Fuel Movements Brief to the Dounreay Stakeholder Sub - Group

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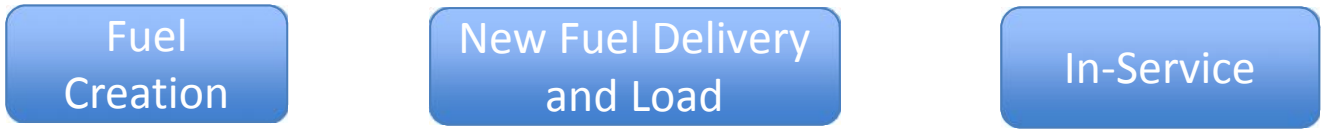
Overview

- Why Naval Nuclear Propulsion
- Purpose of Fuel movements and my role
- Scope of Fuel Movements
- Transportation Framework
- Transportation Arrangements
  - Container
  - Road/Rail
- Nuclear Emergency Organisation (NEO)

Why Nuclear Propulsion? Programme Requirements?

- Royal Navy submarines are powered by nuclear reactors. Nuclear propulsion provides considerable advantages.
    - **Stealth -** Generation of power without air allows nuclear submarines to remain submerged for long periods of time, only limited by food stores and crew fatigue.
    - **Mobility** - High power output allows submarines to operate at high speeds for long periods of time without regular re-fuelling.
    - **Reach** – Long intervals between refuelling and ocean accessibility allows global reach and deployment of capabilities.
- The Defence Nuclear Propulsion (NP) Programme is regulated by the Defence Nuclear Safety Regulator (DNSR) in accordance with JSP 518.

Nuclear Propulsion Fuel Cycle Overview

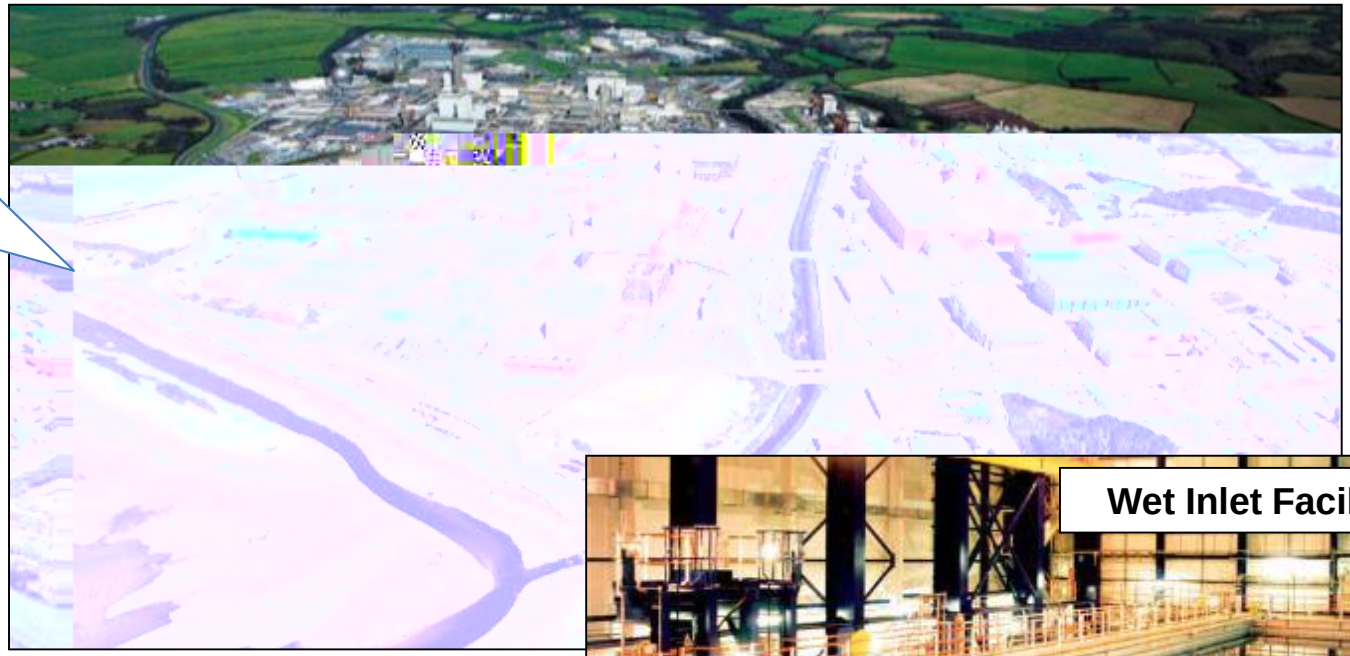


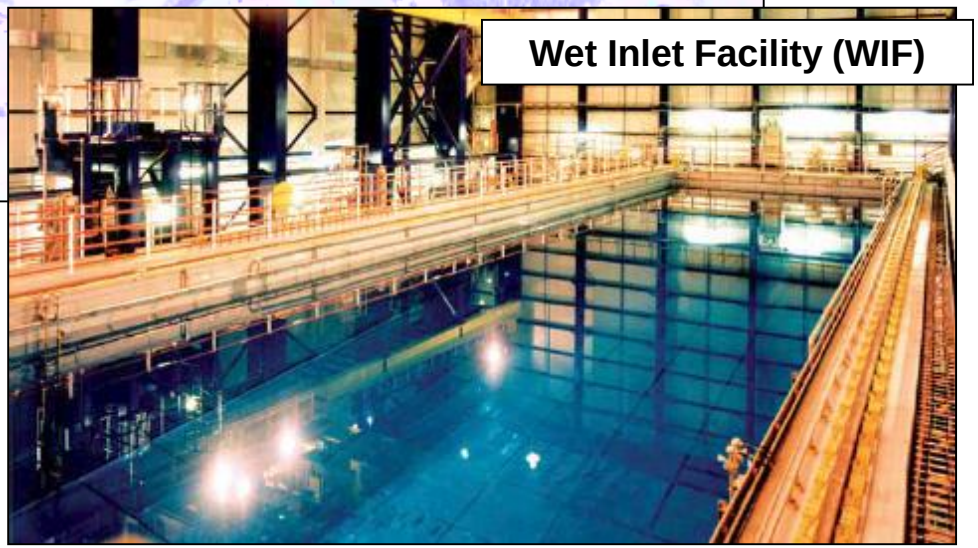
- The transport of nuclear material is required to:
  - Deliver new fuel Modules to support the new submarine build Programme.
  - Deliver new fuel Modules to support the refuel of current in-service submarines.
  - To move and consolidate used fuel Modules to a safe and secure storage facility.

NRTE - Authorised Site

- Ceased Critical operations in 2015
- First move is to export legacy fuel Modules ahead of defuel activity
- Look to undertake 12 moves over next 6 years

Sellafield - Nuclear Licensed Site



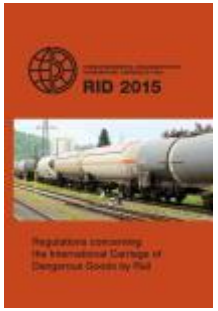


Wet Inlet Facility (WIF)

- MoD intermediate storage facility for Irradiated Fuel.

Nuclear Transport Legal Framework

- Nuclear fuel movements are conducted in accordance with International Atomic Energy Agency (IAEA) Regulations for the Safe Transport of Radioactive Material.
- The IAEA regulations are incorporated into the following texts:
  - European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR 2015).
  - International Carriage of Dangerous Goods by Rail (RID 2015).
- The European Union Inland Transport Directive requires two key commitments from EU member states:
  - Party to ADR Agreement for international movement of dangerous goods into and through the territories of signatory states.
  - Domestic legislation of EU countries should align with the requirements established in ADR.
- The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations (2009) provides the UK domestic legislation that requires compliance with ADR and RID.



Transport Container

- Nuclear propulsion fuel is transported in specially designed Radioactive Material (RAM) container.
- The containers are designed to meet the characteristics of the fuel inside and tested to withstand a range of transport accident scenarios.
- Rolls-Royce are the Design and Technical Authority for the RAM containers under contract to MOD.
- Defence Nuclear Safety Regulator (DNSR) are the Competent Authority for licensing RAM containers for transport of nuclear material in the public domain.

Road Transport to Rail Head

- Trailer will have modesty covers.
- Embedded within convoy will be Consignor Health Physics and Container / Fuel Handling representatives

- Bespoke Trailer and Tractor Unit compliant with statutory requirements.
- Road Transport escorted by Ministry of Defence Police (MDP).

Rail Transport Arrangements

- Transported by rail with Ministry of Defence Police (MDP) security escort and British Transport Police (BTP) rail incident support.
- Rail Transport with to up to two flask transporters and escort coaches.
- Initial Response Force (IRF) embedded within convoy and supported by Consignor Health Physics and Container / Fuel Handling representatives.
- MOD provides 24 hour incident response and Technical Guidance Group.
- Exercised and demonstrated successfully in 2014; Another exercise will be held in 2016 prior to fuel moves.

Nuclear Emergency Organisation (NEO)

To comply with Policy, MOD must plan for, and respond to, an emergency involving Defence nuclear assets.

- MOD meets its statutory/legal obligations through the NEO and:
  - Ensures the safety of nuclear programmes by preventing emergencies happening, and makes arrangements to respond to an incident or emergency which might also arise as a result of a terrorist event.
  - Ensures that nuclear emergency response arrangements and planning assumptions are fully aligned with local / regional response, wider departmental / government crisis management and / or cross government co-ordination arrangements.
- Exercised and demonstrated successfully in 2014
- An exercise will be held in 2016 prior to fuel moves.

Summary

- Fuel Movements between Vulcan and Sellafield will commence in 2016
- Movements will be conducted in specialist Radioactive Material (RAM) containers called Used Fuel Flasks (UFF) under the Carriage of Dangerous Goods (CDG) framework.
- Moved to Sellafield for long term storage and examination
- Planning including engagement with local Authorities, Police Scotland and other English police forces has begun.
- Current Plan is for 12 movements over a 6 year period