

# Atomic Weapons Establishments Off-Site Contingency Arrangements

*A briefing from Nuclear Information Service*

## 1 Background

In September 2009 West Berkshire Council published new off-site contingency arrangements for use in the event of a radiation emergency at either of the two Atomic Weapons Establishment (AWE) sites at Aldermaston and Burghfield. The two AWE sites are owned by the Ministry of Defence, which contracts operations at the site to a private management company, AWE plc. Work undertaken at AWE covers the entire life cycle of nuclear warheads; from initial concept, assessment and design, through to manufacture and assembly, in-service support, and decommissioning and disposal. Each of the two sites handles radioactive materials, explosives, and hazardous chemicals.

As the local authority in which the AWE sites are situated, West Berkshire has a duty under the Radiation (Emergency Preparedness and Public Information) Regulations 2001 (REPPiR) to set out the contingency arrangements for a multi-agency response should a release of radioactive material at an AWE site pose a hazard to the public outside the site boundary. The contingency plan is available online from the West Berkshire website at:

<http://www.westberks.gov.uk/index.aspx?articleid=14122>

The new plan represents a major revision from the previous version, which was published in January 2004. At 245 pages in length it is substantially longer and more detailed, and the Off Site Plan Working Group which has prepared the plan has clearly drawn on good practice and experience during emergency exercises at AWE in drafting the revised version.

Although REPPiR requires off-site emergency plans for nuclear installations to be reviewed every three years, the latest version of the AWE plan, which should have been published in January 2007 to comply with the three year timetable, was released over two years behind schedule.

## 2 Introduction

No emergency plan can realistically attempt to cover every eventuality yet remain a manageable and useful document. West Berkshire Council has adopted a pragmatic approach towards preparing the new AWE Off-Site Contingency Arrangements by setting out a framework for command and control arrangements and providing guidance on how to deal with the most pressing issues that emergency responders are likely to face.

Other than stating that radioactive plutonium, uranium, and tritium may be released during an

accident, the plan gives no information about the composition and magnitude of the anticipated radionuclide releases from an accident at an AWE site, or the radiation doses which emergency responders and members of the public might receive. It is therefore not possible to comment on the adequacy of the contingency arrangements prepared by West Berkshire.

However, the plan gives an insight into the scale of response that would be required to deal with an emergency leading to an off-site release of radiation from an AWE site. Politicians and government officials sometimes give the impression that a nuclear accident, like any other emergency, would be dealt with smoothly and effectively, followed rapidly by a return to everyday life. The content of the emergency plan for AWE shows that a radiation release from an AWE site would have a massive local impact, and would result in a regional, if not national, mobilisation of resources in response. Although responders would undoubtedly do their best to cope, the challenging circumstances and complexity of the situation mean that the response would be chaotic and prolonged.

Following a radiation release from an AWE site, people living or working in the affected area would be required to take shelter and stay put, probably for several hours, to seek protection from radiation. Contaminated areas would be cordoned off and roads closed, and those living in the emergency zone would be prevented from returning home. Instead, they would be sent to a rest centre to wait until the emergency was declared over. The plan notes that “An incident with off site consequences at AWE will not be resolved in a few hours.”<sup>1</sup>, and rest centres may have to remain open for days or, in the event of severe contamination of an area, possibly even weeks.

The contingency arrangements also highlight the difficulties that emergency services and responders would face in dealing with an incident. As well as outlining the technical challenges in dealing with an emergency at an industrial site which handles explosives, radioactive materials, and hazardous chemicals, the plan candidly acknowledges a number of practical concerns. It warns that members of the public may not follow advice to stay at home under cover, recognises the obstacles to alerting householders about the incident, and is honest about the difficulties in identifying vulnerable people who may need particular support during an incident.

Although the contingency arrangements suggest that the response to a major incident at an AWE site would be locally directed, commanded by Thames Valley Police, in practice it is likely that control would rapidly be assumed by central government. The Ministry of Defence would play a key role in the emergency arrangements, and ministers would be informed about an incident and be involved in making key high level decisions through Cabinet Office Briefing Room arrangements. Any information passed on to the media and the public would be tightly controlled, with the emphasis on providing ‘consistent messages’. It is clear that, should a serious accident occur at an AWE site, members of the public would have to do as they were instructed and place considerable trust in the hands of the authorities.

An off site incident involving either AWE Aldermaston or AWE Burghfield would have a major impact on the lives of communities in the surrounding area and beyond and would require a response from across the South of England. The disruption and upheaval caused by the incident would be felt for many weeks and months afterwards. AWE is an important local driver of economic activity, providing income and employment to significant numbers of people in West Berkshire and North Hampshire, but it is clear that these benefits must be qualified when compared to the risks posed to the wider population and economy.

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1 Paragraph 3.3.4, page 162.

### 3 Accident scenario

The emergency plan has been prepared to deal with a 'reference accident' - the maximum credible accident against which it is considered reasonable to prepare detailed emergency plans<sup>2</sup>. Despite the importance of the reference accident scenario for planning purposes, the plan does not define a reference accident in detail for either AWE site, merely assuming that during an accident a pathway occurs that allows radioactive material to escape uncontrolled into the environment. Other than stating that the radioactive materials plutonium, uranium, and tritium are handled at AWE sites, the plan does not give any information on the composition and magnitude of the anticipated radionuclide releases - a key factor in emergency planning for nuclear installations.

Other documents prepared by AWE give more information on the type of accident that might lead to such an event. The Preliminary Safety Report for the AWE Enriched Uranium Project (17 March 2006) defines a design basis accident of a large fire caused by an aircraft crash involving most of the radioactive inventory held in the building. Such an event might serve as a worst case scenario against which an emergency plan should be prepared.

### 4 Emergency responders

The on-site emergency would be dealt with by the Fire and Rescue service working alongside colleagues from AWE's own fire service and other AWE staff. Emergency responders dealing with the on-site incident would have to take steps to protect themselves from radiation released as a result of the incident.

Regulation 14 of REPPiR outlines the conditions under which emergency responders may be asked to receive a radiation dose and specifies that only appropriately trained and equipped employees who have agreed to undergo exposure may be placed at risk of receiving exposure to radiation. The off-site emergency arrangements document does not explain how radiation dose projections would be assessed during the incident, and neither does it identify where sufficient numbers of responders authorised to receive emergency doses of radiation would be drawn from in the event of a prolonged incident. The Fire and Rescue Service may need to call on colleagues from elsewhere in the region to support their response to an incident at AWE, as it may not be possible for individual firefighters to work in a contaminated area for a lengthy period of time without exceeding personal dose limits. Only limited numbers of police officers are trained and equipped to receive emergency radiation doses and able to work in a radioactively contaminated area. Ambulance service staff and council officers are not authorised to work under the terms of REPPiR Regulation 14, and personnel from these agencies would not be able to enter a contaminated zone.

Under national planning arrangements for dealing with chemical, biological, radiation, and nuclear (CBRN) emergencies regional stockpiles of personal protective equipment are being prepared. Police and firefighters would have access to these supplies, but they are unlikely to be available for an immediate response to an emergency.

### 5 Emergency arrangements for local communities

#### 5.1 Alerting the public

The contingency arrangements outline steps which would be taken to protect local communities from the impacts of radiation released from either AWE site. Zones extending 3 km from the centre of AWE Aldermaston and 1.5 km from AWE Burghfield have been

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<sup>2</sup> Paragraph 1.15.1, page 18.

designated as detailed emergency planning zones, where countermeasures are required to protect the public from the effects of a radiation release. Tadley and Aldermaston, the largest settlements within these zones, are highlighted as locations where public protection arrangements would be principally focused in the event of an accident at AWE Aldermaston.

Households in the detailed emergency planning zones surrounding AWE Aldermaston and AWE Burghfield have been provided with public protection leaflets which explain what precautions should be taken in the event of an emergency at an AWE site. The leaflets advise people to 'go in, stay in, and tune in'. The contingency arrangements state that the police would warn the public in areas at risk to shelter indoors with doors and windows closed, and households which are registered with AWE's automatic telephone alerting system would receive a telephone message giving similar advice. Local radio stations and television channels would broadcast similar warnings.

The warnings would advise residents and workers near the site of the accident and downwind of the site to stay indoors for the duration of the incident. This would probably be for a period of several hours as a minimum, and possibly considerably longer depending on the scale of the radioactive release and the resulting level of contamination. During this period each household would need to be self-sufficient and able to feed and fend for itself. In offices and other workplaces, which are unlikely to have food, bedding, and toilet facilities adequate to serve a number of people for a prolonged period, conditions are likely to become fairly uncomfortable.

Once inside, people would be advised to self-decontaminate themselves by taking off their clothes and placing them in a bag outside, blowing their nose, and then showering. They would then be required to stay indoors for an indefinite period until the all clear is given<sup>3</sup>.

Although sheltering would initially be recommended in a sector downwind of the accident site, the plan notes that larger areas may need to be temporarily put under cover depending on changes in wind direction<sup>4</sup>. The Local Authority and Emergency Services Information (LAESI) guidelines, a separate document published by the Ministry of Defence to advise local authorities on arrangements for dealing with an emergency involving nuclear weapons, state that the public should be advised to take shelter for 5 kilometres downwind of the accident site in a 45 degree arc centred on the wind direction<sup>5</sup>.

Access to areas at risk from radiation would be controlled by police officers. No-one would be allowed to enter the area, and those returning to homes and families in the area would be sent to nearby rest centres to wait until the results of radiation monitoring indicated that it was safe to re-enter the area. This could potentially be a matter of days, rather than hours. School children would be cared for by school staff and local authority workers, and the police would eventually inform anxious parents of their whereabouts – although the emergency plan notes that resources will be stretched in dealing with the crisis, and so there is likely to be a nail-biting delay for parents before they learn whether their children are safe.

## **5.2 Rest centres**

Rest centres would be set up to provide accommodation to evacuees and those unable to return to homes located within the emergency zone. The site of the rest centres would depend on the locations of communities affected by the incident. They would need to be staffed by representatives from local authorities and other statutory agencies and provided

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3 Paragraph 5.2, pages 46-7.

4 Paragraph 5.7.3, page 53.

5 Local Authority and Emergency Services Information (LAESI) Edition 7. Ministry of Defence, September 2009. Annex E. [http://www.mod.uk/NR/rdonlyres/7845D644-1347-463B-8960-2D68824B56A0/0/laesi\\_final\\_screen.pdf](http://www.mod.uk/NR/rdonlyres/7845D644-1347-463B-8960-2D68824B56A0/0/laesi_final_screen.pdf)

with equipment and supplies, and so it is likely that they would be unable to open until several hours after the announcement of an accident at AWE. The majority of the Council staff who would run rest centres and help out during an emergency would be volunteers, offering their services over and above their normal duties and under no contractual obligation to undertake an emergency role, and so there would be limits to the duties that they would be able to undertake.

For reasons which are not clear, locations of rest centres are not given in the newly published contingency arrangements document, but the 2004 version of the plan (Atomic Weapons Establishments Off Site Emergency Arrangements) lists the following sites for rest centres:

*West Berkshire:*

- Kennet School and Leisure Centre, Thatcham
- Willinck School, Burghfield Common
- Theale Green School

*Wokingham Borough:*

- Ryeish Green Leisure Centre

*Hampshire:*

- Hurst Community School, Baughurst (special provision for schoolchildren)
- Fieldgate Centre, Kingsclere
- Basingstoke Ice Rink

### **5.3 Vulnerable people**

The Off-Site Contingency Arrangements plan acknowledges the difficulties in supporting vulnerable people during an emergency. The plan states: “Supporting the vulnerable throughout a major incident is always difficult due to the number of agencies involved, the different vulnerabilities of people and the ever changing vulnerability of people due to the incident type”<sup>6</sup>. An Annex in the plan (not included in the public copy of the plan) lists the locations of institutions dealing with vulnerable people within the detailed emergency planning zones surrounding each AWE site, such as schools<sup>7</sup>, nurseries, and residential care homes, and these institutions should have received advice on how to respond during an emergency. However, the home locations of potentially vulnerable individuals are not included in the plan, and it is difficult to see how the authorities could guarantee providing the support needed to ensure the safety of these people during the heat of an emergency.

### **5.4 Evacuation**

The emergency plan does not anticipate any need for immediate evacuation of members of the public outside the AWE fence, although evacuation may be necessary in the longer term depending on the degree of radioactive contamination. However, the plan identifies that spontaneous self-evacuation by members of the public should be considered “a realistic and probable public response to the declaration of a nuclear emergency”<sup>8</sup>. This would place

6 Paragraph 9.0.1, page 192.

7 NIS is aware of 10 schools in the 3 km radius emergency planning zone around AWE Aldermaston, within which evacuation or sheltering may be required. They are:

Alder Bridge School, Aldermaston Church of England Primary, Bishopswood Junior and Infants, Brimpton Church of England Primary, Burnham Copse Primary, Cedars School, Hurst Community College, Silchester Church of England Primary, Tadley Community Primary, and Woolhampton School. In addition to this, there are a number of private nursery schools. There are no schools within the AWE Burghfield detailed emergency planning zone.

8 Paragraph 16.3, page 234.

considerable strain on emergency services.

The emergency plan is being no more than realistic in recognising the risk of self-evacuation. At the time of the accident at the Three Mile Island nuclear power station in 1979 the US authorities recommended that some 3,400 pregnant women and pre-school children within a 5-mile radius of the plant should leave the area, but in fact a spontaneous evacuation of about 200,000 people occurred - nearly 40 percent of the population within 15 miles of the reactor. Numerous studies of evacuation behaviour during the Three Mile Island incident suggest that the public is likely to over-respond to evacuation orders because of fears of radiation exposure<sup>9</sup>.

Should it be necessary to evacuate a particular area, residents would be advised of the need to move by the media and via loudhailers and door-to-door visits from emergency responders – most likely police officers. The plan acknowledges that officers visiting homes in the evacuation zone would probably be dressed in protective equipment, and that “this may be somewhat alarming for residents.”

A more dramatic portrayal of the impact on local communities has been given by Ian Dickinson, Assistant Chief Constable with Lothian and Borders Police, who has responsibility through the Association of Chief Police Officers in Scotland for protecting Scotland from chemical and nuclear emergencies<sup>10</sup>. According to Mr Dickinson, the black protective suits that officers would have to wear and the gas masks that would obscure their faces would look “terrifying”. Mr Dickinson told a recent conference on CBRN threats that the police response to a CBRN incident when it happened would have a “profound effect on our communities which should not be underestimated”.

The Assistant Chief Constable warned of widespread “panic and fear” and said the response of the emergency services “would be chaotic” because of a shortage of resources. As only a limited number of police officers have been assigned CBRN protective suits and are trained in their use<sup>11</sup>, evacuation, if necessary, would be likely to be a long and complex process. There would also be a huge drain on resources from having to reassure many people who were unharmed but worried.

Assistant Chief Constable Dickinson also warned that decontamination after a radiation release could have an “enormous cost”, and that the additional monitoring and clean-up work would be “a major problem”.

After evacuation from a contaminated area it would be necessary for evacuees to undergo decontamination to remove any radioactive material from their bodies. The AWE emergency plan includes proposals to establish a mass tented decontamination centre operated by the Fire and Rescue Service and the Health Service, but it is not clear where the tents and equipment necessary to set up such a centre would be acquired from at short notice. Clothing, money, and access to mobile telephones would be needed to provide to evacuees who had been asked to leave their homes at short notice.

Once people had been evacuated the local authority would have to make preparations for them to stay at a rest centre or in longer term accommodation. Initially this would be with friends and family elsewhere in the area, or at a hotel or rest centre equipped for longer term needs, but it may be necessary to seek more permanent accommodation. The plan notes that this might be difficult if large numbers of people were involved, and that support from neighbouring local authorities might be needed.

9 ‘The Role of Transit in Emergency Evacuation: Special Report 294’. Committee on the Role of Public Transportation in Emergency Evacuation. National Academies Press, 2008. See: <http://books.nap.edu/openbook.php?isbn=0309113334&page=164>

10 ‘Top police officer warns that nuclear attack is inevitable’. Rob Edwards, Sunday Herald, 24 November 2007. See: <http://www.sundayherald.com/news/heraldnews/display.var.1857656.0.0.php>

11 Paragraph 14.2.5, page 228.

## 6 Emergency command and control arrangements

The response to an off-site release of radiation from an AWE site would initially be coordinated by Thames Valley Police, drawing on support from AWE, emergency services and local authorities, and central government departments. According to the AWE Off-Site Contingency Arrangements document, the emergency response would adopt the standard national three tier approach to managing an incident. An operational command centre would be set up in the field at a forward control point close to the incident site (Bronze command), supported by a tactical command centre (Silver command), probably at the police station at either Newbury, Reading, or Basingstoke. A strategic-level command centre (Gold command) would be set up at the Thames Valley Police headquarters in Kidlington, unless the incident looked likely to affect a significant population in Hampshire, in which case it would be located at Hampshire Constabulary's Southern Support and Training Centre at Netley. At each location the police would be joined by advisers from local authorities, emergency and health services, and other specialists.

In reality, however, much of the decision-making would be done by central government. The Ministry of Defence would play a key role in the emergency arrangements, and key high level decisions would probably be taken by ministers<sup>12</sup>. Incidents at nuclear installations leading to an off-site release of radioactive material are classified nationally as 'Level 2' emergencies – serious emergencies threatening a wide and prolonged impact requiring sustained central government co-ordination<sup>13</sup>. Cabinet Office guidance on central government arrangements for responding to a Level 2 emergency states that the central government response would be led nationally from the Cabinet Office Briefing Room (COBR) in Whitehall.

The LAESI guidelines on accidents involving the transport of nuclear weapons and defence nuclear materials between bases indicate that the Ministry of Defence has been designated by the Cabinet Office as the lead government department for all defence nuclear accidents and would co-ordinate the central government response to any emergency involving a nuclear weapon whilst in transit<sup>14</sup>. It seems probable, therefore, that a similar approach would be taken to any accident at AWE, and far from being taken locally, significant decisions would be taken at the COBR level, with the Secretary of State for Defence acting as the lead Minister chairing discussions in COBR<sup>15</sup>.

AWE plc would clearly play a critical role in managing any incident and dealing with the on-site emergency, and in addition would provide technical advice on firefighting, radiation monitoring and dose prediction, and medical treatment to other agencies involved in responding to the incident. AWE's Health Physics staff would be required to take the lead in monitoring the spread of radioactivity from the site and identifying potentially contaminated areas and safe routes of access. Questions arise as to how these roles would be fulfilled in the immediate aftermath of an accident if the scale of the emergency was so large as to incapacitate AWE's ability to undertake them.

## 7 Public information

Release of information about the incident to the media and the public would be tightly

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12 Paragraph 3.0, page 127.

13 Paragraph 1.4.1, page 11. The nuclear emergency exercise programme prepared by the Health and Safety Executive's Nuclear Emergency Arrangement Forum lists the forthcoming 'Aldex' exercise as a Level 2 exercise. See: <http://www.hse.gov.uk/nuclear/emergexeprog.htm>

14 LAESI Guidelines, paragraph 5.8.

15 Central Government Arrangements for Responding to an Emergency. Cabinet Office, 31 March 2005. See: <http://www.cabinetoffice.gov.uk/media/132685/conops.pdf>

controlled<sup>16</sup>. The Thames Valley Police Press Office is responsible for the co-ordination of information to the media during an emergency, with AWE playing a key role in providing information and advice to the police. A media briefing centre would be set up by Thames Valley Police to deal with press enquiries, and an AWE media team would deploy to the centre to assist the police. The emergency plan emphasizes the need for the different agencies involved in managing the emergency to issue constant messages, and refers to a joint AWE / Thames Valley Police media plan which contains pre-prepared statements to provide basic information for the media<sup>17</sup>.

## 8 Transport and infrastructure

An emergency at an AWE site would almost certainly result in transport chaos over a wide area. In order to prevent people and vehicles entering the emergency area where they would face the risk of becoming contaminated, the emergency plan anticipates that temporary road closures would be required. Roads would be closed by barriers set up by local authority contractors, with police officers present. The speed at which this could be achieved is likely to be an issue, and there must also be some question as to whether contract staff would be willing to place themselves at potential risk by approaching the emergency area. Despite the road closures, members of the public determined to enter the cordoned off area would apparently be able to do so without much difficulty as it appears that there are no plans for immediate closure of footpaths during an emergency.

The emergency plan notes that “it is very likely that a wide network of roads will be closed which will have a knock on effect for responders”<sup>18</sup>. Access for responders would be further complicated by the need to use safe routes into the area lying downwind of any radiation plume. A recent nuclear emergency exercise at the Sellafield reprocessing plant resulted in widespread traffic congestion around the site, and similar problems can be anticipated in the event of an accident at an AWE site<sup>19</sup>. In the event of an accident at Aldermaston the A340 road and, if wind was blowing from the South, the A4 trunk road would almost certainly be closed, leading to knock-on congestion on the M4 motorway and cross-country routes such as the A33 and A339. The M4 motorway lies very close to the edge of the 1.5 km emergency countermeasures zone for AWE Burghfield and could be closed in the event of an emergency at Burghfield.

As well as road closures, railway lines between Reading and Newbury and Reading and Basingstoke could be closed for some time as a precaution, and the plans also make provision for establishment of a no-fly zone over the area.

Utilities companies would be notified of the emergency as they would be required to play a key role in ensuring that vital services were maintained. Drinking water supplies would be at risk from radioactive contamination – for example, the Fobney extraction point which supplies water to Reading is downstream from Aldermaston on the River Kennet – and water companies would be required to monitor and assess the risk of contamination and provide alternative supplies of tankered water if necessary. British Telecom would be notified in the early stages of the emergency and would set up an emergency control group to ensure that communications between emergency services could be maintained. It is likely that there would be enormous pressure on mobile phone networks as members of the public tried to contact friends and family to check whether they were safe, and the plan states that mobile

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16 Annex 10.

17 Paragraph 12.4.1, page 216

18 Paragraph 5.6.1, ciii, page 50.

19 ‘Doomsday Scenario’, Whitehaven News, 30 September 2009. See:  
[http://www.whitehaven-news.co.uk/news/doomsday\\_scenario\\_1\\_618159?referrerPath=news](http://www.whitehaven-news.co.uk/news/doomsday_scenario_1_618159?referrerPath=news)

telephone network operators may be requested to activate the Mobile Telephone Preferential Access Service, which would ensure calls to emergency responders were maintained – but deny ordinary users access to the network<sup>20</sup>.

## 9 Recovery

After the emergency and its immediate consequences had been dealt with, recovery from the incident would begin, with local authorities and other public agencies helping the affected area and the community to return to normal life as quickly as possible.

A major issue would be protecting the public from the impacts of radioactive contamination and cleaning up contaminated areas. Residents evacuated from affected areas might be required to stay away from their homes for an extended period to facilitate clean-up<sup>21</sup>, and long term controls on agriculture and the sale of food would be required. Restrictions would be placed on the movement of contaminated food, which would require disposal. The plan states that the area over which restrictions were imposed would be likely to be much larger than the areas where people were asked to shelter from radioactive contamination.

The 2004 version of the AWE Off Site Contingency Arrangements document stated that compensation would be offered to those who had suffered as the result of an accident at AWE, and that claims officers would be sent to deal with emergency payments and give local advice. However, compensation arrangements are not mentioned in the revised version of the plan. Under section 7 of the Nuclear Installations Act 1965 act the operator of a nuclear licensed site is liable for compensation for any injury or damaged caused as a result of operations at the site.

## 10 Emergency exercises

A multi-agency exercise to test the off-site contingency arrangements is required by law next year, and is currently scheduled to take place on 17 November 2010 (Exercise Aldex 10)<sup>22</sup>.

Given the complex nature of the contingency arrangements, in order to provide a credible test of their adequacy NIS considers that the Aldex 10 exercise should rehearse the following activities:

- Establishment of Gold, Silver, and Bronze control centres.
- Establishment of an exclusion zone for a contaminated area, with associated road closures and access restrictions.
- Establishment of a rest centre.
- Sheltering or evacuation arrangements at a vulnerable location such as a school or care home.

NIS considers that, in the interests of transparency and public confidence in the AWE emergency arrangements, observers from the media and local non-government organisations with an interest in AWE should be allowed to observe and comment on this exercise. Emergency planning professionals with an involvement in CBRN planning should also be invited to observe and learn from the exercise.

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<sup>20</sup> Paragraph 10.0 page 144.

<sup>21</sup> Paragraph 13.7.1, page 220.

<sup>22</sup> Nuclear Emergency Arrangement Forum: Nuclear Emergency Exercise Programme. October 2009 - March 2012. See: <http://www.hse.gov.uk/nuclear/emergexeprog.htm>