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**Subject:** **(Abstract) Nuclear and Other Radioactive Material Transports in the Maritime Environment: ‘Evidence over Assertion’ - Assuring the International Community**

*Question - how does the world’s leading Special Nuclear Material and Radioactive Material Shipper assure its own competent authority and the international community that it can safely and securely transport every conceivable cargo on the Radioactive Material spectrum? Answer - through employment of rigorous and robust internal and external assurance programmes.*

International Nuclear Service (INS), part of the United Kingdom’s Nuclear Decommissioning Authority (NDA), has been doing just that for well over 40 years by road, rail and sea. Today the NDA’s estate has a wealth of transport expertise including consignor/consignee knowledge, transport flask design and licensing, emergency response and radiation protection, safety, security and transport and lifting operations. In doing so, it has transported some of most sensitive nuclear materials, including plutonium and high enriched uranium, both domestically and internationally. As one can imagine, transports of this nature are essential and act as a critical enabler to the nuclear sector and its fuel cycle.

Integral key stakeholders and indeed the target audience during this process include the Coastal and Shipping States community, international governments and competent authorities, as well as the wider international community, for example non-governmental organisations (NGOs) and not least the general public through utilisation of, amongst other media, corporate communications. Not forgetting that clear and concise underpinning legislative and regulatory frameworks are pivotal in directing and informing a proportionate yet effective safety and security provision.

Radioactive Material is a ‘broad church’ governed by different areas of legislation. Regarding nuclear material, the CPPNM (Ref 1[[1]](#endnote-1)) entered into force on 8 February 1987 which, inter alia, established physical protection measures that had to be applied to nuclear material in international transport. Thereafter in 2005 the Parties to the Convention achieved consensus for an Amendment, which entered into force on 8 May 2016. The Convention and the Amendment form the single legally binding international instruments in the area of physical protection of nuclear material.

The key point therein pertains to what were previously considered obligations for physical protection under the CPPNM, however, post entering into force are now legally binding for States Parties in order to protect nuclear material during transport but NM is only one part of the conundrum.

For what is termed Other Radioactive Material (ORM), from a shipping perspective, governance is achieved via employment of a number of documents, including the IAEA Code of Conduct on the Safety and Security of Radioactive Sources (Ref 2[[2]](#endnote-2)) (the ‘Code’) and the UNECE Orange book (Ref 3[[3]](#endnote-3)) (UN Recommendations on the Transport of Dangerous Goods Model Regulations). Furthermore, the IAEA SSR-6 Transport Regulations (Ref 4[[4]](#endnote-4)) (outlining guidance on the safe transport of radioactive material) aids formation of the basis of international modal regulations established by other United Nations bodies, such as the International Maritime Organisation’s, namely, the International Maritime Dangerous Goods (IMDG) code (Ref 5[[5]](#endnote-5)) which is holistically fused to provide optimal safety and security standards in the transportation of everything from vitrified high level waste reprocessing returns to spent fuel and radioactive sources.

At the high end of the continuum, and in order to deliver safe and secure Category I nuclear material maritime transports International Nuclear Services (INS), in conjunction with its strategic partner the Civil Nuclear Constabulary (CNC), Her Majesty's Royal Navy, and with the agreement and approval of the United Kingdom’s Office for Nuclear Regulation (ONR), has developed a rigorous and robust quality assurance and operational capability check to ensure both internal and external expectations are met in terms of understanding, timeliness, completeness, and value. This INS bespoke Maritime Integration Training and Demonstration (MIT/MID) programme has been designed specifically to counter the threat posed from maritime and nuclear sector threat actors and vectors and has been successfully employed in advance of numerous live international and national security operations.

In tandem and symbiotic to this, contingency in the form of Emergency Preparedness and Resilience (EP&R) functionality is similarly exercised and scrutinised with a view to delivering a testing and pressurised environment not only at the operational and tactical levels but on the ‘government to government’ communications level via, principally, the Coastal and Shipping States forum and through international exercises conducted at the IAEA’s Incident Emergency Centre (IEC) in Vienna.

In summary, this paper will elucidate further in support of the above assertions providing detailed evidence on how credible assurance is designed, delivered and audited with a view to overcoming the challenges presented by an ever more dynamic and evolving threat environment and in doing so inform the reader on how the global leader in this area engenders confidence in its professional capabilities.

**Subject:** **Subject:** **Nuclear and Other Radioactive Material Transports in the Maritime Environment: ‘Evidence over Assertion’ - Assuring the International Community**

*Question - how does the world’s leading Special Nuclear Material and Radioactive Material Shipper assure its own competent authority and the international community that it can safely and securely transport every conceivable cargo on the Radioactive Material spectrum? Answer - through employment of rigorous and robust internal and external assurance programmes.*

**Background**

1. International Nuclear Service (INS), part of the United Kingdom’s Nuclear Decommissioning Authority (NDA), has been doing just that for well over 40 years by road, rail and sea. Today the NDA’s estate has a wealth of transport expertise including consignor/consignee knowledge, transport flask design and licensing, emergency response and radiation protection, safety, security and transport and lifting operations. In doing so, it has transported some of most sensitive nuclear materials, including plutonium and high enriched uranium, both domestically and internationally. As one can imagine, transports of this nature are essential and act as a critical enabler to the nuclear sector and its fuel cycle.
2. Integral key stakeholders and indeed the target audience during this process include the Coastal and Shipping States community, international governments and competent authorities, as well as the wider international community, for example non-governmental organisations (NGOs) and not least the general public through utilisation of, amongst other media, corporate communications. Not forgetting that clear and concise underpinning legislative and regulatory frameworks are pivotal in directing and informing a proportionate yet effective safety and security provision.
3. Radioactive Material is a ‘broad church’ governed by different areas of legislation. Regarding nuclear material, the CPPNM entered into force on 8 February 1987 which, inter alia, established physical protection measures that had to be applied to nuclear material in international transport. Thereafter in 2005 the Parties to the Convention achieved consensus for an Amendment, which entered into force on 8 May 2016. The Convention and the Amendment form the single legally binding international instruments in the area of physical protection of nuclear material.
4. The key point therein pertains to what were previously considered obligations for physical protection under the CPPNM, however, post entering into force are now legally binding for States Parties in order to protect nuclear material during transport but NM is only one part of the conundrum.
5. For what is termed Other Radioactive Material (ORM), from a shipping perspective, governance is achieved via employment of a number of documents, including the IAEA Code of Conduct on the Safety and Security of Radioactive Sources (the ‘Code’) and the UNECE Orange book (UN Recommendations on the Transport of Dangerous Goods Model Regulations). Furthermore, the IAEA SSR-6 Transport Regulations (outlining guidance on the safe transport of radioactive material) aids formation of the basis of international modal regulations established by other United Nations bodies, such as the International Maritime Organisation’s, namely, the International Maritime Dangerous Goods (IMDG) code which is holistically fused to provide optimal safety and security standards in the transportation of everything from vitrified high level waste reprocessing returns to spent fuel and radioactive sources.

**Scope**

1. This paper will discuss how INS provides evidence over assertion of its efficacy in the assurance space, whether *internally* or *externally*. It will opine on its well-developed Internal Assurance (IA) programme for the maritime environment, its well understood and mature external Global Assurance (GA) programme of international informal engagements, and its utilisation of the IAEA’s Incident Emergency Centre (IEC) to deliver a pressurised environment in which to demonstrate high level communications and incident management skills in real time and be challenged by resident experts and member state ambassadorial level representation.
2. At the high end of the continuum, and in order to deliver safe and secure Category I nuclear material maritime transports International Nuclear Services (INS), in conjunction with its strategic partner the Civil Nuclear Constabulary (CNC), Her Majesty's Royal Navy, and with the agreement and approval of the United Kingdom’s Office for Nuclear Regulation (ONR), has developed a rigorous and robust quality assurance and operational capability check to ensure both internal and external expectations are met in terms of understanding, timeliness, completeness, and value. This INS bespoke Maritime Integration Training and Demonstration (MIT/MID) programme has been designed specifically to counter the threat posed from maritime and nuclear sector threat actors and vectors and has been successfully employed in advance of numerous live international and national security operations.
3. In tandem and symbiotic to this, contingency in the form of Emergency Preparedness and Resilience (EP&R) functionality is similarly exercised and scrutinised with a view to delivering a testing and pressurised environment not only at the operational and tactical levels but on the ‘government to government’ communications level via, principally, the Coastal and Shipping States forum and through international exercises conducted at the IAEA’s Incident Emergency Centre (IEC) in Vienna.

**The Purpose of International Assurance**

1. All transports of radioactive materials take place in the public domain and require the acceptance, and often the support, of local communities, agencies and councils. This socio-economic element is therefore a key enabler to the success of any transport. It is important therefore that effective communication arrangements are in place to inform and give confidence to the public without undermining security arrangements prior to, during and after transports. INS has developed a Global Assurance (GA) programme to deliver this wider assurance and in conjunction with the IAEA facilitated Coastal and Shipping States forum, greater challenge and response is engendered.
2. Specifically pertaining to each international transport of Category I nuclear materials and/or where an armed organic response force is embarked, a number of intergovernmental operational assurance agreements are discussed which directly underpin each transport. These arrangements and agreements are captured in a non-legally binding intergovernmental agreement known as a ‘Record of Discussion’ (ROD).
3. In a similar vein to the operational security arrangements described above, when two or more States are involved in a transport of this nature, the complexity of communications increases. This reflects not only the different socio-political opinions of nuclear as a source of energy but also the risk appetite of particular states around what can and cannot be released on security grounds. These levels can vary significantly depending on the States involved, their Governmental policy and the threat environment in which they operate. The Rules of the Game (ROG) is a phrase used to describe a communications agreement for a particular transport that is agreed between all States involved.

**Intergovernmental Agreements - Operational Security Agreements**

1. Prior to each international transport of Category I nuclear materials, it is essential that thorough planning and preparations have been completed. In doing so, a number of intergovernmental agreements are discussed and agreed which directly underpin each transport. These agreements take stock of the complex operations involved and seek to identify areas of overlap, areas of uncertainty and any potential gaps in the arrangements as the transport moves from one States territory to another.
2. In line with UK’s security regulations, transports of Category I nuclear materials attract high levels of security provision including an armed escort. During international transports these unique arrangements require careful planning, particularly when there is a need to enter the territorial waters of another State with firearms. As such, it is essential that these arrangements are discussed and agreed well in advance of the transport by the States concerned. These arrangements and agreements are captured in a non-legally binding intergovernmental agreement known as a ‘Record of Discussion’ (ROD). This ROD also ensures that those states are fulfilling their obligations under Article 4 of the CPPNM, which states: -

*Each State Party shall not export/import or authorise the export/import of nuclear material unless the State Party has received assurances that such material will be protected during the international nuclear transport at the levels described in Annex I.*

1. The meeting(s) to discuss and agree these arrangements should include representatives from, but not be limited to, the following types of organisations – Government representatives, competent authority representatives, representatives of the shipper including the Master and Chief Officer and representatives from all relevant security forces or Police including operational commanders. The final ROD will should describe, as a minimum, the following types of details:
2. Overview of the transport including dates, routes and material to be transported (including type, form and quantity).
3. Written declaration by each State that it will adhere with Article 4 of the CPPNM.
4. Clarify any relevant intergovernmental communication arrangements, such as commitments between states regarding regular updates on how the transport is progressing.
5. Describe the handover of security responsibility. This should include the point at which formal security is handed over from one State to another State, be clear and unambiguous. It is recommended that the ROD also include how this handover will be recorded, such as being written in the ships log etc.
6. Date, time and location of the rendezvous point (loaded entry only) – the point at which the security forces will rendezvous with the loaded vessel before it enters territorial waters. This may also include arrangements to ensure a positive identification can be achieved, for example by agreeing pre-arranged code words.
7. Security Arrangements in Territorial Waters – whilst security responsibility will sit with the State in whose territorial waters the vessel is in, it is essential to understand what the security posture will look like, whether security personnel will board the vessel, understand the command and control structure for these arrangements and detail any expectations/requirements there are of the vessel should an incident occur.
8. Escalation/De-escalation of armed security arrangements as the vessel enters/exits territorial waters of the foreign State.
9. Describe the security arrangements in port including security posture, responsibilities for ship access, and access lists of staff that require access to the vessel and what transport control centre arrangements will be in place.
10. Once the ROD has been agreed and signed, it should only be shared with those individuals who have a strict ‘need to know’, such as the operational security commanders and ships masters.

**Communications Agreements**

1. All transports of nuclear materials take place in the public domain and require the acceptance, and often the support, of local communities, agencies and councils. This socio-economic element is therefore a key enabler to the success of any transport. It is important therefore that effective communication arrangements are in place to inform and give confidence to the public without undermining security arrangements prior to, during and after transports. For areas where regular transports take place, it is advised that operators build close working relationships with local agencies and councils, and consider engaging stakeholders regularly. For example, INS is reliant upon the support of the community of Barrow-in-Furness where our terminal is located. We therefore work hard to engage with the community and hold a regular forum that is open to the public and involves local council representatives, anti-nuclear campaigners and partner organisations. The forum is an opportunity for INS to provide information on our activities and hopefully provide a degree of confidence that our operations are conducted with the highest levels of safety, security and quality. This openness and transparency builds trust and is a key enabler to the work we conduct.
2. In a similar vein to the operational security arrangements described above, when two or more States are involved in a transport of this nature, the complexity of communications increases. This reflects not only the different socio-political opinions of nuclear as a source of energy but also the risk appetite of particular states around what can and cannot be released on security grounds. These levels can vary significantly depending on the States involved, their Governmental policy and the threat environment in which they operate.
3. As stated above, the Rules of the Game (ROG) is a phrase used to describe a communications agreement for a particular transport that is agreed between all States involved. This agreement will include the following elements:
4. Agree proactive lines to take prior to, during and after the transport
5. Agree the wording of all communications (verbatim)
6. Agree exact date and time of each communication, how they will be communicated and by whom and what method (e.g. internet, media release etc.)
7. Agree reactive lines to take when questions arise from the public, community or media.
8. Ensuring you have consensus on these arrangements is vital, not only to ensure you are being as transparent as possible but also to ensure that the security arrangements for the transport are not being undermined for any State involved in the transport. For example, once a shipment departs, providing details on the arrival port may seem reasonable to release, however the receipt country may not want to advertise this information as it could jeopardise the security of the operation whilst in their territory. Similarly, a receipt country may want to release information on the transport route which could contravene the regulations of the shipping state etc.
9. These meeting(s) to discuss and agree these arrangements should include representatives from, but not be limited to, the following types of organisations – Government representatives, competent authority representatives, representatives of the shipper including the Master and Chief Officer and representatives from all relevant security forces or Police including operational commanders.

**The Purpose of Internal Assurance (IA)**

1. The purpose of a rigorous IA process is to provide an unequivocally clear understanding of ones’ corporate nuclear security capability and capacity through utilisation of a demonstrable programme of works within a wider suite of Security and Resilience (SAR) directorate initiatives designed, principally, that:
	1. Relevant Good security Practice (RGP) is being exercised
	2. Operational Capability (OC) is being maintained
	3. Equipment Availability (EA) is being examined & inspected
	4. robust stops and check exist in support of corporate strategic aims
	5. evidence over assertion, which can be presented to the Competent Security Authority (CSA), namely the Office for Nuclear Regulation (ONR), is generated, and in doing so
	6. reduce corporate risk across the business

**The Duty Holders’ Responsibility**

1. Civil Nuclear Industry duty holders (hereafter ‘duty holders’) are responsible for the leadership, design, implementation, operation and maintenance of security arrangements to protect the public from the risks arising from a radiological event caused by the theft or sabotage of NM/ORM and supporting systems or through the compromise of Sensitive Nuclear Information (SNI).
2. The UK is a member state of the International Atomic Energy Agency (IAEA) and a signatory to the Convention on the Physical Protection of Nuclear Material (CPPNM) (Ref 6[[6]](#endnote-6)). Accordingly, the UK recognises its responsibility for establishing, implementing and maintaining a physical protection regime effective against theft and sabotage for all nuclear facilities, nuclear material in use, storage, and during transport. Furthermore, that these responsibilities extend to ensuring that nuclear material is adequately protected during international transport, until that responsibility is transferred to another state.

**Relationship to IAEA Documentation and Guidance**

1. The essential elements of a national nuclear security regime are set out in the Convention on the Physical Protection of Nuclear Material (CPPNM) and the IAEA Nuclear Security Fundamentals. Further guidance is available within IAEA Technical Guidance and Implementing Guides.
2. Fundamental Principle J of the CPPNM refers to quality assurance and states that a quality assurance policy and quality assurance programmes should be established and implemented with a view to providing confidence that specified requirements for all activities important to physical protection are satisfied. The importance of issues relating to Governance and Leadership are also recognised in the Nuclear Security Fundamentals, specifically:

Essential Element 12: Sustaining a Nuclear Security Regime – 3.12:

a. developing, implementing and maintaining appropriate and effective integrated management systems including quality management systems; and

h. routinely performing assurance activities to identify and address issues and factors that may affect the capacity to provide adequate nuclear security including cyber security, at all times.

1. A more detailed description of the Fundamental Principles and Essential Elements is provided in Recommendations level guidance, specifically Nuclear Security Series (NSS) 13, Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Revision 5) (Ref 7[[7]](#endnote-7)) and IAEA NSS (20) Objective and Essential Elements of a State’s Nuclear Security Regime (Ref 8[[8]](#endnote-8)).

**UK Regulatory Expectation**

1. The framework for the regulation of civil nuclear security within the UK consists principally of The Energy Act 2013 (TEA) (Ref 9[[9]](#endnote-9)) and The Nuclear Industries Security Regulations (NISR) 2003 (Ref 10[[10]](#endnote-10)) and the HMG Security Policy Framework (Ref 11[[11]](#endnote-11)). The latter establishes the system of evaluation, permissioning and inspection. It also allows directions to be made and specifies offences, thus providing effective tools of enforcement and sanction.
2. NISR clearly identifies responsible persons and places requirements on them. This ensures that prime responsibility for the implementation of physical protection of nuclear material or of nuclear facilities rests with INS as the duty holder (DH).
3. As such the legally ‘responsible person’ retains the prime responsibility for security throughout the lifetime of nuclear transports and related activities, and this responsibility cannot be delegated. Other groups, such as designers, manufacturers and constructors, employers, contractors, and consignors and carriers, also have legal, professional or functional responsibilities with regard to security.
4. Regulatory guidance within the UK has seen something of a paradigm shift of late and, as such, now veers towards a more outcome focussed, objective driven approach, one which ultimately may result in a ‘light touch’ approach should the requisite external assurance confidence be engendered by INS. To this end, a new guidance document, the Security Assessment Principles (SyAPs) (Ref 12[[12]](#endnote-12)), has been devised and came into force April 2017.
5. Notwithstanding this new guidance, ONR Civil Nuclear Security’s (CNS’) Deputy Chief Inspector’s security strategy for the fiscal year 2016/17, clearly focussed upon, *inter alia*, robust internal assurance processes required of duty holders.
6. In compliance with, assessing and enforcing against, the regulations, ONR considers the following high level objectives (Fundamental Security Principles (FSyPs)) to be of greatest relevance to this piece. namely:[[13]](#footnote-1)
7. **Leadership And Management For Security,** especially where Directors, managers and leaders at all levels should focus the organisation on achieving and sustaining high standards of security and on delivering the characteristics of a **high reliability organisation and ensuring internal assurance is evidence-based and used to inform strategy** through the Governance process, which welcomes challenge from across the organisation.
	* 1. Assurance Processes Security Delivery Process (SyDP) 1.5 states - There should be evidence-based assurance processes in place to inform strategy through the Governance process, which welcomes challenge from across the organisation (Ref 13[[14]](#endnote-13)).
8. **Competence Management,** especially analysis, which should be carried out of all tasks important to security and used to justify the effective delivery of the security functions to which they contribute, the analysis of roles, tasks and competencies, the development of training needs used to derive the criteria, or standards, against which the trainee is assessed during and/or after training.
9. **Reliability, Resilience and Sustainability,** concerning security structures, systems and components that should be appropriately qualified, with design incorporating reliability and resilience, the regular and systematic examination, inspection, maintenance and testing (EIMT) as defined in the security plan.
10. **Policing and Guarding,** facilitating CNC deployment that is appropriate to achieve their Concept of Operations for the protection of: sites holding Cat I NM; sites with HCVAs; and, NM in transit where appropriate.
11. **Emergency Preparedness and Response (Ep&R),** plans should be designed a tested in order todeal with any nuclear security event, including protest activity, arising on the site and their potential effects, therefore a regime of exercising to train personnel and test the efficacy of the counter-terrorism contingency plans, structures and processes to ensure effective command, control and communications (C3) arrangements during and post security events is critical.

**Maritime Integration Training & Demonstration (MIT/MID)**

1. In order to deliver safe and secure Category I nuclear material maritime transports International Nuclear Services (INS), in conjunction with its strategic partner the Civil Nuclear Constabulary (CNC), Her Majesty's Royal Navy, and with complete agreement and approval of the United Kingdom’s Office for Nuclear Regulation (ONR), has developed a rigorous and robust quality assurance and operational capability check to ensure both internal and external expectations are met in terms of understanding, timeliness, completeness, and value. This INS bespoke Maritime Integration Training and Demonstration (MIT/MID) programme has been designed specifically to counter the threat posed from maritime and nuclear sector threat actors and vectors and has been successfully employed in advance of numerous live international and national security operations over the last 18 months to great effect, inclusive of the largest ever single global plutonium shipment.

Fig (i) – Civil Nuclear Constabulary Officers

1. In developing this assurance programme clearly defined outcomes and metrics generating both quantitative and qualitative deliver sufficient evidence over assertion which is consistent with relevant good practice and proportionate to the prevailing sector threat assessment, Design Basis Threat (DBT), and perceived maritime adversarial Tactics, Techniques and Procedures (TTPs).
2. As the duty holder, risk owner and security intelligent customer, it behoves the corporate security directorate to provide a holistic training and exercise regime that adequately prepares the protection force and ships' command teams, acting in unison, to meet operational capability expectations, and thus provide the tools necessary in a pressurised but safe environment to deter, detect, and defeat those maritime threat actors one might reasonably expect to counter on passage.
3. To that end, a comprehensive programme of threat based scenarios and response drills have been developed to exercise the team alongside (fast cruise) where the protection force simulate being at sea, assessed by an internal assurance provision of suitably qualified and experienced persons (SQEP'D), prior to a regulatory demonstration at sea incorporating live firing with concomitant assessment through an external assurance expertise provider versed in the military maritime sector, namely, Her Majesty's Royal Navy gunnery and security experts of the Flag Officer Sea Training (FOST) organisation.

**MIT/MID Method**

**MIT**

1. In house Maritime Integrated Training (MIT) will continue to be scheduled on board prior to each shipment utilising PNTL vessels whilst berthed alongside in her home port. This methodology within RN circles is known as a ‘Fast Cruise’ and is deemed a cost effective way of delivering ‘at sea’ training whilst obviating the need to actually put to sea (at some cost).
2. A full MIT must be undertaken when new members of the PNTL command team (e.g. OOWs, Master etc.) are appointed. Both teams are to ensure full attendance, and vessel is to assume the lockdown position.
3. The MIT will comprise of three phases:
4. Briefings to outline the scope of the MIT exercise training requirements in support of the INS Transport Security Plan.
5. Scenario driven demonstrations.
6. Comprehensive hot and cold debrief to ensure any learning/improvements are captured.
7. INS will issue a MIT scenario and Main Events List (MEL) in advance of each planned serial. The complexity level of MIT to be delivered will be dependent upon crew/SEG operational capability (OC) and operational tempo. The UK competent authority (ONR) is in receipt of an open invitation to witness any training serial and has access to relevant training materials/documentation, thereby offering flexibility of enabling outcome focused regulation. ONR retains the option to observe unannounced in accordance with their vires to conduct no notice inspections of our capability.
8. During the MIT, all CNC[[15]](#footnote-2) and PNTL crew (most especially the command teams (Master, 1st Officer, OOWs)) will be required to react to, and manage, threats arising from maritime attack vectors and actors at the tactical and operational level. Further development work will be undertaken by INS and CNC to ascertain if any further training serials (table top exercises (TTXs), or command post exercises (CPXs) etc.) would enhance and support the IA of the MIT programme.

**MID**

1. The proposed periodicity of the Marine Integrated Demonstration (MID) for our vessels is 12 monthly. INS will arrange for PNTL and CNC to undertake a full demonstration with FOST and ONR in attendance scheduled to take place on the positioning leg of any ongoing operations (where possible) or as a dedicated training period at sea in order to evidence TTPs.
2. Those vessels and crews (due to personnel rotation) that INS feels require an intensive period of work up will be subject to an extended pre-shipment MIT (formative training) during which an MID (summative assessed) will be conducted (ONR/FOST in attendance for assessment).

**IAEA facilitation IEC**

1. As part of its world-wide international assurance efforts, INS, as the world’s leading shipper of Category I NM partook along with other experts from France, Ireland, Japan, Portugal, Spain in a simulated table-top exercise on 28 June 2017 to practise transboundary cooperation and communication in emergencies relating to nuclear materials being transported by sea.
2. Twenty-four participants took part in a fictional scenario played out at the IAEA’s Incident and Emergency Centre (IEC) in Vienna involving a fire breaking out on a ship transporting nuclear waste. Through the use of ‘injects’ which reflected how real time events might unfold, the participants were asked to assess given information, respond, and describe their respective decisions and actions to the group (Ref 14[[16]](#endnote-14)).



Fig (ii) – Coastal States Table Top Exercise IAEA Vienna

“Safety of maritime transport of nuclear materials, as well as the preparedness to respond to emergencies, are the responsibilities of States, and given the potential effects such an incident would have on several countries, close coordination and communication between the authorities of affected countries is crucial,” (Elena Buglova, Head of the IEC)

1. The Coastal State-Shipping State Dialogue was initiated nearly 20 years ago as an informal consultation and information exchange mechanism relating to nuclear maritime transport. The table-top exercise was a model on which to test international cooperation through this assurance vehicle.

“The exercise showed the importance of communication and cooperation between States during a nuclear or radiological emergency. The scenario helped us to evaluate national communication arrangements and to understand the needs of our partners.” (Ambassador Leigh Turner, Permanent Representative of the United Kingdom to the International Organizations in Vienna)

1. In utilising the offer of an international IAEA sponsored exercise external assurance to the UK competent authority was demonstrated and a wider assurance of strategic communications to the member states of the IAEA, most significantly those who have a negative view of NM and ORM maritime transports.

**Conclusion**

1. In summary, this paper has elucidated further regarding INS’ claims and arguments on how we meet those security and emergency response assertions made, providing detailed evidence on how credible assurance is designed, delivered and audited with a view to overcoming the challenges presented by an ever more dynamic and evolving threat environment and in doing so inform the reader on how the global leader in this area engenders global confidence in its professional capabilities.
2. It is therefore critical that not only the international community, governments of members states and respective competent authorities and NGOs are assured of INS ability to deliver cargoes safely and securely but that corporate entities, business partners and customers are similarly so, and perhaps most importantly public perception of this sometimes esoteric industry.
3. This paper has provided a brief and selective overview of the planning, threat analysis, and resource and force generation required to meet those outlined objectives, as well as aspects of the training and demonstration delivery. Furthermore, it has delivered an overview of those communications and stakeholder engagement programmes which deliver an open and transparent insight, in order to paint a clear picture of the 'INS way' and its nuclear maritime security assurance aspirations.

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