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The beginnings of a Pacific Islands Regional Network for developing a common approach to safe transport of radioactive materials

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Abstract

Over the last two years, IAEA has conducted three workshops in the Pacific (New Zealand, Palau and Fiji) to facilitate safe transport of radioactive materials in the region. Technical support in running the workshops has been provided by experts from New Zealand, Australia, and Germany.

This region faces numerous challenges due largely to its geographical isolation, lack of infrastructure and limited access to expertise and resources related to radiation safety and security.

The workshops have successfully engaged many of the Pacific States in making the first steps to establishing a sustainable regional network. The approach has been a holistic one, recognising the particular needs of the region and encompassing safe transport of radioactive material within the broader context of radiation safety and security.

A regional action plan has been developed and the formation of the network has been accomplished.

The paper will discuss the conduct of the workshops, the topics covered, and the outputs. Some of the challenges will be discussed (for example lack of regulatory framework, expertise, resources,

etc.). In addition an overview of the regional action plan for transport safety will be presented concluding with the way forward for the Pacific Islands Region.

Introduction

The use of radioactive material in the Pacific region is increasing. As infrastructure develops on the islands, so does the use of radioactive sources in road construction (nuclear density meters), industrial radiography and industrial gauges in construction, manufacturing and processing industries.

Furthermore the introduction and use of modern medical diagnostic and therapeutic techniques using radioactive material is beginning to emerge in the region.

Consequently the volume of radioactive material being transported in the region is on the rise and will likely increase dramatically in the next 10 years.

Recognising this situation, the IAEA, with financial support from the European Union, has kick-started a programme in the region, with expert support from New Zealand, Germany and Australia, to raise awareness of radioactive material transport safety and security, leading to the development of a regional action plan to enable implementation of the IAEA Transport Regulations (SSR-6)¹ in the region.

Regional Workshops

Through the IAEA Regional Technical Cooperation (TC) Project RAS 9/067, “Strengthening of Effective Compliance Assurance Regime for the Transport of Radioactive Material”², a series of workshops on transport safety in the region were commenced in 2014.

The workshops were arranged by IAEA TC for the Asia-Pacific Region and led by the IAEA Transport Safety Unit with experts from New Zealand, Germany and Australia assisting in the delivery.

Three workshops have been conducted to date:

Christchurch, New Zealand (April 2014)

Koror, Palau (December 2014)

Suva, Fiji (December 2015).

The Pacific Island States that have participated to date include: Fiji, Marshall Islands, Papua New Guinea, New Zealand, Palau, Tonga, and Vanuatu. Some Non-IAEA member states have also participated including: Cook Islands, Solomon Islands, Kiribati, and Tuvalu.

The workshops covered a broad spectrum of radiation safety and security topics relevant to the use and transport of radioactive material in the region.

Topics included the uses and benefits of radioactive material, principles of radiation safety and security, international safety standards and security recommendations, basic regulatory controls, transport package types, documentation and labelling, radiation measurements and surveys,

emergency preparedness and response and denial of shipment issues.

The workshops were very practically focussed. Participants had the opportunity to see actual radioactive material packages and sources. They were also able to perform radiation measurements around sources and packages, prepare documentation for actual packages and carry out desktop exercises for a number of radiation incidents and transport emergency scenarios.

In addition at each workshop there were site visits to facilities where radioactive materials are used, stored or transported.

Each Pacific country shared the situation regarding use, transport and regulation of radioactive material in their islands.

Each workshop has shown a progression in the knowledge, awareness and action plan development in the participating States and the region as a whole.

A key focus of the workshops has been to introduce the basic elements of the IAEA transport safety regulations, and for each country to complete a self-assessment based on the IAEA Radiation Safety Information Management System (RASIMS)³ and specifically the Thematic Safety Area 7 (TSA 7) for transport safety. This has led to the development of national and regional action plans.

Assessment

A key output from the workshops has been a better understanding of the status of radiation safety and security infrastructure in the region.

Generally the situation is that the region lags well behind in the implementation of international radiation safety standards and requirements and security recommendations with regards to radioactive material including transport.

Some common findings in the region include:

- No national inventory of radioactive material.
- Inadequate import or export controls with respect to Class 7.
- No radiation safety legislation.
- No formal inspection programmes.
- Limited or non-existent radiation safety expertise available in country.
- Inadequate capability to respond to a radioactive material incident or emergency.
- No available radiation monitoring instrumentation.
- Legacy radioactive material in the country with no management plan.
- Inadequate facilities for safe and secure storage of radioactive material.

Recognising these shortcomings national and regional action plans have been developed.

Drafting school for regulations

In order to assist some of the Pacific Islands States with the task of developing regulations for the transport of radioactive material, a drafting school was conducted (Vienna, April 2016) in which

participants from Fiji, Papua New Guinea, Palau, and Vanuatu, under guidance provided by experts from Australia and India, successfully drafted basic transport regulations under the enabling provisions of their respective national laws. The participants were encouraged to present these draft regulations to their respective governments so that they may be duly promulgated.

Voices from the Field

In order to provide some first-hand knowledge of the outcomes of the project, several participating Member States have provided direct feedback below.

Fiji

Fiji has a regulatory authority in place, the Radiation Health Board, which is supported by national legislation, in this case, the Radiation Health Decree of 2009 (Decree 41)⁴, which provides general provisions for the transport of radioactive substances, but needs some additional requirements related to transport safety in the regulation. The Radiation Health Board in Fiji strongly agrees with the findings highlighted in the Assessment section above and offers the opinion that IAEA support is essential to improving the situation in Fiji and the other Pacific Island Member States.

The Radiation Health Board has particular concerns about our ports of entry, i.e. airports and sea ports, which are in need of appropriate systems of detection and enforcement to combat the illegal or related transit of items that are harmful to the environment and most importantly to human life. We encourage the IAEA to consider concerns raised from the smaller island countries in the Pacific and look forward to the continued support and assistance to developing small island states, such as Fiji.

Papua New Guinea

Papua New Guinea (PNG) has applications of radioactive material (RAM) among quite a number of mining sites (both big and small), logging companies, agriculture and the Health Sector. Unfortunately we have no coordinated checks and balances on the import and disposal of RAM, as each sector is currently operating in isolation.

Going forward, a general lack of knowledge of the potential negative impacts of RAM, to the environment and the community as a whole, within the appropriate authorities such as the Transport and Environment Departments, which are not yet involved with transport of RAM, will present major challenges to our efforts to develop our infrastructure for the safe transport of RAM (STRAM).

Recently, several actions have been taken in PNG to further enhance the safe transport of RAM, including:

- (1). The Department of Health took the initiative and has being persistent in its endeavour to ensure that PNG will have a Radiation Act in place, by November 2016. The Draft Bill is named “Nuclear Energy and Ionizing Radiation Act 2016”.
- (2). The Department of Health is acting in the capacity of the Competent Authority (CA) for

PNG until the National Institute of Standards and Industrial Technology of Papua New Guinea (NISIT) is endorsed by the Government to assume this role.

(3). Two national officers are in training for 6 months in Malaysia to become Radiation Safety Officers.

(4). The final draft on the regulation for STRAM would be ready by October 2016.

PNG sincerely thanks the IAEA for the continued Technical support, assistance, patience and giving direction to us to make this mammoth task become a reality.

Palau

Palau does not have a regulatory authority for RAM. Paula was introduced in detail to the transport of RAM during the workshops conducted for the Pacific Islands region under RAS 9/067. Before participating in the workshops, our understanding of RAM was centred around nuclear material and x-rays. Through the workshops began to understand that there were other uses for RAM such as its uses in the medical field to treat cancer as well as in road works, oil drilling, etc. Through this understanding it was realized that there was a gap in the regulations of Palau.

In the absence of a regulatory authority and regulations, Paula realized the need for all concerned agencies in the country to collaborate together. The workshops have brought together Customs officers, Transport officers and the Environmental Quality Protection Board of Palau and agreements to collaborate amongst these organizations were reached. The workshops have helped individuals from these organizations to recognize the packaging requirements for RAM, the types of packaging that they might possibly arrive in and the different types of projects that they could be used for.

The collaboration which came about because of the workshops has allowed the necessary organizations to consult with each other when packages coming in to the country are suspected of containing RAM. While this is ongoing, Palau was able to draft transport regulations for RAM with the assistance of experts from the region.

Palau still faces many challenges including the lack of experts and equipment for detection of RAM. The draft regulations, as well as the transport network that was established in the region, are first steps to helping Palau deal with the transport of RAM. This comes at an opportune time as Palau is planning on opening a cancer treatment unit at our local hospital which would in turn require the regulation of the transport of RAM.

Marshall Islands

The Republic of the Marshall Islands (RMI) comprises 29 atolls and 5 isolated islands scattered over 2,000,000 square kilometres of ocean, with an average height above sea level of less than 2 meters. The population of RMI is around 80,000. The use of radioactive material is limited in RMI as there are currently no diagnostic or treatment procedures available that utilize radioactive substances. Radioactive waste (which includes plutonium) is present on Enewetak Atoll. About 111,000 cubic yards of radioactive debris left behind from 12 years of nuclear weapons tests. This debris is housed

under an 18-inch thick concrete dome.

A framework exists in RMI regarding storage and disposal of RAM stated in Section 125 of the National Environmental Protection Act 1984, but no regulations have been made with respect to the safety and security of radioactive material during transport. It is envisioned that the RMI is in the implementing stage of acceding to the CPPNM (Convention of Physical Protection of Nuclear Material, 2005 Amendment). RMI is also a member of several Regional/International treaties or conventions.

RMI faces a number of significant challenges specifically in the area of the regulations of radioactive material, including:

- The Ministry of Foreign Affairs is the only Government entity that can respond to any transport of radioactive material within the waters of the Republic.
- Approval or concurrences must come from MOFA or the Cabinet (President's Office)
- No legislative infrastructure or guidance to handle, import, store or transport radioactive material/sources exists.
- There is a general lack of knowledge on the subject of nuclear or radioactive material
- Acquiring information from Customs officials and the Ministry of Health is difficult primarily due to high turnover in the staffs of those organizations
- Lack of training and skilled persons i.e., handlers/carriers
- Resistance from public

In the course of this project RMI recently signed the Country Program Framework for Technical Cooperation with IAEA in the areas of human health, water and environment, agriculture and radiation protection. Under the TCP, the programs for Regulatory infrastructure and Radiation safety will provide legislative assistance in the formulation of a law related to peaceful application of atomic energy, including support in the establishment of a competent authority to control nuclear related activities. RMI, based on information provided from the IAEA, confirmed the existence of transport of radioactive material in the country with the Ministry of Health. Finally, RMI identified the National Disaster Committee of the Chief Secretary's office as potential emergency response authority for disasters in the RMI, including accidents that might involve radioactive material. It is RMI's long term goal to bring the capability to treat cancer to the Republic, in order to better serve the Republic's population. The development of the appropriate infrastructure to meet this goal has definitely begun.

Next Steps

At the last workshop (December 2015), the participants developed and agreed a Pacific Island Regional Action Plan (Appendix).

It was agreed that a regional network would be established and a task plan was put in place.

One of the key actions was for each country to identify a lead organisation and contact person to act as a Lead Inspector for rolling out a national inspection programme. New Zealand has agreed to host a training programme for the Lead Inspectors, including visits with NZ inspectors to facilities using and transporting radioactive material. This would then be followed up in pilot visits to Pacific Island countries to help roll out a national inspection programme.

Other key actions include equipping and training in radiation monitoring, developing regional model regulations, developing emergency response capability, developing national inventories of radioactive sources, improving import and export controls, sharing resources and providing peer assistance and mentorship in the region.

Conclusions

This region faces numerous challenges due largely to its geographical isolation, lack of infrastructure and access to expertise and resources related to radiation safety and security.

The workshops have successfully engaged many of the Pacific States in making the first vital steps to establishing a sustainable regional network. The approach has been a holistic one recognising the particular needs of the region and encompassing safe transport of radioactive material within the broader context of radiation safety and security.

A regional action plan has been developed and the formation of the network has been accomplished.

As the use and transport of radioactive material increases in the region in the coming years, it is vital for all the participants involved to progress and develop further the network and action plan.

Acknowledgments

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References

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APPENDIX

Element	Actions/Assistance	Assistance required by	Resource MSs
Monitoring and Inspections of operations	<ol style="list-style-type: none"> 1. Identify a lead inspector for each island 2. Provide a 2 week radiological safety and inspection course in NZ for the lead inspectors. 3. Provide radiation instruments to each lead inspector. 4. Schedule inspections in each country of all users, importers, or exporters (or potential users/importers/exporters) of radioactive material. 	All countries in the region	Fiji\NZ, IAEA
Develop Draft Regional Model Regulation for STRAM	Develop regional agreement to implement IAEA regs across Pacific and identify Contact Points for the Agreement document (e.g., through PIFS or SPC)	ALL countries in the region	PIFS or SPC

Element	Actions/Assistance	Assistance required by	Resource MSs
Regional Handbook for Regulation of Radioactive Material	Develop a handbook that outlines the basic elements to be put in place by the Regulator, including a checklist for inspections.	ALL countries	IAEA, NZ
Training and Distribution of information	<p>Consider participation in IAEA workshop on regulation writing April 2016 (transport expert, legal expert) and other relevant events.</p> <p>Identify training gaps in radiation safety, emergency response, inspection, investigations, use of instruments, etc</p> <p>Arrange/organise relevant training</p>	<p>ALL countries in the region</p> <p>All countries</p> <p>All countries</p>	<p>IAEA</p> <p>IAEA, PIFS, SPC, NZ and other PI</p>
Review/ of existing Legislations and/or Regulations and maintenance of effective legal framework	<p>Regional agreement(see above)</p> <p>National reviews required of existing legislation to strengthen Class 7 enhance existing DG legislation (deals with transport only)</p> <p>Complete review of use of radiation in your country (to develop national inventory)</p> <p>Review/ develop overarching radiation safety legislation – import/export consents, national inventory, rad safety and security regulations, radioactive waste, cradle to grave management of sources.</p>	<p>All</p> <p>All</p> <p>All</p>	PIFS SPC

Element	Actions/Assistance	Assistance required by	Resource MSs
Enforcement and actions, investigation of incidents	<p>Identify resources and responsible organisations required commensurate with radiation use in each country</p> <p>Training of inspectors, investigation personnel</p>	All	IAEA, NZ, AU
Emergency planning, response & Exercise	<p>Develop basic ER plans (communications, key agencies involved)</p> <p>Identify sources of expert advice in your country</p> <p>Equip for response (eg instruments, PPE, training)</p> <p>Perform emergency exercises nationally and regionally</p>	All	IAEA IEC, NZ, AU
Auditing of management system	<p>Existing management systems for class 7 (review)</p> <p>Peer reviews</p> <p>Regional audit programme (SPC)</p> <p>IAEA missions</p>	<p>All</p> <p>All</p> <p>All</p>	IAEA, NZ
ESTABLISH REGIONAL NETWORK FRAMEWORK	<p>APPOINT CHAIR AND OTHERS</p> <p>PRESCRIBE TERMS OF REFERENCE</p>		