS FOR NUCLEAR FUEL

4 October 1999

NUCLEAR FUEL SUPPLY DIVERSIFICATION: WESTINGHOUSE

4 October 1999

FURTHER PRESSURE ON UKRAINE TO RECONSIDER BUSHEHR TURBINE DEAL

Unian reported on 4 October 1999 that a source close to the presidential administration said Russia will include Ukrainian companies in Indian and Chinese NPP construction projects only if Ukraine reconsiders its decision not to build turbines for the Bushehr NPP in Iran. Unian's source stated that Ukrinterenerho, a state enterprise for foreign trade, will lobby the Ukrainian government and presidential administration for Ukrainian inclusion in foreign construction projects.

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—"Ukraina pod davleniyem Rossii mozhет otkazatsya ot myezhdunarodnykh obyazatelstv otноситelno neuchastiya v stroitelstve AES v Irane," Unian, No. 40, 4-10 October 1999.

13 August 1999

DRAFT AGREEMENT ON UKRAINIAN-RUSSIAN-KAZAKHSTANI JOINT VENTURE Nuclear Fuel PRODUCTION APPROVED

17 July 1999

DELIVERY OF NUCLEAR FUEL FROM RUSSIA TO UKRAINE DELAYED

4 June 1999

EBRD TO FUND CONVERSION OF UNFINISHED CRIMEAN NPP

According to Serhiy Yermilov, chairman of the KrymEnergo joint stock company, the European Bank for Reconstruction and Development has agreed to fund reconstruction of the unfinished Crimean NPP (located in Shcholkino). The NPP will be turned into a natural gas-burning power plant.

—Intelnews, 4 June 1999; in "EBRD Approves Funding for Crimean Nuclear Plant," FBIS Document FTS19990604001540.

22 April 1999

AUDIT REVEALS UNAUTHORIZED SPENDING

On 22 April 1999, the Unian news agency reported that a Ukrainian Accounts Chamber audit of the Ministry of Energy and its predecessors (the Ministry of Power Engineering and Electrification and the State Committee on the Use of Atomic Energy) has uncovered misappropriations totalling 972.6 million hryvnias (approximately \$249 million). The Ministry of Energy had created six extrabudgetary funds with money earmarked for covering operating costs at domestic nuclear power plants. The Accounts Chamber also discovered violations involving the fund for creating a national nuclear fuel cycle. From 1996-1997, the fund received 647.7 million hryvnias (approximately \$165.6 million) less than records indicated it had received.

—Unian, 24 April 1999; in "Almost 1 bn Hryvnias Worth of Unauthorized Spending Said Unveiled In Energy Sector," Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>.

2 April 1999

FORMER ICBM MANUFACTURER KHARTRON BUILDS NPP EQUIPMENT

Khartron, a former manufacturer of RS-20 [SS-18 'Satan'] and RS-18 [SS-19 'Stiletto'] ICBMs, has converted 95 percent of its production facilities to non-military purposes. In 1994, together with the US company Westinghouse, Khartron created the Westron joint venture specializing in the production of control systems for Ukrainian NPPs. Westron is the first joint venture set up with the use of Nunn-Lugar funds. Khartron is also supplying pressurized units for an international space station.

—"Kharkovskoye PO 'Khartron' pochti polnostyu pereshlo na proizvodstvo nevoyennoy produktsii," Unian, 29 March-4 April 1999.; Interfax, "Ukraine Business Panorama," 27 September -4 October 1999; in "Ukraine Business Panorama," FBIS Document FTS19991004001661.

Related content is available on the website for the Nuclear Threat Initiative, www.nti.org.



April 1999

UKRAINIAN NUCLEAR POWER PLANTS REDUCE OUTPUT AS A RESULT OF FUEL SHORTAGES

18 March 1999

UKRAINIAN NUCLEAR POWER PLANT WORKERS POSTPONE STRIKE

Ukrainian nuclear power plant workers decided to postpone a scheduled strike over unpaid wages until the Constitutional Court reviews the current labor legislation prohibiting strikes in the nuclear power sector. The strike was planned for 22 March 1999 and was supposed to involve all employees, except those necessary to ensure stable operation of the nuclear reactors. The protest actions over unpaid wages meanwhile continue. The Ukrainian government allocated 120 million hryvnyas (\$30 million) to pay wage arrears; the amount will, however, be distributed between employees of both the nuclear and non-nuclear power sectors.

AP Worldstream; 18 March 1999; in "Ukraine's Nuclear Workers Postpone Strike, but Protests Continue," Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>.; Ukrainian Radio First Programme, 10 March 1999; in "Ukraine to Pay 120m Hryvnyas in Arrears to Energy Workers, Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>.

18 February 1999

PROTESTS AT NUCLEAR POWER PLANTS ESCALATE, TENT CAMPS SET UP

In February 1999, thousands of Ukrainian nuclear power plant workers launched protests demanding the payment of their wages and wage arrears. On 18 February 1999 about 700 employees from nuclear power plants picketed at the Ukrainian government headquarters in Kiev. Protests developed at all five Ukrainian nuclear power plants during the following week, after a promise made by senior government officials to provide 390 million hryvnyas (\$108 million) to pay delayed salaries went unfulfilled. Seeing no progress, the workers held rallies and started to set up tent camps. The protesters are depriving themselves of food and sleep and are prepared to launch an industry-wide hunger strike if their demands are not met. The situation could impact safety at the power plants. A conference of Enerhoatom employees recognized the validity of the workers' demands and approved the protest action. The conference also appealed to Ukrainian President Leonid Kuchma to fulfill the government's agreements concerning salaries for nuclear power plant workers. According to some sources, the salary debt totals 150 million hryvnyas (\$42 million), while other sources indicated 52 million hryvnyas (\$15 million).

—ITAR-TASS, 18 February 1999; in "Nuclear Power Station Workers Picket Government in Kiev," Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>.; Deutsche Presse-Agentur, 18 February 1999; in "Ukraine Nuclear Workers Demand Payment of Back Wages," Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com/universe>.; Interfax, 6 March 1999; in "Nuclear Workers Hold 12,000-strong Rally in Protest at Wage Delays," Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>.; AP Worldstream, 2 March 1999; in "Ukrainian Nuclear Power Plant Workers Escalate Strike," Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>.; Agence France Presse, 27 February 1999; in "Ukraine Nuclear," Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>.; Unian, 17 February 1999; in "Nuclear Plant Workers Decide on Protest Action, Threaten Strike Over Wage Arrears," Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>.; ITAR-TASS, 25 February 1999; in "Ukrainian NPP Workers Demand Payment of Wage Debts," Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com/universe>.; Unian, 24

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February 1999; in "Nuclear Power Plant Workers Stage Protests Over Wage Arrears," Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>.

8 February 1999

EXPERTS SEE NUCLEAR ENERGY CRISIS AS NATIONAL SECURITY THREAT

Twenty-eight managers and senior experts involved in the Ukrainian nuclear field addressed an appeal to President Leonid Kuchma, Chairman of the Verkhovna Rada Oleksandr Tkachenko, and Prime Minister Valeriy Pustovoytenko, in which they stated that "the deep and many-sided crisis in nuclear energy poses a direct threat to Ukraine's national security." The appeal points out the deteriorating state of the Ukrainian nuclear industry, demonstrated by problems with the Ukrainian power grid, which poses a potential threat to safe nuclear power plant operations, and by a lack of resources for maintaining a proper level of output.

—Unian, 8 February 1999; in "Nuclear Energy Crisis 'Threatens National Security' - Nuclear Plant Managers," Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>.

8 February 1999

KUCHMA BANS BARTER ON WHOLESALE ENERGY MARKET AT UNREGULATED RATES

Ukrainian President Leonid Kuchma issued a resolution effective 1 January 1999, banning barter transactions on the wholesale energy market at unregulated rates.

—"HSN: On the Books," *Eastern Economist*, 8 February 1999, p. 23.

31 January 1999

"KHARKIV INITIATIVE" NOT LIVING UP TO UKRAINIAN EXPECTATIONS

Ukraine's withdrawal from the \$240 million Bushehr project in March 1998 was finalized after the United States agreed to compensate Kharkiv regional businesses and government. The "Kharkiv Initiative" began in June 1998. As part of the initiative, the United States agreed to back Ukraine's membership in the MTCR. Membership in MTCR allows Ukraine to export space launch vehicle technology. However, Ukraine's satellite-launch business was set back after the crash of a Zenit rocket. Kharkiv's Governor, Oleg Demin, has said he is still waiting to see concrete results from the initiative. Turboatom, which held the Bushehr contract, has suggested other possible areas of cooperation. These include joint projects to upgrade Ukrainian NPP safety with equipment produced in both the United States and Ukraine, and a joint US-Ukrainian venture to produce turbine blades, which Ukraine currently imports from Russia. US ambassador to Ukraine Stephen Pifer offered his support, but stated that the United States cannot force US businesses to invest in any of these projects. In an interview in the Ukrainian newspaper *Zerkalo nedeli*, US Secretary of State Madeleine Albright stated that the US Department of Commerce would publish a guide for US companies considering projects in the Kharkiv region. In addition, the United States Agency for International Development and Kharkiv Oblast are preparing a contract for the business analysis of and strategic planning for Kharkiv Oblast.

—V. Gorbulin, "Prisoyedineniye Ukrainy k RKRT dalo vozmozhnost uchastiya v mezhdunarodnom proyekte 'Morskoy Start'," Unian, No. 42, 18-24 October 1999.; Vitaliy Panov, "Ukrainskiy bumerang," *Rossiyskaya gazeta*, 23 January 1999, p. 7.; Yuliya Mostovaya, "Nakanune...eksklyuzivnoye intervyyu gossekretarya SShA Madlen Olbrayt 'Zerkaly nedeli'," *Zerkalo nedeli*, No. 5, 12 February 1999, pp. 1-2.

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6 December 1998

"KHARKIV INITIATIVE" MOVES AHEAD AFTER VISIT BY US OFFICIAL

The United States Coordinator for NIS assistance, William Taylor, visited Kharkiv on 6 December to explore further options for US investment in the region. The "Kharkiv Initiative" began as a US aid program for industries affected by Ukraine's withdrawal from the Bushehr turbine deal.

—UT-1 Television Network, 6 December 1998; in "Ukraine Nuclear Plant Loses Money, Jobs After Bushehr Deal," FBIS Document FTS19981207001402.

20 November 1998

KUCHMA ORDERS INVESTIGATION OF PROFIT CONCEALMENT AND TAX EVASION

On 20 November 1998, Ukrainian President Leonid Kuchma ordered an investigation of allegations that Ukrainian NPPs concealed profits from using \$1.1 billion worth of nuclear fuel supplied by Russia in exchange for Ukrainian warheads. They have also been charged with failure to pay taxes on revenues generated by use of the fuel.

—AP Worldstream, 20 November 1998; in "Ukraine's President Orders Probe Into Nuclear Plants' Alleged Tax Evasion," Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>.

29 September 1998

AGREEMENT ON WAGE ARREARS REACHED AFTER PROTESTS

Protests by Ukraine's nuclear power sector workers ended on 29 September, after the Ukrainian government and union leaders signed an agreement on paying wages and debts. The protesters from Ukraine's five nuclear power plants were expressing anger over a several month delay in wage payments. There were approximately 3,000 workers demonstrating at the Zaporizhzhya and South Ukraine NPPs. 300 protesters gathered in Kiev at government headquarters. The government agreed to use a portion of the money normally allotted for nuclear fuel purchases to pay monthly wages. In the government's new plan, overdue wages will be paid by the end of the year with the help of 29.3 million hryvnias (\$7.6 million) allocated specifically for this purpose and revenue from a value-added tax on the sale of nuclear electricity. The workers are, however, also concerned with the loss of value of their delayed wages due to the currency devaluation. The protests were carried out in spite of Ukrainian legislation prohibiting such actions. Operations at the five nuclear power plants were not affected by the protests.

—Unian, 9 October 1998; in "Nuclear Workers Reach Settlement, End Protest," Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>; AP Worldstream, 29 September 1998; in "Hundreds Of Ukrainian Nuclear Plant Employees Demonstrate In Kiev," Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>; Itar-Tass, 26 September 1998; in "Ukraine's Nuclear Power Sector In Protest Of Wage Delays," Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>; AP Online, 26 September 1998; in "Ukraine Nuke Workers Protest Wages," Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>.

21 July 1998

US VICE-PRESIDENT AL GORE VISITS UKRAINE

In July 1998, US Vice-President Al Gore visited Ukraine on the occasion of the second Kuchma-Gor committee meeting (US-Ukraine Binational Commission). During the meeting, both sides agreed on cooperation in enhancing the safety of Ukraine's nuclear power plants and establishing a radiation and ecology research laboratory in the International Chernobyl Center for Nuclear Safety. Ukrainian President Leonid Kuchma complimented US-

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Ukrainian cooperation on international security issues, specifically in the areas of nuclear arms nonproliferation, missile technology controls, and developing a military-political partnership. Gore, on the other hand, favorably assessed Ukraine's nuclear disarmament initiatives. He also said that, as part of the "Kharkiv Initiative," the United States will organize a business development trip to the United States for officials in Kharkiv's power sector. —Xinhua News Agency, 23 July 1998; in "Kiev, Washington Highlight Partnership," Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>.; Uryadovyy Kuryer, 6 August 1998; in "Results Of Ukrainian-U.S. Session Hailed," FBIS-SOV-98-218.; United States Information Service Kiev, *Joint Statement-Second Plenary Session: US-Ukraine Binational Commission* (Kiev, Ukraine: USIS, 22 June 1998), p. 4.

16 June 1998

UNITED STATES AND UKRAINE BEGIN "KHARKIV INITIATIVE"

Representatives from several US government departments and agencies, along with US Ambassador to Ukraine Stephen Pifer, arrived in Kharkiv to discuss investment options in the region. The group planned to address the the negative economic consequences of Ukraine's decision not to participate in supplying turbines to the Bushehr NPP in Iran. Ukraine has lost \$260 million and Turboatom, the company which held the contract, is reported to have lost \$5 million. The Kharkiv Oblast association of businessmen and entrepreneurs, Hranit, believes that thousands of jobs were lost, and has asked President Leonid Kuchma to reconsider the decision.

—UT-1 Television Network, 16 June 1998; in "Ukrainian-US Mission Starts Work on "Kharkiv Initiative," FBIS Document FTS199980617000675; Radio Ukraine World Service, 18 March 1998; in BBC Summary of World Broadcasts, 19 March 1998; in "Unions insist on delivery of nuclear plant turbines to Iran," Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>.

6 March 1998

UKRAINE WITHDRAWS FROM PLAN TO SUPPLY TURBINES TO BUSHEHR NPP

After a meeting with US Secretary of State Madeleine Albright, Ukrainian Foreign Minister Hennadiy Udoenko announced that Ukraine had cancelled Turboatom's plans to supply two turbines to the Bushehr NPP in Iran.

—Interfax, 6 March 1998; in BBC Summary of World Broadcasts, 9 March 1998; in "Ukraine withdraws from Iran nuclear deal," Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>.

April 1997

UKRAINE WARNS AGAINST JOINT FUEL PRODUCTION VENTURE WITH RUSSIA AND KAZAKHSTAN

1 November 1996

NUCLEAR POWER ENERGY TO BE SOLD ONLY THROUGH REGIONAL ENERGY SYSTEMS

Ukrainian Prime Minister Pavel Lazarenko met with the directors and chief engineers of nuclear power plants to discuss the sale of nuclear power. Lazarenko said that electricity generated by Ukrainian nuclear power plants would only be sold through regional, not private, companies.

—"Premier Says Government To End 'Squandering' of Electricity," Interfax, 11/1/96; in FBIS-SOV-96-213.

26 October 1996

MINISTRY OF ATOMIC ENERGY CREATED

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The Ukrainian National Security and Defense Council approved the creation of a Ministry of Atomic Energy which would oversee all nuclear issues, with an emphasis on safety standards. The new Ministry will possess greater authority than that of the State Committee for the Use of Nuclear Energy.

—Interfax-Ukraine, 10/26/96; in "Security Council Discusses Nuclear Industry Situation," FBIS-SOV-96-209, 10/26/96.

18 October 1996

DIFFICULTIES IN ENERGY SYSTEM

According to the Ministry of Power and Electrification, Ukraine's energy system could collapse at any time. Emergency shutdown of generating unit No.1 at Khmelnytsky nuclear power station and reductions in capacity at Chornobyl, Rivne and South Ukrainian nuclear power stations have caused Ukraine to operate its electricity engineering system at frequencies between 49.01 and 49.2 Hz.

—"Energy System Facing Collapse," Kiev Unian, 10/18/96; in FBIS-SOV-96-204.

8 October 1996

BELARUS PLAN FOR ARMY FIRING EXERCISE IN CHORNOBYL ZONE IS BEING STRONGLY CRITICIZED BY UKRAINIAN SCIENTISTS

During his trip to the Chornobyl contaminated Gomel region, Belarusian President Alyaksandr Lukashenko proposed a large-scale army exercise with field firing to be conducted in the depopulated zone. According to 'Segodnya', Defence Ministries staff had already worked out the plan of exercise, triggering a great deal of criticism from Ukrainian scientific circles. According to Vasil Nesterenko, director of the Institute of Radiation Safety, "such an ill-considered experiment may cause a disaster by spreading radioactivity to areas that have not been affected yet".

—"Scientists Criticize Belarusian Plan for Army Firing Exercise in Chernobyl Zone," BBC Monitoring Service: Former USSR 8/10/96.

19 September 1996

NUCLEAR ENERGY CHAIRMAN COMMENTS ON NUCLEAR ENERGY SECTOR

Viktor Chebrov, Chairman of the Ukrainian State Committee for the Use of Nuclear Energy, said that as of 9/96, the nuclear power sector produced nearly 45% of Ukraine's total electric power output, but in early 1996 had been paid for just over half of the nuclear power produced—3 percent in cash and 50 percent in services. Chebrov said that while approximately 8,500 nuclear specialists emigrated to Russia in 1993-1994 due to economic difficulties, the situation has stabilized. As for future plans, Chebrov said that the Russian company TVEL had won a tender to create a complete nuclear fuel cycle in Ukraine.

—Tetyana Hryhorenko, "Nuclear Power Engineering: Ways Of Development," Uryadovyi Kuryer, 9/19/96, p. 12; in "Nuclear Energy Committee Head on Situation in Sector," FBIS-SOV-96-187.

28 July 1996

NEW CORPORATION FORMED TO SELL NUCLEAR-GENERATED ELECTRICITY

A new corporation, UkrEnerhoAtom, has been established in Ukraine to sell electricity produced by Ukrainian nuclear power plants. According to an anonymous source at the Chornobyl press center, power sales will be

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conducted on a territorial level, directly with consumers. However, it is still unclear in what way the energy market shares for each of the five Ukrainian nuclear power plants will be stipulated. According to Chornobyl plant manager Serhiy Parashyn, who is one of the founders of UkrEnerhoAtom, the decision to create the enterprise was made by a council of directors from each of the five nuclear power plants. However, the new corporation will not be involved in the plants' operations and thus will have no responsibility for the reactors' operational safety. It is expected that Ukrainian nuclear power plants will be able to sell electric power directly to customers with payments remitted to the corporate account of the new corporation, thus avoiding the intermediate services of the Energy Ministry, which currently sells all types of power. None of the corporation's business activities will be carried out independently; all of these activities will be capitalized solely by the plants. The president of UkrEnerhoAtom will be elected by the corporation's Board of Directors. It was decided that the corporate headquarters will be located in Enerhodar (Zaporizhzhya NPP) and that the new company's charter will be completed at the second meeting of the Board in 9/96.

—Intelnews (Kiev), 8/29/96; in "New Corporation to Sell Nuclear-Generated Electricity," FBIS-SOV-96-170, 8/29/96.

1 July 1996

30 WORKERS GO ON HUNGER STRIKE AT CHORNOBYL

According to Ukrainian State Committee on the Use of Atomic Energy (Derzhkomatom) spokesman Leonid Kostyuk, 30 workers of the Chornobyl construction department went on a hunger strike demanding payment of several months of back wages. Other employees of the Chornobyl construction department have been on strike since 6/15/95. The main cause of the difficult financial situation at Chornobyl is that consumers are not paying for electricity. In addition, the plant's employees have been paid almost nothing from the state budget allocations for Chornobyl because the plant's management had to cover repair and maintenance expenses first. The total number of participants of both hunger and regular strikes is 129.

—"3 den prodolzhaetsia golodovka stroiteley Chernobylskoy AES," Interfax-Ukraina, 7/4/96.

1 July 1996

LOWER RATES BUT IMMEDIATE PAYMENT

The Ukrainian government decided to allow Ukrainian power plants to sell electricity at slightly lower rates to those customers who pay for it in full immediately rather than purchasing it on credit. Ukrainian customers and enterprises owe more than \$700 million in electricity bills to Ukrainian nuclear power plants.

—Zahar Butyrskiy, "Ukrainskiye AES Budut Prodat Energiyu So Skidkoy," Segodnya, 7/1/96.

July 1996

EUROPEAN COMPANIES OFFER TO HELP FINISH 3 VVER REACTORS

Three European companies, Electricite de France (EDF), Tractabel of Belgium, and IVO of Finland have indicated their willingness to participate in the completion of three unfinished VVER-type reactors—Khmelnitsky-2, Rivne-2, and Zaporizhzhya-6.

—"Nuclear Expansion," The Bulletin of the Atomic Scientists, 7/96, p. 58.

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25 May 1996

GREENPEACE ON TAZHLYTSKA NPP PROJECT

The Mykolaiv "Greenpeace" association sent an appeal to Ukrainian President Leonid Kuchma regarding his plans to go ahead with the Tazhlytska NPP project. (Further information on this project is not available at this time.) The appeal points out that, according to expert analysis, the project is harmful both from the point of view of the environment, and the economy.

—Za Vilnu Ukrainy, 5/25/96, p. 1; in "Ukraine," FBIS-TEN-96-006.

24 May 1996

ONLY \$20 MILLION OF \$86 MILLION RECEIVED

According to Minister of the Environment Yuriy Kostenko, of \$86 million planned for safety maintenance through the winter period of 1996, nuclear power plants have received only \$20 million. This, plus the non-payment of \$180 million in wages to nuclear plant employees, has created a situation where many nuclear power plants cannot carry out repair work.

—Intelnews, 5/26/96; in "Ukraine: Problems of Disposal of Nuclear Fuel Waste Viewed," FBIS-TEN-96-006, 5/24/96.

15 May 1996

UKRAINE ADOPTS NATIONAL ENERGY PLAN THROUGH 2010. WILL IT WORK?

The Verkhovna Rada approved "Ukraine's National Energy Program Through 2010." The program emphasizes independence for Ukraine in the area of electricity, to be achieved through the restructuring of the electricity sector, construction of thermal power plants, and development of the nuclear energy sector. The program envisages that in 2010 50% of Ukraine's electricity will be produced by thermal power plants, 40% by nuclear power plants, and 10% by alternative sources, Oleksandr Kozhuchko, Chairman of the Rada Commission on the Fuel-Energy Complex, told Interfax. In the first three months of 1996, nuclear power plants produced 46% of electricity in Ukraine, an increase in comparison with the corresponding figure of 38% in 1995. Thermal power plants produced less than 50% of electricity in the first three months of 1996. The national Energy Program also envisages the development of coal and gas industries. The Rada instructed the Cabinet of Ministers to work out measures aimed at the realization of the Program, and to make additions and corrections to the National Energy Program as necessary, depending on the changes in the socio-economic situation in Ukraine.

—"Pro natsionalnu enerhetychnu prohramu Ukrainy do 2010 roky," Holos Ukrainy, 5/30/96, p. 2.; "Kiev Adopte Un Plan De Developpement Jusqu'en 2010," Enterpress, 5/20/96.

15 April 1996

COULD UKRAINIAN GOVERNMENT STOP BRAIN-DRAIN?

According to Nur Nihatullin, head of Derzhkomatom, the nuclear industry in Ukraine is one of the three best paid sectors, along with banking and oil. Top industry officials in Ukraine now earn monthly salaries of about \$500—about seven times the average wage. In the initial days after the collapse of the Soviet Union, hundreds of nuclear specialists fled from Ukraine to Russia, attracted by salaries four times higher. After the 1990 moratorium on the construction of nuclear power stations in Ukraine was scrapped in 1993, Derzhkomatom persuaded the government to raise salaries. Nuclear industry officials now see themselves as a vehicle for saving the national

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economy and view with deep suspicion Western criticism of their Soviet-era technology.

—"Ukrainian Industry Thrives Decade After Chernobyl," Reuter Insurance Briefing, 4/15/96.

April-June 1996

ENERHOATOM TO BE SET UP

According to a draft submitted by President Leonid Kuchma, a national generating company called Enerhoatom will be set up based on Ukraine's nuclear power plants. The basic proposal originated in Derzhkomatom, which says that the reform will be completed by 12/96. Enerhoatom is expected to supervise nuclear power stations and sales of nuclear electricity, handle fuel purchases, improve the safety culture at NPPs, and organize training and NPP staff. The board of the new company will be composed of Ukrainian NPP managers. Mykhailo Umanets, former Chairman of Derzhkomatom and a major proponent of providing more freedom in the nuclear sector, is acting as a consultant on the planned changes.

—"Na Ukraine Do 1 Maya Budet Sozdana Natsionalnaya Kompaniya 'Energoatom'," Interfaks-Ukraina, 4/8/96.;

"Ukraine To Restructure Nuclear Industry," Nuclear Engineering International, 6/96, p. 6.; Peter Coryn, "Nuclear Sector Reorganization Awaits Ukraine President's OK," Nucleonics Week, 5/30/96, p. 7.; Nucnet News, 4/26/96; UI News Briefing, 4/4/96.

27 April 1996

UKRAINIAN-CHINESE COOPERATION ON THE PEACEFUL USE OF ATOMIC ENERGY

In Beijing, a representative of the Ukrainian State Committee on the Use of Atomic Energy (Derzhkomatom) and a representative of the People's Republic of China signed an agreement on cooperation in the peaceful use of atomic energy. The Agreement foresees cooperation in the mining and milling of uranium ore, scientific research and design work for VVER reactors, work on the construction of nuclear power plants and safety at these plants.

—CISNP Communications With Volodymyr Chumak, Ukrainian Government Official, 4/28/96.

1 April 1996

UKRAINE HAS NOT RECEIVED ANY Nuclear Fuel RODS FROM RUSSIA

16 March 1996

NPPS PROVIDE 45% OF UKRAINE'S ELECTRICITY

According to the Commission of Nuclear Policy and Environmental Safety, in 3/96 Ukraine's nuclear power plants in were producing 45% of the electricity in Ukraine.

—Volodymyr Korolyuk, "De Tonko, Tam I Rvetsya," Holos Ukrainy, 3/16/96, pp. 1-2.

12 March 1996

UKRAINE REDUCED SUPPLIES OF POWER FOR 7000 FACTORIES

Ukraine was forced to cut off or substantially reduce supplies of power for 7000 of the 40,000 factories which have not paid their energy bills. Outstanding bills reportedly total approximately \$980 million.

—Reuter, 3/12/96.

March 1996

UKRAINIAN REACTORS' LOAD FACTORS THROUGH March 1996

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According to a Western study, none of the 15 power reactors in Ukraine has achieved an annual load factor of over 80%, but five of them achieved an annual load factor of over 70%. Ukraine's average annual load factor for power units was 59% by the end of 3/96. The country's RBMK reactors had an average load factor of 66.9% over the past 12 months and the average lifetime load factor at these reactors was 63.1%. In the case of Ukrainian VVER-1000 reactors, the annual load factor was 62.6% and the lifetime load factor totaled 63.0%.

—Laurie Howles, "Load Factors to End March 1996," *Nuclear Engineering*, 8/96, pp. 12-13.

21 February 1996

KUCHMA PROPOSES JOINT COMMISSION WITH GORE

During a meeting at the US White House, Ukrainian President Leonid Kuchma proposed that the United States and Ukraine create a joint commission on energy to be chaired by Kuchma and US Vice President Al Gore. Kuchma also invited Gore to visit Kiev on the tenth anniversary of the Chernobyl disaster and requested that the Chernobyl issue be raised at the 4/19-20/96 summit of G-7 leaders in Moscow.

—Khristina Lew, "Kuchma Completes Whirlwind Working Visit To Washington," *The Ukrainian Weekly*, 2/25/96.

12 February 1996

RUSSIA REMOVES UKRAINE FROM JOINT POWER GRID FOR THE SECOND TIME

Russia removed Ukraine from their joint power grid for the second time in two months after it noted a surge in demand that the grid could not handle. The frequency of the current in Ukraine's power grid dropped from 49.5 to 49.23 Hz. Russian Energy Ministry spokeswoman Oksana Liven said that it was unlikely that Ukraine would be reconnected in the near future. The cut-off has forced a number of factories to close and Kiev is considering temporarily closing major industrial sites to prevent the collapse of the entire system. According to the Ukrainian National Dispatchers Center, the drop in Ukrainian power output that prompted the cut-off was caused by a coal-miners' strike and an emergency shutdown of Unit 2 at the South Ukraine NPP.

—"Rozednano Enerhosistemy Ukrainy I Rosii," *Holos Ukrainy*, 2/14/96, pp. 1-2.; Viktor Drozd, "Zemlyaki, Gotovte Luchinu," *Pravda*, 2/17/96, p. 4.; Ustina Markus, "Russia Removes Ukraine From Power Grid," *Omri Daily Digest*, 2/14/96.

January 1996

NUCLEAR POWER CONTINUES TO THRIVE IN UKRAINE

Ukraine's nuclear power plants produced 50% of Ukraine's electricity in 1/96.

—Source Book: *Soviet Designed Nuclear Power Plants in Russia, Ukraine, Lithuania, Armenia, The Czech Republic, The Slovak Republic, Hungary and Bulgaria*, 1996, p. 130.

31 January 1996

UKRAINIAN NPPs WILL BE EQUIPPED WITH AUTOMATED CONTROL SYSTEMS

The State Committee for the Use of Atomic Energy confirmed that Ukrainian NPPs will be equipped with automated control systems (ASTUP) developed at Khartron in Kharkiv. The first ASTUP will be set up at the beginning of 1997. In 1998, the system will be installed at South Ukraine 1 and Khmelnytsky 1. In 1999, it will be installed in South Ukraine 2 and 3. By 2002, ASTUP should be installed on almost every Ukrainian reactor. The "Eastern Economist" reports that this system was created by a Westinghouse (United States)-Khartron joint

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venture. Westinghouse reportedly invested \$200 million in the project, a figure matched by the US Department of Energy. This source also reports that the first ASTUP will be installed at Zaporizhzhya 1.

—"Atomky Avtomatyzuyutsya," *Holos Ukrainy*, 1/31/96, p. 8.; "Making Reactor Monitors," *Eastern Economist*, 1/15/96, p. 6.

25 January 1996

ZAGRANATOMENERGOSTROY WILL BUILD TURBINES FOR BUSHEHR PLANT

Kharkiv's Turboatom plant is expected to sign a production contract in the first quarter of 1996 with Moscow's ZaganAtomEnergoSstroy to build two turbines for the Iranian nuclear power plant in Bushehr. Original construction was started in the early 1980s by the Moscow firm and Siemens, but was halted due to an international embargo against the sale and development of nuclear technology in Iran.

—Intelnews, 1/25/96; in FBIS-TAC-96-002, 1/26/96.

24 January 1996

SHORTCOMINGS IN NUCLEAR POWER INDUSTRY SHOULD BE ELIMINATED

A plenary meeting of the central committee of the trade unions of nuclear power workers recommended that the State Committee for the Use of Atomic Energy, the central committee of trade unions, and the sector's trade union committees should eliminate shortcomings in the industry and improve conditions and work safety at nuclear enterprises.

—Unian, 1/24/96; in "Ukraine Trade Unions Call For Improvements In Nuclear Plants," FBIS-SOV-96-017.

18 January 1996

23% OF ELECTRIC ENERGY WILL BE SOLD DIRECTLY TO CONSUMERS

According to the Deputy Minister of Energy Valentiyn Bondarenko, due to the Ministry of Energy's inability to pay the power industry on time, the Cabinet of Ministers has allowed NPPs to sell 23% of electric energy directly to consumers.

—Valentin Bondarenko, "Lyudy Prahnut Tepla," *Holos Ukrainy*, pp. 1, 11-12.

16 January 1996

UKRAINE'S NPPs COULD MEET 20% OF NECESSARY STANDARDS

Nur Nihatullin, the first deputy chairman of Derzhkomatom, reported that the allocations in the state budget for nuclear safety are such that Ukraine's NPPs are only able to meet 20% of necessary standards. In 1996, the sector will have to contend with the fact that 70% of the equipment at nuclear power plants is obsolete and four units will need to be halted for renovations which the sector cannot presently fund. Derzhkomatom plans to increase addressed sales of electric power as part of an effort to form a market for electricity in Ukraine.

—ITAR-TASS, 1/16/96; in "Nuclear Plants Meet 20 Percent Of Safety Criteria," FBIS-SOV-96-011.

1995

UKRAINE PROVIDES MORE ELECTRICITY BUT NUMBER OF EMERGENCIES IS LARGE

Reportedly, Ukrainian NPPs provided 2.4% more electricity in 1995 than in 1994 which accounted for 36.7% of the total energy output for the entire year. (Nucnet News reported that NPPs provided 34.2% of Ukraine's electricity in

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1994.) Nuclear Engineering International reported that in the winter of 1995 NPPs provided 40% of Ukraine's electricity. The planned supply of electricity from NPPs for 1995 was 34.3% and nuclear power's installed capacity share is only 26.2% in Ukraine. The average load factor, according to Nucnet News, was 61.8%. In addition, electricity production by Ukraine's nuclear power plants in 1995 was only 92% of that in 1990. There were 85 emergencies in 1995; one of these emergencies was at Chernobyl and rated a level three (it was only reported in 3/96), ten were rated as level 1 and the rest were level 0 on the INES scale.

—; Pavlo Tlumach, "Enerhetyka Trymaetesya Na AEC," *Holos Ukrainy*, 2/1/96, p. 11; "Nuclear Industry reports Successful Operation, Requests More Attention," *Upresa Daily Digest*, 1/17/96; *Nucnet News*, 1/31/96; "Nuclear Energy Safety Challenges in The Former Soviet Union: Panel Report," *The Center for Strategic and International Studies*, Washington, D.C., 1995, pp. 35-50; "Ukraine," *Nuclear Engineering International*, 6/96, p. 36.

1995

ELECTRICITY GENERATION INCREASED BY 2.5%

According to Derzhkomatom officials, there was a 2.5% increase in electricity generation in 1995. However, consumer debt totaling \$54 million is preventing Ukraine from purchasing enough nuclear fuel from Russia to keep its stations operational. The industry also does not have enough money to replace outmoded equipment at Ukrainian NPPs.

—Chrystyna Lapychak, "Ukraine's Nuclear Authority Strapped For Cash," *Omri Daily Digest*, 1/18/96.

20 December 1995

UKRAINIAN-CANADIAN NUCLEAR COOPERATION AGREEMENT

Ukraine and Canada signed a nuclear co-operation agreement which allows for bilateral trade of nuclear material and equipment to help Ukraine with its energy needs.

—"Canada And Ukraine Sign Nuclear Co-operation Agreement," *News Release of the Canadian Department of Foreign Affairs and International Trade*, 12/20/95.

20 December 1995

WILL UKRAINE'S NUCLEAR INDUSTRY BE PRIVATIZED?

It was reported that a proposal to privatize Ukraine's nuclear power industry has been discussed in Derzhkomatom. Mikhailo Umanets warned that a stabilization fund must be set up before the NPPs can be transferred to the private sector. The ex-director of the Zaporizhzhya NPP, Volodymyr Bronnikov, was against the idea of privatizing the nuclear power industry.

—Peter Coryn, "Byzantine Struggles Seen At Root Of Umanets Affair," *Nucleonics Week*, 11/21/95, pp. 10-11.; Leonid Brovchenko, "Shcho Vidbuvaetsya V Nashii Enerhetitsi?," *Holos Ukrainy*, 12/9/95, p. 10.; "Umanets Sacked," *Nuclear Engineering International*, 1/96.

18 December 1995

UKRAINE'S POWER GRID RECONNECTED TO RUSSIAN

It was reported that Ukraine's power grid was reconnected to the Russian power grid, raising the frequency of current in Ukraine's grid to 49.6-49.7 Hz.

—"Power Supply Improves After Reconnection To Russian Grid," 12/18/95.

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14 December 1995

UKRAINE COULD REDUCE OVERALL POWER CONSUMPTION BY 5-10%

The Global Energy Saving Strategy for Ukraine, under the auspices of TACIS, estimated potential energy saving in Ukraine at 26% of present demand. It predicted that with almost zero costs, Ukraine could reduce overall power consumption by 5-10% within two years. Greenpeace presented a report in late 10/95 which showed that energy consumption between 1990-94 dropped by 30.8%. This report claims that only 55.2% of the country's electricity generating capacity is actually being utilized.

—Peter Coryn, "Ukraine Preparing For Crucial Decision On Chernobyl Closure," *Nucleonics Week*, 12/14/95, p. 13.

5 December 1995

RUSSIA DISCONNECTS UKRAINE FROM JOINT POWER GRID

Russia disconnected Ukraine from a joint power grid for using too much power. Oleksandr Voyevoda, an engineer at the Ukrainian Ministry of Energy, said the surge in Ukrainian consumption was due to the shutdown of a Zaporizhzhya reactor (see 12/5/95 in Zaporizhzhya Comments) and hoped that Russia would bring Ukraine back on line when Zaporizhzhya reactors 4 and 5 are repaired. After being disconnected, the frequency of the current in Ukraine's power grid dropped from 49.6 to 49.2-49.3 Hz. When the current is this low the situation is referred to as critical because the stability of the current is in jeopardy.

—Ustina Markus, "...And Removal From Russian Power Grid," *Omri Daily Digest*, 12/6/95.; "Power Supply Improves After Reconnection To Russian Grid," *Unian*, 12/18/95.; *Interfax*, 12/5/95; in "Russia: Russian and Ukrainian Electricity Grids Disconnected," *BBC Monitoring Service*, 12/8/95.

November 1995

NPPs SUPPLY 37% OF TOTAL ELECTRICITY GENERATION

In the first 11 months of 1995, NPPs reportedly supplied 37% of Ukraine's electricity.

—"Nuclear Energy Safety Challenges In The Former Soviet Union: Panel Report," *The Center for Strategic and International Studies*, Washington, D.C., 1995, pp. 35-50.; Pavlo Tlumach, "Enerhetyka Trymaetesya Na AEC," *Holos Ukrainy*, 2/1/96, p. 11.

October-November 1995

UKRAINE PLANS TO EXPAND NUCLEAR INFRASTRUCTURE

Mikhailo Umanets reported at an international nuclear power symposium that by the year 2000 Ukraine plans to expand the nuclear infrastructure in Ukraine from 34.2% to 40% of domestic electrical power by commissioning Zaporizhzhya-6, Rivne-4, and Khmelnytsky -2 and 4.

—Ted Mole, "1995 UI Symposium: In Pursuit Of A Better World," *Core Issues*, 10-11/95, p. 16.

25 October 1995

\$225 MILLION WERE ALLOCATED TO UKRAINE

The US Foreign Operations, Export Financing, and Related Programs Appropriations Act (H.R. 1868) allocated \$225 million to Ukraine. \$50 million is for improving safety of nuclear reactors and improving energy self-sufficiency. \$2 million is for an energy distribution study.

—"Funds Earmarked For Use Outside Of Russia," *Post-Soviet Nuclear and Defense Monitor*, 10/31/95, p. 2.

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12 September 1995

ELECTRICITY FROM UKRAINIAN NUCLEAR POWER STATIONS IS SAID TO BE 20% CHEAPER THAN OTHER PLANTS

Chairman of Derzhkomatom Mikhail Umanets reported that electricity generated by Ukrainian nuclear power stations is 20% cheaper than that produced by conventional thermal plants. He also stated that Ukraine intends to complete construction of all those nuclear units on which construction has started.

—"Ukraine's Cheaper Energy Option," ENS, 9/12/95.

1 September 1995

NUCLEAR POWER ENGINEERING COMPLEX LEADERS APPEAL TO KUCHMA

An appeal was made to President Kuchma from the trade union leaders of the enterprises in the nuclear power engineering complex. Foremost amongst their concerns were the payment crisis and the need to ensure accident-free operation of the enterprises.

—Radio Ukraine World Service, 9/1/95; in FBIS-SOV-95-170, "Union Leaders Warn of Tension in Nuclear Industry," 9/1/95.

1 September 1995

UKRAINE'S ENERGY SITUATION IS WORSE THAN LAST YEAR

A government official reported that Ukraine's energy situation is much worse than last year. The government had planned to stockpile 10 tons of coal, but instead has been burning it to meet power needs. The Cabinet of Ministers will soon discuss the possibility of scheduled cut-offs in response to limited power resources.

—"In Ukraine," Post-Soviet Nuclear and Defense Monitor, 9/1/95, p. 15.

September 1995

\$426 MILLION IS NEEDED TO MAINTAIN NUCLEAR POWER PLANTS

According to Derzhkomatom, \$426 million is needed to maintain operations of existing nuclear power plants during 1995. Derzhkomatom Chairman Mykhailo Umanets hopes that if the NPPs are kept operational nuclear output will increase by 50 percent by 2020. According to Nur Nihatullin, much of this will depend on Ukraine's ability to raise foreign loans.

—"Zaporizhzhya Startup," Nuclear Engineering International, 9/95, p. 6.

September 1995

UKRAINE IS PLANNING TO RESTRUCTURE ITS ENERGY SECTOR

Nur Nihatullin announced that Ukraine is planning to restructure its energy sector by establishing six thermal generating companies and one nuclear generating company. These will all be state controlled and not joint stock companies.

—"Restructuring," Nuclear Engineering International, 9/95, p. 6.

9 August 1995

UKRAINE AND RUSSIA RE-SYNCHRONIZED ELECTRICITY GRIDS

Ukraine and Russia have now re-synchronized their electricity grids after an 18 month separation accompanied by

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operating problems. The two states hope that this move will facilitate greater operational stability.

—"Cooperation," Core Issues, no. 4, 8-9/95, p. 19.

10 August 1995

APPEAL TO INTERNATIONAL CENTER FOR NUCLEAR SAFETY

An appeal to President Kuchma was made by Vasyl Synko, Chairman of the Kiev region State Administration; Valeriy Shmarov, Defense Minister; Boris Olinyk, member of the Supreme Rada and the Rada Commission on Foreign Affairs and CIS Relations; Boris Paton, President of the National Academy of Sciences; Mikhailo Umanets, Chairman of the State Committee for the Use of Atomic Energy; Oleksandr Osakhovskyy, president of the Servispromatom Joint-Stock Company; and Kostiantyn Prodyn, public activist. This appeal proposed setting up at Chornobyl an international center for Nuclear Safety, to be founded by the presidents of the states which extract and process uranium, operate nuclear power plants, and manufacture nuclear weapons. Initially, this would only include the presidents of Russia, Ukraine, Belarus, and the United States. This appeal made economic arguments in favor of the center.

—"International Effort Urged to Tackle Chornobyl", Kiev Radio Ukraine World Service in Ukrainian, 1200 8/10/95; in FBIS-SOV Daily Report, 8/10/95.

10 August 1995

NUMBER OF VIOLATIONS DROPPED IN 1995

It was reported by the State Committee for the Use of Atomic Energy (SCUAE) that the number of regime violations in the first half of 1995 dropped by 31% in comparison to the first six months of 1994. In the first half of 1995, 47% of electricity supplies, worth around \$250 million, went unpaid. The nuclear power plants (NPPs) contributed 38.6 billion kWh or 39.1% of Ukraine's overall electricity output in the first half of 1995. Only eight reactors are functioning as of August 3, according to the public relations office of SCUAE. Their total output is 5,312 mw. The SCUAE reports that the 5 NPPs contributed only 32.2% of the overall electricity output in 1994. Of the 53 incidents in the first seven months of 1995, 29 occurred at Zaporizhzhya and only one at Chornobyl. Chornobyl accounted for 6.9% of the total electricity output in Ukraine, the highest production level for any Ukrainian NPP.

—"Nuclear Power Plants Show Drop in Regime Violations," Interfax, 8/1/95.; "Only eight nuclear reactors functioning," 8/3/95. "Nuclear Power Plants Operational Statistics Released," Unian, 8/10/95.

13 July 1995

LICENSES WILL REDUCE CHORNOBYL-TYPE ACCIDENTS

Organizations that operate nuclear power stations will be required to obtain licenses, according to Yuriy Kostenko, Minister of Environmental Protection and Nuclear Safety. This procedure is practiced in many other countries and should reduce the risk of another Chornobyl-type accident occurring again.

—Interfax, 7/7/95; in "Safety Licenses To Be Issued to Atomic Power Units," FBIS-SOV-95-135, 7/13/95.

13 July 1995

NO UKRAINIAN NUCLEAR POWER PLANTS HAVE REQUISITE ONE-YEAR SUPPLY OF FUEL

According to Yuriy Kostenko, none of the Ukrainian nuclear power plants has the requisite one year supply of fresh

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nuclear fuel.

—"Interfax-Ukraine News," Interfax (Moscow), 7/13/95.

July 1995

WATER "DEFICIT" WILL INCREASE

It is estimated that by 2000 Ukraine's rivers will not be able to supply the 16 billion cubic meters of water needed for the safe operation of all of its power plants. This will increase the water "deficit" four-fold since 1984.

—Serhiy Vasyuta, "Avariya Na ChAES I Totalitarna Polityka," Zeleny Svit, 7/95, p. 4.

29 June 1995

SYMPOSIUM ON REACTOR SAFETY: MORE PROBLEMS THAN RESULTS

A three-day symposium on reactor safety and energy policy was held in Germany, at which Ukrainian and Russian nuclear experts admitted that there were serious problems in their national nuclear power stations. They blamed their desperate economic situations and stated that Western aid is not being provided quickly enough. Yuriy Kostenko, Ukrainian Minister of Environmental Protection and Nuclear Safety blamed shoddy Soviet equipment and poorly trained personnel for the relatively high number of incidents at Ukrainian plants. Another problem is that much of the equipment is operating beyond its lifetime but Ukraine has no money to replace the old equipment. Other questions to be resolved include guaranteeing the supply of nuclear fuel, waste management for spent fuel rods, and the embrittlement of reactor shells of older power stations. There are more than 4,000 spent fuel rods sitting in cooling installations that are "filled to the brim." Dry storage pools are going to be set up on-site at the plants.

—DDP/ADN (Berlin), 6/29/95; in "Symposium Reviews 'Serious' Nuclear Safety Problems," FBIS-TEN-95-010, 6/29/95.

15 June 1995

CONSORTIUM WILL ASSIST IN COMPLETING TWO POWER UNITS

Electricite de France (EDF), Tractebel Energy Engineering (TEE), and IVO International have formed a consortium and won a EC contract to assist Derzhkomatom complete two VVER-1000 power units (Rivne-4 and Khmelnytsky - 2). The contract, worth more \$3.97 million, has not been signed yet. This contract may include financing for Unit 6 at Zaporizhzhya, which has been completed by Ukraine with no international assistance.

—Ann MacLachlan, "Consortium Wins EC Nod To Aid Ukraine Completion of VVER-1000s," Nucleonics Week, 6/15/95, pp. 9-10.

12 June 1995

SPENT FUEL IS REPROCESSED IN KRASNOYARSK

June 1995

UKRAINIAN ANNUAL LOAD FACTOR

Ukraine's average annual load factor was 62.2%. The lifetime average load factor is 65.1%. PWRs had the highest annual load factor, 63.3% annual and 65.6% lifetime. RBMKs were 56.0% annual and 61.7% lifetime. The highest

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annual load factors were at Rivne 1 and 2, followed by Zaporizhzhya 4.

—"Load Factors To End June 1995," Nuclear Engineering International, PP. 50-51.

June 1995

NUCLEAR POWER PLANTS REPRESENTED 25% OF ELECTRICITY GENERATION

In the first half of 1995, nuclear power supplied 39.1% of total power generation in Ukraine while nuclear power plants represented 25% of total potential electricity generation.

—"Nuclear Power Plants Show Drop in Regime Violations," Interfax, 8/1/95.

June 1995

TACIS AID TO BE PROVIDED TO UKRAINIAN NUCLEAR REACTORS AND FACILITIES

The State Committee for the Use of Atomic Energy and the EC Commission agreed to a general sum of 53.5 million ECU for the TACIS '92, '93, and '94 programs. 25.5 million ECU will be used to purchase equipment and 28 million ECU will be used for engineering work. Currently, funds from TACIS '92 and '93 are being used for: 8 projects totaling 9.5 million ECU with 4.5 million ECU for equipment at the South Ukraine NPP; 11 projects totaling 9.5 million ECU with 4.5 million for equipment at the Rivne NPP; 3 projects totaling 5.5 million with 3.0 million for equipment at the Zaporizhzhya NPP; 1 project totaling 1.5 million ECU at the Chornobyl NPP; 1 project totaling 1 million ECU at the Kiev and Kharkiv Institutes; and 9 projects totaling 8 million ECU, with 2 million ECU going toward a simulator of a VVER 440/213, at the State Committee for the Use of Atomic Energy. As of 12/94 contracts had been signed with French, Danish, and German companies.

—"Yevropeyskaya Podderzhka Yadernoy Bezopasnosti," Information Bulletin, Nuclear Society Internat, Moscow, 6/95, p. 9.

18 May 1995

DERZHKOMATOM PROPOSES REORGANIZATION OF UKRAINIAN NUCLEAR INDUSTRY

Derzhkomatom has proposed reorganizing Ukraine's nuclear industry as a government-owned holding company that operates through branch companies and joint-stock enterprises. These firms would produce electricity and manage the nuclear fuel cycle. Such reform is necessary in order for Ukraine to develop a market economy; additionally, this will allow the crucial tasks that the nuclear industry performs to continue, in spite of the dire economic straits that Ukraine is in.

—Peter Coryn, "Reform, Partial Privatization of Nuclear Industry Posed in Ukraine," Nucleonics Week, 5/18/95, pp. 16-17.

20 March 1995

DERZHKOMATOM WILL BE UNITED WITH MINENERGO

A draft Presidential decree circulating in Kiev that would unite Derzhkomatom and Minenergo has received the support of top Derzhkomatom officials; this is an effort to create a unified national nuclear infrastructure. First Deputy Chairman of Derzhkomatom Nur Nihatullin stated that it was a good proposal that would facilitate the establishment of a system for dealing with radioactive waste as well as a support system for the nuclear industry. Chairman of Derzhkomatom Mikhailo Umanets supports the idea as long as the new organization assumes complete responsibility for all problems related to the nuclear fuel cycle.

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—Alex Brall, "Derzhkomatom Supports Proposal For United Power Generation Body," *Nucleonics Week*, 3/30/95, p. 8.

14 March 1995

BROOKHAVEN LABORATORY WILL PROVIDE ANALYTICAL SIMULATORS

In late 1994 Brookhaven National Laboratory provided Ukraine with a full-scale simulator for training plant operators. The Lab is planning now to provide Ukraine with analytical simulators that are designed to train government regulatory officials, rather than plant operators. These simulators are being provided under the auspices of the Lisbon Initiative.

—"NRC Seeks US Firms To Provide Analytical Simulators for Russia," *Post-Soviet Nuclear & Defense Monitor*, 3/14/95, p. 6.

14 March 1995

GOVERNMENT FUNDS WILL BE APPROPRIATED FOR NUCLEAR ENERGY SECTOR

President Kuchma has issued a new decree that calls for the appropriation of government funds for the nuclear energy sector. The State Committee on the Use of Atomic Energy will allocate some of the money for the completion of Unit 6 at Zaporizhzhya.

—Chrystyna Lapychak, "Kuchma Decrees Funds for Energy Sector," *Omri Daily Digest*, No. 52, Part II, 3/14/95.

9 March 1995

WESTINGHOUSE-KHARTRON AGREEMENT

Westinghouse and Khartron have signed an agreement worth \$200,000 in which the feasibility of using Westinghouse's Instrumentation and Control (I&C) technology on 10 VVER-1000 reactors will be investigated. Westinghouse will provide \$200,000 and Khartron will provide the other half.

—"Ukraine/US.: Westinghouse-Khartron I&C Deal," *Nucleonics Week*, 3/9/95, p. 16.

2 March 1995

NUCLEAR POWER INDUSTRY PERSONNEL WILL NOT ACCEPT RESPONSIBILITY FOR QUALITY OF WORK

Derzhkomatom informed the government that the financial situation is so dire for the nuclear power industry that its personnel will no longer accept responsibility for the quality of work performed at the plants. Spring and summer repairs have been postponed. The nuclear plants require \$224 million for fresh fuel in 1995 but Derzhkomatom has only \$93 million. The lack of finances has required power cutbacks at Chernobyl and the same could happen at other plants as well. Ukraine had plans to purchase spare parts worth \$52 million, but that has been put on hold indefinitely. Fresh fuel was delivered to Rivne just as Unit 1 required refueling. The fuel for Rivne was paid out of a general fuel fund for all nuclear plants in Ukraine, but that resulted in a lack of finances to purchase fuel for Unit 1 at the South Ukraine plant.

—Alex Brall and Ann MacLachan, "Safety Upgrade Quality Uncertain as Ukraine Nuclear Near Bankruptcy," *Nucleonics Week*, 3/2/95, pp. 11-12.

27 February 1995

THE DEPARTMENT OF ENERGY REQUESTS ADDITIONAL MONEY

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The Department of Energy (DOE) has requested an additional \$83.8 million for reactor safety upgrades in the former Soviet Union. Ukraine and Russia are to receive the bulk of the money—\$78.8 million. The shut-down of Chernobyl is one of the projects this money will be used for. DOE FY 95 funding included \$11 million for a simulator at Khmelnytsky as well as \$75 million for activities in both Russia and Ukraine.

—"DOE Requests \$235 Million for FSU Activities," *Post-Soviet Nuclear and Defense Monitor*, 2/27/95, p. 4.

16 February 1995

UKRAINIAN NPPS DENY THEIR RESPONSIBILITIES

The managers of most of Ukraine's nuclear power plants are protesting the lack of funding they are receiving, and denying their responsibility to perform maintenance and safety procedures. During the course of the past three years, the nuclear power industry provided Ukraine with more than 80 trillion karbovantsi, yet received in appropriations only 16 percent of the total value of the power they produced.

—ITAR-TASS, 2/16/95; in "Nuclear Power Plants Near Bankruptcy," *FBIS-SOV-95-033*, 2/16/95.

13 February 1995

KIEV MAINTAINS THAT RUSSIAN NUCLEAR FUEL RODS ARE LOW-QUALITY

12 January 1995

ALL UKRAINE'S NUCLEAR POWER PLANTS ARE OPERATIONAL

All 14 of Ukraine's nuclear power plants are currently operational. The 14 units are Chernobyl 1 and 3, Rivne 1-3, Khmelnytsky 1, South Ukraine 1-3, and Zaporizhzhya 1-5.

—"N-Power in Top Gear for Ukraine's Winter Freeze," *Nucnet*, 1/12/95, No. 22.

12 January 1995

TECNATOM WILL DELIVER NUCLEAR SAFETY EQUIPMENT TO ZAPORIZHZHYA

Tecnatom, a Spanish company that specializes in non-destructive examination equipment, plans to \$2 million worth of nuclear safety equipment to Zaporizhzhya beginning in 9/95; this is the first contract under which a western company will directly supply equipment to a Ukrainian plant. Zaporizhzhya will pay Tecnatom directly; the money is being raised through barter deals with uranium. This contract is separate from the EU's TACIS program, which is being held up due to third-party liability problems. Tecnatom is not concerned about third-party liability because its contract specifies that all responsibility ends once the equipment is tested successfully.

—Ann MacLachlan, "Tecnatom Gets Contract to Supply NDE Equipment to Ukrainian Plant," *Nucleonics Week*, 1/12/95, pp. 5-6.

11 January 1995

TASK FORCE DISCUSSES POSSIBILITY OF NUCLEAR POWER INDUSTRY PRIVATIZING

Derzhkomatom has created a task force to discuss the possibility of privatizing the nuclear power industry. The task force includes individuals from nuclear power stations as well as from uranium mining facilities, and engineering plants. The process of privatization would be very complex in Ukraine because the nuclear enterprises encompass many other facilities.

—"Ukraine Studies Nuclear Power Privatization," *Nucnet*, No. 19-20, 1/11/95.

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1 January 1995

UKRAINE'S ELECTRICITY PRODUCED BY NUCLEAR POWER

The proportion of Ukraine's electricity produced by nuclear power reached a high of 52 percent at certain times during 1994, despite the fact that the total output of nuclear-generated electricity dropped as a result of unscheduled reactor shut-downs. This was because Ukraine experienced a decline of 16 percent in thermal stations' electricity generation. The proportion of nuclear-produced electricity averaged 38 percent.

—David R. Marples, "Nuclear Power in Ukraine: A Look at a Troubled Industry," *The Ukrainian Weekly*, 1/1/95, p. 2.

January 1995

NUCLEAR LEGISLATION DISORGANIZED

Nikolai Steinberg stated that Ukraine's nuclear power complex is functioning basically without a nuclear safety infrastructure as a result of funding crises, political crises, and indecision as to whether or not certain reactors will be shut down and started up. One problem is that there is no nuclear energy law; instead, there are 15 different laws that deal with the nuclear industry indirectly. The nuclear law that has been drafted has yet to be ratified by the Rada due to political wrangling.

—"Ukraine 'Hovers on the Brink'," *Nuclear Engineering International*, 1/95.

January 1995

THREE NEW VVER-1000S WILL BE CONSTRUCTED

A German-Belgium consortium led by Lahmeyer International has finalized plans to complete the construction of three new VVER-1000s at Khmelnytsky -2, Rivne-4, and Zaporizhzhya-6. The project is being funded by the EU's TACIS program. It is estimated that the start-up of all three units will cost \$950 million.

—"Considering Ukrainian Startups," *Nuclear Engineering International*, 1/95.

1994

125 REGIME VIOLATIONS IN TEN MONTHS - 4 EVENTS OFF SCALE, 112 LEVEL-0 EVENTS, 26 LEVEL-1 EVENTS, 2 LEVEL-2 EVENTS

At the five Ukrainian NPPs, there were 125 regime violations in ten months of 1994. The highest number of violations was at the Zaporizhzhya plant (57). The lowest number was at Chornobyl ("only 13"). Nuclear Europe Worldscan reported that in 1994 there were 144 events reported to the IAEA. According to the INES scale, 4 events were out of scale, 112 events were level 0, 26 were level 1, and 2 events were level 2. In addition, the reported total production in 1994 was 68.8 billion kWh, the nuclear share of electricity output was 34.2%, the average load factor was 61.4%, and the total capacity of the 14 units in operation was 12,818 Mwe.

—Yanina Sokolovskaya, "Chornobyl'skaya Ruletko," *Izvestiya*, 7/1/95, p. 5.; "Ukraine," by Nikolai Kurilchik and Alexei Breus, *Nuclear Europe Worldscan*, 7-8/95, pp. 76-77.

1994

NO PROGRESS IN COOPERATION WITH WEST

Nuclear power plants provided 34.2% of Ukraine's electricity in 1994. In 1994, Ukraine under-produced 17.5 billion kWh, while corresponding figure for 1993 was 9 billion kWh. There were 133 malfunctions on the Ukrainian NPPs, down 20% from 1993 (167 malfunctions.) Malfunctions included 30 shutdowns, 28 malfunctions that lead to the

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reduction of reactor capacity, and 75 malfunctions that did not. On average, there were 9.7 malfunctions per reactor. Cooperation of Derzhkomatom with the Western partners did not progress in 1994 due to the lack of Ukrainian legislature governing responsibility for nuclear damage resulting from accidents on the nuclear facilities. Therefore, cooperation did not progress with TACIS (\$66 million), with Germany on the improvement of the safeguard at the Rivne NPP (\$20 million), cooperation under the Lisbon initiative (\$30 million), and cooperation with foreign governments and firms to create in Ukraine enterprises producing nuclear fuel (\$120 million). Also no progress was made on \$20 million project to manufacture advanced instrumentation and control systems for the Ukrainian VVERs at Weston (a joint venture between Westinghouse and Khartron Product Association.)

—"Pidsymky Roboty AES Ukrainy Za 1994 Rik," Vestnik Chornobolya, 2/95, p. 3.

1994

ELECTRICITY PRODUCTION FALLS

In 1994, 59.8% of electricity generation was from fossil fuel, down from 62.4% in 1993; 34.1% was from nuclear power, up from 32.7%; and 6.1% was from hydro power and other sources, up from 4.9%. Total electricity production fell from 229.9 TWh to 193.5 Twh.

—"Data Feature: 1994 World Nuclear Electricity Production," Nukem, 9/95, p. 34.

1994

WORLD'S NINTH TOP PRODUCER OF NUCLEAR ELECTRICITY

In 1994, Ukraine was the world's 9th top producer of nuclear electricity, producing 68.85 billion kilowatt hours.

—"Nuclear Power Surge," The Washington Post, 4/20/96, p. A17.

1994

UKRAINE'S ELECTRICITY DURING THE WINTER

Nuclear power plants provided 43.7% of Ukraine's electricity during the winter months of 1994.

—Pavlo Tlumach, "Enerhetyka Trymaetesya Na AEC," Holos Ukrainy, 2/1/96, p. 11.

22 December 1994

ENERGY DEPARTMENT EXPANDS; LEVEL OF ENERGY CONSUMPTION FALLS

According to Volodymyr Usatenko, consultant to the Rada Commission on the Problems of the Chernobyl Disaster, the power industry was being split in December into two parts. If the split occurred, nuclear power would come under the jurisdiction of Defense Minister Valeriy Shmarov and fossil fuel would come under the jurisdiction of Deputy Prime Minister Anatoly Dyuba. Ukraine's energy consumption level has fallen in recent years and this consultant predicted that Ukraine's 1990 energy consumption level would only be attained again in 2110. Usatenko went on to say, "The unbridled expansion of the nuclear energy department is...leading the country into an economic and ecological catastrophe."

—Valentin Smaga, "Nuzhno li Vozrozhdat ChAES?" Kyivskie Vedomosti, 12/22/94.

December 1994

UKRAINE'S ENERGY SITUATION IS DIRE

According to Deputy Premier Anatoly Dyuba, Ukraine's energy situation for the winter is very dire. From 1-8/94,

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147 TWh were produced, which just barely met demand. A decrease of 9 TWh was reportedly the result of an increase in the pricing policy, a loss in skilled workers, repeated delays in safety improvements, and inadequate fuel supplies. In south-eastern Ukraine, daily electricity shut-downs have become routine as a result of fuel shortages.

—UI News Briefs, 94/49, 12/94.

24 November 1994

UKRAINE RECEIVES RUSSIAN FUEL BUT OFTEN TOO LATE

24 November 1994

ONE-THIRD OF UKRAINE'S THERMAL GENERATING PLANTS ARE NOT OPERATING

According to Heorhiy Kopchinsky, head of Ukraine's Nukom, the importance of nuclear power generation increased during the last year. Nuclear plants in Ukraine account for 24 percent of the installed generating capacity, yet in 1994 they produced 33 percent of Ukraine's electricity. However, since the plants are not receiving the revenue due them, they are having difficulty procuring spare parts and fuel and all safety improvement plans have been temporarily halted. According to Kopchinsky, one-third of Ukraine's thermal generating plants are not operating due to a lack of fossil fuel. Ukraine produces only 44 percent of its fuel supply and currently owes more than \$2.5 billion for oil and natural gas imports. Kopchinsky commented that even at the highest levels of government there is a lack of a safety culture.

—Dave Airozo, "Economic Distress Complicates Search For Solutions At Chernobyl," *Nucleonics Week*, 11/24/94, pp. 9-10.

21 November 1994

CANADA PROMISES \$200 MILLION FOR UKRAINIAN NUCLEAR REACTOR UPGRADES

Canada has promised to provide an additional \$200 million for safety upgrades to Ukrainian nuclear reactors. It will also provide Ukraine with \$100 million so it can repay its energy debts.

—RADA, 11/21/94, p. 2; in "Canada Agrees to Energy Assistance, Exploration," *FBIS-SOV-94-226*, 11/21/94.

17 November 1994

RUSSIA PROVIDED MORE FUEL ASSEMBLIES THAN PLANNED

11-17 November 1994

NUCLEAR POWER PRODUCTION IS GROWING

Electricity consumption fell from 268.3 GWh in 1991 to 226.2 GWh in 1993, which, according to Nikolai Steinberg of the SCNRS, reflects a decrease in electricity demand. The nuclear component of Ukraine's power production is constantly growing. Ukraine is ranked number eight in the world in terms of operational reactors and NPP output of electric power. It is ranked number seven in terms of total NPP capacity and is number twelve or thirteen in terms of percentage of electric power generated at its NPPs.

—"Nuclear Safety And Nuclear Regulatory Process In Ukraine. Status And Problems," Nicolai Steiner, presented at the 1994 Annual American Nuclear Society Meeting, Washington, 11/11-17/94.

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6 October 1994

DERZHKOMATOM CANNOT FUND SAFETY IMPROVEMENTS

Nuclear power plants generated 39 billion kilowatt hours in the first six months of 1994, accounting for more than 38 percent of the electricity generation in Ukraine. But, Derzhkomatom can not supply the 1.6 trillion karbovantsi needed to maintain all the plants; all safety work has been halted. According to Nur Nihatullin, more than \$100 million has been lost as a result of unreliable VVER-1000 fuel rods that have gotten stuck halfway into the reactor core, making it necessary to reduce the output of the reactor by 50 percent. Fuel rod fabrication may have to be altered for the VVER-1000s and the core may be redesigned.

—"Funding and Equipment Woes Dog Ukrainian Nuclear Plants," Nucleonics Week, 10/6/94, p. 7.

6 October 1994

INTERNATIONAL SCIENTIFIC-TECHNICAL CENTER AT CHORNOBYL

The Kurchatov Institute and the Ukrainian National Academy of Science have proposed the creation of an International Scientific-Technical Center at Chornobyl. The goal of this joint project is to involve scientific expertise from Russia, Ukraine, and other nations to resolve many of the safety problems present at the Chornobyl site, including improving the sarcophagus, closing down the three power units currently operating, managing the radioactive wastes, and cleaning up of the land near Chornobyl. Derzhkomatom, MinChornobyl (the agency responsible for the rehabilitation of the Chornobyl area), Russia's Minatom, as well as scientific institutes in Belarus have given their support to the concept. This idea was initially proposed in 1986 but was rejected by the Soviet government; the issue was raised a second time in 1989-90, but the discussion was interrupted by the collapse of the Soviet Union.

—"International Scientific Center at Chornobyl Proposed, Again," Nucleonics Week, 10/6/94, p. 8.

17 August 1994

GERMANY WILL PROVIDE REMOTE MONITORING SYSTEM

According to the director of the Institute of Safety Research near Dresden, Germany, a remote monitoring system will be put into operation at Ukraine's nuclear power plants by 1995. The German institute developed the system which can help simulate defects in nuclear plants. The systems are currently being used in the Czech Republic, Slovakia, Hungary, and Bulgaria. Russia has expressed an interest in the system as well.

—DDP/ADN (Berlin), 8/17/94; in "New Monitoring System Developed for Nuclear Plants," FBIS-SOV-94-160, 8/18/94, p. 25.

9 August 1994

NUCLEAR PLANTS ARE NOT READY FOR WINTER

A familiarization tour of nuclear power plants by a government delegation headed by Deputy Prime Minister Valeriy Shmarov was conducted in early August to check on the readiness of the plants for the winter, as well as the current state of uncompleted reactors at Zaporizhzhya, Khmelnytsky, and Rivne. It was determined that the plants are not sufficiently ready for winter, and that due to errors of the workers at the stations undergoing renovations, there will be further delays in opening them. The main cause for the problems among nuclear plant workers has been cited as lack of pay.

—Unian (Kiev), 8/9/94; in "Nuclear Power Stations Not Ready for Winter," FBIS-SOV-94-154, 8/10/94.

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20 July 1994

SPENT FUEL IS NOT TRANSPORTED FROM POWER PLANTS

Directors of Ukraine's nuclear power plants gave a statement to the President, the Cabinet of Ministers, and Parliament regarding the need for assistance for their ailing industry. The industry currently faces payment delays, problems obtaining spare parts and deliveries of materials, and a mass exodus of experienced personnel to other fields. Also cited was the fact that due to a lack of funds, spent fuel cannot be transported from the power plants. —"Nuclear Plants Want Help," Intelnews 7/20/94.

July 1994

INTERNATIONAL COMMUNITY HELPS UKRAINE AND RECOMMENDS CLOSING CHORNOBYL

At the 7/8-10 Summit in Naples, the G-7 states offered to provide \$200 million in assistance to Ukraine in an effort to reform its nuclear industry. The EC has already provided 100 million ECU and Euratom has pledged to lend 400 million ECU for this purpose. Recommendations to close Chornobyl by 1996 were made, and estimates were given that newer and safer plants (Zaporizhzhya, Rivne, and Khmelnytsky) could make up for the loss in energy production.

—Sergei Brilev, "The New Italian Movie 'Seven and a Half.' Economic Aspect," Moskovskiye Novosti, 7/10-17/94, p. 29.

July 1994

UKRAINIAN NUCLEAR SOCIETY IS CONCERN ABOUT SAFETY IN NUCLEAR POWER INDUSTRY

The Ukrainian Nuclear Society (UNS) issued a letter to the President, the Speaker of the Parliament, and the Prime Minister expressing concern about safety in the nuclear power industry. The UNS, however, attested to the need to keep the plants open, citing that more than forty percent of all energy produced in Ukraine during the first half of 1994 was produced by nuclear power plants, and that nuclear energy was the least expensive type of electric energy. UNS members also said that the Chornobyl plant should not be closed in the near future, but stressed the need for urgent measures to be taken to improve the safety situation.

—"Nuclear Society Rallies for Reactors," Intelnews, 7/21/94, and Unian (Kiev), 8/12/94), in "Nuclear Society Addresses Leaders on AES Safety, Production," JPRS-TEN-94-021, 8/29/94.

July 1994

33% OF UKRAINE'S ENERGY COMES FROM NUCLEAR POWER PLANTS

According to an IAEA estimate, nearly 33 percent of Ukraine's energy in 1993 came from nuclear power plants, as compared with 25 percent in 1992. Total nuclear power generation for 1993 was 75.2 terawatt hours (TWH). The 1993 figures placed Ukraine 13th on the list of nuclear power contributions cited for 30 nations.

—"Nuclear Power Contributions in 1993," Nuclear News, 7/94, p. 47.; Steinberg, 8/94.

10 June 1994

WILL RBMK REACTORS BE SHUT DOWN?

The International RBMK Project presented the findings of its one-year investigation into the safety of RBMK reactors. The Project enumerated more than 300 recommendations for improving RBMK reactors and stated that they are "not as bad as they might be, but they could be better." First-generation reactors and the Chornobyl NPP

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were not included in the study; when the study began, Chernobyl was set to be decommissioned. Russian and Ukrainian officials have hailed the investigation as proof that RBMK reactors need not be shut down. The international investigation found that RBMK reactors cannot be grouped into one category but must be considered individually because each reactor is different. One of the main arguments of Ukrainian authorities has been that due to the lack of major differences between Chernobyl and Russian RBMKs there is no reason to demand that Chernobyl be shut down while Russia keeps its RBMKs running.

—Ann MacLachlan, "RBMK Project Concludes Reactors Aren't Awful, But Could Be Better," *Nucleonics Week*, 6/16/94, pp. 8-10.; Correspondence with Ukrainian nuclear official, 1/95.

June 1994

KURCHATOV INSTITUTE REPORT

According to a Kurchatov Institute report, in 1992 Ukraine operated 14 nuclear power units that generated 12,818 MW(E); this was 29.4 percent of Ukraine's total electricity output. Nuclear-generated electricity is important to Ukraine due to its economic crisis and as a result, Ukraine seeks to complete a number of units under construction, including the 6th unit at Zaporizhzhya (95 percent completed), the 2nd unit at Khmelnytsky (85 percent completed), and the 4th unit at Rivne (80 percent). Ukraine is striving to domestically produce 100 percent of its nuclear reactor fuel by 2003.

—A. Rumiantsev, V. Shmelev, V. Sukhoruchkin, "CIS Nuclear Industry Relations," The Kurchatov Institute-Russian Research Center, Moscow, 1994.

April 1994

EU COMMISSION SUGGESTS CREATING PERSONNEL TRAINING CENTER

After a fact-finding mission to Chernobyl, Zaporizhzhya, and Rivne, and talks with representatives from the South Ukraine and Khmelnytsky power plants, members of an EU Commission concluded that a national training center complete with special literature and equipment should be set up to train personnel in the nuclear power field. They recommend that the G-7 countries provide technical assistance for this project.

—Interfax (Moscow), 4/1/94; in "EU Group Recommends Nuclear Plant Training Center," FBIS-SOV-94-064, 4/4/94, p. 36.

8 March 1994

TECHNICAL ASSISTANCE PROJECT BEGINS WITH SEMINAR IN KIEV

A three year international project, aimed at providing technical assistance in the nuclear safety field in Ukraine, has been fully launched. The project is within the Technical Assistance to the CIS (TACIS) program of the Commission of the European Communities, and is beginning with a seminar in Kiev on licensing nuclear installations. Participants in the seminar include French and German safety experts and their Ukrainian counterparts.

—UkrSCNRS, "Ukraine: Major N-Plant Safety Project Now Fully Underway," ENS NUC NET, 1/14/94.

2 February 1994

SHORTAGES OF NUCLEAR FUEL COULD CLOSE DOWN SEVERAL NUCLEAR POWER PLANTS

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2 February 1994

DOE AUTHORIZATION WILL PROVIDE MATERIALS AND EQUIPMENT

S3 Technologies received US DOE authorization to provide materials and equipment for Unit 1 at Zaporizhzhya, Units 1-3 at Rivne, and Unit 3 at the South Ukraine plant. Approved items include materials for full-scope control room operator training simulators at the three power plants.

—"Part 810 Authorizations: Ukraine," Nuclear Fuel, 7/4/94, p. 14.

February 1994

SWEDEN HELPS UKRAINIAN SAFEGUARDS PROGRAM

It was reported that the Swedish Nuclear Power Inspectorate (SKI) is helping Ukrainian authorities to set up a safeguards program.

—"Sweden Says Launching Safeguards in Ex-USSR Is Slow Process," Nuclear Fuel, 2/14/94, p. 16. An agreement for bilateral cooperation was signed in 9/93 and includes technical and administrative assistance for establishing a safeguards system based on Swedish and international experience.; Text of agreement, "Agreement for Cooperation between Ukrainian State Committee on Nuclear and Radiation Safety (UkrSCNRS) and Swedish Nuclear Power Inspectorate (SKI) Concerning Non-Proliferation of Nuclear-Weapons-Related Materials"

25 January 1994

CONCEPT OF SECURITY STATE REGULATION

The Supreme Rada adopted a "Concept of the state regulation of security and management of nuclear industry in Ukraine."

—Serhiy Galaka, "Domestic Sources of Ukrainian Nonproliferation Policy," Kiev, CIS Nonproliferation Project Core-Group Working Paper, 6/94.

18 January 1994

SAFETY VIOLATIONS AT UKRAINIAN POWER STATIONS INCREASE

Nikolai Steinberg, head of the UkrSCNRS, announced that safety violations at Ukraine's five nuclear power stations increased by 23 percent in 1993. He gave no figures, but official statistics for 1992 listed over 100 safety violations. The problems is caused in part by Ukraine's serious financial situation and "old habits of waiting for someone else to resolve all our problems," Steinberg said.

—"Violations Up 23 Percent At Ukraine's Nuclear Plants," Reuter (Kiev), 1/18/94.

Winter 1994

NUCLEAR POWER WARMS IN WINTER

During the winter of 1993-94, nuclear power provided more than 40% of Ukraine's electricity.

—CISNP Discussions with Ukrainian nuclear official, 3/7/96.

1993

UKRAINE IS THE 13TH ON NUCLEAR POWER LIST

Total electricity generation also fell during the period from 1990-93 from 298.5 billion kWh to 230 billion kWh. Nuclear power generation for 1993 made up nearly 33% of Ukraine's total energy in 1993 (75.2 terawatt hours),

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compared with 25% in 1992. The 1993 figures placed Ukraine 13th on the list of nuclear power contributions cited for 30 nations. Ukraine's electricity exports also reportedly fell from 1991-93 due to a decrease in demand. As a result nuclear electricity in Ukraine has gained in relative importance.

—"Nuclear Energy Safety Challenges In The Former Soviet Union: Panel Report," The Center for Strategic and International Studies, Washington, D.C., 1995, pp. 35-50.

1 June 1993

HIGH RUSSIAN FUEL PRICES WILL LEAD TO EXPANSION OF UKRAINIAN NUCLEAR INDUSTRY

The Ukrainian nuclear power industry is finding it difficult to afford fuel. In a speech to the Supreme Rada, Prime Minister Leonid Kuchma lamented the "near world-market prices" Russia is now charging for its nuclear fuel. This action provides impetus for both energy independence and the drive to expand the nuclear industry, since natural uranium is abundant in Ukraine and could be exploited if the industry expanded with CANDU reactors.

—Nuclear News, 7/93, p. 48.

June 1993

UKRAINIAN-GERMAN NUCLEAR SAFETY ACCORD

Ukraine and Germany signed a nuclear safety accord that includes exchanges of legislation on installation safety, personnel and environment safety, and licensing. It also covers exchanges of information regarding the building, running, and closing of plants. Germany also offered assistance in assessing the damage caused by Chornobyl. The Ukrainian State Committee on Nuclear and Radiation Safety and Germany's Federal Ministry for the Environment and Radiation Safety are also obliged to notify the other in the case of a nuclear accident. The final aspect of this accord reinforces an IAEA convention ratified by Ukraine.

—ENS, 6/28/93.

April 1993

SUPREME RADA CONSIDERING LIFTING MORATORIUM ON THE CONSTRUCTION OF NEW NUCLEAR PLANTS UNITS

The Ukrainian Parliamentary Commissions on Primary Industries, on the Chornobyl Cleanup as well as the Ukrainian Government will propose that the Supreme Rada lift the moratorium on the construction of three new units at the Zaporizhzhya, Rivne, and Khmelnytsky nuclear power plants.

—"NOVOSTI" Television Program, 4/18/93; in Russia and CIS Today, 4/19/93, p. 21.

14 January 1993

RUSSIA AND UKRAINE AGREE TO COOPERATION

Russia and Ukraine signed an agreement on scientific, technical, and economic cooperation in the nuclear power industry.

—Nikolai Steinberg, Presentation made to the Committee on Defense and Military Policy of the Supreme Rada, 11/9/94.

July 1992

RIVNE AND KHMELNYTSKY MAY BE SHUT DOWN

It was reported that the Ukrainian Rivne-3 and Khmelnytsky -1 VVER-1000 reactors may be forced to shut down if

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Russia continues to refuse to accept their spent fuel at Krasnoyarsk, in Russia.

—"Spent Fuel Storage Problems Threaten Operation Of Ukrainian Power Reactors," Nuclear Fuel, 7/20/92, p. 5.

July 1992

UKRAINE MAY TURN TO CANDU-TYPE REACTORS

It was reported that Ukraine may turn to CANDU-type, heavy water reactors to decrease reliance on Russia for enriched uranium and fuel fabrication.

—"Ukraine Advised to Rely on Coal and Nuclear, Maybe Via CANDUs," Nucleonics Week, 7/30/92, p. 12-14.

2 August 1990

SUPREME RADA MORATORIUM

The Supreme Rada passed a resolution to impose a moratorium on construction of all new nuclear power plants in Ukraine.

—"Ukraine Goes Back to Nuclear: Chornobyl, New VVERs to Go Ahead," Nuclear Engineering International, Vol. 38, No. 473, 12/93.

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NPP Safety: 1997-1993

25 July 1997

UNIT 3 REPAIRS SUSPENDED UNTIL OCTOBER 1997

Unit 3, the last operational reactor at the Chornobyl NPP, will remain idle until October 1997. Seventy fuel channels within the reactor are in need of replacement, and the plant has only 25 percent of the parts required to complete the repairs. Since January 1997, little financing for the projects involving the sarcophagus and Units 1 and 2 has materialized. Plant Director Serhiy Parashin opposes permanently closing Chornobyl NPP merely because Ukraine has survived this temporary interruption of all power from Chornobyl. He believes that insufficient funding and the resulting loss of control over the power plant will have "dreadful consequences." Parashin also believes that somehow funds for servicing Unit 1 and 2 and plant financing were mislaid in the state budget approval process.

—ITAR-TASS, 25 July 1997; in "Chornobyl Plant Repairs Suspended Until October," FBIS-SOV-97-206.

21 July 1997

LAST REACTOR AT CHORNOBYL SHUT DOWN FOR REPAIR

The last operating 1,000 MW reactor at the Chornobyl nuclear power station was shut down on 21 July 1997 for intermediate overhaul and routine maintenance. Originally expected to be out of commission for only 70 days, Unit 3 may now stay idle for months. Borys Kutsenko, responsible for the centralized repair and maintenance facility at Chornobyl, asserts that maintenance may take longer than expected because of "weak logistical support" and the unavailability of vital Russian-made spare parts and equipment. The station has only 25 percent of the replacement materials it needs to complete the overhaul. The most important tasks, according to Kutsenko,

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involve the replacement of pipelines, thermal equipment, and fuel channels. The closure of Unit 3, however, undermines Ukraine's negotiating position with respect to postponing the closure of the entire Chernobyl facility if foreign aid for shutdown does not materialize.

—UNIAN, 21 July 1997, in "Ukraine: Sole Operational Chernobyl Reactor Shut Down for Overhaul," FBIS-SOV-97-202, 21 July 1997.; Sander Thoenes, "Last reactor shut for repair," *Financial Times*, 23 July 1997, p. 2.

20 June 1997

G-7 TO CONTRIBUTE \$300 MILLION TOWARDS CHORNOBYL SAFETY

In an economic statement drawn up at the Group of Seven Summit, which took place in Denver, Colorado, from 20-22 June 1997, leading industrial nations disclosed their intention to dedicate \$300 million towards enacting the Shelter Implementation Plan (SIP), which will repair the existing sarcophagus. Officials from Ukraine and a group of Western experts from the EU, EBRD, G-7, and the World Bank initially agreed on the project during a series of meetings on 23-24 April 1997. The SIP agreement finally put to rest the controversial proposal to construct a second cover over the sarcophagus. The agreement includes 22 integrated projects to reinforce the short term safety and stability of the existing sarcophagus structure. Looking further ahead, the Ukrainians hope the SIP will lead to the extrication of fuel-containing materials from within the ruins. Carol Kessler, head of the G-7 nuclear safety panel, expects the SIP, estimated to cost \$780 million and continue until at least 2005, to be a cost-effective approach to dealing with the presently hazardous situation at Chernobyl-4. Although the G-7 commitment falls short of the necessary \$780 million, a source from a G-7 country noted that over the next ten years, there will be time to raise the remaining necessary funds. At the summit, the G-7 leaders invited both private and public entities to take part in a "pledging conference" in the fall of 1997. Countries without nuclear programs have already expressed charitable interest, an unexpected development. Also, Ukraine is committed to contribute \$100 to \$150 million in materials and personnel towards the SIP. G-7 leaders requested that Boris Yeltsin also contribute, but his answer was not yet forthcoming. The statement also noted that these funds are not a part of the roughly \$1 billion previously committed under the December 1995 MoU, but failed to discuss the problems surrounding the release of \$800 million in EBRD loans Ukraine needs to complete replacement power reactors at Rivne-4 and Khmelnytsky-2.

—"Nations pledge \$300 million to Chernobyl safety project," *Nuclear News*, August 1997, p. 31.; "Chernobyl sarcophagus to be maintained," *Nuclear News*, June 1997, pp. 48-49.; Ann MacLachlan, "G-7 Funds Chernobyl Shelter Fix, Replacement Power Stays in Limbo," *Nucleonics Week*, 26 June 1997, pp. 12-13.

18 May 1997

UNIT 3 SHUT DOWN BY CHORNOBYL SAFETY SYSTEM

Chernobyl management is examining why the transformer powering Chernobyl-3 shut down on 18 May 1997. At 12:40 pm (0940 GMT), twenty seconds after employees finished repairs to rechannel electricity to the reactor, the transformer turned itself off. Immediately after the power to the turbogenerators ceased, an automatic safety system took the reactor off line and put it into cooling mode. Valery Idelson, Chernobyl's Kiev spokesman, pointed out that they do not always know why a mechanism may turn itself off. Idelson added that the performance of the safety system was flawless, "preventing any possible consequences." There were no injuries, and the radiation levels at Chernobyl did not increase. Operators expect Unit 3 to be back on line in three days.

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—"Ukraine Nuclear Reactors Shut Down," *Washington Post*, online edition, 19 May 1997.; AFP, 19 May 1997; in "AFP: Incidents at Chernobyl, Zaporozheh Nuclear Plants," FBIS-SOV-97-139.; Interfax, 19 May 1997; in "Chernobyl's Remaining Power Unit Closed Down," FBIS-SOV-97-139.

20 April 1997

WESTINGHOUSE SAFETY PROJECT BEGINS

The Westinghouse project management team began nuclear safety improvements at the Chornobyl NPP on 20 April 1997, in accordance with the January 1997 contract that Westinghouse and Chornobyl signed. The ECU 8.7 million (\$9.9 million) contract with Westinghouse and subcontractors Energoprojekt of Ukraine and NNC of Britain comes from a ECU 118 million (\$147 million) Chornobyl aid grant initially agreed upon by Ukraine and the EBRD in November 1996, and later ratified on 18 March 1997 by the Ukrainian parliament.[1] The grant, funded through the EBRD's Nuclear Safety Account (NSA), represents the first part of a greater \$350 million assistance package for the decommissioning of Chornobyl.[2] The funding will go towards obtaining bids for Unit 3 safety improvements and construction of nuclear waste storage and liquid nuclear waste processing facilities.

—Interfax, 21 April 1997; in "Ukraine: Chernobyl Safety Improvement Project Begins 20 April," FBIS-TEN-97-005.; "An Agreement Between the EBRD and Ukraine...," *Nuclear News*, December 1996, pp. 17-18.

8 April 1997

KOSTENKO WARNS OF DECLINING SAFETY AT CHORNOBYL

On 8 April 1997, Minister of Environment and Nuclear Safety Yuriy Kostenko warned the Ukrainian parliament about recent deteriorations in the safety of the sarcophagus as a result of moisture build-up, unstable structures, and inadequate monitoring and emergency plans. He also stated that Chornobyl could not operate without the installation of a "multifunctional safety system," enhancements in the reactor control and protection system, and guarantees of shutdowns in emergencies. Kostenko believes that safety at all Ukrainian power plants is insufficient, due to a lack of financing, and that urgent steps are needed to ensure future operation. According to Kostenko, the safe operation of Ukrainian nuclear power stations requires advanced nuclear legislation, a practical infrastructure for state regulation of the industry, and indigenous nuclear fuel production capabilities.

—Interfax, 4 April 1997.

28 January 1997

G-7 AGREES TO REMOVAL OF SPENT FUEL FROM CHORNOBYL-4 SARCOPHAGUS

Carol Kessler, head of the G-7 delegation for Chornobyl closure, met with Ukrainian Minister of Environmental Protection and Nuclear Safety Yuriy Kostenko and disclosed that G-7 countries are prepared to help Ukraine remove spent nuclear fuel from the damaged Chornobyl-4 sarcophagus. Kessler indicated that one option for removing the spent fuel could involve the use of US robot technology developed to help clean up the Three Mile Island nuclear power plant after the nuclear accident there in 1979.

—UNIAN, 1/28/97, in "Ukraine: Ministry Notes G-7 'Change Of Heart' At Chernobyl Talks," FBIS-SOV-97-019, 1/28/97.

30 November 1996

INTERNATIONAL CONFERENCE ON CHORNOBYL SAFETY ENDS IN SLAVUTYCH

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It was reported that an international conference on Chernobyl safety issues ended in Slavutych. The conference participants discussed the project to construct a second sarcophagus over the existing one. However, neither the draft plan of this project nor its timetable were approved at the conference. According to preliminary information, the plan called for constructing a suspension structure over the old sarcophagus which would provide reliable protection against radiation releases from the destroyed Unit 4. The plan also called for creating a tunnel through the walls of the sarcophagus through which approximately 200 tonnes of nuclear waste could be removed. According to deputy general director of the Chernobyl NPP Valentyn Kupnyy, the Ukrainian government has not made the decision to construct a second cover over the present sarcophagus due to the high cost of the project. —NTV, 11/30/96; in "Chernobyl Director Says Shutdown Decision May Not Be Final," FBIS-SOV-96-232, 11/30/96.

29 November 1996

DERZHKOMATOM OKAYS OPENING OF CHORNOBYL-2 IN 1997

The Ukrainian State Committee for the Use of Atomic Energy (Derzhkomatom) issued a regulation permitting the restart of Chernobyl-2 in late 1997. A plant spokesman gave these reasons for possibly restarting the unit: Ukraine's current energy crisis to be aggravated by the 11/30/96 closure of Chernobyl-1 and the opportunity to use the qualified which formerly worked at Unit 1. According to one proposal, unit-2 is to go on-line until 2000 once repairs and safety upgrades, estimated at \$280 million, are made. Though some repair work was done at the turbine hall shared by Units 1,2, hardly any safety improvements have been made at Unit 2, since a 1991 fire forced its closure. However, Deputy Chairman of Derzhkomatom V. Hryshchenko said that safety checks in 1996 reported the condition of Unit 2 fuel channels as "good." Work on unit-2 re-start is to be financed from the state budget.

—ITAR-TASS, 29 November 1996; in "Committee Sanctions Opening Of Second Chernobyl Reactor," FBIS-SOV-96-232, 29 November 1996.; Ann MacLachlan, "Chernobyl Managers Want To Reopen Unit 2 To Offset Unit 1 Shutdown," *Nucleonics Week*, 21 November 1996, p. 16.; "Plan Unveiled For Chernobyl-2 Restart," *NucNet*, 11/29/96, www.aey.ch.; "Restart Of Chernobyl Unit 2 Sought By Plant Authorities," *Post-Soviet Nuclear & Defense Monitor*, 11/25/96, p. 12

28 October 1996

UKRAINIAN FIRM PROPOSES WAY TO DEAL WITH DAMAGED UNIT 4

The Ukrainian firm Kolo, based in Kryvyy Rih, has proposed burying Chernobyl's damaged Unit 4 some 450-500 meters underground at a cost of \$600 million. The proposal was submitted to the Ukrainian Parliament's Commission on Nuclear Policy and Safety and is claimed to be a cheaper and more effective solution than a plan submitted by the international consortium Alliance, which has offered to construct a new cover over the original sarcophagus at a cost of between \$1.3 and \$1.6 billion. It is expected that the existing sarcophagus over Unit 4 will not last longer than 10-15 years, which is only half of its projected service life.

—"Ukrainian Firm Proposes to Bury Damaged Chernobyl Reactor," *Post-Soviet Nuclear & Defense Monitor*, 10/28/96, p. 9.

21 October 1996

UKRAINIAN AND GERMAN NUCLEAR EXPERTS DRAFT NUCLEAR SAFETY PROGRAM

Nuclear experts from the Ukrainian Ministry of Environmental Protection and Nuclear Safety and the German

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Nuclear Safety Society have drafted a program for nuclear safety cooperation. According to First Deputy Minister of Environmental Protection and Nuclear Safety Oleksandr Smyshlyayev, the program includes two major projects—the nuclear safety training of Ukrainian specialists and increasing cooperation in completing research on the condition of the sarcophagus at Chernobyl. Under the agreement, German experts will participate in a study of the safety of the sarcophagus under the auspices of the Ukrainian National Research and Technological Center for Nuclear Safety at Chernobyl. According to UNIAN, German participation will increase the authority of the Chernobyl Nuclear Safety Center, which is expected to become an international center for nuclear safety. It is expected that the German-Ukrainian nuclear safety program will be signed by high officials from the Ukrainian Ministry of Environmental Protection and Nuclear Safety and by their German counterparts in the middle of 11/96. —UNIAN, 10/21/96, in "Ukrainian, German Experts Draft Nuclear Safety Program," FBIS-SOV-96-205, 10/21/96.

3 October 1996

RAIN WATER BELIEVED TO BE THE CAUSE OF INCREASED NEUTRON FLUX READINGS IN THE SARCOPHAGUS

According to head of the Chernobyl NPP information center Valeriy Edelson, an expert commission studying the causes of a neutron flux increase registered by instruments inside the sarcophagus came to the conclusion that the most probable cause for the elevated reading was rain water leaking inside the sarcophagus and affecting the monitoring equipment. Rain water may also be affecting the nuclear fuel remaining under the sarcophagus, which might have led to increased neutron flux. According to a 9/20/96 report by the Commission, the increased neutron flux readings in the sarcophagus may indicate the emergence of a chain reaction in the remaining nuclear fuel. However, the Commission found that no changes occurred in the background radiation inside or outside of the sarcophagus since the beginning of 9/96. Although the Commission admitted that the monitoring system and the sarcophagus need improvements, Edelson denied media reports alleging that new equipment had been installed at the sarcophagus. According to Edelson, it is impossible to purchase and install the equipment in such a short time. —Mikhail Melnik, ITAR-TASS, 10/3/96, in "Increasing Chernobyl Neutron Flow 'Caused by Rain Water'," FBIS-SOV-96-194, 10/3/96.; UNIAN (Kiev), 9/20/96, in "Chernobyl Commission Says Incidents May Never Be Explained," FBIS-SOV-96-185, 9/20/96.; Interfax, 9/26/96, in "Atomic Energy Spokesman Denies Chernobyl Accident Threat," FBIS-SOV-96-188, 9/26/96.; "Chernobyl Reactor to be Shut Down," UPI, 10/28/96.

25 September 1996

KOSTENKO'S STATEMENT ON CHORNOBYL INCIDENTS CRITICIZED

On 9/24/96, Ukrainian Minister of Environmental Protection and Nuclear Safety Yuriy Kostenko made an open statement warning of a possible explosion in the sarcophagus over Chernobyl's Unit 4. According to Kostenko, the three recent increases in neutron flux and gamma radiation registered on 9/12/96, 9/16/96, and 9/19/96 signaled a possible nuclear chain reaction that could produce an explosion in Unit 4. Ukrainian authorities, including Ukrainian President Leonid Kuchma, have openly criticized Kostenko's statement. Ukrainian National Security Council Secretary Volodymyr Horbulin doubted Kostenko's assessment that neutron flux increasing inside the sarcophagus signaled a potential chain reaction. According to Chernobyl plant director Serhiy Parashin, there has been no increase in background radiation inside or outside the sarcophagus. Parashin said torrential rains had seeped under Unit 4 causing a malfunction in the instruments, which registered high increases in neutron flux inside the damaged reactor. The Ukrainian government commission, which was set up to conduct an investigation

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on these incidents, produced a preliminary report on 9/26/96, stating that the three recorded increases in neutron emissions in Unit 4 were not accompanied by increases in background radiation levels. Commission Chairman Viktor Chebrov, who is also Chairman of the State Committee for the Use of Atomic Energy (Derzhkomatom), said that the incidents do not pose a significant nuclear threat nor a threat to the sarcophagus. Nevertheless, neither Chebrov nor Horbulin completely ruled out the potential danger of these incidents to the sarcophagus. In general, the Ukrainian officials doubted that the sarcophagus over Unit 4 could possibly collapse due to these particular neutron emissions. According to Ukrainian and Western news agencies, Ukrainian President Leonid Kuchma pointed out that due to the uncertainty over the condition of the sarcophagus, the neutron emission incidents will prompt him to press the G-7 at a 10/11/96 meeting between the G-7 and Ukraine to speed the program of funding the construction of a new shelter for Unit 4.

Russian nuclear experts and government officials generally consider Kostenko's statement ungrounded and political rather than strictly professional. Many Russian nuclear specialists believe that the elevated readings appeared due to faulty instruments made worse by rain water running through holes in the sarcophagus. According to Georgiy Kaurov, Head of the Public Relations Department of the Russian Ministry of Atomic Energy (Minatom), the service lives of all gamma-radiation, neutron-flux, temperature, and humidity instruments inside the sarcophagus have expired and cannot be trusted. Kaurov said that there is no danger of a chain reaction or nuclear explosion in Unit 4, and added that the sarcophagus will survive for additional 10 years. Russian nuclear experts and officials suspect that by exaggerating the nuclear incident inside the Unit 4 sarcophagus, Kostenko and other Ukrainian officials are attempting to repeatedly highlight the problem of Chernobyl in order to speed up the disbursement of \$3 billion in financial aid from the G-7. According to Russian officials and experts, the Ukrainian overreaction on the neutron flux accident is no coincidence in view of the coming 10/11/96 working meeting between the G-7 and Ukraine. Reportedly, Western experts think that another explosion at Unit 4 is unlikely, although a full explanation for these radiation increases may never be found.

—UNIAN , 9/24/96, in "Minister: Chain Reaction Could be Taking Place in Chernobyl," FBIS-SOV-96-187, 9/24/96.; Chrystyna Lapychak, "Reaction to Warning of Possible Explosion at Chernobyl," OMRI Daily Digest, 9/26/96.; Chrystyna Lapychak, "Update on Chernobyl Neutron Leaks," OMRI System Search, <http://solar.rtd.utk.edu>, 9/27/96.; "A Rise in Radiation Readings Reported at Chernobyl Plant," *Ukrainian Weekly*, 9/22/96, p. 2.; Interfax , 9/26/96, in "Chernobyl Diagnostic Systems No Longer Work," FBIS-SOV-96-188, 9/26/96.; Zakhar Butyrskiy, "Ukrainskiye ofitsialnyye litsa vnov zagovorili o vozmozhnosti vzryva na Chernobylskoy AES," *Segodnya*, 9/26/96, p. 1.

19 September 1996

THREE INCREASES IN NEUTRON FLUX REGISTERED INSIDE THE SARCOPHAGUS

According to information provided by the Information Center of the Nuclear Regulation Administration at the Ukrainian Ministry of Environmental Protection and Nuclear Safety, on 9/12/96, two of the 10 instruments situated in one of the chambers of the sarcophagus registered increased neutron flux levels. Similar increases were registered by three of the 10 instruments inside the sarcophagus on 9/16/96 and 9/19/96. The instruments showed neutron readings five to 110 times as high as normal, which could indicate the emergence of a nuclear chain reaction from the remains of the nuclear fuel. In all three cases, the readings returned to normal after a

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while. In the first two cases, personnel were evacuated from the area around the damaged reactor, although no increase in radiation level outside the sarcophagus was detected. An expert commission was formed on 9/17/96 to look into the causes of the incidents.

—UNIAN , 9/17/96, in "Incident at Chernobyl Sparks Fear of Nuclear Chain Reaction," FBIS-SOV-96-182, 9/17/96.;
 ITAR-TASS, 9/19/96, in "Scientists Baffled by Increased Neutron Flow at Chernobyl," FBIS-SOV-96-184, 9/19/96.;
 UNIAN, 9/24/96, in "Minister: Chain Reaction Could be Taking Place in Chornobyl," FBIS-SOV-96-187, 9/24/96.;
 "Chernobyl Reactor to be Shut Down," UPI, 10/28/96.

1 September 1996

SAFETY EXERCISE HELD IN 30-KM CHORNOBYL ZONE

The Ukrainian State Center for Emergencies and Technical Support conducted a planned exercise in the 30-km Chernobyl exclusion zone to practice the implementation of urgent safety measures to effectively deal with any emergency situations that might occur during the transportation of nuclear fuel across Ukrainian territory.

—Radio Ukraine, 9/1/96, in "Accident Exercises Held in Chornobyl Exclusion Zone," FBIS-SOV-96-171, 9/1/96.

27 August 1996

CHORNOBYL URANIUM THIEVES SENTENCED

Three Chernobyl NPP workers, Igor Kabachenko, Viktor Tsvetkov, and Mikhail Bobyrev, along with the director of the local trade firm Asket, Nikolay Kolesnikov, were found guilty by the Kiev Regional Court on charges of polluting the environment and engaging in illegal foreign exchange transactions. Kabachenko, Tsvetkov, Bobyrev, and another man, Shumakov, on the run as of 8/17/96, stole approximately 5.3 kg of fresh LEU nuclear fuel from inside the sarcophagus encasing the destroyed Unit 4, and sold it for \$2,100 to Kolesnikov, who had offered \$6,000 for 10 kg of uranium. Kolesnikov had arranged, through several middlemen, to sell the uranium to Konstantin Nikolayevich Gladkov, who claimed to represent an unspecified Arab firm interested in buying 10 to 100 kg of uranium. While *Izvestiya* reported that Gladkov apparently worked for the Ukrainian authorities, Kiev Regional Court Judge Valentina Kuzmenko later stated that these reports were unsubstantiated. The Ukrainian Security Service raided the exchange and arrested all parties but Gladkov, who disappeared. The middlemen, Valeriy Kurochkin of Avialinii Ukrainy, Major Potylchak of the Kiev Infantry Institute, and Viktor Korchevnyy of the Popelnyanskaya military unit, served as trial witnesses but have not been charged. For more information on smuggling and illicit transactions, see the NIS Illicit Nuclear Trafficking Database.

—Zakhar Butyrskiy, "Pokhitytelyam urana s ChAES vneseny prigovory," *Segodnya*, 8/31/96, p. 5.; Yanina Sokolovskaya, "Samoubiytsy: Chto zastavilo rabotnikov Chernobyl'skoy AES dobyvat' uran iz razrushennogo reaktora," *Izvestiya*, 8/17/96, p. 6.; NTV "Segodnya" newscast, 10/26/96, in "Chernobyl Workers Arrested Trying To Sell 5.5 kg of Uranium," FBIS-SOV-96-209.

29 July 1996

BOUTROS-GHALI URGES ASSISTANCE TO UKRAINE, OTHERS

U.N. Secretary-General Boutros Boutros-Ghali signed an "Appeal to States Members of the United Nations on the tenth anniversary of the accident at the Chornobyl nuclear power plant." Boutros-Ghali appealed to U.N. member states to intensify their assistance to Belarus, the Russian Federation and Ukraine to help them deal with the consequences of the Chornobyl accident.

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—"Appeal to States Members of the United Nations on the tenth anniversary of the accident at the Chernobyl nuclear power plant," in INFCIRC/519, "Communication of 18 June 1996 Received From The Permanent Mission of Belarus To The International Atomic Energy Agency" 7/29/96.

4 July 1996

INCIDENT OCCURRED DURING SCHEDULED REPAIRS

According to the Chernobyl nuclear plant's public relations spokesman Mykhailo Bohdanov, the 6/28/96 radiation leak occurred during scheduled repairs at Unit 1 which required examination of internal parts of the reactor. An increased radiation level was detected in the main hall which required suspension of the repairs and immediate decontamination of internal areas. There were no violations of operational procedure discovered. Reportedly, no personnel were affected by radiation and no damage to the environment was caused. The radiation level in the unit's halls did not exceed the norms stipulated for such accidents. After the decontamination of the area in question was completed, scheduled repairs were resumed, said Bohdanov.

—M. Bohdanov, *Uryadovyy kuryer*, 7/4/96, p. 1; in "Chornobyl Officials Explains 28 June Incident," FBIS-SOV-96-131, 7/4/96.

28 June 1996

RADIATION LEAK AT CHORNOBYL'S UNIT 1: INES—0

There was a small radiation leak in a corridor of the main room of the Chernobyl's Unit 1. According to the station's nuclear engineer Halina Nosach, the incident occurred when the station's staff were monitoring the interior of the reactor using TV cameras. The incident was rated zero on the INES international scale of nuclear accidents. As a result of the leak, the radiation level in the main room's corridor became at levels five times higher than normal. This leak was the second one in two weeks at the Chernobyl station. There was also a small fire accident at Unit 3 two weeks beforehand.

—"Minimal Radiation Leak at Chornobyl," Reuters News Media, 7/1/96, p. 1.

7 June 1996

CHINA HELPS LIQUIDATE CONSEQUENCES OF CHORNOBYL ACCIDENT

China and Ukraine signed a document on China's provision of over \$120,000 to help cope with the consequences of the Chernobyl accident.

—Xinhua, 6/7/96, in "PRC: Beijing Signs Aid Agreement With Ukraine For Chornobyl," FBIS-CHI-96-112, 6/8/96.

27 April 1996

CHORNOBYL DAMAGE TO EUROPEAN COUNTRIES IS \$20 BILLION

According to Professor Aleksey Yablokov, Russian ecologist and chairman of the Russian Center for Ecological Policy, damage to European countries caused by the Chernobyl accident amounts to approximately \$20 billion.

—Aleksandr Annin, "Aleksey Yablokov: 'Chornobyl Is Forever'," *Kuranty*, 4/27/96, p. 5; in "Russia: Yablokov Faults Nuclear Summit," FBIS-SOV-96-133-S, 4/27/96.

26 April 1996

CHORNOBYL CENTER FOR NUCLEAR SAFETY ESTABLISHED

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Ukrainian President Leonid Kuchma issued a decree establishing the Chornobyl center for nuclear safety, radioactive waste, and radio-ecology and appointing Valeriy Glygalo as the center's director. (See ++Ukraine: Administrative Bodies+ for more information.) The center will be involved in all activities related to the development of international scientific research aimed at eliminating the aftermath of nuclear accidents, closure and decommissioning of nuclear facilities, facilitating environmental protection and rehabilitation from radioactive fallout and leaks. The Ukrainian Cabinet was advised to assume responsibility over issues involving the establishment and financing of the center. The operation of the center will also involve the participation of the Ministry for Protection Against the Aftermath of the Chornobyl Nuclear Disaster, the Ministry for Environmental Protection and Nuclear Safety, the Ukrainian State Committee for Nuclear Energy Utilization, the State Committee for Scientific, Technological, and Industrial Policies, the Ukrainian Academy of Sciences, and other institutions and bodies. President Kuchma requested that Foreign Minister Hennadiy Udovenko urge foreign governments and international organizations to participate in the center's activities and support them financially.

—UKRINFORM, 5/6/96, in "Ukraine: Kuchma Creates Chornobyl Center for Nuclear Security, FBIS-TEN-96-006, 5/6/96.; *Holos Ukrainy*, 4/26/96, p. 3.

24 April 1996

RADIATION LEAK AT CHORNOBYL NPP: INES—1

There was a small radiation leak at the Chornobyl NPP when air filters from a pump in the sarcophagus were changed. The old filters were left in a room by Unit 3 and as a result background radiation levels rose seven times above regulatory limits in four rooms. The incident rated a 1 on the INES.

—"Small Radiation Release At Chornobyl," Reuters, 4/25/96.

19 April 1996

OFFICIAL ADMITS CHORNOBYL REACTORS FLAWED

For the first time a top-ranking Ukrainian official, President Leonid Kuchma, has admitted that the Chornobyl reactors are flawed in terms of their construction.

—Ron Popeski, "Ukraine's Kuchma Admits Chornobyl Reactor Flaws," Reuters, 4/19/96.

10 April 1996

CHORNOBYL REACTORS' WATER-COOLING SYSTEMS ARE DANGEROUS

Reportedly, a secret US Department of Energy study concluded that the Chornobyl reactors are dangerous because of defects in the design of their emergency water-cooling systems. It also said that the state of the site is now worse than it was prior to the 4/26/96 accident.

—"Moscow Rejects Nuclear Safety Charges," *The Monitor*, 4/10/96.; Adrian Bridge, "Agency Urges Closure Of Risky Reactors," *The Independent*, 4/11/96.

7 April 1996

DELEGATES OF OREL SEMINAR DECIDE NOT TO CLOSE CHORNOBYL POWER STATION

A delegation from the Ukrainian parliament participated in the CIS-sponsored seminar "Radioactive Safety Problems in CIS countries" held in Orel (Russia). Parliamentary representatives of the CIS countries, who met at the seminar within the framework of the CIS Interparliamentary Assembly, called on their national governments and

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parliaments to develop a specific CIS legislation dealing with economic and social problems created in CIS countries by the Chernobyl disaster. In a joint statement, the representatives of CIS parliaments emphasized that the Chernobyl power station should not be closed until all potential social, economic and environmental problems, that could result from the shutdown are resolved.

—Volodymyr Koroliuk, "Aby Ne Povtorylasya Chornobylska Bida," *Holos Ukrainy*, 4/9/96, pp. 1, 3.; "Parlamenti Ukrainy, RF, Belorussii Prizvali Mirovoye Soobschestvo Kompleksno Reshyt' Problemu Chornobylia," 4/17/96.

4 April 1996

SERVICE LIFE OF THE SARCOPHAGUS WILL NOT EXCEED 15 YEARS

At a news conference, Minister of Environmental Protection and Nuclear Safety Yuriy Kostenko reported that the service life of the sarcophagus would not exceed 15 years and that in 5 years Unit 4 "will look like an active volcano."

—ITAR-TASS, 4/4/96, in "Ukraine: Ukrainian Officials Warn Of Chernobyl Dangers, Urge West To Help," BBC Monitoring Service, 4/12/96.

22 March 1996

RISK OF ACCIDENTS REMAINS HIGH

The French and German institutes for nuclear safety and protection said in a joint statement that the risk of grave incidents and accidents at RBMK reactors remains high in Ukraine and other FSU states.

—"Chernobyl Still A Risk, European Reports Say," *International Herald Tribune*, 3/22/96.

20 March 1996

ANOTHER NUCLEAR CATASTROPHE POSSIBLE AT UNIT 4

Yuriy Kostenko, Minister of Environmental Protection and Nuclear Safety, reported that the condition of the sarcophagus around Unit 4 could lead to another nuclear catastrophe. He added that the sarcophagus was successful as a temporary measure, but in no way can be considered a permanent structure. Western experts at a meeting in Vienna warned that a collapse could release radioactive dust which would be concentrated in the 30-km restricted zone.

—Stanislav Prokopchuk, "Sarkofag Mozhet Vzorzvatsya," *TRUD*, 3/20/96, p. 1.; "Work Needed At Chernobyl To Avert Leaks," Reuters, 4/3/96.

12 March 1996

CRACKS IN SARCOPHAGUS AROUND UNIT 4

A scientist from Kiev State University, Heorhiy Belyavskiy, warned that there are cracks in the sarcophagus around Unit 4 which are allowing radioactive gas, water, and dust to escape.

—"Drevniye sarkofagi ponadezhnee byli," *Rossiyskaya gazeta*, 3/12/96, p. 1.

28 March 1996

CONTAMINATION CONTROL ALMOST NONEXISTENT AT CHORNOBYL

According to a western expert who has visited the Chernobyl NPP, contamination control is virtually non-existent. According to the expert, there is only a wet towel for people to wipe their feet as they go from the reactor hall to

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the "tea-room." There are no personal radiation monitors in the reactor hall.

—"Cover-up At Chernobyl," *Foreign Report*, 3/28/96.

March 1996

\$2.75 MILLION FOR INDIVIDUALS AFFECTED BY CHORNOBYL DISASTER

The European Commission designated \$2.75 million for individuals affected by the Chernobyl disaster. The money will go to residents of Ukraine, Belarus, and Russia.

—"Informatsiya," *Yadernyy kontrol*, 3/96, p. 8.

22 February 1996

50 KG OF FUEL MAY BE RELEASED INTO THE ATMOSPHERE

The sarcophagus around Unit 4 is in precarious shape and urgent action is needed to stabilize it, according to Aleksandr Borovoy of Russia's Kurchatov Institute in a report to the IAEA. The main defects include questionable stability of the supports of the upper beams and over 1000 square meters of holes in the sarcophagus' roof and walls. He warned of a worst-case collapse in which five tons of dust with approximately 50 kg of fuel could be released into the atmosphere in a large cloud.

—Gamini Senevirante, "Russian Expert Warns Of Danger Chernobyl Coffin Could Collapse," *Nucleonics Week*, 2/22/96, pp. 15-16.

19 February 1996

REBUILDING SARCOPHAGUS WILL COST \$1 BILLION

Yuriy Kostenko reported that a feasibility study estimated the cost of rebuilding the sarcophagus around Unit 4 at approximately \$1 billion. According to Kostenko, the current sarcophagus will last only another 10-15 years. There are 200 tons of fuel and 3000 tons of water located at Unit 4.

—UNIAN, 2/20/96.; Chrystyna Lapychak, "Ukrainian Official Gives Chernobyl Sarcophagus 10-15 Years," *OMRI Daily Digest*, 2/18/96.

13 February 1996

CENTER FOR NUCLEAR AND RADIATION SAFETY PLANNED

According to a UNIAN report, Germany intends to allocate DM 4 million for the formation of an international research and development center for nuclear and radiation safety. THE WEEK IN GERMANY reported that Germany will provide DM 3 million a year for his project. German Federal Minister of the Environment Angela Merkel stated that the project is expected to run for three years and will involve 100 scientists from affected countries. The United States intends to allocate \$3 million, and Italy, France, and Japan have all expressed interest in this center.

—UNIAN, 2/13/96.; "Merkel Announces New Aid Projects For Chernobyl," *The Week in Germany*, 3/1/96, p. 5.; "V techenie dvukh blyzhayshikh," *Zelenyy mir*, No. 5, 1996, p. 3.

18 January 1996

GERMANY TO PROVIDE SAFETY, TECHNICAL IMPROVEMENTS

According to Adolf Birkhofer, the director of the German consultancy Gesellschaft fuer Anlagen und Reaktorsicherheit mbh(GRS), Germany should assist Ukraine with short-term (4-5 years) safety and technical

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improvements and backfits to Chernobyl's operational units. Birkhofer singled out improvements in fire protection, clarifying operating guidelines, and installing locking mechanisms on core channels as issues deserving immediate attention. GRS is currently working on a program to improve the sarcophagus.

—Mark Hibbs, "Make Short Term Safety Fixes At Chernobyl, Germans Now Say," *Nucleonics Week*, 1/18/96, pp. 9-10.

1995

ONE OF TWO ACCIDENTS OCCURRED AT CHORNOBYL

Chernobyl was reported to have the best safety record of Ukraine's 5 NPPs in 1996. The Ministry of Environmental Protection and Nuclear Safety reported that there were only 4 malfunctions in 1995, compared to 15 in 1994. However, one of two accidents in Ukraine which resulted in radiation leakage occurred at Chernobyl.

—Chrystyna Lapychak, "Chernobyl Has Best Safety Record For Second Consecutive Year," OMRI Daily Digest, 1/12/96.

1995

ONLY 4-5% OF STATE BUDGET DEVOTED TO CHORNOBYL

According to a Parliamentary Committee probing the accident, in 1995 only 4-5% of the state budget was devoted to Chernobyl problems, as compared to 16% in 1992. The Ministry of Statistics reported that in 1995, 5.8% of the state budget was spent on dealing with the consequences of the Chernobyl accident.

—"Ukraine Calls For World Help In Chernobyl Recovery Actions," *Nucleonics Week*, 1/4/96, pp. 12-13.; UNIAN, 4/10/96, in "Ukraine: Ukraine Spends 5.8% Of State Budget On Chernobyl," BBC Monitoring Service, 4/19/96.

28 November 1995

CHORNOBYL PLANT IS RESPONSIBLE FOR WORK AT SARCOPHAGUS

The Chernobyl plant now has responsibility for work relating to the sarcophagus. Future restoration or reconstruction work will thus be ordered by the plant itself rather than by the Ministry of Chernobyl.

—*NucNet News*, 11/27/95.; "Chernobyl Takes Responsibility For Sarcophagus," *Nuclear Engineering International*, 2/96, p. 2.

18 November 1995

CAPACITY UTILIZATION OF UKRAINIAN PLANTS

Reportedly, Chernobyl's capacity utilization is the highest in Ukraine at 69.9% and Zaporizhzhya NPP is the lowest at 56.3%. An INTELNEWS report in 8/95 suggested that Unit 2 at Rivne had the highest capacity utilization, 90.1%, and the all Ukraine average was 69.3%.

—Yevhen Perehuda, "Chernobyl," *Uryadovyy kuryer*, 11/18/95, p. 5.

17 November 1995

INCIDENT OCCURRED AT UNIT 1: INES-1

An incident occurred at Unit 1 which originally rated a level 1 on the INES scale, but was upgraded to level 3 when further details of the accident were released in 3/96. The event was reportedly due to a defect in the fuel. Pieces of a fuel element leaked into the cooling water in the loading machine. Contamination reached 200 rad per hour

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and contamination spots continued to show up through 12/20/95. One worker exceeded his statutory limit of 50 millisievert per year after the event. It is speculated that the cover up to hide the seriousness of the event occurred at high levels within Derzhkomatom and not at the level of plant management. This incident occurred in the midst of negotiations over G-7 assistance to Chernobyl See 11/24/95 entry above.

—"Cover-Up Charged In Worker Contamination At Chernobyl-1," *Nucleonics Week*, 3/14/96, pp. 2-3.

27 October 1995

DEFECT IN WORK OF RELOADING EQUIPMENT AT UNIT 1

During a planned reloading of Unit 1, plant personnel noted a defect in the work of the reloading equipment. To ascertain the cause of this deviation, the reactor was stopped. There was no change in background radiation. Unit 1 was scheduled to restart on 10/31/95.

—"Ukraine," *Yadernyy kontrol*, 11/95, p. 9.; ITAR-TASS, "Chernobyl Shut Down; Radiation Background Unchanged," in FBIS-SOV-95-209, 10/27/95.; ENS NucNet, 10/30/95

17-26 October 1995

IAEA INSPECTORS VISIT UKRAINE

IAEA inspectors visited Ukraine to check the implementation of the nuclear safety program and to develop IAEA safeguards. These safeguards reportedly would pave the way for donor countries—such as the United States, Japan, Sweden and Finland—to grant aid to develop the Ukrainian nuclear safety program.

—"Inspectors Check Safety Program At Chernobyl," UNIAN, 10/18/95; in "Ukraine," FBIS-SOV-95-202, 10/18/95.

24 October 1995

UKRAINE TO BUILD STORAGE SITES FOR NUCLEAR WASTE

Mykhailo Umanets, Chairman of Derzhkomatom, announced that Ukraine will build storage sites for nuclear waste on the grounds of the incomplete fifth and sixth units at Chernobyl. Umanets said that 90-95% of Ukraine's nuclear waste is stored at Chernobyl and will continue to be stored there.

—Chrystyna Lapychak, "Ukraine To Continue To Store Nuclear Waste At Chernobyl," OMRI Daily Digest, 10/25/95, Part II.

5 October 1995

CHORNOBYL NPP COOPERATES WITH IAEA

A three-day on-site seminar on Chernobyl NPP's cooperation with the IAEA ended. Lectures covered safety culture.

—"Chernobyl Strengthens IAEA Links," NucNet News, 10/4/95.

3 October 1995

RESEARCH AND TECHNOLOGY CENTER IN SLAVUTYCH

Ukraine appealed to the governments of NATO member states for scientific, technical, and financial support to establish and run the proposed international research and technology center in Slavutych, outside of Chernobyl. The government appeal was passed to NATO's assistant secretary general for scientific and environmental affairs, Jean-Marie Cadiou.

—"Ukraine Appeals To NATO For Help In Dealing With Nuclear Accidents," BBC Monitoring Service, 10/3/95.

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28 September 1995

FIRE AT COMPRESSOR STATION

A fire was caused by a short circuit at a compressor station near Chornobyl's cooling pond. The fire was quickly extinguished and posed no threat to the environment. It did not rate as an incident on the International Nuclear Events Scale (INES).

—"Ukraine: Fire Extinguished At Chornobyl Plant," Reuters, 9/29/95.

1 September 1995

COMPLIANCE BEST AT CHORNOBYL

According to a Derzhkatom spokesman, Chornobyl has the best record among Ukrainian NPPs for complying with operational and safety regulations. Unit 3 reached 98.9 percent power output, while the average maximum output in the nuclear industry is 84.7 percent. Unit 1 worked without failures during the first half of 1995.

—"More Doubts over Chornobyl Shutdown," *Post-Soviet Nuclear & Defense Monitor*, 9/1/95, p. 13.; Serhiy Sokolovskiy, "Nuclear Chief on Chornobyl Reactors," Intelnews, 8/13/95.

September 1995

UKRAINE NEEDS FINANCIAL AID FOR SLAVUTYCH CENTER

The Ukrainian government in late 9/95 addressed the international community with a request for technical and financial help to build a nuclear research center in Slavutych near Chornobyl (see 8/18/95 below). The Center would be paid for by fees, revenue from scientific and technical production, and special grants.

—"Ukraine Calls For Help In Creating research Center In Chornobyl Zone," *Nucleonics Week*, 10/26/95, p. 13.; "Ukrainian Appeal," *Jane's Defence Weekly*, 10/14/95, p. 11.

30 August 1995

UKRAINE INTENDS TO MODERNIZE UNIT 2

Serhiy Parashin reportedly said that Ukraine intends to modernize and restart Unit 2 in 1997. Unit 2 was shut down after a fire in 1991.

—"Ukraine to Repair, Restart Damaged Chornobyl Block," Reuters, 8/30/95.

18 August 1995

NUCLEAR SAFETY CENTER TO BE ESTABLISHED IN SLAVUTYCH

Director of the DOE Nuclear Energy Office Terry Lash stated that talks with Ukrainian government officials indicated that they are prepared to establish a Nuclear Safety Center in Slavutych. Ukraine's motivations for the center are nuclear safety, jobs and self-reliance on nuclear issues. US Pacific Northwest Laboratories has been assisting Ukraine in the creation of a charter for the Center. The Center is currently looking at four projects: an evaluation of the safety threat to Unit 3 from the sarcophagus, a spent fuel management plan, a Nuclear Data Center, and a decommissioning plan for the plant. Japan, Italy, Great Britain, and Germany have all shown interest in becoming involved with the Center. In addition, it was reported that Derzhkatom has been very supportive of the center. There are reportedly concrete proposals for the Center's financing through 2005. It was reported that the United States intends to set aside \$3 million for the creation of the Center. The US aid includes tele-video communication lines with American labs, a strategic plan to deal with spent nuclear fuel, and the creation of a

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data-bank on the safety of nuclear materials.

—Grigoriy Nesmyanovich, "'Avariya' pod Kievom," *Krasnaya zvezda*, 9/8/95, p. 3.; Radio Ukraine, 9/22/95; in FBIS-SOV-95-185, 9/22/95.; Anatoliy Panov, "Enerhetika Ukrainy, pozitsii i propozitsii," *Zeleny svit*, 6/95, p. 1.; "Amerika predlagaet pomoshch' v likvidatsii posledstviy Chernobylskoy katastrofy," *Izvestiya*, p.1(Financial News).; "On Nuclear Safety, Power Initiatives in Russia, Ukraine...DOE's Dr. Terry Lash," *Post-Soviet Nuclear & Defense Monitor*, 8/18/95, pp. 4-8.

8 August 1995

GOVERNMENT ADVISED TO DEVELOP RECONSTRUCTION PLAN FOR CHORNOBYL

The Presidential Commission on Nuclear Policy and Ecological Safety reportedly recommended that the government work out a reconstruction plan for the Chornobyl NPP.

—"Chornobyl Closure Still Uncertain," *Nuclear Engineering International*, 10/95, p. 12.

6 August 1995

ACCIDENT RATE AT CHORNOBYL NPP IS 0.5 PER REACTOR

Unit 3 was brought back on-line three days ahead of schedule. The accident rate at the plant is 0.5 per reactor through August, while the average rate in other Ukrainian reactors is 3.3 to date. So far in 1995, Chornobyl NPP has produced over 6 billion kilo-watt-hours of electricity. Yuriy Kostenko, Minister for Environmental Protection and Nuclear Safety, said that the government may be forced to modernize the plant and extend the operation for 10 years, as opposed to shutting it down completely, if financial assistance is not forthcoming for the Chornobyl closure plan.

—"Chornobyl Plant Working At Full Capacity," *Ukrainian Weekly*, 8/13/95, pp. 2, 4.; "Alternative 10-Year Plan Proposed For Chornobyl," *Nuclear News*, 9/95, pp. 40-41.; "Ukrainian Atomic Energy Committee Says Chornobyl Is Safest Plant," OMRI Daily Digest, No. 141, 7/21/95.

23 July 1995

UNITS 1 AND 3 ARE THE MOST DANGEROUS SOVIET REACTORS

The US EPA classified Chornobyl Units 1 and 3 as the most dangerous of all Soviet-built reactors. According to the EPA report on the 10 most dangerous reactors, "the conditions at the Chornobyl Nuclear Power Plant are in many ways worse than they were prior to the 1986 catastrophe." However, Dr. Terry Lash from the US DOE says that the report was "only completely accurate on the date it was produced." It was released on 6/25/95 but information on Chornobyl dates back to 2/94. Lash underlined that "improvements were made (in the last year) and it's on the upswing." Units 1 and 3 were cited as having design flaws, a lack of resources, increased energy demands, difficulty in collecting outstanding payments, and low worker morale. In addition, it was noted that Ukrainian regulatory bodies lacked legal authority. It was reported that the units could be completely destroyed if just a few of the nearly 1700 fuel channels ruptured. The authors of the report also said a "five-year accident cycle" led them to believe that 1996 would be a very telling year.

—Vladimir Kozlovskiy, "Desyatka samykh opasnykh energoblokov," *Segodnya*, 7/27/95.; "Nuclear Reactors likely to fail," *Washington Times*, 7/29/95, p. A7.; "Reports Of Soviet Reactor Dangers Not Accurate Say DOE Officials," *Post-Soviet Nuclear & Defense Monitor*, 8/7/95, pp. 4-5.

Related content is available on the website for the Nuclear Threat Initiative, www.nti.org.



11-12 July 1995

OPTIONS TO COVER UNIT 4 SARCOPHAGUS

The Alliance Consortium announced the results of its 10 month study on the "sarcophagus" to cover Unit 4. Two options were offered: first, a new shelter to cover Units 3 and 4, "Ukritiye-2", was recommended to allow dismantling of the damaged reactor and removal and conditioning of waste. This would mean that Unit 3 could not be kept operational, as some Ukrainian officials currently wish. The alternative solution is a structure to cover only Unit 4. The current structure is not designed to withstand seismic shocks and is not a lasting secure containment. The new structure would be a pre-stressed concrete arch that could be built in sections with a waterproof covering and stainless steel lining. Chernobyl is reportedly likely to experience an earthquake rating 5 on the Richter scale once every 27 years. The Consortium is led by the French civil engineering firm Campenon Bernard and includes Bouygues and SGN of France, AEA Technology and Taywood Engineering of Britain, Walter Bau of Germany, and Russian and Ukrainian partners. Currently, more than 400 kg. of plutonium, 100-plus tons of nuclear fuel, and tens of thousands of cubic meters of waste are under the sarcophagus. The project is estimated to cost \$1.072-1.147 billion for the "basic solution," would begin 4/26/96, and would require approximately ten years for safe containment. The actual construction of the new shelter would begin in 2001 or 2002. Alliance has proposed a two stage funding system: stage 1 would call for the creation of an International Fund for Chernobyl and stage 2 would generate longer-term investments (spread out over 30-35 years) from unrelated activities. Ukrainian officials disagreed with Alliance's conclusions, saying Ukritiye-2 is unnecessary. They also were unhappy that the proposal does not use all Ukrainian materials. Alliance's project is currently funded through TACIS.

—Nikolai Pugovitsa, "Around the Sarcophagus: Chernobyl's Echo," *Selskaya zhizn*, 4/25/95.; *NucNet News*, no. 312, 7/13/95.; "Alliance Consortium Submits Report on Chernobyl NPP," Reuters, 7/15/95.; "Ukrainians, Alliance Dispute Chernobyl-4 Stabilization Approach," *Nucleonics Week*, 7/27/95, pp. 14-15.; "Western Consortium offers Project to Encase Chernobyl Plant, Interfax, 7/14/95.; "Western Consortium offers to build Chernobyl Sarcophagus," OMRI Daily Digest, Vol. 135, 7/13/95, p.5.; "Proposal for a Second Chernobyl-4 Containment," *Nuclear News*, 8/95, p. 13.

[8] "Alliance Proposes an Overarching Solution," *Nuclear Engineering International*, 9/95, p. 6.

July-August 1995

VENTILATION AND PROTECTION SYSTEM INSTALLED

According to the Deputy Director General for Radiation Protection at Chernobyl NPP Anatoliy Nosovskiy, a nitric ventilation system for the tanks for the cooling circuit of Unit 3's control and protection system has been installed.

—Anatoliy Nosovskiy, "Radioactivity Clean-up And Exposures At Chernobyl Nuclear Power Plant," *Nuclear Europe Worldscan*, 7-8/95, p. 100.

July-August 1995

HALF OF SARCOPHAGUS' FRACTURE POINTS ARE SEALED

It was reported that approximately one half of the fracture points on the sarcophagus have been sealed. The sealing is to be completed this year. Also at the sarcophagus, a new electricity supply system has been designed and installed and an alarm system to warn of the onset of a nuclear chain reaction has been put into operation.

—"Ukraine," by Nikolai Kurilchik and Alexei Breus, *Nuclear Europe Worldscan*, p. 78.

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5 July 1995

UNIT 4 SARCOPHAGUS IS IN DANGER OF COLLAPSING

Chornobyl plant officials have warned that the sarcophagus entombing Unit 4 is in danger of collapsing. Workers are trying to patch up 1,000 square meters of cracks in the roof and walls. Additionally, the steel pillars of the structure may collapse.

—Rotislav Khotin, "Chornobyl 'Tomb' potentially dangerous, official says," Reuters, 7/5/95.; Chrystyna Lapychak, "Chornobyl Plant Officials Warn Sarcophagus Is Cracking," OMRI Daily Digest, Vol. 1, No. 130, 76/95.

1 July 1995

PLANT NEEDS TO WORK 25-30 YEARS MORE

Reportedly, Ukrainian experts suggest that if the plant continues to work 25-30 years, then Ukraine will receive \$2.72 billion in profit, which will allow them to build Ukryttya-2 for Unit 4.

—Yanina Sokolovskaya, "Chernobyl'skaya Ruletk," *Izvestiya*, 7/1/95, p. 5.

July 1995

IAEA CONCERNS ABOUT CHORNOBYL

Friedrich Niehaus of the IAEA noted that the emergency core cooling system capacity at Chornobyl is insufficient. The lack of containment means that the rupture of fuel channel integrity following a 300 mm. pipe break would result in a radioactivity release straight to the atmosphere. He also discussed a number of concerns about the availability of spare parts and qualified staff.

—"Chornobyl: Closure by 2000?" *Nuclear Engineering International*, 7/95, p. 15.

18 June 1995

CANADIAN WAX SEALANT TECHNIQUE WILL BE USED IN CHORNOBYL

William Nelson, a Canadian whose wax sealant technique has received praise from the US Environmental Protection Agency, was invited by the Prypyat Research and Industrial Association in Chornobyl to attempt to rustproof steel reinforcing rods and seal the cracks in the sarcophagus at Unit 4 by using wax. Nelson visited Chornobyl previously in 1994, and his work has received praise from V. Tokarevskyi, General Director of the Academy of Science's Interdisciplinary Scientific and Technical Center.

—"Chornobyl 'Sealer' Heads to Ukraine," *Ukrainian Weekly*, 6/18/95, p. 7.

15 June 1995

DISCUSSION ON SAFE METHODS FOR USE OF ATOMIC ENERGY

A round-table discussion was held between deputies from the Verkhovna Rada, representatives of the National Academy of Sciences, and directors of the NPPs to develop safe methods for the use of atomic energy.

—Anatoliy Panov, "Enerhetika Ukrainy, Pozitsii I Propozitsii," *Zeleny svit*, 6/95. p. 1.

12 June 1995

CHORNOBYL CLEAN-UP WILL BE LONG AND EXPENSIVE

The process of cleaning up Chornobyl could take decades, becoming the world's largest and most expensive environmental clean-up ever attempted. The current shelter is cracking more quickly than anticipated, reportedly

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releasing radioactive dust into the air; additionally, the concrete pad poured under the reactor is not preventing radioactive waters from seeping into the ground. If the sarcophagus were to collapse, the resulting contamination would be much more localized than it was in 1986. It would be a low-speed fission, a 'fizzle', that would cause dangerous radiation levels only in and around the building itself. Although the safety levels of Units 1 and 3 are below Western safety standards, improvements have been made to correct some of the flaws that contributed to the 1986 explosion; these improvements include using fuel of higher enrichment that is more stable and more control rods are kept in the reactor cores routinely as an additional safety measure. One problem that as yet has not been properly addressed is that of contamination of the soil and water underneath the reactor that flows into the Prypyat River, a few hundred yards away. According to an American who visited Chernobyl in 1993, the cracks in the shelter are so big that "birds can fly in. Dust can get out." If Chernobyl is completely closed down in 1999, the new sarcophagus might be completed by 2004. The structure, 25 stories high, would include waterproof walls and a foundation sunk 70-90 feet underground. The structure would be double-hulled so that high-pressure between the walls would prevent radioactive air from leaking out as the demolition proceeded inside. Inside the shelter are an estimated 840,000 cubic meters of radioactive waste, the most deadly of which is approximately 200 tons of uranium nuclear fuel, and some of it is still molten in the reactor core. There are no proposals yet as to how best to deal with this "mountain of waste." Mykhailo Umanets stated that the first 30 years of clean-up work might cost around \$10 billion.

—James Rupert, "Chernobyl's Casing Is Breaking Apart," *Washington Post*, 6/12/95, pp. 1, 13.

June 1995

NEW STRUCTURE NEEDS TO BE CONSTRUCTED OVER UNIT 4

The Alliance consortium has completed a feasibility study on the sarcophagus at Chernobyl, which states that the shelter over Unit 4 is in danger of collapsing and is not earthquake-safe. A new structure needs to be constructed over Unit 4 and the existing sarcophagus, which itself needs to be strengthened and stabilized. This construction is to be completed within five years and should provide safe containment for a minimum of 100 years. In order to completely enclose Unit 4, Block V (or 'B' in English) must also be enclosed under the new sarcophagus. If this building were to collapse in an earthquake or under a heavy rainfall or snowstorm, it would cut off the cooling systems to Unit 3, potentially causing another meltdown.

—Natalia Kalashnikova and Mariya Smirnova, "Fear as a Factor of Economic Coercion," *Kommersant-Daily*, 3/28/95, p. 4.; "Alliance solutions to sarcophagus problems," *Nuclear Engineering International*, 6/95, pp. 21-22.; "Alliance Group Says Chernobyl-3 Must Be Shut To Shelter Unit 4," *Nucleonics Week*, 3/23/95.; "New Chernobyl Containment 'Urgently' Needed; Seismic Event Could Cause Collapse of Current 'Ukritiye' Structure, Concludes European Commission," *Post-Soviet Nuclear & Defense Monitor*, 3/31/95.; "Chernobyl, 'Mon Amour'," *Biznes Baltii*, 4/3/95, p. 4.

May-June 1995

CHORNOBYL OPERATES MORE SAFELY THAN OTHER NPPs

According to Serhiy Parashin, Chernobyl's plant manager, in recent years Chernobyl has operated more safely than Ukraine's other nuclear power plants (NPPs); the number of malfunctions has been below the average for all NPPs in Ukraine. Reportedly, Unit 1 is among the 20 best power units in the world according to a comparison of

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performance indicators. \$300 million has been invested in safety improvements and 15 technical improvements of the two operational units began in 1994 and are currently continuing. The Rada's decision in 1993 to continue operation at Chernobyl significantly slowed the "brain drain" of skilled personnel. Ukraine has investigated the possibility of backfitting Units 1-3, which would cost approximately \$360 million. Modernizing the three units, including backfitting, reconditioning the fuel channels, improving the sarcophagus, maintaining the facilities at Slavutych, would cost approximately \$2.7 billion. The cost of complete closure is estimated at \$4.4 billion.

—Serhiy Parashin, "Chernobyl NPP: current status and perspectives," *Nuclear Europe Worldscan*, 5-6/95, p. 12.; Peter Coryn, "G-7 Rejects Ukrainian Plan For Chernobyl Closure," *Nucleonics Week*, 10/12/95, pp. 9-10.

31 May 1995

WATER LEAKAGE AT UNIT 3

A water leakage from the reactor circuit was discovered in Unit 3, which had been shut down for scheduled repairs.

—*Molod Ukrainy*, 6/2/95, p. 1; in " 'Water Leakage From Reactor Circuit' at Chernobyl," FBIS-SOV-95-109, 6/2/95.

23 May 1995

UNIT 3 IS THE BEST NUCLEAR POWER UNIT IN UKRAINE

According to official government figures, Unit 3 was the best performing nuclear power unit in Ukraine in the first quarter of 1995. It achieved a capacity factor of 98.9%, in comparison with the 14 other units in Ukraine that averaged 84.7% in the same time period. The capacity factor is the ratio of electricity produced to the maximum amount possible.

—"Chernobyl-3: Ukraine's Best Performing N-Plant Unit," *NucNet News*, No. 220, 5/23/95.

16 May 1995

US DEPARTMENT OF ENERGY FUNDS FOR UNITS 1 AND 3 UPGRADING

The US Department of Energy (DOE) has allocated \$7 million for both FY 95 and FY96 for short-term safety upgrades at Units 1 and 3. The funds will be used for operator training, fire safety upgrades and an operational safety program.

—"DOE Provides \$3 Million for Chernobyl Safety Center," *Post-Soviet Nuclear & Defense Monitor*, 5/16/95, p. 10.

11 May 1995

SLAVUTYCH CENTER WILL IMPROVE NUCLEAR SAFETY IN UKRAINE

The US Department of Energy (DOE) has announced that it is cooperating with the Ukrainian government in the establishment of an International Nuclear Safety and Environmental Research Center at Slavutych. The agreement was reached in principle in 4/95 and presidential endorsement came on 5/10 by Presidents Clinton and Kuchma in Kiev. The main goal of this center is to improve nuclear safety in Ukraine, according to Secretary of Energy Hazel O'Leary; additionally, the center will do research on environmental contamination and site restoration. Scientists and engineers will receive training in international safety standards and procedures at this center. The United States has pledged to provide up to \$3 million during the next two years and will encourage G-7 and other countries to contribute financially. US Ambassador to Ukraine William Miller and Ukrainian Minister of Environmental Protection and Nuclear Safety Yuriy Kostenko signed the agreement in Kiev on 5/10. \$1 million will

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be provided in 1995 and \$2 million in 1996 for technical and managerial support. Pacific Northwest Laboratory will oversee the project and be the Center's "sister lab." The Center's activities will include "nuclear safety, decontamination, decommissioning, waste management, site remediation, and technical development," it is scheduled to open in mid-1996.

—"US-Ukraine N-Safety Research Project Launched," *NucNet News*, No. 198, 5/11/95.; "DOE Provides \$3 Million for Chernobyl Safety Center," *Post-Soviet Nuclear & Defense Monitor*, 5/16/95, p. 10.

4 April 1995

UNIT 2 IS RESTORED

Unit 2 is still being restored, since Ukraine claims that unless it receives adequate financial assistance from the West, it will restart the unit that was damaged in 1991. One of the turbogenerators has been repaired and the other could be replaced with a generator from Unit 5, the construction of which was halted after the 1986 explosion at Unit 4.

—Peter Coryn, "Ukraine: Restoration Continues at Chernobyl-2," *Nucleonics Week*, 5/4/95, p. 20.

26 April 1995

SUPREME RADA APPEALS TO EU AND G-7

Nine years after the explosion at Chernobyl, the Verkhovna Rada made an appeal to the EU and G-7 nations for an increase in international assistance in dealing with the aftermath of the Chernobyl disaster.

—ITAR-TASS, 4/26/95; in "International Assistance Sought For Chernobyl Aftermath," FBIS-SOV-95-080, 4/26/95.

25 April 1995

UNIT 3 IN DANGER OF BLOWING UP

Mykhailo Umanets called a 3/26/95 report in the *London Observer*, which alleged that Unit 3 is in danger of blowing up, "lies, illiteracy and an insult to the designers of the Chernobyl plant and sarcophagus." Chernobyl plant manager Serhiy Parashin also stated that the article was written only to exert pressure on Ukraine to shut down Chernobyl.

—"Ukraine Nuclear Chief Rejects Charges of Potential Chernobyl Disaster," *Post-Soviet Nuclear & Defense Monitor*, 4/25/95, p. 10.

11 April 1995

NO DATE FOR UNIT 2 RESTART

Unit 2 is being reconditioned, restored, and repaired and the work should be completed by 12/95. No date has been set, however, for its restart.

—"Chernobyl Bosses Launch Plan for Restart of Unit Two," *NucNet News*, No. 164, 4/11/95.

5 April 1995

DUCTS WILL BE REPLACED AT CHORNOBYL

The Commission for Nuclear Policies and Environmental Safety, which is subordinate to the President, has recommended that Chernobyl be modernized by replacing its technological ducts, which would extend the plant's life span an additional 10 years. This would keep Unit 1 running until approximately 2007 and Unit 3 running until

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2011. The replacement would take two years for each unit and would cost \$60 million. This type of nuclear plant by design can operate for 30 years, but the ducts are safe for only 20 years. The replacement of technological ducts was performed at the Leningrad nuclear power plant successfully. The Ministry of Environmental Protection and Nuclear Safety has urged that the plant be allowed to continue in operation until the end of its natural life span; this would mean closing Unit 1 in 1997, Unit 2 between 2000-2002, and Unit 3 between 2001-2003. It has been estimated that the cost of shutting down Chernobyl will be \$3.7 billion.

—Vseukrainskiye Vedemosti, 4/5/95, p. 6; in "Report on Plans to Reconstruct Chernobyl Plant," FBIS-SOV-95-071, 4/5/95.; "Ukraine," NucNet News, 145/95, 3/30/95.

March-April 1995

CHORNOBYL: TO MODERNIZE OR TO SHUT DOWN?

Chernobyl plant manager Serhiy Parashin has proposed a six-point plan for the modernization of Chernobyl as an alternative to shutting the plant down completely. His plan calls for the retrofitting of the safety systems, improved fire protection, backfitting of the system that works to contain the spread of radioactive materials, and the implementation of technical measures that comply with regulatory requirements. The estimated cost for this program of upgrades is \$500 million.

—Serhiy Parashin, "Chernobyl: from accident to improving safety," *Nuclear Europe Worldscan*, 3-4/95, pp. 28-29.

30 March 1995

200 METER PYRAMID SAID TO GUARANTEE 200 YEARS OF SAFETY FOR CHORNOBYL REACTOR

As a result of an international tender aimed to offer a solution to the problem of Unit 4 at the Chernobyl plant, preference was given to a joint Ukrainian-French project to build a 200 meter high pyramid over the destroyed reactor which will guarantee 200 years of safety. It will take 2 years to construct the pyramid and it will cost \$15 billion. "Atompodzemenergo" from St. Petersburg offered an alternative solution to bury the reactor in an underground bunker. This project "Proval" would take only 3 months, costing only \$1.5 billion while guaranteeing the same 200 years of security.

—"Chernobyl Is Tossed From Hot to Cold," *Segodnya*, 3/30/95, p. 9.

28 March 1995

CHORNOBYL REPORT ATTEMPT AT INTIMIDATION

Serhiy Parashin, the Chernobyl NPP General Director, stated that a *London Observer* report that outlined the possibility of a major catastrophe at Chernobyl's third reactor was unfounded and asserted that it was published in an effort to apply pressure on Ukraine to close the Chernobyl reactors.

—"Strakh kak faktor ekonomicheskogo prinuzhdeniya," *Kommersant-Daily*, 3/28/95, p. 4.; "Slukhi o vzryve silno preuvelicheny," *Rossiyskaya gazeta*, 3/29/95, p. 2.; Roman Vershillo, "Avariya na Chernobyle otlozhena," *Segodnya*, 3/28/95, p. 1.

21 March 1995

SECOND SARCOPHAGUS MUST BE BUILT IMMEDIATELY

Valentyn Kupnyi, Deputy Director of Chernobyl, stated that the assertion that a new and improved sarcophagus can not be built until Unit 3 is shut down is not true. The Alliance consortium that is to make the sarcophagus has

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devised an option which would enclose only Unit 4 in a stable and environmentally safe shield. It is the consortium's opinion that a second sarcophagus must be built immediately in order to dismantle the old shelter. The project is funded by the TACIS program.

—*Holos Ukrainy*, 3/21/95, p. 4; in "Chornobyl Official Criticizes Sarcophagus Projects," JPRS-TEN-95-006, 3/21/95.

10 February 1995

SARCOPHAGUS FOR UNIT 4 IS IN DANGER OF COLLAPSING

According to an article published in *Zelenyi svit*, the sarcophagus for the destroyed Unit 4 is in danger of collapsing and radioactive dust may cause contamination and possibly even a new radioactive cloud. The pollution of subsoil waters is another concern. Kiev has asked the international community for suggestions on how to rectify this situation. One Ukrainian suggestion is to completely dismantle Unit 4; the contaminated materials will be temporarily buried in accordance with international standards. To prevent soil and water contamination, the proposed project calls for "the immediate construction of a hermetic membrane to contain the water found under the affected reactor."

—"The Sarcophagus. Transforming the 'Covering' Project at the Chornobyl Nuclear Electric Power Station into an Ecologically Safe System," *Zelenyi svit*, 12/94, No. 15, p. 3; in "Plan to Dismantle Chornobyl 4th Reactor Explained," FBIS-SOV-95-028, 2/10/95.

2 February 1995

CHORNOBYL MINISTER SAYS THE 30 KM EXCLUSION ZONE AROUND CHORNOBYL SHOULD BE REDUCED

A proposal to rehabilitate the 30 km exclusion zone around Chornobyl has been rejected by a group of 200 Russian, Ukrainian, and Belarusian scientists, who maintain that the region is far more valuable as a "scientific experiment ground." Minister of Chornobyl Volodymyr Kholosha has stated that the 2,000 square km. exclusion zone cannot be kept indefinitely and work must begin to reduce it.

—Alex Brall, "Chornobyl Scientists Oppose Rehabilitation of 30-km Zone," *Nucleonics Week*, 2/2/95, p. 13.

29 January 1995

ONE MORE LEAK AT UNIT 3

A small leak in the emergency cooling system at Unit 3 caused workers to shut the reactor down but reportedly there was no release of radiation. The operators were unsure of the severity of the problem when an alarm went off and they shut down the unit. A similar accident caused the shut-down of the same unit last October. Workers trying to adjust the water levels in the emergency cooling system triggered the automatic shut-down system. Unit 3 is scheduled to return to operation in two days. Experts from the Kurchatov Institute stated that the cause may have been a defective sensor, which has caused 10 similar incidents in the past year.

—"Chernobylskaya AES v Yanvare," *Vestnik Chornobylyya*, 2/95, p. 2.; Marta Kolomayets, UPI, 1/30/95; in "Chornobyl Reactor Shut Down," Executive News Service, 1/31/95.; "Chornobyl Reactor Shut Down," *Ukrainian Weekly*, 2/5/95, p. 2.; Igor Dvinskiy, "Trety energoblok ChAES otklyuchen po oshibke," *Segodnya*, 1/31/95, p. 7.; Chrystyna Lapychak, "Panicking Workers Shut Down Chornobyl Nuclear Reactor," OMRI Daily Digest, No. 22, Part I, 1/31/95.

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30 November 1994

TWO UNITS WILL BE OPERATIONAL

Unit 1 is to be returned to operation on 12/2 after a routine maintenance shut-down that began on 10/8. Unit 3 went operational on 10/22 after being shut down on 10/17 for repairs on a cooling pipe.

—"East Europe N-Plants Revving Up for Winter." NUCNET, No. 571, 11/30/94.

17 November 1994

SEMINAR HELD AT CHORNOBYL

A nuclear power safety seminar was held at Chornobyl at which Ukrainian officials from Derzhkomatom and Derzhatomnahliad assured the seminar's other participants that the Chornobyl power plant is functioning reliably and safely. Further cooperation is planned between operators at Chornobyl and experts from the IAEA. Dr. Friedrich Niehaus, head of the IAEA's Safety Assessment Department, stated that the IAEA was not trying to tell Ukraine how to run Chornobyl, but rather the goal of the three-day seminar was to share plant operating experience from other countries in an effort to improve the safety culture at Chornobyl. Chornobyl plant manager Serhiy Parashin demonstrated that Chornobyl operators adhere to all international safety standards. Other sources state that the IAEA found "serious safety deficiencies" at the plant, including problems with design, inspection, fire protection, and radiological protection.

—Mayak Radio Network, 11/17/94; in "Chornobyl Officials, IAEA Hold Safety Talks," FBIS-SOV-94-222, 11/17/94.; "Plan Set For Improving Chornobyl Safety," NUCNET, 11/18/94, No. 558.; *Source Book: Soviet-Designed Nuclear Power Plants in Russia, Ukraine, Lithuania, Armenia, the Czech Republic, the Slovak Republic, Hungary, and Bulgaria*, 1996, pp. 148-49.

November 1994

UPGRADING CHORNOBYL-1 IS NEXT TO IMPOSSIBLE

According to Nikolai Steinberg, Ukraine has three generations of NPPs. Chornobyl-1 is the only first generation NPP in operation and it does not have a full-scope safety system in accordance with international standards. To upgrade this unit to acceptable safety levels would be "a very complicated and expensive task, and may be unrealistic," according to Steinberg. Unit 3 requires sufficient safety improvement measures to be taken in the near future. Safety reassessment has begun at the Chornobyl NPP.

—"Nuclear Safety And Nuclear Regulatory Process In Ukraine. Status And Problems," Nikolai Steinberg, presented at the 1994 annual American Nuclear Society Meeting in Washington DC, 11/11-17/94.

13 October 1994

NO REACTORS AT THE PLANT ARE IN OPERATION

After a crack was discovered in one of its fuel channels, Unit 3 was shut down. According to officials, however, no radiation escaped. Unit 1 was shut down on 10/8 for maintenance, which meant that no reactors at the plant were in operation.

—Ustina Markus, "Another Chornobyl Reactor Temporarily Closed," RFE/RL Daily Report No. 199, 10/19/94.

August 1994

AMERICIUM-241 NEAR CHORNOBYL: SCIENTISTS DETECT, OFFICIALS DENY

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It has been reported that americium-241 has been detected near Chernobyl. Viktor Sedletskyi, President of the Association of Independent Scientists of Ukraine, said the amount of americium discovered is rather substantial and can be linked to inaccurate data regarding the amount of nuclear fuel that was discharged into the atmosphere during the 1986 accident. Some sources have said that americium-242 has also been detected, and is accumulating in the cement of the sarcophagus surrounding the damaged Unit 4, causing damage to the structure. However, a scientist from the Ukrainian Interdepartmental Radiation Control Commission says the reports on the presence of americium are false.

—ITAR-TASS, 8/5/94; in "Further On Contamination," FBIS-SOV-94-151, 8/5/94, p. 29.

July 1994

RADIATION LEAKING FROM SARCOPHAGUS

According to a report by the German Institute for Economic Research, radiation is leaking from the sarcophagus surrounding Unit 4. Radioactive contamination of ground water may be occurring as a result of the sarcophagus' foundations sinking into the ground. The Ukrainian government estimates that building a new concrete casing could cost as much as DM3.5 billion.

—DDP/ADN (Berlin), 7/6/94; in "German Study Highlights Dangers Of Nuclear Power Stations," FBIS-SOV-94-130, 7/7/94.

July 1994

FRENCH CONSORTIUM WILL CONDUCT STUDY ON SARCOPHAGUS

The French consortium "Alliance" won a bid issued by the European Commission to conduct a feasibility study on the sarcophagus surrounding Unit 4. The study will focus on reinforcing the existing containment dome, as well as construction of a new one.

—*Le Figaro*, 7/28/94, in "French Consortium Wins Bid to Conduct Feasibility Study on Chernobyl," JPRS-TEN-94-020, 9/18/94, p. 51.

11-22 April 1994

IAEA: FUEL HANDLING A PARTICULAR SAFETY CONCERN

An IAEA Mission went to Chernobyl to evaluate safety operation at the plant and found that fuel handling was a particular safety concern. The fuel route is operated manually and relies on well trained, highly proficient operators.

—*Source Book: Soviet-Designed Nuclear Power Plants in Russia, Ukraine, Lithuania, Armenia, the Czech Republic, the Slovak Republic, Hungary, and Bulgaria*, 1996, pp. 148-149.

21 April 1994

IAEA DECLARES CHORNOBYL TO BE UNSAFE

The IAEA has declared Chernobyl to be unsafe. According to IAEA General Director Hans Blix, the safety norms at Chernobyl do not meet even the least stringent international standards. This conclusion was reached after Blix, Morris Rosen, Head of the Nuclear Safety Department at the IAEA, and a group of nuclear safety experts visited Chernobyl in April 1994.

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—Ostankino Television First Channel Network (Moscow), 4/21/94, 1100 GMT; in "IAEA Declares Chernobyl Power Station Unsafe," FBIS-SOV-94-078, 4/22/94, p. 57.

21 April 1994

FRENCH AND GERMAN NUCLEAR SAFETY ORGANIZATIONS INSIST ON CHORNOBYL SHUTDOWN

French and German nuclear safety organizations, the IPSN and the GRS, released a joint statement saying that Chernobyl was unsafe and should be shut down early. IPSN and GRS have been assisting Ukraine in the nuclear safety field for the past 2 years through their joint operation "Riskaudit." In the statement they said that Units 1 and 3 were unstable due to departure of trained personnel to Russia, difficulty in obtaining spare parts, and disruptions in the maintenance program due to conflicting decisions. It further noted that the sarcophagus around Unit 4 is deficient. The statement was made at an IAEA sponsored conference in Vienna on the safety of Chernobyl. Due to Ukraine's dependence on power generated by Chernobyl, Ukrainian officials would rather receive technical assistance to improve safety conditions than shut the plant down.

—"French And German Safety Officials Favor Chernobyl Shutdown," ENS NUC NET, 4/21/94, p. 25.;

"International Experts Review Chernobyl Safety," ENS NUC NET, 4/22/94.

20 April 1994

SARCOPHAGUS AROUND UNIT 4 IS IN DANGER

Ukrainian Deputy Prime Minister Valeriy Shmarov stated that the sarcophagus around Unit 4 was in danger of collapsing and that nearly one-fifth of the trained personnel working at Chernobyl had left in 1993. Ukraine maintains that it will cost between \$6-8 billion to close down Chernobyl completely.

—David R. Marples, "Nuclear Power in Ukraine: A Look at a Troubled Industry," *Ukrainian Weekly*, 1/1/95, p. 2.

April 1994

TECHNICAL PROBLEMS AT UNITS 1 AND 3

Units 1 and 3 were temporarily shut down due to technical problems shortly after top officials decided that they would be permanently decommissioned as soon as possible. Unit 3 suffered from a severe problem—there was a defect in the cooling system—and Unit 1 had a minor problem—there was a fuel spillage when a container was dropped by a crane.

—David R. Marples, "Nuclear Power in Ukraine: A Look at a Troubled Industry," *Ukrainian Weekly*, 1/1/95, p. 2.

November 1993

OECD WILL GO AHEAD WITH SAFETY REVIEW

The OECD Nuclear Energy Agency (NEA) has decided to go ahead with an international safety review of plans to construct a new shelter over Unit 4 at Chernobyl.

—"OECD/Ukraine: Sarcophagus Safety Consultation Planned," *Nucleonics Week*, Vol. 34, No. 46, 11/18/93, pp. 17-18.

July 1993

SECOND FIRE STOPS CHORNOBYL OPERATIONS

After the second fire at Chernobyl in 1991, the Verkhovna Rada decided to stop all activity there by the end of

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1993. Given the economic hardships the country is facing, specialists from Chernobyl are insisting that the Supreme Rada made its decision prematurely and should reexamine the situation. Economically speaking, they argue, Chernobyl provides great amounts of energy at relatively little expense. Ecologically, the general manager of Chernobyl claims that his plant meets, and in some cases exceeds, all safety standards. The plant manager also claims that shutting down Chernobyl will exacerbate the ecological situation because more coal or fuel oil will have to be burned to compensate for the loss of nuclear energy.

—*Khreshchatyk*, 7/20/93, p. 5, in "Ukraine: Future of Chernobyl AES Said to be Uncertain," JPRS-TEN-93-021, 8/21/93, pp. 36-37.

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NPP Administration: 1998

4 May 1998

CHORNOBYL CHIEF DISMISSED

Serhiy Parashin was fired from his position as plant manager of the Chernobyl nuclear power plant for "crude violation of his duties and executive discipline." The dismissal came partly in response to a letter Parashin sent to President Leonid Kuchma and to the Ministry of Energy in which he expressed his opposition to the operating principles of Enerhoatom, Ukraine's national energy company. In Parashin's opinion, Enerhoatom was organized too hastily and violated nuclear legislation by failing to procure a proper license to run nuclear power plants. In an interview conducted after his dismissal, Parashin stated that under the present system "no one bears juridical responsibility." According to Parashin, Ukraine's nuclear energy industry is "...returning to a system under which safety becomes a secondary thing and carrying out supervisors' orders is a primary thing." [6] In addition to these complaints, Parashin did not support plans by Enerhoatom to close Chernobyl by 2000. Nur Nigmatullin, president of Enerhoatom, viewed Parashin's direct appeal to Kuchma as a violation of the principle of subordination, and stated that "by speculating on the notion of responsibility for the safety of a nuclear facility, Parashin groundlessly claimed that nuclear legislation had been violated in the process of reorganizing Ukrainian nuclear power plants and suggested suspending the regulating documents of Enerhoatom." Parashin was replaced by Vitaliy Tovstonohov, a representative of Enerhoatom and former chief engineer at Chernobyl.

—Interfax, 4 May 1998; in "Chernobyl Chief Dismissed for 'Crude Violations' of Duties," FBIS-SOV-98-124.; Interfax, 5 May 1998; in "Chernobyl Ex-Director Views Reasons for Dismissal," FBIS-SOV-98-125.; Interfax, 6 May 1998; in "Political Overtones Seen Behind Chernobyl Manager Dismissal," FBIS-SOV-98-135.; Interfax, 5 May 1998, "Novyy i.o. generalnogo direktora chernobylskoy AES uveren v neobkhodimosti sushchestvovaniya kompanii 'Energoatom'."; Vitaliy Portnikov, "Chernobylskoy radiatsii dali novogo direktora," *Russkiy telegraf* online edition www.mosinfo.ru:8080, 6 May 1998.; Volodymyr Zamansky and Iryna Titova, "The Chernobyl Nuclear Power Plant Director Has Been Dismissed. What is Next?" *Kiyevskiy vedomosti*, 11 May 1998, p. 6; in "Former Chernobyl Director on his Dismissal," FBIS-SOV-98-149, 29 May 1998.; Olga Musafirova, "Otstranen direktor Chernobylskoy AES," *Komsomolskaya pravda*, 6 May 1998, p. 1.

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Fuel Energy: 1998-1993

4 May 1998

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26 March 1997

CHORNOBYL DEPUTY DIRECTOR GENERAL SAYS RESTART OF UNIT 2 UNLIKELY

On 3/26/97, Chornobyl Nuclear Power Plant (ChNPP) Deputy Director-General Vasyl Omelchenko stated that bringing Unit 2 back on line was inadvisable. He said that with the proper financing, materials, staff, and equipment, reactor No. 2 could be restarted no sooner than the second quarter of 1998, at a cost of \$150 to \$200 million (including \$50 million for fuel). Omelchenko pointed out that investing the same sum in fuel for coal and thermal power plants could generate 12.5 billion kW/hrs, nearly twice the power output of Unit 2 before it was shut down. Or, as another alternative, the money could be used to complete the Rivne-4 reactor, obviating the need for foreign funding for its construction.

—UNIAN, 3/26/97; in "Ukraine: Second Reactor at Chernobyl May Not be Reconnected," FBIS-SOV-97-085, 3/26/97.

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25 March 1997

RUSSIA'S TVEL SHIPS NUCLEAR FUEL FOR CHORNOBYL-3

Despite the debt of the Chornobyl Nuclear Power Plant (ChNPP) to TVEL, the Russian concern nevertheless shipped enough nuclear fuel on 25 March 1997 to keep Chornobyl-3 operating for two to three months. ChNPP reportedly owes \$30 million to Russian nuclear fuel suppliers for past shipments; the plant has received no fuel since July 1996. (The Chornobyl RBMK reactor uses fuel assemblies that are produced only in Russia.) However, ChNPP manager Serhiy Parashin noted that the plant recently paid 20 percent of its debt to Russian firms. Due to the reduction in power generating capacity, ChNPP produced only 523 million kW/hr in March, 223.7 million kW/hr short of its target production for the month.

—Raisa Stetsyura, ITAR-TASS, 3/24/97; in "Russia: Moscow To Supply Fuel for Chernobyl 'in 7-10 Days'," FBIS-SOV-97-083, 3/24/97.; Veronika Romanenkova, ITAR-TASS, 3/25/97; in "Russia: Firm Ships Fuel to Chernobyl Nuclear Plant Despite Debt," FBIS-SOV-97-084, 3/25/97.; Oleg Varfolomeyev, "Ukraine Gets Nuclear Fuel, Stops Oil Terminal Construction," *OMRI Daily Digest*, Vol. 3, No. 60, 3/26/97.; V. Luhovyk, "Chornobyl Revives," *Eastern Economist*, 4/7/97, p. 10.; *Interfax*, 4/7/97; in "Ukraine: Chernobyl Electricity Production One-third Below Target," FBIS-SOV-97-097, 4/7/97.

12 March 1997

UKRAINE REDUCES CHORNOBYL-3 OUTPUT TO HALF CAPACITY

Ukraine reduced Chornobyl-3 to half capacity on 12 March 1997 due to a fuel shortage caused by the failure of the Chornobyl Nuclear Power Plant (ChNPP) management to pay the Russian joint stock company, TVEL, for nuclear fuel shipments. According to the head of Chornobyl's information department, Valeriy Idelson, the power plant owes TVEL \$3.5 million for past deliveries — a problem in part due to consumer debt to ChNPP, which now stands at \$108 million. One alternative for fueling Unit 3, proposed by the ChNPP management, includes extracting the 600 partially spent nuclear fuel assemblies located in Unit 2; this plan could reportedly save \$30 million in the long term. ChNPP representatives have drafted a document on using Unit 2 fuel and submitted it to Derzhkomatom (the State Committee for the Use of Nuclear Power) and the Ministry for Environmental Protection and Nuclear Safety. Financial problems notwithstanding, Ukraine expects a fuel shipment within the month. Otherwise, Unit 3 would have to be stopped. According to a representative of the Ministry for Environmental Protection and Nuclear Safety, halting Unit 3 represents an unsafe situation, since a reactor requires a large amount of energy for safety and routine maintenance, even when not in operation. Usually, other units at the site provide the needed energy, but in this case, there are no other operable units.

—*Interfax*, 3/13/97; in "Fuel Shortage to Cause Shut Down of Chernobyl Power Unit," FBIS-SOV-97-072, 3/13/97.; UNIAN (Kiev), 3/20/97; in "Ukraine: Chernobyl to Utilize Nuclear Fuel from Ruined Generator," FBIS-SOV-97-079, 3/20/97.; "Fuel Second Time Round," *Izvestiya Ukraina*, 3/25/97, p. 1; in "Ukraine; Fuel from Closed Chernobyl Unit to Be Used in Third Unit," FBIS-SOV-97-084, 3/25/97.; Raisa Stetsyura, ITAR-TASS, 3/13/97; in "Fuel Shortage Halves Chernobyl Reactor Capacity," FBIS-SOV-97-072, 3/13/97.

30 November 1996

UKRAINE SHUTS DOWN CHORNOBYL-1, BUT MAY RESTART UNIT 1 OR 2

Ukraine shut down Chornobyl-1 at 10:00 p.m. local time on 30 November 1996. The move fulfilled a vow by

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Ukrainian President Kuchma, made at the April 1996 Nuclear Safety Summit in Moscow, to take the unit off line by 2000. With Unit 1 shut down, Ukraine loses approximately 4.8 billion kW/hr per year of energy output as well as 1600 jobs in the Slavutych region. Some observers have wondered whether the decision was strictly political, since the safe life of Unit 1 ended in early 1997. At that time, either the management would have taken the reactor off line anyway or replaced and modernized the reactor's channels—an expensive procedure, the funds for which Kiev lacked. In its official application to shut down Unit 1, the ChNPP management cited the need for a comprehensive engineering assessment, especially of the fuel channels, as the reason for the move. According to Chornobyl plant manager Serhiy Parashyn, no document prohibiting the future operation of Chornobyl-1 exists. Speculation that the unit may be restarted has arisen due to the plan to keep 1600 fuel assemblies inside Chornobyl-1 for two years. In fact, both Derzhkomatom (the Ukrainian State Committee for Use of Atomic Energy) and Parashyn have reportedly said that Chornobyl-1 will be maintained and, perhaps, restarted if energy is lacking during the winter. Nevertheless, Kuchma announced that restarting Unit 1 is not economically viable since it would cost an estimated \$225 to \$450 million. The high end of this estimate is approximately the same as the estimated cost of completing the Khmelnytsky-2 or Rivne-4 reactors. At an estimated cost of \$85 to \$280 million, bringing Unit 2 back on line for continued service presents a more likely alternative for immediate power replacement. Shortly before shutting down Chornobyl-1, Derzhkomatom passed a decree sanctioning such a measure. If allocated by the Ukrainian Government, Unit 2 refurbishment money would probably go towards safety backfits, replacement of isolation valves on the inlets to the fuel channels below the reactor, and borrowing turbines and fuel from Unit 1. A recent article, however, expressed some pessimism about restarting Unit 2, placing the earliest possible on-line date in the second quarter of 1998. Thus, only Unit 3 remains in operation at ChNPP.

—Ann MacLachlan, "Ukraine Shuts Chernobyl-1, Fulfilling Promise to West," *Nucleonics Week*, 12/5/96, p. 14.; Peter Coryn, "Chernobyl-1 Is Shut but Ukraine Keeps Units 1,2 Restart Option," *Nucleonics Week*, 1/2/97, p. 14.; Yanina Sokovskaya, "Shutdown of Chernobyl Nuclear Power Station First Unit. Technical Necessity or Political Gesture?," *Izvestiya Ukraina*, 11/30/96, p. 1; in "Ukraine: 'All the Rules Broken' in Shutdown of Chernobyl No. 1 Unit," FBIS-TEN-96-011, 11/30/96.; NTV, 11/30/96; in "Chernobyl Director Says Shutdown Decision May Not Be Final," FBIS-SOV-96-232, 11/30/96.; UNIAN, 11/29/96; in "Kuchma: No Plans to Restart Chernobyl's Generating Set," FBIS-SOV-96-232, 11/29/96.; Ann MacLachlan, "Chernobyl Managers Want to Reopen Unit 2 to Offset Unit Shutdown," *Nucleonics Week*, 11/21/96, p.16.; UNIAN, 3/26/97; in "Ukraine: Second Reactor at Chernobyl May Not Be Reconnected," FBIS-SOV-97-085, 3/26/97.; "Chernobyl-1 shut down, Unit 2 may restart in 1997," *Nuclear News*, 1/97, pp. 33-34.

18 September 1996

CHORNOBYL-1 TO BE PERMANENTLY SHUT DOWN ON 11/30/96

According to Deputy Director General of the Chornobyl NPP Vasyl Omelchenko, the Ukrainian government made its final decision to permanently shut down Unit 1 at Chornobyl on 30 November 1996, which is several months before the reactor's service life expires. Omelchenko said that the decision was made not only because of the agreement signed by the G-7 and Ukraine in Ottawa, but also because nuclear fuel deliveries have been interrupted by the Russian nuclear production company TVEL due to Ukraine's \$25 million unpaid bill for the supplied fuel. Chornobyl is completely dependent on TVEL's fuel, which is produced specifically for RBMK-type reactors. However, Omelchenko mentioned that the management of the Chornobyl NPP will soon find financial

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resources to purchase nuclear fuel from Russia.

—Zakhar Butyrskiy, "Tretiy reactor ChAES skoro budet ostanovlen," *Segodnya*, 9/18/96, p. 9.

1 July 1996

CHORNOBYL HAS NUCLEAR FUEL FOR ONE MONTH ONLY

Ukrainian customers owe \$50 million to Chornobyl NPP for energy. According to the chief engineer of the Chornobyl NPP, Vitaliy Tovstonogov, the plant lacks the financial resources to buy nuclear fuel from Russia, because many of the Chornobyl NPP customers are failing to pay their electricity bills. Tovstonogov said that if Chornobyl NPP had to operate at full capacity and the arrival of nuclear fuel from Russia in late June 1996 never took place, the plant would fully consume available nuclear fuel in one or one and a half months.

—Zahar Butyrskiy, "Ukrainskiye AES budut prodavat energiyu so skidkoy," *Segodnya*, 7/1/96.

28 June 1996

UNIT 1 AND 3 OPERATION DEPENDS ON ARRIVAL OF RUSSIAN NUCLEAR FUEL

Unit 3 at Chornobyl resumed operating at full capacity, after the arrival of nuclear fuel from Russia on 24 June 1996 under the agreement on supplying Ukraine with nuclear fuel in exchange for the nuclear warheads withdrawn from Ukrainian territory. This first consignment of reactor fuel will last until October 1996, taking into account planned stoppages of the Chornobyl reactors for repairs and maintenance. It is expected that Russia will provide two more deliveries of nuclear fuel, each 50 percent larger than the first, by the end of 1996. Before the arrival of Russian fuel, Units 1 and 3 had been operating at reduced capacity; 50 percent and 40 percent respectively. Unit 1 is temporarily shut down for planned maintenance, with its restart planned for 8 July 1996.

UNIAN, 6/28/96; in "Transfer of Russian Nuclear Fuel Supplies Begins," FBIS-SOV-96-127, 6/28/96.; Jack Ashton, "Chernobyl-1 Faces Crucial Test Phase," *NucNet*, 6/27/96.; "Russia ships new fuel to Chernobyl plant," *Nuclear News*, 8/96, p. 72.

22 June 1996

TEMPORARY SHUTDOWN OF UNIT 1 AT CHORNOBYL

Chornobyl's Unit 1 was temporarily shut down until 6 July '96 for planned short-term repair and maintenance. According to experts from the Ukrainian State Committee on Use of Nuclear Energy, one of the main reasons for the unit's shutdown was the lack of nuclear fuel expected from Russia. During the maintenance work on Unit 1, the power plant's specialists will check on the condition of the unit's zirconium pipes, and report back to a group of state experts by 30 June '96. Based on the findings of the report, experts from the Ukrainian Ministry of Environmental Protection and Nuclear Safety will make a final decision concerning the date of the Unit 1 shutdown.

—"1 energoblok Chernobylskoy AES ostanovlen na planovyy remont," Interfax, 24/6/96.

23 May 1996

RUSSIAN-UKRAINIAN-U.S. NUCLEAR FUEL SUPPLY AGREEMENT AMENDED

In Kiev, Russian Prime Minister Viktor Chernomyrdin and Ukrainian Prime Minister Yevhen Marchuk amended the Trilateral Statement between the Ukrainian, Russian, and U.S. presidents of 14 January '94, which provided for the delivery of Russian nuclear fuel (1,800 fuel rods) to Ukrainian nuclear power plants, particularly to Chornobyl, from

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1994 to 1997. According to the amendment, instead of 155 VVER fuel rods scheduled for delivery in 1996, Russia would deliver 1,040 RBMK fuel rods by the end of 1996.

—Lesya Mishchenko, "Both Stars and Fate—In The Name of Ukraine," *Demokratychna Ukrayina*, 6/22/96, pp. 1-2; in "Udoenko Interviewed on NATO, Bosnia, Russian Election," FBIS-SOV-96-126, 6/22/96.; Alex Brall, "Chernobyl-1 Threatened with Lack of Fuel, November Closure," *Nucleonic Week*, 6/13/96, pp. 15-16.

3 April 1996

DELIVERY OF RUSSIAN FUEL AVERTS UNIT 3 SHUTDOWN

Russia delivered 160 fresh fuel assemblies to Chernobyl-3, alleviating the fuel shortage and averting a shutdown. Unit 3 was operating at nominal power and was expected to be shut down by the end of March 1996 due to a lack of \$2.5 million worth of fuel assemblies from Russia.

—"Nesmotrya na zadolzhennost Chernobylskoy AES za postavlyaemoe toplivo, Rossiya prodolzhaet ego otgruzku," *Rossiyskaya Gazeta*, 4/3/96, p. 1.; "Ukraine," *NucNet*, 4/3/96.

12 February 1996

CHORNOBYL NPP OPERATES AT 70% CAPACITY

After Ukraine was cut off from the Russian-Ukrainian power grid, capacity utilization at Chernobyl NPP was increased to 100% at Unit 1 and to 80% at Unit 3. The Chernobyl NPP normally operates at around 70% capacity utilization, which is in-line with government standards.

—"Nuclear Power Plants Pushed to Compensate for Cut from Power Grids," *Post-Soviet Nuclear & Defense Monitor*, 3/12/96, p. 7.

25 January 1996

UKRAINIAN NPPS NEED \$100 MILLION WORTH OF FUEL TO STAY ON-LINE

Ukrainian State Committee for the Use of Atomic Energy (Derzhkomatom) warned that the Ukrainian NPPs need \$100 million worth of fuel from Russia to stay on-line. However, because the government is only receiving payment for 13% of the energy produced at the NPPs, Derzhkomatom cannot afford to buy fuel from Russia and may have to cancel production in February or March 1996.

—"U Ukrainskikh AES ne khvatayet sredstv na zakupku topliva," *Izvestiya-Finansoviye Izvestiya*, 1/25/96, p.1.

1995

REPORTS CONFLICT ON CHORNOBYL'S SHARE OF UKRAINE'S ELECTRIC ENERGY

According to the Verkhovna Rada press service, the Chernobyl NPP supplied 6% of Ukraine's total electric energy at the end of 1995 while the plant's capacity utilization was only 50%. This conflicts with other reports citing Chernobyl NPP as having the highest capacity utilization in Ukraine. According to UNIAN, generating capacity through October '95 was more fully utilized at Chernobyl than any other Ukrainian NPP, 69.2% in comparison with an average of 61.1% for Ukraine's nuclear power industry as a whole. For the first ten months of 1995, Chernobyl reportedly produced 16.1% (9085m kilowatt-hours) of the total output for the nuclear industry.

—"Zabezpechyty natsionalni interesy Ukrainy," *Holos Ukrainy*, 1/6/96, p. 4.; UNIAN, 11/4/95; in "Ukraine: Chernobyl Nuclear Power Plant Best in Ukraine, Performance Shows," BBC Monitoring Service, 11/17/95.

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6 November 1995

UNIT 1 BROUGHT BACK ON LINE

Unit 1 was brought back on line. It had been shutdown since 27 October 1995.

—IAEA Daily Press Review, 11/6/95, No. 285.

23 October 1995

RESTART POSTPONED

Ukraine postponed the restart of Unit 1.

—BBC Monitoring Service, 10/23/95 in "Chornobyl," *IAEA Daily Press Review*, 10/23/95, p. 2.

17 October 1995

UNIT 1 BROUGHT ON LINE AND RECONNECTED TO THE GRID

Unit 1 was brought on line and reconnected to the grid after 39 of the unit's 1692 fuel channels were replaced.

Plant management reportedly is considering major fuel channel reconstruction at the three viable Chornobyl units.

Fuel channel replacement would allow the units to operate until 2010-2015.

—Peter Coryn, "Chornobyl Runs 'Dress Rehearsal' for Operating Plant After 2000," *Nucleonics Week*, pp. 5-6.

11 October 1995

NUCLEAR REACTORS MAY PROVIDE 40% OF UKRAINE'S ENERGY IN 1996

On this date, only Chornobyl-3 is connected to Ukraine's electricity grid. The remaining reactor is undergoing routine maintenance and reportedly should be reconnected to the grid the week of 16 October '95. Prime Minister Yevhen Marchuk expressed hope that nuclear reactors would provide 40% of Ukraine's energy in 1996.

—"Ukraine, G-7 in Talks to Close Chernobyl," *Reuter*, 10/11/95.

1 October 1995

CHORNOBYL NUCLEAR POWER PRODUCTION IN SEPTEMBER

In 9/95, Chornobyl nuclear power plant produced 708.1 kWt/hrs of electricity, which fulfilled 104.9 percent of its plan. The NPP released 647.4 million kWt/hrs into the power system, 106.7 percent of the monthly plan.

Reportedly, only Unit 3 was operating in September. During September '95, radiation emissions from the sarcophagus remained within the established norms.

—"Chornobyl," *UNIAN*, 10/3/95 in *FBIS-SOV*, 10/3/95.

August 1995

ONE MORE STEP TO EXTEND CHORNOBYL'S OPERATION

Planned replacement of 13 of the 1600 zirconium fuel channels began in the beginning of August '95. This may be a step in the movement to extend Chornobyl's operation an additional 10 years if the \$4.4 billion is not supplied by the West.

—"Chornobyl-1 Fuel Channel Replacement Begun in August," *Nuclear News*, 10/95, p. 46.

28 August 1995

REDUCED CAPACITY AT CHORNOBYL'S UNIT 1

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Unit 1 operated at only 70-80% of its capacity for safety reasons.

—"Interview with Serhiy Parashyn, Director of the Chornobyl Nuclear Power Plant," Intelnews, 8/28/9.

13 August 1995

DERZHKOMATOM IS PLANNING TO EXTEND LIFE OF THREE REACTORS

According to Mykhailo Umanets, Chairman of the State Committee for the Use of Atomic Energy, Ukraine will extend the life of the three undamaged reactors if it does not receive billions of dollars in Western aid. A Derzhkomatom plan to extend the life of the three reactors by ten years requires no foreign aid as the station will sell electric power at US\$.03 per kWh. To justify the continued operation of the plant, Umanets cited a number of figures: the Chornobyl NPP fulfilled 104% of its planned quota for the first half of 1995, producing KBV79.4 trillion worth of power, but only received 57% of its payments. During this same period, breaks and errors were reduced by 31%. Unit 1 operated without errors.

—Serhiy Sokolovskiy, "Nuclear Chief on Chornobyl Reactors," Intelnews, 8/13/95.; "Continued Operation of Chornobyl NPP Recommended," UNIAN, 7/28/95.

8 August 1995

NUCLEAR ENERGY COMMITTEE SUPPORTS NON-NUCLEAR POWER PLANTS

The State Committee on the Use of Atomic Energy (Derzhkomatom) reportedly supports the proposal for steam-gas electric plants in Slavutych. The Ministry of Energy supports the modernization of existing coal and gas-oil power plants, which currently make up 67.6 percent of Ukraine's electrical energy capacity.

—Yuriy Orobets, Hennadiy Schastliviy, and Oleksandr Dupak, "What Will We Have Instead of Chornobyl?" *Holos Ukrainy*, 9/5/95, p. 6.

7 August 1995

CHORNOBYL PRODUCES PROFIT

Chornobyl NPP reportedly produced a profit last year. At local festivities, the plant raffled off over half a million kilowatts of electric power to Ukrainian citizens.

—"In Ukraine," *Post-Soviet Nuclear & Defense Monitor*, 8/7/95, p. 16.

15 June 1995

NEW GAS-FIRED PLANT AT CHORNOBYL: PROS AND CONS

There were mixed reactions to the announcement that a new gas-fired plant was to be constructed at Chornobyl as a means to replace the electricity generated by the nuclear units that are slated for closure. Proponents of the idea state that it will increase Western investment and pave the way for future Western-Ukrainian partnerships; additionally the gas-fired plants are very efficient. One of the drawbacks is that gas fuel is more expensive and Ukraine is already deeply in debt to Russia for previous gas deliveries. Minenergo is against the proposal because nearly 40% of Ukraine's generating capacity is sitting idle for lack of fuel; Minister of Energy Vilen Semenyuk has stated that there is no reason then to build new generating units. Mykhailo Pavlovskiy, Chairman of the Rada Standing Commission for Nuclear Policies and Nuclear Safety, and Nuclear Development Subcommittee Chairman Mykola Dudchenko have stated that no final decisions will be taken until a complete feasibility study is finished.

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—Peter Coryn and Ann MacLachan, "Ukrainians Have Mixed Reactions to Chernobyl Gas Proposal," *Nucleonics Week*, 6/15/95, pp. 10-22.

12 June 1995

THERMAL GAS POWER PLANT: SUPPORTERS AND OPPONENTS

Supporters of the plan to build a thermal gas power plant to replace Chornobyl's generating capacity include Serhiy Parashin, Chornobyl's plant manager; Mykhailo Umanets, head of Derzhkomatom; and Yuriy Kostenko, Minister of Environmental Protection and Nuclear Safety (MEPNS). The Ministries of the Economy and Energy, as well as the Nuclear Regulatory Administration, within MEPNS argue that ensuring gas supplies is both difficult and expensive. Umanets and Kostenko oppose the setting of a definite timetable for Chornobyl's closure. First Deputy Minister Smyshlyayev, who works for Kostenko, and Kostenko have been at odds over this and reportedly took their debate to Prime Minister Marchuk for mediation.

—"Ukrainian Government Negotiating Chernobyl's Future with a Divided Team," *Post-Soviet Nuclear & Defense Monitor*, 6/12/95, p. 11.

27 May 1995

ABB WILL REPLACE CHORNOBYL POWER PLANT WITH ALTERNATIVE ENERGY SOURCES

A Western consortium headed by ABB Asea Brown Boveri Ltd. will work to replace the Chornobyl power plant with alternative energy sources and provide employment for the plant workers. Ukraine signed an agreement with ABB for the conversion of the station into a non-nuclear source. President and CEO of ABB, Percy Barnevik, stated that a gas-fired plant, the most fuel efficient and environmentally safe alternative, should be completely operational in three years; the first installation, 100 kilometers from Chornobyl, should be generating electricity within 24 months. Twelve months later, according to ABB representatives, the plant would be at full capacity—3000 megawatts. ABB has converted nuclear power plants into fossil-fuel burning ones in the United States previously. Estimates of the cost of closing Chornobyl and associated costs range from \$1.4-\$1.7 billion. Building a new power plant will cost \$2.3 billion and the entire project will cost an estimated \$10 billion. The consortium, in addition to replacing the nuclear power plant's power capacities, hopes to maintain Chornobyl's social infrastructure, maintain the trained personnel and scientific potential of the Ukrainian nuclear industry, and carry out international financing of the project. The international consortium includes: ABB Kraftwerke AG and Mannesmann (Germany), Stromberg (Finland), Skansa and Vattenfall (Sweden), Danish Power Consult (Denmark), Sulzer (Switzerland), SAE Sadelmi (Italy), ABB Combustion Engineering and CMS Energy Corp. (United States), and Kawasaki Heavy Industries and JGT (Japan). The Ukrainian partners of this consortium include: the State Committee for the Utilization of Atomic Energy (sic), the Ministry of Environmental Protection and Nuclear Safety, the Ministry of Foreign Economic Relations, the National Academy of Sciences, the Chornobyl Nuclear Power Plant, Turboatom, Monolit, Khartron, Dniproenergobudprom, NVP Rotor, AT Budmachin, Energoprojekt Kiev, and Energoprojekt Kharkiv. Siemens AG recently stated that building a gas-fired plant was not the best option for Ukraine given its already substantial debt to Russia for natural gas. The director of Siemens AG predicted that the gas plant would cost \$3 billion, plus \$300 million per year for fuel imports. Mykhailo Umanets, Chairman of the State Committee for the Use of Atomic Energy, meanwhile stated that the Chornobyl problem will not be resolved until 2025, at the earliest.

—"Ukraina," *Yadernyy Kontrol*, 7/95, p. 8.; Intelenws, 5/27/95; in "Accord on Chornobyl Conversion to Non-Nuclear

Related content is available on the website for the Nuclear Threat Initiative, www.nti.org.



Status Signed," JPRS-TEN-95-008, 5/27/95.; "ChAES budet zakryta, esli na eto naidutsia sredstva," *Segodnya*, 5/30/95, p. 4.; Ann MacLachan, "ABB Consortium Seeks Western Funds to Replace Chornobyl with Gas," *Nucleonics Week*, 6/1/95, pp. 6-7.; Serhiy Sokolovskiy, "Special To INTELNEWS," Intelnews, 5/27/95.

17 February 1995

NEW FOSSIL-FUEL BURNING PLANT WILL BE BUILT IN CHERKASSY OBLAST

The joint-stock company ENERGY that is planning to construct a new fossil-fuel burning plant in the town of Chyhyryn in the Cherkasy Oblast has declared that its main reason for building this new plant is the closure of Chornobyl. ENERGY seeks to create conditions that would facilitate the permanent closure of Chornobyl. This industrial financial conglomerate is the first of its kind to exist in Ukraine; it has 30 member firms and institutions, including "the municipal state energy board, Kyivenergo; Donenergo, a similar board in Donetsk; UkrElectroProject, an educational research institution; and DniiproStroyProm, the largest state construction association within the Ministry of Energy." This organization was established by presidential decree on 27 January 95. The president of ENERGY Ravi Abubekerev said that the only realistic method to resolve the Chornobyl closure crisis is to come up with capital to cover the costs of the construction of three 700 MWe fossil fuel plants to replace the electricity generated by Chornobyl. This project will cost an estimated \$1.3 billion. ENERGY is seeking Western partners for the project since efficient and environmentally safe technology is not available domestically. One problem with the project may be the choice of location; Chyhyryn is an environmentally protected site and plans to construct a nuclear plant there during Soviet times were halted. The infrastructure of the incomplete nuclear power station at this site is valued at \$120 million. Seventy percent of ENERGY's statue fund consists of Ukrainian capital. SIEMENS and IBB have expressed interest in the project.

—Intelnews (Kiev), 2/17/95; in "Firm Plans to Build Fossil Fuel Plant," FBIS-SOV-95-034, 2/17/95.; "Global Group Formed to Close Chornobyl," InfoBank, 2/20/95.

1994

CHORNOBYL CONTINUES TO HOLD SHARE OF ELECTRICITY SUPPLY

In 1994, electricity produced at Chornobyl accounted for 7% of the total supply in Ukraine.

—"Nuclear Energy Safety Challenges in the Former Soviet Union: Panel Report," *Center for Strategic and International Studies*, Washington, 1995, pp. 35-50.

22 December 1994

WILL UKRAINE WITHDRAW VERKHOVNA RADA MORATORIUM?

Nur Nihatullin, first Deputy Chairman of Derzhkomatom, reported that Ukraine was offered a \$400 million ECU credit to bring on-line (unspecified) units which had had their construction halted due to a Verkhovna Rada moratorium. According to this politician, Spain also planned on contributing \$500 million for a 500 MWt reactor for Ukraine.

—Valentin Smaga, "Nuzhno li Vozrozhdat ChAES?" *Kyivskyye Vedomosti*, 12/22/94.

9 December 1994

UNIT 1 RESTARTED

Unit 1 was restarted. Returning the unit to operation was delayed due to some problems that had been identified

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during the shut-down inspection. Only one of the unit's turbogenerators is operational; the other is still undergoing repairs.

—"Unit One at Chernobyl Back On-line," *Nucnet*, No. 588-589, 12/9/94.

10 October 1994

SHORTAGE OF FUNDS MEANS NO FUEL RESERVES AT CHORNOBYL

As a result of Ukraine's shortage of funds with which to buy nuclear fuel from Russia, the two units at Chernobyl were forced to refuel directly from the fuel transport car that delivered the assemblies; there were no reserves of fuel left at the plant. Ten fuel reloads were required for the first six months of 1994, but only two were actually delivered. The Trilateral Statement of 14 January '94 stipulated that Ukraine receive 430 fuel assemblies; thus far, only 180 have been received. The 250 additional assemblies should be delivered by the end of the year, but Ukraine needs 550 fuel assemblies for the VVERs and 800 for the RBMKs.

—"Financial Crunch Puts Ukraine on Verge of Running Out of Fuel," *Nuclear Fuel*, 10/10/94, pp. 18-19.

23 February 1994

KUCHMA'S DIRECTIVE ON DEVELOPING OF NUCLEAR POWER

Ukrainian President Leonid Kuchma signed a directive, "On Urgent Steps to Develop Nuclear Power and Complete the Nuclear Fuel Cycle in Ukraine." The directive provides for the introduction of four new nuclear reactors, the restart of Chernobyl's Unit 2, and the completion of the nuclear fuel cycle in Ukraine.

—UNIAN (Kiev), 4/5/94; in "Ministries Demand Cancellation of Nuclear Directive," FBIS-SOV-94-067, 4/7/94, p. 51.

21 October 1993

CHORNOBYL TO BE KEPT OPEN; MORATORIUM TO END

The Ukrainian Parliament voted (221-38) to keep the Chernobyl nuclear power plants open past the end of 1993 and to end the moratorium on the construction of new nuclear power stations in the country. This decision was taken in light of the power shortage in Ukraine; nuclear power currently generates nearly one-third of Ukraine's energy. Given the difficulties Ukraine is having in making its payments to Russia for energy supplies, Ukraine's indigenous energy supplies will become increasingly important. Units 1 and 3 will continue operation. Unit 2, closed after a serious fire in October '91, may be restarted. The Parliament's action reversed a 1991 decision to close the entire power station on 3 December '93 Mykhailo Umanets, Chairman of the State Committee for the Use of Nuclear Power, said the decision would secure increased capacity of 18,000 megawatts within the next year. Ukrainian deputies stated that this reversal of policy was possible due to a dramatic change in both society's and government's attitudes. Evidence of society's change came out in a study of media reports that found 49 percent of all statements published in the first half of 1993 about nuclear power "had a positive coloring," in contrast to the five years following the Chernobyl disaster when only 4 percent of the reports were positive. Chairman of the UkrSCNRS Nikolai Steinberg expressed the government's current opinion, commenting that "the current level of operational safety at Chernobyl allows me to conclude that operation without major risks is possible."

—"Chernobyl to Continue Operating," *Surviving Together*, Winter 1993, p. 51.; Ann MacLachlan, "Ukrainian Regulator Resigns to Protest Chernobyl Decision," *Nucleonics Week*, Vol. 34, No. 49, 12/9/93, pp. 11-12.; Ron

Related content is available on the website for the Nuclear Threat Initiative, www.nti.org.



Popeski, "Ukraine Votes to Keep Chernobyl Open," Reuter, 10/21/94.; *ENS NucNet*, 12/10/93.; *Le Point* (Brussels), 11/6/93, p. 51; in JPRS-TEN-93-027, 12/15/93, pp. 56-57.

September 1993

KALNYUK REPORTS ON UNIT 2 RESTART

V. Kalnyuk, first deputy to the presidential representative in the Lviv Oblast, reported that Unit 2 would be restarted. This decision was made at the 9 September Cabinet of Ministers meeting. The power supplied by Unit 2 should save an estimated 3.3 million tons of coal in Ukraine.

—*Post Postup* (Lviv), 9/13/93; in "Energy Outlook Detailed; 3d Chornobyl Block to Open," FBIS-SOV-93-177, 9/15/93, p. 57.

6 May 1993

CHORNOBYL REACTORS WERE USED TO PRODUCE IRRADIATED SILICON

It was recently revealed that the Chornobyl reactors have been used for much of the decade to produce irradiated silicon, which is a material with semiconductor properties. The silicon may have been produced for the Soviet defense sector as well as for export abroad to Eastern Europe in exchange for hard currency.

—*VESTI Television Program* (in Russian), 5/6/93.

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Fuel Cycle: 2008-1993

1 December 2008

UKRAINE PROGRESSES TOWARDS IUEC MEMBERSHIP

Ukraine's parliament approved a draft agreement on Ukraine's involvement in the International Uranium Enrichment Center, RIA Novosti reported on 1 December. The agreement reportedly confirms the intention of Ukraine's Nuclear Fuel of Ukraine concern to acquire 10 percent of the IUEC venture and authorizes Ukraine's foreign minister Volodymyr Ohryzhko to sign the agreement. Reports in the Ukrainian press in October had also indicated that in July 2008 Kiev sent notes to Moscow and Astana declaring its readiness to join the IUEC.

—"Ukraine moves to join Russia's uranium enrichment project," RIA Novosti, 1 December 2008.; "Ukraine still waiting for Russian response on ascension to the IUEC," Department of Energy Moscow Weekly, 27-31 October 2008, Open Source Center Document CEP20081031026001.

28 October 2008

RUSSIA PLEDGES FUNDING TO CHORNOBYL PROJECT

Russia will provide donor assistance in the amount of 17 billion U.S. dollars towards the implementation of the Chornobyl projects, Russia's United Nations envoy Vitaliy Churkin reportedly announced on 28 October.

—"Russia pledges \$17 bln to Ukraine to enhance Chernobyl safety," Interfax, 28 October 2008.

January-September 2008

WORK ON CHORNOBYL MOVES FORWARD

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On 15 January, Ukraine's president Viktor Yushchenko approved a plan to decommission the Chernobyl nuclear power plant by 2012. The plan would see the final removal of spent fuel from the facility. On 10 January, Russia's Atomstroyexport signed an agreement with Ukraine's special state enterprise Chernobyl NPP to lead the efforts to stabilize the sarcophagus. On 4 March, the company announced that it had begun to work on extending the life of the sarcophagus over Chernobyl's unit 4. The project to strengthen the roof of the sarcophagus by adding new metal supports, led by Atomstroyexport, was completed in mid-April. On 3 April, the Chernobyl NPP concluded an agreement with Ukraine's Yuzhteploenergomonazh, a subcontractor, which had won the tender to set up construction of the basement for the New Safe Confinement facility. Construction of this new facility, designed and implemented by the French-led Novarka consortium, will be carried out from mid-2009 to 2011. The contract with this consortium was concluded in September 2007, and the project is also being financed by 29 countries through the Chernobyl Shelter Fund. In May, Ukraine's emergency ministry reportedly approved the program for decommissioning and dismantling work (at units 1, 2, and 3) at the nuclear plant. That month, the European Bank for Reconstruction and Development, the organization that manages the projects at Chernobyl, also donated an additional 135 million Euros for implementation of the NSC and the dry storage facility projects. Bank officials have indicated that the additional funding was intended to keep the "momentum" for additional funding going and close the "funding gap" for the projects.

Stabilization work on the sarcophagus structure that covers Chernobyl's unit 4 has been completed, *Nucleonics Week* reported, citing a 6 November Ukrainian government press release. Repair of Chernobyl's roof was finished earlier this year, in August. Both projects were financed by the European Bank for Reconstruction and Development and carried out by a consortium, which included Russia's Atomstroyexport. On 30 September, Ukraine's parliament passed legislation that would see decommissioning of the Chernobyl nuclear power plant. —"Yushchenko approves work plan of Chernobyl closure by 2012," ITAR-TASS, 15 January 2008.; "Atomstroyexport prodolzhayet raboty v Chernobyle," Rosatom press service, 4 March 2008, www.rosatom.ru. "Repair work starts on Chernobyl protective shelter," RIA Novosti, 4 March 2008.; Alexei Breus, "Chernobyl 22 years later: reactors defueled, sarcophagus stabilized," *Nucleonics Week*, 1 May 2008.; Alexei Breus, "Contract signed for preparation of new confinement for Chernobyl-4," *Nucleonics Week*, 10 April 2008.; "EBRD to grant 135 mln euros for Chernobyl clean-up," RIA Novosti, 19 May 2008.; Ann MacLachlan, "EBRD contributing part of profit to Chernobyl dry storage project," *NuclearFuel*, 19 May 2008.; Alexei Breus, "Repairs to Chernobyl sarcophagus completed, Ukraine board says," *Nucleonics Week*, 13 November 2008.; "Ukrainian parliament passes law on decommissioning Chernobyl nuclear power plant," Unian, 30 September 2008, OSC Document CEP20080930950335.

29 August 2008

UKRAINIAN OFFICIALS DISCUSS NUCLEAR COOPERATION WITH PAKISTAN

Ukraine's ambassador to Pakistan Ihor Pasco was quoted by the Pakistani newspaper *Jinnah* as saying that Ukraine wanted to cooperate with Pakistan on peaceful nuclear energy. Pasco reportedly indicated that Ukraine was open to, within boundaries of international law, aiding Pakistan in developing nuclear energy generation and expanding exchanges between the two countries.

—Tazain Akhtar, "Civilian nuclear cooperation with Pakistan possible: Ukrainian ambassador," *Jinnah*, 29 August 2008, Open Source Center Document SAP20080829102002.

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31 July 2008

RUSSO-UKRAINIAN NUCLEAR COOPERATION MOVES FORWARD

A meeting of the Ukrainian-Russian subcommittee on nuclear cooperation would take place in mid-August, ITAR-TASS quoted Enerhoatom's Yuriy Nedashkovskiy as saying on 31 July 2008. The two sides are set to discuss construction of a nuclear fuel production plant on Ukrainian territory, for which the Russian side reportedly agreed to take part in. Potential cooperation in zirconium production is also expected to be on the agenda. Nedashkovskiy also reportedly indicated that the contract for deliveries of nuclear fuel by Russia's TVEL to Ukrainian power plants after 2010 will be signed by the end of the year.

—"Russia, Ukraine to discuss joint nuclear projects in mid-August," ITAR-TASS, 31 July 2008, Open Source Center Document CEP20080731950263.

26 June 2008

POLAND INTERESTED IN NUCLEAR COOPERATION WITH UKRAINE

According to press reports, an aide to the Polish Prime Minister Donald Tusk, Wojciech Zajackowski indicated Ukraine's Enerhoatom Yuriy Nedashkovskiy that Poland was interested in cooperating with Ukraine on peaceful nuclear energy projects. Several Polish companies, Enea and Polska Grupa Energetyczna, are particularly seeking to engage with their Ukrainian counterparts, Zajackowski reportedly stated.

—"Poland hopes to cooperate with Ukraine in nuclear industry," PAP, 26 June 2008, Open Source Center Document EUP20080626950047.

25 June 2008

RUSSIA'S KIRIYENKO SAYS UKRAINE'S AGREEMENT WITH WESTINGHOUSE IS POLITICAL

Sergey Kiriyyenko, head of Russia's Rosatom corporation was quoted as saying that "for political reasons, Ukraine has decided to buy some of nuclear power stations fuel at a higher price [compared to Russian prices] from the Westinghouse corporation," RIA Novosti reported on 25 June 2008.

—"Russian official says Ukraine move to buy U.S. nuclear fuel 'political decision,'" RIA Novosti, 25 June 2008; Open Source Center Document CEP20080625950147.

28 May 2008

UKRAINE SIGNS AGREEMENT WITH CANADA TO DEVELOP CANDU TECHNOLOGY

Ukraine's Ministry of Fuel and Energy signed a memorandum of understanding with Atomic Energy of Canada Limited (AECL) that would see Ukraine developing CANDU (Canada Deuterium Uranium) reactor technology, AECL announced on 28 May. The press release also stated that "Ukraine has shown a strong interest in CANDU features related to the use of natural uranium. The CANDU design also offers synergies with the existing Ukrainian VVER reactors by offering the potential of burning uranium recovered from VVER spent fuel. This 'recovered uranium' has fissile content similar to natural uranium, which can best be utilized in a CANDU reactor."

On May 29, the two sides also inked a memorandum of understanding on nuclear energy cooperation. In an earlier press conference with Canada's Prime Minister Stephen Harper, Ukraine's president Viktor Yushchenko indicated that Ukraine was interested in using CANDU reactors for generation of electricity. Ukrainian officials, however, have reportedly indicated that the country would only be able to consider use of CANDU technology in actual

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projects in 2020, after the legal and the licensing hurdles have been cleared. Ukrainian experts have also reportedly expressed concerns regarding the potential negative consequences of integration of CANDU technology into Ukraine's nuclear industry.

—"AECL establishes framework for development of CANDU technology with Ukraine," AECL press release, 28 May 2008, www.aecl.ca.; Alexei Breus, "Ukraine-AECL MOU envisions building Candu reactors in Ukraine," *Nucleonics Week*, 5 June 2008.; "Ukraine interested in Canada's nuclear technology, technical aid-president," Unian, 26 May 2008, Open Source Center Document CEP20080527950093.

13 May 2008

UKRAINE DISCUSSES NUCLEAR COOPERATION WITH LITHUANIA

In his discussions with Lithuania's Prime Minister Gediminas Kirkilas, Ukraine's President Viktor Yuschenko reportedly indicated that Ukraine was interested in taking part in nuclear energy projects in Lithuania. Yuschenko was specifically referring to projects dealing with the shutdown of the Ignalina nuclear power plant and construction of a nuclear power plant that would replace it. Lithuania, along with Estonia, Latvia, and Poland are engaged in planning for construction of a new nuclear power plant.

—"Ukraine eyeing nuclear projects in Lithuania," RosBusinessConsulting, 13 May 2008.; "Nuclear power in Lithuania," World Nuclear Association briefing paper, August 2008, www.world-nuclear.org.

17 June 2008

UKRAINE'S NUCLEAR SECTOR UNDERGOES ANOTHER RESTRUCTURING AS NUCLEAR FUEL OF UKRAINE CONCERN IS CREATED

The Ukrainian government has created a new entity that would head up Ukraine's nuclear energy complex, Nuclear Fuel of Ukraine (NFU), Ukrinform reported 14 April 2008. As creation of the new concern moves forward, Ukratomprom, which was set up in the spring of 2007 (see 12/27/2006 entry, below), is set to be liquidated by August 2008. This entry describes the events that took place in Ukraine's nuclear complex prior to NFU's creation.

On 4 June 2007, the newly-created Ukratomprom signed a protocol of intent to cooperate with Russia's Rosatom on nuclear energy issues. The protocol also announced intent to participate in Russia's international uranium enrichment center (IUEC) in Angarsk. Following a political dispute on the future of Ukraine's nuclear industry between the president and the prime minister, in August 2007, a month before heated parliamentary elections, Ukraine's president Viktor Yuschenko issued an edict which in effect declared creation of Ukratomprom unconstitutional.

On 8 December 2007, the Economic Court of Kyiv halted bankruptcy proceedings initiated against Ukraine's nuclear utility Enerhoatom in December 2003. However, the head of Enerhoatom was dismissed after he was elected to the Verkhovna Rada. Responding to the turbulence in the nuclear sector, the board of the Ukrainian nuclear society appealed to the president and the speaker of the parliament to not politicize the nuclear industry on 20 December. Citing leadership turnover at Enerhoatom, which saw 8 presidents in 11 years, they argued for the exclusion of the "nuclear sector from the political spectrum."

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The new government headed by prime minister Yuliya Tymoshenko announced in late December 2007 that creation of Ukratomprom would be reversed. On 15 January 2008, Ukraine's Ministry of Fuel Energy announced that Ukratomprom would be soon liquidated by a presidential decree and the state-run NFU concern would replace it. NFU will focus on nuclear fuel production and nuclear fuel cycle development. The new entity, unlike Ukratomprom, will not subsume Enerhoatom or the nuclear equipment maker Turboatom. It is expected that a newly-created state enterprise dealing with zirconium would undergo integration into NFU in 2008 as well.

— "Ukraina: pravitelstvo sozdalo kontsern yadernoye toplivo Ukrainy," Ukrinform, 17 April 2008, www.ukrinform.ua.; Alexei Breus, "NFU ushers in liquidation of Ukraine's state-owned Ukratomprom," *NuclearFuel*, 5 May 2008.; "Ukratomprom, Rosatom sign cooperation protocol," Interfax, 4 June 2007, Open Source Center Document CEP20070604950323.; Irina Khmara, "Tsepnyaya reaktsiya zagovorov," *Nezavisimaya Gazeta*, 21 August 2007, www.ng.ru.; "Ukraine quashes bankruptcy action vs nuclear plant operator," Interfax, 8 December 2007.; "Ukrainian nuclear professionals ask leaders not to politicize the industry," Interfax, 20 December 2007.; Alexei Breus, "Ukraine plans fuel company, supplanting Ukratomprom," *NuclearFuel*, 28 January 2008.; "Ukraine to set up new concern for nuclear fuel production," Interfax, 15 January 2008.

31 March 2008

ENERHOATOM CONCLUDES FUEL SUPPLY AGREEMENT WITH WESTINGHOUSE

On 31 March 2008, Ukraine's Enerhoatom signed a fuel supply deal with U.S.-Japanese nuclear conglomerate Westinghouse. The contract was signed prior to the visit by U.S. President George Bush to Ukraine. Under the terms of the agreement, supplies were extended to the 3rd unit of South Ukraine NPP, and two units at Rivne and Khmelnytsky NPPs. Ukraine's decision was met with disapproval and skepticism in the Russian press, where commentary argued that the traditional domination of Russia's TVEL on the Ukrainian nuclear supply market was challenged.

— "A nuclear reaction with a U.S. component," *Vremya Novostey*, 8 April 2008; DOE Moscow Weekly, Open Source Center Document CEP20080411026001.; Tatyana Sinitsyna, "Ukrainian nuclear safety at stake," RIA Novosti, 8 April 2008.

3 December 2007

UKRAINE TO USE WESTINGHOUSE FUEL FOR FUTURE NPPS

Ukraine's National Security and Defense Council will reportedly require the Ukrainian Energy Ministry to purchase Westinghouse fuel for at least three of the 15 nuclear power plants (NPP) slated for construction in the next several decades. At present, all of the fuel for Ukraine's NPPs is supplied by Russia's TVEL; and use of Westinghouse would move Ukraine closer to its strategy of source diversification. France's Areva is reportedly the third source of nuclear fuel that the Ukrainian authorities are considering.

— Alexei Breus, "Ukraine intends to use US fuel for three VVER-1000 reactors," *NuclearFuel*, 3 December 2007; Lexis Nexis Academic Universe, <http://global.lexisnexis.com>

17 September 2007

CONSTRUCTION OF NEW SHELTER FOR CHORNOBYL REACTOR SET TO BEGIN

On 17 September 2007, Ukrainian officials concluded an agreement with the Novarka consortium on design and construction of a new metal sarcophagus for Chernobyl reactor No. 4. The design and construction of the new

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\$505 million casing is set to take over five years and will be managed by the European Bank for Reconstruction and Development. The reactor will eventually be dismantled inside the new arch-shaped sarcophagus, set to be 105 meters tall by 150 meters long. Moreover, the European Bank for Reconstruction and Development has agreed to finance the project to decommission the other three Chornobyl plant reactors, which were halted in 2000. The construction of the storage containers for spent fuel from these reactors will be carried out by U.S.-based Holtec International, which in December 2005 also won the tender to construct a spent nuclear fuel repository in Chornobyl. Reportedly, a total of \$2.5 billion have been pledged so far to the Chornobyl projects by 28 countries and the European Union.

—Maria Danilova, "\$505 million deal for Chernobyl shelter," Associated Press, 17 September 2007, www.ap.org;
"Chernobyl reactor to be encased in new metal coffin," Deutsche Welle, 18 September 2007, www.dw-world.de.

25 July 2007

RUSSIA'S TENEX TO ENRICH URANIUM FOR UKRAINE'S NPPS

On 25 July 2007, Energoatom and Rosatom signed an agreement that would see Rosatom convert and enrich uranium for Ukraine's nuclear power plants. The contract with Rosatom came after the company in April 2007 won an Energoatom tender for fuel cycle services as part of the UNFQP program, funded by the U.S. government.

—"Energoatom and Tekhsnabeksport zakliuchili dogovor na obogasheniye urana," ("Energoatom and Tekhsnabeksport conclude agreement on uranium enrichment"), 27 July 2007, Energoatom press release, www.energoatom.kiev.ua.

12 January 2007

RUSSIA AND UKRAINE SIGN NUCLEAR FUEL SUPPLY CONTRACT FOR 2007

On 12 January 2007, representatives of Russia's TVEL and Ukraine's Energoatom signed a contract for the year 2007 to supply fuel to Ukrainian NPPs. The sides reportedly discussed additional agreements on fuel supply beyond 2010 as well as application of "price bands" on the contracts for 2008.

—"TVEL and Energoatom signed the contract for nuclear fuel supply," 23 January 2007, Energoatom press release, www.energoatom.kiev.ua.

27 December 2007

UKRAINE RESTRUCTURES NUCLEAR ENERGY SECTOR, PONDERES ENRICHMENT

On 27 December 2007, the Ukrainian government reportedly took steps towards consolidation of its nuclear industry into a national company — Ukratomprom. The new company will be a subsidiary of Energoatom, and will be similarly vertically integrated. The 10 entities set to be consolidated under Ukratomprom include Energoatom, VostGOK, Novokonstantinov, SOE Smoly, SOE Dnepropertovsk Precision, and others. Moreover, internal discussions have reportedly focused on eventual establishment of a complete nuclear fuel cycle after 2030. Ukraine is estimated to spend \$2.7 over the next 10 years on expansion of its fuel cycle, including production of nuclear fuel components, refurbishment of existing fuel cycle facilities, as well as construction of an enrichment facility.

—Alexei Breus, "Ukraine takes steps to establish national fuel cycle, with enrichment," *NuclearFuel*, 29 January 2007; Lexis Nexis Academic Universe, global.lexisnexis.com.

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21 January 2006

RUSSIA TO CONTINUE SALES OF DISCOUNTED FUEL TO UKRAINE, UPGRADE MINING TECHNOLOGY

Rosatom head Sergey Kiriyyenko reiterated Russia's commitment to deliver fuel for Ukraine's NPPs at a discount. The pledge reportedly came after a meeting with Ukraine's Prime Minister Yuri Yekhanurov, during which the sides discussed extending existing fuel supply arrangements beyond 2010. Ukraine has reportedly been purchasing fuel assemblies at a base price, set in 2000, while Russia's TVEL gradually reduced the discount from 28 percent to 9 percent. During the meeting, the sides agreed to retain the base price under the condition that Enerhoatom would purchase additional fuel. Moreover, Russia and Ukraine agreed to jointly work in upgrading mining technology as part of the Ukrainian-Russian-Kazakh UkrTVS Company.

—"Ukraine, Russia approve pricing mechanism for nuclear fuel," ITAR-TASS, 21 January 2006, OSC Document CEP20060121029033.; "Ukraine, Russia to upgrade uranium mining technology," ITAR-TASS, 21 January 2006, OSC Document CEP20060121029035.

1 August 2003

KRASNOYARSK ADMINISTRATION WILL NOT ALLOW IMPORT OF UKRAINE'S SPENT FUEL UNTIL DEBT PAID

On 1 August 2003, UNIAN reported that, according to Yuriy Lebedev, head of Russia's International Fuel and Energy Company, which is managing the import of spent nuclear fuel to Krasnoyarsk Kray for storage, the Krasnoyarsk administration will not allow new shipments of spent fuel from Ukraine for storage until Ukraine pays its \$11.76 million debt for 2002 deliveries.

—"Krasnoyarskiy kray otkazhetsya prinimat otrabotannoye yadernoye toplivo iz Ukrainy v sluchaye nepogasheniya 11.76 mln. dollarov dolga," UNIAN, 1 August 2003; in Integrum Techno, www.integrum.com.

15 August 2002

FUEL PRODUCTION AGREEMENT APPROVED

On 15 August 2002, the government of Ukraine approved an agreement on developing a joint venture incorporating Ukrainian, Russian, and Kazakhstani firms for the purpose of manufacturing nuclear fuel. It is hoped that the joint venture will enable Ukraine to reduce its nuclear fuel expenditures by 25%. The joint venture was registered in October 2001.[1] Enerhoatom signed contracts with the joint venture for fuel supplies even before the agreement was approved. Zaporizhzhya NPP is to be the first to receive the new fuel. Firms involved in the venture include the Ukrainian State Property Fund, Kazakhstan's Kazatomprom, and Russia's TVEL.[2] (For more information, see the 11/29/2001 entry in the Kazakhstan: Ulba Metallurgy Plant file.)

—ITAR-TASS, 15 August 2002; in "Ukraine approves agreement on producing nuclear fuel," FBIS Document CEP20020815000386.; UNIAN, 23 September 2002; in "Ukraine begins diversification of nuclear fuel supplies," FBIS Document CEP20020923000196.

23 March 2002

UKRAINE TO BEGIN LOADING VVER-1000 REACTORS WITH US-PRODUCED FUEL IN 2003

On 23 March 2002, Ukrainian Minister of Fuel and Energy Vladimir Lushkin announced that Ukraine intends to begin loading one of its VVER-1000 reactors with US-made fuel in 2003. The five-year project will be carried out with the assistance of Westinghouse, which, in accordance with the US-Ukraine Nuclear Fuel Initiative signed in June 2000, was selected to provide Ukraine with fuel, training, and technology to re-fit its reactors to fuel

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assemblies of US manufacture. The process of re-fitting Ukrainian VVER-1000 reactors to accept US-made fuel assemblies is already ongoing and is expected to be completed in 2003.

—Vitaliy Matarykin, ITAR-TASS, 23 March 2002; in "Ukraine to Load Nuclear Plant with Fuel from Non-Russian Source in 2001 [sic]," FBIS Document CEP20020323000043.

28 February 2002

RUSSIAN REACTOR FUEL DELIVERIES TO COST \$246 MILLION IN 2002

Yadernyye materialy reported on 28 February 2002 that Russian Minister of Atomic Energy Aleksandr Rumyantsev and Ukrainian Minister of Fuel and Energy Vitaliy Gayduk signed an agreement under which Ukraine will buy reactor fuel worth \$246 million from Russia in 2002. Ukraine will pay for the fuel in regular installments of \$22.2 million.

—"Rossiya postavit yadernoye toplivo," *WPS Yadernyye materialy*, No. 7, 28 February 2002.

5 July 2001

TRILATERAL AGREEMENT ON FUEL FABRICATION SIGNED

On 5 July 2001 *Kommersant* reported that Kazakhstan's Kazatomprom, Russia's TVEL, and Ukraine's Enerhoatom signed an agreement to establish a joint venture to produce nuclear fuel elements for Ukrainian nuclear power plants. For more information, see the 7/5/2001 entry in the Kazakhstan: Ulba Metallurgy Plant entry.

—"Bratya Nigmatulliny obyedyayut energetiku," *Kommersant*, 5 July 2001; in Integrum-Techno, www.integrum.com.

11 March 2001

ENERHOATOM PLANS TO BUY \$209.9 MILLION IN NUCLEAR FUEL FOR 2001

Interfax reported on 11 March 2001 that Enerhoatom plans to buy \$209.9 million in nuclear fuel from Russia's TVEL for 2001. Nuclear fuel will be bought for all 13 operating NPP units in Ukraine at the same level as last year. Energoatom President Nur Nihatulin stated that the payments to TVEL will begin in March at a monthly rate of \$21 million. Nihatulin further added that the Russian price of nuclear fuel is 30% lower than the world market price. Enerhoatom reported that in 2001 Ukraine also plans to export spent nuclear fuel worth \$73.9 million to Russia. The spent fuel will be transported to Mayak Production Association in Chelyabinsk and the Mining and Chemical Combine in Zheleznogorsk. Last year spent fuel amounting to \$46.6 million was transported from Ukraine to Russia. According to Nihatulin, Ukraine pays Russia approximately \$370 for 1kg of exported spent fuel, and construction of spent fuel storage facilities in Ukraine would reduce these export costs by 9-10 times.

—Interfax, 11 March 2001; in "Ukraine to Transport Spent Nuclear Fuel Worth \$73.9 Million to Russia by Year-End," FBIS Document CEP20010312000079.; "V tekushchem godu Ukraina vyplatit Rossii 209 mln. dol. za svezheye yadernoye toplivo," UNIAN, No. 9, 26 February-4 March 2001.

10 February 2001

UKRAINIAN RADA COMMITTEE CHAIRMAN ON UKRAINIAN NUCLEAR FUEL CYCLE EFFORTS

On 10 February 2001 *Zerkalo nedeli* published an article by the Supreme Rada Fuel and Energy Complex, Nuclear Policy and Safety Committee Chairman, Aleksandr Gudyma, outlining his views on Ukraine's need to develop a domestic nuclear fuel cycle. Gudyma considers ensuring Ukraine's energy security, which he defines as not relying

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on any single country to supply more than 30 percent of its of energy needs, as one of the key aspects of Ukrainian national security. Unfortunately, according to Gudyma, Ukraine is far from achieving that goal, since it is so heavily dependent on Russia in this area. This includes nuclear energy, which Gudyma considers to be the "backbone" of Ukraine's energy system. Not only is Russia the sole source of Ukraine's nuclear fuel, but it is also the recipient of Ukraine's spent fuel, and the provider of 85 percent of equipment used at Ukrainian power plants. This state of affairs gives Russia considerable means of influence over Ukraine. Although Ukraine's government issued a number of directives concerning the development of domestic fuel cycle beginning in 1993, the project has not yet begun to be implemented. Gudyma partially ascribes the slow pace of this effort to a strong pro-Russian lobby in virtually every one of Ukraine's governments. Other causes of Ukraine's failure to develop a domestic fuel cycle include underfinancing of the program. While the Nuclear Fuel Cycle Fund (NFCF) was to collect a portion of the income from power generated by nuclear fuel received as payment for nuclear warheads transferred to Russia, in actuality it received only a fraction of funds it was supposed to receive. Even though Ukraine's government has taken measures to ensure that nuclear power plants' indebtedness to the NFCF is erased by 2004, the fund will receive only a small fraction of the funds it was intended to receive (estimated at about \$800 million) due to the devaluation of the hryvne. Gudyma considers the original figure of \$800 million more than adequate for the purpose of developing domestic fuel production, basing this estimate on South Korea's successful \$400 million effort to construct a fuel assembly plant. Gudyma also criticizes Ukraine's slow progress in expanding uranium ore mining operations in Ukraine. While the plans to expand uranium mining have been criticized on the grounds of cost (Ukrainian uranium would cost approximately \$40-42/kg, as opposed to \$18/kg for uranium supplied by Russia), Gudyma predicts that the current uranium glut will be over in a few years, leading to high uranium prices. Gudyma also points to the Russian strategic energy plan which also predicts higher uranium prices in the future and treats uranium mining as profitable up to \$80/kg. Given these factors, Gudyma considers the creation of a domestic fuel cycle, including fuel assembly manufacture, to be in Ukraine's national interest and within Ukraine's technical and financial capabilities, particularly if it uses the experience of other Central European countries in such areas as spent fuel storage.

—Aleksandr Gudyma, "Realii i perspektivy yaderno-toplivnogo tsikla Ukrainy," *Zerkalo nedeli*, 10 February 2001, p. 9; in WPS Yaderniye Materialy, 7 March 2001.

4 October 2000

ENERHOATOM GUARANTEES SUFFICIENT NUCLEAR POWER THROUGH WINTER

At a 4 October 2000 meeting at the Ministry of Fuel and Energy, Enerhoatom President Yuriy Nedashkovskiy issued assurances that Ukrainian NPPs would operate at 85% capacity through the winter of 2000-2001. This would satisfy 34% of Ukraine's total power needs. Since the beginning of 2000, Ukrainian NPPs have operated at only 60% capacity due to unplanned repairs and delays in fresh nuclear fuel deliveries from Russia. As of 27 September 2000, Ukraine had paid for nuclear fuel for all but three of 14 operational power reactors. However, Enerhoatom still needs funds for necessary repairs and for paying off the fuel debt. Reorganization in the energy sector has also caused several problems, including delays in shipping spent fuel to Russia; as of 19 August 2000, only one of seven shipments had been sent. By 20 September 2000 Enerhoatom had paid \$125 million towards the \$214.7 million owed for fresh fuel bought this year. For more information on fuel purchases, see the 7/18/2000 and 6/7/2000 entries below.

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—'"Energoatom' garantiruyet rabotu AES zimoy na moshchnosti 10 tys Mvt, chto sostavit 34% maksimalnoy potrebnosti Ukrainy," Interfax, 4 October 2000.; *Zerkalo nedeli*, 19 August 2000; in "Ukraine: energy situation worsening ahead of cold seasons," FBIS Document CEP20000824000255.; "AES Ukrainy polnostyu gotovy k zimmemu periodu - ekspert," Interfax, 27 September 2000.

30 August 2000

UKRAINE TO SELL URANIUM CONCENTRATE IN EUROPE

According to Interfax, Ukrainian Deputy Prime Minister Yuliya Tymoshenko asked the Ministry of Fuel and Energy to look into the possibility of selling uranium concentrate to Europe. The uranium will come from the Eastern (Skhidnyi) Mining and Conversion Combine (also known as Vostgok). State Directorate for Nuclear Energy Deputy Director Anatoly Chernov told Interfax that the Ukrainian government intends to set up negotiations on Ukraine's accession to Euroatom. Currently Ukraine ships uranium to Russia's TVEL for \$18 per kg, while production costs \$40-\$41 per kg. Uranium concentrate trades at \$31-\$35 per kg on the world market.

— Interfax, 30 August 2000; in "Ukraine to sell uranium concentrate in Europe," Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>.

28 August 2000

ADDITIONAL FUNDS FOR DOMESTIC NUCLEAR FUEL PRODUCTION

On 28 August 2000 the Ukrainian government signed a decree ordering the transfer of energy market funds to the Fund for the Creation of Nuclear Fuel Production. This special fund to develop domestic nuclear fuel production infrastructure had remained dormant up to this point. The monthly payment amount is expected to be 22.5 million hryvnyas (about \$4 million as of 28 August 2000); the first payment has already been forwarded to the fund. As of August 2000, Ukraine does not have facilities to produce its own nuclear fuel and it would take large amounts of money to establish them. Specialists at the Russian Ministry of Atomic Energy estimate that the investment necessary to develop the capacity to produce 1 MT of nuclear fuel would be comparable to the cost of building a nuclear power reactor. For more information, see the 1/13/1998 entry below.

—Roman Khrapachevskiy, "Uranium Fever," *Izvestiya*, 31 August 2000; in "Ukrainian Government Plans for Nuclear Fuel Production," FBIS Document CEP20000831000197.

7 2000

ZIRCONIUM PRODUCTION TO BE REVIVED

The government of Ukraine is planning to revive zirconium production at the Zirkoniy State Research and Production Enterprise, according to a report in the 7 August 2000 issue of *NuclearFuel*. Zirkoniy was created in the Dnipropetrovsk Oblast in 1998 to take place of Pridneprovsk Chemical Plant workshops and manufactured zirconium dioxide for a US company until the end of 1999, when its contract was completed. The initial impetus behind creating Zirkoniy came from the 1994 governmental program for developing Ukraine's nuclear industry; however, only 10% of that program has been implemented to date. Since the beginning of 1999, the zirconium plant operated for only about two months, and it completed its last order in March 2000, when it produced 500kg of metallic zirconium. Due to lack of funding, the plant has not been repaired or upgraded in recent years, and as of August 2000 its workers were owed back pay for the last 20 months. As a result, over 100 workers, many of them highly skilled, have left the plant, out of approximately 600 engaged in actual production. Given the scale of

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the plant's problems, Ukrainian officials fear that even the government's plans to revive Zirkoniy are belated, and that the failure to rescue Zirkoniy will increase Ukraine's dependence on imported nuclear fuel.

—"Plan to Revive Zirconium Plant In Ukraine May Be Too Late," *NuclearFuel*, 7 August 2000, pp. 15-16.

18 July 2000

ENERHOATOM-TVEL PREPAYMENT AGREEMENT EXTENDED UNTIL END OF YEAR

On 18 July 2000 Interfax reported that the Enerhoatom-TVEL agreement on prepayments for nuclear fuel deliveries from Russia has been extended until the end of 2000. The agreement between the Russian Ministry of Atomic Energy and Ukrainian Ministry of Fuel and Energy stipulates that Enerhoatom provide a 35% prepayment for nuclear fuel it purchases from TVEL. That rate was scheduled to go up to 50% as of 1 July 2000. In the first half of 2000 Enerhoatom paid TVEL \$63.7 million, out of the \$242 million necessary to provide Ukrainian NPPs with fuel for the entire year. TVEL representatives have remarked that so far this year Enerhoatom has been making both prepayments and regular payments for nuclear fuel deliveries regularly and without delays.

—"NAEK 'Energoatom' v pervom polugodii zaplatil za rossiyskoye yadernoye toplivo \$63.7 mln.," Interfax, No.1, 13 July 2000.; "Agreement on Energoatom Nuclear Fuel Delivery Prepayment Extended till End of Year," Interfax, No.3, 18 July 2000.

12 July 2000

UKRAINE TO ENTER JOINT VENTURE WITH RUSSIA AND KAZAKHSTAN

During a news conference in Almaty on 12 July 2000, Ukrainian Ambassador to Kazakhstan Evhen Kartashov stated that Ukraine intends to take part in establishing a joint venture with Russia and Kazakhstan for nuclear fuel element production. Kartashov said that Kazakhstan has already conducted talks on the subject in Ukraine and began similar talks in Russia on 11 July 2000, but that the process of setting up the joint venture was proceeding only with great difficulty. If the joint venture is established, the Kazakhstani Ulba Metallurgical Plant (UMZ) would produce fuel pellets, which would then be processed by Russian enterprises. Ukraine would produce the zirconium cladding for the pellets, although Kartashov did not indicate which Ukrainian enterprises would be involved. The joint venture will also entail exchanging shares among the participating enterprises. UMZ already transferred 34% of its shares to the Russian company TVEL and received an equivalent amount of shares in TVEL, giving it a voice in Russian nuclear industry operations.

—Interfax-Kazakhstan, 12 July 2000; in "Ukraine to take Part in Russo-Kazakh Nuclear Fuel Joint Venture," FBIS Document CEP200007130000192.

7 June 2000

ENERHOATOM'S PLANNED FUEL PURCHASES FROM TVEL TO TOTAL \$204 MILLION IN 2000

Ukraine's Enerhoatom has paid the Russian company TVEL \$52.8 million for nuclear fuel since the beginning of the year, according to Deputy Prime Minister Yuliya Tymoshenko. Of this sum, \$26 million were transferred in January 2000, \$11.1 million in March, and \$15.7 in the first half of June. Overall, Ukraine plans to purchase \$204 million worth of nuclear fuel from TVEL in 2000. Enerhoatom is also seeking to enlist the support of Ukrainian banks in financing the nuclear fuel purchases from TVEL, and invited 10 banks to compete for the right to provide financial support. According to Volodymyr Pyshnyy, the general director of the Zaporizhzhya nuclear power station, nuclear fuel shortages resulted in a shortfall of 3 billion kilowatt/hours in January through May 2000. In the first five

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months of 2000, the Zaporizhzhya-1 and Zaporizhzhya-6 units were off line for 65 and 49 days, respectively, due to fuel shortages. The total energy production losses caused by inactive reactors sustained by Ukrainian nuclear power stations reached 5.8 billion kilowatt/hours between January and May of 2000, of which 3.7 billion kilowatt/hours were attributed to nuclear fuel shortages. However, Deputy Prime Minister Tymoshenko denied the reports that reactor shut-downs were unplanned or caused by fuel shortages.

—"Ukraina zaplatila v 2000 godu rossiyskomu AO 'TVEL' \$52.8 mln za yadernoye toplivo-Vitse-premyer Tymoshenko," Interfax, No.4, 7 June 2000.; "'Energoatom' nameren privilech banki k finansovoy podderzhke za rossiyskoye yadernoye toplivo," UNIAN, No.20, 15-21 May 2000.; "Na Ukraine nezaplanirovannyye prostoi dvukh blokov Zaporozhskoy AES sostavili 114 sutok," Interfax, No.3, 2 June 2000.; "Otsutstviye topliva i nezaplanirovannyye prostoi priveli k nedoproizvodstvu elektroenergii ukrainskimi AES v yanvare-maye," Interfax, No.4, 23 June 2000.

5 June 2000

UNITED STATES TO HELP UKRAINE REDUCE DEPENDENCE ON RUSSIAN NUCLEAR FUEL

On 5 June 2000, during President Bill Clinton's visit to Kiev, the United States and Ukraine signed an agreement on implementing the Ukraine Nuclear Fuel Qualification Project intended to help Ukraine establish additional sources of nuclear fuel. The project will enable Ukraine to certify the reliability and safety of non-Russian fuel for its VVER-1000 reactors, helping reduce its dependence on nuclear fuel deliveries from Russia. The estimated cost of the US contribution of equipment, technology, and technical assistance is \$30 million. The project will be funded by the US State Department's Agency for International Development, with Westinghouse Electric Co., whose fuel will be certified for use in Ukrainian reactors, being the primary contractor (for additional information please see the 10/4/1999 entry). The US contribution will include the transfer of nuclear fuel and reactor core design technologies to the Center for Reactor Core Design at the Kharkiv Institute of Physics & Technology, as well as the transfer of nuclear safety and licensing expertise. Ukrainian contributions are to consist of personnel, materials, and supplies. The first Ukrainian NPP slated to receive Westinghouse fuel is the South Ukraine NPP, scheduled to receive six test assemblies in 2003, and a reload of 42 assemblies in 2005.

—"Kuchma i Klinton privetstvuyut nachalo realizatsii na Ukraine proyekta kvalifikatsii yadernogo topliva," Interfax, No.4, 5 June 2000.; "U.S.-Ukraine Agreement Aimed at Ending Ukrainian Dependence on Russian Fuel," *NuclearFuel* online edition, available from www.mhenergy.com, Vol.25, No.12, 12 June 2000.

2 April 2000

BILL FOR RUSSIAN NUCLEAR FUEL SUPPLIES PAID IN FULL

Deputy Prime Minister Yuliya Tymoshenko stated on 2 April 2000 that Ukraine had fully paid Russia for nuclear fuel. This will allow NPPs with units currently idle to begin power generation. According to Ms. Tymoshenko, cash payments from customers increased because Enerhoatom has done away with barter and related business practices and has cut power supplies to businesses with delinquent accounts.

—Novy Kanal Television, 2 April 2000; in "Ukraine Pays Russia in Full for Nuclear Fuel Supplies," FBIS Document CEP20000402000036.

March 2000

TVEL BEGINS FUEL DELIVERIES TO UKRAINE

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At the end of March 2000 Enerhoatom made an advance payment of approximately \$23 million dollars for nuclear fuel to the Russian company TVEL. According to UNIAN, the payment was made thanks to a commercial loan from Prominvestbank. However, Interfax reported on 25 April 2000 that the payment became possible after the Krivorozhstal steel works signed a futures contract for electricity supplies with Enerhoatom. Enerhoatom then opened a line of credit at Oshchadbank and paid TVEL. Under its agreement with Enerhoatom on 2000 fuel deliveries, TVEL will provide fuel on the condition that payments are made in cash and that thirty-five percent of the total cost will be paid up front. The deliveries are to be made to three reactors. For more information please see the 2/18/2000 entry below.

—Natalia Kozlova, ITAR-TASS, 10 April 2000; in "Russia Begins Deliveries of Nuclear Fuel to Ukraine," FBIS Document AFP20000409000223.; UNIAN, 1 April 2000; in "Ukrainian Nuclear Plant Receives Loan for Fuel Purchase," FBIS Document CEP20000401000067.; "Russia Delivers Nuclear Fuel to South Ukrainian Nuclear Plant," Interfax, 25 April 2000.

18 February 2000

UKRAINE TO BUY NUCLEAR FUEL DIRECTLY FROM TVEL

Ukraine will purchase its nuclear fuel directly from the Russian company TVEL. According to Deputy Prime Minister Yuliya Tymoshenko, by eliminating middlemen, the change will bring down fuel costs by 30 percent.

—Ukrainian New Channel Television, 18 February 2000; in "Fuel purchases from Russia to cut out middlemen," 25 February 2000, Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>.

3 December 1999

EXPERIMENTAL FUEL PROGRAM REJECTED BY STATE ADMINISTRATION

UNIAN news agency reported on 3 December 1999 that the Nuclear Regulatory Administration (NRA) rejected a proposal by the state nuclear energy company Enerhoatom to use experimental fuel at the Zaporizhzhya NPP. The NRA cited a study by the Ministry of Emergency Situations and Consequences of the Chernobyl Disaster which stated that this type of fuel should not be used in nuclear reactors. In addition, the Russian producer of this fuel stated that experimental fuel is not used in the Russian nuclear industry. The NRA further highlighted the fact that no legal grounds exist in Ukraine for experimental fuel use because experimental fuel rods are not included in the list of fuel supplied to Ukrainian NPPs. For more information, see the 10/4/99 entry below.

—UNIAN, 3 December 1999; in "Experimental nuclear fuel prohibited," Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>.

December 1999

MAGNITUDE OF UKRAINIAN FUEL DEBT UNCLEAR

On 12 December 1999, Interfax reported that according to Ukrainian Energy Minister Ivan Plachkov, Ukraine's debt for Russian nuclear fuel totaled \$70 million. The report further states that of the \$65 million Ukraine owed Russia in cash payments for 1999 fuel deliveries, \$45 million had been paid. As of 9 December, \$55 million of payment in kind for 1999 fuel deliveries had been made, while \$10 million more was due. (Interfax did not explain the source of the additional \$40 million debt that would produce the quoted \$70 million debt.) Payment problems have led Russia to reduce nuclear fuel shipments. However, Tetiana Amosova, vice-president of Enerhoatom, told a news conference on 25 November 1999 that the company is making payments for fuel on time. She stated that as of 15

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November 1999 Enerhoatom had already paid \$71.5 million for \$88 million worth of fuel. In 1999, fuel shortages caused the output of Ukraine's NPPs to fall from 45 percent of Ukraine's electricity production to just one third. —Interfax, "Ukraina zadolzhal Rossii za yadernoye toplivo v 1999 godu \$70 mln," 12 December 1999.; Interfax, 29 November 1999; in "Ukraine Business Panorama for 22-29 Nov 99," FBIS Document FTS19991129001599.

11 November 1999

RUSSIAN 'CONDITIONS' FOR NUCLEAR FUEL SUPPLIES TO UKRAINE OUTLINED, STILL NO AGREEMENT

In an 11 November 1999 article, *Nezavisimaya gazeta* reported that there is still no special bilateral agreement on the Russian supply of nuclear fuel to Ukraine, and that Russian experts do not believe Ukraine is interested in signing such an agreement. Vitaliy Konovalov, president of the Russian nuclear fuel producer TVEL, said that in 1998 Russia made several conditions for nuclear fuel deliveries to Ukraine. According to these conditions, 35 percent of the payment due for nuclear fuel must be paid in cash, while the rest of the payment can be made in kind (the provision of uranium, various metals, equipment, parts, and zirconium concentrate). TVEL does not send the fuel until the cash payment is received. The barter supplies are supposed to be sent within several months of fuel delivery. Ukraine's current fuel debt, therefore, is not large because TVEL has reduced shipments to match payments received. However, TVEL has suffered losses because Ukraine orders more fuel than it buys, leaving TVEL with unsold fuel and debts to its own suppliers. In 1998, Ukraine ordered \$250 million worth of fuel, but only purchased a little over \$50 million. Ukraine ordered \$210 million in fuel for 1999, and purchased \$90 million during the first three quarters of the year. While the 35 percent cash payment for the 1999 fuel was received before shipment, as of November 1999 the barter supplies had not been received.

—Andrey Vaganov, "Ukraine ssoritsya s Rossiyei nevygodno," *Nezavisimaya gazeta* online edition, <http://news.mosinfo.ru>, 11 November 1999.

October 1999

UKRAINE HOPES TO TRADE RUSSIAN BLACK SEA FLEET DEBTS FOR NUCLEAR FUEL

In October 1999, in accord with a 3 June 1999 Cabinet of Ministers decree, Minenerho began preparing a proposal to write off some of debts the Black Sea Fleet and other Russian military establishments on Ukrainian territory owe Ukraine in exchange for nuclear fuel. The first such fuel shipment would be worth \$15 million. According to the Sevastopol city administration, the Black Sea Fleet owes the city \$1.65 million, without counting its debts for electricity, for taxes, or to individual enterprises. The idea of trading for fuel is not a new one: until 1998 Ukraine was receiving nuclear fuel in exchange for the transfer of nuclear warheads from Ukraine to Russia.

—"Minenergo Ukrainy gotovit predlozheniye po postavkam yadernogo topliva iz Rossii," *Anti-Atom Press*, No. 288, October 1999, <http://cci.glasnet.ru>

4 October 1999

NUCLEAR FUEL SUPPLY DIVERSIFICATION: WESTINGHOUSE

The US company Westinghouse won a tender to produce nuclear fuel for Ukraine's VVER-1000 reactors. According to Zaporizhzhya Director Danko Biley, an experimental batch may arrive at the Zaporizhzhya plant in 2000-2001. According to another source, the first six containers of US fuel will be tested at the South Ukraine NPP in 2001. An expert at the Ukrainian Ministry of Energy says that producing the first experimental batch of fuel may take until 2004. Ukraine has been attempting to lower its dependence on the Novosibirsk Chemical Concentrate Plant in

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Russia, which is still the only facility that produces fuel for Soviet-built VVER reactors, although an effort to create new experimental fuel rods for the reactors began at Elektrostal, Moscow Oblast, Russia in 1990. See the 8/13/99 entry below for information on Ukrainian efforts to produce nuclear fuel.

—Interfax, "Ukraine Business Panorama," 27 September-4 October 1999; in "Ukraine Business Panorama," FBIS Document FTS19991004001661.; UNIAN, 29 October 1999; in "Ukraine To Try US Pilot Fuel at Nuclear Plants in 2001," FBIS Document FTS19991029001500.; "Toplivo dlya ukrainskikh AES," *Zerkalo nedeli*, No. 36, 11-17 September 1999, p. 14.

26 August 1999

UKRAINE'S FUEL DEBT TO RUSSIA NOT RESOLVED AFTER PRIME MINISTERS' MEETING

At their August 1999 meeting in Moscow, Ukrainian Prime Minister Valeriy Pustovoytenko and his Russian counterpart Vladimir Putin failed to resolve the issue of Ukraine's fuel debt to Russia. Ukrainian Deputy Prime Minister Serhiy Tyhypko commented that Ukraine pays cash for deliveries of nuclear fuel from Russia, but acknowledged delays in supplying commodities in exchange for other fuel. A Russian-Ukrainian agreement on settling the fuel debt through barter was not signed at the meeting. The issues discussed by both prime ministers will be further examined at the meeting of the joint Russian-Ukrainian Commission on Economic Cooperation at the end of September 1999.

—"V. Pustovoytenko i V. Putinu ne udalos dogovoritsya po probleme uregulirovaniya ukrainskoy zadolzhennosti za energonositeli," UNIAN, No. 34, 23 - 29 August 1999.

13 August 1999

DRAFT AGREEMENT ON UKRAINIAN-RUSSIAN-KAZAKHSTANI JOINT VENTURE NUCLEAR FUEL PRODUCTION APPROVED

With Resolution No. 1474, on 13 August 1999, the Ukrainian Cabinet of Ministers approved a draft agreement on the creation of a Ukrainian-Russian-Kazakhstani joint venture VVER fuel plant in Ukraine. A 1996 Ukrainian tender commission awarded the construction of the nuclear fuel plant to the Russian company TVEL. For more information on joint venture efforts, see the 4/97 entry.

— Interfax, "Ukraine Business Panorama," 23 August 1999; in "Ukraine Business Panorama," FBIS Document FTS19990823000971.

13 August 1999

UKRAINE'S FUEL DEBT TO RUSSIA REACHES \$74.66 MILLION DURING THE FIRST HALF OF 1999

According to Ukrainian Minister of Energy Ivan Plachkov, Ukraine's debt to Russia for nuclear fuel for the first half of 1999 totals \$74.66 million. As a result, Ukrainian NPPs are experiencing delays in refueling and repairs. Plachkov pointed out that Ukrainian consumers owe electricity producers 7 billion hryvnyas (\$1.53 million) in unpaid bills, hampering the purchase of nuclear fuel.

—Natalya Kozlova, "Ukraine Fails To Pay For Russian Nuclear Fuel," ITAR-TASS, 13 August 1999; in "Ukraine Due To Pay Russia \$74 Million For Nuclear Fuel," FBIS Document FTS19990813000907.

17 July 1999

DELIVERY OF NUCLEAR FUEL FROM RUSSIA TO UKRAINE DELAYED

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Delivery of nuclear fuel from Russia to Ukrainian NPPs has been delayed since the fall of 1998. Russia is scheduled to deliver \$300 million worth of nuclear fuel in 1999. During the first half of 1999, however, Russia supplied only 10 percent of this amount. As a result, Enerhoatom was forced to shut down seven of its 14 nuclear reactors and terminate electricity supply to approximately 18,000 major customers.

—Viktor Yadukha, "Sevastopolskoye nebo i more vykupleny za 1,8 mlrd dollarov," *Segodnya*, 17 July 1999.

29 May 1999

AGREEMENT ON PEACEFUL NUCLEAR ENERGY COOPERATION BETWEEN US AND UKRAINE ENTERS INTO FORCE

April 1999

UKRAINIAN NUCLEAR POWER PLANTS REDUCE OUTPUT AS A RESULT OF FUEL SHORTAGES

Owing to fuel shortages, Ukrainian nuclear power plants have been forced to operate at reduced power. Since March 1999, output has been lowered at South Ukraine-2 and Zaporizhzhya-1. Zaporizhzhya-6 is the only unit operating with sufficient fuel supplies and was refueled at the beginning of April 1999. There are no fuel reserves in Ukraine for 1999, with the exception of Chernobyl's partially irradiated assemblies. The situation is caused by two factors: insufficient funds due to nonpayment of electric bills by Ukrainian customers and depletion of stocks of fuel received in past years in exchange for nuclear warheads returned to Russia. Ukraine has taken measures to cope with the situation. In March 1999, the Verkhovna Rada Committee on the Energy Sector, Nuclear Policy and Nuclear Safety approved a draft decree proposing measures to deal with the fuel crisis and calling for the establishment of a state nuclear fuel stock in the FY 2000 budget. The Verkhovna Rada also plans to propose creating a special \$80 million fund to buy nuclear fuel from Russia. Enerhoatom is meanwhile developing a program which includes continued nuclear fuel deliveries from Russia and Kazakhstan and cooperation with the US in the development of a nuclear fuel manufacturing partnership.

—UT-2 Television Network, 31 March 1999; in "Nuclear Fuel At Nuclear Plants Dwindling," FBIS Document FTS19990330001938.; Alexei Breus, "Ukrainian Reactors Cut Output Because of Fuel Shortages," *Nucleonics Week*, 8 April 1999, p. 5.

12 March 1999

RUSSIA CLAIMS UKRAINE OVERPRICES COMMODITIES EXCHANGED FOR NUCLEAR FUEL

In a letter to Ukrainian First Deputy Prime Minister Volodymyr Kuratchenko, Russian Atomic Energy Minister Yevgeniy Adamov accused Ukraine of overpricing the goods supplied under contract to Russia in exchange for nuclear fuel. In the letter Adamov warned that if Ukraine's prices on goods did not become competitive, the Russian joint stock company TVEL would be "compelled to buy them in other countries." In particular, Adamov noted Ukraine's overpricing of zirconium concentrates.

—UNIAN, 10 March 1999; in "Russia Accuses Ukraine Of Overpricing In Nuclear Swap Deal," Lexis-Nexis Academic Universe, <http://web.lexis-nexis.com>.

12 February 1999

ENERHOATOM UNABLE TO PAY FOR MAY'S NUCLEAR FUEL SHIPMENT FROM RUSSIA

The Ukrainian state company Enerhoatom is unable to pay the Russian joint stock company TVEL for May's supply of nuclear fuel. In addition, Enerhoatom was not able to pay \$5 million for February's shipment. According to an

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agreement between the two companies, Enerhoatom is required to pay 50 percent in advance and 50 percent within a month following each shipment.

—Kiev STV Television, 12 February 1999; in "Ukrainian Company Fails To Pay For Russian Nuclear Fuel," FBIS Document FTS19990212001189.

13 January 1998

UKRAINE ANNOUNCES COMPLETE FUEL CYCLE AMBITIONS

Ukraine has enough uranium and zirconium ore to produce its own nuclear fuel, Deputy Energy and Power Engineering Minister Mykola Friedman stated at an international conference entitled "The Energy Security of Ukraine." Ukraine's intention to establish a complete nuclear fuel cycle involves several measures, including the creation of a large concern to unite nuclear enterprises, the enhancement of personnel training, and construction of a site for radioactive waste storage.

—Viktor Demidenko, "Ukraine Intends To Produce Nuclear Fuel," RIA Novosti, 13 January 1998.

November 1997

UKRAINE APPROVES NUCLEAR FUEL JOINT VENTURE WITH RUSSIA

The Ukrainian State Property Fund approved statutory documents to create a joint venture between Ukraine and Russia to pay for fuel for Ukrainian nuclear power plants. The founders of the joint venture, called TVEL-Energiya, are Russia's TVEL and Inkombank, the Ukrainian-Andorran joint venture AMP, VA-Bank in Ukraine, and the Ukrainian State Property Fund, which represents the interests of Enerhoatom (the national nuclear energy company). TVEL will hold a 35 percent stake in the new joint venture, while Inkombank will get a 10 percent stake, resulting in a 45 percent stake for the Russian partners. On the Ukrainian side, the remaining 55 percent is divided as follows: AMP will hold a 15 percent stake, VA-Bank a 10 percent share, and the Ukrainian State Property Fund will take 30% of the venture. TVEL-Energiya will have \$1 million in charter capital and will facilitate payment for nuclear fuel by allowing payment deferrals of 180 days. Annual nuclear fuel requirements cost Ukrainian NPPs \$350 million, with an additional \$100-\$150 million required annually for spent nuclear fuel to be shipped and buried in Russia. Before the joint venture, each Ukrainian nuclear power plant had to find its own way of paying for fuel deliveries, a problem exacerbated by the fact that consumers pay for only six percent or less of their electricity in Ukraine. TVEL also proposed the creation of an insurance fund as an offshoot of the joint venture to provide payments and a fuel reserve. The Russian side would provide nuclear fuel worth \$100 million and then create a matching insurance fund of \$100 million. The insurance fund would pay for subsequent nuclear fuel supplies by accumulating money owed for electricity and also by collecting money derived from exports to Russia.

—"A New JV With Russia," *Eastern Economist*, 17 November 1997, p. 14.; Intelnews, 28 September 1997; in "Ukrainia [sic], Russia Planning Nuclear Fuel Joint Venture," FBIS-SOV-97-271.; "Ukraine and Russia Establish New Fuel Venture," *Financial Times East European Energy Report*, Issue 73, October 1997.; Interfax, 7 October 1997; in "Interfax Business Report," FBIS-SOV-97-280.; "Ukraine and Russia Form Joint Venture to Pay For Russian Fuel," *Nuclear Fuel*, 6 October 1997, pp. 10-11.

13 October 1997

COMPLETE ZIRCONIUM PRODUCTION CYCLE PLANNED

In an additional attempt to create a complete nuclear fuel production cycle, the Ukrainian state enterprise

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"Zirconium" will move to the supervision of the Ministry of Energy. The enterprise, previously part of the Prydniprovsk chemical industrial complex, makes intermediate-grade zirconium products, which are shipped to Russia and refined for nuclear fuel rod cladding. Establishing a full zirconium production cycle would bring Ukraine one step closer to its goal of achieving a complete nuclear fuel production cycle.

—"Ukraine: New Move To Full N-Fuel Cycle," ENS NucNet, 13 October 1997.

September 1997

UKRAINE MAKES ARRANGEMENTS FOR 1998 NUCLEAR FUEL SUPPLY

With the expiration of the 1994 US-Russian-Ukrainian Trilateral Agreement, according to which Ukraine received nuclear fuel in exchange for handing over its nuclear warheads to Russia, Ukraine faces the problem of making nuclear fuel payments to Russia. According to Enerhoatom Acting Executive Director Vitalii Tovstonohov, failure to resolve the payment problems will create extreme hardships for Ukrainian NPPs in 1998. Since 1994, nearly 80 percent of the Russian fuel delivered to Ukraine was in compensation for nuclear warheads, and Ukraine paid Russia's TVEL for only 20 percent of the cost of nuclear fuel. As of September 1997, Ukraine's debt for nuclear fuel was under \$4 million. The National Dispatch Center is chronically indebted and owes Ukrainian nuclear power plants 1.5 trillion hryvnias (approximately \$806 million; as of 6 September 1997, 1 hryvnia = \$0.5373). Even though Russian suppliers have agreed to a 50 percent advance payment for nuclear fuel, Ukrainian nuclear power plants still must come up with a significant sum of money. (Each Ukrainian nuclear power plant must pay individually for its fuel.) The problem is further complicated by the fact that Ukrainian reactors rely solely on Russian nuclear fuel. Using Western fuel would require 100 percent advance payments and numerous time-consuming and expensive technological changes. At an August 1997 conference, directors of Ukrainian nuclear power stations and representatives of Enerhoatom and TVEL discussed such financial issues at length. While the Russian side suggested that Ukrainian nuclear power plants adjust their nuclear fuel needs according to budgetary constraints, the Ukrainian side suggested the formation of a joint venture to help pay for nuclear fuel. According to First Deputy Minister of Energy Mykola Friedman, who heads the State Department on the Problems of Nuclear Power, a joint venture between TVEL and Ukrainian producers would make it possible to arrange payments for nuclear fuel. However, Tovstonohov warned against putting too much hope in the joint venture and noted that Russian and Ukrainian legislative action is imperative to resolving this issue.

—Maya Orel, "Will Ukrainian Nuclear Power Plants Go On 'Starvation Diet' Next Year?" *Ukrayina Moloda*, 6 September 1997, p. 4; in "Daily Predicts Problems With Nuclear Fuel Supply," FBIS-SOV-97-254.

19-20 August 1997

RUSSIA AND UKRAINE COMPROMISE ON NUCLEAR FUEL PAYMENTS

Negotiations between Russia and Ukraine on the form of payment for nuclear fuel concluded successfully in early August 1997. Vitaliy Tovstonohov, the executive director of Enerhoatom, signed a protocol with the Russian company TVEL and Russia's Ministry of Atomic Energy on the payment process during his 19-20 August visit to Moscow. This new agreement replaces the 1994 US-Russian-Ukrainian Trilateral Agreement, under which Ukraine received nuclear fuel in exchange for handing over its nuclear warheads to Russia, which expired in summer 1997. Ukrainian nuclear power plants annually require \$300 million to \$350 million worth of fuel. Under the terms of the new agreement, state securities will pay for 40 percent of the nuclear fuel; the Kharkiv TurboAtom and

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Zaporizhzhya Transformato plants will pay 30 percent in the form of barter supplies, as well as food; and cash payments will account for the remaining 30 percent. Enerhoatom and TVEL will establish a joint venture to facilitate payment.

— Lvov Infobank, 21 August 1997; in "Ukraine, Russia Sign Accord on Nuclear Fuel Supply Payment," FBIS-SOV-97-233.; ITAR-TASS, 6 August 1997; in "Russia, Ukraine Agree on Payment for Nuclear Fuel," FBIS-SOV-97-218.; Interfax, 29 August 1997; in "Interfax Business Report," FBIS-SOV-97-245.

14 August 1997

TALKS BREAK DOWN BETWEEN RUSSIA, KAZAKHSTAN, AND UKRAINE ON FUEL PLANT CONSTRUCTION

Negotiations between Russia, Kazakhstan, and Ukraine on the construction of a nuclear fuel plant broke down with no indication of when the talks might resume. According to Derzhkomatom, the talks broke down after representatives from Russia and Ukraine refused to continue discussions. In October 1995, the Russian company TVEL won the right to supply Ukraine with nuclear fuel through an international tender in which ABB Atom and Westinghouse also participated. When TVEL failed to submit the necessary paperwork in a timely manner, reports began to appear in the Ukrainian press suggesting that the second-place finisher in the international bidding, Westinghouse, might be reconsidered. However, it was reported that Westinghouse's prices are much higher and their technology works only with Westinghouse equipment. Nevertheless this option remains should the preliminary agreement for a three-sided joint venture be cancelled.

—Viktor Zamyatin, "Razdelit toplivo na troikh poka ne poluchayetsya," *Kommersant*, 14 August 1997, p. 4.

April 1997

UKRAINE WARNS AGAINST JOINT FUEL PRODUCTION VENTURE WITH RUSSIA AND KAZAKHSTAN

The Ukrainian Ministry of Environmental Protection and Nuclear Safety voiced its opinion to Ukrainian President Leonid Kuchma that a joint venture with Russia and Kazakhstan to produce fuel is inadvisable. The ministry suggested that Ukraine continue to buy fuel from Russia while it begins to construct its own fuel production facilities. Ukraine will need an estimated \$200 million to follow through with this plan. The ministry recommends that Ukraine seek aid from western nuclear companies and international financial organizations. The joint venture would produce a low quality fuel and would help Russia by modernizing its facilities while impeding Ukraine from developing its own production plants, according to the ministry. The ministry feels that the trilateral agreement would be disadvantageous to Ukraine and inconsistent with the country's needs and plans. In addition, domestic zirconium production may suffer. The ministry asserts that Russian zirconium is "polluted" with graphite and is therefore undesirable on the world market. It is also concerned that Russia will gain control of zirconium production and jeopardize the Ukrainian industry, which claims to have a better quality metal. Ukraine prefers to produce zirconium on its own, and this would not be possible under the joint production venture.

—Mikhail Melnik, ITAR-TASS, 4/1/97; in "Ukraine Says Joint Nuclear Fuel Production Inexpedient," FBIS-SOV-97-091.; Ihor Osypchuk, "The Ukrainian Nuclear Committee 'Is Surrendering' Zirconium Production to Russian Rivals, the Ukrainian Ministry of Environmental Safety Is Warning," *Vseukrainskiye Vedomosti*, 4/9/97, p. 6; in "Ministry Warns Against Joint Production of Nuclear Fuel," FBIS-SOV-97-104.

April 1997

RUSSIA, KAZAKHSTAN, AND UKRAINE TO CONSTRUCT FUEL PLANT

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The governments of Russia, Kazakhstan, and Ukraine have agreed to create a joint venture to construct a nuclear fuel production plant and storage facilities in Ukraine. The plant will produce fuel for Ukraine's 11 VVER-1000 reactors. (The Russian company TVEL, which currently supplies Ukraine with VVER-1000 reactor fuel, will continue to supply fuel for Ukraine's one RBMK and two VVER-440 reactors.) In addition, the joint venture will enable Ukraine to store spent nuclear fuel on-site in special containers for up to fifty years, rather than sending it to Russia for reprocessing, Ukraine's current practice. A storage facility with three experimental containers holding a total of 72 spent fuel rods will be constructed at Zaporizhzhya nuclear power plant by the firm Energodar. Following trial use of this facility, storage facilities will be constructed to house 9000 spent fuel rods. The Ukrainian cabinet approved a deadline of April 1997 for the completion of the final text of the agreement. The Kiev-based joint venture is to be established in June 1997. The Ukrainian firms Pridneprovskiy Chemical Plant in Dneprodzerzhinsk, Vostochnyy Mining and Metallurgical Combine in Zholtiye Vody, and the State Pipe Institute in Dnepropetrovsk will participate in the project. Russia, Kazakhstan, and Ukraine will have equal shares in the project. While much of the project has been planned out, the problem of funding remains.

—Oleg Kilnitskiy, Intelnews, 28 April 1997; in "Joint Venture To Establish Nuclear Fuel Processing Company," FBIS-SOV-97-118.; "Ukraine, Russia, Kazakhstan to Build Nuclear Fuel Plant," *The Russian*, April 1997, p. 7.

15 March 1997

CHEBROV REVEALS PLANS FOR CREATION OF NUCLEAR FUEL CONCERN

Viktor Chebrov, chairman of Derzhkomatom, announced that charter documents on the creation of a nuclear fuel concern are being developed. The goal of this company will be to provide Ukraine's nuclear power stations with nuclear fuel. According to Chebrov, however, the creation of this concern will not conflict with separate plans by Ukraine, Russia, and Kazakhstan to produce nuclear fuel for Ukrainian nuclear power plants.

—Bogdana Kostyuk, "Boi ne mestnogo znacheniya," *Zerkalo nedeli*, 15 March 1997, p. 14.

27 December 1996

RUSSIA, UKRAINE, KAZAKHSTAN ENTERING FUEL AGREEMENT

Segodnya reported that Russia, Ukraine, and Kazakhstan are in the process of drawing up an agreement to create a facility for producing fuel assemblies for Ukrainian nuclear power plants. Participants from the three countries will have equal shares in the facility.

—"Budet sozdano SP po proizvodstvu yadernogo topliva dlya AES Ukrainy," *Segodnya*, 12/27/96, p. 1.

23 September 1996

TVEL TO STOP PRODUCING FUEL ASSEMBLIES FOR UKRAINE

The Russian concern TVEL will stop producing nuclear fuel assemblies for Ukrainian nuclear power plants until Ukraine pays in full for the Russian nuclear fuel it has already received. According to TVEL officials, Ukraine has paid only ten percent of the \$25 million that Ukrainian power plants owe for Russian nuclear fuel delivered in 1996. TVEL supplies nuclear fuel primarily to the Chornobyl NPP. It is expected that Ukraine's debt to TVEL could reach \$30 million by the end of 1996.

—UX WEEKLY, 9/23/96, in UI NEWS BRIEFING, 96.39-17, 9/24/96-10/1/96; UNIAN, 10/3/96, in "Russia: Chernobyl Nuclear Plant's Debt for Russian Fuel Worsens," BBC Monitoring Service, 10/11/96.

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13 August 1996

UKRAINIAN NUCLEAR POWER PLANTS OWE RUSSIAN PRODUCERS FOR 7/96-8/96 FUEL SUPPLIES

According to the Ukrainian state nuclear energy committee, Ukrainian nuclear power plants have paid their Russian suppliers only 10.7 % of the 7/96-8/96 nuclear fuel debt.

—INTERFAX (Moscow), 8/13/96, in "Nuclear Plants Underpay Russian Suppliers," FBIS-SOV-96-157, 8/13/96.

4 July 1996

UKRAINIAN OFFICIALS DISCUSS FUTURE OPTIONS OF NUCLEAR FUEL SUPPLY FOR UKRAINIAN POWER PLANTS

According to Ukrainian Minister of Environmental Protection and Nuclear Safety Yuriy Kostenko, the nuclear fuel which Ukrainian power plants receive from Russia is 25 percent less efficient than foreign fuel sold at almost the same price. This implies that Ukraine receives 25 percent less electric energy for the same money. Kostenko suggested that since the reactors built in Ukraine can use only fuel produced in Russia, Ukraine should consider a switching to other type of reactors, namely CANDU reactors produced in Canada. According to Kostenko, this option, considering the CANDU reactor's design, would make it possible for Ukraine to use unenriched uranium, which is abundant in the country. However, the Deputy Chairman of the Ukrainian State Atomic Energy Committee Vasyl Kotko disagreed with Kostenko by saying that the Ukrainian government would need to allocate at least \$3 billion to build a CANDU reactor, to develop essential infrastructure, as well as to train personnel necessary for maintaining this reactor type. According to Kotko, it will take approximately 10 years for Ukraine to resolve the problem of Ukraine's dependence on Russian fuel supply.

—Nina Klymkovska, "The Quality of Russian Fuel is the Same as its Price," *Kyivskiye Vedomosti*, 7/4/96, p. 7, in FBIS-SOV-96-131, 7/4/96.

25 June 1996

RUSSIAN CONCERN TVEL WILL SUPPLY FUEL TO UKRAINIAN NUCLEAR POWER PLANTS

At a meeting at the South Ukraine NPP, Russian suppliers and Derzhkomatom reached an agreement on supplies of Russian nuclear fuel to Ukraine. According to the Derzhkomatom press office, the agreement sets forth ways of cooperation with the Russian Atomic Energy Ministry and terms of nuclear fuel supplies to Ukraine for the next ten years. Under the agreement, the Russian TVEL concern will act as fuel supplier and chief consultant on fuel use at Ukrainian nuclear power plants. It will also be fully responsible for the quality of the product. Russia and Ukraine agreed on the need to optimize prices for supplies of fresh fuel, and to improve its quality.

—INTERFAX, 6/25/96, in "Ukraine: Agreement Reached with Russia on Nuclear Fuel," FBIS-SOV-96-124, 6/25/96.

21 June 1996

UKRAINE TO BE FULLY SUPPLIED WITH NUCLEAR FUEL BY RUSSIA IN 1996

According to Ukrainian Minister of Environmental Protection and Nuclear Safety Yuriy Kostenko, Russia will fully supply Ukraine with nuclear fuel in 1996 as compensation for nuclear weapons removed from Ukrainian territory. Kostenko emphasized that Ukraine has still not established the National Nuclear Energy Development Fund, which would finance the creation of Ukraine's own nuclear fuel cycle. According to Kostenko, Ukraine's dependence on Russian fuel, which is reportedly 25% less efficient than other fuel available on the world market, hinders the development of the Ukrainian nuclear sector, making it very unprofitable. Kostenko supported the idea of purchasing nuclear fuel from the US company Westinghouse.

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—"Ukraina poluchit ot RF v 1996 godu yadernoye toplivo dlya AES v polnom obyeme—Ministr ekologii respubliki," INTERFAX, 6/21/96.

13 June 1996

UKRAINIAN DEBT FOR RUSSIAN NUCLEAR FUEL HAS INCREASED

Since the beginning of 1996, Ukraine has accumulated about \$13 million in debt to Russia for nuclear fuel deliveries, even though Ukrainian nuclear power plants have significantly reduced their fuel purchases. As of 6/13/96, the power plants reportedly have spent \$100 million less on Russian nuclear fuel than had been planned. —Alex Brall, "Chernobyl-1 Threatened with Lack of Fuel, November Closure," *Nucleonics Week*, 6/13/96, pp. 15-16.

11 June 1996

UKRAINIAN GOVERNMENT'S NUCLEAR FUEL DEAL WITH RUSSIAN CONCERN TVEL

In the second week of June the Russian government confirmed its approval of preferential prices for uranium supply and enrichment services to Ukraine, a condition set forth by the Ukrainian government to confirm the Russian concern TVEL as the partner for a planned Ukrainian nuclear fuel fabrication venture. When TVEL provisionally won the Ukrainian government tender in February, it was announced that TVEL would invest in the construction of a fuel production plant in Ukraine (see entry from 2/5/96). According to later reports, however, TVEL was not planning to build a plant in Ukraine. Rather, it proposed that Ukraine invest in modernization of existing production capacities in Russia (to double production at the Elektrostal fuel assembly plant near Moscow, and to replace obsolete equipment at the Novosibirsk concentrates plant, and to modernize the zircalloy complex at Chepetsk). TVEL also proposed that Derzhkomatom buy a portion of stock in Russian enterprises, and that TVEL invest in Ukraine. However, TVEL's plans envisage no transfer of manufacture to Ukraine. Thus, Ukraine would retain only uranium mining and zirconium manufacture, that is, only those facilities already existing in Ukraine. Bids submitted by the US companies Westinghouse and ABB had provisions for technology and equipment transfer to Ukraine, thus addressing the aim of Ukraine to develop indigenous fuel manufacturing using domestic sources.

However, all of Derzhkomatom's representatives at the tender voted for TVEL, while the overwhelming majority of the others voted for Westinghouse. Derzhkomatom favors a decision in favor of Russia's TVEL reportedly because is beneficial for Ukraine due to Russia's lower fuel prices. Derzhkomatom estimated that it will allow Ukraine to save up to \$2 billion through the year 2010. But Russian fuel is also 8% less efficient than fuel produced by Westinghouse. Experts evaluate the annual profit to Ukraine under the Russian proposal at \$90 million, whereas with the Westinghouse option it would have been \$120 million. Derzhkomatom has come under sharp attack from the Rada Committee on Nuclear Policy and Radiation Safety for its decision in favor of TVEL. Minister of Environmental Protection and Nuclear Safety Yuriy Kostenko also spoke against buying less efficient Russian fuel, and in favor of buying fuel from Westinghouse.

—Interfax, 6/21/96; I. Osypchuk, "Our Nuclear Scientists Have Played Up To Greenpeace. This Unprecedented Case Will Go Down In History. The Ukrainian State Nuclear Committee and the Greens Do Not Want To Organize Production of Fuel For Nuclear Power Plants in Ukraine. Why?" *Vseukrainskiye Vedomosti*, 6/11/96, p. 6, in "Ukraine: Investing in Russian Nuclear Fuel Sector Assessed," FBIS-SOV-96-117, 6/11/96; Peter Coryn, "Moscow Confirms Discounts in Ukrainian Fuel Supply Deal," *Nuclear Fuel*, 6/17/96, pp. 13-14.

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1 April 1996

UKRAINE HAS NOT RECEIVED ANY NUCLEAR FUEL RODS FROM RUSSIA

According to Derzhkomatom's Nur Nihmatullin, Ukraine has not received any nuclear fuel rods from Russia in 1996. Nihmatullin said that they have used Ukraine's fuel reserves to keep its nuclear power plants operational. —"Hrushevsky Street News," *Eastern Economist*, 8 April 1996, p. 26.

5 February 1996

RUSSIAN CONCERN TVEL WINS TENDER TO BUILD A PLANT IN ZHOVTI VODY

The Russian concern TVEL won the Ukrainian government tender to build a nuclear fuel plant in Zhovti Vody, Ukraine. The deal is subject to guarantees from the Russian government on stable prices for uranium and uranium concentrates and confirmation by the Ukrainian government. If the deal goes through, TVEL will invest \$100 million in the construction of the plant. If the guarantees do not come through in three months, the tender committee will likely sign the contract with Westinghouse Electric, S.A., which placed second in the tender. The other bidders were ABB and European VVER fuels. The proposed plant, which could be operational in four years, will produce fuel rods for VVER-1000 reactors by converting UF₄ to UF₆, and UF₆ to UO₂ powder for the pressing and sintering of pellets. Uranium for the rods will be enriched in Russia.

—Matthew Kaminski, "TVEL Wins Ukraine Contract," *Financial Times*, 5 February 1996.; "Russia Wins Fuel Plant Tender," *Nuclear Engineering International*, March 1996, p. 7.; Peter Coryn and Ann MacLachlan, "Russia's TVEL Beats Westinghouse In Ukrainian Fuel Fabrication Bid," *Nuclear Fuel*, 12 February 1996, pp. 6-7.; "News Service," Infobank, 6 February 1996; in "Russian Concern to Provide Nuclear Fuel," FBIS-SOV-96-025.

21 January 1996

CZECH FIRM APPLIES TO BUILD PLANT IN ZHOVTI VODY

The Czech firm Skoda-Pilzen filed an application to take part in an international tender for the construction of a nuclear fuel production plant in Zhovti Vody. Minister of Environmental Protection and Nuclear Safety Yuriy Kostenko traveled to the Czech Republic to determine Czech capability to manufacture nuclear fuel for Ukrainian power plants.

—Infobank, Intelnews, 21 January 1996.

November 1995

UNITED STATES HELP UKRAINE TO ESTABLISH REGULATORY CONTROLS OVER FUEL CYCLE

There are US DOD, DOE, NRC, and State Department aid programs focused on helping Ukrainian and Russian authorities establish regulatory controls over the fuel cycle.

—"Nuclear Safety: Concerns With Nuclear Facilities And Other Sources Of Radiation In The Former Soviet Union," *GAO Report to the Honorable Bob Graham, US Senate*, November 1995, pp. 15-16.

9 October 1995

VVER-1000 FUEL PRODUCTION ENTERPRISE SELECTS PARTNER

Mykhailo Umanets opened bids from foreign companies to select a partner for the creation of a VVER-1000 fuel production enterprise in Ukraine. Bids were received from the Russian company TVEL, the Franco-German consortium European VVER Fuels GmbH, ABB Combustion Engineering, and Westinghouse/British nuclear fuels.

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The winner of the tender will be determined in 2-4 months by representatives of Derzhkomatom; the Ministry of Environmental Protection and Nuclear Safety; the Ministries of Economy, Foreign Economic Relations, and Industry; and the Academy of Sciences. The program will require a total of \$993.5 million from 1995-2010 and will increase uranium mining and milling, establish a conversion facility, expand zirconium alloy production, and modernize zirconium tube production. Ukraine is expected to save \$100 million a year once the program is in place. Umanets reportedly boasted that the plant will enable Ukraine to produce 45% of the fuel it requires, will provide 25,000 new jobs, and will save Ukraine 30% on the costs of importing fuel from Russia.

—Peter Coryn and Ann MacLachlan, "Ukraine Begins Reviewing Bids For VVER Fabrication Plant," *Nuclear Fuel*, 23 October 1995, pp. 7-8.; "Fuel Plant Planned: Ukraine," *Nuclear Engineering International*, October 1995, p. 12.

August 1995

GOVERNMENT ADOPTS NATIONAL PROGRAM ON DESIGN AND CONSTRUCTION OF NUCLEAR FUEL FACILITIES

The Government of Ukraine passed a Resolution to adopt a national program on the design and construction of nuclear fuel facilities. The fuel facilities will include "a network of conversion plants, pelletizing facilities, plants to produce zirconium alloy pipes and other products, and plants for manufacturing fuel assemblies." The network will only lack enrichment and back end fuel cycle facilities. A fuel assembly manufacturing facility is planned as one of the first new units. According to the General Director of the Eastern Mining and Conversion Combine, Mykhailo Babak, the program is designed for a 15 year term through 2010; however, Ukraine hopes to be producing its own fuel assemblies by 2000.

—"Goskomatom Speaks," NUKEM, August 1995.; Interview with Mykhailo Babak, "The General Director Speaks," NUKEM, August 1995, p. 13.

28 July 1995

UKRAINE WILL CREATE ITS OWN NUCLEAR FUEL CYCLE

According to a State Committee for the Use of Atomic Energy press release, Ukraine will create its own nuclear fuel cycle to stabilize the situation in its own nuclear energy complex. Talks are underway with the French company COGEMA on the joint development of uranium deposits. Ukraine intends to increase uranium output and set up a nuclear fuel production facility. Projects for this facility have been tendered by ABB (United States), Westinghouse (United States), Siemens (Germany), Framatome (France), and the Russian Atomic Energy Ministry.

—"Government to build nuclear fuel production plant," UNIAN, 28 July 1995.

13 July 1995

UKRAINE INTERESTED IN BUILDING FACTORY FOR FUEL ASSEMBLIES

According to Yuriy Kostenko, Ukraine currently has no plans to develop a completely closed fuel cycle. Ukraine is interested, however, in building a factory for the creation of fuel assemblies, since the fuel assemblies that are purchased from Russia are 25 percent less powerful than those produced by other countries. This facility would most likely be built in Zhovti Vody, which would help ameliorate the difficult economic situation in that region.

—Interfax, 13 July 1995; in "No Plans to Create Closed Cycle of Nuclear Production," FBIS-SOV-95-135.

13 July 1995

NO UKRAINIAN NUCLEAR POWER PLANTS HAVE REQUISITE ONE-YEAR SUPPLY OF FUEL

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According to Yuriy Kostenko, none of the Ukrainian nuclear power plants has the requisite one year supply of fresh nuclear fuel.

—"Interfax-Ukraine News," Interfax (Moscow), 13 July 1995.

11 July 1995

UKRAINE IS READY TO CREATE A NUCLEAR FUEL CYCLE

Nur Nihatullin, First Deputy Chairman of the Ukrainian State Committee for the Use of Atomic Energy, stated that Ukraine has everything necessary to create a nuclear fuel cycle. A conference outside of Kiev devoted to "International Cooperation in Nuclear Development" looked into international cooperation in developing safe nuclear technologies, including storing and reprocessing nuclear waste. In an attempt to further justify a Ukrainian closed fuel cycle, Nihatullin reported that storage of spent fuel is less expensive in Ukraine than in Russia.

—"Ukraine has everything to Create a Nuclear Fuel Cycle," *Holos Ukrainny*, 11 July 1995, p. 1.

21 June 1995

DECISION TO CREATE CLOSED FUEL CYCLE UNOFFICIAL

No official decision had been taken by the President or the Verkhovna Rada regarding the creation of a closed fuel cycle.

—CISNP Discussions with Ukrainian nuclear official, 19 June 1995.

20 June 1995

FAST BREEDER REACTORS WILL COMPLETE CLOSED FUEL CYCLE

Yuriy Kostenko, Minister of Environmental Protection and Nuclear Safety, discusses in this article Ukraine's potential to complete a closed fuel cycle. Kostenko sees his "primary task" as designing fast-breeder reactors, which would "crown a closed (fuel) cycle." As an advantage to the cycle, Kostenko believes that using only uranium extracted in Ukraine will reduce the cost of electricity produced at Ukrainian NPPs. However, the lack of stationary storage sites for spent radioactive waste still stand in the way of a complete cycle. Kostenko noted that RBMK reactors produce weapons grade plutonium "in volumes larger than those produced at VVER-type reactors."

—Dmytro Lykhoviy, "Yuriy Kostenko: If the West Squeezes us, and We Close Chernobyl Nuclear Power Plant, Assistance to Chernobyl will become an Illusion," *Ukraina Moloda*, 20 June 1995, pp. 3-4.

20 June 1995

UKRAINIAN URANIUM WILL BE ENRICHED IN FRANCE, GREAT BRITAIN OR RUSSIA

Yuriy Koshyk, director of the Ukrainian Scientific Research Institute of Industrial Technology, stated that Ukraine is pursuing the capability to produce fuel rods domestically. The rationale is that Ukraine spends \$390 million annually for nuclear fuel and once five new nuclear power units are operational, the cost will increase to \$600 million. The fuel assemblies purchased from Russia are rated for only three years while fuel assemblies from other countries last for four. Construction reportedly is slated to begin in 1996 in Zhovti Vody. Ukraine plans to send its natural uranium to either France, Great Britain, or Russia for enrichment and then the enriched uranium will be made into fuel rods in Ukraine. The Ministries of Health and Environmental Protection and Nuclear Safety will be involved in the process so as to ensure that the process is as environmentally-friendly as possible.

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—Tetyana Khomych, "TVELs for Nuclear Plants Will Originate in the Dnieper Region...", *Molod Ukrainy*, 20 June 1995, p. 2, in "Plans for Ukraine's Heat Elements Detailed," FBIS-SOV-95-121, 20 June 1995.

19 June 1995

IDEA OF CLOSED FUEL CYCLE IS STILL ONLY IDEA

Derzhkomatom is the governmental body most actively pursuing the idea of a closed fuel-cycle. It is not likely to happen in the near future due to the prohibitive cost. Thus far, no concrete steps have been taken, even in term of the construction of a fuel fabrication facility; no money has been set aside for the project, but draft plans may exist. The safeguards division is responsible for licensing such activities and as yet, nothing official has developed. There has been no official decision by the President or the Supreme Rada on the creation of a closed fuel cycle. For the present, Ukraine plans to continue purchasing fuel from Russia. Ukraine is still receiving fuel shipments from Russia as stipulated by the Trilateral Statement but this provides only enough fuel for a few units of a few plants. According to Lopatin, all the nuclear power plants have sufficient fuel as well as reserves.

—CISNP interview with Serhiy Lopatin, Head of the Safeguards Division, Nuclear Regulatory Administration, Ministry of Environmental Protection and Nuclear Safety, Kiev, 19 June 1995.

12 June 1995

SPENT FUEL IS REPROCESSED IN KRASNOYARSK

Yevhen Mikerin, Head of the Fuel Cycle and Nuclear Weapons Production Facilities Directorate of Minatom, stated that Ukraine's claims that not enough nuclear fuel was being delivered to its power plants was false; he said that fresh fuel was being supplied at near world prices and that Russia continues to upgrade its fuel so Ukraine will receive the highest quality fuel possible. Also, the problem regarding spent fuel reprocessing has been resolved. In early June 1995, a container set out from Krasnoyarsk to pick up spent fuel that would be stored and reprocessed at the T-2 facility. Negotiations are currently underway to conclude a long-term spent fuel agreement with the South Ukraine and Zaporizhzhya plants. Reprocessing Ukraine's spent fuel is beneficial for Krasnoyarsk, which is currently experiencing financial difficulties since it shut down its plutonium producing reactors; Ukraine is reportedly paying less than world prices for this reprocessing.

—"Interview on Russia's Nuclear Reactor Sale to Iran, Ukrainian Relations," *Post-Soviet Nuclear and Defense Monitor*, 12 June 1995, p. 14.

June 1995

DOMESTICALLY PRODUCED FUEL IS EXPECTED TO COST 30 PERCENT LESS THAN RUSSIAN

It was reported that Ukraine continues to pursue its program to create a closed fuel-cycle and a uranium enrichment plant under its auspices. The plant will provide 40-45 percent of the nuclear fuel that Ukrainian nuclear power plants require. Domestically-produced fuel is expected to cost 30 percent less than fuel imported from Russia.

—"Ukraine," *Yadernyy Kontrol*, June 1995, p. 13.

June 1995

FIRST VERSION OF PROGRAM TO DEVELOP NUCLEAR CYCLE PREPARED

Scientific, technical, and economic assessments have been made by leading Ukrainian authorities and the first

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version of the "Program for Nuclear Cycle Development in Ukraine" has been prepared.
—CISNP discussion with Ukrainian nuclear official, June 1995.

25 May 1995

UKRAINE SEEKS AID TO DEVELOP INDIGENOUS FUEL PRODUCTION

Ukraine is seeking to secure \$1 billion in foreign aid for the development of an indigenous fuel rod production capability. The project would take 15 years and would enable Ukraine to make 45 percent of the fuel rods used in the five nuclear power stations in Ukraine. This project would provide jobs for 25,000-30,000 people and be 30 percent cheaper than purchasing the fuel rods from Russia, which costs Ukraine \$300 million each year.

—"Ukraine's Coming Crisis," *Foreign Report*, 25 May 1995.

8 May 1995

UKRAINE HOPES TO DEVELOP FUEL FABRICATION CAPABILITY OF 600 METRIC TONS A YEAR

Derzhkomatom developed a nuclear fuel program that was adopted on 4/12 by the Rada and has been tasked by President Kuchma to set up a fund explicitly for this purpose as well as seek out international partners for the project, which will cost an estimated \$1 billion. By 2003, the amount of uranium mined and milled in Ukraine is to triple as is the quality of the uranium; Ukraine plans to spend a total of \$611 million by 2010 on these efforts. Plans for the construction of a hexafluoride (UF₆) conversion plant are to be completed by 1999. Ukraine seeks to develop a fuel fabrication capability of 600 metric tons per year.

—Peter Coryn, "Ukraine Approves Outlines of Nuclear Fuel Industry Plan," *Nucleonics Week*, 25 May 1995, pp. 19-20.

28 April 1995

CREATION OF NUCLEAR FUEL CYCLE WILL PRODUCE THREEFOLD INCREASE IN URANIUM MINING

The State Committee for the Use of Atomic Energy (Derzhkomatom) has a general program for a nuclear fuel cycle, as outline in the April 12 resolution, "On the Creation of a Nuclear Fuel Cycle." This provides for a threefold increase in uranium mining over the next several years. The Zhovti Vody Ore Enrichment Combine (ZVOEC) has been a supporter of the closed fuel cycle, which would equate to increased production, modernization, and profits for them. ZVOEC sold \$13 million worth of natural uranium concentrate in 1994, the larger part of which was sold abroad). Anatoliy Chernov, Deputy Chair of Derzhkomatom, said that Ukraine's mines can supply Ukraine's 14 reactors plus the 5 planned for construction with enough raw material for nuclear fuel for 100 years. The program also envisions production of zirconium pipes for fuel assemblies in Dniprodzerzhynsk (mining of zirconium has already begun in Vilnohirska) and construction of a plant producing fuel assemblies close to Zhovti Vody.

—Olena Zvarych, "For Ukraine to Have its Own Nuclear Fuel, We Have to 'Activate the Process.' The Uranium Industry: Can Reality and Projects be Compatible?" *Ukrayina moloda*, 28 April 1995, p. 4; in "Uranium Mining, Nuclear Fuel Cycle Viewed," FBIS-TAC-95-014-L.

12 April 1995

UKRAINE SEEKS JOINT VENTURE PARTNER FOR FABRICATING FUEL PELLETS AND RODS

A resolution "On the Creation of a Nuclear Fuel Cycle in Ukraine" was adopted by the government and currently

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Ukraine is seeking a joint-venture partner for the fabrication of fuel pellets, rods, and assemblies.

—Viktor Demidenko, ITAR-TASS, 21 April 1995; in "Ukraine to Organize Nuclear Fuel Production," FBIS-SOV-95-078.

April 1995

DOMESTIC FUEL CYCLE WILL MEET 40-45% OF UKRAINIAN NEEDS

The Ukrainian government approved a plan to meet 40-45% of its fuel needs through a domestic fuel cycle. This would entail a threefold increase in domestic uranium mining and milling, the creation of a conversion facility, the manufacture of intermediate zircaloy products, and the construction of a fuel fabrication plant. Ukraine will continue to rely on foreign uranium enrichment.

—*Source Book: Soviet-Designed Nuclear Power Plants in Russia, Ukraine, Lithuania, Armenia, the Czech Republic, the Slovak Republic, Hungary, and Bulgaria*, 1996, p. 137.

20 March 1995

UKRAINE HOPES TO SPEND \$1.2 BILLION ON DEVELOPING NUCLEAR INDUSTRY

Ukraine hopes to spend \$1.2 billion to develop its nuclear industry in order to supply nuclear fuel rods for its reactors. On 20 March 1995, a closed tender was announced by the State Committee on the Use of Atomic Energy. Plans currently are to build a fuel fabrication factory in Zhovti Vody.

—INFO-TASS, 3/20/95; "Nuclear Energy Safety Challenges In The Former Soviet Union: Panel Report," Center for Strategic and International Studies, Washington, DC, 1995.

13 February 1995

KIEV MAINTAINS THAT RUSSIAN NUCLEAR FUEL RODS ARE LOW-QUALITY

Ukraine is seeking suggestions from the international community as to how to lessen its dependence on Russian nuclear fuel rods, which Kiev maintains are low-quality. The 14 nuclear reactors in Ukraine provide up to 46 percent of the country's electricity supply during the winter.

—"Ukraine Wants to Build Nuclear Fuel Plant," Reuters, 13 February 1995.

12 February 1995

TO CREATE A CLOSED FUEL CYCLE WILL COST UKRAINE \$1.5 BILLION AND WILL TAKE 10-12 YEARS

First Deputy Chairman of Derzhkomatom Nur Nihatullin told INTERFAX that Ukraine is planning to enlist international assistance in its quest to develop a fuel fabrication facility in Ukraine. Companies from France, the United States, Germany, and Russia are competing for the contract. Mykhailo Umanets, Chairman of Derzhkomatom, stated that it should be possible for Ukraine to develop fuel production capabilities within five to six years. It would take Ukraine 10-12 years to create a complete closed fuel cycle, which would cost at least \$1.5 billion. Umanets suggested that fuel fabrication should take place at Zhovti Vody or at Dniprodzerzhynsk. A prominent Ukrainian physicist supports Ukraine's development of an indigenous fuel fabrication capability. Viktor Zelenskyi, of the Kharkiv National Institute of Physics and Technology, stated that all Ukraine needs from the West is financial assistance; he believes that if Ukraine uses Western processing technology, the fuel it would produce would be superior to Russia's.

— Interfax, 12 February 1995; in "Four Foreign Firms to Bid for Factory Project," FBIS-SOV-95-029, 12 February

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1995.; Victor Zamyatin, "Lots of Plans, but Not Enough Capability," *Kommersant-Daily*, 22 February 1995.; "Ukraine Should Produce Nuclear Fuel," *Ukrainian Weekly*, 12 February 1995, p. 2.

31 January 1995

UKRAINE'S STOCKPILE OF NUCLEAR RESOURCES WILL LAST FOR 150 YEARS

Mykhailo Pavlovskiy, Chair of the Verkhovna Rada Commission for Nuclear Policies and Nuclear Security, stated that since Ukraine possesses large uranium and zirconium reserves, it should work to develop its own nuclear fuel cycle. Ukraine's stockpile of the necessary resources should last for 150 years.

—UNIAN (Kiev), 31 January 1995; in "Commission Chairman Urges Nuclear Energy 'Concept'," FBIS-SOV-95-021, 31 January 1995.

January 1995

UKRAINE WILL CONTINUE TO PURCHASE ENRICHED URANIUM FROM RUSSIA

Representatives from the Atomic Energy Ministries of Russia and Ukraine reached an agreement under which Ukraine will continue to purchase enriched uranium in the form of fuel assemblies from Russia.

—Correspondence with Ukrainian nuclear official, January 1995.

24 November 1994

UKRAINE RECEIVES RUSSIAN FUEL BUT OFTEN TOO LATE

Mykhailo Umanets, chairman of the Ukrainian State Committee for the Use of Atomic Energy (Derzhkomatom), stated that Ukraine's nuclear fuel supply for the winter is provided for. Following Ukraine's ratification of the NPT, Derzhkomatom appropriated approximately 1 trillion karbovantsi (US\$7.7 million) for nuclear fuel purchases from Russia. However, Kostiantyn Hryshchenko, chief of the Directorate for Control Over Armament and Disarmament in the Ministry of Foreign Affairs, has stated that the fuel Ukraine is receiving from Russia is substandard and often delivered late.

—Alex Brall, "Ukraine to Receive Russian Fuel but Officials Criticize Quality," *Nucleonics Week*, 24 November 1994, p. 7.

17 November 1994

RUSSIA PROVIDED MORE FUEL ASSEMBLIES THAN PLANNED

According to Russian authorities, Russia has more than fulfilled its obligations to Ukraine under the Trilateral Statement, by providing 249 fuel assemblies, which is more than was originally planned. Since Ukraine ratified the NPT, Russia has no problems related to its fuel deliveries to Ukraine. Russia and Ukraine signed an agreement in 1/93 that mandates that Russia will deliver fuel to Ukraine for two years with an automatic extension for five years as long as Ukraine is pursuing nuclear disarmament.

—Interfax, 17 November 1994; in "Nuclear Fuel Supplies to Ukraine Ready to Continue," FBIS-SOV-94-223.

1 November 1994

UKRAINE GRANTED RIGHT TO IMPORT NUCLEAR MATERIALS

In accordance with the Russian-Ukrainian bilateral agreements—1/14/93 "On Scientific, Technical, and Economic Cooperation," and 1/3/93 "On the Reprocessing Of Nuclear Fuel," Ukraine was granted the provisional right to

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import nuclear materials. Ukraine had not yet signed an IAEA safeguards agreement at that time.

—Nikolai Steinberg, Presentation before the Committee on Defense and Military Policy of the Verkhovna Rada, 1 November 1994.

28 October 1994

CONFERENCE ON NUCLEAR FUEL AND INSURANCE ISSUES ORGANIZED IN KHARKIV

The Ukrainian State Committee on the Use of Atomic Energy organized a conference on nuclear fuel and insurance issues in Kharkiv. The Kharkiv Physical-Technical Institute, the American firm Westinghouse, and Arma, the Ukrainian insurance company were co-sponsors. Twenty Ukrainian organizations took part in the conference that dealt with issues such as nuclear fuel design, the nuclear fuel cycle, and nuclear power industry insurance; this marked the first time that insurance was discussed at a meeting of this nature. Ukraine is seeking to develop a closed nuclear fuel cycle, including the construction of a nuclear fuel fabrication plant with western financial and technical assistance.

—Nucnet News, No. 519/94, 28 October 1994.

21 October 1994

UKRAINE REQUESTS \$150 MILLION FROM UNITED STATES TO DEVELOP CLOSED FUEL CYCLE

Oleksandr Moroz, Chairman of the Verkhovna Rada, has stated that Ukraine seeks to develop a closed fuel cycle and told Assistant Secretary of Defense (sic) Gloria Duffy that Ukraine would appreciate a US contribution of between \$120-150 million for the project. Since the United States has both the personnel and technology to develop a complete fuel cycle, its assistance would make the process less time consuming and costly for Ukraine. US officials have reportedly stated that they will consider the request.

—UkrInform, 21 October 1994; in "Moroz Meets US Official on Nuclear Industry Aid," FBIS-SOV-94-211.

5 October 1994

PRESIDENT KUCHMA SPEAKS IN FAVOR OF CREATING NUCLEAR FUEL PRODUCTION FACILITY IN UKRAINE

President Kuchma, speaking at a Cabinet of Ministers' meeting spoke out in favor of creating a nuclear fuel production facility in Ukraine.

—[*Holos Ukrainy*, 5 October 1994, p. 1; in "Kuchma Favors Nuclear Fuel Production," FBIS-SOV-94-195.

19 August 1994

NO NEED FOR UKRAINE TO DEVELOP ENRICHMENT CAPABILITIES

Nikolai Steinberg contends that Ukraine does not intend to develop enrichment capability anytime in the foreseeable future. He also believes that, despite statements by some Ukrainian officials to the contrary, the development of reprocessing capability in Ukraine "is unthinkable in Ukraine's current economic situation." He notes that the world's major reprocessing centers—England, France, Japan, and Russia—already possess the capacity to reprocess the world's spent fuel and that to establish another center would be dangerous from a proliferation standpoint. Ukraine is the largest buyer of Russian uranium in the form of nuclear fuel since the United States passed anti-dumping legislation, effectively preventing Russia from selling large amounts of uranium in the United States.

—Interview with Nikolai Steinberg, Monterey, CA, 19 August 19/94.

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9 August 1994

INTERNATIONAL TENDER FOR FUEL PRODUCTION PLANNED FOR FALL 1994

Mykhailo Umanets, Chairman of the State Committee for Use of Atomic Energy, announced that Ukraine plans to produce fuel for its nuclear power plants. An international tender for the project is planned for Fall 1994. Fuel production would be undertaken at the Pridniprivsky Chemical Factory, the Skhidnyi Mining and Chemical Works, and the Pivdennotrubnyi Factory at Nikopol. Viktor Baryakhtar, Chairman of the Presidential Commission for Nuclear Policy, added that Ukraine has everything necessary to produce its own fuel, including large reserves of natural uranium and zirconium, which is used to make the fuel rod cladding that hold the fuel pellets. According to the Committee for Use of Atomic Energy's plan, Ukraine would not enrich the uranium itself, but rather would buy enriched uranium from abroad using natural uranium as payment. This enriched uranium would then be made into fuel rods.

—ITAR-TASS, 9 August 19/94, in "Government Plans To Make Own Nuclear Fuel," FBIS-SOV-94-154.; ITAR-TASS, 15 August 1994, in "Official On Nation's Uranium, Zirconium Supplies," FBIS-SOV-94-157.; "Ukraine Intends To Produce Its Own Nuclear Fuel," *Krasnaya Zvezda*, 11 August 1994, p. 1.

15 July 1994

UKRAINE HAS POTENTIAL TO ESTABLISH OWN FUEL CYCLE

The Parliamentary Commission for Nuclear Policy and Safety conferred with other government officials today on the problem of securing a reliable supply of nuclear fuel from Russia. It was determined that Ukraine has the scientific and technical potential to establish its own fuel cycle, and that the government needs to takes steps to bring the necessary resources together.

—"Ukraine: Nuclear Self-Sufficiency Planned," *Nucleonics Week*, 8/18/94, p. 14.

5 April 1994

SEVERAL ORGANIZATIONS DEMAND INVALIDATION OF FEBRUARY DIRECTIVE

A number of Ukrainian governmental and non-governmental organizations, including the Ministry of Environmental Protection and the Ministry for the Protection of the Population from the Chornobyl Aftermath, signed an appeal to Kravchuk demanding the invalidation of the February directive, on the grounds that it violates the rights to ecological, radiation, and nuclear safety, and does not comply with the International Covenant on Economic, Social, and Cultural Rights.

—UNIAN, 5 April 1994, "Ministries Demand Cancellation of Nuclear Directive," FBIS-SOV-94-067, 7 April 1994, p. 51.

23 February 1994

DIRECTIVE PROVIDES FOR COMPLETION OF NUCLEAR FUEL CYCLE

Ukrainian President Leonid Kravchuk signed a directive, "On Urgent Steps To Develop Nuclear Power And Complete The Nuclear Fuel Cycle In Ukraine." The directive provides for the introduction of four new nuclear reactors, the restart of Chornobyl's Unit 2, and the completion of the nuclear fuel cycle in Ukraine.

—UNIAN, 5 April 1994, "Ministries Demand Cancellation of Nuclear Directive," FBIS-SOV-94-067, 7/4/1994, p. 51.

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2 February 1994

SHORTAGES OF NUCLEAR FUEL COULD CLOSE DOWN SEVERAL NUCLEAR POWER PLANTS

Nuclear industry officials announced that severe shortages of nuclear fuel could close down several units at Chernobyl within a week and Ukraine's four other nuclear power plants within months. Fuel shortages have already slowed operations down; Chernobyl's Unit 3 and all of the units at Zaporizhzhya are operating at only 50 percent capacity.

—Alexander Tkachenko, "Chernobyl Could Begin Shutdown Within A Week," Reuters, 2 February 1994.

3 September 1993

RUSSIA AND UKRAINE SIGN AGREEMENT ON UTILIZATION OF NUCLEAR MILITARY SUPPLIES

"The Agreement between the Government of Ukraine and the Government of the Russian Federation on the Utilization of Nuclear Military Supplies" was signed. Article 3 outlined that Russia will supply Ukraine with fuel assemblies for its nuclear power plants as long as Ukraine puts its nuclear activities under IAEA safeguards. Article 4 outlines the parties responsible for the fulfillment of this agreement: for the Ukrainian side, the Ministry of Defense and the State Committee for the Use of Atomic Energy. Article 6 states that this Agreement is to stay in effect 30 years from the day of signing, unless the two sides agree in writing otherwise.

—From the text of "Soglashenie Mezhdru Pravitelstvom Ukrainy i Pravitelstvom Rossiyskoy Federatsii Ob Utilizatsii Yadernykh Boezaryadov," signed 3 September 1993.

July 1993

UKRAINE NEEDS REPROCESSING FACILITIES, IS UNABLE TO ENRICH URANIUM

Goskomatom Chairman Mikhailo Umanets said Ukraine needs to create a closed fuel cycle. Umanets rejected the idea of Ukraine developing the ability to enrich uranium, but stressed the need for reprocessing facilities. By 1998, he also expects Ukraine to have upgraded its zirconium production facilities at the Pridnepriivskiyi Chemical Factory at Dniprodzerzhynsk and to have a domestic uranium oxide pellet and fuel assembly production center. Currently, uranium oxide fuel production only takes place at Ust-Kamenogorsk (Kazakhstan) in the form of fuel pellets and Elektrostal (Russia) in the form of fuel rods and assemblies. Ukraine apparently has abandoned plans to develop an indigenous enrichment facility because it realized that it could not compete with Western plants due to, among other problems, a lack of expertise and high construction costs.

—Mark Hibbs, "Kiev to Finance RT-2 Construction, Take Back PU and HLW, Minatom Says," *Nucleonics Week*, 19 July 1993, pp. 12-13.

1 June 1993

HIGH RUSSIAN FUEL PRICES WILL LEAD TO EXPANSION OF UKRAINIAN NUCLEAR INDUSTRY

The Ukrainian nuclear power industry is finding it difficult to afford fuel. In a speech to the Supreme Rada, Prime Minister Leonid Kuchma lamented the "near world-market prices" Russia is now charging for its nuclear fuel. This action provides impetus for both energy independence and the drive to expand the nuclear industry, since natural uranium is abundant in Ukraine and could be exploited if the industry expanded with CANDU reactors.

—*Nuclear News*, July 1993, p. 48.

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19 February 1993

UKRAINE PLANS TO CONSTRUCT ENRICHMENT AND WASTE FACILITY

Ukraine maintains that it has plans to construct its own enrichment and waste facilities and will hold an international competition for the best design.

—THE ARMS CONTROL REPORTER, Institute for Defense and Disarmament Studies, March 1993, in "Update on Former Soviet Nuclear Weapons Facilities-Enrichment: Ukraine," FBIS-SOV-93-032, 19 February 1993.

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Contamination: 1997-1993

25 July 1997

UNIT 3 REPAIRS SUSPENDED UNTIL OCTOBER 1997

Unit 3, the last operational reactor at the Chernobyl NPP, will remain idle until October 1997. Seventy fuel channels within the reactor are in need of replacement, and the plant has only 25 percent of the parts required to complete the repairs. Since January 1997, little financing for the projects involving the sarcophagus and Units 1 and 2 has materialized. Plant Director Serhiy Parashin opposes permanently closing Chernobyl NPP merely because Ukraine has survived this temporary interruption of all power from Chernobyl. He believes that insufficient funding and the resulting loss of control over the power plant will have "dreadful consequences." Parashin also believes that somehow funds for servicing Unit 1 and 2 and plant financing were mislaid in the state budget approval process.

—ITAR-TASS, 25 July 1997; in "Chernobyl Plant Repairs Suspended Until October," FBIS-SOV-97-206.

21 July 1997

LAST REACTOR AT CHORNOBYL SHUT DOWN FOR REPAIR

The last operating 1,000 MW reactor at the Chernobyl nuclear power station was shut down on 21 July 1997 for intermediate overhaul and routine maintenance. Originally expected to be out of commission for only 70 days, Unit 3 may now stay idle for months. Borys Kutsenko, responsible for the centralized repair and maintenance facility at Chernobyl, asserts that maintenance may take longer than expected because of "weak logistical support" and the unavailability of vital Russian-made spare parts and equipment. The station has only 25 percent of the replacement materials it needs to complete the overhaul. The most important tasks, according to Kutsenko, involve the replacement of pipelines, thermal equipment, and fuel channels. The closure of Unit 3, however, undermines Ukraine's negotiating position with respect to postponing the closure of the entire Chernobyl facility if foreign aid for shutdown does not materialize.

—UNIAN, 21 July 1997, in "Ukraine: Sole Operational Chernobyl Reactor Shut Down for Overhaul," FBIS-SOV-97-202, 21 July 1997.; Sander Thoenes, "Last reactor shut for repair," *Financial Times*, 23 July 1997, p. 2.

20 June 1997

G-7 TO CONTRIBUTE \$300 MILLION TOWARDS CHORNOBYL SAFETY

In an economic statement drawn up at the Group of Seven Summit, which took place in Denver, Colorado, from

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20-22 June 1997, leading industrial nations disclosed their intention to dedicate \$300 million towards enacting the Shelter Implementation Plan (SIP), which will repair the existing sarcophagus. Officials from Ukraine and a group of Western experts from the EU, EBRD, G-7, and the World Bank initially agreed on the project during a series of meetings on 23-24 April 1997. The SIP agreement finally put to rest the controversial proposal to construct a second cover over the sarcophagus. The agreement includes 22 integrated projects to reinforce the short term safety and stability of the existing sarcophagus structure. Looking further ahead, the Ukrainians hope the SIP will lead to the extrication of fuel-containing materials from within the ruins. Carol Kessler, head of the G-7 nuclear safety panel, expects the SIP, estimated to cost \$780 million and continue until at least 2005, to be a cost-effective approach to dealing with the presently hazardous situation at Chornobyl-4. Although the G-7 commitment falls short of the necessary \$780 million, a source from a G-7 country noted that over the next ten years, there will be time to raise the remaining necessary funds. At the summit, the G-7 leaders invited both private and public entities to take part in a "pledging conference" in the fall of 1997. Countries without nuclear programs have already expressed charitable interest, an unexpected development. Also, Ukraine is committed to contribute \$100 to \$150 million in materials and personnel towards the SIP. G-7 leaders requested that Boris Yeltsin also contribute, but his answer was not yet forthcoming. The statement also noted that these funds are not a part of the roughly \$1 billion previously committed under the December 1995 MoU, but failed to discuss the problems surrounding the release of \$800 million in EBRD loans Ukraine needs to complete replacement power reactors at Rivne-4 and Khmelnytsky-2.

— "Nations pledge \$300 million to Chernobyl safety project," *Nuclear News*, August 1997, p. 31.; "Chernobyl sarcophagus to be maintained," *Nuclear News*, June 1997, pp. 48-49.; Ann Maclachlan, "G-7 Funds Chernobyl Shelter Fix, Replacement Power Stays in Limbo," *Nucleonics Week*, 26 June 1997, pp. 12-13.

18 May 1997

UNIT 3 SHUT DOWN BY CHORNOBYL SAFETY SYSTEM

Chornobyl management is examining why the transformer powering Chornobyl-3 shut down on 18 May 1997. At 12:40 pm (0940 GMT), twenty seconds after employees finished repairs to rechannel electricity to the reactor, the transformer turned itself off. Immediately after the power to the turbogenerators ceased, an automatic safety system took the reactor off line and put it into cooling mode. Valery Idelson, Chornobyl's Kiev spokesman, pointed out that they do not always know why a mechanism may turn itself off. Idelson added that the performance of the safety system was flawless, "preventing any possible consequences." There were no injuries, and the radiation levels at Chornobyl did not increase. Operators expect Unit 3 to be back on line in three days.

—"Ukraine Nuclear Reactors Shut Down," *Washington Post*, online edition, 19 May 1997.; AFP, 19 May 1997; in "AFP: Incidents at Chernobyl, Zaporozhch Nuclear Plants," FBIS-SOV-97-139.; Interfax, 19 May 1997; in "Chernobyl's Remaining Power Unit Closed Down," FBIS-SOV-97-139.

20 April 1997

WESTINGHOUSE SAFETY PROJECT BEGINS

The Westinghouse project management team began nuclear safety improvements at the Chornobyl NPP on 20 April 1997, in accordance with the January 1997 contract that Westinghouse and Chornobyl signed. The ECU 8.7 million (\$9.9 million) contract with Westinghouse and subcontractors Energoprojekt of Ukraine and NNC of Britain

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comes from a ECU 118 million (\$147 million) Chernobyl aid grant initially agreed upon by Ukraine and the EBRD in November 1996, and later ratified on 18 March 1997 by the Ukrainian parliament. The grant, funded through the EBRD's Nuclear Safety Account (NSA), represents the first part of a greater \$350 million assistance package for the decommissioning of Chernobyl. The funding will go towards obtaining bids for Unit 3 safety improvements and construction of nuclear waste storage and liquid nuclear waste processing facilities.

—Interfax, 21 April 1997; in "Ukraine: Chernobyl Safety Improvement Project Begins 20 April," FBIS-TEN-97-005.; "An Agreement Between the EBRD and Ukraine...," *Nuclear News*, December 1996, pp. 17-18.

8 April 1997

KOSTENKO WARNS OF DECLINING SAFETY AT CHORNOBYL

On 8 April 1997, Minister of Environment and Nuclear Safety Yuriy Kostenko warned the Ukrainian parliament about recent deteriorations in the safety of the sarcophagus as a result of moisture build-up, unstable structures, and inadequate monitoring and emergency plans. He also stated that Chernobyl could not operate without the installation of a "multifunctional safety system," enhancements in the reactor control and protection system, and guarantees of shutdowns in emergencies. Kostenko believes that safety at all Ukrainian power plants is insufficient, due to a lack of financing, and that urgent steps are needed to ensure future operation. According to Kostenko, the safe operation of Ukrainian nuclear power stations requires advanced nuclear legislation, a practical infrastructure for state regulation of the industry, and indigenous nuclear fuel production capabilities.

—Interfax, 4 April 1997.

28 April 1997

G-7 AGREES TO REMOVAL OF SPENT FUEL FROM CHORNOBYL-4 SARCOPHAGUS

Carol Kessler, head of the G-7 delegation for Chernobyl closure, met with Ukrainian Minister of Environmental Protection and Nuclear Safety Yuriy Kostenko and disclosed that G-7 countries are prepared to help Ukraine remove spent nuclear fuel from the damaged Chernobyl-4 sarcophagus. Kessler indicated that one option for removing the spent fuel could involve the use of US robot technology developed to help clean up the Three Mile Island nuclear power plant after the nuclear accident there in 1979.

—UNIAN, 1/28/97, in "Ukraine: Ministry Notes G-7 'Change Of Heart' At Chernobyl Talks," FBIS-SOV-97-019, 1/28/97.

30 November 1996

INTERNATIONAL CONFERENCE ON CHORNOBYL SAFETY ENDS IN SLAVUTYCH

It was reported that an international conference on Chernobyl safety issues ended in Slavutyich. The conference participants discussed the project to construct a second sarcophagus over the existing one. However, neither the draft plan of this project nor its timetable were approved at the conference. According to preliminary information, the plan called for constructing a suspension structure over the old sarcophagus which would provide reliable protection against radiation releases from the destroyed Unit 4. The plan also called for creating a tunnel through the walls of the sarcophagus through which approximately 200 tonnes of nuclear waste could be removed.

According to deputy general director of the Chernobyl NPP Valentyn Kupnyy, the Ukrainian government has not made the decision to construct a second cover over the present sarcophagus due to the high cost of the project.

—NTV, 11/30/96; in "Chernobyl Director Says Shutdown Decision May Not Be Final," FBIS-SOV-96-232, 11/30/96.

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29 November 1996

DERZHKOMATOM OKAYS OPENING OF CHORNOBYL-2 IN 1997

The Ukrainian State Committee for the Use of Atomic Energy (Derzhkomatom) issued a regulation permitting the restart of Chornobyl-2 in late 1997. A plant spokesman gave these reasons for possibly restarting the unit: Ukraine's current energy crisis to be aggravated by the 11/30/96 closure of Chornobyl-1 and the opportunity to use the qualified which formerly worked at Unit 1. According to one proposal, unit-2 is to go on-line until 2000 once repairs and safety upgrades, estimated at \$280 million, are made. Though some repair work was done at the turbine hall shared by Units 1,2, hardly any safety improvements have been made at Unit 2, since a 1991 fire forced its closure. However, Deputy Chairman of Derzhkomatom V. Hryshchenko said that safety checks in 1996 reported the condition of Unit 2 fuel channels as "good." Work on unit-2 re-start is to be financed from the state budget.

—ITAR-TASS, 29 November 1996; in "Committee Sanctions Opening Of Second Chernobyl Reactor," FBIS-SOV-96-232, 29 November 1996.; Ann MacLachlan, "Chernobyl Managers Want To Reopen Unit 2 To Offset Unit 1 Shutdown," *Nucleonics Week*, 21 November 1996, p. 16.; "Plan Unveiled For Chernobyl-2 Restart," *NucNet*, 11/29/96, www.aey.ch.; "Restart Of Chernobyl Unit 2 Sought By Plant Authorities," *Post-Soviet Nuclear & Defense Monitor*, 11/25/96, p. 12

28 October 1996

UKRAINIAN FIRM PROPOSES WAY TO DEAL WITH DAMAGED UNIT 4

The Ukrainian firm Kolo, based in Kryvyy Rih, has proposed burying Chornobyl's damaged Unit 4 some 450-500 meters underground at a cost of \$600 million. The proposal was submitted to the Ukrainian Parliament's Commission on Nuclear Policy and Safety and is claimed to be a cheaper and more effective solution than a plan submitted by the international consortium Alliance, which has offered to construct a new cover over the original sarcophagus at a cost of between \$1.3 and \$1.6 billion. It is expected that the existing sarcophagus over Unit 4 will not last longer than 10-15 years, which is only half of its projected service life.

—"Ukrainian Firm Proposes to Bury Damaged Chernobyl Reactor," *Post-Soviet Nuclear & Defense Monitor*, 10/28/96, p. 9.

21 October 1996

UKRAINIAN AND GERMAN NUCLEAR EXPERTS DRAFT NUCLEAR SAFETY PROGRAM

Nuclear experts from the Ukrainian Ministry of Environmental Protection and Nuclear Safety and the German Nuclear Safety Society have drafted a program for nuclear safety cooperation. According to First Deputy Minister of Environmental Protection and Nuclear Safety Oleksandr Smyshlyayev, the program includes two major projects—the nuclear safety training of Ukrainian specialists and increasing cooperation in completing research on the condition of the sarcophagus at Chornobyl. Under the agreement, German experts will participate in a study of the safety of the sarcophagus under the auspices of the Ukrainian National Research and Technological Center for Nuclear Safety at Chornobyl. According to UNIAN, German participation will increase the authority of the Chornobyl Nuclear Safety Center, which is expected to become an international center for nuclear safety. It is expected that the German-Ukrainian nuclear safety program will be signed by high officials from the Ukrainian

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Ministry of Environmental Protection and Nuclear Safety and by their German counterparts in the middle of 11/96.
—UNIAN, 10/21/96, in "Ukrainian, German Experts Draft Nuclear Safety Program," FBIS-SOV-96-205, 10/21/96.

3 October 1996

RAIN WATER BELIEVED TO BE THE CAUSE OF INCREASED NEUTRON FLUX READINGS IN THE SARCOPHAGUS

According to head of the Chernobyl NPP information center Valeriy Edelson, an expert commission studying the causes of a neutron flux increase registered by instruments inside the sarcophagus came to the conclusion that the most probable cause for the elevated reading was rain water leaking inside the sarcophagus and affecting the monitoring equipment. Rain water may also be affecting the nuclear fuel remaining under the sarcophagus, which might have led to increased neutron flux. According to a 9/20/96 report by the Commission, the increased neutron flux readings in the sarcophagus may indicate the emergence of a chain reaction in the remaining nuclear fuel. However, the Commission found that no changes occurred in the background radiation inside or outside of the sarcophagus since the beginning of 9/96. Although the Commission admitted that the monitoring system and the sarcophagus need improvements, Edelson denied media reports alleging that new equipment had been installed at the sarcophagus. According to Edelson, it is impossible to purchase and install the equipment in such a short time.
—Mikhail Melnik, ITAR-TASS, 10/3/96, in "Increasing Chernobyl Neutron Flow 'Caused by Rain Water'," FBIS-SOV-96-194, 10/3/96.; UNIAN (Kiev), 9/20/96, in "Chernobyl Commission Says Incidents May Never Be Explained," FBIS-SOV-96-185, 9/20/96.; Interfax, 9/26/96, in "Atomic Energy Spokesman Denies Chernobyl Accident Threat," FBIS-SOV-96-188, 9/26/96.; "Chernobyl Reactor to be Shut Down," UPI, 10/28/96.

25 September 1996

KOSTENKO'S STATEMENT ON CHORNOBYL INCIDENTS CRITICIZED

On 9/24/96, Ukrainian Minister of Environmental Protection and Nuclear Safety Yuriy Kostenko made an open statement warning of a possible explosion in the sarcophagus over Chernobyl's Unit 4. According to Kostenko, the three recent increases in neutron flux and gamma radiation registered on 9/12/96, 9/16/96, and 9/19/96 signaled a possible nuclear chain reaction that could produce an explosion in Unit 4. Ukrainian authorities, including Ukrainian President Leonid Kuchma, have openly criticized Kostenko's statement. Ukrainian National Security Council Secretary Volodymyr Horbulin doubted Kostenko's assessment that neutron flux increasing inside the sarcophagus signaled a potential chain reaction. According to Chernobyl plant director Serhiy Parashin, there has been no increase in background radiation inside or outside the sarcophagus. Parashin said torrential rains had seeped under Unit 4 causing a malfunction in the instruments, which registered high increases in neutron flux inside the damaged reactor. The Ukrainian government commission, which was set up to conduct an investigation on these incidents, produced a preliminary report on 9/26/96, stating that the three recorded increases in neutron emissions in Unit 4 were not accompanied by increases in background radiation levels. Commission Chairman Viktor Chebrov, who is also Chairman of the State Committee for the Use of Atomic Energy (Derzhkomatom), said that the incidents do not pose a significant nuclear threat nor a threat to the sarcophagus. Nevertheless, neither Chebrov nor Horbulin completely ruled out the potential danger of these incidents to the sarcophagus. In general, the Ukrainian officials doubted that the sarcophagus over Unit 4 could possibly collapse due to these particular neutron emissions. According to Ukrainian and Western news agencies, Ukrainian President Leonid Kuchma pointed out that due to the uncertainty over the condition of the sarcophagus, the neutron emission incidents will

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prompt him to press the G-7 at a 10/11/96 meeting between the G-7 and Ukraine to speed the program of funding the construction of a new shelter for Unit 4.

Russian nuclear experts and government officials generally consider Kostenko's statement ungrounded and political rather than strictly professional. Many Russian nuclear specialists believe that the elevated readings appeared due to faulty instruments made worse by rain water running through holes in the sarcophagus. According to Georgiy Kaurov, Head of the Public Relations Department of the Russian Ministry of Atomic Energy (Minatom), the service lives of all gamma-radiation, neutron-flux, temperature, and humidity instruments inside the sarcophagus have expired and cannot be trusted. Kaurov said that there is no danger of a chain reaction or nuclear explosion in Unit 4, and added that the sarcophagus will survive for additional 10 years. Russian nuclear experts and officials suspect that by exaggerating the nuclear incident inside the Unit 4 sarcophagus, Kostenko and other Ukrainian officials are attempting to repeatedly highlight the problem of Chornobyl in order to speed up the disbursement of \$3 billion in financial aid from the G-7. According to Russian officials and experts, the Ukrainian overreaction on the neutron flux accident is no coincidence in view of the coming 10/11/96 working meeting between the G-7 and Ukraine. Reportedly, Western experts think that another explosion at Unit 4 is unlikely, although a full explanation for these radiation increases may never be found.

—UNIAN , 9/24/96, in "Minister: Chain Reaction Could be Taking Place in Chornobyl," FBIS-SOV-96-187, 9/24/96.; Chrystyna Lapychak, "Reaction to Warning of Possible Explosion at Chornobyl," OMRI Daily Digest, 9/26/96.; Chrystyna Lapychak, "Update on Chornobyl Neutron Leaks," OMRI System Search, <http://solar.rtd.utk.edu:81>.; "A Rise in Radiation Readings Reported at Chornobyl Plant," *Ukrainian Weekly*, 9/22/96, p. 2.; Interfax , 9/26/96, in "Chernobyl Diagnostic systems No Longer Work," FBIS-SOV-96-188, 9/26/96.; Zakhar Butyrskiy, "Ukrainskiye ofitsialnyye litsa vnov zagovorili o vozmozhnosti vzryva na Chernobylskoy AES," *Segodnya*, 9/26/96, p. 1.

19 September 1996

THREE INCREASES IN NEUTRON FLUX REGISTERED INSIDE THE SARCOPHAGUS

According to information provided by the Information Center of the Nuclear Regulation Administration at the Ukrainian Ministry of Environmental Protection and Nuclear Safety, on 9/12/96, two of the 10 instruments situated in one of the chambers of the sarcophagus registered increased neutron flux levels. Similar increases were registered by three of the 10 instruments inside the sarcophagus on 9/16/96 and 9/19/96. The instruments showed neutron readings five to 110 times as high as normal, which could indicate the emergence of a nuclear chain reaction from the remains of the nuclear fuel. In all three cases, the readings returned to normal after a while. In the first two cases, personnel were evacuated from the area around the damaged reactor, although no increase in radiation level outside the sarcophagus was detected. An expert commission was formed on 9/17/96 to look into the causes of the incidents.

—UNIAN , 9/17/96, in "Incident at Chernobyl Sparks Fear of Nuclear Chain Reaction," FBIS-SOV-96-182, 9/17/96.; ITAR-TASS, 9/19/96, in "Scientists Baffled by Increased Neutron Flow at Chernobyl," FBIS-SOV-96-184, 9/19/96.; UNIAN , 9/24/96, in "Minister: Chain Reaction Could be Taking Place in Chornobyl," FBIS-SOV-96-187, 9/24/96.; "Chernobyl Reactor to be Shut Down," UPI, 10/28/96.

1 September 1996

SAFETY EXERCISE HELD IN 30-KM CHORNOBYL ZONE

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The Ukrainian State Center for Emergencies and Technical Support conducted a planned exercise in the 30-km Chornobyl exclusion zone to practice the implementation of urgent safety measures to effectively deal with any emergency situations that might occur during the transportation of nuclear fuel across Ukrainian territory.

—Radio Ukraine, 9/1/96, in "Accident Exercises Held in Chornobyl Exclusion Zone," FBIS-SOV-96-171, 9/1/96.

27 August 1996

CHORNOBYL URANIUM THIEVES SENTENCED

Three Chornobyl NPP workers, Igor Kabachenko, Viktor Tsvetkov, and Mikhail Bobyrev, along with the director of the local trade firm Asket, Nikolay Kolesnikov, were found guilty by the Kiev Regional Court on charges of polluting the environment and engaging in illegal foreign exchange transactions. Kabachenko, Tsvetkov, Bobyrev, and another man, Shumakov, on the run as of 8/17/96, stole approximately 5.3 kg of fresh LEU nuclear fuel from inside the sarcophagus encasing the destroyed Unit 4, and sold it for \$2,100 to Kolesnikov, who had offered \$6,000 for 10 kg of uranium. Kolesnikov had arranged, through several middlemen, to sell the uranium to Konstantin Nikolayevich Gladkov, who claimed to represent an unspecified Arab firm interested in buying 10 to 100 kg of uranium. While *Izvestiya* reported that Gladkov apparently worked for the Ukrainian authorities, Kiev Regional Court Judge Valentina Kuzmenko later stated that these reports were unsubstantiated. The Ukrainian Security Service raided the exchange and arrested all parties but Gladkov, who disappeared. The middlemen, Valeriy Kurochkin of Avialinii Ukrainy, Major Potylchak of the Kiev Infantry Institute, and Viktor Korchevnyy of the Popelnyanskaya military unit, served as trial witnesses but have not been charged. For more information on smuggling and illicit transactions, see the NIS Illicit Nuclear Trafficking Database.

—Zakhar Butyrskiy, "Pokhititelyam urana s ChAES vyneseny prigovory," *Segodnya*, 8/31/96, p. 5.; Yanina Sokolovskaya, "Samoubiytsy: Chto zastavilo rabotnikov Chernobyl'skoy AES dobyvat' uran iz razrushennogo reaktora," *Izvestiya*, 8/17/96, p. 6.; NTV "Segodnya" newscast, 10/26/96, in "Chernobyl Workers Arrested Trying To Sell 5.5 kg of Uranium," FBIS-SOV-96-209.

29 July 1996

BOUTROS-GHALI URGES ASSISTANCE TO UKRAINE, OTHERS

U.N. Secretary-General Boutros Boutros-Ghali signed an "Appeal to States Members of the United Nations on the tenth anniversary of the accident at the Chornobyl nuclear power plant." Boutros-Ghali appealed to U.N. member states to intensify their assistance to Belarus, the Russian Federation and Ukraine to help them deal with the consequences of the Chornobyl accident.

—"Appeal to States Members of the United Nations on the tenth anniversary of the accident at the Chernobyl nuclear power plant," in INFIRC/519, "Communication of 18 June 1996 Received From The Permanent Mission of Belarus To The International Atomic Energy Agency" 7/29/96.

4 July 1996

INCIDENT OCCURRED DURING SCHEDULED REPAIRS

According to the Chornobyl nuclear plant's public relations spokesman Mykhailo Bohdanov, the 6/28/96 radiation leak occurred during scheduled repairs at Unit 1 which required examination of internal parts of the reactor. An increased radiation level was detected in the main hall which required suspension of the repairs and immediate decontamination of internal areas. There were no violations of operational procedure discovered. Reportedly, no

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personnel were affected by radiation and no damage to the environment was caused. The radiation level in the unit's halls did not exceed the norms stipulated for such accidents. After the decontamination of the area in question was completed, scheduled repairs were resumed, said Bohdanov.

—M. Bohdanov, *Uryadovyy kuryer*, 7/4/96, p. 1; in "Chornobyl Officials Explains 28 June Incident," FBIS-SOV-96-131, 7/4/96.

28 June 1996

RADIATION LEAK AT CHORNOBYL'S UNIT 1: INES—0

There was a small radiation leak in a corridor of the main room of the Chornobyl's Unit 1. According to the station's nuclear engineer Halina Nosach, the incident occurred when the station's staff were monitoring the interior of the reactor using TV cameras. The incident was rated zero on the INES international scale of nuclear accidents. As a result of the leak, the radiation level in the main room's corridor became at levels five times higher than normal. This leak was the second one in two weeks at the Chornobyl station. There was also a small fire accident at Unit 3 two weeks beforehand.

—"Minimal Radiation Leak at Chornobyl," Reuters News Media, 7/1/96, p. 1.

7 June 1996

CHINA HELPS LIQUIDATE CONSEQUENCES OF CHORNOBYL ACCIDENT

China and Ukraine signed a document on China's provision of over \$120,000 to help cope with the consequences of the Chornobyl accident.

—Xinhua, 6/7/96, in "PRC: Beijing Signs Aid Agreement With Ukraine For Chornobyl," FBIS-CHI-96-112, 6/8/96.

27 April 1996

CHORNOBYL DAMAGE TO EUROPEAN COUNTRIES IS \$20 BILLION

According to Professor Aleksey Yablokov, Russian ecologist and chairman of the Russian Center for Ecological Policy, damage to European countries caused by the Chornobyl accident amounts to approximately \$20 billion.

—Aleksandr Annin, "Aleksey Yablokov: 'Chornobyl Is Forever'," *Kuranty*, 4/27/96, p. 5; in "Russia: Yablokov Faults Nuclear Summit," FBIS-SOV-96-133-S, 4/27/96.

26 April 1996

CHORNOBYL CENTER FOR NUCLEAR SAFETY ESTABLISHED

Ukrainian President Leonid Kuchma issued a decree establishing the Chornobyl center for nuclear safety, radioactive waste, and radio-ecology and appointing Valeriy Glygalo as the center's director. (See ++Ukraine: Administrative Bodies+ for more information.) The center will be involved in all activities related to the development of international scientific research aimed at eliminating the aftermath of nuclear accidents, closure and decommissioning of nuclear facilities, facilitating environmental protection and rehabilitation from radioactive fallout and leaks. The Ukrainian Cabinet was advised to assume responsibility over issues involving the establishment and financing of the center. The operation of the center will also involve the participation of the Ministry for Protection Against the Aftermath of the Chornobyl Nuclear Disaster, the Ministry for Environmental Protection and Nuclear Safety, the Ukrainian State Committee for Nuclear Energy Utilization, the State Committee for Scientific, Technological, and Industrial Policies, the Ukrainian Academy of Sciences, and other institutions and

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bodies. President Kuchma requested that Foreign Minister Hennadiy Udovenko urge foreign governments and international organizations to participate in the center's activities and support them financially.

—UKRINFORM, 5/6/96, in "Ukraine: Kuchma Creates Chornobyl Center for Nuclear Security, FBIS-TEN-96-006, 5/6/96.; *Holos Ukrainy*, 4/26/96, p. 3.

24 April 1996

RADIATION LEAK AT CHORNOBYL NPP: INES—1

There was a small radiation leak at the Chornobyl NPP when air filters from a pump in the sarcophagus were changed. The old filters were left in a room by Unit 3 and as a result background radiation levels rose seven times above regulatory limits in four rooms. The incident rated a 1 on the INES.

—"Small Radiation Release At Chornobyl," Reuters, 4/25/96.

19 April 1996

OFFICIAL ADMITS CHORNOBYL REACTORS FLAWED

For the first time a top-ranking Ukrainian official, President Leonid Kuchma, has admitted that the Chornobyl reactors are flawed in terms of their construction.

—Ron Popeski, "Ukraine's Kuchma Admits Chornobyl Reactor Flaws," Reuters, 4/19/96.

10 April 1996

CHORNOBYL REACTORS' WATER-COOLING SYSTEMS ARE DANGEROUS

Reportedly, a secret US Department of Energy study concluded that the Chornobyl reactors are dangerous because of defects in the design of their emergency water-cooling systems. It also said that the state of the site is now worse than it was prior to the 4/26/96 accident.

—"Moscow Rejects Nuclear Safety Charges," *The Monitor*, 4/10/96.; Adrian Bridge, "Agency Urges Closure Of Risky Reactors," *The Independent*, 4/11/96.

7 April 1996

DELEGATES OF OREL SEMINAR DECIDE NOT TO CLOSE CHORNOBYL POWER STATION

A delegation from the Ukrainian parliament participated in the CIS-sponsored seminar "Radioactive Safety Problems in CIS countries" held in Orel (Russia). Parliamentary representatives of the CIS countries, who met at the seminar within the framework of the CIS Interparliamentary Assembly, called on their national governments and parliaments to develop a specific CIS legislation dealing with economic and social problems created in CIS countries by the Chornobyl disaster. In a joint statement, the representatives of CIS parliaments emphasized that the Chornobyl power station should not be closed until all potential social, economic and environmental problems, that could result from the shutdown are resolved.

—Volodymyr Koroliuk, "Aby Ne Povtorylasya Chornobylska Bida," *Holos Ukrainy*, 4/9/96, pp. 1, 3.; "Parlamenti Ukrainy, RF, Belorussii Prizvali Mirovoye Soobshchestvo Kompleksno Reshyt' Problemu Chornobylia," 4/17/96.

4 April 1996

SERVICE LIFE OF THE SARCOPHAGUS WILL NOT EXCEED 15 YEARS

At a news conference, Minister of Environmental Protection and Nuclear Safety Yuriy Kostenko reported that the

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service life of the sarcophagus would not exceed 15 years and that in 5 years Unit 4 "will look like an active volcano."

—ITAR-TASS, 4/4/96, in "Ukraine: Ukrainian Officials Warn Of Chornobyl Dangers, Urge West To Help," BBC Monitoring Service, 4/12/96.

22 March 1996

RISK OF ACCIDENTS REMAINS HIGH

The French and German institutes for nuclear safety and protection said in a joint statement that the risk of grave incidents and accidents at RBMK reactors remains high in Ukraine and other FSU states.

—"Chornobyl Still A Risk, European Reports Say," *International Herald Tribune*, 3/22/96.

20 March 1996

ANOTHER NUCLEAR CATASTROPHE POSSIBLE AT UNIT 4

Yuriy Kostenko, Minister of Environmental Protection and Nuclear Safety, reported that the condition of the sarcophagus around Unit 4 could lead to another nuclear catastrophe. He added that the sarcophagus was successful as a temporary measure, but in no way can be considered a permanent structure. Western experts at a meeting in Vienna warned that a collapse could release radioactive dust which would be concentrated in the 30-km restricted zone.

—Stanislav Prokopchuk, "Sarkofag Mozhet Vzorvatsya," *TRUD*, 3/20/96, p. 1.; "Work Needed At Chornobyl To Avert Leaks," *Reuters*, 4/3/96.

12 March 1996

CRACKS IN SARCOPHAGUS AROUND UNIT 4

A scientist from Kiev State University, Heorhiy Belyavskiy, warned that there are cracks in the sarcophagus around Unit 4 which are allowing radioactive gas, water, and dust to escape.

—"Drevniye sarkofagi ponadezhnee byli," *Rossiyskaya gazeta*, 3/12/96, p. 1.

28 March 1996

CONTAMINATION CONTROL ALMOST NONEXISTENT AT CHORNOBYL

According to a western expert who has visited the Chornobyl NPP, contamination control is virtually non-existent. According to the expert, there is only a wet towel for people to wipe their feet as they go from the reactor hall to the "tea-room." There are no personal radiation monitors in the reactor hall.

—"Cover-up At Chornobyl," *Foreign Report*, 3/28/96.

March 1996

\$2.75 MILLION FOR INDIVIDUALS AFFECTED BY CHORNOBYL DISASTER

The European Commission designated \$2.75 million for individuals affected by the Chornobyl disaster. The money will go to residents of Ukraine, Belarus, and Russia.

—"Informatsiya," *Yadernyy kontrol*, 3/96, p. 8.

22 February 1996

50 KG OF FUEL MAY BE RELEASED INTO THE ATMOSPHERE

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The sarcophagus around Unit 4 is in precarious shape and urgent action is needed to stabilize it, according to Aleksandr Borovoy of Russia's Kurchatov Institute in a report to the IAEA. The main defects include questionable stability of the supports of the upper beams and over 1000 square meters of holes in the sarcophagus' roof and walls. He warned of a worst-case collapse in which five tons of dust with approximately 50 kg of fuel could be released into the atmosphere in a large cloud.

—Gamini Senevirante, "Russian Expert Warns Of Danger Chornobyl Coffin Could Collapse," *Nucleonics Week*, 2/22/96, pp. 15-16.

19 February 1996

REBUILDING SARCOPHAGUS WILL COST \$1 BILLION

Yuriy Kostenko reported that a feasibility study estimated the cost of rebuilding the sarcophagus around Unit 4 at approximately \$1 billion. According to Kostenko, the current sarcophagus will last only another 10-15 years. There are 200 tons of fuel and 3000 tons of water located at Unit 4.

—UNIAN, 2/20/96.; Chrystyna Lapychak, "Ukrainian Official Gives Chornobyl Sarcophagus 10-15 Years," OMRI Daily Digest, 2/18/96.

13 February 1996

CENTER FOR NUCLEAR AND RADIATION SAFETY PLANNED

According to a UNIAN report, Germany intends to allocate DM 4 million for the formation of an international research and development center for nuclear and radiation safety. THE WEEK IN GERMANY reported that Germany will provide DM 3 million a year for his project. German Federal Minister of the Environment Angela Merkel stated that the project is expected to run for three years and will involve 100 scientists from affected countries. The United States intends to allocate \$3 million, and Italy, France, and Japan have all expressed interest in this center.

—UNIAN, 2/13/96.; "Merkel Announces New Aid Projects For Chornobyl," *The Week in Germany*, 3/1/96, p. 5.; "V techenie dvukh blyzhayshikh," Zelenyy mir, No. 5, 1996, p. 3.

18 January 1996

GERMANY TO PROVIDE SAFETY, TECHNICAL IMPROVEMENTS

According to Adolf Birkhofer, the director of the German consultancy Gesellschaft fuer Anlagen und Reaktorsicherheit mbh(GRS), Germany should assist Ukraine with short-term (4-5 years) safety and technical improvements and backfits to Chornobyl's operational units. Birkhofer singled out improvements in fire protection, clarifying operating guidelines, and installing locking mechanisms on core channels as issues deserving immediate attention. GRS is currently working on a program to improve the sarcophagus.

—Mark Hibbs, "Make Short Term Safety Fixes At Chornobyl, Germans Now Say," *Nucleonics Week*, 1/18/96, pp. 9-10.

1995

ONE OF TWO ACCIDENTS OCCURRED AT CHORNOBYL

Chornobyl was reported to have the best safety record of Ukraine's 5 NPPs in 1996. The Ministry of Environmental Protection and Nuclear Safety reported that there were only 4 malfunctions in 1995, compared to 15 in 1994. However, one of two accidents in Ukraine which resulted in radiation leakage occurred at Chornobyl.

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—Chrystyna Lapychak, "Chornobyl Has Best Safety Record For Second Consecutive Year," OMRI Daily Digest, 1/12/96.

1995

ONLY 4-5% OF STATE BUDGET DEVOTED TO CHORNOBYL

According to a Parliamentary Committee probing the accident, in 1995 only 4-5% of the state budget was devoted to Chornobyl problems, as compared to 16% in 1992. The Ministry of Statistics reported that in 1995, 5.8% of the state budget was spent on dealing with the consequences of the Chornobyl accident.

—"Ukraine Calls For World Help In Chornobyl Recovery Actions," *Nucleonics Week*, 1/4/96, pp. 12-13.; UNIAN, 4/10/96, in "Ukraine: Ukraine Spends 5.8% Of State Budget On Chornobyl," BBC Monitoring Service, 4/19/96.

28 November 1995

CHORNOBYL PLANT IS RESPONSIBLE FOR WORK AT SARCOPHAGUS

The Chornobyl plant now has responsibility for work relating to the sarcophagus. Future restoration or reconstruction work will thus be ordered by the plant itself rather than by the Ministry of Chornobyl.

—*NucNet News*, 11/27/95.; "Chornobyl Takes Responsibility For Sarcophagus," *Nuclear Engineering International*, 2/96, p. 2.

18 November 1995

CAPACITY UTILIZATION OF UKRAINIAN PLANTS

Reportedly, Chornobyl's capacity utilization is the highest in Ukraine at 69.9% and *Zaporizhzhya NPP* is the lowest at 56.3%. An INTELNEWS report in 8/95 suggested that Unit 2 at *Rivne* had the highest capacity utilization, 90.1%, and the all Ukraine average was 69.3%.

—Yevhen Perehuda, "Chornobyl," *Uryadovyy kuryer*, 11/18/95, p. 5.

17 November 1995

INCIDENT OCCURRED AT UNIT 1: INES-1

An incident occurred at Unit 1 which originally rated a level 1 on the INES scale, but was upgraded to level 3 when further details of the accident were released in 3/96. The event was reportedly due to a defect in the fuel. Pieces of a fuel element leaked into the cooling water in the loading machine. Contamination reached 200 rad per hour and contamination spots continued to show up through 12/20/95. One worker exceeded his statutory limit of 50 millisievert per year after the event. It is speculated that the cover up to hide the seriousness of the event occurred at high levels within Derzhkomatom and not at the level of plant management. This incident occurred in the midst of negotiations over G-7 assistance to Chornobyl See 11/24/95 entry above.

—"Cover-Up Charged In Worker Contamination At Chornobyl-1," *Nucleonics Week*, 3/14/96, pp. 2-3.

27 October 1995

DEFECT IN WORK OF RELOADING EQUIPMENT AT UNIT 1

During a planned reloading of Unit 1, plant personnel noted a defect in the work of the reloading equipment. To ascertain the cause of this deviation, the reactor was stopped. There was no change in background radiation. Unit 1 was scheduled to restart on 10/31/95.

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—"Ukraina," *Yadernyy kontrol*, 11/95, p. 9.; ITAR-TASS, "Chornobyl Shut Down; Radiation Background Unchanged," in FBIS-SOV-95-209, 10/27/95.; ENS NucNet, 10/30/95.

17-26 October 1995

IAEA INSPECTORS VISIT UKRAINE

IAEA inspectors visited Ukraine to check the implementation of the nuclear safety program and to develop IAEA safeguards. These safeguards reportedly would pave the way for donor countries—such as the United States, Japan, Sweden and Finland—to grant aid to develop the Ukrainian nuclear safety program.

—"Inspectors Check Safety Program At Chornobyl," UNIAN, 10/18/95; in "Ukraine," FBIS-SOV-95-202, 10/18/95.

24 October 1995

UKRAINE TO BUILD STORAGE SITES FOR NUCLEAR WASTE

Mykhailo Umanets, Chairman of Derzhkatom, announced that Ukraine will build storage sites for nuclear waste on the grounds of the incomplete fifth and sixth units at Chornobyl. Umanets said that 90-95% of Ukraine's nuclear waste is stored at Chornobyl and will continue to be stored there.

—Chrystyna Lapychak, "Ukraine To Continue To Store Nuclear Waste At Chornobyl," OMRI Daily Digest, 10/25/95, Part II.

5 October 1995

CHORNOBYL NPP COOPERATES WITH IAEA

A three-day on-site seminar on Chornobyl NPP's cooperation with the IAEA ended. Lectures covered safety culture.

—"Chernobyl Strengthens IAEA Links," NucNet News, 10/4/95.

3 October 1995

RESEARCH AND TECHNOLOGY CENTER IN SLAVUTYCH

Ukraine appealed to the governments of NATO member states for scientific, technical, and financial support to establish and run the proposed international research and technology center in Slavutych, outside of Chornobyl. The government appeal was passed to NATO's assistant secretary general for scientific and environmental affairs, Jean-Marie Cadiou.

—"Ukraine Appeals To NATO For Help In Dealing With Nuclear Accidents," BBC Monitoring Service, 10/3/95.

28 September 1995

FIRE AT COMPRESSOR STATION

A fire was caused by a short circuit at a compressor station near Chornobyl's cooling pond. The fire was quickly extinguished and posed no threat to the environment. It did not rate as an incident on the International Nuclear Events Scale (INES).

—"Ukraine: Fire Extinguished At Chornobyl Plant," Reuters, 9/29/95.

1 September 1995

COMPLIANCE BEST AT CHORNOBYL

According to a Derzhkatom spokesman, Chornobyl has the best record among Ukrainian NPPs for complying with operational and safety regulations. Unit 3 reached 98.9 percent power output, while the average maximum

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output in the nuclear industry is 84.7 percent. Unit 1 worked without failures during the first half of 1995.
—"More Doubts over Chornobyl Shutdown," *Post-Soviet Nuclear & Defense Monitor*, 9/1/95, p. 13.; Serhiy Sokolovskiy, "Nuclear Chief on Chornobyl Reactors," *Intelnews*, 8/13/95.

September 1995

UKRAINE NEEDS FINANCIAL AID FOR SLAVUTYCH CENTER

The Ukrainian government in late 9/95 addressed the international community with a request for technical and financial help to build a nuclear research center in Slavutych near Chornobyl (see 8/18/95 below). The Center would be paid for by fees, revenue from scientific and technical production, and special grants.

—"Ukraine Calls For Help In Creating research Center In Chornobyl Zone," *Nucleonics Week*, 10/26/95, p. 13.; "Ukrainian Appeal," *Jane's Defence Weekly*, 10/14/95, p. 11.

30 August 1995

UKRAINE INTENDS TO MODERNIZE UNIT 2

Serhiy Parashin reportedly said that Ukraine intends to modernize and restart Unit 2 in 1997. Unit 2 was shut down after a fire in 1991.

—"Ukraine to Repair, Restart Damaged Chornobyl Block," *Reuters*, 8/30/95.

18 August 1995

NUCLEAR SAFETY CENTER TO BE ESTABLISHED IN SLAVUTYCH

Director of the DOE Nuclear Energy Office Terry Lash stated that talks with Ukrainian government officials indicated that they are prepared to establish a Nuclear Safety Center in Slavutych. Ukraine's motivations for the center are nuclear safety, jobs and self-reliance on nuclear issues. US Pacific Northwest Laboratories has been assisting Ukraine in the creation of a charter for the Center. The Center is currently looking at four projects: an evaluation of the safety threat to Unit 3 from the sarcophagus, a spent fuel management plan, a Nuclear Data Center, and a decommissioning plan for the plant. Japan, Italy, Great Britain, and Germany have all shown interest in becoming involved with the Center. In addition, it was reported that Derzhkomatom has been very supportive of the center. There are reportedly concrete proposals for the Center's financing through 2005. It was reported that the United States intends to set aside \$3 million for the creation of the Center. The US aid includes tele-video communication lines with American labs, a strategic plan to deal with spent nuclear fuel, and the creation of a data-bank on the safety of nuclear materials.

—Grigoriy Nesmyanovich, "'Avariya' pod Kievom," *Krasnaya zvezda*, 9/8/95, p. 3.; *Radio Ukraine*, 9/22/95; in FBIS-SOV-95-185, 9/22/95.; Anatoliy Panov, "Enerhetika Ukrainy, pozitsii i propozitsii," *Zeleny svit*, 6/95, p. 1.; "Amerika predlagaet pomoshch' v likvidatsii posledstviy Chernobylskoy katastrofy," *Izvestiya*, p.1 (Financial News).; "On Nuclear Safety, Power Initiatives in Russia, Ukraine...DOE's Dr. Terry Lash," *Post-Soviet Nuclear & Defense Monitor*, 8/18/95, pp. 4-8.

8 August 1995

GOVERNMENT ADVISED TO DEVELOP RECONSTRUCTION PLAN FOR CHORNOBYL

The Presidential Commission on Nuclear Policy and Ecological Safety reportedly recommended that the

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government work out a reconstruction plan for the Chernobyl NPP.

—"Chernobyl Closure Still Uncertain," *Nuclear Engineering International*, 10/95, p. 12.

6 August 1995

ACCIDENT RATE AT CHORNOBYL NPP IS 0.5 PER REACTOR

Unit 3 was brought back on-line three days ahead of schedule. The accident rate at the plant is 0.5 per reactor through August, while the average rate in other Ukrainian reactors is 3.3 to date. So far in 1995, Chernobyl NPP has produced over 6 billion kilo-watt-hours of electricity. Yuriy Kostenko, Minister for Environmental Protection and Nuclear Safety, said that the government may be forced to modernize the plant and extend the operation for 10 years, as opposed to shutting it down completely, if financial assistance is not forthcoming for the Chernobyl closure plan.

—"Chernobyl Plant Working At Full Capacity," *Ukrainian Weekly*, 8/13/95, pp. 2, 4.; "Alternative 10-Year Plan Proposed For Chernobyl," *Nuclear News*, 9/95, pp. 40-41.; "Ukrainian Atomic Energy Committee Says Chernobyl Is Safest Plant," OMRI Daily Digest, No. 141, 7/21/95.

23 July 1995

UNITS 1 AND 3 ARE THE MOST DANGEROUS SOVIET REACTORS

The US EPA classified Chernobyl Units 1 and 3 as the most dangerous of all Soviet-built reactors. According to the EPA report on the 10 most dangerous reactors, "the conditions at the Chernobyl Nuclear Power Plant are in many ways worse than they were prior to the 1986 catastrophe." However, Dr. Terry Lash from the US DOE says that the report was "only completely accurate on the date it was produced." It was released on 6/25/95 but information on Chernobyl dates back to 2/94. Lash underlined that "improvements were made (in the last year) and it's on the upswing." Units 1 and 3 were cited as having design flaws, a lack of resources, increased energy demands, difficulty in collecting outstanding payments, and low worker morale. In addition, it was noted that Ukrainian regulatory bodies lacked legal authority. It was reported that the units could be completely destroyed if just a few of the nearly 1700 fuel channels ruptured. The authors of the report also said a "five-year accident cycle" led them to believe that 1996 would be a very telling year.

—Vladimir Kozlovskiy, "Desyatka samykh opasnykh energoblokov," *Segodnya*, 7/27/95.; "Nuclear Reactors likely to fail," *Washington Times*, 7/29/95, p. A7.; "Reports Of Soviet Reactor Dangers Not Accurate Say DOE Officials," *Post-Soviet Nuclear & Defense Monitor*, 8/7/95, pp. 4-5.

11-12 July 1995

OPTIONS TO COVER UNIT 4 SARCOPHAGUS

The Alliance Consortium announced the results of its 10 month study on the "sarcophagus" to cover Unit 4. Two options were offered: first, a new shelter to cover Units 3 and 4, "Ukritiye-2", was recommended to allow dismantling of the damaged reactor and removal and conditioning of waste. This would mean that Unit 3 could not be kept operational, as some Ukrainian officials currently wish. The alternative solution is a structure to cover only Unit 4. The current structure is not designed to withstand seismic shocks and is not a lasting secure containment. The new structure would be a pre-stressed concrete arch that could be built in sections with a waterproof covering and stainless steel lining. Chernobyl is reportedly likely to experience an earthquake rating 5 on the Richter scale once every 27 years. The Consortium is led by the French civil engineering firm Campenon Bernard and includes

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Bouygues and SGN of France, AEA Technology and Taywood Engineering of Britain, Walter Bau of Germany, and Russian and Ukrainian partners. Currently, more than 400 kg. of plutonium, 100-plus tons of nuclear fuel, and tens of thousands of cubic meters of waste are under the sarcophagus. The project is estimated to cost \$1.072-1.147 billion for the "basic solution," would begin 4/26/96, and would require approximately ten years for safe containment. The actual construction of the new shelter would begin in 2001 or 2002. Alliance has proposed a two stage funding system: stage 1 would call for the creation of an International Fund for Chernobyl and stage 2 would generate longer-term investments (spread out over 30-35 years) from unrelated activities. Ukrainian officials disagreed with Alliance's conclusions, saying Ukritiye-2 is unnecessary. They also were unhappy that the proposal does not use all Ukrainian materials. Alliance's project is currently funded through TACIS.

—Nikolai Pugovitsa, "Around the Sarcophagus: Chernobyl's Echo," *Selskaya zhizn*, 4/25/95; *NucNet News*, no. 312, 7/13/95.; "Alliance Consortium Submits Report on Chernobyl NPP," Reuters, 7/15/95; "Ukrainians, Alliance Dispute Chernobyl-4 Stabilization Approach," *Nucleonics Week*, 7/27/95, pp. 14-15; "Western Consortium offers Project to Encase Chernobyl Plant, Interfax, 7/14/95; "Western Consortium offers to build Chernobyl Sarcophagus," OMRI Daily Digest, Vol. 135, 7/13/95, p.5; "Proposal for a Second Chernobyl-4 Containment," *Nuclear News*, 8/95, p. 13.; "Alliance Proposes an Overarching Solution," *Nuclear Engineering International*, 9/95, p. 6.

July-August 1995

VENTILATION AND PROTECTION SYSTEM INSTALLED

According to the Deputy Director General for Radiation Protection at Chernobyl NPP Anatoliy Nosovskyi, a nitric ventilation system for the tanks for the cooling circuit of Unit 3's control and protection system has been installed.

—Anatoliy Nosovskyi, "Radioactivity Clean-up And Exposures At Chernobyl Nuclear Power Plant," *Nuclear Europe Worldscan*, 7-8/95, p. 100.

July-August 1995

HALF OF SARCOPHAGUS' FRACTURE POINTS ARE SEALED

It was reported that approximately one half of the fracture points on the sarcophagus have been sealed. The sealing is to be completed this year. Also at the sarcophagus, a new electricity supply system has been designed and installed and an alarm system to warn of the onset of a nuclear chain reaction has been put into operation.

—"Ukraine," by Nikolai Kurilchik and Alexei Breus, *Nuclear Europe Worldscan*, p. 78.

5 July 1995

UNIT 4 SARCOPHAGUS IS IN DANGER OF COLLAPSING

Chernobyl plant officials have warned that the sarcophagus entombing Unit 4 is in danger of collapsing. Workers are trying to patch up 1,000 square meters of cracks in the roof and walls. Additionally, the steel pillars of the structure may collapse.

—Rotislav Khotin, "Chernobyl 'Tomb' potentially dangerous, official says," Reuters, 7/5/95.; Chrystyna Lapychak, "Chernobyl Plant Officials Warn Sarcophagus Is Cracking," OMRI Daily Digest, Vol. 1, No. 130, 76/95.

1 July 1995

PLANT NEEDS TO WORK 25-30 YEARS MORE

Reportedly, Ukrainian experts suggest that if the plant continues to work 25-30 years, then Ukraine will receive

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\$2.72 billion in profit, which will allow them to build Ukrytaya-2 for Unit 4.

—Yanina Sokolovskaya, "Chernobylskaya Ruletka," *Izvestiya*, 7/1/95, p. 5.

July 1995

IAEA CONCERNS ABOUT CHORNOBYL

Friedrich Niehaus of the IAEA noted that the emergency core cooling system capacity at Chornobyl is insufficient. The lack of containment means that the rupture of fuel channel integrity following a 300 mm. pipe break would result in a radioactivity release straight to the atmosphere. He also discussed a number of concerns about the availability of spare parts and qualified staff.

—"Chornobyl: Closure by 2000?" *Nuclear Engineering International*, 7/95, p. 15.

18 June 1995

CANADIAN WAX SEALANT TECHNIQUE WILL BE USED IN CHORNOBYL

William Nelson, a Canadian whose wax sealant technique has received praise from the US Environmental Protection Agency, was invited by the Prypyat Research and Industrial Association in Chornobyl to attempt to rustproof steel reinforcing rods and seal the cracks in the sarcophagus at Unit 4 by using wax. Nelson visited Chornobyl previously in 1994, and his work has received praise from V. Tokarevskyi, General Director of the Academy of Science's Interdisciplinary Scientific and Technical Center.

—"Chornobyl 'Sealer' Heads to Ukraine," *Ukrainian Weekly*, 6/18/95, p. 7.

15 June 1995

DISCUSSION ON SAFE METHODS FOR USE OF ATOMIC ENERGY

A round-table discussion was held between deputies from the Verkhovna Rada, representatives of the National Academy of Sciences, and directors of the NPPs to develop safe methods for the use of atomic energy.

—Anatoliy Panov, "Enerhetika Ukrainy, Pozitsii I Propozitsii," *Zeleny svit*, 6/95. p. 1.

12 June 1995

CHORNOBYL CLEAN-UP WILL BE LONG AND EXPENSIVE

The process of cleaning up Chornobyl could take decades, becoming the world's largest and most expensive environmental clean-up ever attempted. The current shelter is cracking more quickly than anticipated, reportedly releasing radioactive dust into the air; additionally, the concrete pad poured under the reactor is not preventing radioactive waters from seeping into the ground. If the sarcophagus were to collapse, the resulting contamination would be much more localized than it was in 1986. It would be a low-speed fission, a 'fizzle', that would cause dangerous radiation levels only in and around the building itself. Although the safety levels of Units 1 and 3 are below Western safety standards, improvements have been made to correct some of the flaws that contributed to the 1986 explosion; these improvements include using fuel of higher enrichment that is more stable and more control rods are kept in the reactor cores routinely as an additional safety measure. One problem that as yet has not been properly addressed is that of contamination of the soil and water underneath the reactor that flows into the Prypyat River, a few hundred yards away. According to an American who visited Chornobyl in 1993, the cracks in the shelter are so big that "birds can fly in. Dust can get out." If Chornobyl is completely closed down in 1999, the new sarcophagus might be completed by 2004. The structure, 25 stories high, would include waterproof walls

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and a foundation sunk 70-90 feet underground. The structure would be double-hulled so that high-pressure between the walls would prevent radioactive air from leaking out as the demolition proceeded inside. Inside the shelter are an estimated 840,000 cubic meters of radioactive waste, the most deadly of which is approximately 200 tons of uranium nuclear fuel, and some of it is still molten in the reactor core. There are no proposals yet as to how best to deal with this "mountain of waste." Mykhailo Umanets stated that the first 30 years of clean-up work might cost around \$10 billion.

—James Rupert, "Chernobyl's Casing Is Breaking Apart," *Washington Post*, 6/12/95, pp. 1, 13.

June 1995

NEW STRUCTURE NEEDS TO BE CONSTRUCTED OVER UNIT 4

The Alliance consortium has completed a feasibility study on the sarcophagus at Chornobyl, which states that the shelter over Unit 4 is in danger of collapsing and is not earthquake-safe. A new structure needs to be constructed over Unit 4 and the existing sarcophagus, which itself needs to be strengthened and stabilized. This construction is to be completed within five years and should provide safe containment for a minimum of 100 years. In order to completely enclose Unit 4, Block V (or 'B' in English) must also be enclosed under the new sarcophagus. If this building were to collapse in an earthquake or under a heavy rainfall or snowstorm, it would cut off the cooling systems to Unit 3, potentially causing another meltdown.

—Natalia Kalashnikova and Mariya Smirnova, "Fear as a Factor of Economic Coercion," *Kommersant-Daily*, 3/28/95, p. 4.; "Alliance solutions to sarcophagus problems," *Nuclear Engineering International*, 6/95, pp. 21-22.; "Alliance Group Says Chornobyl-3 Must Be Shut To Shelter Unit 4," *Nucleonics Week*, 3/23/95.; "New Chornobyl Containment 'Urgently' Needed; Seismic Event Could Cause Collapse of Current 'Ukritiye' Structure, Concludes European Commission," *Post-Soviet Nuclear & Defense Monitor*, 3/31/95.; "Chornobyl, 'Mon Amour'," *Biznes Baltii*, 4/3/95, p. 4.

May-June 1995

CHORNOBYL OPERATES MORE SAFELY THAN OTHER NPPs

According to Serhiy Parashin, Chornobyl's plant manager, in recent years Chornobyl has operated more safely than Ukraine's other nuclear power plants (NPPs); the number of malfunctions has been below the average for all NPPs in Ukraine. Reportedly, Unit 1 is among the 20 best power units in the world according to a comparison of performance indicators. \$300 million has been invested in safety improvements and 15 technical improvements of the two operational units began in 1994 and are currently continuing. The Rada's decision in 1993 to continue operation at Chornobyl significantly slowed the "brain drain" of skilled personnel. Ukraine has investigated the possibility of backfitting Units 1-3, which would cost approximately \$360 million. Modernizing the three units, including backfitting, reconditioning the fuel channels, improving the sarcophagus, maintaining the facilities at Slavutych, would cost approximately \$2.7 billion. The cost of complete closure is estimated at \$4.4 billion.

—Serhiy Parashin, "Chornobyl NPP: current status and perspectives," *Nuclear Europe Worldscan*, 5-6/95, p. 12.
 [2] Peter Coryn, "G-7 Rejects Ukrainian Plan For Chornobyl Closure," *Nucleonics Week*, 10/12/95, pp. 9-10.

31 May 1995

WATER LEAKAGE AT UNIT 3

A water leakage from the reactor circuit was discovered in Unit 3, which had been shut down for scheduled

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repairs.

—*Molod Ukrainy*, 6/2/95, p. 1; in " 'Water Leakage From Reactor Circuit' at Chornobyl," FBIS-SOV-95-109, 6/2/95.

23 May 1995

UNIT 3 IS THE BEST NUCLEAR POWER UNIT IN UKRAINE

According to official government figures, Unit 3 was the best performing nuclear power unit in Ukraine in the first quarter of 1995. It achieved a capacity factor of 98.9%, in comparison with the 14 other units in Ukraine that averaged 84.7% in the same time period. The capacity factor is the ratio of electricity produced to the maximum amount possible.

—"Chornobyl-3: Ukraine's Best Performing N-Plant Unit," *NucNet News*, No. 220, 5/23/95.

16 May 1995

US DEPARTMENT OF ENERGY FUNDS FOR UNITS 1 AND 3 UPGRADING

The US Department of Energy (DOE) has allocated \$7 million for both FY 95 and FY96 for short-term safety upgrades at Units 1 and 3. The funds will be used for operator training, fire safety upgrades and an operational safety program.

—"DOE Provides \$3 Million for Chornobyl Safety Center," *Post-Soviet Nuclear & Defense Monitor*, 5/16/95, p. 10.

11 May 1995

SLAVUTYCH CENTER WILL IMPROVE NUCLEAR SAFETY IN UKRAINE

The US Department of Energy (DOE) has announced that it is cooperating with the Ukrainian government in the establishment of an International Nuclear Safety and Environmental Research Center at Slavutyich. The agreement was reached in principle in 4/95 and presidential endorsement came on 5/10 by Presidents Clinton and Kuchma in Kiev. The main goal of this center is to improve nuclear safety in Ukraine, according to Secretary of Energy Hazel O'Leary; additionally, the center will do research on environmental contamination and site restoration. Scientists and engineers will receive training in international safety standards and procedures at this center. The United States has pledged to provide up to \$3 million during the next two years and will encourage G-7 and other countries to contribute financially. US Ambassador to Ukraine William Miller and Ukrainian Minister of Environmental Protection and Nuclear Safety Yuriy Kostenko signed the agreement in Kiev on 5/10. \$1 million will be provided in 1995 and \$2 million in 1996 for technical and managerial support. Pacific Northwest Laboratory will oversee the project and be the Center's "sister lab." The Center's activities will include "nuclear safety, decontamination, decommissioning, waste management, site remediation, and technical development," it is scheduled to open in mid-1996.

—"US-Ukraine N-Safety Research Project Launched," *NucNet News*, No. 198, 5/11/95.; "DOE Provides \$3 Million for Chornobyl Safety Center," *Post-Soviet Nuclear & Defense Monitor*, 5/16/95, p. 10.

4 May 1995

UNIT 2 IS RESTORED

Unit 2 is still being restored, since Ukraine claims that unless it receives adequate financial assistance from the West, it will restart the unit that was damaged in 1991. One of the turbogenerators has been repaired and the other could be replaced with a generator from Unit 5, the construction of which was halted after the 1986

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explosion at Unit 4.

—Peter Coryn, "Ukraine: Restoration Continues at Chornobyl-2," *Nucleonics Week*, 5/4/95, p. 20.

26 May 1995

SUPREME RADA APPEALS TO EU AND G-7

Nine years after the explosion at Chornobyl, the Verkhovna Rada made an appeal to the EU and G-7 nations for an increase in international assistance in dealing with the aftermath of the Chornobyl disaster.

—ITAR-TASS, 4/26/95; in "International Assistance Sought For Chornobyl Aftermath," FBIS-SOV-95-080, 4/26/95.

25 May 1995

UNIT 3 IN DANGER OF BLOWING UP

Mykhailo Umanets called a 3/26/95 report in the *London Observer*, which alleged that Unit 3 is in danger of blowing up, "lies, illiteracy and an insult to the designers of the Chornobyl plant and sarcophagus." Chornobyl plant manager Serhiy Parashin also stated that the article was written only to exert pressure on Ukraine to shut down Chornobyl.

—"Ukraine Nuclear Chief Rejects Charges of Potential Chornobyl Disaster," *Post-Soviet Nuclear & Defense Monitor*, 4/25/95, p. 10.

11 May 1995

NO DATE FOR UNIT 2 RESTART

Unit 2 is being reconditioned, restored, and repaired and the work should be completed by 12/95. No date has been set, however, for its restart.

—"Chornobyl Bosses Launch Plan for Restart of Unit Two," *NucNet News*, No. 164, 4/11/95.

5 May 1995

DUCTS WILL BE REPLACED AT CHORNOBYL

The Commission for Nuclear Policies and Environmental Safety, which is subordinate to the President, has recommended that Chornobyl be modernized by replacing its technological ducts, which would extend the plant's life span an additional 10 years. This would keep Unit 1 running until approximately 2007 and Unit 3 running until 2011. The replacement would take two years for each unit and would cost \$60 million. This type of nuclear plant by design can operate for 30 years, but the ducts are safe for only 20 years. The replacement of technological ducts was performed at the Leningrad nuclear power plant successfully. The Ministry of Environmental Protection and Nuclear Safety has urged that the plant be allowed to continue in operation until the end of its natural life span; this would mean closing Unit 1 in 1997, Unit 2 between 2000-2002, and Unit 3 between 2001-2003. It has been estimated that the cost of shutting down Chornobyl will be \$3.7 billion.

—Vseukrainskiye Vedemosti, 4/5/95, p. 6; in "Report on Plans to Reconstruct Chernobyl Plant," FBIS-SOV-95-071, 4/5/95.; "Ukraine," *NucNet News*, 145/95, 3/30/95.

May-April 1995

CHORNOBYL: TO MODERNIZE OR TO SHUT DOWN?

Chornobyl plant manager Serhiy Parashin has proposed a six-point plan for the modernization of Chornobyl as an

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alternative to shutting the plant down completely. His plan calls for the retrofitting of the safety systems, improved fire protection, backfitting of the system that works to contain the spread of radioactive materials, and the implementation of technical measures that comply with regulatory requirements. The estimated cost for this program of upgrades is \$500 million.

—Serhiy Parashin, "Chernobyl: from accident to improving safety," *Nuclear Europe Worldscan*, 3-4/95, pp. 28-29.

30 March 1995

200 METER PYRAMID SAID TO GUARANTEE 200 YEARS OF SAFETY FOR CHORNOBYL REACTOR

As a result of an international tender aimed to offer a solution to the problem of Unit 4 at the Chernobyl plant, preference was given to a joint Ukrainian-French project to build a 200 meter high pyramid over the destroyed reactor which will guarantee 200 years of safety. It will take 2 years to construct the pyramid and it will cost \$15 billion. "Atompodzemenergo" from St. Petersburg offered an alternative solution to bury the reactor in an underground bunker. This project "Proval" would take only 3 months, costing only \$1.5 billion while guaranteeing the same 200 years of security.

—"Chernobyl Is Tossed From Hot to Cold," *Segodnya*, 3/30/95, p. 9.

28 March 1995

CHORNOBYL REPORT ATTEMPT AT INTIMIDATION

Serhiy Parashin, the Chernobyl NPP General Director, stated that a *London Observer* report that outlined the possibility of a major catastrophe at Chernobyl's third reactor was unfounded and asserted that it was published in an effort to apply pressure on Ukraine to close the Chernobyl reactors.

—"Strakh kak faktor ekonomicheskogo prinuzhdeniya," *Kommersant-Daily*, 3/28/95, p. 4.; "Slukhi o vzryve silno preuvelicheny," *Rossiyskaya gazeta*, 3/29/95, p. 2.; Roman Vershillo, "Avariya na Chernobyle otlozhena," *Segodnya*, 3/28/95, p. 1.

21 March 1995

SECOND SARCOPHAGUS MUST BE BUILT IMMEDIATELY

Valentyn Kupnyi, Deputy Director of Chernobyl, stated that the assertion that a new and improved sarcophagus can not be built until Unit 3 is shut down is not true. The Alliance consortium that is to make the sarcophagus has devised an option which would enclose only Unit 4 in a stable and environmentally safe shield. It is the consortium's opinion that a second sarcophagus must be built immediately in order to dismantle the old shelter. The project is funded by the TACIS program.

—*Holos Ukrainy*, 3/21/95, p. 4; in "Chernobyl Official Criticizes Sarcophagus Projects," JPRS-TEN-95-006, 3/21/95.

10 February 1995

SARCOPHAGUS FOR UNIT 4 IS IN DANGER OF COLLAPSING

According to an article published in *Zelenyi svit*, the sarcophagus for the destroyed Unit 4 is in danger of collapsing and radioactive dust may cause contamination and possibly even a new radioactive cloud. The pollution of subsoil waters is another concern. Kiev has asked the international community for suggestions on how to rectify this situation. One Ukrainian suggestion is to completely dismantle Unit 4; the contaminated materials will be temporarily buried in accordance with international standards. To prevent soil and water contamination, the

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proposed project calls for "the immediate construction of a hermetic membrane to contain the water found under the affected reactor."

—"The Sarcophagus. Transforming the 'Covering' Project at the Chornobyl Nuclear Electric Power Station into an Ecologically Safe System," *Zelenyi svit*, 12/94, No. 15, p. 3; in "Plan to Dismantle Chornobyl 4th Reactor Explained," FBIS-SOV-95-028, 2/10/95.

2 February 1995

CHORNOBYL MINISTER SAYS THE 30 KM EXCLUSION ZONE AROUND CHORNOBYL SHOULD BE REDUCED

A proposal to rehabilitate the 30 km exclusion zone around Chornobyl has been rejected by a group of 200 Russian, Ukrainian, and Belarusian scientists, who maintain that the region is far more valuable as a "scientific experiment ground." Minister of Chornobyl Volodymyr Kholosha has stated that the 2,000 square km. exclusion zone cannot be kept indefinitely and work must begin to reduce it.

—Alex Brall, "Chornobyl Scientists Oppose Rehabilitation of 30-km Zone," *Nucleonics Week*, 2/2/95, p. 13.

29 January 1995

ONE MORE LEAK AT UNIT 3

A small leak in the emergency cooling system at Unit 3 caused workers to shut the reactor down but reportedly there was no release of radiation. The operators were unsure of the severity of the problem when an alarm went off and they shut down the unit. A similar accident caused the shut-down of the same unit last October. Workers trying to adjust the water levels in the emergency cooling system triggered the automatic shut-down system. Unit 3 is scheduled to return to operation in two days. Experts from the Kurchatov Institute stated that the cause may have been a defective sensor, which has caused 10 similar incidents in the past year.

—"Chernobylskaya AES v Yanvare," *Vestnik Chornobylyya*, 2/95, p. 2.; Marta Kolomayets, UPI, 1/30/95; in "Chornobyl Reactor Shut Down," Executive News Service, 1/31/95.; "Chornobyl Reactor Shut Down," *Ukrainian Weekly*, 2/5/95, p. 2.; Igor Dvinskiy, "Trety energoblok ChAES otklyuchen po oshibke," *Segodnya*, 1/31/95, p. 7.; Chrystyna Lapychak, "Panicking Workers Shut Down Chornobyl Nuclear Reactor," OMRI Daily Digest, No. 22, Part I, 1/31/95.

30 November 1994

TWO UNITS WILL BE OPERATIONAL

Unit 1 is to be returned to operation on 12/2 after a routine maintenance shut-down that began on 10/8. Unit 3 went operational on 10/22 after being shut down on 10/17 for repairs on a cooling pipe.

—"East Europe N-Plants Revving Up for Winter." NUCNET, No. 571, 11/30/94.

17 November 1994

SEMINAR HELD AT CHORNOBYL

A nuclear power safety seminar was held at Chornobyl at which Ukrainian officials from Derzhkomatom and Derzhatomnahliad assured the seminar's other participants that the Chornobyl power plant is functioning reliably and safely. Further cooperation is planned between operators at Chornobyl and experts from the IAEA. Dr. Friedrich Niehaus, head of the IAEA's Safety Assessment Department, stated that the IAEA was not trying to tell Ukraine how to run Chornobyl, but rather the goal of the three-day seminar was to share plant operating

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experience from other countries in an effort to improve the safety culture at Chernobyl. Chernobyl plant manager Serhiy Parashin demonstrated that Chernobyl operators adhere to all international safety standards. Other sources state that the IAEA found "serious safety deficiencies" at the plant, including problems with design, inspection, fire protection, and radiological protection.

—Mayak Radio Network, 11/17/94; in "Chernobyl Officials, IAEA Hold Safety Talks," FBIS-SOV-94-222, 11/17/94.; "Plan Set For Improving Chernobyl Safety," NUCNET, 11/18/94, No. 558.; *Source Book: Soviet-Designed Nuclear Power Plants in Russia, Ukraine, Lithuania, Armenia, the Czech Republic, the Slovak Republic, Hungary, and Bulgaria*, 1996, pp. 148-49.

November 1994

UPGRADING CHORNOBYL-1 IS NEXT TO IMPOSSIBLE

According to Nikolai Steinberg, Ukraine has three generations of NPPs. Chernobyl-1 is the only first generation NPP in operation and it does not have a full-scope safety system in accordance with international standards. To upgrade this unit to acceptable safety levels would be "a very complicated and expensive task, and may be unrealistic," according to Steinberg. Unit 3 requires sufficient safety improvement measures to be taken in the near future. Safety reassessment has begun at the Chernobyl NPP.

—"Nuclear Safety And Nuclear Regulatory Process In Ukraine. Status And Problems," Nikolai Steinberg, presented at the 1994 annual American Nuclear Society Meeting in Washington DC, 11/11-17/94.

13 October 1994

NO REACTORS AT THE PLANT ARE IN OPERATION

After a crack was discovered in one of its fuel channels, Unit 3 was shut down. According to officials, however, no radiation escaped. Unit 1 was shut down on 10/8 for maintenance, which meant that no reactors at the plant were in operation.

—Ustina Markus, "Another Chernobyl Reactor Temporarily Closed," RFE/RL Daily Report No. 199, 10/19/94.

August 1994

AMERICIUM-241 NEAR CHORNOBYL: SCIENTISTS DETECT, OFFICIALS DENY

It has been reported that americium-241 has been detected near Chernobyl. Viktor Sedletskyi, President of the Association of Independent Scientists of Ukraine, said the amount of americium discovered is rather substantial and can be linked to inaccurate data regarding the amount of nuclear fuel that was discharged into the atmosphere during the 1986 accident. Some sources have said that americium-242 has also been detected, and is accumulating in the cement of the sarcophagus surrounding the damaged Unit 4, causing damage to the structure. However, a scientist from the Ukrainian Interdepartmental Radiation Control Commission says the reports on the presence of americium are false.

—ITAR-TASS, 8/5/94; in "Further On Contamination," FBIS-SOV-94-151, 8/5/94, p. 29.

July 1994

RADIATION LEAKING FROM SARCOPHAGUS

According to a report by the German Institute for Economic Research, radiation is leaking from the sarcophagus surrounding Unit 4. Radioactive contamination of ground water may be occurring as a result of the sarcophagus'

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foundations sinking into the ground. The Ukrainian government estimates that building a new concrete casing could cost as much as DM3.5 billion.

—DDP/ADN (Berlin), 7/6/94; in "German Study Highlights Dangers Of Nuclear Power Stations," FBIS-SOV-94-130, 7/7/94.

July 1994

FRENCH CONSORTIUM WILL CONDUCT STUDY ON SARCOPHAGUS

The French consortium "Alliance" won a bid issued by the European Commission to conduct a feasibility study on the sarcophagus surrounding Unit 4. The study will focus on reinforcing the existing containment dome, as well as construction of a new one.

—*Le Figaro*, 7/28/94, in "French Consortium Wins Bid to Conduct Feasibility Study on Chernobyl," JPRS-TEN-94-020, 9/18/94, p. 51.

11-22 April 1994

AEA: FUEL HANDLING A PARTICULAR SAFETY CONCERN

An IAEA Mission went to Chornobyl to evaluate safety operation at the plant and found that fuel handling was a particular safety concern. The fuel route is operated manually and relies on well trained, highly proficient operators.

—*Source Book: Soviet-Designed Nuclear Power Plants in Russia, Ukraine, Lithuania, Armenia, the Czech Republic, the Slovak Republic, Hungary, and Bulgaria*, 1996, pp. 148-149.

21 April 1994

IAEA DECLARES CHORNOBYL TO BE UNSAFE

The IAEA has declared Chornobyl to be unsafe. According to IAEA General Director Hans Blix, the safety norms at Chornobyl do not meet even the least stringent international standards. This conclusion was reached after Blix, Morris Rosen, Head of the Nuclear Safety Department at the IAEA, and a group of nuclear safety experts visited Chornobyl in April 1994.

—Ostankino Television First Channel Network (Moscow), 4/21/94, 1100 GMT; in "IAEA Declares Chernobyl Power Station Unsafe," FBIS-SOV-94-078, 4/22/94, p. 57.

21 April 1994

FRENCH AND GERMAN NUCLEAR SAFETY ORGANIZATIONS INSIST ON CHORNOBYL SHUTDOWN

French and German nuclear safety organizations, the IPSN and the GRS, released a joint statement saying that Chornobyl was unsafe and should be shut down early. IPSN and GRS have been assisting Ukraine in the nuclear safety field for the past 2 years through their joint operation "Riskaudit." In the statement they said that Units 1 and 3 were unstable due to departure of trained personnel to Russia, difficulty in obtaining spare parts, and disruptions in the maintenance program due to conflicting decisions. It further noted that the sarcophagus around Unit 4 is deficient. The statement was made at an IAEA sponsored conference in Vienna on the safety of Chornobyl. Due to Ukraine's dependence on power generated by Chornobyl, Ukrainian officials would rather receive technical assistance to improve safety conditions than shut the plant down.

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—"French And German Safety Officials Favor Chernobyl Shutdown," ENS NUC NET, 4/21/94, p. 25.; "International Experts Review Chernobyl Safety," ENS NUC NET, 4/22/94.

20 April 1994

SARCOPHAGUS AROUND UNIT 4 IS IN DANGER

Ukrainian Deputy Prime Minister Valeriy Shmarov stated that the sarcophagus around Unit 4 was in danger of collapsing and that nearly one-fifth of the trained personnel working at Chernobyl had left in 1993. Ukraine maintains that it will cost between \$6-8 billion to close down Chernobyl completely.

—David R. Marples, "Nuclear Power in Ukraine: A Look at a Troubled Industry," *Ukrainian Weekly*, 1/1/95, p. 2.

April 1994

TECHNICAL PROBLEMS AT UNITS 1 AND 3

Units 1 and 3 were temporarily shut down due to technical problems shortly after top officials decided that they would be permanently decommissioned as soon as possible. Unit 3 suffered from a severe problem—there was a defect in the cooling system—and Unit 1 had a minor problem—there was a fuel spillage when a container was dropped by a crane.

—David R. Marples, "Nuclear Power in Ukraine: A Look at a Troubled Industry," *Ukrainian Weekly*, 1/1/95, p. 2.

November 1993

OECD WILL GO AHEAD WITH SAFETY REVIEW

The OECD Nuclear Energy Agency (NEA) has decided to go ahead with an international safety review of plans to construct a new shelter over Unit 4 at Chernobyl.

—"OECD/Ukraine: Sarcophagus Safety Consultation Planned," *Nucleonics Week*, Vol. 34, No. 46, 11/18/93, pp. 17-18.

July 1993

SECOND FIRE STOPS CHORNOBYL OPERATIONS

After the second fire at Chernobyl in 1991, the Verkhovna Rada decided to stop all activity there by the end of 1993. Given the economic hardships the country is facing, specialists from Chernobyl are insisting that the Supreme Rada made its decision prematurely and should reexamine the situation. Economically speaking, they argue, Chernobyl provides great amounts of energy at relatively little expense. Ecologically, the general manager of Chernobyl claims that his plant meets, and in some cases exceeds, all safety standards. The plant manager also claims that shutting down Chernobyl will exacerbate the ecological situation because more coal or fuel oil will have to be burned to compensate for the loss of nuclear energy.

—*Khreshchatyk*, 7/20/93, p. 5, in "Ukraine: Future of Chernobyl AES Said to be Uncertain," JPRS-TEN-93-021, 8/21/93, pp. 36-37.

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