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Central European Approaches to the Protection of Civil Nuclear Programmes

In light of the Fukushima Daiichi nuclear disaster, some countries are preparing to phase out their nuclear energy producing reactors whereas others are moving in the opposite direction and are either considering or have already announced their intention to expand their civil nuclear programmes. Among those faced with increasing demand for energy due to growing economies are the three Central European countries (two of which border Germany), the Czech Republic, Hungary and Poland. The first two intend to add new reactors to the existing nuclear power plants in Dukovany and Temelín (the Czech Republic) and Paks (Hungary), and Poland aims to construct its first nuclear power plant.

The expansion of these civil nuclear programmes, as well as the fact that the three nations are the only post-communist countries which have amassed weapons-grade nuclear materials (i.e. at least a kilogram of highly enriched uranium and/or plutonium)¹ merit an analysis of the challenges of protecting their nuclear sites. While confirming that, overall, levels of nuclear security are good, this paper will put forward some qualitative concerns expressed by the officials employed in the Central European civil nuclear programmes, and who are entrusted with the orderly management of the programmes' expansion as far as nuclear security is concerned.² It will also attempt to position their comments in relation to the Czech, Hungarian and Polish security strategies, which adopt a broad perception of nuclear security, and could consequently appear to be less concerned with protection of existing or planned nuclear facilities.

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¹ See Nuclear Threat Initiative (NTI) Nuclear Materials Security Index at: www.ntiindex.org for more information.

² This paper is a result of the author's study visits to all three of the nuclear power plants in the Czech Republic and Hungary (Dukovany, Temelín and Paks), during which he conducted interviews with representatives of their personnel, including heads of sections responsible for maintenance of security at the nuclear power plants. Moreover, the author and the Polish Institute of International Affairs' experts were granted unprecedented access to the site of the Polish National Centre for Nuclear Research, where they were able to conduct wide ranging interviews with directors and representatives of its different sections.

Central European Nuclear Programmes

The Czech experience with nuclear energy dates back to 1958, when the then Czechoslovak government started building its first nuclear power plant – a gas-cooled heavy water reactor at Bohunice (now in Slovakia). The first Czech nuclear plant, in Dukovany, was constructed between 1978 and 1987. Two of four planned new reactors at the Temelín nuclear power plant were completed between 1982 and 2003. The nuclear power plants jointly generate up to 33% of Czech electricity production. The Czech civilian nuclear programme is to expand, with plans for more reactors at Temelín, and possibly a new reactor at Dukovany.

The Hungarian nuclear programme dates back to 1956, but the most critical decisions on building a nuclear power plant were made a decade later. The Paks plant was completed in the 1980s, and today it generates up to 42% of Hungary's electricity. The government is committed to construction of the so-called Paks 2 plant, effectively a new power plant with two modern nuclear reactors (Paks 1 has four), which would be adjacent to Paks 1.

Poland's nuclear programme is the least developed of the three. It commenced, along with its Czech and Hungarian counterparts, in the mid-1950s, and the government decided the location of the country's first nuclear power plant in 1972. Ten years later, work at the site of the future nuclear power plant at Żarnowiec commenced, only to be abandoned after seven years amidst grave financial crisis and local protests. However, in 2009 the Polish government decided to revive the concept of nuclear energy in Poland, in order to diversify the energy portfolio and to decrease dependence on fossil fuels. Currently, Poland's only reactor is a research facility, and is situated in Świerk, about 30km South-East of Warsaw.³

The Threat Perception

Nuclear security is, at least on a rhetorical level, a serious concern for European and Western officials. However, its perception concentrates mostly on issues related to the potential proliferation of CBRN (chemical, biological, radiological and nuclear) weapons and technologies, and the most potent ways of stemming this. The European Union's *European Security Strategy* recognises the "nuclear risks in South Asia, and proliferation in the Middle East" as a "concern to Europe".⁴ It focuses on deterring the proliferation of nuclear weapons and materials through prevention, i.e. export controls, and political, economic and other pressures, directed at the countries of concern. The *European Union Counter-terrorism Strategy* commits the EU to working "with partners and international organisations on transport security, and non-proliferation of CBRN materials and small arms/light weapons."⁵ Similar sentiments are also expressed in NATO's *Strategic Concept* which focuses on countering the "proliferation of nuclear weapons and other weapons of mass destruction,

³ For more information on Świerk and the National Centre for Nuclear Research see: www.ncbj.gov.pl.

⁴ *A Secure Europe in a Better World. European Security Strategy 2003*, www.consilium.europa.eu.

⁵ *The European Union Counter-Terrorism Strategy*, www.register.consilium.eu.int.

and their means of delivery.”⁶ The EU has a 2009 *Action Plan* for strengthening CBRN security in Europe via enhancement of “preventive, detection and response measures in the field of CBRN threats and risks”, pooling, sharing, and dissemination of experiences, and lessons learnt amongst the Member States.⁷

The perception of threats related to nuclear security in Central Europe does not differ from the aforementioned European standard, and is mostly focused on nuclear proliferation. One is also, however, able to discern elements related to other security and safety issues, such as natural and industrial disasters, in the relevant policy documents:

The *Security Strategy of the Czech Republic* “advocates the intensification and greater efficiency of processes and mechanisms for disarmament, arms control, and non-proliferation of weapons of mass destruction and their means of delivery.” The Czech Republic is “developing capabilities to protect itself against the threat of chemical, biological, radiological and nuclear weapons of mass destruction” while focusing on building up its traditional military specialisation in protection against WMDs (weapons of mass destruction). At the same time, it “ensures the protection of energy infrastructure (oil and gas pipelines, distribution networks, and nuclear power plants), and builds such infrastructure with foresight.”⁸

The recently published *Hungarian National Security Strategy* stresses Hungary’s dedication to a peaceful and civilian nuclear programme, and underlines the country’s interest in further “strengthening of the international disarmament process [and] the effective implementation of international arms control and regulation.” The strategy notes the threats associated with “natural and industrial disasters,” especially in nuclear power plants, which could have disastrous consequences for the whole country. Special attention is to be paid to nuclear safety, which is to be strengthened through vigilant monitoring and Hungary’s unequivocal support for international efforts in enhancing nuclear safety.⁹

Poland’s *National Security Strategy* of 2007 speaks of the intent to develop a civilian nuclear energy programme, and mentions “growing threats to health and life of large groups of population as a result of terrorist attacks, including radiation and chemical terrorism and bioterrorism.” It affirms Poland’s dedication to “putting a stop to the proliferation of weapons of mass destruction.” The document also names “potential break-downs of obsolete nuclear power plants, trading in fissile materials, storage and transport of radioactive materials, chemical substances and organic waste, and break-downs of pipelines transporting crude oil and fuels” as “environmental threats.”¹⁰

⁶ *Active Engagement, Modern Defence. Strategic Concept for the Defence and Security of the Members of the North Atlantic Treaty Organization*, www.nato.int.

⁷ *EU CBRN Action Plan*, www.register.consilium.europa.eu.

⁸ *Security Strategy of the Czech Republic 2011*, www.mzv.cz.

⁹ *Magyarország Nemzeti Biztonsági Stratégiájáról*, www.kormany.hu.

¹⁰ *National Security Strategy of the Republic of Poland*, www.merln.ndu.edu.

The aforementioned strategic guidelines in relation to the protection of the Central European civil nuclear programmes might successfully contextualise a given country's obligation and commitment to combat the proliferation of CBRN weapons and technologies. However, the Central European officials responsible for nuclear safety perceive their programmes as relatively safe and unlikely to become sources of proliferation. In their view, the most immediate security concerns faced by the regional nuclear programmes are far less spectacular and of a different type.

Security Threats to Central European Civil Nuclear Programmes

The experts employed at the Central European nuclear facilities identify two main threats to their programmes—non-violent anti-nuclear activism, and terrorism. To a lesser extent, they are also concerned about the human resources strategies developed within each of the three nuclear programmes. The next part of the paper will outline their main concerns in relation to the aforementioned threats and challenges.

Non-violent anti-nuclear activism

Nuclear facilities are tempting targets for political protests, publicity stunts, or activities organised by different groups with radical agendas, aimed at disrupting the operation of nuclear sites.¹¹ Such a threat, far less lethal than that espoused by terrorism, is probably of most pressing concern to security officials working on the three civil nuclear programmes. It could easily be misinterpreted as a prelude to sabotage or a terrorist attack, and its perpetrators and participants might consequently be mistreated by the sites' security and the police forces. It has the potential to embarrass security and law enforcement officers, and staff at the sites, and to expose any shortcomings in the security arrangements.

Before 1989, the nuclear facilities (Dukovany, Paks, Świerk) witnessed relatively few publicity stunts or activities aimed at hampering the sites' activities. It is worth recalling, however, that local farmers did block roads leading to the site of the Żarnowiec nuclear power plant throughout the 1980s, and Dukovany witnessed a protest by environmental campaigners dressed as clowns, outside its gates in 1987. The latter event forced the power plant to purchase the plot situated in between the facility's gate and car park, and the adjacent road, in order to deny further protesters the space and legal grounds for allegedly spontaneous and uncoordinated stunts such as so-called "flash mobs". Similar decisions were consequently taken by the authorities in Paks and Temelín.¹²

¹¹ A recent example of such a stunt is the successful infiltration, allegedly to highlight a lack of security at France's nuclear facilities, of two French nuclear power plants by Green Peace. See: Justin McKeating, *Greenpeace once again exposes security failures at French nuclear reactors*, blog entry, May 2, 2012, www.greenpeace.org.

¹² In Świerk's case the situation is different as the facility is located approximately one kilometre from the Warsaw-Lublin road.

The collapse of communism brought new political freedoms to the region, and allowed newly established organisations such as the Czech “Stop the Atom” or “Mothers Against the Atom,” to prevent the completion of the Temelín nuclear power plant in the mid to late 1990s. Between 1995 and 2000 the site witnessed an almost daily barrage of usually low-key protests, staged by activists from the Czech Republic and abroad, who blocked the entry gate and chained themselves to the outside perimeter fence. The protests, however, never escalated into violence, and served as publicity stunts which were an attempt to persuade the Czech government to abandon construction. All of these protests were happening against the backdrop of strong local support for the construction and expansion of the power plant (with approx. 70% of the local inhabitants in favour), which was a major employer in one of the poorest parts of the Czech Republic. It has to be remembered that a similar pro-nuclear power plant dynamic developed in Dukovany, where the local authorities even used the Temelín social protests as a basis to lobby for the inclusion of the reactors originally planned for the other nuclear power plant to be added to their site.

The gravest publicity stunt at a nuclear facility in any of the three countries under discussion took place in 2003 at the Paks power plant. An international group of Greenpeace activists organised a multi-pronged assault on the power plant’s external defences, which was preceded by meticulous preparation encompassing videotaped “dummy runs”, and a boot camp secretly organised in neighbouring Austria. In the end, despite sophisticated diversionary tactics (one group of activists chained themselves to the gate, another activated sirens mounted on trucks parked around the site’s perimeter), the group which was supposed to scale the perimeter fence and consequently unfurl a large banner from the top of the site’s meteorological tower failed to breach the power plant’s external defences and its members were subsequently arrested.

Such events demand wide ranging preparations and utmost secrecy in order to prevent the authorities from acting long before a given plot’s execution. This, of course, limits the attractiveness of this option, and deters potential activists from following suit. Nonetheless, these threats are not taken lightly by any of the security officials employed in the civil nuclear programmes, who also study similar cases involving other types of facilities (for example, a successful breach of the Polish coal powered plant perimeter in Bełchatów, in 2007). At the same time, they preferred not to elaborate on the defensive measures at their disposal. The officials who were interviewed were confident of their ability to contain publicity stunts at their gates, but maintained that countering more elaborate plots is the responsibility of the law enforcement agencies and security services.

Terrorism

Nuclear facilities might constitute enticing targets for different terrorist groups intent on causing maximum destruction. A successful attack would not only damage the power plant and, for example, disrupt the national electricity grid, but would also spread chaos and panic, if fears of a “deliberate” Chernobyl type of disaster were to dominate the headlines.

In the past, cells of would-be Jihadi terrorists were said to have been planning attacks on nuclear facilities (e.g., the Lucas Heights research reactor in Sydney, Australia, in 2005).¹³

Such incidents happen against the backdrop of the introduction of thorough security measures, which aim to deter potential assailants from attempting any attack or breach at the nuclear power plants. It is telling that al-Qaida, the world's most widely known terrorist organisation, despite mentioning its desire to deploy nuclear weapons or utilise nuclear fuel or waste in its bombs,¹⁴ has never attempted to attack a nuclear power plant to obtain the material for a "dirty bomb" or to simply damage a reactor.¹⁵ Given the risks involved and the low probability of success, al-Qaida's planners must have shifted their attention to other targets. Other terrorist organisations, less intent on maximising the deadly fallout of their attacks and definitely more concerned about their image in the countries in which they operate, are far less likely to conduct attacks resulting in deadly radioactivity releases.

Terrorism is not deemed a high priority security concern in Central Europe. Poland and Hungary lack individual national counter-terrorism strategies, despite developing extensive, yet mostly untested, domestic terrorism prevention apparatus.¹⁶ The Czech *Counter-Terrorism Strategy 2010-2012*, on the other hand, recognises the risk of terrorists using chemical, biological, radioactive, or nuclear material in their attacks, and stresses the need to prepare "hard" targets such as nuclear power plants in anticipation of terrorist activities.¹⁷

None of the three civil nuclear programmes have ever been a target of a terrorist attack. However, the security officials employed in all three civil nuclear programmes acknowledged the potential of a terrorist threat to their facilities and stressed that their responsibility ends at the gates of the power plants or research reactors. Thus, it is up to the state security agencies to monitor potential terrorist threats to nuclear facilities and disrupt as many as possible at inception. Simultaneously, the security officials questioned the ability of any armed group to mount a successful terrorist attack against a nuclear facility. They agreed that, provided that the security services do not intercept the plotters at the planning stages of the operation, a determined, numerous and well-armed force might breach the site's perimeter but could consequently fail to reach either the reactor(s) or nuclear waste facilities, as the power plant's security can regroup and count on support from the SWAT police teams which are to be deployed in an event of an emergency. Even if the terrorists actually manage to reach a target, such as casks with spent fuel stored in repositories on

¹³ *The Sydney Morning Herald*, "Case against the Sydney accused," 15 November 2005, www.smh.com.au.

¹⁴ H. Blake, Ch. Hope, "WikiLeaks: al-Qaeda 'is planning a dirty bomb'," *The Daily Telegraph*, 2 February 2011, www.telegraph.co.uk.

¹⁵ Nonetheless, the organisation did not shy away from attacking oil facilities, e.g. in Saudi Arabia. See: J. C. K. Daly, "Saudi Oil Facilities: Al-Qaeda's Next Target?", www.susris.com.

¹⁶ K. Rękawek, "The Threat of Terrorism to the Visegrad Group Countries" in: K. Rękawek (ed.), *Non-military aspects of security in V4 countries – prospects for co-operation*, Warsaw: PISM, 2011, p. 31.

¹⁷ Similar passages are to be found in the aforementioned *Hungarian National Security Strategy*. See: Ministry of the Interior of the Czech Republic, *Counter-Terrorism Strategy 2010-2012*. The author would like to thank Dr Oldrich Bures for providing him with a copy of the *Strategy*.

site, they will be faced with the problem of transporting them outside the power plant (for example, an empty cask at the Dukovany spent nuclear fuel storage facility weighs approx. 94 tonnes). Successful transportation still does not guarantee that the terrorists would accomplish their mission, as they would consequently have to break the casks' lids in order to extract radioactive elements, then connect those elements to an active explosive device and deploy the thus constructed "dirty bomb" to its designated target. All of this would have to be done with the security services and police forces of any given country in hot pursuit of the terrorists. The situation is further complicated by the fact that the Czech and Hungarian nuclear facilities are located in relatively remote parts of these countries. Therefore, deployment of a "dirty bomb" from a construction point on-site or just outside the perimeter of a given plant, to a major population centre, where it would be the most effective, increases the chances that law enforcement officers and security forces would intercept the plotters.¹⁸

Given the odds stacked against any terrorists attempting a breach of a nuclear power plant or a research reactor, one could also reflect on the possibility of an attack on a convoy transporting fuel to, or radioactive waste from, the facility. Any assailant would first have to know the date of the planned transport, and then overcome the convoy's security - consisting of not only security guards but also police officers, and sometimes military contingents. Moreover, a successful attack would still leave the terrorists to face challenges identical to those outlined in the scenario of an attack on a nuclear plant.

Human resources strategies and practice: threat of infiltration

The directors of nuclear facilities must pursue a long term human resources strategy which will allow the efficient development of a pool of qualified staff for the overall civil nuclear programme, while simultaneously protecting it from the threat of criminal or terrorist infiltration. This policy, however, can only be realised through cooperation with, on the one hand, higher education institutions, and, on the other, the country's security apparatus. All of the three Central European countries have mixed records of developing such dual-track strategies, and the implications of this state of affairs are of concern for the civil nuclear programmes' security officials. This aspect increases in importance, given the plans for the expansion of the Polish nuclear programme (all but frozen for the past two decades), and the planned construction of more reactors at Paks 2 and Temelín, which all entail increased personnel recruitment in the coming years.

All three nuclear programmes originated around the same time (the mid to late 1950s), but each country finds itself in a different position in relation to the human resources situation. One of the most pressing problems for the Polish nuclear programme is

¹⁸ It would be no easier to target a nuclear facility using a large (smaller aircraft would not penetrate reactor's outer concrete walls) passenger or cargo plane, as it requires hijacking the plane and then directing it towards the intended target. Given the introduction of more intrusive security measures at airports, this has become much more difficult to accomplish in the course of the past decade.

the generation gap created after the abandonment of the Żarnowiec project in the late 1980s. Poland is now in the process of addressing this issue, and in two to three years time will be ready to staff the first nuclear power plant with its own crew. The formerly vast cadres of Świerk, where up to 4,000 people were employed – this number now stands at approx. 1,100 - are mostly no longer available for manning the Polish nuclear programme. The reconstruction of Poland's intellectual capacity in the nuclear sphere is to be achieved with the help of higher education establishments, which are involved in designing new courses for the benefit of the expanding nuclear programme.

In the past, Hungary, whose government long deliberated on the pros and cons of constructing Paks 2, had a mixed experience with protecting and developing cadres crucial to the ongoing success of a nuclear programme. As late as the 1990s, engineers younger than those who established Paks in the late 1980s, were sent to Russia for training. No specific courses at any of the Hungarian universities were devoted solely to honing the skills of future power plant workers and operators. In light of the decisions on Paks 2, this is bound to change, as employment and promotion prospects are becoming available.

The most sophisticated system of developing cadres for a nuclear programme exists in the Czech Republic, which was the first of the three to possess an operating nuclear power plant, and continues to share training and experience with neighbouring Slovakia. The authorities at Dukovany and Temelín developed simple programmes which encourage high school students in particular to complete internships at the power plants, and to sit special "nuclear exams" which determine whether they would be eligible for scholarships funded by the country's nuclear operator (CEZ, České Energetické Závody) for studies on "nuclear" courses at Czech universities and technical colleges. This is then followed by extensive on-site training (at Dukovany nuclear power plant) and then more exams (first in order to qualify as a nuclear power plant operator and then, periodically, to have one's licence prolonged). The programmes attract a large following, which is not surprising given the decision to continue expanding the Temelín and potentially Dukovany power plants.

The nuclear facilities' security officials all admitted the interest of the respective security services in the development and expansion of the civil nuclear sectors. It is a well-known fact that the police forces perform routine background checks on those employed in the civil nuclear programmes, but these alone will not suffice to prevent infiltration by criminal or terrorist groups. Inserting a mole into a nuclear programme, however, demands a high degree of commitment and of long-term planning on behalf of any organisation wishing to infiltrate a given nuclear site. It could take years before such an individual turns into a real asset and occupies a vital position, which is, even then, far from guaranteed. Thus, a hostile entity to approach individuals already employed by the nuclear programmes, and attempts to recruit them coercion or different incentives, are more likely.

Developing defences against such a threats offers a perfect convergence point between the reactive efforts of the sites' security officials and cooperating police forces, and

the more preventive actions of a given country's security services, whose involvement is essential in dismantling terrorist and/or sabotage plots aimed at civil nuclear programmes. Of course, their involvement and preoccupation with nuclear security provision could be limited by developing successful long-term recruitment strategies (modelled on the Czech programme) for future employees, which act as mechanisms for self-vetting, and limit the potential of civil nuclear programme infiltration.

Conclusions

In relation to nuclear security, the three Central European states with weapons-grade nuclear materials are, on a strategic level, mostly preoccupied with and concerned about proliferation of CBRN weapons and materials threats. The fact that their nuclear programmes are relatively small in size and are of course not militarily oriented could provide them with a strong sense of security in this field. Such an opinion was further validated by the author's research at the Czech, Hungarian and Polish nuclear facilities, where officials present a well-grounded aura of confidence in the security arrangements.

Nonetheless, those officials were clear that they would welcome more attention and financial support from the authorities, and were adamant that some threats, such as dismantling a terrorist cell planning to strike a nuclear facility, were beyond their reach. They were far less concerned about the strategic, proliferation-oriented threats to their countries' nuclear programmes. Their major concerns were seemingly non-violent, anti-nuclear or environmental activists, who have a track record of breaking into or storming nuclear facilities around Europe, and terrorists or criminals either targeting the facility for an attack, or planning to infiltrate it to carry out further illicit activities.

The security services of the nuclear facilities in Central Europe have already proven their readiness to address the first of these threats successfully. They could reasonably expect, however, some more determined cooperation from the security services and the police forces while dealing with elaborate and wide ranging activist plots, such as the 2003 attempted break-in at Paks, which could be successfully prevented at the preparation stage. The other threats are still low-level possibilities, as successful terrorist attacks or infiltration are difficult to accomplish. However, the fact that the security services of the nuclear sites in Central Europe have already taken into account these terrorist and criminal threats, in a preventive fashion—as this paper demonstrates—justifies the high marks that the Czech Republic, Hungary and Poland all received, for example, in the 2012 NTI *Security Index* rating.¹⁹

¹⁹ The three are ranked second (Hungary), third (Czech Republic) and eighth (Poland). See: Nuclear Threat Initiative and Economist Intelligence Unit, *NTI Nuclear Materials SECURITY INDEX. Building a Framework for Assurance, Accountability, and Action*, January 2102, Washington DC, p. 14.