



**Dounreay Site
Restoration Ltd**

Dounreay, Thurso Caithness
KW14 7TZ, Scotland

This information has been sent to Orkney,
Shetland and Western Isles Councils in
response to meetings held and questions
raised.

Direct Line:
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10th October 2014

Following Adrian Simper's letter dated 30 September 2014, as agreed please find attached a briefing note and three factsheets on the proposed ship, containers and emergency responses which have been prepared to cover the third bullet point.

- Briefing note on emergency response arrangements, including further information on how the Highland Council can tie into the emergency control structures

If you wish to discuss further please do not hesitate to get in touch.

Yours sincerely

A handwritten signature in black ink, appearing to read "B. Falconer" or similar, written over the printed name.

pp **Mark Rouse**
Managing Director, DSRL
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ENC DSRL and NDA Response to Questions
 Oceanic Pintail Factsheet
 Packaged Safety Factsheet
 Emergency Response Factsheet

DSRL and NDA Response to Questions during visits to Highland and Island Councils during September 2014

Some questions were asked during the visits to Highland Council, the Western Isles Council, Orkney Council and Shetland Council by Adrian Simper, NDA director and others. This document together with information sheets provided by International Nuclear Services, provide our responses to the questions indicated under the headings below.

Roles, responsibilities, command and control

- *Site licensee/consignor's role:*

When Dounreay Site Restoration Limited (DSRL) is sending UK material from its site to another, it is described as the consigning organisation. As such it has the primary responsibility for the transport. DSRL can sign over specific responsibilities to other suitable organisations. For these transports DSRL will maintain overall responsibility until the consignment is received at the destination site. The global safety and security standards for different types of transports are set by the International Atomic Energy Agency (IAEA) and in the UK their application is verified by the Office for Nuclear Regulation (ONR). DSRL is responsible for submitting plans for the transports and as an independent body ONR assesses and must approve all such arrangements before permission is granted for nuclear transports to take place.

- *Local authorities' role:*

In the event of an incident in the UK, the relevant local authority would activate its emergency plan. For the Highland area this would be coordinated from Police Scotland headquarters in Inverness. The incident centre in Inverness would be manned by multiple agencies to ensure that all necessary aspects were covered. DSRL has exercised this capability with the Inverness centre, for both site-based events and off-site transport incidents.

- *RADSAFE:*

RADSAFE is a private company limited by guarantee that offers mutual assistance in the event of a UK transport accident involving radioactive materials belonging to a RADSAFE member. DSRL is a RADSAFE member and the primary RADSAFE responder in the Highland area. For each transport, as soon as the load passes the inner security gate at Dounreay site, the RADSAFE arrangements become applicable. A RADSAFE response would only be invoked if a situation arose that required them.

Where rail transports goes beyond the Highland area resources may be obtained from another site, such as a nuclear power station, depending on the situation and location. DSRL maintains the responsibility as consignor until the consignment reaches its destination, normally as it passes through a security gate on a nuclear site or at the receiving facility.

- *Responses for different types of transport:*

- Road near Dounreay – DSRL would provide both mechanical and radiological expertise as any situation requires as part of RADSAFE
- By rail from Dounreay – Direct Rail Services is the specialised contractor and would invoke RADSAFE response arrangements from the nearest site, in conjunction with DSRL as the consignor

- At sea – INS is the specialist contractor and provides full emergency response support, including radiological response.
- *Command and control during a nuclear transport emergency:*
 - Road, rail – The nature of the event would determine the command and control structure. The local authority in which the event occurs would enact its emergency plan with the local police force as the lead organisation. Command and control would then be carried out as per the well-rehearsed Gold (strategic), Silver (tactical) and Bronze (operational) structure using the National Decision Model to respond to the incident. In a more serious event, a national level response is available incorporating the Scottish or Westminster governments depending on the location of the event.
 - Sea – (full details are on the factsheet) The nature of the event would determine the command and control structure. For example, INS has the ability on board to respond quickly to any incident, be it conventional or radiological and call on backup if required. Depending on the nature of the event, the Maritime and Coastguard Agency (MCA) may also respond, drawing on national resources if required.

Industry's emergency preparedness

- *Emergency arrangements, exercise scenarios and contingencies:*
There have been a number of credible accident scenarios considered and exercised under table-top conditions. These include lifting equipment failures at the port, road traffic accidents, transport package recovery from the sea and in port, attendance to vessels in distress. Different modes of transport require different types of emergency planning, as follows:
 - Road transports – a range of scenarios from mechanical failure to significant accidents are considered. The transport packages for nuclear material are tested for credible accident scenarios and licensed in accordance with the requirements. In the very unlikely event of material escaping from its package as a result of an incident, additional measures would be invoked to minimise the effect of the leak. For the area local to the Dounreay site, the approach would be to remedy the situation and return the materials to Dounreay as soon as this could be safely achieved. The same would apply beyond the local area with the material being taken to the nearest suitable location.
 - Rail transports – DSRL uses the specialist rail company Direct Rail Services (DRS), which ensures there are suitable arrangements in place to respond to incidents on planned routes. DRS regularly tests its arrangements with both customers and emergency services to ensure they are effective.
 - Sea transports – (full details available on fact sheet) DSRL uses International Nuclear Services (INS), the world's leading transporter of specialist nuclear materials. INS has in place extensive arrangements, including emergency tug and salvage support. Its emergency exercise programme simulates and tests responses to all credible scenarios. This includes in-shore and at-sea events, from fires, to radiological incidents at various locations around the world, including Scotland. Both physical responses and communications, command and control process are tested. Each vessel is fully equipped and the crew trained to be effective first responders to such events, with extensive shore-based back-up available if required.

Lessons learned from exercises and from rehearsals and from actual transports are incorporated in the continuous improvement of arrangements for transport.

- *Bespoke or standing arrangements?*

Emergency planning and exercising is standard practice among all industry, local and national parties. There is a culture of continuous improvement to emergency planning and the busy exercise diary ensures that this always takes place, often in anticipation of changes in regulations. Security regulations are also continuously updated, and nuclear transports will only be permitted only once those regulations have been met. This may be visible to the public in the form of a police presence, which is common for nuclear sites and transports.

- *Precautionary decision making*

No matter what type of event takes place involving a nuclear transport, the mind set of any response is that of precautionary decision making. Responders will take actions based on an extremely pessimistic view of what could happen, not what is expected to happen.

So for example, if a ship has several different power systems to rely on, if just one of them fails a response would be initiated at that point as a precaution, instead of relying on the back-up systems.

- *Continuous improvement*

Throughout the nuclear industry there is a very mature information sharing network and this applies to nuclear transports too. There is a collective will to understand the causes of events in all fields, even if they bear little relation to the industry itself. This is important to ensure that lessons are learned and applied, even from unrelated events, so that safety and security standards are always improving.

Safety in depth – package and vessel resilience (full details are on the INS fact sheets)

- *Package resilience:*

Transport packages are designed to meet or exceed IAEA safety and security standards. They are then tested so that the Office for Nuclear Regulation can verify whether they can be licenced for use. Such testing involves extreme accident scenarios of impact, fire or immersion. The material that is used to make the packages is also highly resistant to corrosion in salt water, with no corrosive impacts likely for several years.

- *Vessel resilience:*

The ships used by International Nuclear Services are purpose-built to meet the highest standards for transporting specialist nuclear cargoes. These standards are set by the United Nations body, the International Maritime Organisation, and are applied in the UK by the Maritime and Coastguard Agency. The vessel for use in these transports is classified as INF3, the highest level of the International Maritime Organisations INF code.

Each vessel is essentially a ship within a ship, with double hulls, double engines and dual navigation, all vital systems, steering and navigation. The structure incorporates extremely high collision resistance, a design principle that has been carried forward into a new generation of purpose built ships. In the unlikely event of the loss of both main engines, INF3 vessels have independently powered bow thrusters which can help minimise drifting by turning the vessel into wind. While transport packages are designed to be safe in themselves without any further protection, when they are loaded on to a ship they are bolted down to become part of the ship structure and are even better protected by the inherent safety features of the ship, so a scenario of a container rolling along the seabed is not credible.

In the unlikely event the vessel was to sink it can be accurately located to depth of around 8,000m using special transponders which can be interrogated from the surface to gather information on the orientation of the vessel, extent of damage and whether any radiological containment has been breached. The packages are fixed within the vessel.

Failure of equipment on board is immediately reported to a report centre in Barrow-in-Furness that is manned 24-hours-a-day. If any vital equipment were to breakdown, duplicate equipment is

available on board. Despite this built-in redundancy, INS emergency response procedures would immediately be activated to monitor and respond to the situation as necessary.

This response includes emergency tug support and, as a guide, a tug based out of Glasgow should be alongside a vessel in distress in five to ten hours along the potential routes for such shipments.

Oceanic Pintail



- We design complete end-to-end transport solutions, including engineering bespoke transport packages to meet your needs
- We bring to you the benefits of our experts' ongoing contribution to IAEA regulations to ensure your transport is efficient and compliant
- Working with INS gives you access to 40 years of transport experience coupled with the latest operational insight

Oceanic Pintail is a world-class nuclear cargo vessel with a flawless 25-year nuclear safety and security record and is operated by International Nuclear Services (INS). It is the flagship vessel in our fleet and offers our customers across the world a bespoke solution to their specialist nuclear transport challenges.

With a track record of safely carrying Mox and high level radioactive waste across the world, and most recently separate plutonium from Sweden to the USA, Oceanic Pintail is available for the most complex of nuclear transport projects, including high security movements.

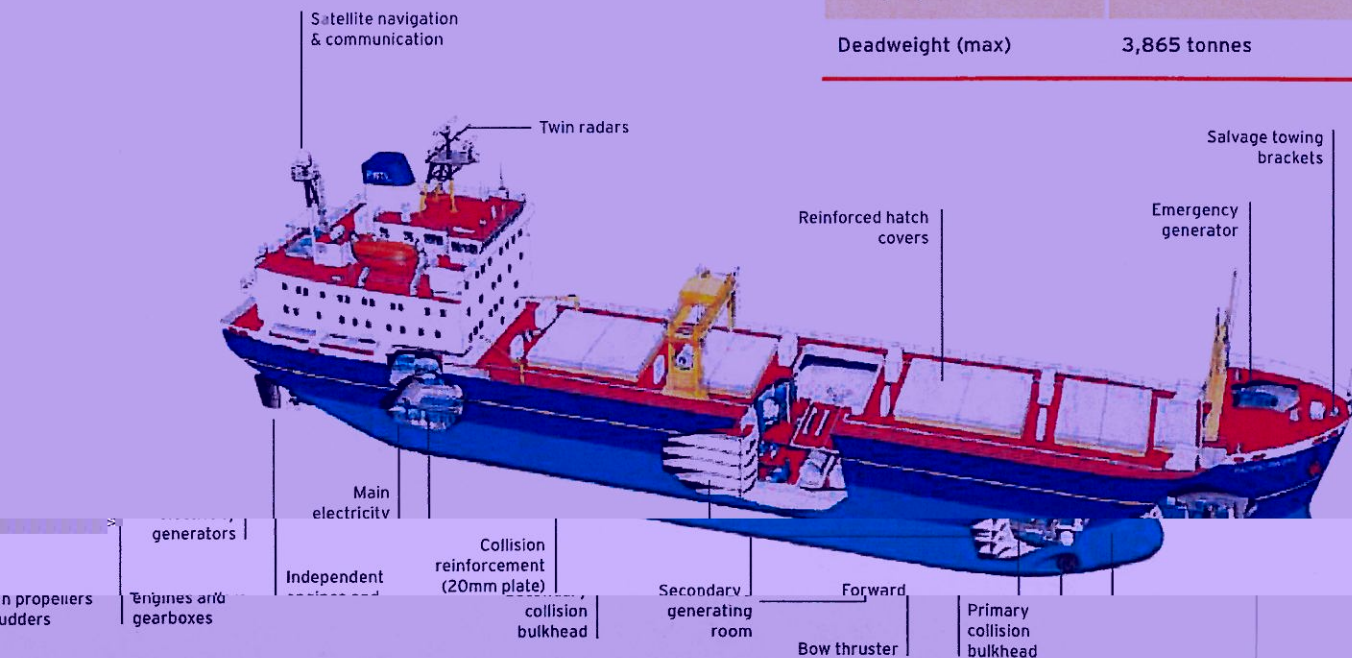
It is an INF3-class vessel – the highest level of the International Maritime Organization's INF Code which regulates shipments by sea of packaged irradiated nuclear fuel, plutonium and high level radioactive wastes – with a wide range of safety features, including a double hull around cargo spaces, twin engines and a comprehensive suite of built-in redundancy to all critical operating systems. There is always a back-up system ready to be brought into operation.

This safety-in-depth approach extends to its crew, who are the most experienced nuclear cargo personnel in the world. All of our senior navigating and engineering officers hold certificates of competence for a higher rank than the one they serve.

Oceanic Pintail is dedicated to the transport of nuclear materials right up to the most hazardous and most complex cargoes. Its key benefits lie in its flexible but extraordinarily resilient design which provides an outstanding level of protection to the cargo, in addition to that provided by the material packaging.

Oceanic Pintail facts:

Length overall	103.9m
Breadth	16.5m
Draft	6.64m
Number of holds	5
Capacity	up to 24 flasks
Design speed	11 knots
Deadweight (max)	3,865 tonnes



is delivered by impact resistant structures, two hulls and the duplication of all essential systems to provide high reliability and accident survivability. It also has enhanced buoyancy and additional firefighting equipment, including a hold flooding system and spare generators.

tail underwent extensive refurbishment early in 2012 including modifications to broaden the capability to cover a more extensive range of flasks and cargo, further enhancing the vessel's operational flexibility to meet the requirements of our customers.

tail's design and operation meets all the regulations for nuclear transports by sea.

As required by the International Atomic Energy Authority, in the unlikely event of an emergency situation developing, all our transports are supported by our in-house emergency response team, which is on 24-hour standby and has access to global resources.



This protection is provided by the ship's internal structure, which is designed to withstand impact between the hulls and the duplication of all essential systems to provide high reliability and accident survivability. It also has enhanced buoyancy and additional firefighting equipment, including a hold flooding system and spare generators.

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Packaged safely



Nuclear materials are transported in packages that protect the public and the environment in both normal transport conditions and in the unlikely event of an accident.

Each package design is rigorously tested and independently assessed to ensure it exceeds the high standards set by the International Atomic Energy Agency (IAEA), which is a United Nations agency.

The standards have been established by experts and national regulators from many of the IAEA's 150+ member countries and are continuously reviewed and revised.

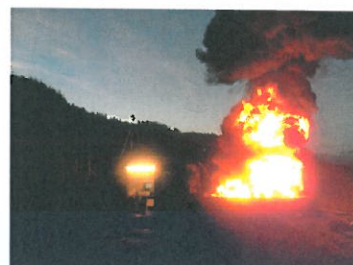
Transport packages can only be used after their robustness has been confirmed by the independent Office for Nuclear Regulation (ONR) which verifies that they meet the IAEA standards.

Transport packages must maintain their integrity even after a series of challenging tests that demonstrate to ONR their resistance to severe impacts, prolonged high temperature fire and immersion.

Transport packages vary from batches of small canisters, each of which is about the size of a milk churn held within specially-designed shipping containers, to single massive forged steel structures weighing several tonnes.

Extreme tests

- Repeated drops from 9m onto a hard surface and from 1m onto a steel punch
- Exposure to 800°C fire for 30 minutes
- Simulated immersion in 200m of water - in addition, packages can withstand corrosion in salt water for several years



Packages undergo extreme tests which are independently assessed

Transport at sea

Transport packages are designed to be safe without any further protection around them. When they are loaded onto an INS ship, the packages are even better protected because they are surrounded by all the benefits of the ship's structure and the way it operates. This means the double hulls, the collision avoidance systems and the built-in back-up measures for power and navigation, but also all the skills and

experiences of the crew, who are the best in the world at transporting nuclear material.

This multi-faceted approach of safety in depth has contributed to the 50-year flawless nuclear safety record of nuclear transports by International Nuclear Services.



Tough regulations apply across all different shapes and sizes of package

Emergency response Anywhere, any time



To ensure resilience, all nuclear transports undertaken by International Nuclear Services are supported every hour of the day with a team of highly qualified emergency response managers who are ready to draw on global resources to react effectively to any situation, anywhere in the world at a moment's notice.

Each ship operated by International Nuclear Services and its subsidiary Pacific Nuclear Transport Ltd, has tried and tested emergency response arrangements in the unlikely event of an accident. The regular contact between the vessel and its report centre in Barrow-in-Furness, allows information about unforeseen events to be evaluated and responded to quickly and conservatively, be they conventional or radiological.

Trained and ready

As the carrier of nuclear cargoes, INS is required to have in place thorough arrangements for emergency planning, preparedness and response in line with International Atomic Energy Agency Standards.

The top level emergency plans have to be approved by the Maritime UK's Coastguard Agency before transports can be undertaken.

These plans start with the first responders being the crew on board the vessel. In addition, INS has a fully trained and experienced shore-based rapid response team ready to manage any conventional or radiological incident on its vessels at any time, anywhere in the world.

INS also has the permanent support of salvage experts, Shirex, which has global resources in maritime incident management.

Each ship is equipped with a sonar location system capable of operating in depths in excess of 8,000 metres of water.

Special monitors in the holds are able to provide information to a salvage team about the position of the ship, its depth and status of the cargo.

Emergency exercises

Emergency response exercises are a requirement of international radioactive materials transport regulations and form an essential part of INS's contingency planning system.

In parallel with its flawless nuclear safety record, INS and its transport partners run a busy calendar of live, table top and control post exercises. These test the communication systems, the expertise of the team members and the ship's crews as well as the performance of the emergency equipment across a variety of locations, from port to open water, involving both conventional and radiological scenarios.

INS's report centre at Barrow-in-Furness is fully equipped with charts for sea routes across the world, ship diagrams, multiple communications systems, a ship stability computer and an emergency power supply allowing for an immediate response to any situation.

National Contingency Plan for UK marine emergencies

As a Party to the United Nations Convention on the Law of the Sea (UNCLOS), the United Kingdom (UK) has an obligation to protect and preserve the marine environment. The NCP is one of the measures that the UK has taken to meet this obligation.

After saving human life, the key purpose of responding to a maritime incident is to protect human health, and the marine and terrestrial environment. A range of national and local agencies, some of which have more specific statutory duties than others, undertake the response to incidents that threaten to pollute the seas around the UK.

This plan parallels similar documents dealing with the UK Government's responsibility for saving life at sea, for search and rescue and for caring for survivors brought ashore. Plans prepared by coastal local authorities, harbour authorities, and operators of offshore installations underlie this national plan. These local plans provide detailed information on the local response to marine incidents and should describe arrangements for mutual support.

Secretary of State's Representative (SOSREP)

The Government has appointed the SOSREP to provide overall direction for salvage, intervention and the prevention of marine pollution incidents involving ships or offshore installations that require a national response.

In an incident the SOSREP may initially operate from the MCA Marine Emergency Information Room in Southampton, but as soon as possible and where appropriate, he will quickly establish a Salvage Control Unit which may either be close to the incident site or co-located with the Operator's Emergency Response Room. The SOSREP will require the Master or Owners/Operators to provide detailed information on their intentions.

Where the Owners/Operators have appointed a salvor it is for the SOSREP to decide whether the salvor has the capability to carry out the necessary salvage actions, in terms of experience, personnel, and material.

SOSREP uses all the information available to assess whether the actions proposed are in the public interest. One of these actions could be the consideration of appropriate places of refuge. SOSREP also considers what should happen if the current salvage plan goes wrong or the incident escalates in severity. The SOSREP is empowered to exercise intervention powers to whatever extent is required in the public interest and may take control of the salvage operation, by issuing directions. If SOSREP takes control of a salvage operation, all those involved act on directions issued. In other cases, the salvors operate by agreement.

relevant plans. This ensures that all of the plans can continue to function efficiently, whatever the circumstances.

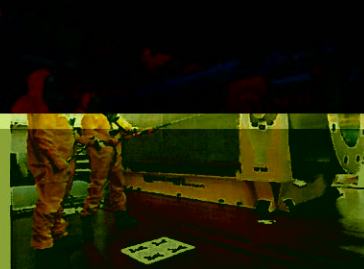
How we meet IAEA standards for emergency response

- Vessels have a direct connection to a report centre which is manned 24-hrs a day
- The report centre has direct contact to a duty incident manager who is on call 24-hrs a day, with multiple ways of being alerted
- The duty incident manager then has immediate connections via several different means to a core team of multi-disciplinary emergency responders, 24-hours a day. They range in expertise from strategic to tactical response
- Depending on the nature of the emergency, that team can then activate a further group of radiological and transport emergency specialists who are on standby 24-hours a day
- Standing contracts are in place for fixed and rotary wing transport to ensure this emergency response capability can be deployed to vessels anywhere in the world at any time, including all required radiological and technical equipment
- In addition, INS has a contract with salvage specialists Svitzer, which is also available to respond 24-hrs a day and has global resources for maritime emergencies, from emergency tugs and cranes, to naval architects and salvage masters



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Radiological experts are part of the emergency response team