

**Article 35 Verification Visit to Dungeness Power Stations, Kent, England
6/11 November 2000**

Technical Report UK-00/2

UK RESPONSE TO RECOMMENDATIONS

ENVIRONMENT AGENCY

1. Main findings with respect to the operators' radioactive effluent monitoring programme and analytical laboratory

1.1 Dungeness A – gaseous discharges

The verification team recommends the Environment Agency to consider the implementation of regular monitoring of I-131 in gaseous discharges from Magnox power stations.

Iodine-131 can only arise in gaseous discharges from Magnox power stations as a result of a failed fuel element. If such a fuel element failure occurred in a Magnox station, the reactor is shutdown for safety reasons. As correctly stated in the Dungeness Article 35 report, monitoring of the discharges would occur during the blowdown of a reactor following the failure of a fuel element. Consequently, there are not expected to be routine operational discharges of iodine-131 from Magnox stations and no reason at present to instigate routine gaseous effluent monitoring for iodine-131.

However, the Agency will consider requiring Magnox to undertake trials of iodine-131 monitoring to confirm that there are no routine gaseous discharges. Routine monitoring of milk is currently undertaken by the operators and FSA which would detect any releases of iodine-131 from either of the two Dungeness power stations.

The verification team considers that the control of airborne radioactivity in the Reactor Coolant Gas Circuit is broadly satisfactory. However, the verification team recommends the Environment Agency to ensure the continuous availability of the Reactor Coolant Gas sampling devices.

Magnox Electric plc have a rolling programme to replace these sampling devices with more reliable equipment. The Environment Agency Inspector for the Dungeness power stations will continue to follow this matter up during routine inspections.

1.2 Dungeness B – gaseous discharges

The verification team recommends the Environment Agency to consider the implementation of independent sampling of radioactive effluents to enhance the

current programme of independent analysis of gaseous radioactive effluents from both power stations.

The Environment Agency has carefully considered the options available for the independent sampling of both liquid and gaseous radioactive effluent for all nuclear sites. These options included the installation of additional sampling ports, devices and equipment which would only be accessible to Agency staff, but also considered the witnessing of samples being taken by the site operators.

For liquid radioactive effluent, the devices for taking effluent samples (flow proportional samplers etc) are often installed in active plant and the costs, practicalities and health and safety concerns arising from installing additional sampling devices far outweigh the benefits to be gained from truly independent sampling. However, the Agency considers that the witnessing of the collection of liquid effluents at the majority of nuclear sites in England and Wales is a practicable option. The Agency's independent effluent monitoring programme has recently been re-tendered and now includes a requirement to witness the collection of liquid effluent samples. The frequency of collection of these samples varies from site to site but is normally between two and four samples per year per discharge route. This revised independent effluent monitoring programme, including the witnessing of collection of liquid effluent samples for analysis by the Agency's contract laboratory, is currently being implemented.

In the case of gaseous effluent discharges, the same cost and health and safety concerns arise from the installation of independent sampling ports. However, there are additional difficulties in ensuring the collection of representative samples. The physical layout of ductwork in many cases precludes the installation of a secondary sampling port which could collect such a representative sample. Thus, the collection of independent samples of particulate material on a filter paper is not possible, except on relatively modern plant which have duplicate sampling ports. Such duplicate ports are not available for the Dungeness power stations. The particulate discharges of radioactive substances from nuclear power stations are low and present a negligible radiological impact.

However, the witnessing of sampling for gaseous discharges of tritium, carbon-14 and sulphur-35 trapped using bubbler devices at the nuclear power stations in England and Wales is practicable and is currently being implemented.

1.3 Dungeness A & B – effluents laboratory

The verification team recommends the Environment Agency to ensure that the operators, in the framework of general quality control, optimise the accessibility of electronically archived working instructions.

Magnox Electric plc have confirmed that access to electronic working instructions at Dungeness A has been improved and that operators have reported no problems in seeking access. The Environment Agency Inspector for the Dungeness power stations will continue to follow this matter up during routine inspections.

The verification team recommends the Environment Agency to ensure that operators duly report and justify any departure from the rulings and principles laid down in the Certificate of Authorisation and detailed in the Implementation Documents.

The verification team recommends the Environment Agency to audit the operators Management Procedures and Health Physics Instructions at set intervals to check

the compliance of these quality control and assurance documents with the Certificate of Authorisation and related Implementation Documents.

The Environment Agency Inspector for the Dungeness power stations will continue to follow this matter up during routine inspections. This matter will be targeted by the Agency in future compliance inspection plans for nuclear sites.

The verification team recommends the Environment Agency to consider transmitting the results of their independent effluent sampling programme to the operators concerned, more in particular with respect to bulk samples, quarterly or otherwise, so as to provide the operators with a valuable means of performing analytical quality assurance checks.

The Environment Agency's effluent monitoring programme results are now transmitted routinely to operators.

2. Main findings with respect to the operators' environmental monitoring programme and analytical laboratory

The verification team recommends the Environment Agency to ensure an improvement of the representativeness of the operators herbage sampling through the implementation of yearly herbage sampling at all 'inner' locations on well defined sampling spots.

There appears to be a miss-understanding of the herbage sampling programme undertaken by British Energy on behalf of both power stations. The following samples are taken:

- Herbage sampling - Quarterly samples collected from location nearest to site and four nearest farms (total of 5 sites). Each of these locations is currently well defined. The samples from the four farms are bulked prior to analysis. The samples are analysed for carbon-14 (annually) and sulphur-35 (quarterly).
- Soil cores, root mat and herbage - These samples are collected from a further 12 farms further away from the site on a rotational basis of one location per quarter (each location being visited approximately every 3 years). These samples are analysed by gross beta.

In future, it is expected that the Environment Agency will be requiring the operators to analyse the four farm samples separately. Therefore, samples from five locations will be analysed quarterly for sulphur-35 and annually for carbon-14. This overall frequency of sampling is greater than that recommended by the verification team.

3. Main findings with respect to the Environment Agency environmental monitoring programme

The verification team recommends the Environment Agency to install medium velocity air samplers as collectors for representative sampling and quantitative assessment of aerosol-borne radionuclides resulting from atmospheric releases of activity. Such air samplers should be located at sites in the vicinity of the power stations where the dispersion of the releases may contribute to the dose to the population through inhalation.

The Environment Agency plans to undertake a 12 month trial of ambient air monitoring around three nuclear sites in England and Wales, including Dungeness. The trial will provide protocols for the siting of ambient air samplers, compare the results obtained from high volume/velocity and medium volume/velocity air samplers and provide recommendations for a future routine ambient air monitoring programme.

FOOD STANDARDS AGENCY

4. Main findings with respect to the Food Standards Agency (FSA) environmental monitoring programme

The verification team recommends the FSA to implement a sampling programme for herbage where herbage is harvested as feeding stuff.

Although the FSA could find no evidence of herbage being made into silage for animal feed herbage samples were taken from a sheep farm about 1 mile distant from the Dungeness site. Samples from this farm will be reported in the FSA's RIFE report for 2001, due to be published in October 2002. The radionuclides analysed are those expected to be released from the Dungeness site (tritium, carbon-14, sulphur-35) plus a complete gamma scan to pick up any other radionuclides. This monitoring will continue to be implemented as part of the FSA's future programme.

DEFRA - Department for Environment, Food & Rural Affairs

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