Physical Protection Enhancements in Japan and the Role of JNES

Seishi NISHIDA,
Nuclear Security Support Office,
Japan Nuclear Energy Safety Organization (JNES),
TOKYU REIT Toranomon Bldg. 3-17-1 Toranomon Minato-ku Tokyo, 105-0001 Japan

Abstract

The possibility of terrorist attacks on nuclear material and nuclear facilities has posed a continuing threat since the events of September 11, 2001.

The Japanese government has strengthened its physical protection regime, including legislative amendments, due to the necessity of upgrading the degree of protection of nuclear facilities to be equivalent to international levels, in order to cope effectively with the threat of theft of nuclear material and sabotage of nuclear facilities.

In relation to these enhancements of the physical protection regime in Japan, the Japan Nuclear Energy Safety Organization (JNES) gives technical support to the regulatory agency, the Nuclear and Industrial Safety Agency (NISA), in the area of physical protection examination and inspection, through the development of technical guides for inspectors and operators, acquisition, analysis, and evaluation of related information, and international cooperation. This support is aimed at ensuring the consistent implementation of physical protection measures in Japan.

In the future also, the JNES will provide further support to the NISA aimed at a well-developed physical protection framework in Japan, giving consideration to international physical protection enhancements such as publication of IAEA nuclear security series documents, inter alia Recommendations for physical protection of nuclear material and nuclear facilities being also Revision 5 of INFCIRC 225.

1. Introduction

Nuclear terrorism, representing the most immediate and extreme threat to global security, constitutes the greatest challenge to the international community, as identified by President Obama in his Prague speech in April 2009.

In view of this global situation, the physical protection of nuclear materials and nuclear facilities in Japan has been strengthened to be equivalent to international levels, and the JNES, ever since its assignment of experts at the time of its inauguration in 2003, has supported the NISA as a technical support organization.

The roll of the JNES covers various fields, such as assistance in the review and inspection of physical protection of nuclear facilities conducted by the NISA,

development of the basic data used for regulation through experiment and analysis, and information exchange with other countries and promotion of international cooperation.

２． Enhancement of physical protection measures in Japan

In Japan, physical protection measures for nuclear facilities have been in operation since the middle of the 1970's and partial amendments of the related laws and ordinances were enacted 1988, in line with accession to the Convention on the Physical Protection of Nuclear Material and Nuclear Facilities (CPPNM). Accordingly, each nuclear facility operator became legally obliged to provide the requisite measures for physical protection, to obtain approval for their nuclear security plan, and to appoint a physical protection administrator.

Subsequently, in consideration of the increased threat of nuclear terrorism since the terrorist attacks in the U.S. on September 11, 2001 and the publication of the IAEA INFCIRC 225 Rev. 4 on June 1999, the "Law for Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors" was revised in May 2005.

The main contents of the revision are as follows:

1) Introduction of Design Basis Threat (DBT)
2) Implementation of physical protection inspection
3) Enhancement of security of sensitive information

The main purpose of the amendment is to expand physical protection measures to cover not only "theft of nuclear materials" but also "sabotage."

1) Introduction of Design Basis Threat (DBT)

The DBT is the threat which the facility operator should take into consideration when designing a physical protection system and it was introduced as a mechanism for requiring the operator to respond appropriately to the postulated threat and implement effective physical protection measures.

The DBT is defined by the regulatory agencies in consultation with the national security authorities, who are in possession of threat and security information. The regulatory agencies submit the DBT to the operators, and the operators develop physical protection measures so that they can deal with the DBT.

If necessary, the DBT is revised in line with current threat and security information.

Based on the DBT, specific physical protection measures are developed and these are described by the operators in security plans for each of the respective facilities. Security plans are required to cover the following:

- Organization and functions of physical protection
- Definition of protected/restricted areas

- Access control
- Material control
- Physical protection system
- Information management (including confidentiality)
- Education and training
- Emergency preparedness plan
- Measures taking DBT into account
- Evaluation and necessary improvements
- Recordkeeping
- Other

2) Implementation of physical protection inspection

The operator defines the physical protection measures for nuclear facilities in the form of a nuclear security plan, and the physical protection inspection system was established for verification by the regulatory authorities of adherence to this plan.
In other words, it is a system by which the authorities verify through inspection that the protection measures against the DBT are being implemented effectively and thoroughly by the operators.

Inspections are of the following three types.

- Protection standards inspection
  The authorities check that the protection measures implemented by the operators meet the minimum level requirements demanded by national rules and regulations.

- Time-line analysis
  The operators provide proof of the sufficiency of the protection measures against the DBT, i.e. demonstrate the adequacy of the delay time up to arrival of the response force at the facility. The authorities verify the adequacy of this proof.

- On-site exercises and evaluation
  Through the simulated response exercises carried out periodically by the operator, the authorities evaluate the results of protection standards inspections and time-line analysis from the viewpoint of the effectiveness of the protection systems at the facility. The evaluation results are reflected in improvements to the operator's protection measures etc.

3) Enhancement of security of sensitive information

For development of a new physical protection framework or for the sharing of international nuclear security information, strict controls for the safeguarding of information represent a prerequisite. The confidentiality regime for nuclear security information has therefore been amended.

The main information which needs to be subject to control is as follows, and the penalties for unlawful disclosure of sensitive information are imprisonment of up to one year and/or a fine of up to ¥1 million.

- DBT (Design Basis Threat)
- Details of PP systems (PPS)
- Details of surveillance and guards
- Details of contingency and emergency plans
- Detailed results of assessment

Etc.

3. Technical support provided by JNES

The physical protection for nuclear power plants is implemented through collaboration between the NISA as the regulatory agency, National Police Agencies and the Japan Coast Guard as the security authorities, nuclear power plant operators, and the JNES as the technical support organization.

The role of each organization is shown in Figure-1.

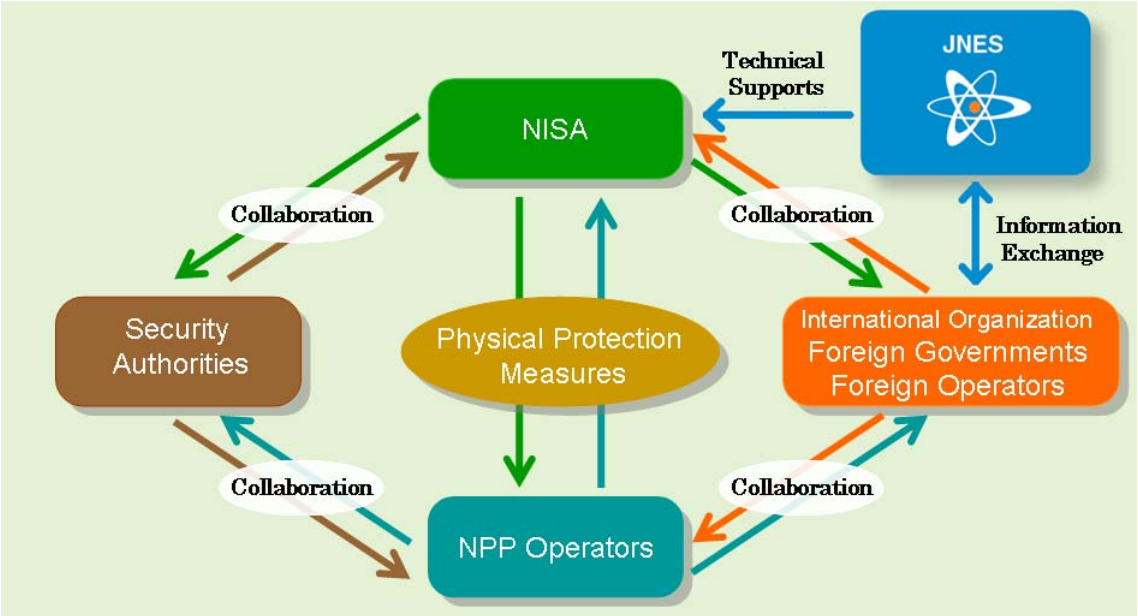

Figure-1 Role of each Organization

The main activity of the JNES is the provision of technical support to the regulatory agency, the NISA, while other activities include technical cooperation with international organizations such as the IAEA and information exchange with foreign TSOs etc.
An outline of the main activities of the JNES Nuclear Security Support Office is given below.

1) Investigation of overseas trends in PP regulations and technology

With respect to physical protection, the JNES investigates overseas trends in regulation and technology, and terrorist attacks both in Japan and abroad. The results of these investigations are provided to the NISA.

2) Investigation of PP system technology

The JNES gives technical support to the NISA in the area of basic performance tests on the intrusion detection systems, access control systems, etc. used in domestic nuclear facilities. Results regarding the effectiveness of PP equipment, such as detection rate, nuisance alarm rate, and influence on the environment, are obtained through these tests. The results are utilized as data for guidelines on the design and inspection of PP equipment.

3) **Development of technical guidelines**

The JNES develops technical guidelines, such as guidelines on PP exercises, time-line analysis, and PP equipment design, for use by operators and inspectors.

4) **International cooperation**

The JNES carries out technical information exchange with related overseas organizations in the U.S., France, Germany, and South Korea, and the information acquired relating to regulations and PP technology is utilized in PP measures in Japan.

In addition, the JNES cooperates actively in the development of the IAEA nuclear security series documents by participating in consultant meetings, technical meetings, etc.

4. Further enhancement of PP regime and the role of JNES

In Japan, the “Law for Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors” was revised in May 2005 and the PP regime was radically enhanced in order to bring it up to international levels. Since then five years have passed, and in this

period the amended CPPNM (Convention on the Physical Protection of Nuclear Material and Nuclear Facilities) has been adopted, and the International Convention for the Suppression of Acts of Nuclear Terrorism has been ratified. Moreover, since the IAEA recommendation document for nuclear material and nuclear facilities (being also Revision 5 of INFCIRC 225) will be published in the near future, it is necessary to make Japanese PP regulation consistent with the international framework in order to win international trust for Japan's PP measures, and this can be achieved by taking these international trends into consideration and amending the Japanese regulatory system as necessary.

1) Examination of IAEA recommendation documents and incorporation into Japanese regulatory framework

The JNES has been cooperating actively in the amendment and development of the IAEA nuclear security series documents, having dispatched a specialist in consultation with the NISA. Since the IAEA recommendation document for nuclear material and nuclear facilities (being also Revision 5 of INFCIRC 225) will be published in the near future, the JNES will provide technical support to the NISA in their corresponding investigation, which will compare the IAEA recommendation document to the Japanese regulations and amend the Japanese regulatory system as necessary.

2) Support for upgrading PP inspection system

Although the PP inspection system in Japan is based on confirmation through a paper audit approach, it is now necessary, in consideration of international trends, to initiate a step-by-step change to a performance-based inspection system.

To this end, the JNES plans to provide support to the NISA in its initiatives for upgrading PP inspection by developing technical guidelines on performance tests and inspection procedures for PP equipment based on information collected from overseas.