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Nuclear Safety Assurance  
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Our reference: BNSO/[REDACTED]

Date: 20 September 2019

**HER MAJESTY'S NAVAL BASE, PLYMOUTH – RADIATION (EMERGENCY PREPAREDNESS AND PUBLIC INFORMATION) REGULATIONS 2019 – CONSEQUENCES REPORT**

1. Her Majesty's Naval Base Devonport (HMNB(D)) has made an assessment pursuant to Regulation 5(1) of the Radiation (Emergency Preparedness and Public Information) Regulations 2019 (REPPiR), considering and evaluating a full range of the possible consequences of the identified radiation emergencies, at HMNB(D) in Plymouth. In accordance with Regulation 7(3) a report setting out the consequences identified by that assessment is attached with this letter.
2. The operations considered when undertaking the hazard evaluation were:
  - a. Berthing and movements of nuclear powered warships;
  - b. Operation and maintenance of the naval reactor plant, including associated systems;
  - c. Long-term berthing of submarines in 3 Basin;
  - d. Movement of radioactive materials on the Authorised Site.

The hazard evaluation identified all hazards arising from the work undertaken which have the potential to cause a radiation emergency.

3. It should be noted that a separate Consequences Report will be provided by Devonport Royal Dockyard Ltd to cover their own operations. This will present the full picture from both operators on the Devonport Site.

4. HMNB(D) formally invites the Local Authority to discuss the attached consequences report, in accordance with Regulation 7(4).

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**Nuclear Safety Assurance - Deputy Head**

## Consequences Report

### Part 1 – Factual Information

1. **Clause 1(a) - Name and address of the operator:**
  - a. Naval Base Commander Devonport (NBC(D)).
  - b. Her Majesty's Naval Base Devonport (HMNB(D)), Plymouth, Devon, PL2 2BG.
2. **Clause 1(b) - Postal address of the premises where the radioactive substance will be processed, manufactured, used or stored, or where the facilities for processing, manufacture, use of storage exist:**
  - a. Her Majesty's Naval Base Devonport HMNB(D), Plymouth, Devon, PL2 2BG.
3. **Clause 1(c) - The date on which it is anticipated that the work with ionising radiation will commence or, if it has already commenced, a statement to that effect:**
  - a. HMNB(D) has worked work with ionising radiations to provide technical, logistic and administrative support to nuclear powered warships since the early 1970's.

### Part 2 – Recommendations

1. **Clause 2(a) - The proposed minimum geographical extent from the premises to be covered by the local authority's off-site emergency plan:**
  - a. The proposed minimum geographical extent from the premises to be covered by the local authority's detailed emergency plan is an area extending to a distance of 1.5 km from operational nuclear submarine berths and anchorages.
  - b. An outline planning zone of 5 km has been determined for HMNB(D) Plymouth by the Secretary of State for Defence in accordance with Regulation 9(1)(c). This 5 km outline planning zone should be centred on the centre of 5 Basin.
2. **Clause 2(b) – The minimum distances to which urgent protective actions may need to be taken, marking against each distance the timescale for implementation of the relevant action; and Clause 3(a) – The recommended urgent protective actions to be taken within that zone, if any, together with timescales for the implementation of those actions:**

The following distances are recommended for the urgent protective actions of evacuation, sheltering and administration of Stable Iodine Tablets (SITs). These distances are based on analysis of a range of source terms and include consideration of a range of weather conditions:

- a. 200 m from the submarine in all directions - controlled evacuation of the immediate area around the submarine (NB: No member of the public would be expected to be within this area).
- b. 400 m from the submarine in all directions – personnel to shelter indoors within the first few hours.
- c. 1.5 km from the submarine in the downwind sector - provision and consumption of SITs within the first few hours.
- d. 1.5 km from the submarine in the downwind sector - sheltering indoors within the first few hours.

It is recommended that the declaration of an Off-Site Nuclear Emergency by the operator to the Local Authority is the trigger for implementing the off-site emergency plan and initiating all of the above recommended urgent protective actions.

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- 3. Clause 3(b) – Details of the environmental pathways at risk in order to support the determination of food and water restrictions in the event of a radiation emergency:**
- a. A release of radioactive material from the submarine could create the requirement for food and water restrictions. For a submarine, this can take the form of an airborne release and/or a marine release.
  - b. For an airborne release, radioactive material will be dispersed downwind. A proportion of this material will fall to the ground - this material will be available for uptake into the terrestrial food chain via ingestion of contaminated foodstuffs. Radioactive material released to the air may also make its way into freshwater either through run-off or direct deposition on open water.
  - c. For a marine release, radioactive material is deposited in the area surrounding the submarine - this may affect the marine food chain and pose a hazard via ingestion of contaminated seafoods.

### Part 3 - Rationale

- 1. Clause 4 – The rationale supporting each recommendation made:**
- a. Controlled evacuation of the immediate area around the submarine to 200 m in all directions is to protect against the direct gamma radiation hazards from the submarine, in accordance with the lower emergency reference level (ERL) for evacuation of 30 mSv.
  - b. Sheltering indoors up to 400 m in all directions from the submarine is to protect against the direct gamma radiation hazards from the submarine, in accordance with the lower ERL for shelter of 3 mSv.
  - c. Consumption of SITs in the 1.5 km downwind zone is to protect against an uptake of radioactive iodine to the thyroid, in accordance with the lower ERL for stable iodine of 30 mSv. This is only required for radiation emergencies involving the naval reactor plant.
  - d. Sheltering within the 1.5 km downwind zone is to protect against contamination following a release of radioactive material, in accordance with the lower ERL for shelter of 3 mSv.
  - e. The recommendation to shelter and consume SITs out to 1.5km in the downwind sector differs from the previous recommendation of 1.2km due to the consideration of a wider range of weather conditions in accordance with Schedule 3. This is in line with the current emergency arrangements, and ensures the public are protected from the full range of possible consequences identified.
  - f. The Secretary of State for Defence has determined an outline planning zone distance of 5 km.
- 2. Clause 5(a) – The rationale for its recommendation on the minimum distances for which urgent protective action may need to be taken:**
- a. The minimum distances recommended are based on a full range of possible consequences of the identified radiation emergencies evaluated in the consequence assessment made in accordance with Regulation 5(1). These consequences were subsequently compared with the ERLs listed in PHE-CRCE-049 May 2019.
- 3. Clause 5(b) – The rationale for agreement that no off-site planning is required.**
- a. This clause does not apply to HMNB(D) Plymouth.