



WORLD NUCLEAR TRANSPORT INSTITUTE

Nuclear Transport – The Regulatory Dimension

presentation paper

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**Dedicated to the
safe, efficient
and reliable
transport of radioactive
materials**

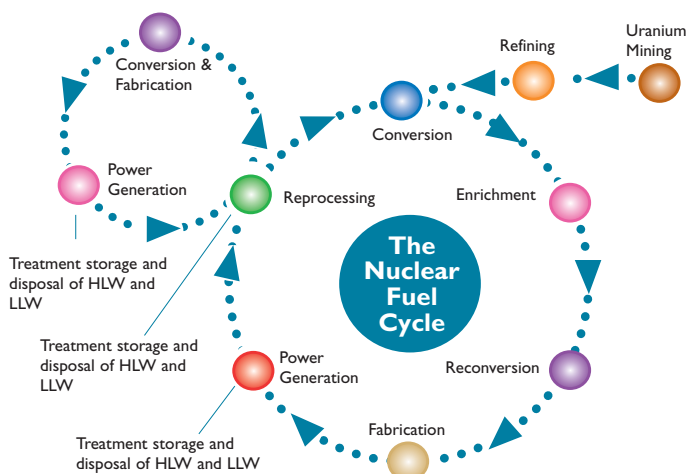
Transport as an essential link

For nearly 50 years the international community, through the International Atomic Energy Agency (IAEA), has supported the objective of accelerating and enlarging the contribution of atomic energy to peace, health and prosperity throughout the world. One of the founding articles of the IAEA (Article III) authorises the Agency to make provision to meet the needs of research, development and practical application of atomic energy for peaceful purposes, including the production of electric power, with due consideration for the needs of the under-developed areas of the world.

And that was nearly half a century ago – long before the world took up the global challenge to reduce CO₂ emissions which threaten the entire planet. All countries, developed and developing, derive benefit from technologies that contribute to the reduction of CO₂ emissions. According to a recent study as many as 30,000 deaths a year in the United States alone are related to power plant emissions. The beneficiaries of nuclear power do not live only in those countries that produce nuclear power. But if nuclear power is to play its part in meeting the energy needs, and the clean air needs of peoples everywhere, it must be able to transport its materials to where they are needed.

Transport is not a side issue in the nuclear fuel cycle; it is intrinsic to it; transport is what makes the cycle go around. Most people are familiar with the graphics typically used to display the fuel cycle. You know the one; beginning with the uranium mine site, the arrows carry the eye around the circle from refinement, conversion, enrichment, reconversion and fabrication facilities to reactor site. And then, in the case of reprocessing, the cycle spins off on another round ultimately carrying spent fuel through the reprocessing cycle back once more to the reactor site. There are, of course, off-ramps to the cycle, carrying radioactive residues away for treatment, storage and disposal.

The arrows represent the transport legs of the cycle. Knock the transport legs out from under the cycle and the whole thing inevitably grinds to a halt. That is what some people would like to happen; to stop the use of nuclear energy for the production of electricity. There are others, perhaps in countries or regions that do not themselves rely on nuclear power generation, who do not see themselves deriving direct benefit and so, do not see why they should accept the transport of fuel cycle materials past their coasts or through their ports. The sad fact is that sometimes the transport protest may be the Trojan Horse of opposition to the nuclear power industry.



Transport as a safe link

Transports of radioactive materials have an outstanding safety record; indeed, the transport of such materials could be regarded as a model for the transport of other classes of dangerous materials. The industry has a long track record over several decades. It is noteworthy that where there have been transport incidents involving radioactive materials, and these have been few relative to the number of such transports, they have been without major radiological consequence for health and the environment. The incidents there have been largely transport events involving radioactive materials, not radiological events involving transport. There is good evidence that packages conforming to the IAEA standards offer appropriate protection under accident conditions. That is the conclusion of the international community of nations, members of the IAEA. The IAEA General Conference in 1998 recognised that, and I quote “Compliance with regulations which take account of the Agency’s Transport Regulations is providing a high level of safety during the transport of radioactive materials” (Resolution GC(42)/RES/13). Last year the European Parliament considered a report dealing with the safe transport of radioactive materials in the European Union. During the debate, Trade Commissioner Pascal Lamy, speaking on behalf of the European Commission, said that the report confirmed that “Measures taken at international and national level ensured a high level of safety for nuclear transport operations”.

There are two principal reasons for this outstanding safety record. It is due primarily to well-founded regulations developed by such key intergovernmental organisations as the IAEA, with the essential contributions of the Member States who participate actively in the regulation implementation and review process, and their reflection in the international transport safety regime of modal, regional and national regulations. It is due also to the professionalism of those in the industry. There is a necessary synergy between the two – between the regulators whose task it is to make and to enforce the rules for safe, efficient and reliable transport, and those whose job it is to transport within the rules. Both, I suggest, the regulator and the transporter, can be more effective in achieving their purposes when they co-operate in the interest of mutual understanding.

Security of transport of dangerous goods has attracted increased attention since the terrible events of 11 September last year. The transport of radioactive materials has always been subject to stringent security measures. By their very nature those security measures are not always for public disclosure. Indeed, some have accused the industry of sometimes putting security considerations ahead of transparency. A balance must be struck, in accord with the international regulatory regime, to ensure that appropriate notices are given consistent with the requirements both of safety and of security. Industry is fully committed to ensuring both safety and security of transport.

The international regulatory regime for transport

No form of transport is subject to a stricter regulatory regime to ensure safety and security. The international standards developed at the IAEA are reflected in the standards and regulations of the modal bodies such as the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO), regional regimes such as the ADR, RID and ADN for road, rail and inland waterways in Europe, and the regulatory regimes of the IAEA Member States themselves.

Industry has co-operated in the full implementation of this regime. There is a clear determination on the part of industry and the key international organisations to dialogue and through the World Nuclear Transport Institute, industry has a vehicle for taking part in this dialogue.

WNTI as transport's eyes, ears and collective voice

The World Nuclear Transport Institute, or WNTI as it is known, sprung from a discussion a few years ago among some companies of how best to represent the collective interests of industry. Based in London, with regional offices in Washington and Tokyo, WNTI has in a relatively short time grown from the original three members to 35 members worldwide. The membership represents several sectors of the nuclear industry and utilities. WNTI's ability to represent the collective interests of its members is enhanced by the global span of its membership and the diversity of transport concerns it represents. The World Nuclear Transport Institute offers a forum for members to share information, ideas and concerns, and importantly, it acts as a catalyst to stimulate development of consolidated industry positions on industry matters. In effect, the World Nuclear Transport Institute provides the nuclear transport industry, and those who rely on it, with the collective eyes, ears and voice in the key intergovernmental organisations which are so important to it.

Industry's voice is made more powerful when it is heard as one. Industry's capacity to collaborate in the development of consolidated positions on the key issues so that it presents a united front on the issues makes the industry case more compelling. The very fact that companies are able to collaborate in this way sends an important message. WNTI provides industry with a dedicated channel through which to work together, to develop well-researched and professionally presented consolidated positions, and to have those positions represented in important bodies such as the International Atomic Energy Agency.

On the basis of its non-governmental organisation status, the World Nuclear Transport Institute has an intensive continuing exchange with the IAEA and the International Maritime Organization. WNTI has consultative status with the United Nations Committee of Experts on the Transport of Dangerous Goods, and is a Liaison Member of the appropriate ISO committee. Industry, through WNTI, is represented at the key international meetings where implementation and review of regulations are discussed.

The transport safety rules of the road

The IAEA Transport Safety Regulations, from which the international transport safety regime flows, are based on the philosophy that radioactive materials being transported should be packaged adequately to provide protection against the hazards of the material under all conditions of transport, including foreseeable accidents. Therefore, it is considered, as far as possible, that:

- safety is vested in the design of the package. This, combined with simple operational controls, ensures safety;
- the consignor bears most responsibility for ensuring the safety of the transport, because it is he who prepares the package for transport;
- packages of radioactive materials should be dealt with in the same way as other dangerous goods.

Regulatory changes can and do have an important impact on packaging, on operations, and on the commercial climate.

The importance of harmonised rules of the road

The bottom line of regulation is safety and security. But safety and security are not a factor exclusively of the wording of the regulatory provisions. Safety and security also are better assured to the extent

that there is clarity within the regulations; to the extent there is consistency and uniformity in their interpretation and their application around the world, and to the extent that they provide for efficient operation. This is not always the case. Different time schedules for introduction of changes to modal and national regulations, and different transition periods from one set of regulations to another, can cause confusion, introduce further complexity, and delay transports. By January 1 of this year, the latest version of the IAEA Transport Regulations, TS-R-1, was in force in international and modal regulations. Not all countries, however, were able to adjust their national regulations to implement TS-R-1 provisions by then.

Consistent interpretation and application of international regulations is important to the safe, efficient and secure movement of radioactive materials. Implementation is the reverse side of the regulation coin; there is an intrinsic relationship between the two. Consistency and predictability assist in ensuring compliance, help to avoid confusion among all those involved in the transport chain, avoid any perception that differing applications of the regulations in different jurisdictions are somehow more or less stringent than others, and focus resources on safety considerations and compliance. The impact of differing approaches is significant at a time when there is increased pressure for new design reviews and foreign validations.

Differing interpretations currently exist in a number of areas. A single package design may be assigned significantly different Criticality Safety Indexes in different countries. The desired sequence of performance tests may differ among authorities from one jurisdiction to another. To illustrate, for Type B(U) and Type B(M) packages, as well as for packages containing fissile material, tests for demonstrating ability to withstand accident conditions of transport include, typically, two drop tests: a punch test, which is a one metre drop of the package onto a bar of circular section 15 centimetres in diameter, and a nine metre drop test which is a drop of the package onto a flat and unyielding surface. The IAEA Regulations prescribe that these tests must be performed in the order which leads to the maximum damage. However, at least one national jurisdiction specifies that the nine metre drop test must be performed first, and the one metre punch test second. Should the applicant and national authority with regulations based directly on the IAEA regulations agree that performing the punch test before the nine metre drop is the most damaging sequence, what happens if the applicant further requires a validation in the national authority which takes a different view? And vice versa.

To take another example of how differing interpretations can complicate and confuse matters; drop tests for such packages must be performed with the package in the most damaging orientation, and sequencing of drops must consider the most damaging order of impacts. Even if the designer provides analyses to justify the most damaging orientations and sequences, and in addition succeeds in convincing his own competent authority of the correctness of these justifications, other authorities can hold differing opinions.

The World Nuclear Transport Institute takes every opportunity to impress on all stakeholders the importance of a uniform approach in the interest of safe, efficient and reliable transport.

And so we have the situation today whereby TS-R-1 still is in the process of being implemented, the IAEA process of reviewing TS-R-1 has just run its course, and a new review is unfolding. The move from the former ten-year cycle which produced TS-R-1 to the current two-year cycle has potentially significant consequences for transport. If regulations were to change so substantially every two years as to require a whole new edition of transport safety regulations, it is not at all clear that national regulations worldwide could keep up with the pace. Does two years allow sufficient time for public

consultations and for the necessary legislative or other regulatory procedures before incorporation of changes into national regulations? Does two years allow adequate time for industry to make necessary modifications where required by new regulation, to train staff in new requirements, and, where necessary, to modify operational procedures? Nobody would benefit from a smorgasbord of regulations of varying vintage.

Significantly, the recently altered TS-R-1 will appear as an amended rather than wholly new, revised edition. This recognises that the changes were not of such magnitude to require a whole new edition with the necessary accompanying processes of substantial regulatory change around the world. It also is noteworthy that the current IAEA process launched this year has been characterised as one of review rather than revision.

The transport of radioactive materials relies on the accessibility of approved packages, and the IAEA Member States have recognised the need to authorise existing package designs over a reasonable period of time. A viable system in which packagings that are properly maintained, and continue to meet their original design intent may safely continue in use to the end of their useful design lives is essential to the continued flow of radioactive materials in an increasingly international marketplace. Differing approval processes, and differing interpretations of regulatory provisions can impact on the availability of suitable packagings for multi-national shipments. Evaluation of existing design review and validation processes by industry and by national competent authorities may be helpful to determine how increased efficiencies can be built into the current system. For example, Safety Analysis Reports which are more standardised internationally would be helpful.

Summary


In summary, there is a widespread recognition today that maintaining transport options requires open and sustained dialogue between regulator and licensee. It also requires close collaboration among all parties in the industry. This type of industry co-operation and collaboration is possible through participation in the World Nuclear Transport Institute.

Our Members recognise that they must educate themselves and their partners in the industry. At the same time, industry must take the opportunities afforded it to inform the regulators and others of the context in which industry operates and, to be engaged in the regulation implementation and review process. Practical, efficient and safe transport regulation should take account of its impact on those who do the transporting. The context today in which radioactive materials are transported is complex, it is challenging, and it takes place in a rapidly changing environment. In many respects transport now is being viewed as an integral market issue and not a subsidiary concern. The availability of carriers drives routing decisions, and changes in material flows necessitate new approaches to packaging and transport scenarios. Pressures on the transport sector are not without potential serious consequences; they can cause delays and in some cases cancellation of planned movements. Complex routings and the necessary use of chartered carriers can push up costs and work against cost efficiency.

The voice of industry is made stronger through the elaboration and presentation of consolidated positions, and that is made possible through participation in the work of the World Nuclear Transport Institute.

The logo for the World Nuclear Transport Institute (WNTI) consists of the letters 'WNTI' in a white, serif font, centered within a blue rectangular box. A white curved line is positioned below the text, suggesting a globe or a stylized horizon.

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