

David Blee.

We are now going to move to an IAEA perspective and there could be no better person to be bringing the message from the IAEA than Pil-Soo Hahn. He is the Director of the Division of Radioactive Transport and Waste Safety. He started his career at Dae Woo Engineering Company as a process engineer, came to the United States for some post graduate work, then he returned to work with the Korean Atomic Energy Research Institute, KAERI, where his career really evolved over the next 25 years. He held a variety of ever escalating positions at KAERI including director of the R and D division, high level waste disposal, technology development, vice president of the advanced radiation technology institute of KAERI, vice president of the advanced nuclear technology center and most recently vice president of applied nuclear technology development. He's also been chair of the working group for the development of nuclear supplier group technical guidelines for stable isotope separation. It was actually to the benefit of all of us that in 2011 he assumed the position of director of the division of radiation transportation waste safety, his current position at the IAEA in the Department of Nuclear Safety and Security. We are delighted to have your leadership skills, your technical background Mr. Hahn, and we look forward to your message today. Please join me in welcoming Pil-Soo Hahn.

Pil-Soo Hahn.

Good morning, ladies and gentlemen. It is my great honor to address you today on behalf of the International Atomic Energy Agency, a proud participating partner in the PATRAM symposium. This presentation was scheduled to be given by Danny Flourey who is the DDG in charge of nuclear safety and security but he has to accompany our DG Amano on an important and urgent mission this week.

As you heard by the chair for my introduction, I'm not from the transportation background so it has been amazing to see this large size of participants and this much discussion on this issue.

It is exciting to be here in San Francisco, a very dynamic city that offers many different and even unusual sights and sounds for visitors experience. While I am here I will enjoy learning about some of the latest developments and innovations in the safe transport of radioactive material.

As many of you know, the 2011 marked the 50<sup>th</sup> anniversary of the publication of the first regulations governing the international transport of radioactive material by the IAEA. However, transport safety at the IAEA obviously predates this since these regulations took time to develop.

At the first IAEA general conference in 1957, the very first document issued with the title of GC1/1 contained some interesting references to the safe transport of radioactive material. Recommending in its paragraph 98 that “the agency should undertake status with a view to the establishment of regulations relating to the international transportation of radioactive materials. In particular, the agency should obtain information on and consider the formulation of regulations governing the international transport of radioactive materials.”

This recommendation is not unexpected but looking a little more deeply the documents also state in paragraph 35 “the transport of radioisotopes and radiation sources has brought to light many problems and involves the need for uniform packaging and shipping regulations. And it continues to say that the agency finds it desirable to study these problems in relation to questions of international transport in consultation with other international organizations’ concerns.”

As you can see, transport of radioactive material and the need and benefit of harmonization in transports was on the minds of delegates at the founding of the IAEA. And it continues to be a key focus of our efforts today. However, harmonization occurs on many different levels including between the IAEA and other U.N. bodies and between safety and security within IAEA documents and

also between safety requirements and security recommendations within and between members.

Many of you attended the IAEA international transport conference entitled The Next 50 Years, to create a safe, secure and sustainable framework which was held in Vienna October 2011. At that conference we clearly recognized the outstanding record achieved by the shippers, consignors, regulators and all the organizations involved in providing for the safe transport of radioactive material over the 50 years from 1961 to 2011.

We also recognized a remarkable safety record achieved by the implementation and the use of the IAEA regulations for the safe transport of radioactive material. Now record two has specific safety requirements number 6, with acronym SSR-6 but probably more commonly known to many of you by the previous acronym TSR-1. While we celebrated success at that conference, our focus was clearly on the future, how do we provide a safe, secure and sustainable framework for future decades. I believe we all see the need for and the envision of where radioactive material can be transported where it is needed, when it is needed without delays.

Back in 1957 at the agency's first general conference it was pointed out that one of the essential tools to provide sustainability was harmonized packaging

and shipping standards. It was also quite clear these standards should provide adequate safety. Ever since these early days the focus on safety has been supplemented by the need to ensure adequate security. While we still face some of the same challenges today, for example, with denial of shipments, progress has been made. We now have well established requirements for the safe transport of radioactive material and excellent history of safety records and the coming of age of recommendations for security in transport of all radioactive materials.

I want to especially note the substance of shift in already establishing security recommendations for the transport of nuclear materials and note the work currently underway to develop security recommendations for the transport of other radioactive materials are concerned.

Finally, I believe the findings of the 2011 transport conference and the tasks highlighted in the followup technical meeting continue to be relevant and useful. The agency has authorized funding to facilitate the work that remains to be done on the findings. This will take the form of technical meetings in 2014 and 2015 in which I hope many of you will participate.

The past March marked the two year anniversary of the devastating earthquake and tsunami that led to the events at the Fukushima Daiichi nuclear power plant

in Japan. While the analysis of the tragic events that occurred is still ongoing, some lessons were learned from these events. I was very pleased to see that IAEA transport safety units and the transport committee conducted a review of the lessons to be learned from the Fukushima Daiichi events, especially those lessons that apply specifically to transport.

With the outstanding support of our Japanese colleagues, the events and subsequent experiences were reviewed from a transport perspective. We were able to incorporate one immediate change in an ongoing revision of the transport regulations concerning the transport of contaminated persons. IAEA steps together with the transport community reviewed and determined appropriate actions to address the lessons learned. Whether we got to emergency preparedness it is clear that prompt and clear communication is a key element in properly responding to emergencies regardless of where they are or how severe they are. And I will add, regardless if it's in response to a site or a transport emergency.

Having the appropriate resources available, programs in place, people trained and qualified, knowing how and where those resources may be obtained is also another vital element to effective emergency response. These issues must be considered in the planning for response to a severe transport accident involving radioactive material or one to ever occur. In this regard, I am pleased to note

that IAEA and TRANSSC have approved a complete review and revision of the IAEA safety guides, planning and preparing for emergency response to transport accidents involving radioactive material to include the lessons learned from the Fukushima Daiichi and other changes needed to properly plan and be prepared for a transport accident and subsequent response.

In the technical sessions this week you will hear about the many activities that are currently underway in the area of transport at the IAEA. I will speak to some of those briefly in this talk including the transport regulations, developing a document to capture the technical basis for these regulations, clarity of the regulatory language, the different environments to which packages are exposed during transport. The work of TRANSSC Technical Corporation projects for furthering transport safety, and finally denial of shipments.

The details on these topics will be provided in the sessions that occur this week starting this afternoon with a session on regulatory issues. I hope that my brief introduction on these topics will whet your appetite to hear more and that you will attend the sessions on these topics this week.

As many of you are aware, the 2012 edition of the IAEA's regulations for the safe transport of radioactive materials were issued in October of last year. We have already begun our next two year review cycle and comments received for this

review cycle will be considered at the 27 TRANSSEC meeting in November this year when a decision where to commence a new revision cycle for SSR-6 will be reached. As you are aware, we have followed a two year review cycle for our transport regulations primarily to align ourselves with the revision cycles followed by other U.N. organizations involved in the transport of radioactive material. This includes the U.N. subcommittee on the transport of dangerous goods and the production of the U.N. model regulations, namely, recommendations on the transport of dangerous goods, more commonly referred to as the U.N. orange book.

It also includes the transport regulations issued by the U.N. model bodies, international maritime organization and the international civil aviation organization. The concept of regulatory stability has been raised when considering our current two year review cycle and subsequent revisions to the regulations. Changes made to the regulations must improve safety and be necessary. An additional question then must be kept in the backs of our minds during development of regulations is, can these regulations be implemented as they are written? In addition, the impact of changes on those who use and implement the regulations must also be considered. There are significant costs to the IAEA and especially to its members associated with simply producing a new edition of the regulations. However, we recognize that cost for other organizations that reference our transport regulations, the cost for member



states to revise their national regulations to incorporate the revised regulations and the cost to those that must implement changes in the regulations can also be extremely high.

In general, the more significant changes to the regulations are the higher the cost for those who use them and to those who must implement those changes. A balance must be achieved between revising the regulations that are justified and needed for safety and the impact that changes to the regulations have on the governments and industry that implement them.

Changes that have little impact on safety but dramatically increase costs are to be avoided. In the same token, changes which provide a significant cost savings and maintain the same level of safety are to be considered as this can reduce the regulatory burden on those with the responsibility to implement the regulations. The elements of risk should perhaps play a greater role in determining what changes to the regulations are warranted. While the nuclear regulatory world has made a move towards risk informed regulation, which has offered some cost savings without reducing safety, regulations are more deterministic in nature. A question I would like to pose to you for your consideration is, should risk be better addressed in the transport regulations? And if so, how?

Risk is already addressed through our package type classification and limits on package contents for different package designs and testing requirements. My question is, should we reexamine this framework or are there other ways to better address risk in our transport regulations? I believe we collectively have the world's foremost transport experts here this week and I hope the question on how best to address transport risk receives some thought and consideration.

This time of regulatory change based on risk considerations would potentially lead to a shift in the frequency with which the other U.N. organizations consider their regulations for the transport of dangerous goods including class 7. The agency proposed to begin the dialog on this subject with other U.N. bodies that it works with in the coming years.

In order to properly inform our efforts going forward the agency has recently put some efforts into looking back at the history of the transport regulations documenting the technical basis on which the current regulations are resting. These efforts have produced a draft of a technical basis document which captures the historical discussions and decisions related to many of the provisions that are currently in the transport regulations. These efforts have also resulted in the gathering of an extensive electronic library of references dating back to the 1950s. It is the intent of the agency to eventually make the technical basis documents and reference library available to a wider transport

community. The documents and references will also serve as a very important training and knowledge management tool informing the next generation of transport experts as to the thinking of those who have gone before in the development of regulations providing a resource with a collective wisdom of the founding fathers of transport safety if you will, with the particular hope to avoid reinventing the wheel.

In addition as future changes are proposed to the transport regulations, the technical basis documents will provide a reference for review of the existing regulation, its technical basis and how the regulation was established. This is seen as a very important tool for the IAEA and TRANSSC to use to determine the need and benefit of a proposed change to any existing requirements.

As we looked into this historical development behind the current regulations, the challenge of transforming, engineering more technical concepts into clearly understood regulations was revealed. The challenge expense when those regulations are translated into other languages and must be understood and implemented throughout the world. Clarity in the language used for the base regulatory text is essential to ensure a consistent application of those regulations across many countries. At the IAEA English is, of course, the working language for all our document preparation. Some of you here today have English as your native language. You probably just concluded that. In this case there is no

problem. Well, I can tell you from my personal experience as a native speaker of Korean, there are more differences between native English speakers than you might imagine. For exact example, there is British English, American English, and many others with not only their unique spelling of many different words but also the different uses of English language in different regions as the use of [tennis] English which has been introduced to TRANSSC by the current TRANSSC chair over the past few years. The formulation of the regulations in English is critical. The wording needs to be clear so that it can be translated into other five official languages of the agency on... . One of the strengths of the IAEA transport regulations is the effect that they are utilized internationally. The IAEA is mindful of this responsibility and the need to pay particular attention to the accuracy of the translation of the regulations into the other official languages. Clear communication and clear writing are not simple tasks. I have heard on many occasions on the need to revisit the English formulation of particular concepts in the regulations in light of lessons learned when translating technical documents. Such issues need to be considered in future revisions of the regulations.

With the record-breaking heat that many parts of the world have experienced this year, including here in San Francisco and in the desert southwest. The impacts of the environments and environmental changes on transport of radioactive material is another consideration that must be accounted for in this age of varying climates. It is necessary to extend this concept to consider not

only extreme severe natural events but also changes in industrial practices that can affect the environment to which packages are exposed during transport.

All these issues need to be considered when we evaluate the validity of the current requirements. The agency had a technical meeting on this very subject last month and found that while immediate changes to the transport regulations were not warranted, the transport environment is more complex than one might think and it is indeed changing. These changes need to be considered by those that develop the regulations going forward.

Many of you here are familiar with the work of the Transport Safety Standard Committee who will convene their 27<sup>th</sup> meeting later this year. This committee serves as a gatekeeper for the transport regulations having responsibility for reviewing proposed changes, reacting to the latest development in transport technology and reviewing other agency's 10 docs or documents with relevance to transport.

TRANSSC provides guidance and direction to the agency in the daily work that is carried out related to transport. The transport plan is a tool developed by the committee to track ongoing work and plan for work that needs to be accomplished in the future. This work plan will be expanded upon in one of the presentations this afternoon.

A large part of the assistance that the IAEA provides to member states is through technical cooperation projects. The agency has several projects that currently feature a transport safety component that includes training for regulations and competent authorities that will be establishing the regulatory framework for transport in their respective countries. Courses and workshops have been conducted in the Middle East, Africa, Latin America and ... regions and similar projects are planned for Asia Pacific Islands and Mediterranean member states, the latter funded by the European Union.

In addition, interregional projects on transport has been proposed and is in the formative stages. One that will among other things provide opportunity for transport experts from around the world to meet in different regions to address the issues particular to those regions including the issue of denial of shipments which I will discuss in more detail shortly.

This international project will also have a peer review component which will allow participating countries to receive an honest assessment of their regulatory infrastructure for transport. And then receive targeted training to further develop their infrastructures for safe transports. To this end the agency has recently completed the addition of a new [fema tick] safety area, TSA, which specifically addresses transport safety in the agency's radiation safety information

management system, Ra-sims. The Ra-sims is a web based system that enables agencies to endorse member states that receive assistance from IAEA to evaluate the progress made in developing and strengthening the national regulatory infrastructure. The new TSA-7 is derived from IAEA safety standards and includes topics such as legal and regulatory framework for safe transport of radioactive material, design assessment and approvals, manufactured materials and packaging, inspection of transport operations, transport emergencies, addition protection programs for transport of radioactive material, training of workers and competent authority staff, international national ... and cooperation and management systems.

This tool is designed to assist member states and staff at the agency to ensure that programs to aid in strengthening the regulatory infrastructure in member states are based on clearly identified needs. I would therefore like to encourage those member states that receive assistance from the agency to actively participate in providing the information needed to update TSA-7 in Ra-sims.

Denial of shipments has been an area of focus for the agency since the conception of the transport regulations. The agency at the direction of the general conference in 2006 established the international steering committee on denial of shipments of radioactive material. This steering committee officially

concluded its work with the eighth and final meeting in June of this year. The steering committee made significant progress in dealing with the issue of denial.

Some of the accomplishments of the steering committee include the establishment of national and regional networks, training and information awareness workshops for ... certain countries, certain aviation and maritime ports and certain organizations involved in or potentially involved in radioactive material transport. The steering committee was congratulated by D.G. Amano of the IAEA at the closing of their meeting for their significant contributions to reducing instances of denials throughout the world and also for establishing a network to address the problem of denials in the future.

Denials will still occur, however, the issue will continue to receive attention through the U.N. interagency group led by the IAEA which promotes participation by U.N. organizations such as IMO, EKO and U.N. subcommittee of experts on the transport of dangerous goods among others.

As you can see, it is a very busy time for the transport safety unit at the IAEA and there are many ongoing activities and many outcomes to be accomplished in the next year. This is also a time of change for the units, as in June we bid adieu to Mr. Jim Stewart who was the unit head for the last five years. And we will



welcome Mr. Steve Whittingham from the U.K. into this position in just a few weeks.

Also, Mr. Bill Brach the current chair of TRANSSC, will chair his final TRANSSC meeting in November and this year we'll see the three year term of the current TRANSSC member expire so there will likely be some new faces in TRANSSC next year.

As we look forward to the next year, we will encourage your participation in our technical meetings, [con sir tan sees], workshops and other events as we seek to further the cause of safe transport radioactive material throughout the globe. I wish you all the best for an interesting and eventful week and wonderful stay in San Francisco. Thank you very much for your attention.

David Blee.

We have time for questions.

Question.

Ron Pope. I really don't have a question, but I'd like to emphasize the need for clarity in writing the regulations by looking back at history. I was at the agency responsible for the 85 edition of regulations. And when it went to the Board of Governors they approved it but they said that the translations that had been

made from English into French, Spanish and Russian were inadequate. So they asked us to please review them. We sent them out. The French edition went to France and Canada, Spanish edition to Spain and Argentina, and the Russian edition to Russia.

We got responses back from France and Canada and the letter that accompanied the Canadian response was recognize that our response looks at French from the Canadian French perspective. Similar to the difference between English English and American English. We got the same response from the Argentinians, just recognize that this is Argentinian Spanish and not Spanish Spanish. We gave those responses to the translators at the agency and within days they were coming to my office almost on a daily basis saying, okay, now in plain English what did you mean by paragraph number so and so? And then we'd have a five to ten minute discussion in English. And then they would go off and revise the whatever language it was edition.

There is a definite need to strive for accuracy and clarity in English, but there's also the same need in all the other languages.

Pil-Soo Hahn.

Thank you for the nice comments and I think we need to work on to make the regulations more clear in all different languages. But I think there is some

limitation in the process of translation. In some cases I heard that in some languages there is no differences in the description of the safety and security in their own words. There is some intrinsic difficulties we are facing in the process of translation. But we are working to make the regulations more clear in its application process. Thank you for your nice comments.

David Blee.

I'm going to be at the IAEA general conference as part of the Department of Commerce's business delegation. But as you look ahead to the next year and a quarter, for members of this group what are the key meetings that might be happening in the next 15 months or the key activities that they should be focused on as people involved in this packaging and transport arena?

Pil-Soo Hahn.

I think the first one will be the one to be held in November, the next TRANSSC meeting to be held in Vienna.

David Blee.

And that's the group that Bill Brach has been

Pil-Soo Hahn.

Right. And then I think they're going to discuss some of the ways how to incorporate lessons learned from the Fukushima accidents and then there will be different sources of input from the member states and then all those inputs are to be dealt within the community meeting to see how the lessons could be incorporated in the future revision of the safety requirements.

David Blee.

You mentioned the fact, I met Steve yesterday. Steve where are you? I met Steve who is coming in now as the transport point of contact there. And Bill Brach is presumably here somewhere as well and will be speaking later on this week. But have you found a successor for Bill? He's a hard act to follow as we say.

Pil-Soo Hahn.

No, not that I know of but there must have been some discussion going on behind. We'll have a not as good, good chair for the committee, but we'll have good high quality replacement of Bill.

David Blee.

Good. As I said Bill worked here for years in the NRC and I think has done a wonderful job there in his current post. He'll be missed but hopefully he'll stay involved in some manner. I think we'll be hearing from Bill on Thursday morning.