Dedicated to the safe, efficient and reliable transport of radioactive materials
## 2010 in Review

### WNTI Industry Groups

- Uranium Concentrates Industry Task Force
- Sustaining Shipments Industry Task Force
- Transport Security Industry Working Group
- Emergency Preparedness and Response Industry Working Group
- TS-R-1 Industry Working Group
- Waste and Spent Fuel Transport Industry Working Group
- HEXT Industry Working Group

### Intergovernmental Organisations

- International Atomic Energy Agency (IAEA)
- International Maritime Organization (IMO)
- International Civil Aviation Organization (ICAO)
- UN Sub-Committee of Experts on the Transport of Dangerous Goods
Message from the Chairman

If there is one quality above all others that impresses me about the World Nuclear Transport Institute (WNTI) it is its single-minded devotion to serving the business interests of its Member companies. The WNTI is all about safe, efficient and reliable packaging and transport of radioactive materials. This Institute has an industry-driven, very practical agenda, with the focus and expertise to commit itself to working on often highly complex technical issues. The work agenda is set and driven by industry for industry, working in collaboration with other key stakeholders including intergovernmental organisations and national competent authorities, and other industrial organisations.

I continue to be impressed by the determination of the WNTI membership worldwide to work together to share experiences and ideas, and together with the catalyst of the WNTI organisation, to develop consolidated industry positions to carry forward to those bodies where safety regulations and standards are discussed and reviewed. The breadth of expertise across the WNTI membership is very substantial, and applied to the great packaging and transport issues of the day can and does make a real difference.

The WNTI has an intensive work programme – the challenges of packaging and transport of spent fuel and waste materials arising from a mature nuclear industry is one notable example. Excellent work is being done within the WNTI on such issues as the dual use of casks for transport and storage, the movement of large objects and fissile exceptions. The rationale for the continued safe transport within the regulations of uranium concentrate and the requirements for meeting the thermal test criteria for packages containing uranium hexafluoride are being further examined. The WNTI continues to pursue an active dialogue with carriers, ports and harbour authorities to encourage understanding in the interest of sustaining the widest possible shipping options. Issues related to transport security as well as safety also demand continued close scrutiny.

We were delighted to welcome Nuclear Waste Management Organization (NWMO) and Timeline Logistic of Canada, Kazatomprom of Kazakhstan, PacTec Inc. of the U.S.A and TRANSRAD of Belgium as new Member companies over the past year.

It would be remiss of me not to single out for recognition the small but dedicated WNTI staff whose continued dedication, enthusiasm and professionalism constitute the linchpin to this busy and vital Institute. It is to the great credit of the WNTI, its Member companies, its staff and its Secretary General, Lorne Green, that at the PATRAM 2010 Symposium in October it was announced that WNTI was the recipient of the Aoki Foundation Award for Organisational Long-Term Achievement and a Lifetime Achievement Award to Lorne Green.

Mark Jervis  Chairman

“The breadth of expertise across the WNTI membership is very substantial, and applied to the great packaging and transport issues of the day can and does make a real difference”
Edward de Bono, the great exponent of lateral thinking tells us that traditional thinking is all about “what is”. Future thinking will also need to be about – what can be. The WNTI with its member companies has been reflecting over the past year not only on what is, but also, on what can be. We can be proud of what is – ours is a good news story. The safe packaging and transport of radioactive materials is absolutely essential to the provision of sustainable, clean, base-load electricity. It brings the industrial and health benefits of peaceful applications of the atom to where they are wanted the world over. There is more good news – the packaging and transport of radioactive materials has an outstanding safety record over a half-century, with no substantial damage to life or the environment in all that time. No transport sector is subject to such a rigorous safety regime of international, modal and national regulation. This fact, combined with the professionalism of the industry, has assured this excellent safety record.

There is a strong argument to be made for stability in transport safety regulations and operations – with stability goes predictability, and predictability can enhance safety. Stability need not, however, be the enemy of creativity, nor the denial of new thinking or of necessary change. The industries dependent on radioactive materials transport are entering a period of change – we are witnessing new sources of supply and new customers – hence new routes and need for new operators, new infrastructure. This is why we at the WNTI are focussed on future needs and challenges while not forgetting past achievements. The World Nuclear Transport Institute is dedicated to pursuing a practical, industry-driven agenda while thinking outside the box – hanging question marks on new challenges or on things that have for long been taken for granted; questions such as:

- how most efficiently, while safely, to package and pack radioactive materials for transport;
- how most safely and effectively to assure security while assuring safety;
- how most effectively to address the packaging and transport challenges of a mature nuclear industry facing interim and final storage of spent fuels and waste products, decommissioning and the increased movement of large objects that will follow therefrom, and the dual use of casks for transport and storage.

All these questions and more engaged the WNTI over the past year. The WNTI Industry Working Groups have been looking for opportunities to assure safety while enhancing efficiency across the fuel cycle from the packaging of uranium concentrate at the front end, the packaging of uranium hexafluoride, to the movement of spent fuel and wastes at the back end. Prodigious efforts have gone into streamlining and harmonising the transport safety regulatory regime over the past decade and good progress has been made. The World Nuclear Transport Institute has continued to promote the notion within the regulatory review process that a look forward should begin with an assessment of where we have been, and what we have achieved. Opportunities for substantial safety improvements will continue to be pursued; at the same time we can be pleased that we have arrived at a situation where future editions of the transport safety regulations likely will focus more on clarity, simplification and compliance.

The WNTI was proud to support the United Kingdom Department for Transport in its hosting of the successful international symposium on Packaging and Transport of Radioactive Materials (PATRAM 2010) in London in October. I am delighted that the work of the WNTI over the past twelve years was recognised at PATRAM when the Institute received an Aoki Foundation Award for Organisational Long Term Achievement.

The theme of PATRAM 2010 was “Looking to the Future”. It could not have been more appropriate for the World Nuclear Transport Institute. I invite you to join the WNTI to be a part of this exploration of the possibilities for safe, efficient and reliable transport of radioactive materials, not only through the pages of this Review, but looking to the future.
In 1998, the World Nuclear Transport Institute (WNTI) was founded by International Nuclear Services Ltd (formerly part of BNFL) of the United Kingdom, AREVA NC (formerly known as Cogema) of France, and the Federation of Electric Power Companies (FEPC) of Japan to represent the collective interests of the nuclear transport industry, and those who rely on it in the safe, efficient and reliable transport of radioactive materials.

Since the beginning, the WNTI has been growing with Member companies drawn from a wide range of industry sectors including major utilities, fuel producers and fabricators, transport companies, package designers, package producers and mines.

The generation of electricity, medicine and health, scientific research and agriculture are aspects of modern life that rely on the safe, efficient and reliable transport of radioactive materials. All of these sectors are becoming increasingly global in terms both of products and services. Maintaining safe and secure national and international transport by all modes is essential to support them.

The radioactive transport industry has established an enviable international safety record – delivering shipments of radioactive materials of all kinds each day around the world. This impressive record is backed by a stringent regulatory regime that has been in place and under continuous review for several decades.

The radioactive materials transport industry provides a fundamental service within a complex regulatory, commercial and political context. Through the WNTI, companies are working together to promote a sound international framework for the future by helping to build international consensus, co-operation and understanding.

Our Objectives

- To ensure that radioactive materials are transported by sea, land and air safely, efficiently and reliably through the harmonised application of national and international standards, regulations and procedures;
- To consult with governmental and nongovernmental bodies to support balanced international standards, regulations, guidelines and procedures through the preparation of industry position papers, technical briefs and scientific research;
- To act as a catalyst and facilitator bringing Members together to exchange views on radioactive materials transport issues and to participate in appropriate meetings, conferences and media briefings;
- To support research, development and testing of packaging and systems for the transport of radioactive materials.
The WNTI is an international industrial organisation for all sectors of radioactive materials transport. Headquartered in London, the WNTI Secretariat has a small staff of qualified professionals working closely with Members and other international bodies involved in the transport of radioactive materials.

The WNTI provides:
- a forum for Members to share information and ideas;
- well-researched, consolidated positions;
- time-sensitive, value-added analyses of regulatory changes;
- technical research, studies and publications;
- dialogue with intergovernmental organisations;
- a collective voice for industry.

International Co-operation

Intergovernmental organisations such as the International Atomic Energy Agency (IAEA) and the International Maritime Organization (IMO) play a pivotal role in establishing standards and regulations that apply to radioactive materials transport and it is important that industry views are represented. Through its non-governmental status, the WNTI supports the work of the key intergovernmental organisations in promoting an efficient, harmonised international transport safety regime.

During 2010, the WNTI actively participated in an intense schedule of meetings of the IAEA and the IMO, including the provision of specialist experts for technical meetings. The WNTI was also represented at key meetings of the UN Sub-Committee of Experts on the Transport of Dangerous Goods and followed the work of the International Civil Aviation Organization (ICAO) in this transitional year for the drafting of the Air Transport Regulations.

Exchanges within intergovernmental organisations, with national competent authorities and collaboration with related industry organisations such as FORATOM, the Nuclear Energy Institute (NEI), the World Nuclear Association (WNA), the World Institute of Nuclear Security (WINS) and the International Organization for Standardization (ISO) are essential and remain a priority for the WNTI.

Developing Awareness

The WNTI produces technical and factual information to support a background for balanced policies and regulations. Scientific and other academic papers are published regularly and presented to key officials including regulators.

Forum for Exchange of Information and Views

Through its semi-annual Members meetings, the WNTI brings together its Member companies to address challenges facing industry, to share information and ideas.

Industry-led Working Groups meet under WNTI auspices to provide a forum for the exchange of information, with a view to developing consolidated industry positions.


In addition, the WNTI has established two industry Task Forces to address key subject areas; one seeking positive responses to the issues which can cause delays or even denials to the shipment of radioactive materials, and a second which is exploring possibilities for a more harmonised approach to uranium concentrates packing and transport.

Our Role

Review 2010
The WNTI is the trading name of World Nuclear Transport Limited, a company limited by guarantee and governed under English Law. The WNTI has two membership categories – Ordinary and Associate. Ordinary Members are those prepared to make a substantial commitment and to be actively involved in the Institute's development. Associate Members have access to information produced by the WNTI and may be consulted in defining common positions.

The Board of Directors, drawn from Ordinary Members, currently comprises six Directors and meets biannually. Headquartered in London, the Institute is managed by the Secretary General. The Secretary General chairs an Advisory Committee which reports to the Board of Directors.

The WNTI operates successfully as a network organisation, with regional offices in Tokyo and Washington. The Institute's small team of professional secretariat staff works closely with WNTI Members and international bodies to ensure that the transport of radioactive materials is conducted safely, efficiently and reliably.

In December 2010, the WNTI was certified as meeting the requirements of ISO 9001 for the provision of membership services.

**WNTI Membership**

The WNTI is an international organisation and its ability to represent Members’ interests is influenced by the number, global reach and variety of its Members. As the WNTI membership has grown, the Institute has won increasing recognition for its capacity to represent the collective views of industry. New Members from all sectors of industry having a stake in safe radioactive materials transport are being encouraged to join the WNTI.

The large part of the WNTI’s expertise rests with its Members and, to provide any necessary technical support, the WNTI seeks collaboration with Members and external experts.

**WNTI Members (Dec 2010)**

- Advanced Nuclear Fuels GmbH
- AREVA NC
- AREVA NP
- BHP Billiton Olympic Dam Corporation Pty Ltd.
- Cameco Corporation
- ConverDyn
- Direct Rail Services Ltd. (DRS)
- Electricité de France (EDF)
- ENUSA Industrias Avanzadas S.A.
- F.S.U.E Atomic Fleet ‘Atomflot’
- GHS Gesellschaft für Nuklear-Service mbH
- GTS Group
- International Nuclear Services Ltd. (INS)
- James Fisher & Sons plc.
- Japan Nuclear Fuel Ltd. (JNFL)
- Joint Stock Company “Atomredmetzoloto” (ARMZ)
- Joint Stock Company National Atomic Company Kazatomprom
An Introduction to WNTI

WNTI Members of Staff

Headquarters

- Lorne Green
  Secretary General
- Henry-Jacques Neau
  Secretary General – Designate
- Darren Waller
  Company Secretary / Finance and Operations Manager
- Betty Bonnardel-Azzarelli
  Communications Manager / Specialist Advisor
- Michelle Aslett
  Membership Secretary / Communications Officer

Ashlee Drewett
Finance and IT Assistant

Naomi Evans
Secretary

Trevor Dixon
Specialist Advisor

Daiichiro Ito
Specialist Advisor

WNTI Board of Directors

- Mark Jervis
  Chair
- Alastair Brown
- Nobuaki Hashimoto
- Ichizo Kokaji
- Henry-Jacques Neau
- Catherine Weber-Guevara
- Darren Waller
  Company Secretary

WNTI Advisory Committee

- Lorne Green
  Chair
- Michel Hartenstein
- Pierre Malesys
- Garry Owen
- Graham Rose
- Riichiro Takayama
- Darren Waller

Tokyo office
Riichiro Takayama
Principal Representative

Washington office
Eileen Supko
Principal Representative

- Joint Stock Company Saint Petersburg “IZOTOP”
- Low Level Waste Repository Ltd.
- Marubeni Corporation
- Mitsubishi Corporation
- NTP Logistics (Pty) Ltd.
- Nuclear Cargo & Service GmbH (NCS)
- Nuclear Fuel Industries, Ltd. (NFI)
- Nuclear Fuel Transport Co., Ltd. (NFT)
- Nuclear Risk Insurers Ltd. (NRI)
- Nuclear Waste Management Organization (NWMO)
- NuFcor International Ltd.
- OCL Corporation
- Pacific Nuclear Transport Ltd. (PNTL)
- PacTec, Inc.
- Paladin Energy Ltd.
- Rio Tinto plc.
- RSB LOGISTIC Projektspedition GmbH
- Sellafeld Ltd.
- Shipcraft Group
- Sojitz Corporation
- Sumitomo Corporation
- Svensk Kärnbränslehantering AB (SKB) (Swedish Nuclear Fuel & Waste Management Co.)
- Swiss Nuclear Fuel Commission
- TAM International Inc.
- The Federation of Electric Power Companies of Japan (FEPC)
- Timeline Logistic
- TN International
- Transing Ltd.
- Transnuclear, Inc.
- Transnuclear Ltd.
- nv TRANSRAD sa
- Transport Logistics International Inc. (TLI)
- URENCO Ltd.
- USEC Inc.
- Westinghouse Electric Company
Uranium Concentrates Industry Task Force
Uranium ore concentrates are transported internationally by road, rail and sea from the uranium producers to uranium converters. The concentrates are LSA-I type material transported in a Type IP-1 package, typically standard open-head steel drums. Transport generally involves the use of dry 20’ sea (ISO) containers. International routes involve sea transport and often include both rail and road segments.

Being classified as radioactive materials, transports of uranium ores are subject not only to the requirements of the regulatory regime including control of radiation dose and contamination, but also interest from ports and other jurisdictions in the security of the cargo.

Following the publication of the WNTI information paper no.4, “Uranium Concentrates, Industry Good Practices for ISO Containers in Multimodal Transports – Revision 0” in 2008, the WNTI Uranium Concentrates Industry Task Force has been working to develop further guidance and supporting documents which include:

- an information paper with Emergency Response guidance for UOC;
- a best practice document to secure drums in ISO containers;
- radiological measurement for loading into ISO containers.

After an initial WNTI internal discussion paper “Current Practices and Experience of Shipping Bulk Powders in Freight Containers” that explored the current practices of shipping bulk powders, the uranium concentrates industry is moving the project to the next stage and setting up a feasibility study into the packaging and supply chain of uranium concentrates.

Sustaining Shipments Industry Task Force
There is a continuing trend for some shipping companies, air carriers, and ports not to accept radioactive materials. Unwillingness to accept radioactive consignments, also known as Class 7 under the United Nations classification of dangerous goods, has potentially grave consequences for the global supply of such materials for power production, medical and industrial applications. Experience has shown that there are many reasons for denials or delays in such transports; some worry about the perception of other customers whose goods they want to carry; carriers are concerned by the perception of problems they may have with ports, or by additional or onerous regulations making acceptance of Class 7 material unprofitable. With consolidations in the shipping sector, the options for consignors in the vessels and routes they can use are becoming more limited. This can cause consignors to have to trans-ship materials several times using smaller vessels on less established routes with consequent additional cost to the transports. The Task Force continues to work in a pro-active and positive way to address these problems.

As transport safety regulations develop, the WNTI continues to review and update the WNTI Members’ Knowledge Base, which comprises straightforward, factual information on the kind of issues that can arise for operators in their dealings with transport service providers, in the interest of ensuring that latest information is available to WNTI Members. The WNTI continues to pursue a dialogue with port authorities and shipping companies, and to support the work of the IAEA International Steering Committee on Shipment Denials, and efforts within the International Maritime Organization. The WNTI would like to stress the importance of reporting any denials of shipments of Class 7 Radioactive Materials to the IMO and IAEA. The relevant reporting form and a list of National Focal Points can be found on the WNTI website. WNTI participated in the 2010 meeting of the IAEA International Steering Committee on Denials of Shipments and assisted in development of the Action Plan for the National Focal Points. In addition WNTI undertook a study into the documentation requirements for a Class 7 cargo compared to those required by other dangerous goods.
Transport Security Industry Working Group

It is well understood by the transport industry that security requirements are a matter for individual States and industry must work within these requirements. However, internationally, these regulations are not always joined-up and for industry to best understand and work with them, a WNTI Transport Security Industry Working Group was established to evaluate where there is common ground. In recent years there has been increased interest in the security issues affecting the transport of radioactive materials.

The main objectives of the Working Group are to:

- assess the impact of the increasing use of port radiation monitors;
- evaluate industry experience with satellite and package tracking devices;
- develop industry guidance publications;
- liaise with other security non-governmental organisations;
- be active in developments of transport-related IAEA security series; and
- report to WNTI Members on security-related issues.

Through this Working Group, industry is able to share best practices in transport security-related issues.

The Transport Security Industry Working Group followed closely the IAEA meetings to revise INFCIRC 225. The amendments to the IAEA publications and consequences to the transport industry were discussed at the Group’s December meeting. The WNTI will continue to foster industry best practices and relations with the IAEA and other organisations addressing transport security.

Emergency Preparedness and Response Industry Working Group

Even with an outstanding safety record spanning five decades, the transport of radioactive materials cannot and must not be taken for granted. Through this Working Group, the Industry members of the World Nuclear Transport Institute meet on a regular basis to discuss issues surrounding emergency response and share experience in their preparation for the unlikely event of an accident. Two surveys have been conducted among the Members to review various national emergency response arrangements, and to learn the lessons from exercises, and workshops have taken place to discuss crisis communication, company experiences and international guidance for emergency preparedness.

A Working Group meeting took place in December and set up a work plan for the coming meetings; addressing themes such as training, risk assessment, and feedback.
**TS-R-1 Industry Working Group**
The principal purpose of the WNTI TS-R-1 Industry Working Group is to arrive at consolidated industry positions on TS-R-1 review and implementation issues. The Working Group also plays an important role in providing advice to support WNTI representatives at IAEA and other meetings. The WNTI participated actively in the TS-R-1 review process during 2010, submitting proposed changes and items for consideration to the IAEA. In addition, the WNTI participated in the IAEA Technical Meeting; TM-38950, Technical Meeting to facilitate and coordinate the review of the technical basis for the Regulations for the Safe Transport of Radioactive Material (TS-R-1). This was the first meeting of a project the goal of which is to identify the essential safety requirements in TS-R-1, locate and review the technical bases that support each requirement, assess what fundamental transport safety principles lie behind the safety requirements, and if necessary, propose amendments to the regulations to align the requirements with the technical bases.

**Waste and Spent Fuel Transport Industry Working Group**
Radioactive wastes, particularly those arising from nuclear fuel cycle plants and decommissioning activities, are not easily characterised; they vary greatly in their chemical, physical and radioactive properties. The IAEA transport regulations, TS-R-1, must be able to cater for these materials without imposing undue constraints which could result in significant operational difficulties and economic penalties. The Waste and Spent Fuel Transport Industry Working Group focused on the following topics which are of particular importance from the industrial perspective:

- **Characterisation of wastes;** the aim is to identify broad categories of waste streams and to develop principles for their characterisation which could be helpful as a basis for package design and the preparation of transport safety cases.

- **Transport of contaminated large objects;** there are practical difficulties in using the existing transport regulations for decommissioned plant items such as reactor heat exchangers. Various proposals have been made to revise TS-R-1 to accommodate such transport operations and the WNTI is forming a view on feasible options.

- **Dual-use casks for long term storage and transport;** the timeframe for spent fuel storage is growing longer due mainly to the lack of reprocessing or disposal facilities. This can raise regulation issues because of the different times for which storage and transport licenses are valid (storage-long, transport-relatively short). The WNTI is cooperating with the IAEA study on feasible options and how these might be realistically accommodated in the IAEA waste and transport regulations.

- **Fissile wastes;** many fissile waste streams from fuel processing and decommissioning operations contain only a small quantity of fissile material in a large quantity of non-fissile material and also, in some cases, neutron absorbers. The current regulations require many such wastes to be transported in fissile packages when there is no realistic criticality hazard. The WNTI is cooperating with the IAEA in the review of TS-R-1 to make the regulations more realistic for materials containing low concentrations of fissile materials.
In addition to wastes, for which a case can be made to classify them as fissile-excepted materials, there are a large variety of other wastes which will have to be dealt with as fissile materials for storage and transport. The regulations will have to accommodate these.

**HEXT Industry Working Group**

The WNTI HEXT Industry Working Group considers package requirements in TS-R-1 for the transport of uranium hexafluoride (Hex). The Working Group provides a forum for WNTI Members to exchange information on a range of issues including package approvals and validations. Information also is shared on technical and operational solutions to satisfy regulatory requirements.

Additionally, the Working Group closely follows developments in TS-R-1 and related documents, especially with regard to non-fissile, fissile-exempted and fissile Hex. In this context, the development regarding the HI(U) approvals for 48 inch cylinders and the shipment of small quantities of UF₆ requires special attention.
International Atomic Energy Agency (IAEA)

Transport Safety Regulations

The IAEA was set up as the world’s “Atoms for Peace” organisation in 1957 within the United Nations family. The Agency works with its Member States and multiple partners worldwide to promote safe, secure and peaceful nuclear technologies. There currently are 151 Member States of the IAEA, 71 intergovernmental organisations and non-governmental organisations, including the WNTI, which provide expertise and technical guidance. For decades the International Atomic Energy Agency (IAEA) Transport Safety Regulations for the Safe Transport of Radioactive Material, known as TS-R-1, have set the standards for the worldwide transport safety regulatory regime. The Transport Safety Standards Committee (TRANSSC) is the premier body within the IAEA recommending on transport safety regulation review and implementation. The IAEA convenes Technical Meetings and Consultant Meetings to propose and further develop positions on issues for consideration by the IAEA Secretariat and TRANSSC. During 2010, the WNTI participated in consultants and technical meetings organised by the Agency to develop a new edition of the Transport Safety Regulations.

The accompanying guidance document, TS-G-1.1, also is under review and will be available following the publication of the new version of the Transport Safety Regulations. The WNTI also supported the IAEA in the development of a working group on the dual-use of casks for transport and long-term storage and on the transport schedules, which provide regulatory references for twenty-five UN Numbers.

Transport Security

Maintaining secure as well as safe transport continued to receive priority attention at the IAEA in 2010. With the publication of the Nuclear Security Series No. 9 Implementing Guide, Security in the Transport of Radioactive Material, the focus for 2010 was on other IAEA security-related materials that have a transport element to ensure consistency for transport within the IAEA framework of publications. To provide a better understanding of security issues for WNTI Members on cross-border transports, the WNTI Transport Security Industry Working Group continued working together, and in co-operation with other organisations related to security, to provide a better understanding of transport security issues and concerns.

IAEA Annual General Conference

The 2010 Annual General Conference nuclear safety Resolution urges Member States to adopt and implement a national regulatory document on Transport Safety, and looks forward to the International Conference on the Safety and Security of Transport of Radioactive Material: The next Fifty Years of Transport – Creating a Safe, Secure and Sustainable Framework, to be held in Vienna in October 2011.
IAEA Steering Committee on Shipment Denials

The IAEA International Steering Committee on Shipment Denials of Radioactive Materials was established as a follow-up to the July 2003 IAEA International Transport Safety Conference where considerable attention was paid to the increasing difficulties of assuring timely, cost-effective transport. The main objective of the Steering Committee is to develop an international, integrated Plan of Action for addressing and reducing the instances of denials of shipments of radioactive materials. Priority areas identified in the Action Plan include awareness, training, communication, and lobbying.

At the 5th International Steering Committee (ISC) the IAEA Deputy Secretary General challenged the ISC to find solutions to the denial and delay issues so that by 2013 they would be of no concern. The meeting focused on four workshops; Denial Report and Database Evaluation, ISC Future Direction, Communication Toolkit and the Action Plan Review/Next Steps. Prior to the ISC meeting, the IAEA and the National Focal Points and Regional Coordinators (NFP/RC) met to discuss the roles and responsibilities of the National Focal Points and Regional Coordinators. They provide a framework of communication between those who experience difficulties in transporting radioactive materials; port authorities and service providers at a local level.

The WNTI has played an active role in the Steering Committee and has been assisting the IAEA in further developing the Action Plan for 2011 and merging roles and responsibilities of the NFP/RCs into the Action Plan.

Documentation Study

For several years there have been discussions on the denial of and delays to transports of radioactive materials at the International Maritime Organization (IMO) and the International Atomic Energy Agency (IAEA). Service providers, shipping companies and port authorities have many reasons why they do not accept radioactive materials. Some say “shipping radioactive materials is 99% hassle for 1% profit, so why bother”.

Considering the amount of documentation that has to be completed, and possible duplication of information to be provided, for a successful, unhindered shipment of Class 7 radioactive material, this in some cases could be a contributing cause.

To investigate this, the WNTI undertook a study examining in detail shipping documents that are required to be completed for an international maritime shipment of radioactive material, compared with the typical documentation required for other dangerous goods. This comparison highlighted the paper burden put on the Class 7 radioactive material transport industry. The study summarised the compulsory fields of the documentation outlining why these were required by nuclear regulatory competent authorities, shipping companies, freight forwarders, port authorities and customs officials. It also highlighted where duplication of information appears in the documentation, and any lack of harmonisation in presentation where the same information is required between different organisations, authorities and countries. Importantly, the study suggested where greater harmonisation between the shipping documents could be realised.

The WNTI will use the study findings as a basis for advancing ideas in appropriate bodies on how to simplify the maritime documentation requirements with a view to expediting safe, effective and reliable transport of radioactive materials.

1: Type B package for safe transport of medical isotopes
2: Type B(U) package for safe transport of Molybdenum-99 used in medical applications
International Maritime Organization (IMO)
The International Maritime Organization (IMO) is the specialised agency of the United Nations Organization providing the mechanism for Member States to develop regulations and codes of practice to preserve safety of life at sea, ensure maritime security, and protect the marine environment from pollution by shipping. The IMO provisions for radioactive materials are based on the IAEA Transport Safety Regulations and are incorporated into the IMO International Maritime Dangerous Goods Code.

There currently are 169 Member States of the IMO, 54 intergovernmental organisations and over 75 non-governmental organisations, including the WNTI, which provide expertise and technical guidance.

Protests at Sea
Concerns about protests and actions of those protesting at sea were brought to the IMO Maritime Safety Committee (MSC) and the Safety of Navigation Sub-Committee for consideration in 2008. The 2009 session of the Navigation Sub-Committee finalised the MSC Resolution addressing the issue. The Resolution was approved by MSC at its May 2010 meeting.

IAEA Assistance
The IAEA is preparing a guidance document on Emergency Preparedness and Response for Maritime Incidents involving radioactive material and has requested the relevant bodies of the IMO to assist in this work. The IMO Committees and Sub-Committees are expected to start considering the issues in 2011.

World Maritime University
The World Maritime University (WMU), established by the IMO in 1983, and based in Malmö, Sweden, has as its prime objective to increase the number of highly trained specialist maritime personnel around the world. Over the past year, the WNTI continued its partnership with the WMU in the interest of encouraging a fuller understanding of the issues surrounding the transport of radioactive materials, including packaging and the need for such transports. The WNTI gave a lecture on radioactive materials transport to WMU students and others within the framework of the WMU Dangerous Goods Professional Development Seminar.

WNTI Industry Site Visits
In the interest of enhancing communication and broadening understanding, the WNTI continued its programme of site visits to industrial facilities in France and the UK subject to the international transport safety regulatory regime. The visits have given an opportunity to many senior officials of the IMO and IAEA Secretariats, and members of national delegations to these organisations, to see first-hand the practices, procedures and equipment involved in fuel cycle transport.
Intergovernmental Organizations

Feasibility Study into Packaging and Transport of Uranium Concentrate

International Organization for Standardization (ISO)

The International Organization for Standardization (ISO) is a non-governmental body with a mission to promote the development of standardization and related activities worldwide. A Technical Committee (TC85) deals with nuclear energy, nuclear technologies, and radiological protection; standards relating to the transport of radioactive materials are included in the activities of Sub-Committee 5 (nuclear fuel technology).

A new standard; ISO 10276:2010 “Trunnions for packages used to transport radioactive material” was published in August 2010 and two standards, “Leakage testing on packages” and “Packaging of uranium hexafluoride (UF6) for transport” are being revised.

UN Sub-Committee of Experts on the Transport of Dangerous Goods

The United Nations Sub-Committee considered amendments to Recommendations on the Transport of Dangerous Goods that reflects changes to the IAEA Transport Safety Regulations (TS-R-1). The changes will be further reflected in the modal regulations.

Several papers were submitted to the United Nations Sub-Committee regarding radioactive materials, particularly related to harmonisation between the IAEA Regulations for the Safe Transport of Radioactive Material (TS-R-1) and the United Nations Recommendations on the Transport of Dangerous Goods – Model Regulations (Orange Book). Papers included the transport of excepted quantities of UF6, a new UN number, and harmonising the security requirements. There is a proposal under discussion to form a joint working group to consider IAEA issues during UN Committee meetings.

Feasibility Study into Packaging and Transport of Uranium Concentrate

Uranium concentrates have been transported safely since the earliest days of commercial mining in 210 litre open-head steel drums. During development of the WNTI Information paper No. 4, “Uranium Concentrates Industry Good Practices for ISO Containers in Multimodal Transport”, it became apparent that the current practice of using drums had not been reviewed for some time. Therefore, the WNTI posed the questions:

- does this remain the most efficient, cost effective way of transporting uranium concentrates?

The Uranium Ore Concentrate (UOC) transport industry believed it to be timely, relevant and aligned with the concept of product stewardship to benchmark current practices against leading practices for transporting bulk high density industrial-based powders.

After an initial WNTI Members discussion paper “Current Practices and Experience of Shipping Bulk Powders in Freight Containers” which explored the current practices of shipping bulk powders and granules through the experiences of shippers, shipping lines and consignees, the UOC industry discussed within the WNTI moving the project forward and some companies, with the support of the WNTI, agreed to undertake a feasibility study into the packaging and supply chain of uranium concentrates. The purpose of the study is to assess the current practices against those who transport other bulk powders and to conclude from there the most efficient means going forward for handling UOC from origin to destination.

The feasibility study provides an opportunity to investigate the suitability and applicability of bulk powder transport technologies to the transport of uranium concentrate. The study will investigate existing and potential UOC packaging and transport technologies from several points of view including the robustness of the package, ease of use (filling/sampling/emptying), restraint during transport, minimising waste, surface contamination control and environmental impact.
Whilst the official theme of PATRAM 2010 in London was “Looking to the Future”, the nearly 800 participants to this triennial International Symposium on the Packaging and Transport of Radioactive Material were also “looking for the future” and its challenges.

As a result of the “nuclear renaissance”, including life extension of existing nuclear power plants (NPPs), increasing their electric power output and the building of new NPPs and other new fuel cycle facilities, the transport of radioactive material will increase and is more than ever an essential service. Transport has to provide the “life blood” of the nuclear fuel cycle. This includes the need for more reliability while maintaining the traditionally high-level of safety and security.

To increase the number of packaging
To meet the demand for more packaging, a proper plan for manufacturing is necessary, as the need for large components is increasing globally for the “nuclear renaissance”, but also for other industries.

To increase the capacity of the packaging
From both economic and safety perspectives, the payloads of packagings should increase: package designers need to be innovative and think “outside the box”.

To satisfy new needs
New types of material to be transported, larger quantities, more countries involved, new routes - all pose additional challenges. Regulatory infrastructures and bodies must be developed in countries which previously have had limited need. Enhanced competency is needed among both industry and competent authorities worldwide.

To maintain a high level of safety
It is recognised that compliance with the IAEA Regulations for the Safe Transport of Radioactive Material (TS-R-1) provides a high level of safety. An important challenge is to demonstrate compliance with the Regulations without increasing the paper work in the interest both of safety and cost-effectiveness.

With a stable regulatory regime, worldwide harmonisation in its interpretation and implementation also is a great challenge for safety reasons, and to avoid undue burden on the stakeholders. Notwithstanding, it is recognised that the Regulations must continue to evolve to take into account new needs.

To transport radioactive material after a long period of storage
There are uncertainties about the duration of storage periods due to the lack or postponement of decisions on back-end issues. Strategies must be defined to prolong the safe storage, and to permit to transport safely after extended periods of storage. Analysis of knowledge gaps is needed to compare what is currently available with what now is needed for longer term storage.

To transport industrial and medical sources
Along with fuel cycle materials, industrial sources and materials for medical applications also are critical. Reductions in source production capacities make denial and delay of shipments even more consequential. In addition, recovery, transport and management of orphan sources need consideration.

To keep the routes open
Acceptance of transport by all stakeholders is important for success. Efforts in areas of training, information, communication, global acceptance, nuclear liability, insurance and emergency planning must continue to increase understanding and obviate denial and delay of shipments.

Effective communication is a major key to success; ill thought-out improvisation is not permitted: communication must be well-tailored, proactive and make appropriate use of new media.

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Conclusion
Radioactive materials are the life blood of the nuclear industry, and safe, secure, cost-effective packaging and transport allows this blood to keep flowing!

Though the challenges facing industry to assure this are many and substantial, it is fully committed to assuring the safe, secure, efficient and reliable transport of radioactive materials for the benefit of people the world over.
Member Services
The WNTI holds semi-annual Members meetings to discuss current issues and challenges facing industry. The first meeting in 2010 was held in Montréal, Canada and the second in London, UK. The Montréal meeting focused on issues related to the import and export of radioactive materials, and included an informative site visit to the Port of Montréal. At the December meeting, Mr. Ahmad Al Khatibeh, the Section Head of the Regulatory Infrastructure and Transport Safety Section, International Atomic Energy Agency, gave a presentation on the 2011 Transport Safety and Security Conference being organised by the Agency. Further discussion focussed on key issues raised at the PATRAM 2010 Symposium with Members coming together to identify issues for priority attention in 2011.

At both meetings the WNTI industry groups convened to continue their work. Those groups dedicated to packaging and transport issues related to uranium hexafluoride and uranium concentrates took the opportunity while in Canada to hold their meetings at Cameco’s Port Hope facility.

Conferences
The WNTI participates in a variety of important conferences each year; over the past year, the list included:
- Public Information Material Exchange (PIME) 2010, Budapest
- AREVA International Nuclear Recycling day, Paris
- Middle East Nuclear Energy Summit, Amman
- IAEA Spent Fuel Management Conference, Vienna
- IAEA General Conference, Vienna
- 35th World Nuclear Association Symposium, London
- 16th Packaging and Transport of Radioactive Materials Symposium (PATRAM) 2010, London

Media Relations
As part of the ongoing WNTI media relations programme, a network of contacts continues to be developed with key industry publications. In addition, the WNTI is pursuing further opportunities outside the nuclear sector to raise awareness of the exacting standards of radioactive materials transport, the importance of radioactive materials to society, and the problems caused by delay to and denial of shipments of these essential materials.

Website
The content and structure of the WNTI website is updated and improved regularly and now features English, Spanish, Korean, French and Portuguese language portals. The Members’ intranet provides latest available information. During this past year, the website’s media centre has been under major reconstruction and will be re-launched in the new year to include additional, more detailed information on the safe transport of radioactive materials.

Publications
An important WNTI communications function is the publication of baseline information, reviews, and technical studies to support its principal activities. The suite of materials includes Fact Sheets, Information Papers, Conference Papers, as well as the more technical Review Series. All WNTI publications are available in hard copy as well as in electronic format on the WNTI website. During the year, all WNTI publications, which are available electronically, were reviewed to ensure they remain current.
The WNTI, with its member companies, is deeply engaged in an intensive work schedule which carries forward into 2011. It was clear from the discussions at the PATRAM 2010 international symposium on the Packaging and Transport of Radioactive Materials in London that the WNTI work programme is addressing a host of key issues important to assuring continued safe, effective and reliable transport of radioactive materials of all kinds. A number of these issues doubtless will find their way onto the agenda of the proposed IAEA international transport safety and security conference planned for 2011 and the WNTI will devote effort to the development of consolidated industry positions to help inform discussion at this important meeting.

Much of the WNTI work will be done within the industry-led WNTI working groups and task forces. In particular, we can expect continued concentrated attention on key issues related to the packaging and transport of spent fuel and waste materials – including dual use of casks for transport and storage, movement of large objects from decommissioned facilities, fissile exceptions. The Uranium Concentrates Industry Working Group will continue to promote greater industry standardisation in the packing, packaging and transport of uranium concentrate while reviewing the rationale for the 210 litre drum. Transport security has had a higher profile in recent years and will continue to engage the attention of WNTI Members.

The WNTI will continue its strong support for key meetings of intergovernmental organisations including notably the International Atomic Energy Agency (IAEA), the International Maritime Organization (IMO), the International Civil Aviation Organization (ICAO), and the UN Sub-Committee of Experts on the Transport of Dangerous Goods. In all these organisations, the Institute will continue to encourage efforts for greater harmonisation and simplification of the transport safety regulatory regime in the interest of safety and efficiency. The WNTI will continue to play an active role within the IAEA Steering Committee on Shipment Denials and will pursue the WNTI programme of engagement and dialogue with transport service providers including shipping lines, ports and harbour authorities.
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