APPROACHES TO DESIGN BASIS THREAT IN RUSSIA IN THE CONTEXT OF SIGNIFICANT INCREASE OF TERRORIST ACTIVITY

Dmitry Kovchegin
Harvard University
79 John F. Kennedy Street,
Cambridge, MA, 02138, USA 617/384-8166

ABSTRACT

Design Basis Threat is one of the main factors to be taken into account during design of physical protection system of nuclear facility. In according with IAEA's recommendations outlined in INFCIRC/225/Rev.4 (Corrected) "*The Physical Protection of Nuclear Material and Nuclear Facilities*" Design Basis Threat (DBT) defined as: "the attributes and characteristics of potential insider and/or external adversaries, who might attempt unauthorized removal of nuclear material or sabotage, against which a physical protection system is designed and evaluated". Development of DBT is considered as one of the significant task during the work on domestic Russian regulations in the field of physical protection.

Events of the last years have demonstrated that terrorist attack (with the goal of stealing nuclear materials or sabotage with catastrophic consequences) should be considered among the top threats to nuclear facilities. Moreover, possible scale of terrorist acts significantly raises requirements to physical protection systems. In particular Russian situation, recent hostage taking event in Moscow in October 2002 and subsequent statements of Chechen terrorist leaders regarding possible attacks against nuclear facilities confirmed that threat of attack by the group consisting of the large number of well-trained well-equipped terrorists should be considered as real and taken in to account during physical protection system development.

Within the context described above this paper is intended to analyze Russian approach to the development of design basis threat taking into account risk of attack against specific nuclear facilities. Russian approach to international cooperation in this sphere with particular emphasis on debated amendments to Convention on Physical Protection of Nuclear Materials will also be considered.

INTRODUCTION

Recent years events highlighted the fact that large-scale terrorist attacks should be considered among the possible and most dangerous threats to nuclear and radioactive hazardous facilities. In particular, terrorist attack of September 2001 in US and hostage taking event of October 2002 in Moscow demonstrated terrorists' ability to commit well planned actions involving large number of participants, large number of arms and objects public infrastructure.

Some new trends also exacerbate the threat of attack against nuclear facilities and put in the forefront the need for new approaches to protection of hazardous facilities. In particular, modern terrorists do not always seek opportunity to save their lives after terror act. Moreover, growing number of suicidal attacks is the evidence of the opposite. While having different goals and approaches in comparison to old-fashioned terrorist organizations, modern terrorists tend to be much more violent, therefore increasing the risk of terrorism involving WMD or with consequences

comparable to WMD use. Hence, prevention of theft of nuclear and radioactive materials suitable for nuclear explosive or radiological dispersal device development should be the top priority of international and domestic agenda. Also, among the most dangerous, while accomplishable events, are attacks against nuclear facilities with the purpose of sabotage resulting in significant release of radiation. These threats should be considered during design of physical protection systems of nuclear facilities.

RUSSIAN PECULIARITIES

Terrorism threats should also be adequately addressed in Russia. There are a number of specific factors, which make this problem even more acute in Russia in comparison to another countries:

- A raise of terrorism since middle ninetieths. Since the war in Chechnya started in 1994, terrorism has become a part of existing security environment in Russia. This was demonstrated by a number of terrorist attacks including extremely violent events of 1999 and 2002.
- Inadequate level of physical protection, which is particularly true in case of widely used radioactive sources. Only a little more than one third of weapon-grade nuclear material in Russia have comprehensive or interim, rapid security upgrades completed. There are nearly 400 radioisotope thermoelectric generators (RTG), containing significant amount of radioactivity, along the Northern coastline of Russia, these RTGs has no any physical protection intended t prevent their deliberate destruction or theft.
- Recent Russian history saw precedent of use of radioactive source by Chechen terrorists, when cesium was buried in Izmailovsky Park in Moscow. While real effect of this act is doubtful, it demonstrated terrorists' ability and willingness to employ radioactive materials. Chechen leaders also repeatedly stated their intention to attack nuclear and other dangerous facilitites. Moreover, Russian mass media, referring to law enforcement agencies, cited some cases of terrorists' attention to nuclear facilities.
- Extensive illegal trafficking in conventional arms. Problem of access to necessary small arms or powerful explosives essentially does not exist for criminals – large amount of explosives was used to destroy residential buildings in Moscow, Volgodonsk and Buinaksk in 1999; stolen shoulder fired anti-aircraft missiles hit Russian military helicopters in Chechnya and terrorists attacked Moscow theater in October 2002 were heavily armed with a wide range of weaponry.
- In March 2003 Ministry of Transport reported that during inspections in 2002 more than 1000 unregistered air-vehicles, including 364 airplanes, were discovered. It may present significant threat as far as these air-vehicles may be used for suicidal attacks against hazardous facilities.

In fact, significant attention to security of nuclear and other hazardous and critical facilitites has been paid since middle ninetieths, when terrorism became a reality in Russia. Events of September 1999, when blasts of residential buildings in Moscow, Volgodonsk and Buinaksk killed some hundreds of people, and September 2001 in United States gave additional momentum to anti-terrorism efforts. It is worth noting that additional protective measures around nuclear facilities were implemented during major crises, which contribute to the rise of terrorism. Last time it took place after the start of US-led military operation in Iraq.

CHANGES IN THREAT PERCEPTION AND RESPONSE MEASURES

It is necessary to make an important reservation here. Issues of nuclear facilities security are often pertaining to state secrets. This may also be true with regard to specific measures of physical protection and counterterrorism activity and specific details of threats and intruder profiles taken into consideration for design of physical protection systems. Therefore, this paper is based on analysis of relevant legislation and open sources of information, which allow judging the current level of readiness of system of anti-terrorism fight in Russia.

In according to the basic Russian law "On Atomic Energy Use" one of the main functions of physical protection of nuclear facilities is "timely detection and prevention of sabotage and terrorist acts". However, in would be wrong to say that physical protection system is the only barrier for terrorists.

Significant legislative base of counterterrorism activity has been developed in Russia since late ninetieths. Basic law "On Fight against Terrorism" was approved in July 1998. This law refers to Criminal Code for definition of terrorism. This definition includes offence against nuclear facilities as well as radioactive substances and radioactive sources.

Law "On Fight against Terrorism" defines FSB, Ministry of Interior, Foreign Intelligence, Federal Guard Service and Ministry of Defense as agencies directly involved in counterterrorism activity. Government Decree of June 1999 also determined Minatom and Gosatomnadzor as agencies participating in counterterrorism activity within their authority. Generally, Russian legislation provides for transfer of issue of prevention of terrorist attacks against nuclear facility from specific authority of nuclear agencies and facility management to the higher level of government-wide activity.

Thus, it is not applicable in Russia's case to speak about DBT in its INFCIRC/225 definition as a basic assumption for development of measures preventing terrorist attacks against nuclear facilities and, respectively, about purely physical protection measures to protect nuclear facilities from terrorists. It is more appropriate to consider wider DBT, i.e. threat perception by the whole range of relevant agencies, including Minatom, and, therefore, measures to fight this threat and physical protection system is one of its elements – essential, but not in any way sufficient.

There are a number of evidences that Russian authorities consider terrorist threat as real and keep it in mind during development of protective measures.

First, numerous statements were made by top Russian security officials showing their concern about possible terrorist attacks against nuclear facilities. These officials also noted that evidences had been received about terrorists' intention to assault nuclear and other hazardous facilities. However, there were some discord between security officials' statements and public statements of top nuclear establishment, which were rather complacent and claimed sufficient protection of nuclear facilities.

Second, a number of legislative acts were approved immediately after blasts in September 1999. On September 15, 1999 – just two days after second blast in Moscow – government decree "On Measures of Counteraction to Terrorism" was signed. In particular, it ordered to law enforcement agencies to increase protection of nuclear facilities and enterprises handling radioactive materials.

Currently this decree serves as a legal base for anti-terrorism activity, including protection of nuclear facilities.

Practical implementation of aforementioned decree appeared in a number of measures:

- Areas with restricted access around nuclear facilities were enlarged
- Access procedures to restricted areas were toughened
- Amount of protective forces was increased and reinforced by special forces

Special attention was also paid to various trainings intended to improve protection of nuclear facilities. Frequency of such trainings in Russia was drastically increased after terror acts of 1999. Main types of trainings are as follows:

- **Facility's response forces and physical protection vs. mock terrorists**. Main purpose of such training is to check preparedness of protective forces and reliability of physical protection and reveal flaws. Usually the role of mock terrorists played by special forces unit "Vympel", which is specially trained to act at nuclear facilities.

- **Special forces vs. terrorists seized nuclear object.** Main purpose of this kind of training is to improve special forces capability to neutralize terrorists seized nuclear facility and improve interaction of all relevant authorities in crisis situation.

- **Simulations for relevant authorities** – emergency teams, law enforcement, municipal officials – to improve response and coordination in the crisis situation.

In the recent years these trainings took place at Balakovo, Volgodonsk NPPs, Urals Electrochemical Combine, Mining and Chemical Combine and others.

However, capability of site-based protective forces to defend nuclear facility lowered by current process of their transformation. As head of Minatom, Alexander Rumyantsev, mentioned in his testimony to State Duma in March 2003, a number of Ministry f Interior (MVD) troops around nuclear facilities has been decreasing because of inadequate funding. It forced Minatom to start deploying its own guards as protective forces. Development of Minatom's departmental protective forces is carried out in according with the federal law "On Departmental Protective Forces" adopted in April 1999 and regulation on Minatom's departmental protective forces approved by Government decree of February 2001. These legislative acts allow departmental guards to use firearms and other means against perpetrators.

Also, as is known from public accounts, assumption currently used for trainings is that terrorists would try to keep nuclear facility under control during continuous period of time to use it for blackmailing or eventual theft of nuclear material. This assumption does not take into account the possibility that terrorists may immediately damage critical systems to cause failures in operation resulting in significant release of radioactivity. In case of nuclear power plants it may also seriously damage population and entities dependent on energy supply from NPP under attack.

Another possible threat – crashes of air vehicles into nuclear facilities – is also considered as realistic by Russian nuclear authorities. Current level of protection is not trustworthy. For example, in according to existing rules of nuclear safety, nuclear power plants must be designed to withstand crash of airplane with mass up to 20 ton at a speed of 700 km/h taking into account the risk of fuel inflammation. Such parameters are not adequate to the threat of crash of heavy passenger liner or small airplane loaded with explosives.

Special attention is also paid to the threat of radiological terrorism. Minatom experts admit that currently existing system of management of radioactive sources was created without terrorist threat in mind. Major emphasis in prevention of improper use of radioactive materials is made on improvement of state system of control and accounting of radioactive materials and detection of radioactive sources outside their normal locations.

Another evidence of the fact that Russian authorities perceive terrorist attack threat as real is acceleration of some cooperative US-Russian programs in the field of physical protection of nuclear installations. It is indicative that Russian side asked American partners for accelerated cooperation after events of September 11, 2001 in United States. In particular, cooperation to improve protective forces' capability to protect nuclear materials was given additional impetus. Rapid upgrades were made to increase survivability of response forces, decrease response time and place more guards closer to possible targets.

Facts mentioned above show that burden of protection nuclear objects from terrorists lies mostly on law enforcement agencies and use measures intended to prevent attacks against nuclear facilities and defeat terrorism in general. Certainly, it is reasonable policy. The number of possible terrorists' targets are much wider than number of nuclear facilities. It includes a large number of chemical and other hazardous enterprises, objects of public infrastructure and information systems, attacks against which may cause damage comparable to attack against nuclear facilities. Overwhelming majority of these objects is much less protected than nuclear sites. Spot protection of each possible target would be extremely expensive even for states much wealthier than Russia.

To some extent inadequate level of technical means of physical protection may be compensated by enhanced amount of protective forces. In according to mentioned above regulation on Minatom's departmental protective forces, "structure and strength of departmental protective force units are determined depending on particular features of guarded objects, level of its equipment with technical means of protection and other conditions relevant to ensuring reliable protection". This provision implicitly refers to the need to take into account design basis threat, which may be attributed to "particular features of guarded objects" and "other conditions relevant to ensuring of reliable protection".

However, it does not remove the problem of providing physical protection systems with technical means more adequate to current threats. Design basis threat development had not been completed before terrorist acts of September 2001 in USA. This allows incorporating new threats at early stages avoiding subsequent amendments. In fact, new version of rules of physical protection, which are under development in Russia, shift from specifying elements of physical protection to proposition of adequacy to design basis threat.

Major problem is what kind of threat or intruder(s) profile should be considered as real while not exaggerated. It is particularly acute under condition of limited resources, what is the case for Russia. In October 2002 theatre in well packed by police Moscow were captured by a group of 40 heavily armed well-trained terrorists. One cannot guarantee that next time the group twice of that amount will not attack any nuclear facility. While it is clear that threat parameters must be increased in comparison to "pre-terrorism era", this process cannot continue infinitely.

To avoid extensive increase of physical protection measures (to interpret this simplistically - "higher fences", "thicker walls" etc) and over-expenditure of scarce resources a number of measures aimed at qualitative increase of protective forces capabilities may be suggested. Among them:

- Improved detection capabilities
- Improved command, control and communications systems, i.e. video surveillance, reliable communication equipment etc.
- Increased survivability of protective forces
- Better training and equipment for facilities' protective forces personnel. Shift from MVD conscripts with low motivation to professional departmental guards may significantly help.
- Faster response by off-facility forces

These measures while not themselves providing an additional protection for nuclear facilities and materials may significantly increase capabilities of protective forces to withstand terrorist attacks and prevent adverse course of events at early stages.

INTERNATIONAL COOPERATION

Issues of physical protection at domestic level have always been subject to national sovereignty. It is particularly true in case of nuclear weapon powers including Russia. However, threat of terrorism involving nuclear materials or sabotage against nuclear facilities has no boundaries – once nuclear material is stolen in one country, there is always a chance of its use in terrorist act against other country; large scale radiological accident in one country may inflict significant damage in another. That is why, issue of physical protection should be on top of international agenda and common approaches to design basis threat determination should be elaborated.

However, there is little cooperation between Russia and other countries in the field of design basis threat determination. Main reason for this is that specific parameters of design basis threat and detailed intruder profiles are the matter of state secrecy as far as they have direct relation to the protection of security related assets. As far as issue of design basis threat is relatively new for Russian nuclear industry, main cooperation is devoted to the training for nuclear industry and law enforcement agencies personnel involved in physical protection activity at nuclear facilities. A number of seminars and meetings in this field were conducted in cooperation with IAEA and foreign experts.

At the same time, threat perception is different in different countries and there is a lack of international legally binding requirements for common standards of physical protection of nuclear materials in domestic use. Major nuclear powers, including Russia, do not agree for amendments to

Convention on Physical Protection of Nuclear Materials capable to drastically increase security of nuclear materials and facilities over the world.

However, there is some cooperation on bilateral US-Russian level, which can, to some extent, compensate the lack of common approach to design basis threat on international level. Thus, top Russian and US security and intelligence officials repeatedly drew attention to significant increase in mutual intelligence sharing and other forms of cooperation between US and Russia in their fight against terrorism.

CONCLUSION

Russian authorities have been paying significant attention to the threat of terrorist attack against nuclear facility since the rise of terrorist activity in Russia in the middle of ninetieths. A number of new threats, including radiological terrorism and airplane crash into nuclear facilities have also been under consideration since events of September 2001 in United States. However, there are some significant threats, acts of sabotage in particular, which are not properly addressed.

Leading role in the counterterrorism activity belongs to law enforcement and security agencies. Therefore, range of measures intended to protect nuclear facilities includes primarily legislative and organizational activity contributing to prevention of attack and effective response to it. These efforts are not limited to the locations of nuclear facilities, but nation-wide. In itself technical and organizational means of physical protection of specific nuclear facility are not intended to match design basis threat and, thus, serve as one of important elements of protection.

Under condition of limited resources primary attention should be paid to qualitative upgrades contributing to capability of protective forces to respond to adverse actions, not to extensive upgrades of fences, walls etc.

Although events of September 2001 in United States gave significant momentum to international cooperation in counterterrorism activity, no significant changes in the field of physical protection and determination of common minimal level of design basis threat have occurred so far. While specific details of design basis threat and intruder profiles may be kept secret in every country, minimal standards should be legally binding for nuclear materials in domestic use. Intelligence sharing on possible terrorists' intentions and capabilities with regard to possible offence against nuclear facilities or materials should also continue.

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