



Summary of the planned changes to the Detailed Emergency Planning Zone (DEPZ)
for the Dounreay and Vulcan sites

Executive summary

Dounreay and Vulcan are legally required to regularly review the radiological hazards at the two sites and assess the impact of possible worst-case accident scenarios. This information is used, in part, by Highland Council (HC) to determine the size of the Detailed Emergency Planning Zone (DEPZ) around the two sites.

The DEPZ is the defined area around Dounreay and Vulcan where it is proportionate to predefine protective actions which would be implemented without delay to mitigate the most likely consequences of a radiation emergency. The DEPZ should be sized to accurately reflect the hazard at the sites and both Dounreay and Vulcan must have suitable emergency arrangements in place capable of responding to an incident that impacts all locations within the DEPZ.

The most recent review identified that the reduction of hazards at Dounreay over the past 3 years (primarily the removal of significant quantities of radiological fuel), has resulted in a need to reduce the DEPZ. This decision resided with the HC and is undertaken with oversight from the Office for Nuclear Regulation (ONR).

Accordingly, a new DEPZ has been agreed between the HC, Dounreay and Vulcan sites; and in conjunction with the ONR. The new DEPZ will be implemented on 1 November 2023.

Introduction

The minimum DEPZ at a nuclear site is determined by assessing the impacts of the worst-case possible radiological incidents at the site. Significant incidents are identified as those capable of breaching a 1milliSievert threshold dose to members of the public. Dose contour information from these identified scenarios provides a minimum radius from the potential incident location that the DEPZ must extend to. The HC then take this minimum radius information and adapt it to take into consideration geographical boundaries and other constraints (e.g. roads, vulnerable areas etc).

As a result of the decommissioning programme undertaken at Dounreay over the past 3 years (primarily the removal of large quantities of the fuel inventory), the minimum radial DEPZ has been reduced from 700m to 630m. This relatively small reduction has some significant impacts when geographical constraints and boundaries are considered with respect to the DEPZ. These are outlined in the information below.

Existing and future DEPZ for Dounreay and Vulcan

The existing DEPZ was produced from the 2019 hazard review that identified a 700m minimum radial zone originating from the high hazard areas of the Dounreay/Vulcan sites. This radial zone touched upon the A836 road to the south of the site in some accident scenarios. Accordingly, the HC determined a DEPZ that included several residential properties (e.g. Buldoo, Upper Dounreay); noting that they could be impacted as a result of an incident that restricted access along the A836 (see image 1).



Image 1- Existing Dounreay/Vulcan DEPZ (blue outline), with 700m minimum DEPZ radial shown for illustration (red circle).

The 2022 hazard review identified worst case accident scenarios resulting in a 630m minimum radial zone from high hazard areas. This moves the possible impacts of an incident suitably north of the A836, such that the DEPZ can be reduced substantially. This new DEPZ effectively comprises mainly fields and a small number of outbuildings (see image 2).



Image 2 –New DEPZ (blue outline) with 630m minimum DEPZ radial shown for illustration (red circle)

Impact of change

Changing the DEPZ has certain expected impacts:

Positives:

- It demonstrates the decommissioning programme is progressing towards its goal to reduce hazards at the sites
- Emergency response can be easier managed knowing there are no members of the public residing in areas that are affected from any foreseen accident scenarios
- The size and complexity of the DEPZ is one factor that is used to determine the appropriate level of emergency preparedness for the sites. This includes both the required onsite response arrangements and offsite resource requirements. A DEPZ that accurately reflects the hazards at the sites facilitates appropriately resourced and value for money response arrangements to be determined
- Legislation (i.e. the *Radiation Emergency Preparedness and Public Information Regulations, REPIR2019*) requires regular pre-emptive communications to be provided to all members of the public residing within the DEPZ regarding site hazards and appropriate response actions. The reduced DEPZ would remove members of the public from the area covered by the DEPZ and remove the requirement for those persons to receive such information; should they no longer wish to continue to be informed. Note:- the site will continue to provide information proactively to all existing residents within the current DEPZ who wish to continue to receive this information.

Challenges:

It is possible (although unlikely) that the DEPZ could require to be widened again in the future. For example, as a result of changes to the current operating strategies for either of the two sites. This could include a new project that made a significant offsite radiological incident more likely. Dounreay and Vulcan have considered the future programme of decommissioning and do not envisage this to be likely.

Some future project work (e.g. Dounreay shaft decommissioning and new planned Dounreay waste processing facilities) would likely change the hazard profile of the site, but it is considered highly unlikely that this would be to such an extent that the DEPZ would be impacted. Additionally, none of these planned changes are expected to materialise until at least 5-10 years from now. Such timescales are considered to be of suitable length such that in the unlikely event the DEPZ did need to be extended again; the change could be suitably managed.