

Maintaining the flow: international cooperation to help address denial of shipment of radioactive material

Serge Gorlin – World Nuclear Association; Natanael Bruno - Comissão Nacional de Energia Nuclear;
John Mulkern – World Nuclear Transport Institute; Ulric Schwela - Salus Mineralis

Abstract

The phenomenon of delay and denial of shipments, the non-acceptance of radioactive material by transport companies and ports even when shipments are in full compliance with domestic regulations and internationally accepted requirements, has been addressed at previous PATRAM Symposia. In 2018, IAEA General Conference Resolution GC(62)/RES/6 and IMO Facilitation Committee paper IMO FAL 42/16/1 submitted by WNTI recognized ongoing difficulties relating to the delay and denial of shipments. The serious effects of such difficulties range from added physical protection risk due to material sent by longer indirect routes and detriment to public health caused by delaying or restricting patient treatment. The Transport Facilitation Working Group (TFWG) is a standing group of experts whose role is to propose strategies and activities necessary to facilitate the global transport of radioactive materials, and to contribute to their implementation. It submits regular reports to the Inter-Agency Group (IAG), composed of representatives of the IAEA, ICAO, and IMO Secretariats as well as UNECE. The presentation will outline analysis by TFWG members relating to the facilitation of Class 7, including data on the consolidation of maritime carriers. It will also propose ways that the findings and recommendations found in GC(62)/RES/6 and IMO FAL 42/16/1 could be addressed.

Introduction

For peaceful nuclear technologies to fulfil their essential role, nuclear and other radioactive materials need to be transported, for example, from manufacturer to end user. It is in the general public interest – including with respect to safety and security – that this material is shipped in an efficient and timely manner. Yet this is often difficult to accomplish owing to the non-acceptance of radioactive materials by transport companies and ports, a phenomenon known as denial of shipments (DOS). Because radioactive materials are used in all countries but mined or produced in just a few, transport of radioactive materials, and the challenges arising from it, tend to have an international dimension. This paper examines the main international initiatives to resolve DOS over the last 15 years, and looks at current initiatives to moderate its effects over the medium to long term.

ISC-DOS

The phenomenon of difficulties encountered during the international shipment of radioactive materials dates back many years. The publication of the International Atomic Energy Agency (IAEA) Regulations for Safe Transport in 1961 was, in part, a response to the difficulties experienced by Member States in shipping radioactive materials internationally, due to conflicting regulationsⁱ.

However, even with the more harmonized regulatory framework provided for by the IAEA regulations, problems persisted.

The IAEA's International Conference on the Safety of Transport of Radioactive Material held in Vienna from 7 to 11 July 2003 addressed problems with denials of shipments noting inter alia "the increasing frequency of use of radioactive material in medical applications, including life-saving measures requiring urgent transport, and the difficulties that are being experienced in accomplishing those transports" and that "the nuclear industry and other industries using radioactive material are facing a reduced availability of transport modes and carriers as a result of decisions by commercial carriers, ports and handling facilities not to accept radioactive material". The findings from this conference led to the establishment of a fact-finding discussion forum embracing relevant UN bodies, International Organizations, shipping companies and national regulatory authorities, about how delays and denials in transporting radioactive material might be alleviated.

This forum eventually led to the creation by the IAEA of the International Steering Committee on Denials of Shipments (ISC-DOS) in 2006, whose membership included representatives from the International Maritime Organization (IMO), International Civil Aviation Organisation (ICAO), the International Federation of Airline Pilots (IFALPA), Member States and industry bodies.

The ISC-DOS enjoyed much success in determining the causes of denial and raising understanding among the transport community of this issue. Pilots became more aware, for example, that radioactive materials can be carried safely alongside pets and biological samples in the hold of airplanes and do not need to be off-loaded. Airlines, such as Air Canada and those under ANAC (Agência Nacional de Aviação Civil) in Brazil, even made it their policy to prioritize certain radioactive material for transportation over other cargoes and passengers.

Notwithstanding these efforts, the International Conference on the Safe and Secure Transport of Radioactive Materials, which took place on October 2011, found that denial of shipments continued to be a problem which had to be addressed, inter alia, because it was adversely affecting security in transport and also hindering radioactive source returns as well as beneficial uses involving radioactive material.

By 2013, the year it had set as a target to make denial and delay "insignificant", the IAEA decided that ISC-DOS had run its course. It dissolved the committee and ceased supporting the valuable Regional Coordinator and National Focal Point networks that had been built up.

Transport Facilitation Working Group

In 2014, the Transport Facilitation Working Group (TFWG) – made up of former Chairs of ISC-DOS, and representatives of interested Member States and industry bodies – was set up. TFWG is an independent, multi-stakeholder group of experts that aims to maintain some of the activities of ISC-DOS by highlighting new and ongoing problems and by proposing strategies to help facilitate Cl. 7 transportⁱⁱ. TFWG submits reports to the Inter-Agency Group (IAG), composed of representatives of the IAEA, ICAO, and IMO Secretariats as well as UNECE, and to the IAEA's Transport Safety Committee (TRANSSC).

According to TFWG's research and analysis, including a comprehensive survey of over 60 entities relying on the shipment of radioactive materials, problems with denial of shipments are on-going.

Maintaining or developing routes is highly complex and supply chains are fragile. Furthermore, in order to avoid problems, consignors often ship material by indirect routes. The shipment of nuclear and radioactive material by circuitous routes runs contrary to the IAEA’s security guidance with respect to transportⁱⁱⁱ.

Examples of other consequences stemming from difficulties encountered in the shipment of radioactive material by maritime mode are presented in Table 1.

Table 1: Examples of problems arising from the denial of shipment by maritime mode^{iv}

Product	Consequences of non-shipment
Teletherapy/radiosurgery sources	Detriment to public health delaying or restricting patient treatment. Potentially fewer patients treated
Irradiator (sterilizer) sources	Increased cost to sterilize products; shortage of sterile medical disposable products
Nuclear fuel (U3O8, UF6, fuel assemblies)	Security of supply to nuclear facilities affected; added physical protection risk to the material when sent indirectly; more countries decide to develop proliferation-sensitive fuel cycle facilities
Disused sources	Difficulty in shipping sources from countries where sources cannot be adequately managed sometimes due to political unrest. Sources become out of regulatory control

The reasons for DOS are complex but TFWG has identified three important factors:

Perception: There are nine classes of Dangerous Goods, but radioactive material (Class 7) is often perceived by stakeholders in the transport chain as the most dangerous. This perception is not based on evidence – indeed transport of Class 7 has an enviable safety record over more than 50 years – however companies and authorities often lack the will and the resources to inform their staff and local communities about the important role of this cargo and its excellent safety record.

Economics: Radioactive material is premium cargo, and there are an estimated 20 million shipments taking place in a year. Nevertheless, this represents a small fraction of the overall transport of goods, and companies in the transport chain must weigh the investments needed to be qualified to carry Class 7, against the income to be earned.

Harmonized regulations: The regulatory system for Class 7 transport derives from IAEA safety standards and has served the international community well for nearly 60 years. Problems can occur, however, when interpretation of these standards differs between countries and it becomes difficult to maintain compliance as a shipment passes through different jurisdictions.

Maritime challenges

In June 2018, the International Maritime Organization's Facilitation Committee (FAL) accepted a report submitted by World Nuclear Transport Institute (WNTI) "Difficulties in Shipments of IMDG Code Class 7 Radioactive Materials". The report outlined how – notwithstanding previous efforts by the IMO – problems are still being encountered in shipping radioactive cargoes efficiently and directly.

In characterizing the challenges, FAL 42/16/1 identifies that there is “a continued consolidation of shipping lines, with some companies which have historically accepted IMDG Code class 7 radioactive materials being merged or bought out by companies that have policies not to accept IMDG Code class 7 radioactive materials.” Moreover, remaining shipping companies often operate in alliance groups in response to the strong competition in the industry. “In a shipping alliance, companies share cargo space, and if one carrier is not willing to accept IMDG Code class 7 radioactive materials it affects all the alliance.” The total number of shipping alliances decreased from ten in 2005, to only three in 2017. Finally, the document identifies the trend towards increases in vessel size as an issue. This raises the risk of a severe economic impact if a vessel is denied entry to a particular port during its voyage.

Recent initiatives

Further to the recommendation of IMO FAL, WNTI is now exploring the development of a model course on the safe and efficient transportation of Class 7 Radioactive Material aimed at port operatives and shipping company employees. A gap analysis has been conducted and a proposal will be brought to the next meeting of IMO Sub-Committee on Carriage of Cargoes and Containers (CCC-6.)

The World Nuclear Association is developing a set of tools for communicating the everyday transport of radioactive materials, under the slogan: “Goods worth shipping, systems you can trust”. The process for developing the tools is explained in Patram paper: 1436

At the intergovernmental level, the IAEA – in its annual safety resolution – continues to encourage efforts to avoid and address problems related to denials of and delays in the shipment of radioactive material, particularly shipment by air. It calls upon Member States “to facilitate the transport of radioactive materials and to identify, if they have not done so, a national focal point (NFP) on denials of shipment of radioactive materials to achieve a satisfactory and timely resolution of this issue”. It is clear, however, that since the IAEA withdrew support to the ISC-DOS and its networks in 2013, member states are no longer maintaining NFPs. The IAEA Transport Safety Unit is rolling out a multi-media e-learning programme, which will help contribute to building regulatory capacity.

At the 2018 IAEA General Conference, Brazil hosted a meeting on the topic of difficulties in the shipment of radioactive material. Since 2010 Brazil has maintained a committee on denial of shipments. Meeting twice a year, this committee embraces representatives from air and land modal transport agencies, qualified Class 7 cargo carriers, consignors and consignees. The Brazilian Competent Authority (CNEN) provides expertise, the Scientific Secretary and – at the meetings – is the facilitator. The outputs from the meetings are forwarded as suggestions and recommendations to the top-level administration of national/international organizations which directly or indirectly

contribute to the transport of radioactive material. Respondents to a 2015 survey carried out by TFWG showed that a majority of respondents in Brazil thought that improvements have been witnessed in the period 2012 – 2015 in relation to denial of shipment.

The objectives of the GC side meeting were to raise awareness of the ongoing issue of denial of shipment and to discuss ways the recommendations of the IAEA resolution and IMO FAL paper could be implemented. The meeting heard from MS representatives (Brazil, Tanzania), IAEA Transport Safety Unit, as well as industry bodies. Among the ideas emerging from the meeting, a Code of Conduct on facilitation of transport was recognized as having strong potential. Among the advantages of such a code, it could provide a justification for regulatory bodies intervening when radioactive materials to / from a country are encountering facilitation difficulties.

A Code of Conduct combined with the IAEA efforts to build regulatory capacity for transport among MS, and the work of the TFWG's members to develop training tools and communication materials that explain the role of radioactive materials in modern society, provide the elements of an overall strategy to help minimize the effects of DOS in the medium to long term.

Conclusions

This paper's review of international efforts over the last 15 years has tried to show that DOS is a perennial issue with causes relating to economics, regulation as well as perception. The serious effects of this, including detriment to public health and added physical protection risk due to material being sent indirectly, should be addressed in a concerted way. The TFWG has provided a forum for diverse stakeholders to share findings and coordinate efforts to tackle DOS. Valuable initiatives relating to training and communication are ongoing. A Code of Conduct on Transport Facilitation, which would imply a greater commitment on Members States to ensure Cl. 7 moves efficiently and directly, is worthy of consideration for adoption.

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References

ⁱ Presentation by Denis Flory to the 2011 IAEA Conference on the Safe and Secure Transport of Radioactive Material (<https://www-pub.iaea.org/MTCD/Meetings/cn187presentations.asp>)

ⁱⁱ www.tfwg.info

ⁱⁱⁱ IAEA Nuclear Security Series No. 9 and INFCIRC/225/Rev5 (NSS 13)

^{iv} Adapted from annex of FAL 42/16/1 "Difficulties in Shipments of IMDG Code Class 7 Radioactive Materials" by WNTI