



## ASIA-PACIFIC SAFEGUARDS NETWORK SURVEY: REPORT OF FINDINGS

### 1. SURVEY OVERVIEW

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During the ad hoc Asia-Pacific Safeguards Network (APSN) meeting in March 2011 in Singapore, APSN members took concrete steps in charting a path forward to support safeguards development in the Asia-Pacific region.

In October 2011, two surveys were conducted to obtain a better understanding of safeguards needs in the region and to establish a baseline of available training capabilities. The *Safeguards Needs Survey* was designed to identify all training needs of APSN member states including those of immediate priority. The *Training Providers Survey* was designed to determine available resources and interest to meet those needs. Together, the surveys enable APSN to optimize available training resources and ensure that the highest priority training needs are met. This report, compiled by the U.S. DOE/NNSA International Nuclear Safeguards and Engagement Program (INSEP), provides a summary of findings from the two surveys. The majority of responses were provided by organizations responsible for safeguards implementation in their respective countries, or entities whose core objective is safeguards training. The results of the two surveys can be found in Appendix 1 and 2.

The surveys were developed with input from the International Atomic Energy Agency (IAEA) and APSN members. Participation in the surveys was voluntary and all responses and survey findings are intended solely for APSN members. The surveys were sent out to all fourteen member states comprising the APSN, as well as observer entities.<sup>1</sup> Ten member states completed a total of fourteen surveys – six *Safeguards Needs Surveys* and eight *Training Provider Surveys*. Three states completed both surveys, indicating simultaneous interest in both receiving and providing targeted training. The two sample surveys can be found in Appendix 3 and 4.

### 2. SUMMARY OF FINDINGS

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Analysis of the survey responses resulted in several key findings:

**Key Finding 1 (Training Needs):** Data collected from the *Safeguards Needs Survey* offered valuable insight into the specific safeguards needs of the surveyed training recipients. Each country indicated specific training interests by selecting from a list of 26 safeguards-related training opportunities. These 26 topics spanned three major categories: Legislative and Regulatory Framework, State System of Accounting and Control (SSAC) Technical Capacity Building, and Additional Protocol (AP) Implementation. Each recipient country has been assigned a letter A through F to protect the confidentiality of the information.

All six countries expressed interest in receiving training in non-destructive assay (NDA) and containment and surveillance. Five countries indicated an overall need for training in international reporting requirements, development of legal procedures, negotiating with the IAEA, quality assurance and

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<sup>1</sup> The surveys were not completed by the IAEA.

quality control (QA&QC), design information, physical inventory taking (PIT), SSAC as an information system, safeguards by design, outreach to field organizations, and AP/commodity identification training (AP/CIT).

Training recipients were also given the opportunity to provide a ranked list of their top five priorities. This information revealed several common high-interest topics across the surveyed members. Five countries identified "SSAC as an information system" as a top priority, whereas four countries identified NDA as another top training need. Three countries identified as priorities AP declaration preparation, development of procedures (NMAC), and safeguards by design. The survey did not assess what level of training (e.g. basic, intermediate, advanced or refresher) is needed. However, this could be addressed in follow-on discussions with the training recipients.

**Key Finding 2 (Training Offerings):** The analysis of the responses in the *Training Provider Survey* indicated ample capability in the region to address the safeguards training needs, as indicated by the six training recipients. Of the eight training providers, a number of providers offered training in the same areas. Many safeguards topics are offered by at least seven training providers (for detailed assessment, please refer to Section 4). As the training providers increase their outreach to the training recipients, it will be beneficial to initiate some level of coordination or cooperation to avoid duplication. There may also be an opportunity to leverage several training providers' expertise and resources to make the offerings more effective and efficient.

Several topics also emerged as low-redundancy areas that may require more effort in the future. Among the surveyed topics, only QA&QC, licensing, enforcement, radiation protection, safeguards by design, and AP/CIT were identified as areas that are covered by three or fewer providers. The survey did not evaluate what level of training the providers offer (e.g. basic, intermediate, advanced or refresher) and whether the training modules could be immediately deployed. This could be addressed in future discussions among the training providers.

**Key Finding 3 (Preferred Method of Receiving and Conducting Training):** Out of the surveyed countries that indicated safeguards training needs, the preferred method of receiving training was hands-on training, including instrumentation training, demos, tours, mock exercises, etc. Five training providers (Countries 1, 2, 3, 6, and 8) underscored this method of training as part of their offerings. The training recipients also favored bilateral consultations, regional workshops and E-learning as preferred methods of receiving training. With respect to the E-learning, four training recipients (Countries B, C, D, and E) expressed interest in this approach to training. However, no surveyed training providers offered E-learning as an option.

**Key Finding 4 (Additional Comments):** Only two countries responded to the question asking how APSN can increase opportunities for safeguards training in the region. One suggestion was to provide a list of training opportunities, such as when a course/workshop is offered and the contents of the course. If this information was provided ahead of time, organizations interested in sending staff could make advance plans and take advantage of those opportunities. There may be a need to develop a yearly schedule or catalogue of training courses being offered that could be shared among APSN members via APSN's future website. Another suggestion was to improve coordination among training providers to reduce gaps and duplication. As indicated in Key Finding 2, there is a considerable need for initiating a discussion on the coordination of future training courses.

### 3. ANALYSIS OF THE SURVEYED COUNTRIES' TRAINING NEEDS

Six countries noted interest in receiving training on specific safeguards-related topics (for a comprehensive table of responses, see Appendix 1). The *Safeguards Needs Survey* included 26 safeguards-related topics that spanned three major categories: Legislative and Regulatory Framework, SSAC Technical Capacity Building, and AP Implementation (see Appendix 3 for a sample survey). All six countries indicated interest in additional training in NDA, and containment and surveillance. Other areas identified by five training recipients included international reporting requirements, development of procedures, QA&QC, negotiating with the IAEA, design information, physical inventory taking, SSAC as an information system, safeguards by design, outreach to field organizations, and AP/CIT. The majority of the noted areas fell under the SSAC Technical Capacity Building category. While the survey did not evaluate the level of training needed (basic, intermediate, advanced, refresher, etc), these responses warrant further follow-up on with the training recipients and providers to understand the scope and level of the indicated needs.

While the general survey of training needs provides a region-wide, comprehensive understanding of training recipients' needs, the prioritization of their training needs offered particularly valuable insight. In an era of fiscal constraints and limited resources, for both training providers and training recipients, the data point on top five priorities will provide a starting point for future conversations and signifies where APSN can make the most impact.

Table 1 demonstrates that there may be a considerable convergence of interests in certain areas. In general, SSAC-related engagements may be particularly well-received. For example, Country B and Country C's top four priorities are in the SSAC Technical Capacity Building category, and three of the top priorities from Countries A, D, and F are also SSAC Technical Capacity Building topics. SSAC as an information system and NDA were selected as the top two priority topics by five and four countries, respectively. At least three countries noted AP declaration preparation and development of procedures (NMAC) and safeguards by design as additional priority topics.

**Table 1. Top Five Training Priorities by Country**

	COUNTRY A	COUNTRY B	COUNTRY C	COUNTRY D	COUNTRY E	COUNTRY F
<b>1st</b>	Safeguards by Design	Safeguards by Design	Development of Procedures (NMAC)	AP Declaration preparation	Non-destructive Assay	Development of Procedures (NMAC)
<b>2nd</b>	AP/Commodity Identification	SSAC as an Info System	Preparing for inspections	Containment and surveillance	Development of Procedures (NMAC)	SSAC as an Info System
<b>3rd</b>	AP declaration preparation	Nuclear Security and PP	AP Declaration preparation	SSAC as an Info System	QA&QC	Physical Inventory Taking
<b>4th</b>	SSAC as an Info System	Non-destructive Assay	Non-destructive Assay	Negotiating with IAEA	Int'l Reporting Requirements	Complementary Access
<b>5th</b>	Non-destructive Assay	Outreach to field organization	SSAC as an Info System	QA&QC	Outreach to field organization	Safeguards by Design

#### 4. ANALYSIS OF THE SURVEYED COUNTRIES' TRAINING OFFERINGS

All eight training providers noted capabilities and interest in providing safeguards training in the Asia-Pacific region (for a comprehensive table of responses, see Appendix 2). An analysis of their responses indicated that training providers' current offerings appear sufficient to address the safeguards training needs in the Asia-Pacific region. There are at least two training providers for every topic mentioned in the survey, and considerable redundancies exist. For example, seven training providers offer training in NDA – one of the key priority needs identified. As APSN training providers consider increasing their outreach to the region, a major challenge will be coordinating the training efforts and opportunities to avoid duplication.

At this point in time, the survey was not designed to address the level of training offerings (e.g., basic, intermediate, advanced, refresher) or whether the training modules could be deployed immediately. As APSN moves forward to developing an organizational approach for addressing the region's safeguards needs, a better understanding is required as to what level of training could be provided and what capabilities can be immediately deployed. In some cases, the responses indicated interest in developing training capabilities; additional clarification is warranted.

The following tables list areas where there are three or less training providers:

**Table 2. Low Redundancy Training Offerings**

Training Offering	Providers
QA&QC	Country 1, Country 8
Licensing	Country 1, Country 2, Country 7
Enforcement	Country 1, Country 2, Country 6
Radiation Protection	Country 2, Country 8
Safeguards by Design	Country 2, Country 4, Country 8
AP/Commodity Identification Training	Country 2, Country 6, Country 8

**Table 3. High Redundancy Training Offerings**

The following table is a list of activities which have 7 or more potential training providers.

Training Offering	Providers
NPT Safeguards System	All
International Reporting Requirements	All except Country 3
Design information	All
MC&A	All except Country 5
Non-destructive Assay	All except Country 4
Reporting Requirements	All except Country 3
Declaration preparation	All except Country 3
Complementary Access	All

One of the findings in the analysis of *Training Provider Survey* was the ability and the interest of emerging nuclear states to provide training in targeted safeguards areas. There is substantial value in sharing practices and experiences by countries with similar infrastructures and safeguards systems as the training recipients.

## 5. PREFERRED METHODS OF RECEIVING AND PROVIDING TRAINING

There is a reasonably established consensus on preferences for training methods. A summary of responses in Table 4 demonstrates that all six training recipients indicated a strong preference for hands-on training. Five training providers (Countries 1, 2, 3, 6, and 8) underscored this method of training as part of their offerings. The training recipients also selected bilateral consultations, regional workshops and E-learning as preferred methods.

With respect to the E-learning, four countries expressed interest (Country B, C, D, and E) but no surveyed training providers currently offer this approach to training. This training gap may provide an opportunity for APSN to develop some E-learning training modules. E-learning modules are potentially cost effective, offer greater access, and could be used to fulfill a number of training objectives. These could include providing basic safeguards information to more advanced courses that conduct virtual simulations. APSN could leverage the future website, which is currently under development, to offer E-learning modules.

**Table 4. Responses on Preferred Methods of Receiving and Providing Training**

Preferred Methods of Receiving and Providing Training	Responses of Countries Interested in Receiving Training						Responses of Countries Interested in Providing Training							
	A	B	C	D	E	F	1	2	3	4 <sup>2</sup>	5	6	7 <sup>3</sup>	8
Bilateral Consultations	X		X	X	X			X			X	X		X
Regional Workshops	X	X	X		X		X	X			X	X		X
Hands-on Training	X	X	X	X	X	X	X	X	X			X		X
Short-Term Technical Visits	X	X	X				X	X				X		X
Long-Term Fellowships			X		X						X			
E-Learning		X	X	X	X		No training provider currently offers E-learning opportunities							
Course curricula, tailored training modules		X	X		X		X		X			X		X

<sup>2</sup> No response was indicated.

<sup>3</sup> No response was indicated.

## 6. ADDITIONAL COMMENTS FROM MEMBERS

Only two countries offered a response to the question asking how APSN can increase opportunities for safeguards training in the region. One suggestion was to provide a list of training opportunities including when the course/workshop is offered, and the contents of the course. If this were available ahead of time, organizations interested in sending staff could plan in advance to take advantage of those training opportunities. There may be a need and an opportunity to develop a yearly schedule or catalogue of available training offerings that could be shared via APSN's future website.

Another suggestion was to improve coordination among training providers to reduce gaps and duplication. As indicated in Section 4, a number of training providers offer training on the same safeguards topics. As APSN training providers look ahead to increasing their outreach to the region, a major challenge will be coordinating training efforts and opportunities to avoid duplication. Some level of coordination will be required to optimize the available resources and meet the region's safeguards needs as effectively and efficiently as possible.

## 7.0 IDEAS FOR FURTHER CONSIDERATION BY APSN

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The surveys highlighted several areas of opportunity for APSN to begin addressing safeguards training needs in the Asia-Pacific region. The following ideas warrant future consideration by APSN members:

- 1. Enhance regional "visibility" of the safeguards training events.** The survey clearly illustrated several areas of need that could be immediately fulfilled if the training recipients knew when the training workshops took place. This can be easily addressed by taking advantage of the forthcoming APSN website. Under the Events feature, the training providers can post information on the workshops being conducted in the upcoming calendar year and whether those workshops are open to other participants. It may be useful for the members to consider developing a yearly schedule or catalogue of safeguards training offerings in the region. The catalogue could include a schedule of regular training courses offered by the participating states and the IAEA, as well as ad hoc training workshop opportunities. The APSN members, including those interested in receiving and offering trainings, may wish to consider conducting an APSN-sponsored workshop to bring together the training providers and recipients. The workshop could also provide an opportunity for the members to discuss the organization's approach to meeting regional safeguards needs.
- 2. Enhance interaction and coordination among the APSN training providers.** The survey also indicated that a number of training providers offer trainings on the same safeguards topics. There may be an opportunity for further discussion to establish a mechanism for exchanging information on materials, lessons learned, good practices, or perhaps, coordinating training efforts among the training providers. Since the surveys did not assess the levels of various training offerings, the members may consider compiling such information (e.g., NDA training-basic, intermediate, advanced, refresher). Looking ahead, it may also be valuable for the training providers to establish a common baseline or standard for offering safeguards training.
- 3. Increase opportunities for the emerging nuclear states to provide training.** One of the most interesting findings of the survey is the targeted expertise that the emerging nuclear states could offer to address the safeguards needs in the region. Some emerging nuclear states have had years of safeguards experience and have established a track record for effective implementation. Interest on part of the emerging nuclear states to offer training on specific topics would provide a unique opportunity to countries with similar nuclear infrastructures. There may be opportunities to pair up

established training providers with these emerging nuclear states that are interested in providing training for future safeguards workshops, meetings, etc.

**APPENDIX 1. SUMMARY OF TRAINING NEEDS BY TRAINING RECIPIENT**

Country	Country A	Country B	Country C	Country D	Country E	Country F
<b>Legal &amp; Regulatory Framework</b>						
NPT Safeguards System		x				X
National Nuclear Law		x				X
Int'l Reporting Requirements		x	x	x	x	X
Development of Procedures		x	x	x	x	X
Reporting to IAEA	x					X
QA&QC	x	x	x	x	x	
Licensing	x	x				X
Enforcement	x	x	x			X
Preparing for inspections		x	x	x		X
<b>SSAC Tech Capacity Building</b>						
Negotiating with IAEA		x	x	x	x	X
Design information	x	x	x		x	X
MC&A		x	x			X
Physical Inventory Taking		x	x	x	x	X
SSAC as an Info System	x	x	x	x		X
Non-destructive Assay	x	x	x	x	x	X
Containment and surveillance	x	x	x	x	x	X
Nuclear Security and PP		x	x			X
Radiation Protection			x			
Safeguards by Design	x	x	x		x	X
<b>AP Implementation</b>						
Reporting Requirements		x	x	x		X
Declaration preparation	x		x	x		X
Outreach to field organization	x	x	x		x	X
Complementary Access		x	x	x		X
AP/Commodity Identification	x	x	x	x		X



**APPENDIX 2. SUMMARY OF OFFERINGS BY POTENTIAL TRAINING PROVIDER**

Country	Country 1	Country 2	Country 3	Country 4	Country 5	Country 6	Country 7	Country 8
<b>Legal &amp; Regulatory Framework</b>								
NPT Safeguards System	x	x	x	x	x	x	x	x
National Nuclear Law	x	x			x	x	x	x
Int'l Reporting Requirements	x	x		x	x	x	x	x
Development of Procedures	x			x		x		x
Reporting to IAEA	x	x		x	x	x		x
QA&QC	x							x
Licensing	x	x					x	
Enforcement	x	x				x		
Preparing for inspections	x	x		x		x		x
<b>SSAC Tech Capacity Building</b>								
Negotiating with IAEA	x	x		x		x	x	
Design information	x	x	x	x	x	x	x	x
MC&A	x	x	x	x		x	x	x
Physical Inventory Taking	x		x		x	x	x	x
SSAC as an Info System	x	x		x		x		x
Non-destructive Assay	x	x	x		x	x	x	x
Containment and surveillance	x		x		x		x	x
Nuclear Security and PP		x			x	x	x	x
Radiation Protection		x						x
Safeguards by Design		x		x				x
<b>AP</b>								
Reporting Requirements	x	x		x	x	x	x	x
Declaration preparation	x	x		x	x	x	x	x
Outreach to field organization		x		x		x		x
Complementary Access	x	x	x	x	x	x	x	x
AP/Commodity Identification		x				x		x

**APPENDIX 3. SAMPLE SAFEGUARDS TRAINING NEEDS SURVEY**

1. **Please indicate the name of your organization and country:**
2. **How many staff members in your organization support the implementation of safeguards?**
3. **What areas of expertise currently exist in your organization? (please check all that apply)**  
 Legal/Regulatory    Information Management    QA/QC    NDA  
 Radiation Protection    Containment/Surveillance    AP Implementation  
 Fuel Cycle    Nuclear Materials Measurements    PIT/PIV    DIQ/DIV  
 Nuclear Material Assessment    Other:
4. **Please indicate the safeguards and safeguards-related topics that your organization would like to receive training in: (please check all that apply)**
  - 4.1 Legal and Regulatory Framework:  
 NPT Safeguards System (history, evolution, agreements)  
 National Nuclear Law  
 International and domestic reporting requirements  
 Development of procedures (NMAC (including PIT, PIV...))  
 Reporting (at the facility and state level; to IAEA)  
 QA and QC  
 Licensing (export/import)  
 Enforcement  
 Preparing for and Supporting IAEA and domestic inspections and verification activities
  - 4.2 SSAC Technical Capacity Building  
 Negotiating with IAEA (including for the implementation of integrated safeguards)  
 Design Information  
 Material Control and Accounting  
 Physical Inventory Taking (PIT) and Physical Inventory Verification (PIV)  
 SSAC as an Information System  
 Non-Destructive Assay (NDA)  
 Containment and surveillance  
 Nuclear Security and Physical Protection; Design Basis Threat  
 Radiation Protection and Health Physics  
 Safeguards by Design
  - 4.3: Additional Protocol Implementation  
 Reporting Requirements  
 Declaration preparation and submission  
 Outreach to field organizations  
 Complementary Access  
 AP/Commodity Identification Training
  - 4.4: Other (please specify):

**5 Please list your top five priority topics from the above list:**

- (1)
- (2)
- (3)
- (4)
- (5)

**6 What method of training delivery would you prefer? (please check all that apply)**

- Bilateral consultations (single support program)
- Regional workshops (multiple member states)
- Hands-on training (instrumentation training, demos, tours, mock exercises)
- Short-term technical training visits (two-three weeks)
- Long-term fellowships (several months)
- E-Learning (websites, computer based, distance learning)
- Course curricula, existing training materials, tailored training modules
- Other: (please describe)

**7 Please indicate which Member States, international organizations, or other entities are currently providing safeguards training to your organization. Please list the topics they are addressing with you.**

- Australia:
- Canada:
- China:
- EU:
- IAEA:
- Japan:
- Korea:
- Russia:
- United States:
- Other (Please provide):

**8 Please provide additional comments and suggestions on how you would like APSN to increase opportunities for safeguards training for your organization:**

#### Appendix 4. SAMPLE SAFEGUARDS TRAINING PROVIDER SURVEY

1. Please indicate the name of your organization and country
2. Please indicate the safeguards and safeguards-related topics that your organization addresses or could address in its training activities: (please check all that apply):
  - a. Legal and Regulatory Framework:
    - NPT Safeguards System (history, evolution, agreements)
    - National Nuclear Law
    - International and domestic reporting requirements
    - Development of procedures (NMAC (including PIT, PIV...))
    - Reporting (at the facility and state level; to IAEA)
    - QA and QC
    - Licensing (export/import)
    - Enforcement
    - Preparing for and Supporting IAEA and domestic inspections and verification activities
  - b. SSAC Technical Capacity Building
    - Negotiating with IAEA (including for the implementation of integrated safeguards)
    - Design Information
    - Material Control and Accounting
    - Physical Inventory Taking (PIT) and Physical Inventory Verification (PIV)
    - SSAC as an Information System
    - Non-Destructive Assay (NDA)
    - Containment and surveillance
    - Nuclear Security and Physical Protection; Design Basis Threat
    - Radiation Protection and Health Physics
    - Safeguards by Design
  - 2.3: Additional Protocol Implementation
    - Reporting Requirements
    - Declaration preparation and submission
    - Outreach to field organizations
    - Complementary Access
    - AP/Commodity Identification Training
  - 2.4: Other (please specify):
3. What is your methodology for providing formal training to states?
  - Do you follow a methodology for assessing recipient needs and requirements? Please describe:
  - Please indicate the resources and methods you use to provide training:
    - Bilateral consultations (single support program)
    - Regional workshops (multiple member states)
    - Hands-on training (instrumentation training, demos, tours, mock exercises)
    - Short-term technical training visits (two-three weeks)
    - Long-term fellowships (several months)
    - E-Learning (websites, computer based, distance learning)
    - Course curricula, existing training materials, tailored training modules
    - Other: (please describe)

4. Please indicate to which APSN Member States you are currently providing, or are planning to provide, safeguards training and please indicate the key areas.

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5. What does your organization hope to achieve through provision of such training?

6. Where does your organization normally provide its training (check all that apply):

Conference Center/Hotel  Operating Facilities  Laboratory

Training Center in Provider Country  Regional Center near Recipient Country

Other:

7. Has your organization cooperated with other provider countries on joint outreach? If so, please indicate which countries:

Australia  Canada  China  EU  IAEA  Japan  Republic of Korea

Russia  United States  Other:

8. Please share your views on how APSN can enhance safeguards training opportunities for recipient countries/organizations?