Japan's Regulatory and Safety Issues Regarding Nuclear Materials Transport

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1. BACKGROUND

This paper focuses on the regulatory and safety issues on nuclear materials transport which the Government of Japan (GOJ) faces and needs to well handle. Background information about the status of nuclear power plants (NPP) and nuclear fuel cycle (NFC) facilities in Japan will promote a better understanding of what this paper addresses.

1.1. One-third of Electricity Comes from Nuclear Power

Japan is poor in natural resources, relying on imports for approximately 80% of its primary energy demands. Since the oil crises of 1973 and 1979, Japan has diversified energy resources by introducing nuclear energy as well as liquefied natural gas and coal, while it has continuously made its endeavours to save energy consumption. Japan's nuclear power generation capability currently amounts to more than 45,000 megawatts (MW) with 16 commercial NPPs, or 52 commercial nuclear reactors, and one-third of Japan's electricity supply comes from nuclear power. Japan is the third largest producer of nuclear powered-electricity after the United States (US) and France. Additional five nuclear reactors are expected to start producing electricity by the year 2010.

1.2. Eleven Nuclear Cycle Facilities in Operation and One Reproceeing Plant under Construction

The GOJ has been implementing a NFC policy. There are currently eleven NFC facilities in operation in Japan: Two uranium enrichment plants, one reconversion plant, and four new fuel fabrication plants for the front-end operations; and four low/high-level radioactive waste storage facilities for the back-end operations. In addition, in order to complete the NFC policy, one commercial reprocessing plant with the maximum reprocessing capability of 800 metric ton uranium per year is under construction.

In this regard, Japan Nuclear Fuel Limited (JNFL), which is affiliated with Japan's electric power companies, conducts NFC-related business in the northern area of Japan at Rokkasho Village, Aomori Prefecture. JNFL currently operates three types of facilities there: one uranium enrichment plant, one vitrified waste storage center for high-level radioactive waste (HLW) and one low-level radioactive waste (LLW) disposal center. The company is currently constructing a reprocessing plant that is expected to start its operation in a few years to come. JNFL also has a plan for the construction of a mixed oxide (MOX) fuel fabrication plant.

1.3. Interim Spent Fuel Dry Storage Facilities Drafted

The spent fuel removed from Japan's nuclear reactors amounts to approximately 900 metric tons uranium per year. This amount is estimated to increase because of the operation of newly-constructed nuclear reactors. Some electric power companies have drafted a plan for the construction of interim spent fuel dry storage facilities somewhere outside the areas of existing NPPs, owing to the shortage of capacity for spent fuel repository. The first facility for spent fuel dry storage is expected to start its operation by the year 2010.

2. CURRENT STATUS OF JAPAN'S NUCLEAR MATERIALS TRANSPORT

In this section background information on the current status of Japan's nuclear materials transport is provided for the audience.

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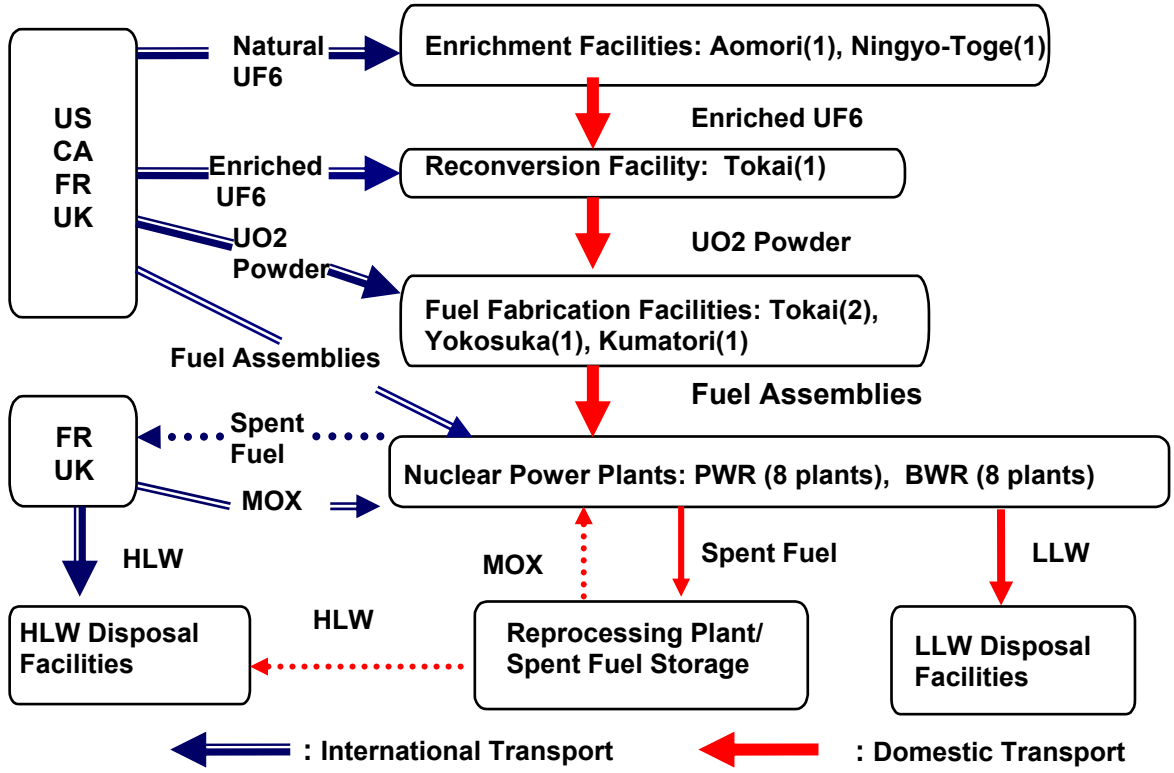
2.1. Overview of Japan's Nuclear Materials Transport

The safe transport of nuclear fuel materials as well as radioactive wastes is a key factor for the maintenance of the Japan's nuclear power industry. The international and domestic transport of nuclear materials and radioactive wastes has been conducted as shown in Figure1. Almost all nuclear fuel materials such as natural/enriched uranium hexafluoride (UF6) or uranium dioxide (UO2) powder for Japan's nuclear reactors are imported from the US, Canada, France and the UK. These materials are shipped to Japan's NFC facilities to enrich and/or reconvert for the fabrication of new reactor fuel assemblies. Japan's electric power companies import even new fuel assemblies from the US fuel fabrication plants for the diversification of supply channels. The cumulative volume of overseas/inland transport of these nuclear materials excluding spent fuel and radioactive wastes amounts to about 2,500-3,000 metric ton uranium a year.

Fig. 1 Overview of Japan's Nuclear Materials Transport



Japan's spent fuel, meanwhile, had been shipped to France and the UK since 1969 for reprocessing it there because Japan had no commercial reprocessing plant. Pursuant to the existing contracts between the Japan's electric power companies and the French/UK reprocessing companies (COGMA/BNFL), not only reusable uranium/plutonium but also high/low-level radioactive waste that remains after spent fuel is reprocessed must be returned from Europe to Japan. Although the shipment of spent fuel from Japan to Europe has been finalized, the transport of MOX fuel as well as radioactive wastes will continue for some years to come.

With regard to the domestic transport of spent fuel and radioactive wastes, the amount of spent fuel transport stands relatively small nowadays, mainly because the commercial reprocessing plant at Rokkasho Village has not been completed yet for its operation. On the other hand, LLW transport from nuclear power plants to the LLW Disposal Center at Rokkasho Village is made constantly.

2.2. Some Prospects for Japan's Future Transport of Nuclear Materials

The volume of Japan's nuclear materials transport as a whole will most likely increase in the future. The amount of transport of UF6, UO2 and new fuel assemblies will steadily increase due to the operation of the newly-constructed

nuclear reactors. In addition, the domestic transport of MOX fuel for NPPs will be conducted nationwide after the operation of the MOX fabrication plant at Rokkasho Village begins.

With regard to the back end transport, the amount of spent fuel transport in metal casks for the Rokkasho Reprocessing Plant as well as future interim spent fuel dry storage facilities will substantially be increasing. Additionally, a large amount of HLW/LLW transport is in prospect owing to the decommissioning of decrepit NPPs in the future.

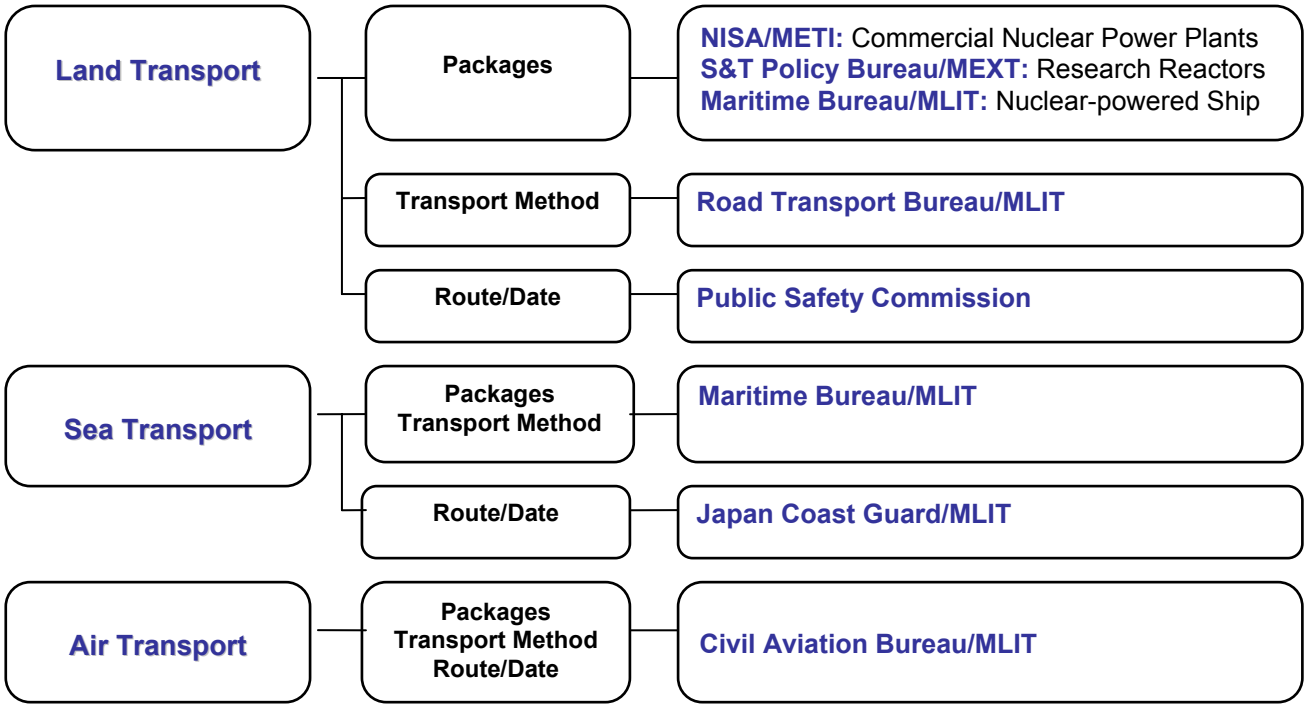
Considering the above-mentioned prospect of an increase in the transport volume of nuclear materials and radioactive wastes, it is crucially important for both nuclear regulatory bodies and nuclear power-related companies to make sustained efforts towards ensuring transport safety. A lack or a dismissal of nuclear safety culture would easily lead to a collapse or a deterioration of public confidence in the safety of nuclear materials transport.

2.3. Who Regulates Nuclear Materials Transport in Japan?

The reorganization of governmental bodies in January 2001 led to the change in transport-related jurisdiction among the GOJ regulatory bodies. Owing to the disestablishment of the former Science and Technology Agency (STA) that had been a leading body for the safety of transport involving radioactive material, the newly-established Nuclear and Industrial Safety Agency (NISA) of the Ministry of Economy, Trade and Industry (METI), and the Science and Technology Policy Bureau of the Ministry of Education, Culture, Sports, Science and Technology (MEXT) have divided the STA's authority over licensees related to the land transport of radioactive material.

As is usual with most Member States' regulatory authorities responsible for transport safety, the several regulatory bodies of the GOJ divide responsibilities for the safety of transport of nuclear materials as shown in Figure 2.

Fig. 2 Who Regulates Nuclear Materials Transport in Japan?



2.3.1. Land Transport

Land transport is the most complicated in terms of what responsibility each regulatory body assumes. The safety of nuclear materials land transport is regulated under the Law on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (Reactor Regulation Law) and its subordinate regulations. The METI, the MEXT and

the Ministry of Land, Infrastructure and Transport (MLIT) divide the responsibilities for regulating the safety of packages in accordance with their respective jurisdiction over licensees. The NISA/METI takes the responsibility of regulating the safety of land transport packages that contain nuclear materials for use as commercial nuclear reactor fuel, their spent fuel and radioactive wastes, while the Science and Technology Policy Bureau of the MEXT is responsible for the safety regulation of packages containing research reactors-related nuclear materials.

The Maritime Bureau of the MLIT, meanwhile, handles regulatory business on land transport packages containing nuclear materials of a nuclear-powered ship. (However, Japan currently does not possess such a ship.) The MLIT is also responsible for the safety regulation of matters regarding all conveyances, including methods of loading nuclear materials packages into land vehicles.

With regard to information on transport route and date/period, licensees should give an advance notice of such information to an assigned local (prefectual) Public Safety Commission and carry nuclear materials under the supervision of an assigned local police HQ.

All regulations for the land transport of nuclear materials have timely been amended in accordance with the updated IAEA Transport Regulations. (The transport safety for radioisotopes is regulated under the Law Concerning Prevention from Radiation Hazards due to Radioisotopes and its subordinate regulations, which are also kept compatible with the IAEA Transport Regulations.)

2.3.2. Sea and Air Transport

The MLIT is responsible for all elements of safety regulation during sea or air transport. The safety of sea transport of radioactive material is regulated under the Ship Safety Law and its subordinate regulations. The Maritime Bureau, MLIT regulates both packages and transport method including how to load materials onto a ship, while the Japan Coast Guard, MLIT regulates the safety of shipments while packages are in transit on the sea. The Civil Aviation Bureau of the MLIT, meanwhile, regulates the safety of air transport of radioactive materials under the Civil Aviation Law and its related regulations. The Bureau currently prohibits the transport of nuclear materials by air, while it allows radioisotope transport. The said sea and air transport regulations have been amended in accordance with the International Maritime Organization's (IMO) International Maritime Dangerous Goods (IMDG) Code and the International Civil Aviation Organization's (ICAO) Technical Instructions on the Safe Transport of Dangerous Goods by Air (TI) respectively.

2.4. Efforts towards Transport Community Revitalization

After the January 2001 governmental reorganization, the GOJ transport regulatory bodies had to make some rearrangements of how the respective bodies should carry out their designated responsibilities in cooperation with each other. As previously mentioned, the reorganization disestablished the STA that had been a leading body for transport safety and the NISA/METI and the S&T Policy Bureau/MEXT have divided the STA's authority over licensees related to the land transport of radioactive material. Since land transport is the main mode for radioactive material transport, the reorganization resulted in a situation where there was no law-enacted administrative body that acted as a national coordinating authority in terms of the overall safety regulation of radioactive material transport.

Under such circumstances the NISA/METI, which is primarily responsible for the linchpin of regulating the safety of land transport packages and representing the GOJ in relation with the IAEA Transport Safety Standards Committee (TRANSSC), has reorganized in January 2004 a regular interagency coordinating meeting (ICM) on matters regarding the safe transport of radioactive material. The ICM chaired by the director for the Nuclear Fuel Transport and Storage Regulation Division, NISA, is comprised of the senior officials of all related governmental organizations or bureaus, including emergency response organizations such as the National Policy Agency, the Coast Guard and the Fire and Disaster Management Agency.

What the ICM has been doing to date are to 1) share transport safety-related information and exchange views on this, 2) conduct a review/revision of the former transport emergency plans, and 3) make arrangements for the harmonic and timely implementation of the 2003 Edition of the IAEA Transport Regulations (TS-R-1) and its relevant international transport regulations.

3. WHAT ACCIDENTS HAPPENED AND HOW HAS GOJ DELT WITH THEM?

While nuclear materials in Japan have been carried safely over 30 years without serious accidents that cause radiological releases to the environment or harm to the public, a string of nuclear safety-related accidents/incidents at NPPs and NFC facilities occurred in the last decade in Japan, which lost public trust in the nuclear safety activities by both the regulators and the licensees.

3.1. Lessons Learned from the Past Accidents/Incidents

The Tokyo Electric Power Company (TEPCO) Falsification Case was revealed in the year 2002. The TEPCO had organically concealed and falsified the inspection data related to the cracks in the core shrouds, which were detected during the company's self-imposed inspections of nuclear reactors from late 1980s to 1990s, and also had illegally falsified the leakage rate during its inspections of the reactor contamination vessels.

The fatal JCO Criticality Accident occurred in September 1999 at the JCO uranium fuel reconversion facility at Tokai Village located in the northeast of Tokyo. This criticality accident was caused by the workers who mistakenly poured an excessive amount of uranium solution into a precipitation tank by using steel buckets. This process illicitly deviated from the approved procedures. The radiation leak killed two workers, exposed more than 600 people to radiation and forced the emergency evacuation of thousands of nearby residents.

Besides the above accidents/incidents that happened at nuclear facilities, a falsification case regarding spent fuel cask data occurred in October 1998. The Nuclear Fuel Transport Co. (NFT) disclosed the falsification of data related to the resin, or the neutron shield material of spent fuel casks, which is key material for cask integrity. This incident also showed the quality assurance program was insufficient in terms of the NFT's management system for checking the cask manufacturing in accordance with the approved package design.

The common lessons learned from these accidents or incidents are that 1) the licensees tend to lack or dismiss a sense of duty of abiding by the safety regulations or guidelines, 2) the quality assurance program as a whole is inadequate, in particular, for the management system to ensure satisfactory quality in the phase of manufacture or maintenance, and 3) the improvement of the emergency response and the crisis management capability is required for both the regulators and the licensees.

3.2. Measures to Foster Safety Culture and Rebuild Public Confidence

The intensive discussions conducted by the regulatory authorities and the stakeholders, with a view to fostering safety culture and rebuilding public confidence, have developed plans for the revision of regulations related to quality assurance systems as well as the self-imposed inspection, the reinforcement of safety regulatory bodies, and the improvement of transparency and communication with the public.

3.2.1. Former Self-imposed Inspection Replaced by Compulsory Inspection

The amendments to the Electricity Utility Industry Law and the Reactor Regulation Law passed during the 2002 extraordinary session of the Diet in order to preclude a falsification case caused by the NPP licensees and to implement safety regulations in line with international level. The former self-imposed inspection was replaced by a legally compulsory periodic inspection that is conducted by the operators. The licensees are required to make some arrangement about the implementation of the compulsory inspection, including management system, inspection scope, inspection methods and other necessary items. This arrangement needs an examination by the newly-established Japan Nuclear Energy Safety Organization (JNES).

3.2.2. Reshaping Quality Assurance System for Nuclear Facilities

Pursuant to the requirements of the amended Reactor Regulation Law, the licensees of NPPs as well as NFC facilities are required to formulate a quality assurance (QA) plan that covers how to manage the implementation of the plan and matters regarding the circulating movements of planning, implementing, evaluating and improving the safety assurance activities. This plan is incorporated into the existing licensee's safety preservation rule, which is a compulsory document that needs approval by the NISA. The QA activities based on the international standards for QA (e.g. ISO 9001-2000) need the initiative by top management (Chief Executive Officer) and an overall checkup

by independent audit sections. The NISA checks the status of the above QA activities through quarterly safety preservation inspections.

3.2.3. Reinforcement of Regulatory Bodies

The 1999 JCO Criticality Accident and the 2002 TEPCO Falsification Case have revealed both quantitative and qualitative insufficiencies in regulators' capacity and led to some reinforcement of the GOJ nuclear safety regulatory authorities.

The Nuclear Safety Commission (NSC) was established in 1978 as an organization that from a neutral standpoint supervises regulatory activities by the GOJ administrative agencies. The 1999 JCO accident urged the NSC on involving itself into the regulatory process for construction and operation approval as well as master plan approval. The January 2001 reorganization positioned the NSC inside the newly-established Cabinet Office that supervises overall governmental organizations. The organization and staff number of the NSC were expanded to meet its missions, while the number of the NSC Commissioners was unchanged. In December 2002 the NSC enhanced its authority to conduct direct inquiry into licensees and have a quarterly debriefing from the NISA about what it has conducted during the past quarter, in particular, in terms of NISA's approval and inspection. These newly-added NSC's responsibilities are expected to improve the so-called double-check function for ensuring nuclear safety.

Meanwhile, the NISA was established in January 2001 as an independent nuclear safety regulatory authority. Because of the lessons learned from the 2002 TEPCO Falsification Case, the NISA reinforced its manpower for rigorous inspection. The current personnel number of the NISA for nuclear safety amounts to more than 400 including about 100 local inspectors. Furthermore, the JNES, which is comprised of about 420 staff members, was set up in October 2003 as an incorporated administrative agency that executes technical affairs in cooperation with the NISA in order to ensure the safety of NPP/NFC operation and nuclear materials transport.

3.2.4. Special Law of Emergency Preparedness for Nuclear Disasters

The 1999 JCO criticality accident stimulated discussions on emergency response capabilities. As a result the proposed Special Law of Emergency Preparedness for Nuclear Disasters passed the Diet in December 1999 and entered into force in June 2000. The Special Law and its subordinate regulations outline what GOJ competent authorities, local governments and licensees must do in case of emergency at nuclear facilities or during nuclear materials transport. These regulations highlight a prompt emergency response, the establishment of central-local government cooperation and the enhancement of central government emergency preparedness.

There are about 20 Emergency Response Centers (ERC) located near the nuclear facilities nationwide, where central and local governmental officials will immediately undertake their joint operations in an emergency to collect information and implement necessary measures in order to minimize accident-caused damage to the environment as well as the local community.

Each nuclear operator, in cooperation with the near ERC, implements regular emergency training programs. In addition, the NISA conducts an annual exercise involving the Prime Minister and other relevant Ministers of State, central and local governmental officials, nuclear operators, local people, and nuclear facility-related company's employees with a view to maintaining and developing their operational expertise to cope with a nuclear disaster. The operational manuals have continuously been reviewed and revised in accordance with lessons learned from periodic exercises.

3.2.5. Improvement of Interactive Communication with the Public

Public relations about nuclear regulatory activities have been positioned in the most important place for restoring public confidence in the safety regulation of nuclear industry. The NISA provides the public with a wide range of information about its activities by using various means of an official web-site, brochure distribution, a public briefing, a press release and a joint conference/seminar with nuclear safety-related specialists or local communities. In particular, interactive communication with the local communities surrounding nuclear facilities as well as the press is underscored in order to produce a situation where they see NISA-provided information credible and feel calm with nuclear facilities.

3.3. Mihama Nuclear Power Plant Accident on 9 August 2004

Unfortunately, despite the above-mentioned efforts toward rebuilding public confidence, the mismanagement of QA activities brought about a deadly accident on the afternoon of 9 August 2004 at the PWR-type Mihama NPP Unit 3 of the Kansai Electric Power Co., Inc (KEPCO), which is located at Mihama Town, Fukui Prefecture about 350 kilometers west of Tokyo. The rupture of the secondary system piping on the second floor of the turbine building occurred when the workers were preparing for a mandatory periodic inspection that was scheduled to start on 14 August. This accident killed five workers and injured six (as of 31 August 2004) because non-radioactive but high temperature water vaporized and filled the second floor of the turbine building with scalding stream. Although the investigation into this accident is ongoing, it is reported that the erosion/corrosion wastage-caused pipe rupture occurred about one meter downstream from the orifice flowmeter and that the fractured part of pipe around one or two millimeters thick is thinner than the minimum required thickness of 4.7 millimeters. Most importantly, the pipe had not been properly inspected and managed by the KEPCO since the start of Unit 3 operation in spite of warnings about a need for inspection. The KEPCO needs to enhance the credibility of its QA system.

4. WHAT ARE THE GOJ'S REGULATORS DOING TOWARDS TRANSPORT SAFETY?

Although nuclear materials in Japan have safely been carried to date without causing any radiological releases to the environment or harm to the public, the Japanese competent authorities need to well handle existing and potential issues or concerns about transport safety. Considering the lessons learned from the past accidents/incidents related to nuclear facilities, an accident during nuclear materials transport, even if it does not cause radiological damage to the public, might exert a seriously negative impact on public trust in both the regulatory authorities and the transport-related licensees and on daily activities conducted by the nuclear industry. In order to preclude such deterioration in nuclear materials transport, the GOJ competent authorities need to implement comprehensive measures, including 1) a review/revision of the existing emergency response plans while conducting periodic drills or exercises, 2) the timely implementation of the newly amended IAEA Transport Regulations and relevant international transport regulations, 3) a review of the existing quality assurance program for transport packages, and 4) the improvement of interactive communication with the public.

4.1. Review/Revision of the Emergency Response Plans

The former STA collaborated with the former Ministry of Transport and other related regulatory bodies in drawing up two documents; one is the Nuclear Materials Safe Transport Guidelines (STG) for licensees to establish their own manuals or standards that address 1) how to safely carry nuclear materials, 2) how to cope with an emergency or an accident during transport, and 3) education and training programs for personnel who are engaged in nuclear materials transport. The other is the Radioactive Materials Transport Accident Response Plan (ARP) that covers what the GOJ regulatory bodies should do in case of a transport accident involving radioactive materials, e.g. the responsibilities of each organization, the procedures for notifying related organizations and persons, the interagency meeting on measures to be taken against the accident, and the dispatch of assigned experts.

Owing to the 2001 disestablishment of the former STA, the NISA/METI, as a newly designated coordinating body, has completed a revised version of the ARP through the ICM on the safe transport of radioactive material. The crux of this revised version was to make rearrangements for the responsibilities of each organization, in particular, to previously designate a coordinating governmental body that primarily leads in coping with an emergency. The NISA will take the leadership in case of a road accident involving packages containing nuclear materials for use as commercial nuclear reactor fuel, while the MEXT will assume it for a road accident involving research reactors' materials. The MLIT is primarily responsible for both sea and air accidents. At the same time, the revised ARP reassigns individuals or experts related to radioactive material packages and radiation protection/exposure, who will be dispatched to the place where an accident occurs.

The STG, on the other hand, is still under review by the ICM because there are a lot of things to be considered toward the completion of the revised version. In particular, consideration should be given to matters regarding an updated communication network among the related parties, a transport monitoring system and some physical protection measures in the process for reviewing and revising the existing STG.

4.2. Current Status of Emergency Drills and Exercises

Emergency drills and exercises for the response to land traffic accidents involving nuclear materials are conducted periodically and ad hoc in Japan. Transport-related companies annually conduct a self-imposed field exercise based on the said STG, focusing on what and how those who actually are engaged in transport should do in case of a traffic accident. The various skills (e.g. communication/notification, victims rescue and medical aid, hazard identification, fire and radiation hazard control, and decontamination) are monitored and checked throughout the exercise.

Meanwhile, transport emergency drills or exercises conducted by the GOJ regulatory bodies still stand at a basic level. In April 2004 the NISA carried out a land transport accident drill for the first time, while it annually conducts an exercise for the response to nuclear facilities accidents. This short drill focused on 1) the familiarization of participants with the transport emergency plan, 2) accident notification procedures, and, most importantly, 3) how to make a decision about the location of the ERC. Unlike a nuclear facility accident, one cannot easily identify at first the accurate position where a traffic accident occurs and has difficulty in setting up a local emergency command post that is available for those who are engaged in the accident.

The emergency response to transport accidents is more difficult than that to nuclear facility accidents in terms of information collection, the establishment of communication channels, coordination/communication with local communities and the press. Concerted efforts should be made to keep the news media and the public well informed at all times about the situation. The GOJ regulatory authorities for transport safety need to develop both exercise scenario and the existing emergency response plan and equip them with additional appropriate communication instruments as necessary.

4.3. Implementation of the IAEA Regulations and Relevant International Transport Regulations

The bottom line for transport safety is that IAEA Member States should harmonically comply with the IAEA Transport Regulations and relevant international transport regulations. In fact, the IAEA recommends that its Member States implement a new version of the IAEA Transport Regulations in a timescale consistent with the implementation of the international modal transport regulations, while both the IMO and the ICAO require their Member States to implement their respective regulations (IMDG Code and TI) by an agreed date.

The NISA, in collaboration with the MLIT, the MEXT and other transport regulatory bodies, has been conducting the ICM to make arrangements for the simultaneous implementation of the land, sea and air transport safety regulations with a view to keeping them in line with the IAEA Transport Regulations, the IMDG Code and the TI. Although the amendments this time do not include the changes to the package design or the package test requirements, a lot of things should be done in preparation for the timely incorporation of the IAEA Regulations and other international transport regulations into the respective Japanese transport regulations. However, the GOJ will implement the amended version (1996 Edition (As amended 2003)) of the IAEA Regulations and the new versions of the said international modal transport regulations in early 2005 anyhow.

The TRANSSC/IAEA, in cooperation with its Member States, has been conducting a two-year review/revision cycle for the IAEA Transport Regulations. While this effort to ensure a high level of transport safety should be appreciated, the highly frequent revisions to the IAEA Regulations might undermine stability in the transport safety regulatory regime, because such frequent revisions might cause difficulties for some Member States' regulatory authorities in keeping their domestic regulations up to date and in line with the international modal regulations, and unexpected delay of shipment owing to international regulatory disharmony.

The IAEA Commission on Safety Standards (CSS) is suggesting that, while keeping the existing two-year review cycle for the IAEA Transport Regulations, a full text of the revised Regulations should be published every six years, unless there is a change to the package design or the package test requirements in the intervening years. This suggestion by the CSS would be preferable.

4.4. Review of the Existing Quality Assurance Program

The NISA/METI has an established QA program related to the packages for the land transport of nuclear materials as well as radioactive wastes. The NISA as well as other regulatory bodies usually checks packages at the three phases of design approval, manufacturing method approval and pre-transport confirmation. The NISA checks that

the submitted designs of a package (i.e. packaging design and radioactive contents specifications) satisfy the GOJ-established requirements in compliance with the IAEA Transport Regulations, and make sure that before actual transport the packages with nuclear materials meet several regulatory requirements including maintenance-related matters. The NISA is now considering a review of the existing package QA programs in order to improve them toward the establishment of a top management system and the improvement of QA activities for package maintenance.

4.5. Promotion of Public Information about the safety of Transport Packages

The NISA has been providing the public with information about the GOJ's procedures for transport package approval, the package test requirements and the database about the list of approved packages. In addition, the NISA has a plan to provide a newly-revised brochure regarding the safety of front-end (UF6, UO2, new fuel assemblies) packages that are mainly transported by land vehicle. This brochure will be produced by utilizing an analytical report regarding the integrity of nuclear fuel packages that precludes nuclear material leakage in case of a severe accident. This analysis has been carried out by the Japan Atomic Energy Research Institute under contract with the NISA.

4.6. A TranSAS Mission to Japan

The IAEA provides a Transport Safety Appraisal Service (TranSAS) mission to a Member State on request with a view to making a comprehensive and balanced assessment of State's regulatory activities in the area of transport safety of radioactive material. The GOJ in late July submitted to the IAEA Director General a request for a TranSAS mission to Japan. Hopefully, the IAEA will organize and conduct the mission sometime in the Japanese fiscal year 2005.

The IAEA Secretariat explains that the objective of TranSAS is to assist any requesting Member State with ensuring a high level of safety during the transport of radioactive material by reviewing its implementation of the IAEA Transport Regulations and by making recommendations and suggestions for improvement where appropriate. The GOJ regulatory bodies understand that a TranSAS mission to Japan will provide a good opportunity for them to make a close and thorough check on the current status of transport safety regulatory activities and make some amendments to the existing regulatory procedures or activities as necessary in advance of the TranSAS mission to Japan. In addition, the IAEA-published report on the TranSAS in Japan will hopefully enhance transparency as to what the GOJ regulatory bodies are doing for transport safety by making the report available to the public and build up public confidence in both the regulatory bodies and the licensees.

5. CONCLUSIONS

The safety regulation of nuclear materials transport has been well performed to date, partly because of continuous endeavours to keep the Japanese transport safety regulations in line with the updated IAEA Transport Regulations and relevant international transport regulations, and partly because of the more stringent safety guideline for the transport of nuclear materials.

However, current and potential worries about crisis management as well as quality assurance programs still remain, when one takes into account prospects for Japan's nuclear materials transport as mentioned at 2.2. Because of public sensitivity about nuclear materials transport, should an accident during land transport involving nuclear materials or a package quality assurance-related case occur, such an accident or a case might undermine public confidence in the GOJ safety regulators.

Japan is still in the process of fostering safety culture and restoring public confidence in safety regulations. The GOJ transport safety regulatory bodies need to implement comprehensive measures that cover a continuous review/revision of the emergency response plans while conducting periodic drills or exercises, the timely amendment to the national transport safety regulations in line with the IAEA Transport Regulations and relevant international regulations, a review of the quality assurance program for packages, and the improvement of interactive communication with the public.

The preparations for a TranSAS mission to Japan will hopefully accelerate the overhaul of existing regulatory procedures and activities and revitalize the safe transport community in Japan.