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Communication dated 14 December 2012 received from the Australian Government

1. The Secretariat has received a communication dated 14 December 2012 from the Australian Safeguards and Non-Proliferation Office, enclosing a paper on behalf of the Asia-Pacific Safeguards Network on the fundamentals and good practices of safeguards regulatory authorities.

2. The aforementioned communication and, as requested, the enclosed paper are herewith circulated for the information of Member States.

Australian Government

Australian Safeguards and Non-Proliferation Office

ASIA-PACIFIC SAFEGUARDS NETWORK

14 December 2012 File: 11/26824

Mr Yukiya Amano
Director General
International Atomic Energy Agency
PO Box 10A-1400 VIENNA
AUSTRIA

Dear Mr Amano

As Chair of the Asia-Pacific Safeguards Network (APSN), and on behalf of APSN, I have the honour to enclose herewith a paper by APSN on the fundamentals and good practices of safeguards regulatory authorities (SRA). I would be grateful if you could circulate this document as an Information Document (INFCIRC). The 3rd plenary meeting of APSN, held in Bangkok 29-30 October 2012, attended by ten countries, endorsed this paper for publication as an INFCIRC.

This APSN paper represents the perspectives and experiences in safeguards implementation of the broad community of safeguards authorities in the Asia-Pacific region, and is intended to complement and support the important work the IAEA is doing in the area of SRA effectiveness. The members of APSN hope that this paper might be of utility to States in other regions of the world for assessing, evaluating or benchmarking their SRAs.

Yours sincerely,

Dr Robert Floyd
Chair, APSN
Director General, Australian Safeguards and Non-Proliferation Office

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Fundamentals and Good Practices of Safeguards Regulatory Authorities

a paper by the Asia-Pacific Safeguards Network (APSN)

30 October 2012

INTRODUCTION

The International Atomic Energy Agency (IAEA) safeguards system is the fundamental instrument for ensuring and verifying that non-proliferation commitments under the Nuclear Non-Proliferation Treaty (NPT) are met. Under the terms of the IAEA's comprehensive safeguards agreements based on INFCIRC/153[1], states are required to "establish and maintain a system of accounting for and control of all nuclear material subject to safeguards under the Agreement". This system, known commonly as the SSAC (State system of accounting for and control of nuclear material) is a critical component of the architecture for the effective implementation of safeguards. The term SSAC is broad in scope, encompassing the national authority overseeing safeguards implementation, as well as other supporting elements, such as facility operators, operating/accounting records, accounting systems and procedure, etc.

This paper uses a generic term for the governmental authority responsible for overseeing implementation of IAEA safeguards in a State – the 'Safeguards Regulatory Authority' (SRA)[2]. SRA refers to the authority responsible for safeguards implementation, which may involve more than on entity in the government, a regional entity, or a combination of State and regional entities. The SRA encompasses all of the regulatory authority and governmental bodies responsible for implementing IAEA safeguards requirements in the State.

The SRA is usually the primary interface between the State and IAEA in the IAEA's implementation of safeguards. A well-designed SSAC with an effectively functioning SRA should facilitate the IAEA's work in achieving its safeguards objectives as well as serving the needs of government. This is reflected in the basic understandings of APSN's Statement of Principles, which state that: "it is in the interest of all members that each individual [SSAC] in the region is able to meet its safeguards responsibilities effectively and efficiently[3].

SCOPE OF THIS PAPER

This paper is not intended to be a detailed "how to" guide on implementing safeguards; it is intended to support and complement the IAEA's suite of safeguards guidance documents, such as the recently published guide in footnote 2. The purpose of this paper is to characterise SSAC fundamentals and provide some examples of SRA good practices, from the collective perspective and experiences of the community of States that make up the APSN membership.

The term SRA is used predominantly in this paper for consistency with the IAEA safeguards guidance document[2]. In some States the system may divide safeguards responsibilities and authorities amongst a few government organisations. This paper uses the term SRA to denote the single or multiple organisations responsible for safeguards, so should be understood to apply collectively. There are different types of safeguards agreements that can apply, depending on the type of State and the commitments it has made, namely: comprehensive safeguards agreements; small quantities protocols; additional protocols; voluntary offer agreements; and item-specific safeguards agreements. This paper will not differentiate by agreement type so should be considered in the most part to be applicable to all States.

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[1] *The Structure and Content of Agreements between the Agency and States Required in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons*, published as INFCIRC/153 (corrected)

[2] Defined in the IAEA's Guidance document, *Guidance for States Implementing Comprehensive Safeguards Agreements and Additional Protocols* (www.iaea.org/OurWork/SV/Safeguards/Resources_for_States.html)

[3] APSN Statement of Principles available at: www.apsn-safeguards.org

OVERVIEW

The fundamentals and good practices fall under a series of broad headings:

- International engagement
  - with the IAEA
  - with international counterparts
- Domestic engagement
  - with those in possession of nuclear material and/or facilities
  - with Government department/agencies
  - with the broader community
- Education/training/professional development
  - for safeguards authority staff and government
  - for facility operators and licence holders
  - for the broader community

The following will outline the views of APSN members on what constitutes SSAC fundamentals, and provide some generalised characteristics or examples of SRA good practices, under each of the broad headings listed above. Although this paper does not provide a "how to" guide on implementing each of the good practices, the annex of this paper contains contributions by individual APSN members of their own first-hand experiences and lessons learnt, which provide some practical guidance on how to implement good practices.

INTERNATIONAL ENGAGEMENT

The **fundamentals** of international engagement are that the SRA:

- promotes and cultivates a good cooperative relationship with the IAEA; and
- operates under a mindset that builds confidence, by seeking to provide voluntary bilateral or multilateral support to, and where necessary seeks support from, counterpart safeguards authorities and networks.

The following outlines some examples of good SRA practices that can support the pursuit of the fundamentals on international engagement.

Engagement with the IAEA

It is **good practice** for the SRA to engage actively and cooperatively with the relevant areas of the IAEA. This includes:

- cultivating regular communication with the IAEA country officer for the State;
- being proactive in the voluntary provision of relevant information to the IAEA on activities of safeguards relevance in the State;
- being responsive to IAEA requests for information or other forms of assistance of safeguards relevance in the State;
- supporting the IAEA in logistical terms in its performance of verification activities, e.g. through facilitating visa approvals and entry and exit formalities, providing timely access, facilitating transport to sites, facilitating import/export of equipment and samples, etc;
- facilitating the work of the IAEA by either developing, for example, a Member State Safeguards Support Program (MSSP) or cooperating with the MSSPs of other States in support of specific projects;
- providing cooperation to enable the IAEA to continue its outreach activities and further assist States in need of capacity building for meeting the IAEA safeguards requirements.

Engagement with the international safeguards community

It is **good practice** for the SRA to seek voluntary engagement with counterpart safeguards authorities and networks internationally, both in its region and more widely. Such engagement allows SRAs to share common experiences, to find common solutions to issues, and to facilitate cooperation and training. There are very few problems that occur in an SRA's work that are unprecedented or unique to one State. Close engagement with counterparts enables the sharing of solutions and materially improves the effectiveness and efficiency of safeguards. Furthermore, engagement with counterparts is a confidence-building measure that can help build trust between States about their respective nuclear activities. All such engagement can also contribute to universalisation of the international safeguards norms together with good practices for implementation.

DOMESTIC ENGAGEMENT

The **fundamentals** of domestic engagement are that the SRA has:

- regulatory authority and independence;
- enforcement powers;
- accountability to and support from a suitably high level of government; and
- involvement in, or general awareness of, all the State's policies/strategies related to nuclear material and activities.

In practice, regulatory independence is taken to mean that the SRA is functionally independent of the facilities[4], i.e. should not share a common management structure with the facility operators or licensees. This is generally achieved by ensuring that the SRA is a fully independent authority. If it is a part of a government ministry, it should have a separate line of reporting to a suitably high level of government (e.g. a portfolio minister, the Prime Minister/President, Parliament) other than to the facilities that are regulated. One important condition that supports regulatory independence is that the SRA be adequately resourced to perform its responsibilities.

The following outlines some examples of SRA good practices that can support the pursuit of the fundamentals on domestic engagement.

Engagement with facility operators

It is **good practice** for the SRA to actively cultivate and maintain links with all facility operators and any other entity that has the types and quantities of nuclear material and equipment of relevance to safeguards. Without active engagement, situations can arise in which the SRA fails to report to the IAEA on activities or nuclear materials of relevance to safeguards simply because of a breakdown in internal communication. Regular contact is a simple means of averting communications failures.

Engagement with government

It is **good practice** for the SRA to actively engage with other areas of government (particularly departments/agencies with responsibilities for issues related to nuclear regulation). It is difficult for an SSAC to fulfil every aspect of its role unless it can draw

[4] In accordance with paragraph 81(b) of IAEA document INFCIRC/153 (the model comprehensive safeguards agreement) SSAC independence is one factor the IAEA can take into account in determining the number, intensity, duration, timing and mode of routine inspections.

broadly upon the services of other relevant authorities. The SRA should be able to deal effectively with the elements of their own government in relation to areas such as:

- Legal structure – to ensure that the State has appropriate legislation in place to allow it to fulfil its safeguards obligations;
- Issuing of visas – to ensure that IAEA inspectors are able to obtain visas, where necessary, in a timely fashion to conduct inspections;
- Controls on imports and exports – in order both to control imports and exports of nuclear material, nuclear equipment and related technologies and to facilitate entry and exit formalities for IAEA inspection equipment and shipping of nuclear samples;
- Law enforcement – so that relevant agencies know to consult the SRA if necessary, for incidents involving nuclear material or facilities; and
- Controls on mining and milling activities – to ensure not only that uranium and thorium mining activities are known to the SRA but also other mining activities which could potentially produce or export material of relevance to safeguards.

Engagement with domestic community

It is **good practice** for the SRA to actively engage with the broader domestic community. At a minimum this will mean engagement with those responsible for:

- Education, research and training – to ensure that all parties are aware of their reporting obligations to the IAEA arising from work in the areas such as science and engineering;
- Industry – to ensure that all relevant activities that are of relevance to safeguards are known to the SRA. This includes going beyond the industrial fuel cycle activities that are directly subject to safeguards to include relevant mining and milling activities, industrial research and technology development; and
- The general public – to build awareness of the role safeguards plays in maintaining international peace and security.

EDUCATION, TRAINING & PROFESSIONAL DEVELOPMENT

The **fundamentals** of education, training and professional development are that the SRA:

- includes some staff that have appropriate experience and expertise in the academic disciplines that underpin the implementation of safeguards; and
- adequately trains and retains staff to perform safeguards functions.

The following outlines some examples of good SRA practices that can support the pursuit of the SSAC fundamentals on education and training.

SRA staff training

It is **good practice** for the SRA to devote resources to the training and professional development of its staff. Examples of useful areas of training include:

- taking part in SSAC training courses[5] that are regularly held in regional centres under the auspices of the Safeguards Training section of the IAEA Department of Safeguards;
- training on domestic laws and processes so that staff understand the steps necessary to fulfil the State's international obligations in a domestic context; and where possible
- advanced training in areas related to safeguards, to improve the professionalism and expertise of safeguards practitioners, e.g. international safeguards conferences; IAEA or regional workshops or fora on specialist topic areas.

Government training

Safeguards is a highly specialised field, underpinned by several academic disciplines, such as physics, engineering, law, and international relations, and is not broadly understood at senior levels of government. As such, the SRA generally has to work to make its voice heard. It is **good practice** for the SRA to devote resources to developing and maintaining a general level of understanding of safeguards and related nuclear issues among responsible line management and the government more generally. Given knowledge of safeguards (and nuclear-related issues more generally) is not widely distributed amongst senior-level government officials, this can act as a barrier to obtaining necessary policy support for resolving issues or undertaking worthwhile initiatives within government. Provision of training to areas of government outside of the SRA is one means to improve both the profile of the SRA within government and to ensure that safeguards concerns are taken into account in the setting of policy.

Public and industry education

It is **good practice** for the SRA to devote resources to educate the general public and industry on the importance of safeguards. This can take the form of:

- maintaining an functional and informative website;
- presenting papers at relevant scientific meetings and symposia; and
- providing journalists with accurate information on safeguards issues and engaging with them to correct misunderstandings when such issues are misreported.

[5] Such courses are intended to provide those working within the SSAC (SRAs and operators) with an understanding of the state's international obligations and the steps necessary to fulfil those obligations.

ANNEX

APSN members' experiences and lessons learnt on SSAC good practice

(Caveat: the following examples of SSAC/SRA good practices have been provided by individual APSN members and do not necessarily represent the views of APSN)

Safeguards Implementation in Australia

Australia has a relatively small nuclear industry, consisting of one operational research reactor, two shutdown research reactors, limited nuclear fuel cycle research, uranium mines, and several Locations Outside Facilities (LOFs) – i.e. universities, hospitals, etc, with small quantities of nuclear material. The IAEA's annual verification activities in Australia comprise one PIV (physical inventory verification), one short notice random inspection, and a few complementary access visits. The SRA in Australia is the Australian Safeguards and Non-Proliferation Office (ASNO), a statutory authority with functions and responsibilities set in the *Nuclear Non-Proliferation (Safeguards) Act 1987*. ASNO is part of the Department of Foreign Affairs and Trade, but the Director General of ASNO reports directly to the Minister for Foreign Affairs in relation to statutory functions related to safeguards.

Challenges and lessons learnt

Training

Given the relatively small size of Australia's nuclear industry, the number of regulatory staff positions with responsibility for domestic safeguards implementation in the ASNO (the SRA) is small. This staffing level poses two challenges: (1) maintaining a critical mass of experienced staff through times when key staff move out of ASNO; and (2) delivering training for new staff. ASNO addresses these challenges by placing a priority on training, including: sending new staff to international SSAC training courses; finding opportunities for staff to do consultancies in the IAEA; finding opportunities for staff to prepare and present on safeguards developmental topics at international safeguards conferences and workshops; and, on-the-job training. On-the-job training is a major element of ASNO's training program as it is not practical to run in-house training seminars for what may only be one or two new staff at any given time.

Cooperation with the IAEA

Australia has been involved in the nuclear industry for over fifty years, including activities such as operating nuclear research reactors, nuclear R&D, radio-pharmaceutical production, and uranium mining. Given the broad range of activities over several decades, challenges arise on occasion with answering IAEA enquiries.

Australia takes an approach of being cooperative and flexible with the IAEA in meeting IAEA requests for information or access. The following is an example of what Australia considers a good-practice flexible approach to an actual IAEA enquiry:

> The IAEA identified, and sought verification access to, a location in Australia that had the characteristics of a radioactive burial pit, but which was just outside the site boundaries declared by Australia under Article 2.a.iii of the Additional Protocol. The IAEA requested access to this location during the course of an inspection. If Australia and the IAEA had approached this "by the book", the IAEA would have needed to: first raise a specific question with Australia in accordance with Article 4.d of the Additional Protocol; given Australia an opportunity to respond; and, then requested access. Instead, because ASNO and the facility operator were able to readily negotiate access

to the location with the appropriate authorities, access was provided during the week of the inspection. This approach potentially saved the IAEA a second trip to Australia, and the associated effort by the Australian Government to host a second visit, so ensured a swift resolution of the IAEA's enquiries and helped demonstrate to the IAEA Australia's commitments to transparency and openness.

With the changes underway within the IAEA to safeguards approaches that make greater use of the State-level concept, State-specific factors such as the SSAC's transparency and cooperation with the IAEA may become more important factors in the IAEA's safeguards evaluations of States. Taking a flexible and cooperative approach to IAEA enquiries should make a positive contribution to the IAEA's safeguards evaluations of the State and potentially lead to improvements in the way the IAEA implements safeguards in the State.

Implementing the State-Level Integrated Safeguards Approach in Canada

Background

After receiving the broad safeguards conclusion in 2005 that all nuclear material remained in peaceful activities, implementation of the State-Level Integrated Safeguards Approach for Canada was initiated on a sector-by-sector basis, culminating in a full State-wide Integrated Safeguards (IS) regime in January 2010. The approach has resulted in a significant reduction in IAEA person-days of inspection; a shift from scheduled routine inspections to randomized, short-notice and unannounced inspections; increased information streams to the IAEA on operational activities and inventory flows; and closer collaboration between the IAEA, the SSAC and facility operators.

Examples of Good Practices

A major theme throughout the following examples of SSAC and SRA good practices is the high level of cooperation and communication among the IAEA, CNSC (SRA) and Canadian nuclear industry. The success in each area can be largely attributed to this close interaction among the three parties.

Development of IAEA Procedures

The Canadian fuel cycle is divided into four sectors, each representing facilities with similar characteristics and verification requirements by the IAEA. However it was determined that for certain cases even within individual sectors, separate procedures were required to ensure that specific safeguards requirements were clearly addressed. These detailed IS procedures were developed through extensive consultations involving the IAEA, CNSC, and affected facility operators. As an example, 15 trilateral meetings were held between June 2006 and October 2009 to establish three comprehensive IAEA procedures associated with CANDU reactors and with their associated spent fuel transfers to dry storage at multi-unit and also single-unit power reactor sites in Canada. In total, 10 IAEA procedures have been developed through this process and these have been accepted by all parties as the definitive reference documents for specified IS applications covering all locations in Canada.

Provision of Enhanced Information

A fundamental IS concept is the provision of enhanced information to the IAEA through a secure electronic communication system, such that the IAEA has a near-real-time overview of the flows of nuclear material within the fuel cycle. It was determined that secure email would be the most convenient and practical mode of communication. The IAEA has therefore established a dedicated email address for a "mailbox" to receive information from Canadian

facilities, the content and frequency of which are specified in IS procedures. Messages sent to this address must be digitally signed to ensure sender authentication and may be encrypted, depending on the sensitivity of the information. The CNSC has set up a similar dedicated email address and is copied on all emails submitted to the IAEA mailbox. This ensures that the CNSC is kept aware of all information flowing from facility operators to the IAEA, and enables any follow-up that may be required by the CNSC in response to questions by the IAEA on mailbox postings. Establishment of this system required coordinated effort by all the major players, as well as input from Information Technology experts at the IAEA, the CNSC and each affected facility. Ongoing cooperation is also required from the CNSC to supervise and administer the large amounts of near-real-time data flowing from the industry to the IAEA through the mailbox system.

Provision of Enhanced Access

Another major IS concept used in Canada is unannounced or short notice, randomized inspections (UIs/SNRIs), which are aimed at the detection and deterrence of nuclear material diversion and facility misuse. The introduction of unpredictability into the inspection regime allows the IAEA to replace the traditional system of scheduled inspections with a smaller number of randomized ones, while still maintaining the same level of confidence in its safeguards evaluations. Once again, close trilateral collaboration was required to ensure that all parties were clearly aware of, and in agreement with, the procedural and administrative requirements – including site security considerations – to ensure that such unscheduled access could be provided to the IAEA on an ongoing basis and under a wide range of possible circumstances.

Expansion of SSAC On-Site Support

In addition to the establishment of UIs/SNRIs, significant changes to the application of Physical Inventory Verifications (PIVs) have also been introduced under IS. While each Canadian facility is still required to perform an annual Physical Inventory Taking (PIT) to close the Material Balance Period, the verification of PITs by the IAEA is now randomized. The CNSC has undertaken to confirm that all facilities are prepared for PIV regardless of selection and to initiate activity designed to support this confirmation by means of on-site PIT Evaluations performed directly by CNSC staff. Summarized results of these evaluations are provided to the IAEA to provide assurance of facility readiness in preparation for future PIVs.

Japan's Collaborations with the IAEA for Ensuring Effective and Efficient IAEA Safeguards

Background

With a view to achieving and facilitating efficient and effective IAEA safeguards under the NPT, Japan has been actively engaged in various activities for promoting close cooperation on the SSAC between Japan and the IAEA. The Government of Japan (GOJ) has made efforts to maintain effective communication and cooperative relationship with the IAEA since the entry into force of the Comprehensive Safeguards Agreement (CSA) in 1978, and expanded such efforts particularly after the entry into force of the Additional Protocol (AP) in 1999 and also the introduction of the Integrated Safeguards (IS) in 2004. The followings are some examples of Japan's experiences gained, and practices developed through such collaborations in safeguards implementation to date:

International Engagement

Engagement with the IAEA

Joint Committee Meetings

In accordance with the CSA (INFCIRC/255), JCMs (Joint Committee Meetings) have been established and are held annually. The representatives of Japan and the IAEA review not only issues arising from the implementation of the CSA and the AP in order to reach mutually agreeable solutions, but also examine the development of safeguards methods and techniques with a view to further benefiting from the result of new technological developments. As substructures of JCMs, the Plenary and the relevant Working Groups meet several times per year to address specific issues at technical and professional level for practical solutions.

Tokyo Regional Office

With the cooperation of the GOJ, the IAEA established (in July 1984) and has been operating the Tokyo Regional Office (TRO) for the efficient and effective implementation of IAEA safeguards in the Far East region. Good working relationship has been established for years between the TRO and Japan's safeguards regulatory authority.

Japan Support Programme for The IAEA Safeguards

In 1981 Japan established JASPAS (Japan Support Programme for Agency Safeguards) as a Member State Support Program to assist the IAEA in the area of safeguards R&D as well as to provide CFEs (cost-free experts), training of inspectors and financial support. There have been 90 tasks completed and 16 tasks are currently in progress, covering such areas as a) design of safeguards systems and approaches, b) collection, processing and evaluation of safeguards data, c) measurement methods and techniques, d) containment and surveillance technology, and e) provision of CFEs and training.

AP Implementation Trials and IS Rehearsals

As a part of JASPAS, the GOJ offered the IAEA a series of implementation trials of the AP prior to its entry-into-force. The trials were conducted between March 1998 and December 1999 at two large research centers to cover the measures contained in the Model AP, including complementary access and managed access in order to provide relevant implementation experience for the IAEA, facility operators, State authorities, and eventually other States. With the objectives similar to AP implementation trial, Japan provided the IAEA with the opportunity and financial support to conduct a series of IS rehearsals in 2003 and 2004, focusing on the implementation of random interim inspections (RIIs).

Development of Safeguards Approaches

Japan and the IAEA have been collaborating extensively in establishing facility-specific safeguards approaches as well as generic safeguards approaches including IS approaches, site approaches and SLA (State Level Approach). In the case of nuclear fuel cycle facilities, like RRP (Rokkasho Reprocessing Plant) and JMOX (JNFL MOX Fuel Fabrication Plant), consultations are carried out even from the facility design phase, implementing the concept of "safeguards by design" far ahead of the time when the concept is recognized essential for achieving effective and efficient safeguards.

Facility Operators Cooperation

The GOJ has been successful in gaining the cooperation of facility operators to use their facilities as a test bed for advanced safeguards equipment and methodologies as well as to provide some of their equipment/instrumentation for safeguards use with necessary authentication requirements in order to facilitate the IAEA's independent verification.

Provision of open source information

In order to ensure the completeness of the declaration under the CSA and the AP, open source information relevant to Japanese nuclear related R&D and other information is provided to the IAEA voluntarily, which is translated in English. It contributes to the IAEA's ability to widen the information sources.

Joint-use of the safeguards related equipment

The Joint Use Procedure (JUP) was developed in 2011 to ensure the appropriate and proper use of Joint Safeguards Equipment by the IAEA, Japanese Safeguards Office (JSGO), Nuclear Material Control Center (NMCC) and operators. The purpose of JUP is to ensure authentic data and acquisition and drawing of independent conclusion with enhanced cost effectiveness and reduction of burden to the Facility Operators.

Operation of On-Site Laboratory

In order to implement the safeguards to RRP, the IAEA and Japan decided to build the On-Site Laboratory at the RRP site. Japan (including the facility operator) provides the funding of its operation, safety control and other necessary services for its operation.

Provision of the facility specific training for IAEA inspectors

To smoothly implement IAEA's inspections for the specific facilities in Japan, JSGO and facility operators provide special training courses for IAEA inspectors, e.g. at the Tokai site.

Engagement with the international safeguards community

Initiation and Promotion of Safeguards Projects such as TASTEX, HSP and LASCAR

Japan has been actively participating in such international/multilateral safeguards projects as TASTEX (Tokai Advanced Safeguards Technology Exercise), HSP (Hexapartite Safeguards Project) and LASCAR (Large Scale Reprocessing Plant Safeguards Project) in order to develop/demonstrate effective and efficient safeguards technologies for Tokai Reprocessing Plant (TRP), to develop effective and efficient safeguards approaches for a centrifuge enrichment facility and a large scale commercial reprocessing facility, respectively.

Bilateral safeguards capacity building support

The Integrated Support Center for Nuclear Non-proliferation and Nuclear Security (ISCN) at Japan Atomic Energy Agency (JAEA) with close cooperation of the Ministry of Education, Culture, Sports, Science and Technology (MEXT) and NMCC is conducting tailor-made safeguards capacity building support programs for Vietnam and other Asian countries. These programs are aimed at facilitating safeguards good practices in partner countries through close knowledge- and experience-sharing. As an example, the program for Vietnam has focused on the three areas: the development of legal instruments for safeguards implementation, the preparation for its AP implementation (AP declarations, complementary access), and the enhancement of its SSAC. Since 2011, this program has advanced to provide more practical training for the safeguards practitioners in Vietnam, thereby greatly advancing Vietnam's effort towards its AP ratification as well as its SSAC regulatory capacity.

Multilateral engagement for safeguards capacity building

Japan has been supporting IAEA safeguards capacity building as JASPAS program by organizing and co-organizing SSAC training courses for mostly Asian countries since 1985. The number of trainees, including Japanese ones, is 320 in total. This SSAC training course has been providing precious opportunities for practical learning of safeguards implementation through 2-week's intensive course.

Forum on Nuclear Cooperation in Asia (FNCA): Nuclear Security and Safeguards Project

Japan has also been proactively supporting multilateral engagement in efforts to support human resource and infrastructure development through information exchange and discussion of safeguards and nuclear security under newly established Nuclear Security and Safeguards Project of the FNCA. From the perspective of safeguards good practices, Japan is promoting the project to raise the awareness of the importance of safeguards, facilitate information sharing in safeguards good practices, promote the regional capacity building efforts, and more importantly, work out coordination with other multilateral frameworks, such as APSN, to achieve effective safeguards capacity building engagement.

Domestic Engagement

Engagement with facility operators

SIR Seminars

In order to improve inspection goal attainment in Japanese facilities, NMCC has been organizing since 1985 "SIR Seminars" for facility operators, with the cooperation of MEXT and the IAEA, to better understand the causes of non-attainment of inspection goals at their facilities, if any, and to take remedial measures to prevent recurrence as appropriate.

Seminars and meetings relevant to reporting to the IAEA

In order to prepare the appropriate reports to the IAEA, NMCC holds seminars and meetings in order to prepare the ICR and PIL. It will contribute to ensuring the appropriate reports to the IAEA.

Lessons Learned and Good Practices in the Implementation of the AP in the Philippines

Lessons Learned

The unexpected ratification of the Philippine AP on 26 February 2010 caught the implementing organization, the Philippine Nuclear Research Institute (PNRI), by surprise. It had been roughly 12 years following the Philippine signing of the AP in 1997 that the Philippine Senate forwent the deliberation of the AP for what was considered lack of urgency. As a result, PNRI needed to muster enough personnel and resources in a short time to meet the initial declaration. It was then that the PNRI realized, albeit too late, the need to prepare and be ready for the implementation despite the uncertainty of the date of ratification of the AP.

At the start of the implementation, one of the first things that PNRI urgently needed was a list of possible stakeholders to contact for purposes of gathering AP relevant information. It became clear that PNRI needed to establish a database of possible stakeholders to make communication with stakeholders reasonably smooth and easy. Moreover, as AP relevant information came pouring in it became obvious that having an efficient system for collating

data was necessary to make life easier for implementing personnel.

PNRI conducted its first AP outreach seminar/workshop in March 2012. The outreach was for colleges and universities that have established R&D activities. Although the seminar/workshop was successful, behind the scene PNRI had difficulty mustering enough people in the audience because March is the last month of school year and people are busy with exams, papers, clearances and graduation, among others. PNRI failed to consider semestral/school year breaks, examinations periods and other events that may have an effect on the availability of the target audience.

The Philippines hosted three CAs since entry into force. The first two CAs had not been as smooth as PNRI would have wanted due to problems with the facility layouts and site maps. Availability of updated and accurate facility layouts and site maps is imperative especially in the conduct of a CA.

While there were significant challenges that PNRI faced with making the initial AP declaration, these challenges related primarily to planning and preparation for the initial declaration. The lesson learnt was that planning and preparation for the transition to the AP is very important, but after a few annual AP declarations have been prepared and submitted, the systems and procedures are far more manageable.

Good Practices

Perhaps the most useful available resources with respect to the implementation of the AP are the assistance and guidance from of the IAEA, US DOE/INSEP (International Nuclear Safeguards Engagement Program) and the Australian Safeguards and Non-proliferation Office (ASNO) that have available experts in AP implementation. Taking advantage of available assistance and guidance coupled with open communication between PNRI and assisting organizations, especially the IAEA, proved not just helpful but, in fact, indispensable in the success of the Philippine implementation of the AP.

Human resource development with respect to the AP is yet one other essential aspect in the AP implementation in the Philippines that greatly contributed to its success. PNRI's competency building, which includes sending the implementing personnel to participate in relevant training, seminars and workshops held locally and abroad, is nothing short of commendable.

Safeguards Implementation in Viet Nam

Viet Nam acceded to the NPT in 1982 and signed the Safeguards Agreement with the IAEA in 1989. We have signed the Additional Protocol in 2007 and brought it into force on 17 September 2012. Our safeguards regulatory authority is the Vietnam Agency for Radiation and Nuclear Safety (VARANS), responsible for safety, security and safeguards. The Division of Nuclear Control under VARANS is directly responsible for implementing safeguards activities.

Nuclear activities in Vietnam are limited. In addition to 3 Locations Outside Facility (LOF) with small amounts of nuclear material at research institutes, the research reactor with capacity of 500 KW in Da Lat is the only nuclear facility that we have.

We consider openness in working with the IAEA is good practice. The following is our experience:

In 2007, the IAEA identified and sought verification for a research on preparation of pellets using natural uranium conducted in a research institute and the import of depleted uranium for shielding of therapy machines at hospitals. As the safeguards authority, we requested the institute to provide us with a report on their activity concerning the pellet preparation and the hospitals to report on the depleted uranium and sent those reports to the IAEA. Later in the year, during an annual inspection, we negotiated with the institute and the hospitals for a visit of the IAEA inspector and openly discussed with the inspector how best to report those nuclear material. As a result, LOFs were established and early in 2008 we were able to receive an approval from the IAEA for the exemption of the depleted uranium in hospitals.

This example clearly shows that working in an open and cooperative manner with the IAEA is an important factor contributing to the IAEA safeguards evaluation of a State.

Safeguards Implementation in Republic of Korea

Since 1997, the ROK has been implementing its own national inspections additional to the IAEA's inspections. The activities required for national inspections are described in domestic law and regulations, which currently apply for all nuclear facilities in the ROK.

The ROK has various nuclear facilities including two different types of power reactors, a fuel fabrication plant, and research institutes. As of the end of 2011, the ROK has 39 Material Balance Areas and one Location Outside Facility.

The ROK has ratified the Additional Protocol (AP) and reports to the Agency accordingly. To support the IAEA's verification activities, the ROK SSAC is making an effort to expand the cooperation with the IAEA in various areas.

Cooperation with the IAEA

Enhanced Cooperation with the Agency

The ROK has four CANDU type reactors and nineteen LWRs in operation. In 2001, The ROK signed an MOU on the enhanced cooperation on LWRs with the IAEA. Based on this, the IAEA installed unmanned monitoring systems and requested the ROK Safeguards Regulatory Authority, the Korean Institute of Nuclear Nonproliferation and Control (KINAC), to implement interim inspections. The IAEA also introduced random interim inspections to promote efficiency. In 2008, the IAEA drew the broader conclusion for the ROK which concludes that there are no hidden nuclear activities or material in the ROK. Integrated safeguards began to be implemented right after the broader conclusion was drawn. Accordingly, enhanced cooperation for LWRs was closed and the ROK and the IAEA concluded a new comprehensive enhanced cooperation arrangement which extended enhanced cooperation to the all facilities in the ROK.

Communication with the Agency

The ROK and the IAEA hold a meeting annually to review safeguards implementation results and discuss the issues raised during the implementation. Also, we hold an implementation working group to review issues in detail. Recently the ROK and the IAEA have discussed some of the following areas to improve implementations.

Strengthening the capability of the SSAC

Strengthening the capability of the SRA inspector

In the enhanced cooperation arrangement, it specified that domestic inspectors need to provide the inspection results to the IAEA. The results from these domestic inspections combined with the results from the IAEA inspections helps the IAEA build comprehensive information about safeguards-relevant activities in the ROK. For that purpose, domestic inspectors should have the same capabilities as the IAEA inspectors. To this end, some of the ROK safeguards inspectors participate in training courses provided to the Agency inspectors to strengthen domestic inspection capabilities.

Safeguards culture

The AP requires the state to report the status of nuclear fuel cycle research and other information. To report in time, the SRA needs to know what kinds of researches are ongoing in its territory. Likewise, researchers should know what their obligations are under the AP. While reflecting the AP duties in its legislation in 2005, the ROK also included "the education course on nuclear non-proliferation" as compulsory training. The ROK provides relevant courses two times a year so that all the related personnel such as fuel cycle research project investigators, facility operators who work on safeguards reports can participate.

Safeguardability of the new nuclear fuel cycle facilities

Nuclear fuel cycle research and development are very active in the ROK. For the new types of facility, safeguards should be considered during the design phase. The ROK reports to the Agency its plans and holds discussions with the IAEA on how to implement safeguards. The ROK realized the importance of considering safeguards in the design phase when we developed the dry storage for the CANDU reactors (see below). The ROK is also considering the safeguards at the early stage of the design for a Pyro-processing facility.

Safeguards By Design

The ROK developed a new type of dry storage for the CANDU type reactor. Compared to the original MACSTOR which has two columns of spent fuel storage, MACTSOR400-KN has four columns of spent nuclear fuels. During the design stage, the ROK discussed the implementation of safeguards with the IAEA, however, because this was a new type of facility there were still some important safeguards design features that were not picked up during the design phase. After the construction of the dry storage, safeguards aspects such as how to verify the nuclear material and how to apply seals were examined again. The ROK worked closely with the Agency to solve the problem, minimizing the interference of the operation.

Learning the lessons from the experience with the CANDU dry store, the ROK started discussion on the safeguards of a pyro-processing facility at the very beginning stage. The ROK successfully concluded the development of a safeguards approach for a model pyro-processing facility. Through this, the ROK expects to find the best way to implement safeguard on this sensitive stage of the nuclear fuel cycle.