Yugoslavia Nuclear Chronology

Last update: September 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

2008-1947

13-16 May 2008

Government representatives from Serbia, the United States, Russia, Hungary, Slovenia, Romania and the IAEA meet in Vienna to discuss possible routes for the transportation of spent nuclear fuel from Serbia to Russia. Ukraine has not yet given the permission for transit through its territory, and the parties at the meeting reviewed alternative routes.

—"Završena runda pregovora u Beču" ["A Round of Negotiations Concludes in Vienna"], Ministry of Science of the Republic of Serbia, 26 May, 2008, www.mntr.sr.gov.yu.

April 2008

The IAEA signs an $8.63 million agreement with the Serbian government and the European Commission to help fund the removal of spent fuel from the Vinca reactor. The EC contribution supports efforts to prepare 8,000 fuel elements for transport and to ship them to Russia. An additional $25 million is needed to pay for the transport of the material within Russia. The second phase of Vinca's decommissioning is the construction of new storage and processing facilities for reactor waste.

—"UN-backed effort to remove dangerous nuclear fuel from Serbia moves ahead," UN News Service, 15 April 2008; "IAEA Announces New Funds to Support Decommissioning of Serbian Nuclear Research Reactor," Global Security Newswire, 15 April 2008.

November 2007

Construction of the new radioactive waste storage facility (Hangar 3) begins on 2 November at the Vinca Institute of Nuclear Sciences. The construction is part of the Vinca Institute Nuclear Decommissioning (VIND) Program, implemented by the Serbian government in cooperation with IAEA and with support from the United States, European Commission, and other donors.

—"Počinju radovi na izgradnji 'Hangara 3,'" ["Construction of Hangar 3 Begins"], Ministry of Science of the Republic of Serbia, 30 October, 2007), www.mntr.sr.gov.yu.

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October 2006
According to a report in the Belgrade-based *Vecernje Novosti*, a committee formed by the Serbian Ministry of Science has submitted a report to the Serbian government recommending that the Tesla Accelerator Project at the Vinca Institute be shut down. The project, launched in 1989, was intedned to provide a source of pharmaceuticals used in the detection and treatment of cancer. The director of the Tesla project, Dr. Nebojsa Neskovic, said that shutting down the accelerator would mean issuing a "death sentence" for the entire Vinca Institute.
—*Vecernje Novosti*, 4 October 2007; in "Serbian Government to Shut down Vinca Institute's Tesla Accelerator Project," FBIS Document ID EUP20071006012001. *BETA Week*, 6 September 2007; in "Serbia's Scientists Disgruntled by Decision to Cut Vinca Institute's Funding," FBIS Document ID EUP20070908073006.

October 2006
In October 2006, the IAEA announced that it had finalized a multi-million dollar contract to package and ship over two metric tonnes of spent nuclear fuel to Russia. The IAEA concluded a $4.3 million contract with a Russian consortium and Serbia to prepare 8,000 old fuel elements for shipping. Another contract worth $5.5 is being negotiated to cover transport costs.
—"Vinca's Long and Winding Road Nears Milestone: Countries Step Up to Help Serbia Improve Nuclear Safety, Security," IAEA Staff Report, 6 October 2006.

April 2005
The Krsko nuclear power plant shuts down twice: once automatically because of a capacity reduction during a test of turbine valves, a second time because of a minor glitch in the ventilation system of the non-nuclear portion of the plant. The Nuclear Safety Administration of Slovenia insists that the Krsko plant, which provides 26% of both Slovenia's and Croatia's power, was fully operational and safe. It was immediately reconnected to the power grid.
—"Slovene Nuclear Plant Safe Despite Shutdowns, Director Says," BBC Monitoring International Reports, April 16, 2005, Lexis-Nexis.

March 2005
A joint Slovene-Croatian commission agree on the establishment of a program for the dismantlement of the Krsko nuclear power plant and the storage of low and medium- radioactive waste. To date, the Slovenian government has appropriated 115 million euros for the program while Croatia has not yet established a fund.
—"Croatian-Slevene Commission Favours Scrapping Nuclear Plant," BBC Monitoring International Reports, March 4, 2005, Lexis-Nexis.

December 2004
Croatian parliamentary parties give consent to ratify a Croatian-Slovene agreement for the dismantlement of the Krsko nuclear power plant, but did not finalize plans for the financing or waste disposal of the project. The plant, scheduled to operate until 2023, would undergo dismantlement procedures from 2017 until 2042.
—"Croatian MPs Support Plan to Dismantle Krsko Nuclear Power Plant," BBC Monitoring International Reports, December 8, 2004, Lexis-Nexis.

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August 2004
Despite assurances made by the Serbian Ministry of Energy in December 2003 against future nuclear power development, reports indicate that Serbia will contract with either interests in France, the United States, or Russia to build a nuclear power plant for completion in the next two or three years, probably in Kostolac. Since that time, however, numerous statements by the Serbian government have again confirmed that there are no plans to build a nuclear plant.
—"Serbia to Announce Building of First Nuclear Plant Soon," BBC Monitoring International Reports, August 25, 2004, Lexis-Nexis.

May 2004
Serbia and Montenegro ratify the Comprehensive Test Ban Treaty (CTBT) on May 19, 2004. It had previously signed the CTBT on June 8, 2001. Bosnia-Herzegovina is the last former Yugoslav Republic not to ratify the treaty.
—"The Status of the Comprehensive Test Ban Treaty: Signatories and Ratifiers," Arms Control Association, January 2005, www.armscontrol.org.

March 2004
Reports indicate that Serbian Minister Andjelka Mihajlov stated the Serbian government would choose a central location for storing nuclear waste. Because scientists recommend basalt rocks for nuclear waste storage, the Fruska Gora Mountains were estimated a potential site.
—"West Allegedly Plans to Store Nuclear Waste in Serbia-Montenegro," BBC Monitoring International Reports, March 4, 2004, Lexis-Nexis.

December 2003
Slovenian government officials declare intentions for the development of a second nuclear power plant near the current site of the Krsko plant in order to meet future energy demands. The Krsko plant, a joint venture established between the governments of Slovenia and Croatia in the 1970s, stopped exporting power to Croatia in 1991 after lengthy disputes erupted after the dissolution of Yugoslavia in 1991. Transfers to Croatia resumed in 2001.
—"Slovenia to Build Second Nuclear Power Plant", Xinhua, December 19, 2003, Lexis-Nexis.

November 2003
Representatives of France's Framatome pay an unofficial, low-profile visit to Vinča's Institute of Nuclear Sciences. According to Serbian media, the country's nuclear experts believe that the visit has something to do with a prospect of building a "nuclear facility" in Vinča, which would produce electricity, as coal reserves are running out. It is unclear what a "nuclear facility" would embody, but the experts' comparison of projected financial returns of the facility to the Krsko nuclear plant, suggests the "nuclear facility" would entail a similar power plant.
—Branka Jaksic, "Nuclear Power Station in Serbia," *Ekspres (Belgrade),* 6 November 2003, in "Report Links French Nuclear Firm's Visit to Construction of Facility in Serbia," FBIS, EUP20031108000209.

August 2002
48 kg of fresh or unirradiated nuclear fuel containing 80%-enriched uranium is transported from the Vinča Institute

of Nuclear Sciences to Russian Institute of Atomic Reactors in Dmitrovgrad, Russia.
—"NTI Commits $5 Million to Help Secure Vulnerable Nuclear Weapons Material," *Nuclear Threat Initiative*, August 23, 2002, www.nti.org; Philipp C. Bleek, "Project Vinča: Lessons for Securing Civil Nuclear Material Stockpiles," *The Nonproliferation Review*, Vol. 10, No.3, Fall-Winter 2003, http://cns.miis.edu.

July 2002
The RA reactor is shut down permanently; decommissioning work begins.
—"RA Reactor," Center for Nuclear Technologies and Research NTI web page, Vinča Institute for Nuclear Sciences, Accessed on December 23, 2003, www.vin.bg.ac.yu/150/CentarWebEngleski/ReactorRA.htm; "SCG/4/004: Decommissioning of the Vinča RA Research Reactor," *International Atomic Energy Agency*, Accessed on January 7, 2003www-tc.iaea.org.

19 December 2001
Croatia and Slovenia sign an agreement regarding the ownership of the Krsko nuclear power plant, ending a decade long dispute. Under the agreement, the two countries will become equal co-owners of the plant, draw and equal share of energy, and assume responsibility for nuclear waste management. The two countries agreed to set July 1, 2002 as the deadline for ratification by both parliaments. [As of January 2004, the issue has not been resolved].
—"Croatia, Slovenia Reach Deal on Sharing Nuclear Plant," *Agence France-Presse*, July 20, 2001; "Slovenia, Croatia Sign Agreement on Contentious Nuclear Plant," *Agence France-Presse*, December 19, 2001; Nada Stanic, "Deadline Passes with Settlement for Krsko Disputes Still Uncertain," *Nucleonics Week*, Vol. 43, No. 28, July 11, 2002.

March-June 2001
On 30 March 2001 the Yugoslav police takes Slobodan Milosevic into custody. On 28 June 2001 Milosevic is handed over to the United Nations war crimes tribunal in The Hague, where he will face charges of "crimes against humanity." Milosevic's arrest and transfer to The Hague jump-start international negotiations to remove fresh nuclear fuel from Vinča.
—"Ex-dictator Milosevic arrested in Belgrade," *Deutsche Press-Agentur*, March 30, 2001; Anthony Deutsch, "Milosevic in Hague to Face Tribunal," *Associated Press*, June 28, 2001; Philipp C. Bleek, "Project Vinča: Lessons for Securing Civil Nuclear Material Stockpiles," *The Nonproliferation Review*, Vol. 10, No.3, Fall-Winter 2003, http://cns.miis.edu.

7 October 2000
Yielding to widespread citizen uprising, Slobodan Milosevic formally accepts defeat in 24 September 2000 presidential elections. Vojislav Kostunica becomes Yugoslavia's president. [Milosevic, whose whereabouts are unknown, has been indicted by the United Nations war crimes tribunal in May 1999.] Officials in the U.S. State Department view Milosevic's defeat as an opportunity to begin discussion with the new Yugoslav government to address the inadequate storage conditions of fissile material at Vinča.
—R. Jeffrey Smith, "Milosevic Admits Defeat, Steps Aside in Yugoslavia Army, Russia Back Kostunica," *Washington Post*, October 7, 2000; "Milosevic indicted for war crimes," *Agence France-Presse*, May 26, 1999; Mark Hibbs,

"Belgrade Intimidated Officials Who Sought Foreign Help for Vinča," *NuclearFuel*, Vol. 25, No. 21, October 16, 2000.

24 September 2000

Presidential, parliamentary and local elections take place in Yugoslavia. While both Slobodan Milosevic and his opposition, led by Vojislav Kostunica, claim victory, Western leaders widely believe Milosevic has lost. Milosevic calls for a run-off election, setting off widespread popular uprisings.

—Paul Watson, "Both Sides Claim Victory in Yugoslavia Election: Opposition is hopeful despite reports of tampering by Milosevic allies," *Los Angeles Times*, September 25, 2000; R. Jeffrey Smith, "Opposition Pressure on Milosevic Mounting," *Washington Post*, October 2, 2000; Tamara Zamyatina and Nikolai Kalintsev, "Opposition meetings and rallies held all over Yugoslavia," *Itar-Tass*, September 30, 2000.

30 July 1998

Slovenia passes a law that privatized the Krsko nuclear power plant and decides to stop supplying electricity to Croatia.

—"Slovene Government Privatizes Krsko Nuclear Power Plant," *Radio Slovenia*, 3 August 1998 in BBC Monitoring International Reports, August 3, 1998; "Croatia, Slovenia Reach Deal on Sharing Nuclear Plant," *Agence France-Presse*, July 20, 2001.

1995-1999

IAEA carries out half-dozen inspections at Vinča to ascertain the safety of storage conditions of Vinča's fissile material. The IAEA inspections determine that the spent fuel storage pool is corrosive, and the fuel is damaged and leaking.

—Mark Hibbs, "Belgrade Intimidated Officials Who Sought Foreign Help for Vinča," *NuclearFuel*, Vol. 25, No. 21, October 16, 2000; "Measures to Strengthen International Co-operation in Nuclear, Radiation and Waste Safety," *The Nuclear Safety Review 1997*, International Atomic Energy Agency, General Conference, GC(41)/INF/5, 23 July 1997, www.iaea.org.

1995-2002

Officials at the Vinča Institute of Nuclear Sciences express concern over the safety of an inventory of 40kg of fresh highly-enriched uranium fuel, in metal form, supplied by the USSR for the RA research reactor after 1976. Officials express the desire that the fuel be taken out of the country lest it falls into criminal hands, as a result of political unrest in Yugoslavia. President Slobodan Milosevic reportedly systematically intimidates Vinča officials who voice concern about the safety of fissile material at Vinča, and in early 1997 replaces Miroslav Kopecni, Vinča's director, for speaking out about the matter.

—Mark Hibbs, "Vinča Wants Fresh HEU Removed in View of Growing Serbian Unrest," *NuclearFuel*, Vol. 22, No. 3, February 10, 1997, via Lexis-Nexis; Mark Hibbs, "Belgrade Intimidated Officials Who Sought Foreign Help for Vinča," *NuclearFuel*, Vol. 25, No. 21, October 16, 2000.

July 1991

According to Marjan Ursic, director of the Zirovki Vrh uranium mine and mill (RUZV) in Slovenia, the RUZV will most

likely be permanently shut down and dismantled. Citing the national moratorium on nuclear plant construction, Ursic stated that since RUZV was built to supply uranium to two to three nuclear power plants, such as the Krsko plant, it is no longer economically feasible for RUZV to stay in business. In 1990, RUZV was slated to supply the Krsko plan fully for the first time with 120 metric tons of U3O8 per year, however in July 1990 the Slovenian government cancelled the mill financing, and RUZV has not operated since.
—Nada Stanic, "Zirovki Vrh Mine Faces Closure, " *NuclearFuel*, Vol. 16, No. 4, February 18, 1991, in Lexis-Nexis.

1991-2004
Croatia and Slovenia negotiate a new arrangement over the jointly owned Krsko nuclear power plant. The dispute involves compensation owed by Croatia to Slovenia for provided electricity and ownership issues. The Krsko matter is part of a bundle of issues that the countries are resolving, including the demarcation of sea boundaries and economic issues. [As of January 2004, the issue has not been resolved].
—Nada Stanic, "Krsko is Focus of Dispute Between Slovenia and Croatia," *Nucleonics Week*, Vol. 35, No. 4, January 27, 1994, via Lexis-Nexis; "Croatia Settles Debt with Krsko Nuclear Plant," *Ljubljana Radio Slovenia Network*, 11 March 1993, in FBIS, 16 March 1993, Doc. No. FBIS-EEU-93-049.

June 1991
Croatia and Slovenia declare independence. As a result of the breakup of Yugoslavia, a dispute arises over the fate of the Krsko nuclear power plant, situated in Slovenia and co-owned with Croatia.
—"Croatian President's Independence Speech," *Zagreb Radio Croatia Network*, 25 June 1991, in FBIS, Doc. No. FBIS-EEU-91-123; "Slovene Assembly Approves New State Symbols," *Belgrade Radio Belgrade Network*, 24 June 1991, in FBIS, 25 gJune 1991, FBIS-EEU-91-122; "Croatia, Slovenia reach deal on sharing nuclear plant," *Agence France-Presse*, July 20, 2001.

15 June 1989
The Federal Chamber, the upper house of the Yugoslav Parliament, goes further than expected in revising nuclear energy and amends the FEC moratorium to prohibit construction of nuclear facilities indefinitely, impose criminal penalties for planning such facilities, including preparation of investment decisions and technical documentation, not to allow federal funding of nuclear energy safety-related and other research activities. This decision is largely expected to bring all nuclear-related activities in Yugoslavia to an indefinite halt.
—Nada Stanic, "Nuclear Planning Ban Said to End Nuclear Option for Yugoslavia," *Nucleonics Week*, Vol. 30, No. 28, July 13, 1989, via Lexis-Nexis.

8 May 1989
Dr. Vujo Miljevic, head of the cold fusion research group at Vinča reports on the results of cold fusion experiments undertaken by his group at Vinča. The fusion experiments are conducted in a gas environment and produce neutron radiation "two to three times higher than the natural phon (sic)." Dr. Milos Skoric, Ljupco Hadzijevski and Dr. Jovan Konstantinovic also take part in the experiment.
—Vujo Miljevic, "Cold Fusion in Vinča," *Politika*, 8 May 1989, in "Vinča Institute Confirms Cold Fusion Results," FBIS, 15 May 1989, Doc. No. FBIS-EEU-89-092.

25 January 1988

The West German newspaper *Der Spiegel* reported that the Rudjer Boskovic Nuclear Research Institute, with financial assistance from the Energoinvest Company of Sarajevo, is engaged in reprocessing activities. The newspaper also notes speculations that the firm Energoinvest, Yugoslavia's largest exporter of nuclear equipment, and which financed the Rudjer Boskovic Institute is a front for Libya's efforts to finance the Institute's work on a nuclear bomb for Libya. Scientists at the Rudjer Boskovic Institute and Energoinvest, and the IAEA officially dispute *Der Spiegel*'s allegations of Libya's financial assistance to Yugoslavia to build a nuclear bomb, and call them "unfounded" and "absurd".

—"Are the Yugoslavs Working on the Atom Bomb?" *Der Spiegel,* 25 January 1988 in "West German Paper on Yugoslav Nuclear Efforts," FBIS, 26 January 1988, Doc. No. FBIS-EEU-88-016; "Allegations of SFRY A-Bomb for Libya's 'Absurd'," *Tanjug*, 28 January 1988, in FBIS, 29 January 1988, Doc. No. FBIS-EEU-88-019.

1988

The International Atomic Energy Agency assists Yugoslavia in the construction of a cyclotron for the production of radioisotopes. The cyclotron would be located at Vinča.

—"YUG/1/011: Construction of a Cyclotron," *International Atomic Energy Agency*, 1988, www-tc.iaea.org.

24 December 1987

The Federal Executive Council (FEC) declares its support for a moratorium on construction of nuclear power plants until 2000. The FEC stated that the decision, spurred by the Slovenian Parliament's initiative is in agreement with the "Draft SFRY Energy Development Plan Envisaging Development Until 2020," which states that domestic resources will meet electrical power demands by the end of the century and that nuclear power is not need at the moment. The newspaper report noted that the Draft Energy Plan differs from the Yugoslav social plan for 1986-1990, which expected nuclear power plants to be an "integral part of [Yugoslavia's] total energy development," and from the long-term social plan for 1986-2000, which specifically stated: "research into nuclear fuels will be intensified, two nuclear power stations will be built, and the construction of two further stations with a capacity of 1,000 megawatts each will begin." The FEC announced that the Federal Planning Institute will be responsible for amending the social plan for 1986-1990 and the long-term social plan for 1986-2000 to reflect the adopted moratorium.

—"Moratorium Until the 21st Century—The FEC Does Not Want Nuclear Power Stations Either," *Borba*, 24 December 1987, in "FEC Supports Moratorium on Nuclear Power," FBIS, 7 January 1988, Doc. No. FBIS-EEU-88-004; "Assembly Commission on Nuclear Power Moratorium," *Zagreb Domestic Service*, 11 June 1987, in FBIS, 12 June 1987, Doc. No. FBIs-EEU-87-113.

20 July 1987

The Republican Parliament of Slovenia adopts a "draft theses" of a new energy law, which explicitly prohibits construction of nuclear power plants on the territory of Slovenia until 2000. [Slovenia has long been the leader of and a strong advocate for nuclear energy in Yugoslavia].

—Nada Stanic, "Yugoslavia Moves Towards Nuclear Moratorium Debate," *Nucleonics Week*, Vol. 28, No. 31, July 30, 1987, via Lexis-Nexis.

25-26 April 1986
An accident at the Chernobyl-4 reactor of the Chernobyl nuclear power plant in Pripyat, Ukraine, results in 30 deaths and hundreds of cases of thyroid cancer and radiation poisoning, 28 deaths are caused by radiation. The accident is widely considered to be a result of a flawed reactor design and personnel mistakes. The accident has the immediate effect of casting doubt on safety of nuclear programs in countries around the world. As a result of the accident, the Croatian Parliament removes what was to become Yugoslavia's next nuclear power plant, Prevlaka nuclear plant, from the 1986-1990 provincial plan.
—"Chernobyl," *World Nuclear Association*, March 2001, www.world-nuclear.org; "Chernobyl Casts a Shadow," *Nuclear Engineering International,* June 1986, p. 2; Michael Knapik and Ann MacLachlan, "Europeans Try to Piece Together Chernobyl as Details Remain Scarce," *Nucleonics Week*, Vol. 27, No. 19, May 8, 1986, via Lexis-Nexis.

August 1984
The RA research reactor is shut down for refurbishment and reconstruction. The reactor is not restarted until 2002.
—"RA Reactor," Center for Nuclear Technologies and research NTI web page, Vinča Institute for Nuclear Sciences, Accessed on December 23, 2003, www.vin.bg.ac.yu.

22 June 1984
The electric utility associations of Croatia and Slovenia, Zajednica Elektro-Privrednih Organizacija Hrvatske-Zeoh and Elektrogospodarstvo Slovenije-Egs, respectively, issue a bidding call for architect-engineering consultants for the planned 1,000MW or larger nuclear power plant at Prevlaka, Croatia. The Prevlaka plant is part of a larger plan by Yugoslavia to construct a series of five plants of approximately 1,000MW each. The plant is estimated to be completed in 1993.
—Nada Stanic, "Yugoslavia Prequalifying Consultants for Nuclear Power Plant," *Nucleonics Week*, Vol. 25, No. 28, July 12, 1984, via Lexis-Nexis.

February 1982
The Krsko Nuclear Power Plant begins operation at full capacity after the test run.
—"Krkso Nuclear Powerplant at Full Operation," *Tanjug*, 12 February 1982, in FBIS, Doc. No. FBIS-EEU-82-030.

December 1981
The heads of the executive councils of Yugoslavia's six republics and two autonomous provinces and a representative of the Federal Executive Council (FEC) sign a "Social Compact on the Development and Application of Nuclear Energy to the Year 2000," a plan that entrust the FEC with the final authority over the shape of the nuclear fuel cycle. The plan calls for coordinated planning and activities in developing nuclear fuel cycle technology, "manufacturing materials and equipment for nuclear power plants, and promoting nuclear power plant design and construction capability."
—Nada Stanic, "Yugoslavia Taking Major Step Toward Centralized Nuclear Planning," *Nucleonics Week*, Vol. 22, No. 48, December 3, 1981, in Lexis-Nexis.

August 1981
The 632MW pressurized water reactor, Nuklearna Elektrana Krsko (NEK), purchased from U.S. firm Westinghouse

begins test production of electricity at Krsko, Slovenia. The reactor is co-owned by Croatia and Slovenia. According to Yugoslav media, the country's industry built 68% of the plant.
—"Krsko Nuclear Plant to Begin Test Production," *Borba,* August 18, 1981, in FBIS, Doc. No. FBIS-EEU-81-159; "Krkso Nuclear Powerplant at Full Operation," *Tanjug*, 12 February 1982, in FBIS, Doc. No. FBIS-EEU-82-030.

1981
The International Atomic Energy Agency aids Yugoslavia in carrying out a study to determine the feasibility of recovering uranium from phosphoric acid.
—"YUG/3/005: Uranium Recovery Study," *International Atomic Energy Agency*, 1981, www-tc.iaea.org.

4 May 1980
Josef Broz Tito dies. Lazar Kolisevski assumes the presidency of the Socialist Federal Republic of Yugoslavia.
—"Tito Dead at 87; Announcement by Presidency, LCY Central Committee," *Tanjug Domestic Service*, May 5, 1980, in FBIS, Doc. No. FBIS-EEU-80-088.

December 12, 1979
Slovenia, Croatia Discuss Krsko Nuclear Plant with Westinghouse.
—"Slovenia, Croatia Discuss Krsko Nuclear Plant with Westinghouse," *Tanjug (Telegraphic Agency of New Yugoslavia),* December 12, 1979, in FBIS, Doc. No. FBIS-EEU-79-248.

July 1978
At Yugoslavia's urging in 1975, The Ministerial Conference of Nonaligned Nations establishes a coordinating group of 14 countries to study the question of nuclear research and cooperation. The members of the group include: Algeria, Argentina, Central African Empire, Cuba, Egypt, Ethiopia, Gabon, Indonesia, Libya, Morocco, Nigeria, Niger, Tunisia, and Yugoslavia.
—Edvard Kljun, "The Nonaligned Countries and Peaceful Uses of Nuclear Power," *Review of International Affairs*, No. 684, October 5, 1978.

13 March 1977
In an interview with a Yugoslav weekly magazine *Nin*, Col.-Gen. Ivan Kukoc, a member of the Executive Committee of the Yugoslav League of Communists Central Committee Presidium, states, "...we have been advising against any monopoly which member countries of the so-called club of nuclear power are seeking to establish. It depends the least upon us whether Yugoslavia will be obliged to consider her A-bomb or even to begin her production." Col.-Gen Kukoc appears to link the slow pace of nuclear technology transfers afforded to developing countries by the nuclear powers to Yugoslavia's plans to develop a nuclear weapons.
—"Interview with Col.-Gen Kukoc," *Nin*, 13 March 1977, reprinted in *Survival*, Vol. 20, May/June 1977, p. 128.

Late 1970s
According to scientists at Vinča, Yugoslavia's reprocessing research ends. Reprocessing equipment used in the program is removed from the Vinča laboratory, all facilities are placed under IAEA safeguards.
—Andrew Koch, "Yugoslavia's Nuclear Legacy: Should We Worry?" *The Nonproliferation Review*, Spring-Summer 1997, http://cns.miis.edu.

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7 December 1975
Writing in the Communist Party newspaper *Borba*, the author hints of the possibility of Yugoslavia's developing a nuclear deterrent: "Should the use of mass terror be contemplated, or should nuclear or other weapons for mass destruction be used, our country may, in the framework of the general defence concept, reconsider its attitude towards the question of non-proliferation of nuclear weapons."
—Dimitrije Seserinac Gedza, *Borba*, 7 December 1975, reprinted in "Yugoslavia and Nuclear Weapons," *Survival*, Vol. 18, May/June 1976, p.117.

August 1975
Prompted by the difficulty in access to nuclear technology Yugoslavia suggests at the Ministerial Conference of Nonaligned Nations that the nonaligned countries coordinate nuclear research and development.
—James P. Nichol and Gordon L. McDaniel, "Yugoslavia," in *Nuclear Power in Developing Countries*, James Everett Katz and Onkar S. Marwah (eds.), (Lexington: D.C. Heath and Company, 1982), p. 348.

June 1974
Tito calls a top-secret meeting for heads of Yugoslavia's major nuclear research institutes, representatives of armed forces and military intelligence services. At the meeting, according to Ivo Slaus, then acting director of the Rudjer Boskovic Institute, who attending the meeting, the participants are instructed to use the country's nuclear power program as a camouflage for a parallel weapons program.
—William C. Potter, Miljanic, Djuro and Ivo Slaus, "Tito's Nuclear Legacy," *Bulletin of the Atomic Scientists*, Vol. 56, No. 2, March/April 2000, www.bullatomsci.org.

18 May 1974
India conducts its first nuclear test. This is a milestone event in Yugoslavia's decision to restart its weapons program. Yugoslavia and India compete for the leadership position within the Non-Aligned Movement (NAM).
—Bernard Weintraub, "India Becomes 6th Nation to Set Off Nuclear Device," *The New York Times*, May 19, 1974, p. 1.

1974
Construction begins on the 664MW Westinghouse pressurized light water reactor at Krsko. The Krsko reactor begins operation in 1981. [The power of the Krsko reactor is sometimes cited as 632MW. "Krsko Nuclear Plant to Begin Test Production," *Borba,* August 18, 1981, in FBIS, Doc. No. FBIS-EEU-81-159].
—Nada Stanic, "Yugoslavia Aiming to Define Next 20 Years of Nuclear Growth by Year End," *Nucleonics Week*, Vol. 22, No. 9, March 5, 1981, via Lexis-Nexis.

28 December 1973
Yugoslavia and IAEA enter into a safeguards agreement, INFCIRC/204. [After the breakup of the Socialist Federal Republic of Yugoslavia, the agreement continues to be applied to the Federal Republic of Yugoslavia (Serbia and Montenegro).]
—"Information Circulars," *International Atomic Energy Agency*, INFCIRC/1/Rev.14, May 2002, www.iaea.org.

November 1973
U.S. firm Westinghouse is selected over Germany's Kraftwerk Union to build Yugoslavia's first nuclear power plant at Krsko, Slovenia, 30 miles West of Zagreb. The 615MW plant is scheduled to begin operation in 1980. The Krsko project will also include gas turbine plants and a uranium ore extraction plant.
—"Yugoslavia Takes PWR," *Nuclear Engineering International,* December 1973, p. 919; "Yugoslavia: Contract for First Nuclear Plant," *Nuclear Engineering International,* August 1974, p. 624.

1970s
Reprocessing of gram quantities of plutonium takes place.
—William C. Potter, Miljanic, Djuro and Ivo Slaus, "Tito's Nuclear Legacy," *Bulletin of the Atomic Scientists*, Vol. 56, No. 2, March/April 2000, www.bullatomsci.org.

4 March 1970
Yugoslavia ratifies the Nuclear Nonproliferation Treaty.
—"Multilateral Arms Regulation and Disarmament Agreements: NPT, Yugoslavia" *UN Department for Disarmament Affairs*, Accessed on 11 January 2004, http://disarmament.un.org.

10 July 1968
Yugoslavia signs the Nuclear Nonproliferation Treaty.
—"Multilateral Arms Regulation and Disarmament Agreements: NPT, Yugoslavia" *UN Department for Disarmament Affairs*, Accessed on 11 January 2004, http://disarmament.un.org.

1968
Mining begins at pilot-scale uranium mine at Zirosky. The mine is shut down in June 1990.
—Andrew Koch, "Yugoslavia's Nuclear Legacy: Should We Worry?" *The Nonproliferation Review*, Spring-Summer 1997, http://cns.miis.edu.

1966
Norway transfers gram quantities of high-grade plutonium to Vinča, presumably for the reprocessing facility at Vinča.
—William C. Potter, Miljanic, Djuro and Ivo Slaus, "Tito's Nuclear Legacy," *Bulletin of the Atomic Scientists*, Vol. 56, No. 2, March/April 2000, www.bullatomsci.org.

1966
Laboratory-scale plutonium reprocessing facility at Vinča, built with the help of Norway and Czechoslovakia, begins operation. The facility contains four hot cells and employs the Purex reprocessing technology. The facility operates until 1977-78.
—William C. Potter, Miljanic, Djuro and Ivo Slaus, "Tito's Nuclear Legacy," *Bulletin of the Atomic Scientists*, Vol. 56, No. 2, March/April 2000, www.bullatomsci.org; James P. Nichol and Gordon L. McDaniel, "Yugoslavia," in *Nuclear Power in Developing Countries*, James Everett Katz and Onkar S. Marwah (eds.), (Lexington: D.C. Heath and Company, 1982), p. 356.

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1963
Uranium mine begins operation near Kalna. Geological exploration and construction of refining facilities at Kolna represents the first major effort by Yugoslavia to produce uranium oxide for its research needs cost-effectively. The mine was closed in 1966, mainly due to low ore quality.
—James P. Nichol, and Gordon L. McDaniel, "Yugoslavia," in James Everett Katz and Onkar S. Marwah (eds.), *Nuclear Power in Developing Countries*, (Lexington: D.C. Heath and Company, 1982), pp. 354-55.

1962
Yugoslavia receives engineering blueprints for a reprocessing plant, to be modeled on the Norwegian plant at the Institute for Energy and Nuclear Technology at Kjeller, but larger. Norwegian firm Noratom is to build the plant, which would reprocess spent fuel from the RA reactor at Vinča. Noratom never builds the plant.
—William C. Potter, Miljanic, Djuro and Ivo Slaus, "Tito's Nuclear Legacy," *Bulletin of the Atomic Scientists*, Vol. 56, No. 2, March/April 2000, www.bullatomsci.org.

1962
A laboratory for reactor materials is created at Vinča. The laboratory carries out research on metallic and oxide nuclear fuel fabrication techniques.
—Andrew Koch, "Yugoslavia's Nuclear Legacy: Should We Worry?" *The Nonproliferation Review*, Spring-Summer 1997, http://cns.miis.edu.

1961
The Federal Nuclear Energy Commission Program for 1961 includes a provision for nuclear power production that provides for comprehensive preliminary investigation for a construction of an experimental nuclear power plant by 1965.
—Slobodan Nakicenovic, *Nuclear Energy in Yugoslavia,* (Beograd: Export Press, 1961), p. 133.

Early 1960s
Tito deactivates nuclear weapons program.
—William C. Potter, Miljanic, Djuro and Ivo Slaus, "Tito's Nuclear Legacy," *Bulletin of the Atomic Scientists*, Vol. 56, No. 2, March/April 2000, www.bullatomsci.org.

22 October 1960
Slobodan Nakicenovic, Yugoslav Undersecretary of State in a letter to Gunnar Randers, leader of Norway's nuclear research program, indicates his country's interest in acquiring a reprocessing plant for spent fuel from the research reactor at Vinča.
—William C. Potter, Miljanic, Djuro and Ivo Slaus, "Tito's Nuclear Legacy," *Bulletin of the Atomic Scientists*, Vol. 56, No. 2, March/April 2000, www.bullatomsci.org.

1960
Construction begins on the U.S.-supplied 250kW Triga Mark-II light water reactor at Jozef Stefan Institute in Ljubljana. The reactor becomes operational in May 1966.
—Slobodan Nakicenovic, *Nuclear Energy in Yugoslavia,* (Beograd: Export Press, 1961), p. 35; James P. Nichol and

Gordon L. McDaniel, "Yugoslavia," in *Nuclear Power in Developing Countries*, James Everett Katz and Onkar S. Marwah (eds.), (Lexington: D.C. Heath and Company, 1982), p. 349.

15 October 1958

A criticality excursion at Vinča's heavy water RB reactor causes the death of one person and injures five more.
—Marko M. Ninković, "Radiation Protection Experience in Yugoslavia: From the Vinča Accident to Nowadays," Paper presented at 10th Congress of International Radiation Protection Association, May 2000, www.irpa.net.

April 1958

RB reactor reaches criticality.
—"RB Reactor," Center for Nuclear Technologies and research NTI web page, Vinča Institute for Nuclear Sciences, Accessed on December 23, 2003, www.vin.bg.ac.yu.

1957

Yugoslavia partners with the Soviet Union to design and build an unreflected zero power heavy water – natural uranium critical assembly RB reactor. The reactor's systems are subsequently upgraded and the reactor is converted into a flexible heavy water reflected experimental reactor with 1W nominal power, able to operate up to 50W.
—"RB Reactor," Center for Nuclear Technologies and research NTI web page, Vinča Institute for Nuclear Sciences, Accessed on December 23, 2003, www.vin.bg.ac.yu; Slobodan Nakicenovic, *Nuclear Energy in Yugoslavia,* (Beograd: Export Press, 1961), p. 29.

1956-1959

The Institute of Theoretical and Experimental Physics (Moscow, USSR) designs and constructs the 6.5MW heavy water moderated and cooled research reactor RA to be located at Vinča. The reactor commences operation in December 1959. The reactor operates initially with 2% enriched metal uranium fuel elements, in 1976 the original fuel elements are supplemented by 80% enriched uranium dioxide fuel elements, which are then used exclusively 1980 on.
—"RA Reactor," Center for Nuclear Technologies and research NTI web page, Vinča Institute for Nuclear Sciences, Accessed on December 23, 2003, www.vin.bg.ac.yu.

January 1956

Yugoslavia signs a nuclear cooperation agreement with the Soviet Union. As part of the pact, Yugoslavia will acquire a research reactor with power of 6.5 to 10 MW.
—Slobodan Nakicenovic, *Nuclear Energy in Yugoslavia,* (Beograd: Export Press, 1961), p. 53; "Relations Between the Soviet Union and Yugoslavia," Memorandum to the Canadian Department of Foreign Affairs and International Trade, May 22, 1956, *Documents on Canadian External Relations*, Vol. 23, No. 540, www.dfait-maeci.gc.ca.

1956

Spent fuel reprocessing department is established at Vinča.
—William C. Potter, Miljanic, Djuro and Ivo Slaus, "Tito's Nuclear Legacy," *Bulletin of the Atomic Scientists*, Vol. 56, No. 2, March/April 2000, www.bullatomsci.org.

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Mid-1950s-Late 1960s

In cooperation with their Norwegian counterparts, Yugoslav scientists at Vinča, Rudjer Boskovic and Josef Stefan nuclear institutes carry out large-scale laboratory investigations into reprocessing and purification of plutonium, such as continuous countercurrent solvent extraction of uranium fission products and plutonium in pulse columns.
—Vojno Dizdar, "Primena Pulsnih Kolon Pri Odvajanju Urana, Fisionih Produkata I Plutoniujuma Metodom Ekstrakcije Fecnost-Fensocu" [Use of Pulse Columns in the Separation of Uranium, Fission Products and Plutonium Using Liquid-Liquid Method], *Tehnika*, Vol. 12, No. 2, 1958. An extensive list of similar work is summarized in Mark Gorwitz, "Foreign Assistance to Iran's Nuclear and Missile Programs," October 1988, www.fas.org.

1955

The Federal Geological Institute is established to conduct geological and mining exploration for occurrences of nuclear raw materials in Yugoslavia.
—Slobodan Nakicenovic, *Nuclear Energy in Yugoslavia,* (Beograd: Export Press, 1961), p. 76.

August 1955

The first world atomic conference takes place in Geneva. The conference opens up a range of possibilities for Yugoslavia to initiate cooperation in the nuclear field with numerous European countries, the United States, the Soviet Union, India, and others.
—Slobodan Nakicenovic, *Nuclear Energy in Yugoslavia,* (Beograd: Export Press, 1961), p. 121.

March 1955

Federal Commission for Nuclear Energy is established. Aleksandr Rankovic, head of secret police, heads the Commission.
—William C. Potter, Miljanic, Djuro and Ivo Slaus, "Tito's Nuclear Legacy," *Bulletin of the Atomic Scientists*, Vol. 56, No. 2, March/April 2000, www.bullatomsci.org; Slobodan Nakicenovic, *Nuclear Energy in Yugoslavia,* (Beograd: Export Press, 1961), p. 128.

1953

According to Stale Hansen, of the Norwegian Broadcast Company, Yugoslavia may have successfully smuggled a quantity of highly enriched uranium from during a stay of one of its scientists at the Institute for Energy and Nuclear Technology at Kjeller, to Vinča.
—William C. Potter, Miljanic, Djuro and Ivo Slaus, "Tito's Nuclear Legacy," *Bulletin of the Atomic Scientists*, Vol. 56, No. 2, March/April 2000, www.bullatomsci.org.

1953

Stevan Dedijer, director of Vinèa from 1952 to 1955, concludes a draft agreement with Norway's Norsk Hydro-Elektrisk Kvaelstofaktieselskab for the purchase of 10 tons of heavy water, presumably for a possible purchase of a heavy water reactor from Norway. Yugoslavia never concludes the deal, and opts for a less expensive reactor from the Soviet Union. Despite the fact that the agreement with Norway does not materialize, scientists at Vinča begin close research collaboration with Norwegian counterparts, particularly in the area of plutonium reprocessing.

—William C. Potter, Miljanic, Djuro and Ivo Slaus, "Tito's Nuclear Legacy," *Bulletin of the Atomic Scientists*, Vol. 56, No. 2, March/April 2000, www.bullatomsci.org.

1952

Yugoslav nuclear scientist Dragoslav Popovic begins a two-year term at the Research Institute for Energy and Nuclear Technology at Kjeller, Norway, Gunnar Randers' home institution, as part of the exchange program between Norway and Yugoslavia. During his time at the Institute at Kjeller, Popovic's work involves research on plutonium extraction.

—William C. Potter, Miljanic, Djuro and Ivo Slaus, "Tito's Nuclear Legacy," *Bulletin of the Atomic Scientists*, Vol. 56, No. 2, March/April 2000, www.bullatomsci.org; "Jugoslaver på jakt etter bomben," *Brennpunkt*, 2 January 2001, www.nrk.no.

1952

The Josef Stefan Institute commissions a 30 MeV betatron from Switzerland to study nuclear processes, photoeffects, for material testing and for use in medicine.

—Slobodan Nakicenovic, *Nuclear Energy in Yugoslavia,* (Beograd: Export Press, 1961), p. 35-36.

1952

Scientists at the Josef Stefan Institute design and construct a 2.5 MeV Van de Graaff electrostatic generator.

—Slobodan Nakicenovic, *Nuclear Energy in Yugoslavia,* (Beograd: Export Press, 1961), p. 36.

1952

Scientists at the Rudjer Boskovic Institute design and begin construction of a 16 MeV cyclotron for the acceleration of deutrons and heavy ions to oxygen.

—Slobodan Nakicenovic, *Nuclear Energy in Yugoslavia,* (Beograd: Export Press, 1961), pp. 42, 48.

1952

Yugoslavia's collaboration with Norway in the nuclear field begins with the visit of Gunnar Randers, head of Norwegian nuclear research program, to Vinča.

—William C. Potter, Miljanic, Djuro and Ivo Slaus, "Tito's Nuclear Legacy," *Bulletin of the Atomic Scientists*, Vol. 56, No. 2, March/April 2000, www.bullatomsci.org.

1951

The Vinča Institute acquires the 1.5 MeV Cockcroft-Walton particle accelerator. It begins operating in 1952.

—Slobodan Nakicenovic, *Nuclear Energy in Yugoslavia,* (Beograd: Export Press, 1961), p. 26.

1950

In order to take advantage of possible collaboration with Zagreb University and other institutes, the Rudjer Boskovic Institute is established in the outskirts of Zagreb, Croatia.

—Slobodan Nakicenovic, *Nuclear Energy in Yugoslavia,* (Beograd: Export Press, 1961), p. 41.

17 January 1949
Stevan Dedijer, a former director of Vinča, meets with Edvard Kardelj, then Minister of Foreign Affairs and one of Tito's closest associates, who informs him of the plans to develop a nuclear weapons capability. Kardelj states: "We must have the atomic bomb." [Dedijer was recruited to what soon shaped into a weapons program in September 1949.]
—Stevan Dedijer, *Tito's Bomb*, draft manuscript, Institute of Advanced Study in the Social Sciences, Palo Alto, California, 1969, as quoted in William C. Potter, Miljanic, Djuro and Ivo Slaus, "Tito's Nuclear Legacy," *Bulletin of the Atomic Scientists*, Vol. 56, No. 2, March/April 2000, www.bullatomsci.org.

1949
The first occurrences of uranium ore are uncovered in Kalna at Stara Planina.
—Slobodan Nakicenovic, *Nuclear Energy in Yugoslavia,* (Beograd: Export Press, 1961), p. 85.

1949
Construction begins on the Jozef Stefan Institute in Ljubljana, Slovenia. The Institute, originally established as the Institute for Physics, commences full operation in 1954.
—Slobodan Nakicenovic, *Nuclear Energy in Yugoslavia,* (Beograd: Export Press, 1961), p. 35; "Josef Stefan Institute," Accessed on December 20, 2003, www.ijs.si.

28 June 1948
After criticizing Stalin and refusing to acquiesce to the will of the Soviet Union, Yugoslavia is expelled from the Communist Information Bureau (Cominform), a loose organization established by the Soviet Union to coordinate foreign policies.
—"Cominform Communiqué: Resolution of the Information Bureau Concerning the Communist Party of Yugoslavia, June 28, 1948," *The Soviet-Yugoslav Dispute*, (London: Royal Institute of International Affairs, 1948), as cited in *The Internet Modern History Sourcebook*, November 1998, www.fordham.edu.

21 January 1948
The Vinča Institute of Nuclear Sciences is founded as the Institute for Research on Structure of Matter. It is located 15km from the center of Belgrade. [In 1953 the institute is renamed Boris Kidric Institute of Nuclear Sciences.]
—Slobodan Nakicenovic, *Nuclear Energy in Yugoslavia,* (Beograd: Export Press, 1961), p. 33.

1948
The Institute for Nuclear Raw Materials is founded in Belgrade.
—James P. Nichol and Gordon L. McDaniel, "Yugoslavia," in *Nuclear Power in Developing Countries*, James Everett Katz and Onkar S. Marwah (eds.), (Lexington: D.C. Heath and Company, 1982), p. 346.

1947
The Yugoslav government decides to establish the country's first nuclear research center at Vinča.
—Slobodan Nakicenovic, *Nuclear Energy in Yugoslavia,* (Beograd: Export Press, 1961), p. 23.

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