

**The role of International Nuclear Services in Global Threat Reduction**

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**1. ABSTRACT**

As the world leader in the maritime transport of specialist nuclear cargos, International Nuclear Services (INS) is a true global player, helping to make the world a safer place.

Working with overseas customers, INS has a vital role to play in transporting nuclear material to the United States of America (USA) in support of their Department of Energy programme known as the Global Threat Reduction Initiative (GTRI).

This paper examines the work INS has successfully completed in the safe and secure transport of GTRI related materials, including the recent transport of separated plutonium from Sweden to the USA and the transport of Mixed Oxide Fuel (MOX) from the UK to Germany.

It will discuss the ways in which INS and its subsidiary, Pacific Nuclear Transport Limited (PNTL), integrates the International Atomic Energy Agency (IAEA) requirements of safety and security and works with key partners such as the Civil Nuclear Constabulary (CNC) and with other key stakeholders including UK / overseas regulators, in order to ensure strict compliance with both domestic and international regulations.

Finally, the paper will cover the specialist transport assets and capabilities the company has in place to truly deliver Category I, II and III shipments for its customers and reduce the overall nuclear threat.

**2. INTRODUCTION**

At the 2013 IAEA Conference on 'Nuclear Security: Enhancing Global Efforts' the UK Office for Nuclear Regulation (ONR) highlighted the UK as the leader in the field of international maritime shipments of nuclear material and concluded that no organisations are more experienced in this subject matter than INS and PNTL [1].

With more than 40 years experience of transporting nuclear material around the world INS worked with international customers and stakeholders to build the highest standards of safety and security standards into their transport arrangements. Operating a fleet of specialist Irradiated Nuclear Fuel Carriers [2] INS and PNTL have covered over five million miles without a single incident resulting in the release of radioactivity.

These arrangements were covered in detail at the 2011 IAEA Conference on the Safe and Secure Transport of Radioactive Materials [3].

In addition to the transports of MOX, High Level Waste and Intermediate Level Waste from Europe to Japan by PNTL, INS, on behalf of the UK Nuclear Decommissioning Authority (NDA), has a proven track record of transporting Category I, II and III materials in support of both the nuclear fuel cycle and material consolidation projects such as the GTRI programme.

In order to successfully deliver for its customers and balance the national and international safety and security requirements, INS works with various transport partners, UK and foreign government agencies and regulators to reduce the potential threat posed during the transport of nuclear material and maintain their unique position in the marketplace.

### **3. REGULATORY FRAMEWORK**

In the support of GTRI related transports, INS has been contracted by European customers to transport material to the USA in compliance with a well establish national and international regulatory framework. As a UK based company operating UK flagged nuclear fuel carriers, INS meets or exceeds the obligations defined in the following:

- ISM Code - International Safety Management Code [4]
- IMDG Code - International Maritime Dangerous Goods Code [5];
- INF Code - International Code for the Safe Carriage of Packaged Irradiated Nuclear Fuel, Plutonium and High-Level Radioactive Wastes in Flasks on Board Ships [2];
- Regulations for the Safe Transport of Radioactive Material [6]; and
- Planning & Preparing for Emergency Response to Transport Accidents Involving Radioactive Material [7].

The ISM Code requires INS / PNTL to have a safety management system that is approved and audited by the Maritime and Coastguard Agency (MCA) as the UK Administration and safety regulator. All transport operations are carried out in accordance with the safety management system and where security issues could impact upon the safe operation of a vessel or the safety of the crew then discussion would be held between the MCA and ONR as the UK nuclear security regulator. Any changes to the safety management system or formal dispensations such as changes to the operation of the Automatic Identification Systems (AIS) would be agreed between both regulators before being implemented by INS as the carrier and operator of the vessel.

The IMDG and INF Codes set out the safety obligations that must be met by INS for every voyage involving an INF cargo and also covers a link to the security requirements defined by UK as the Flag State.

The IAEA Safety Regulations re-enforce the safety requirements imposed by the Member States and again, these are administered by the radioactive materials transport section of ONR and the MCA.

Whilst safety of the public, crew, vessel and material will always take priority, INS is required to meet a number of key security obligations in order to operate the fleet, these include the following:

- ISPS Code – International Ship and Port Facilities Security Code [8];
- Nuclear Industry Security Regulations 2003 [9]; and
- Anti-Terrorism Crime and Security Act 2001 [10].

The ISPS Code requirements are administered by the UK Department for Transport's Maritime Security section and were covered extensively by Booker & Barnwell (2004) [11].

The Nuclear Industry Security Regulations 2003 (NISR) are regulated on behalf of the Secretary for State by ONR and are also covered in the above paper [11]. Under the regulations INS / PNTL are regulated as a 'Class A Carrier' and hold transport security statements and plans that are approved by ONR. The effective regulation of NISR covers carrier, personnel, information and physical security and ensures that the UK meets its obligation under the IAEA Nuclear Security Recommendations on Physical Protection of Nuclear Facilities and Nuclear Material [12]. It also covers the credible threats posed to RAM transports through the Nuclear Industries Malicious Capabilities Planning Assumptions (formerly the UK Design Basis Threat).

With regard to the international transport of RAM, ONR play a vital role in negotiating the arrangements for the formal transfer of security from the UK Government to the receiving or transit State. These arrangements are documented in the INS / PNTL Transport Security Plans and the actual handovers are recorded onboard. For GTRI shipments the Record of Discussion (ROD) agreements have been concluded with both the Government of the consigning State and the Government of the USA as the receiving State. Hasted (2013) [1] covers the threat assessment and ROD process in detail.

#### **4. TRANSPORT ASSETS**

In addition to the PNTL fleet of Nuclear Fuel Carriers, INS operates the Motor Vessels (MV) Oceanic Pintail and Atlantic Osprey under the INF Code. Both vessels have transported material under the GTRI programme and can carry a specialist compliment of armed escort officers from the CNC Strategic Escort Group to provide the Master with dedicated physical protection arrangements in accordance with the INS Transport Security Statement (TSS) and specific Transport Security Plan (TSP).

In order to support future business opportunities, INS is currently reviewing what assets will be required to service this market in the coming years. INS is also working closely with the CNC to increase the number of armed escort officers available to support existing and new Category I and II transport opportunities.

#### **5. PHYSICAL PROTECTION AND ARMED RESPONSE CAPABILITY**

The physical protection arrangements and armed response capability developed by INS are delivered in accordance with the requirements of NISR and independently approved by ONR for and on behalf of the UK Secretary of State for Energy.

Whenever an INS or PNTL vessel carries an armed escort force the escort group and ship's crew work together under the overall command of the Master to protect the vessel and material from the threat of theft, sabotage or terrorism.

Prior to granting INS an approval to undertake a Category I and II transport, ONR will obtain a transport specific threat assessment from the UK national intelligence agencies. ONR will consider this assessment when determining whether or not to allow the transport to take place as planned.

In relation to the specific threat of terrorism and the maritime shipment of radioactive material, Doctor Ron Smith (Smith, 2006) [13] concluded in his paper that 'There is very little prospect of attacks... having any serious consequences'.

In the event of a security incident involving an INS vessel during the transport of Category I and II material, the INS / PNTL emergency management arrangements which are required by the INF Code to cover a number of specific safety and security related scenarios, including acts of piracy

and terrorism would be invoked. In addition to these specific requirements all plans, procedures and training include a generic element to encompass the safety and security response to any incident regardless of the cause.

During any potential incident INS, the crew and CNC would rely upon their training, experience and dedicated management systems (including the TSP and CNC tactical procedures) to quickly decide if the incident posed a credible safety or security risk, in order to deploy the required countermeasures. At worst, and in relation to the physical protection of the vessel, crew and / or nuclear material, then these measures could include an escalation of force, in accordance with the UK rules of engagement.

INS is required by law to inform the ONR duty officer of any incidents that have security implications. In parallel to ONR, the CNC secure command centre could be utilised to provide support from the UK Government and the Ministry of Defence in terms of the national security arrangements and military aid to a UK flagged vessel. ONR could also facilitate requests for international security assistance from other member States in accordance with the Convention for the Protection of Nuclear Material [14].

## **6. TRANSPORT PARTNERS**

The key relationship between INS, PNTL, NDA and CNC has already been covered but INS also works with a number of other partners to provide transports of Category I and II material. These currently include:

- Serco - for the provision of ship management services;
- Royal Navy - for the provision of maritime warfare and force protection training; and
- Cheshire Constabulary - for the provision of specialist security and diving services.

## **7. RECENT TRANSPORT EXPERIENCE**

Following the successful completion of the Eurofab Category I transports of Plutonium (Pu) and MOX between France and the USA in 2005, INS has undertaken numerous Category I, II and III transports in support of material consolidation projects and the GTRI programme.

Most recently, these transports include the first ever transport of separated plutonium under the GTRI. The material was transported from Sweden to the USA on the MV Oceanic Pintail. The Pu was used in research programmes in Sweden in the 1960s and originated from both Sweden and the USA. Approximately three kilograms were transported in this shipment, with INS supporting Swedish company, AB SVAFO, and the US Department of Energy [15].

Sweden's Foreign Minister, Carl Bildt, announced the shipment at the 2012 World Nuclear Security Summit in Seoul, saying, "by transferring plutonium from historical Swedish nuclear research and development activities to the USA within the framework of the GTRI, Sweden is contributing to international security co-operation in this area. We are also setting an example and hope that it will be followed by other countries that have such material in their possession" [16].

2012 also saw INS successfully deliver two shipments of MOX from the UK to Germany safely which required secure Category I road transports in both the UK and Germany and Category I marine transport between the two countries utilising an armed escort from the CNC. These transports did attract a great deal of interest from Non Governmental Organisations (NGOs) and direct action by various groups in German territorial waters and in Germany itself. As a result of the unsafe acts by some of these NGOs during the first shipment, INS was successful in obtaining a

formal legal injunction against Greenpeace EV preventing them from approaching the vessel in German territorial waters or disrupting communications during the second shipment.

## **8. CONCLUSION**

INS / PNTL strive to delight their fuel cycle customers and maintain its lead in the world wide transport of specialist nuclear material. The experience of this core business places INS in the ideal position to support nuclear material consolidation projects around the world and in particular customers that are committed to the GTRI programme.

As a major operator, INS faces a number of unique challenges created by balancing the national and international safety and security obligations. It is only by working in partnership with its customers, partners, regulators and stakeholders that INS will continue to pioneer these standards and develop a new strategic objective to have a platinum standard safety and security culture.

Whilst extremely proud of their heritage and reputation it is important to note that INS and PNTL are committed to the continuous improvement of their safety and security culture thus supporting the nuclear fuel cycle and the wider global threat reduction programme [17].

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