

## **NUCLEAR SECURITY THREAT ASSESSMENT**

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Attention to nuclear security is at its lowest point in decades. Not since the days of the Soviet Union has there been less appreciation for and focus on the risks posed by non-state actors developing an improvised nuclear device. Once a topic for heads of state during the Nuclear Security Summit process from 2010-2016, it has been relegated to lower levels within governmental bureaucracies. Moreover, the increasing focus on geopolitical challenges between democracies and authoritarian regimes dominates not only the headlines but the policy-making process around the globe.

Underscoring this point, the latest edition of the Nuclear Threat Initiative's Nuclear Security Index revealed that nuclear security conditions in countries with the biggest responsibility for securing nuclear materials are deteriorating for the first time ever. These countries include 22 countries with weapons-useable nuclear materials (highly enriched uranium and separated plutonium) and the additional 24 countries and Taiwan with nuclear facilities. Their overall scores have dropped due to increases in quantities of separated plutonium, a sharp reduction in international assurances and transparency, and increasing levels of violence and instability. Meanwhile, progress on protecting against insider threats and strengthening security culture at nuclear facilities has stagnated.

Amid this disturbing trend, the threat of non-state actor acquisition of a nuclear weapon or weapons-usable nuclear material has become much more complicated. There are five primary drivers contributing to a challenging and evolving threat landscape.

### **1. Increased Non-State Actor Interest in Nuclear and Radiological Terrorism**

In recent years, there has been a resurgence in ideological groups that have expressed interest in weapons of mass destruction. While there isn't a single transnational terrorist organization that has dominated the headlines like Al Qaeda or the Islamic State of Iraq and the Levant, there are new violent "accelerationist" groups that are looking for opportunities to create mass chaos and damage to achieve their goals. Their professed goals can include overthrowing a government, taking control of an area of land, or trying to bring about a cataclysmic clash of civilizations. Over the last decade or so, the number of U.S.-based groups that see the "Western democratic state so mired in corruption and ineptitude that true patriots should instigate a violent insurrection" has increased.<sup>1</sup>

One such example is the now-disbanded Atomwaffen Division, a U.S. accelerationist group that expressed interest in obtaining nuclear weapons to hasten the collapse of civilization. Atomwaffen members were arrested for pursuing a plan to destroy the Turkey Point nuclear power plant not far from Miami, Florida. Concerningly, Atomwaffen's strategy included the recruitment of U.S. military or government personnel.

Another example of a militant accelerationist group interested in nuclear terrorism is the Order of 9 Angles, or O9A.<sup>2</sup> An estimated several thousand members are spread around the world. This

group expresses admiration for bin Laden as well as Hitler. O9A urges adherents to join the military (as well as street gangs), to acquire training.

In May 2020, a member of that group, Private Ethan Melzer, planned a “jihadist” attack on his own military unit. Melzer was about to be redeployed to a sensitive<sup>3</sup> military base in Turkey. *Task and Purpose*, a journal that covers US military issues, subsequently revealed that the base was Incirlik,<sup>4</sup> which houses U.S. nuclear weapons.<sup>5</sup> Melzer shared classified details about the base, including the number of military personnel guarding it and how they were armed. His goal was to facilitate a mass casualty attack on the base. He released these details on “RapeWaffen Division,” a Telegram channel known used by O9A. Melzer was sentenced to 45 years in March 2023.<sup>6</sup> Most importantly, Melzer was not recruited while serving in the military – he joined the military to advance the group’s militant accelerationist goals.<sup>7</sup>

The threat is not limited to the United States. In 2011, violent far-right extremist Anders Breivik’s terror attacks killed 77 people in Norway. Dozens of pages in his 1,500-page “manifesto” advocated for and described the execution of different acts of nuclear terrorism.

## **2. Sophisticated Non-State Actor Attacks**

In recent years, there have been an increase in sophisticated attacks from non-state actors using techniques and technologies intended to maximize scenes of mass chaos and carnage. Recent support from governments, covered in the next section, also plays an important role in advancing non-state actor capabilities.

In October 2024, Hamas launched a highly coordinated, multi-domain assault on multiple Israeli targets, resulting in over a thousand deaths. The attack, which took years to plan, began with drones disabling Israeli military communications stations, surveillance towers, and remote-controlled machine guns positioned along the border. Hamas then detonated explosives at several points along the border fence, allowing heavily armed militants to cross into Israel. Hamas utilized trucks, motorcycles, bulldozers, speedboats, and paragliders to infiltrate Israeli territory. Simultaneously, Hamas launched approximately 3,000 rockets into Israel within 20 minutes, overwhelming the Iron Dome missile defense system. Hamas’ October 7 attacks were examples of the use of extra-lethal violence, including the taking of hostages, as psychological warfare. The kind of dread and horror created by this event is comparable to what a group might use a nuclear weapon to achieve.

Another example was the attack on Crocus City Hall in Moscow on March 22, 2024. Four gunmen stormed the hall with assault rifles and indiscriminately shot at the spectators, as well as using knives to create havoc. They also utilized flammable liquid and petrol bombs to set fire to strategic points in the arena, including near wounded civilians and in emergency exits, in order to force people back toward the attacker’s position in the middle of the lobby. It took authorities 10 hours to contain this fire. The attackers were associated with the Islamic State – Khorasan Province, (ISIS-K) which is based in Afghanistan and Pakistan, but has set its sights on international targets. ISIS-K has become among the most dangerous ISIS-affiliate. In addition to its deadly Moscow attack, ISIS-K was responsible for a massacre in Iran, killing 95 people and wounding 284 more. ISIS-K was also responsible for foiled plans to attack three Taylor Swift

concerts in Austria, and authorities now describe ISIS-K as the most significant external terrorist threat to Europe.

### **3. Blurred Lines Between State and Non-State Actors**

Augmenting the sophistication of non-state actor attacks is the seeming increased support from state actors. For decades, governments have been training and equipping non-state actors to use violence to achieve their goals beyond their borders. Today, we are seeing the implications of this support in large-scale violent conflicts in Europe and Asia.

One example of this is Iran's "ring of fire strategy" in the Middle East, where it directly supports Hamas and Islamic Jihad in Gaza, Hezbollah in Lebanon, Houthis in Yemen, and various foreign and local militias in Syria. These groups are funded and suspected to be equipped by the Islamic Revolutionary Guard Corps and, while Iran does not have direct control over their actions, there are open lines of communication, and these groups act in a way to support Iran's ultimate objectives in the region.

Other examples include the Wagner Group's activities in Ukraine and Africa, as well as Pakistan's support of the Haqqani Network and Lashkar-e-Taiba. Even though these organizations rely on support from governments, there are examples of each of these groups acting independently and against their government sponsors' best interests. That adds an element of unpredictability to their actions.

One of the implications of this phenomenon is the spread of sophisticated technologies to non-state actors. For example, a 2019 United Nations report noted that Houthi forces in Yemen deployed extended-range uncrewed aerial systems "with a top speed of between 200 km/h and 250 km/h" and which may have a maximum range of between 1,200 km and 1,500 km, depending on wind conditions" with a payload of about 18 kg.<sup>8</sup>

We have seen the results of the shared technology. In 2019, Houthi rebels used a combination of "at least 20 drones and several cruise missiles" to conduct precision strikes on 17 targets at a Saudi Arabian oil processing facility disabling half of the country's oil production.<sup>9</sup> It is unclear what level of automation was involved in this attack. As software improves, it may soon become possible for a limited number of adversaries to control a larger group or swarm of drones attacking together.

### **4. Expansion of Nuclear Energy Programs**

We are on the cusp of a global nuclear expansion, often described as a "nuclear renaissance", as countries look to nuclear energy to meet their net-zero carbon targets by 2050. More than two dozen countries without operating nuclear power plants are now exploring the technology, particularly smaller or remote nations where small modular reactors (SMRs) can offer a scalable and clean energy solution. This growth has the potential to reshape global energy systems, but it also presents serious challenges. As nuclear materials and technologies spread to countries with limited prior experience, the risk of mismanagement, diversion, or deliberate attack increases, especially in regions affected by political instability or conflict.

Advanced reactor designs introduce new considerations, including the use of novel fuels like HALEU which will require enhanced security measures, and in some cases, plutonium-based fuels, which is a weapons-usable nuclear material and pose significant proliferation risks. A global scale-up of nuclear energy will require more enriched uranium, without adopting widespread enrichment capability which decreases the technical barrier to producing weapons-usable material. Meanwhile, the growing number of nuclear facilities globally will place greater demands on the monitoring and verification activities of the International Atomic Energy Agency. Scaling its resources and expertise will be essential to keep pace with the sector's anticipated growth and to ensure nuclear technology remains strictly for peaceful purposes.

If nuclear energy is to live up to its promise as a climate solution, it will require proper planning, international collaboration, and early engagement with safeguards, regulatory, and security partners.

## **5. Artificial Intelligence**

Artificial intelligence (AI) holds enormous potential to enhance security at nuclear facilities but also presents significant risks if misused. In the wrong hands, AI could enable non-state adversaries to execute attacks on nuclear facilities with unprecedented precision and sophistication. AI-powered drones could carry out automated standoff or blended attacks targeting specific personnel or critical safety systems. Beyond physical threats, adversaries might exploit AI for advanced propaganda campaigns designed to mislead nuclear operators or undermine trust in facility operations. Additionally, AI tools could be weaponized to attack vulnerable digital systems integral to nuclear safety, increasing the risk of sabotage. In the long term through "AI-as-a-Service" platforms, the barriers for non-state actors to leverage such tools could erode, making these dangerous technologies widely accessible.

AI could also speed up the process where an adversary could gain important knowledge in order to construct an improvised nuclear device.

The convergence of growing ideological extremism, increasingly sophisticated non-state actor capabilities, blurred lines between state and non-state entities, the global expansion of nuclear energy, and rapid advances in artificial intelligence presents a dangerously complex threat environment for nuclear operators. The high-level complacency that has set in since the end of the Nuclear Security Summit era is dangerous and must be reversed. Reinvigorating global attention to nuclear security is not a matter of choice—it is a strategic imperative. Without decisive action, the world risks sleepwalking into a preventable nuclear catastrophe.