

Meeting:	NuLeAF Steering Group, 25 January 2012
Agenda Item:	10
Subject:	Nuclear Emergency Planning
Author:	Fred Barker
Purpose:	To provide an overview of developments relating to nuclear emergency planning in the UK

Introduction

This report covers:

- an outline of the post-Fukushima reviews of nuclear emergency planning;
- the current position on ‘detailed emergency planning zones’ and the concept of their ‘extendability’ to deal with major nuclear accidents;
- planning for the recovery phase of a major nuclear accident; and
- nuclear emergency exercises.

Recommendation

It is recommended that the Steering Group keep developments under review and consider further reports as the results of further DECC and Office for Nuclear Regulation reviews become available.

Contribution to Achieving Strategic Objectives

This report is relevant to the strategic objective proposed under item 8 on the implications of the Fukushima accident:

- with regard to the implications of the Fukushima accident for nuclear legacy management in the UK, to encourage the Government and the Office for Nuclear Regulation to ensure that appropriate actions are taken and improvements sustained, and to regularly communicate progress to stakeholders.

1 Post-Fukushima Reviews of Nuclear Emergency Planning

As reported in the briefing paper for the October meeting of the Steering Group, the Weightman report contains a considerable amount of discussion about the need for improvements in severe accident preparedness and nuclear emergency planning.

On severe accident preparedness, it states that:

- Although extreme events have a very low assessed probability of occurrence, we believe that the industry should consider how it might respond and manage its plant in extreme circumstances... we would expect industry to identify potential strategies and contingency measures for dealing with situations in which the main lines of defence are lost. (para 831, p154)
- The industry needs to ensure it has the capability to analyse severe accident progression to the extent necessary to properly inform and support on-site severe accident management actions and off-site emergency planning. This may require further research and modelling development ... (para 833, p155)
- The review of Severe Accident Management Guidelines (SAMG) should consider not only critical safety functions prioritisation, but also whether and how SAMGs support any dynamic re-prioritisation based on emerging information. Consideration should also be given to operator support requirements relating to tactical and strategic decision making. In addition to the acute phase of a severe accident, consideration also needs to be given to stabilisation, recovery and clean-up, and the personnel involved from the many organisations involved. (para 836, p156)

The final report explains that DECC has the lead department role in bringing together organisations involved in off-site nuclear emergency preparedness and response through the Nuclear Emergency Planning Liaison Group (NEPLG). The NEPLG issues consolidated guidance to those involved in emergency planning for nuclear accidents. This is available on the DECC website, along with the notes of NEPLG meetings and sub-groups (see [Nuclear Emergency Planning Liaison Group](#)).

The final report also explains (paras 543 – 547, p96) that the NEPLG has conducted an initial review of emergency arrangements with particular regard to dealing with a prolonged event similar to the devastating one at Fukushima. This is in direct response to Recommendation IR-3 of the interim Weightman report.

The initial review conducted by NEPLG focused in particular on four key areas: radiation monitoring capacity, capability and co-ordination; central government response; extendibility (see below); and capacity and capability of emergency services including emergency exposures.

The Weightman report notes that: “NEPLG found current arrangements to be fit for purpose. In light of the events in Japan, however, a number of opportunities for strengthening arrangements have been identified. A programme of work has been instigated to address the issues found to require strengthening.” It adds that the opportunities identified by NEPLG will form part of a wider programme of work being taken forward by DECC.

The timelines for this programme (and any work NEPLG does) were to be finalised in October, and then taken forward by DECC as a priority. This was to include updating DECC's published guidance on the UK's response to an overseas nuclear incident by December 2011.

These target dates appear not to have been met. DECC informed the secretariat in late November that "it is important that this additional work is handled in conjunction with guidance revisions. DECC is looking at its work plan for these outstanding actions alongside the work being done by NEPLG."

In the meantime, it is worth briefly reviewing the position pertaining to some of the key issues that may be subject to further review, including Detailed Emergency Planning Zones (DEPZs) and their 'extendability', arrangements for recovery after a major nuclear accident, and nuclear emergency exercises.

2 DEPZs and Extendability

The following description of the UK approach to DEPZs and 'extendability' is taken from the Weightman Report (paras 787 – 791, p144).

Each UK nuclear licensed site with the potential for accidents with off-site radiation consequences is required to establish a DEPZ, for which the local authority must make detailed plans to protect people in a radiation emergency. The radii of these zones have been set by considering releases of radioactive materials from accidents which can be reasonably foreseen, taking account of the most significant design basis accidents derived from the site safety cases. These zones may also be influenced by local factors, e.g. the presence of a neighbouring nuclear site, and have been subject to the agreement of ONR or its predecessors. Detailed actions have not been identified for beyond design basis accidents, either within or beyond the DEPZ, because it has been considered impracticable to make detailed plans against very uncertain and improbable events. Instead, existing plans are capable of being extended to deal with a larger than "reasonably foreseeable" accident, based on civil emergency contingency arrangements.

The radii of the DEPZs around UK nuclear power stations range from 1km for Heysham and Hartlepool to 3.5km for Hinkley Point, which is common to both the Magnox and AGR stations at that location. The minimum DEPZ radius that is permitted for a licensed site for which a radiation emergency is reasonably foreseeable in the UK is 1km. A minimum radius is set to provide a basis for extending countermeasures for the protection of the public to wider areas in the event of an accident with greater off-site consequences than the reasonably foreseeable accident for the site.

The licensees also maintain arrangements for monitoring radioactivity in the environment to distances of 15km for the AGR stations and Sizewell B, and 40km for the Magnox stations. This is to inform any decisions in an emergency on the need for restrictions on the consumption of milk and other foodstuffs.

ONR concludes that the lessons from Fukushima in this area show the need for effective pre-planned detailed emergency zones which are easily extended in a controlled way. More specifically, the Weightman report states that: "The radii established for emergency planning zones must, of course, depend on the radiological releases that are considered reasonably foreseeable and the practicability of implementation of the emergency plans. However, as it

is considered that licensees should review on-site measures to improve resilience to severe accidents in the light of the Fukushima accident, it follows that the practicability and effectiveness of the arrangements for extending countermeasures beyond a small DEPZ in the event of more serious accidents should also be reviewed. It is therefore considered that NEPLG should examine the need to enhance the UK's extendability arrangements for extending countermeasures beyond the DEPZ in the event of more serious accidents." (para 793, p145)

The Government response to the Weightman report, states that NEPLG has considered the response required for beyond design basis accidents and recommended that industry consider the planning assumptions for these. It also recommended that ONR should enforce a stronger testing regime which includes extendability arrangements and overseas nuclear accident response.

As explained below, ONR has initiated a review of the existing programme of exercises, but the findings are not yet publicly available.

Finally, a recent NFLA survey of local authority emergency planners on nuclear emergency planning indicates that most felt that there was scope for DEPZs to be quickly and flexibly extended (see NFLA Briefing No. 93 at [NFLA Briefing 93 Nuclear EP](#)). They add that the increased emphasis on Chemical, Biological, Radiological and Nuclear emergency planning over the last few years had helped local authorities in thinking more flexibly around the size of DEPZs.

3 Arrangements for Recovery

The Weightman report states that generally, in the UK, there is no detailed consideration given to the resources and facilities required for the recovery phase of a major nuclear accident, and co-ordination and control of such activities. It adds that this is of particular importance in terms of the arrangements for radiological monitoring and protection of workers, and the need to train many contract workers who may have little or no familiarity with the hazards on a nuclear site. (para 511, p91)

Nonetheless, for design basis accidents, Part 3 of the NEPLG's consolidated guidance does deal with the recovery phase and NEPLG has a Recovery Sub-Group. The note of the meeting of this sub-group on 11 August 2011 explains that key discussion has been focussing on the development of a 'transition model of recovery', which is to be tested in an emergency exercise called Oscar 10 in March 2012 at Sellafield. The transition in question is the transition from emergency to recovery phases, when coordination of the response would be transferred from the police to the relevant local authority.

The NFLA briefing referred to above notes that most local authority recovery plans remain quite generic by nature, and points out that experience of widespread flooding and their reviews has shown that recovery planning is a difficult, complex and expensive part of the emergency planning process¹. The NFLAs have encouraged the Government and the

¹ Following the floods in 2007, Government has put in place arrangements to help meet local authority costs incurred in recovery from exceptional emergencies. These arrangements are described in guidance on the Cabinet Office website (<http://www.cabinetoffice.gov.uk/sites/default/files/resources/Chapter%205.pdf> see section 5). The Government has also consulted on the implementation of changes to the Paris and Brussels Conventions on nuclear third party liability. This includes extending the scope of damage for which compensation can be claimed to include the costs of measures to reinstate significantly impaired environment,

NEPLG to consider in detail the issues around prolonged recovery planning for nuclear emergencies, and to provide advice to local authorities on the issues that would arise.

4 Emergency Planning Exercises

The Weightman report points out that, in the UK, although it is typical to rehearse nuclear emergency plans, it is not typical to exercise severe, long timescale, multiple hazard events affecting multiple units, involving large numbers of people. (para 508, p90)

The interim Weightman report indicated that there is a need to consider extending some emergency exercises in the UK to include severe accident scenarios. The extensive and extended nature of the Fukushima accident highlighted areas where improvements may be made through exercising in real time such matters as handover arrangements, sustainability of resourcing, the provision of technical advice in short timescales (tailored to the needs of the different recipients) and the vital role of communications and the acquisition of reliable data.

The final report states that as a result (para 590-592, p105), ONR has initiated a review of the existing programme of exercises to evaluate how changes to exercise scenarios supported by longer exercise duration will permit exercising in real time such matters as hand-over arrangements etc. It will also look closely at how automatic decisions taken to protect the public can be confirmed and supported by plant damage control data. It will then make recommendations on what should be included in an appropriate UK exercise programme for testing nuclear emergency plans. Relevant guidance will be provided.

ONR aimed to produce a report on this review by the end of 2011. At the time of writing, this is not yet available.

and increasing the liability of nuclear operators from 300m to 1500m Euros. Critics point out that this increase would be insufficient to cover the compensation costs arising from an accident on the scale of Fukushima.