WG5 PROPOSALS

Response to MIIB Recommendation 11

Operators of Buncefield-type sites should review the classification of places within COMAH sites where explosive atmospheres may occur and their selection of equipment and protective systems (as required by the Dangerous Substances and Explosive Atmospheres Regulations 2002). This review should take into account the likelihood of undetected loss of containment and the possible extent of an explosive atmosphere following such an undetected loss of containment. Operators in the wider fuel and chemicals industries should also consider such a review, to take account of events at Buncefield.

Response to MIIB Recommendation 12

Following on from Recommendation 11, operators of Buncefield-type sites should as part of their arrangements to deal with accidents, incidents and emergencies (as required by the Dangerous Substances and Explosive Atmospheres Regulations 2002) evaluate the siting and/or suitable protection of emergency response facilities such as firefighting pumps, lagoons or manual emergency switches.

1. The event that operators should plan for, **with respect to emergency arrangements**, is that of a multiple tank fire following an explosion. Emergency arrangements will need to be capable of operating effectively following such an event.

2. Further research is underway on the explosion mechanism at Buncefield, however, the results of this research are not expected in the near future. Therefore, in order to identify what scale of explosion the emergency arrangements need to be capable of surviving, the best available information from the Buncefield incident itself has been used. Accordingly, a blast overpressure in excess of 500 millibar over a radius of 250 metres has been assumed to be the magnitude and extent of the explosion to be used as the basis of the credible incident **with respect to emergency arrangements**.

3. The research may reveal that a blast over-pressure considerably in excess of 500 mB occurred at Buncefield. The table below details typical effects of over-pressure. The effects of over-pressure are not exact and sensible interpretation erring on the side of caution should be employed. It is thought highly unlikely that the research will conclude that the blast over-pressure was less than 500 mB.

Typical effects of blast overpressure on people, buildings and plant

Damage Details	Incident Equivalent Peak Overpressure in mBar
Effects on people	
Threshold for ear drum rupture.	138
Minimum pressure for penetration injury by glass fragments.	55.2
Threshold of skin laceration by missiles.	69-138
Persons knocked to the ground.	103-200
Possible death of persons by being projected against obstacles.	138
50% probability of eardrum rupture.	345-480
90% probability of eardrum rupture.	690-1034
Threshold of internal injury from the blast.	490
50% fatality from serious missile wounds.	276-345
Near 100% fatality from serious missile wounds.	483-689
Threshold of lung haemorrhage.	837-1034
Immediate blast fatalities.	4826-13790
Building damage details	
Nearly 100% of exposed glass panes broken.	46-110
Partial demolition of houses - made uninhabitable.	69
Nearly complete destruction of houses.	345-483
Probable total destruction of houses.	689
Effects on Plant	
Most pipes fail.	300
Steel cladding of buildings ruptured.	400
Brisk panels in steel or concrete frame rupture.	500
Reinforced structures distort and unpressurised tanks fail.	210-340
Wagons and plant items overturned.	340-480
Extensive damage to chemical plant.	>480
Failure of a pressurised sphere.	>700

4. At Buncefield, the damage from the Vapour Cloud Explosion (VCE) occurred out to approximately 250 metres from the bund containing the tank that was overfilled. Whilst the behaviour of vapour clouds can be directional, the movement of the cloud is heavily dependant on factors such as site topography, degree of congestion and weather conditions. Attempting to predict the travel of a potential vapour cloud with the necessary level of reliability in view of its potential effects is not a practical proposition with existing knowledge. Hence the effects of the explosion should be considered as being 250m from the bund assuming that the cloud could travel in any direction.

5. Further information on the predictive assessment of COMAH safety reports in light of the Buncefield incident can be found at http://www.hse.gov.uk/foi/internalops/hid/spc/spcperm11.pdf .

6. The methodology below is for duty holders to evaluate the potential impact of a VCE on the emergency arrangements at their site. These arrangements will include fixed equipment such as fire pumps and hydrants as well as foam stocks, site ingress and egress points for off-site emergency resources, control rooms and critical equipment.

7. Duty holders should carry out individual site assessments based on the following methodology.

a. Identify the critical equipment and resources necessary to respond to a credible incident scenario following a VCE. Typically this would be a multi-tank fire initiated by the VCE.

b. For those resources identified plot the location on a site plan of those that are installed at the facility or provided as part of a mutual aid or common user scheme.

c. Apply the overpressure area of 250 metres radius from the edge of any relevant bund (e.g. contains a gasoline storage tank).
Note: It is possible that this area will cover the whole site and may extend to include areas where mutual aid or common user equipment is held.

d. The effects of blast overpressure should be applied to all items of critical equipment and resources within the designated area. Decide whether the equipment or resource would remain usable or not.
Note: Apply the precautionary principle and if in doubt treat as unusable.

e. For each item of critical equipment or resource that is likely to be damagedin the event of a VCE, the facility should consider:.

- Moving the equipment outside the area likely to be affected.
- Duplicating the equipment by providing an alternative outside the area.
- Providing protection in the form of blast shielding.
  Note: if site power and control systems are lost there may be little advantage in protecting pumps or other equipment that cannot be used.
- Reducing the consequence of the damage. For example, if a fire pump is lost in the blast, but an underground hydrant system is still usable, then additional inlet points for mobile pumps from open water could restore operation of the system.
- Using off-site emergency equipment and resources e.g. by providing mobile equipment from the Fire and Rescue Service or mutual aid scheme.
- For access and egress points used by emergency services, provide alternate routes in case the main roads and gates are affected by the incident.

20. The results of the assessment should be documented and incorporated into the on-site and off-site emergency plans. These results should be used to plan the emergency arrangements for the site. Any dependency on mutual aid or external resources should be agreed, and these arrangements regularly tested and reviewed.

The template for completion of the on-site plan for COMAH sites is provided in Appendix 1.The template can be completed and used as the basis for the on-site emergency plan. This approach may be of benefit to lower-tier COMAH sites.

21. The blank template can be used as a checklist against which to verify an existing on-site plan.

26. Each emergency plan should be specific to a site. Duty holders should review their on-site emergency plan to ensure that there are enough people with the right training and competence to deal with the emergency.

27. The following factors should be considered:

a. Have all the risks been identified for the site with respect to the foreseeable emergency scenarios?

b. Have response plans been developed to deal with these risks?

c. Do the response plans identify actions and resources needed especially people?

d. Do the response plans identify escalation measures including the resources needed to action the plan?

e. Are there sufficient resources to action these plans? This can be done by a gap analysis of the staff and other resources. Consider the following:

- Time - Can staff be released in an emergency? Have they time to do all that they need to under the plan?
- Tools – Do staff have access to the correct equipment/information?
- Ability - Can they use the equipment/understand the information and do what they need to properly?
- Sustainability – (For longer duration scenarios) Are suitably competent relief staff available to maintain the emergency plan over a realistic response period.

30. This can be summarised as – does the site at all times have enough staff who are able to do what they need to in the time available to make the plan work.

31. Each member of staff should be competent to implement the emergency plan. Competency should be checked during training and testing of emergency plans. Can each person do what they need to – if not train and evaluate? Refresher training is vital to maintain competence and there needs to be realistic testing to ensure that staff demonstrate competence. Duty holders should record all reviews, analysis, training and testing.

32. The table below is derived from the Energy Institute guidance in Model Code of Safe Practice Part 19: Fire Precautions at Petroleum Refineries and Bulk Storage Installations[5]. The table provides an example of the competencies required by a typical emergency response team member. The areas where competencies are necessary have been identified by analysing the tasks that the person will fulfil as their part in the plan. The same process can be applied to all tasks and the competencies required identified.

33. It is essential to consider tasks such as drainage, firewater management, pollution control and site recovery when deciding on training and competencies.

EMERGENCY RESPONSE TEAM MEMBER – EXAMPLE COMPETENCY PROFILE			
IP19 Annex E – an example ERT member competency profile based on four units			
Operations	**Maintenance**	**Procedures**	**Skills**
1.1 Inspect and test fire vehicles	2.1 Inspect and test site portable/mobile fire equipment	3.1 Execute assigned duties	4.1 Respond to emergencies
1.2 Inspect and test fire station communications	2.2 Inspect and test site fixed fire systems	3.2 Working safely	4.2 Fixed systems/fire tender work in incident area
1.3 Exercise emergency response	2.3 Inspect and test site fire hydrants		4.3 Carry out fire-fighting or incident control operations
1.4 Fire prevention			4.4 Rescue personnel

[5] (ref: 978-0-85293-437-1 This can be ordered through the Energy Institute website at http://www.energyinstpubs.org.uk)

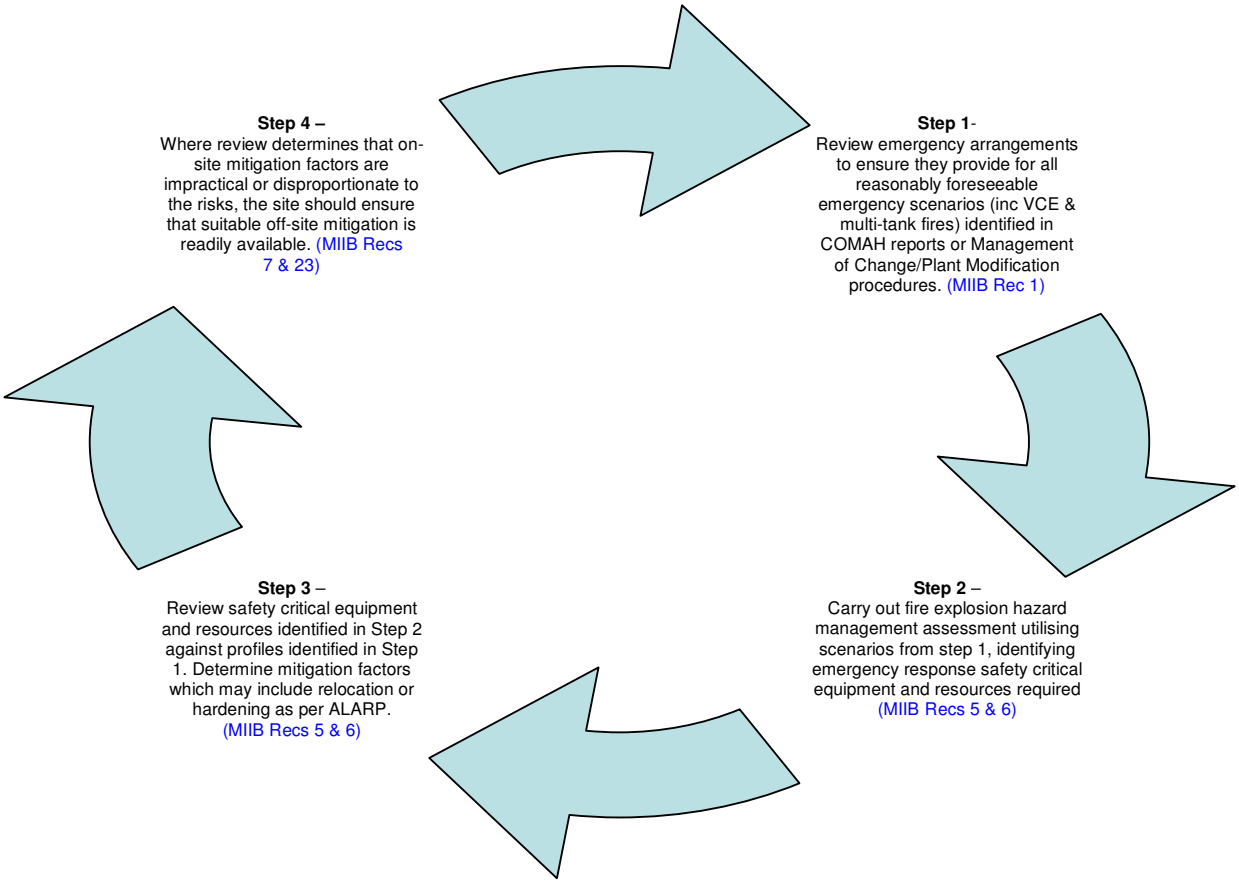
			4.5 Reinstate resources
			4.6 Training and instruction

34. Duty holders should evaluate the siting and protection of emergency response facilities, and put in place contingency arrangements either on or off site in the event of failure. This should include identifying and establishing an alternative emergency control with a duplicate set of plans and technical information.

35. IP 19 – Model Code of Safe Practice – Fire Precautions at Petroleum Refineries and Bulk Storage Installations[6] provides good practice guidance on protection of safety critical equipment and resources.

36. Fire protection and other critical emergency equipment and resources should be located in non hazardous areas. Duty holders should consider the consequence of a major incident to determine where to locate such items as they may constitute sources of ignition. Locate equipment and resources to enable access at all times during incidents. They should be capable of functioning despite the effects of fire and explosion, for example, fire pumps should be located at a safe distance away from any possible explosion/fire consequences.

The following framework can be used to evaluate the vulnerability and siting of emergency response equipment and resources.



37. **Step 1** Duty holders should consider and list worst case events in terms of:

- Hazard distances
- Overpressures
- Radiant heat levels
- Potential for missile generation

The emphasis should be on the effects of 'worst-case' incident scenarios, as these identify the most vulnerable emergency equipment and resources. However, duty holders should consider specific issues that may arise from lesser incidents e.g. different types of foam concentrate, critical emergency equipment located near relatively low-hazard operational areas, etc.

[6] (ref: 978-0-85293-437-1 This can be ordered through the Energy Institute website at http://www.energyinstpubs.org.uk)

38. **Step 2** Identify critical emergency response equipment and resources vulnerable to the worst case scenarios. Start by reviewing the list to identify critical equipment and resources that may be vulnerable in a major incident. Detailed site plans with significant hazard ranges marked on them may be used as an aid.
The templates in Appendix 2 provide a detailed list of emergency response equipment and resources, drawn from industry guidance, codes, reports of the Buncefield Standards Task Group (BSTG)[7] and the MIIB[8]. Relevant issues in "Buncefield: Hertfordshire Fire and Rescue Service's Review of the Fire Response" (2006)[9] have also been included. The list should not be seen as exhaustive. Duty holders should also consider unique features of their own sites and emergency response arrangements.

39. **Step 3** In reviewing critical equipment and resources consider all necessary measures to manage the incident, i.e. drainage, firewater management, power supply, control centres, communications etc. Consider the requirements to deal with the more likely scenarios, not just the high impact - low probability events. Assess what the likely level of damage would be to vulnerable equipment and resources, in terms of:

Functionality (Can the system still meet its intended role or function?)	Availability (Is the system still available when it might be needed?)	Reliability (Can the system still work as intended w**hen cal**led upon?
- Total loss (e.g. loss of foam supplies) - Partial lost (e.g. water spray system pipework may be damaged so that it cannot give adequate coverage to all vessels exposed to radiant heat and/or flames? - No significant loss (the system can still function as intended)	- Total loss (e.g. fire pumps destroyed by blast) - Partial lost (e.g. emergency access may be obstructed from certain directions) - No significant loss (the system is still available for use)	- Total loss (e.g. severe bund wall) - Partial lost (e.g. damage to cabling may mean remote operation of valves is lost/unreliable, but manual operation may still be possible) - No significant loss (the system can still function when called upon)

Step 4 Where there are gaps against current good practice, as an alternative to upgrading the on-site facilities, duty holders may consider other contingency arrangements, for example, relocating mobile equipment and resources. Where further measures are necessary to provide an alternative to fixed equipment, it may be more appropriate to identify what external assistance may be available to provide sufficient contingency (e.g. local emergency services, mutual aid schemes). Emergency plans should be revised to take into account any possible loss of critical equipment and resources.

40. Additional measures to consider include:
- Reducing the risk of the incident at source
- Increased redundancy, e.g. alternative fire pumps in different locations
- Increasing supplies
- Relocating resources
- Splitting supplies into different locations
- Manual back up for automated systems
- Resources that can be brought in by the emergency services
- Mutual aid schemes
- Contracts/agreements with specialist companies who can provide additional resources within a reasonable time period
- Duplicate copies of emergency information (hazard data, site plans, etc). Information kept in different locations (on and off site) and different formats (hard copy and electronic).
- Alternative emergency control centre off site
- Alternative emergency response tactics (e.g. consideration of controlled burn if firewater supplies are lost)
- Revision of emergency plans, tactics and strategies.

[7] Available at http://www.hse.gov.uk/comah/buncefield/response.htm
[8] Available at http://www.buncefieldinvestigation.gov.uk/index.htm
[9] Available through http://www.tsoshop.co.uk/

- Exercises to test the adequacy of contingency arrangements

41. Should the duty holder rely on off-site fire and rescue services, the on site plan should clearly demonstrate that there are adequate arrangements in place between the parties.

42. The following guidance is aimed at sites whose current arrangements rely on the Fire and Rescue Service (FRS) or other off-site responders to fulfil functions as part of their on-site emergency plan. These arrangements should also include off-site FRS response required to prevent/deal with a Major Accident to the Environment (MATTE).

43. Appendix 3 provides a template for auditing the test of an off-site emergency plan. It can also be used as a basis for identifying those parts of an on-site emergency plan that rely on off-site responders. The following are examples of areas where this is likely:

- Reliable relations between duty holders, the emergency services and other responders, for example, EA/HPA, are critical in the successful management of major emergencies and there should be scheduled liaison meetings held.
- If the external FRS supplements on-site fire teams, the level of training and compatibility of BA & fire fighting equipment must be established.
- Where a fire plan been produced by the FRS for specific COMAH sites including RV points and alternative access to the site.

The effectiveness of these arrangements should be exercised and evaluated.

45. When all instances of reliance on off-site responders have been identified, the adequacy of the joint arrangements should be demonstrated. Appendix 3 can be used to audit a test of the emergency plan. Assumptions should be validated and emergency plans reviewed and updated as appropriate.

46. Paragraphs <paragraphs from BSTG final report – D Pascoe to advise>[10] clearly defines the arrangements between the duty holder and the FRS. These include but are not limited to:

- Raising an alert and initial information
- Access points, suitable hard-standings for vehicles and RV points
- Site information (water supplies, foam stocks, equipment details, drainage information, containment capability, evacuation arrangements, etc)
- Pre-fire plans clearly indicating fire fighting capability, resources available and firewater management arrangements

[10] www.hse.gov.uk/comah/buncefield/final.htm

Duty holders should review their arrangements to communicate with people and establishments likely to be affected by a major accident to ensure that this information takes account of the revised major accident scenario as set out in paragraph 1.

Guidance on provision of information to the public is given in L111 and HSG191. Examples of communications plans and information letters are provided in appendices 4 to 9

47. Useful references are:
Emergency planning for major accidents: Control of Major Accident Hazards Regulations 1999 (COMAH) HSG191 HSE Books 1999 ISBN 978 0 7176 1695 4
A guide to the Control of Major Accident Hazards Regulations 1999 (as amended). Guidance on Regulations L111 HSE Books 2006 ISBN 978 0 7176 6175 6

Recommendation 3 Appendix 1 Template for completion of the on-site plan for COMAH sites

By using this template the operator should comply with the requirements of the COMAH Regulations, as detailed in HSG190[1], HSG191[2] and L111[3]. A summary of the requirements detailed in these documents can be found in the *Route map*[4] to these documents. These documents should be used as guidance when completing this template.

The operator must consult with off-site agencies, and it is advised that the plan is formulated in consultation with the agencies (local authority emergency planners, Fire and Rescue Service, environment agencies, HSE, police and ambulance) as appropriate during the preparation of the plan. It is advised that consultation starts at an early stage to allow for full involvement with the off-site agencies.

Table 1 – Overview of Emergency Arrangements	
Name of facility	
Full postal address	
Name or position of the person responsible for compiling this on-site plan and for liaison with the local authority for preparing the off-site plan	
Overview of the activities carried out on site. This should include number of employees at different times of day and a sample of the potential hazardous scenarios from the site's activities from a high level; more detail will be provided in Table 2 below	
List of agencies consulted in the preparation of this plan. Include name and address of contacts	
Fire and Rescue Service	
Police service	
Health authority	
Environment Agency/SEPA	
HSE	
Local authority	
Employees	

[1] *Preparing safety reports: Control of Major Accident Hazards Regulations 1999 (COMAH)* HSG190 HSE Books 1999 ISBN 978 0 7176 1687 9

[2] *Emergency planning for major accidents: Control of Major Accident Hazards Regulations 1999 (COMAH)* HSG191 HSE Books 1999 ISBN 978 0 7176 1695 4

[3] *A guide to the Control of Major Accident Hazards Regulations 1999 (as amended). Guidance on Regulations* L111 HSE Books 2006 ISBN 978 0 7176 6175 6

[4] www.hse.gov.uk/comah/buncefield/final.htm

Objectives of the on-site plan (see paragraph 19, HSG191)
Contain and control incident so as to minimise effects and to limit damage to persons, the environment and property. Implement the measures necessary to protect persons and the environment from the effects of a major accident. Communicate the necessary information to the public and to the emergency services and authorities concerned in the area. Ensure the safe and legal removal and disposal of any waste generated, and where environmental measures have failed, provide for the restoration and clean up of the environment.
Names or positions of persons authorised to set the emergency procedures in motion and the person in charge of and co-ordinating the on-site mitigatory action. Note: Fire and Rescue Service may at their discretion initiate these measures Identify the criteria for contacting internal/external emergency services.
Safety of persons on site. Arrangements to limit the risk to on-site persons. Include how warnings are to be given and the actions persons are expected to take on receipt of warnings Detail the site's means of collating a record of persons on site, identifying casualties and their locations.
Safety of persons off site. Arrangements to inform residents located in the Public Information Zone of the site's activities. Include how warnings are to be given and the actions persons are expected to take on receipt of warnings
Arrangements for providing: • **early warning of the incident to local authority (usually Fire and Rescue Service) and the Environment Agency/SEPA;** • **for initiating the off-site emergency plans;** • **the type of information that should be contained in the initial warning; and** • **the arrangements for the provision of more detailed information as it becomes available**
Arrangements for training staff in the duties that they will be expected to perform, including where necessary co-ordination with emergency services. Also identify key competencies for these staff and identify methods of testing the plan
Arrangements for assisting with the off-site effects of the incident Include specialist equipment, personnel, media, gas testing, plume modelling, water testing, decontamination facilities.
Location of the Site Emergency Control Room (SECC) and the facilities and equipment contained in the SECC, including communications, record keeping and plans and maps of the site
Identify resources (people) required to manage the response to the incident, identify resources available to ensure 24/7 cover and identify specialists who can provide information to the emergency services
Identify the key roles, actions and communication flows of the Site Controller and the Site Incident Controller to ensure that these are consistent and effective.

Detail how on-site emergency responders will be made readily identifiable to off-site responders.	
Identify suitable locations and mandates for the all the control centres used to mitigate the incident	
Forward control point	
Site Emergency Control Centre (SECC)	
Silver Command	
Gold Command	
Health Advisory Team	
Identify key contact numbers for the establishment, eg SECC, alternative SECC, site main controller, operations control room, medical centre, operations control rooms	
Identify environmental consequences of hazard scenarios described in this document. Identify the environment pathways, eg air, permeable ground, drainage systems and receptors at risk, eg local populations, rivers, groundwaters and land	
Identify resources available for the restoration and clean up of the environment following a major accident. COMAH specifically requires limitation of consequences and consideration of off-site mitigatory measures including appropriate restoration and clean up, eg pre-arranged contractor callout, removal and disposal of waste, provision of sampling and analytical resource to facilitate determination of disposal of polluted firewater. Identify key steps and actions during the restoration stage for the identified hazard scenarios and the procedures and resources available to: • provide for clean up containment systems/plant areas if firewater/pollution is confined to the site; • clean up and restore the off-site environment if containment systems prove inadequate or fail. See Environment Agency web page www.environment-agency.gov.uk/ for further information see Pollution Prevention Guides (PPG), eg PPG18, PPG21 and PPG28	

Table 2: Hazardous events

On-site emergency plan: A sample of major accident scenarios

Potential events and consequences	Other plant areas with similar (lower) potential	Process and emergency response	On-plant equipment/ facilities (excluding emergency response equipment)	Distances effect	Human health consequences	Environmental consequences
EG *Petroleum products* *Mogas* *Catastrophic failure of mogas tank containing 10,000 litres, with the potential to over-top the bund and ignite*	*Tank 1, Tank 2, Tank 3*	*Remote valve isolation of the tanks and transfer pumps.* *Evacuate site using on-site siren.* *Call emergency services.* *Apply foam on to pool of mogas.*	*Tank deluge and foam systems.* *Firewater storage 70,000 litres, pumps 3000 litres, min, pressure 10 bar.*	*If fire developed personnel within 150 m of the fire, would be unlikely to escape injury.* *LFL would extend 230 m.*	*Prolonged exposure to petroleum products vapour can result in narcotic effects leading to unconsciousness.* *Will also cause breathing difficulties, which could be fatal.* *On ignition, burns could result to persons within 150 m of the fire without protection.*	*Volatile components will evaporate. Less volatile components will persist in the aqueous environment.* *Components will biodegrade with time.* *It is likely the contents will enter the river (if it is likely then addition containment must be provided).* *Firewater run off and FP foam would enter the drainage system and should be contained on site, eg shut Penstock to divert to firewater containment system.*

Table 3: Information needs of the emergency services

Fire and Rescue Service

Provide information on the site layout including any other associated risks, including transformers, substations and water treatment facilities. Identify designated rendezvous points	
Identify the location of on-site fire service (if applicable) and emergency medical or first-aid facilities	
Identify systems that enable the operator to provide information during an incident, including inventory levels of notifiable hazardous substances and their physical state	
Provide information on how technical data will be provided during an incident. The data must provide general information on the properties and physical nature of the substances	
Provide information on fixed fire protection installations (eg roof vents, sprinklers, drenchers, fire shutters), with technical detail of their operation	
Identify all loading and unloading installations with technical detail of their operation	
Identify watercourses, separators and plant drainage systems with the aim of minimising environmental pollution. Include areas where firewater run off can be contained. Identify equipment required to assist in this, eg drain sealing equipment, booms and fire service *New dimensions* pumping equipment. Consideration should be made of the resources held by Fire and Rescue Service (FRS) and how on-site resources will be used by FRS personnel. See Environment Agency section below for more detail	
Identify water supplies available on site	
Stored water on site (litres)	
Top up facilities	
Firewater pumps, pumping capacity and pressures, activation	

Availability of systems to protect specific plant	
Alternative water supplies	
Identify alternative water resources (ore holes, rivers, canals etc) and the distance from the site	
Identify alternative water supplies to supplement on-site storage	
Identify how many *New dimensions* high-volume pumping equipment is available within your area	
Confirm quantities available from alternative supplies – consider seasonal changes	
Pre-planned strategy to estimate the maximum quantities of firewater run off and to identify lagoon and catchment areas and size	
Identify the on-site communications that can be used by the Fire and Rescue Service and identify any areas for intrinsically safe radios	
Identify any plans that allow for a controlled burn	
Identify foam supplies held on site or are available to the site via mutual aid, or other agreements	
Foam on site (litres)	
Type of foam and percentage ratios	
Storage containment methods (eg drums, IBC, bulk)	
Location of foam stock	
Method of transporting around site	
Fire and Rescue Services foam stock and type (litres)	
Location of foam	
Method of transport	
Third party/mutual aid/suppliers foam stock and type	

Location of the foam	
Method of transport	
Identify hose on site	
Size, quantities, pressure ratings, couplings (Note: if Storz-type couplings are fitted, detail lug spacing)	
Identify type and location of hose adaptors on site	
Identify hose provided by Fire and Rescue Services, mutual aid and third parties	
Size, quantities, pressure ratings, couplings (Note: if Storz-type couplings are fitted, detail lug spacing)	
Identify type and location of hose adaptors carried	

Site staff and visitors

Details of the actions they should take to protect themselves from the effects of the accident

Police Service

For scenarios identified in Table 2, identify potential numbers of off-site casualties
Detail how the site operates its media management so that its response can be dovetailed into emergency services arrangements and allow the police to co-ordinate the media response in the event of an incident
Identify major roads on the site perimeter

Ambulance Service

For scenarios identified in Table 2, identify potential numbers of off-site casualties, including likely injuries (ie burns)
Information regarding an on-site medical facilities and types of treatment that could be provided

Health

For scenarios identified in Table 2, identify potential numbers of off-site casualties, including likely injuries
Details of hazardous substances and their acute and long-term human health effects
Identification numbers of hazardous substances

Local authority

Details of on-site personnel and how they will interface with the emergency services, eg the roles of the Site Main Controller and Site Incident Controller
Details of the on and off-site resources that can be mobilised
For scenarios identified in Table 2, provide details of the impact on people and the environment not already documented, eg effect on local schools, communities, shopping centres

Environment Agency

For scenarios identified in Table 2, identify environmental consequences and environmental protection measures to prevent/mitigate them, including: • Identify vulnerable surface and groundwaters and pathways to them, eg site drainage systems that need to be protected. • Details of on-site environmental protection measures, eg separators and areas where firewater run off can be contained. • A copy of the planned environmental protection strategy, eg use of controlled burn, how firewater will be contained, environmental monitoring/sampling • Details of equipment available to assist in this action, eg drain sealing mats, pipe blockers, booms, gully suckers and addition equipment held on site and/or on FRS environmental protection units. • Provide a full inventory of all products stored on site and their environmental properties. Include firefighting foams to be used. • Identify arrangements for the removal of waste and clean up of the environment, eg arrangements with licensed waste contractors. • Details of on-site personnel with responsibilities for environmental protection and how they will interface with the emergency services and Environment Agency.

Recommendations 5 & 6 Appendix 1
Assessment of Vulnerable Emergency Response Equipment and Resources

Assessment of Vulnerable Emergency Response Equipment and Resources							
Site:							
Major Incident Scenario:			Results Of Consequence Analysis (Hazard Ranges):				
1. Identify vulnerable critical emergency response eqpt & resources			2. Assess the potential damage and consequences (Consider potential loss of functionality, availability and reliability)	3. Identify existing contingency arrangements	4. Are existing arrangements adequate?	**5.** Consider additional measures and take necessary action	
Critical emergency response eqpt & resources	Applicable?	Vulnerable?				Additional measures	Comments/ actions (including amendments to emergency plan/exercises to test adequacy of contingency arrangements)
On Site equipment							
Fire pumps/ Pumphouse							
Firewater tanks/ pipework							
Fixed deluge/spray systems							
Firewater hoses							
Ancillary equipment (adaptors, fittings, etc)							
Mobile pumps							
Mobile water/foam cannons							
On site emergency vehicles							
Specialist equipment (mobile detectors, etc)							
Personal/Respiratory protective equipment (PPE/RPE)							
Spill response equipment							
Emergency shutdown systems							
Automated systems							
Other (specify):							

Assessment of Vulnerable Emergency Response Equipment and Resources							
Site:							
Major Incident Scenario:			Results Of Consequence Analysis (Hazard Ranges):				
1. Identify vulnerable critical emergency response eqpt & resources			**2.** Assess the potential damage and consequences (Consider potential loss of functionality, availability and reliability)	**3.** Identify existing contingency arrangements	4. Are existing arrangements adequate?	5. Consider additional measures and take necessary action	
Critical emergency response eqpt & resources	Applicable?	Vulnerable?				Additional measures	Comments/ actions (including amendments to emergency plan/exercises to test adequacy of contingency arrangements)
On Site supplies							
Water supplies							
Foam supplies							
Other (specify):							
Infrastructure							
Emergency Control Centres							
Access for external emergency services							
Rendezvous points/ parking areas for external emergency services							
Access/hardstanding for mobile pumps and specialist equipment							
Off-site holding areas for large numbers of responders							
Other (specify):							

Assessment of Vulnerable Emergency Response Equipment and Resources							
Site:							
Major Incident Scenario:			Results Of Consequence Analysis (Hazard Ranges):				
1. Identify vulnerable critical emergency response eqpt & resources			2. Assess the potential damage and consequences (Consider potential loss of functionality, availability and reliability)	3. Identify existing contingency arrangements	4. Are existing arrangements adequate?	5. Consider additional measures and take necessary action	
Critical emergency response eqpt & resources	Applicable?	Vulnerable?				Additional measures	Comments/ actions (including amendments to emergency plan/exercises to test adequacy of contingency arrangements)
Human, Welfare and Information Equipment and Resources							
Critical personnel/ functions - On-site fire team - On site incident controllers/ responders - Operational - Management - Technical/ engineering - SHE - HR (next of kin contact) - PR/media liaison - Other specialists:							
Welfare facilities - toilets - washing - rest areas - mess/eating areas							
Critical information - Emergency plans - Site drawings - Drainage drawings - Engineering drawings - Product hazard data IT systems							
Other (specify):							

Recommendation 7 – Appendix 1 COMAH Off-site plan exercising/auditing Record

COMPANY: SITE:

	ELEMENTS OF PLAN	EXERCISE DATE	AUDIT DATE	OPERATOR	COMPETENT AUTHORITY	COMMENTS ACTIONS REQUIRED
1	ADMINISTRATION					
1.1	Plan written; reviewed and updated					
1.2	Plan readily available to emergency services					
1.3	Maps and plans reviewed and updated					
1.4	Maps and plans readily available to emergency services					
1.5	Public informed as required (COMAH Reg 14)					
1.6	Staff emergency plan training records reviewed and updated					

	ELEMENTS OF PLAN	EXERCISE DATE	AUDIT DATE	OPERATOR	COMPETENT AUTHORITY	COMMENTS ACTIONS REQUIRED
2	PRE-INCIDENT FIRE PLANNING					
2.1	Plan considers worst case scenario					
2.2	Fire water capability proven					
2.3	Controlled burn strategy documented					
2.4	Foam capability recorded					
2.5	Fire fighting equipment capability proven					
2.6	Fire water demand established					
2.7	Foam demand established					
2.8	Mutual aid/ fire services foam requirements established					
2.9	Foam delivery to site agreed and tested					
2.10	Fire fighting equipment demand established					
2.11	Mutual aid fire fighting equipment requirements established					
2.12	Delivery of equipment agreed and tested					
2.13	Fire water run-off demand established					
2.14	Fire water run-off plans in place					
2.15	Site staff trained to carry out actions in plan and records available					
2.16	Fire services trained to carry out actions in plan and records available					
2.17	Written agreement in place of what the fire services will provide					

	ELEMENTS OF PLAN	EXERCISE DATE	AUDIT DATE	OPERATOR	COMPETENT AUTHORITY	COMMENTS ACTIONS REQUIRED
3	ACTIONS by COMPANY SHOULD AN INCIDENT OCCUR					
3.1	Initiation of off-site plan timely and adequate					
3.2	Notification to neighbours timely and adequate					
3.3	Notification to Emergency Services timely and adequate					
3.4	Any PPE requirements clearly communicated to the Emergency Services					
3.5	Setting up of Major Emergency Control Centre (MECC)					
3.6	Alerting & calling out of staff not on site, systems in place. Tested and recorded					
3.7	Provision of 'fall-back' MECC tested.					
3.8	Key staff in MECC					
3.9	Off-site communications identified and tested					
3.10	Notification to competent authority					
3.11	Dynamic risk assessment of off-site or potential off-site consequences					
3.12	Management of any evacuation from site tested and recorded					
3.13	Emergency services liaison, including meeting at site entrance, directions to scene of incident, etc.					
3.14	Company Representative with adequate knowledge available					

	ELEMENTS OF PLAN	EXERCISE DATE	AUDIT DATE	OPERATOR	COMPETENT AUTHORITY	COMMENTS ACTIONS REQUIRED
4	MAJOR EMERGENCY CONTROL CENTRE					
4.1	Communication System between MECC bronze and Silver command adequate					
4.2	Briefing Procedures / 'time outs' managed well					
4.3	Adequate availability / accuracy of Site plans/maps					
4.4	Adequate technical information supplied to Silver command by company representative					
4.5	Effective sharing and dissemination of information					
4.6	Company response adequate					
4.7	Incident Log updated accurately with key events					
4.8	Effective links with Forward Control					
4.9	Adequate mapping to assist mitigation action(s) and reduce off-site consequences / impact on off-site arrangements					
4.10	Mitigatory action(s) to reduce any adverse effects to the environment					

	ELEMENTS OF PLAN	EXERCISE DATE	AUDIT DATE	OPERATOR	COMPETENT AUTHORITY	COMMENTS ACTIONS REQUIRED
5	ONSITE FORWARD CONTROL					
5.1	Communication Links between agencies adequate and effective					
5.2	Adequate provision of up to date and relevant information to MECC / Emergency Services					
5.3	Adequate technical information supplied to MECC/Emergency Services					
5.4	Effective Liaison with Emergency Services					
6	OFF SITE RESPONSE					
6.1	Rendezvous Points identified clearly, communicated to the Emergency Services and utilised correctly					
6.2	Safe routes identified and used					
6.3	Road closures/traffic management initiated by Silver command					
6.4	Access to site adequately controlled by site gate staff					
6.5	Site gate staff notified of any mutual aid deliveries					

	ELEMENTS OF PLAN	EXERCISE DATE	AUDIT DATE	OPERATOR	COMPETENT AUTHORITY	COMMENTS ACTIONS REQUIRED
7	Adequate activation of and response by:					
7.1	Police					
7.2	Fire Brigade					
7.3	Ambulance					
7.4	Local Authority					
7.5	Harbour Authority					
7.6	Health Authority					
7.7	Hospital(s)					
7.8	Environment Agency					
7.9	Health & Safety Executive					
7.10	Other Agencies eg Food Standards					
8	Availability of additional resources					
8.1	Equipment					
8.2	Staff					
8.4	Communications Strategy					
	ELEMENTS OF PLAN	EXERCISE DATE	AUDIT DATE	OPERATOR	COMPETENT AUTHORITY	COMMENTS ACTIONS REQUIRED
9	Communications:					
9.1	Adequate communication level between Emergency Services and Company					
9.2	Adequate communication level between Emergency Services					
9.3	Adequate communication level between Emergency					

	Service, Local Authorities and other Agencies					
9.4	Adequate communication level between Emergency Services, Control Rooms and Forward Control Posts					

	ELEMENTS OF PLAN	EXERCISE DATE	AUDIT DATE	OPERATOR	COMPETENT AUTHORITY	COMMENTS ACTIONS REQUIRED
10	POST INCIDENT					
10.1	Do Liaison procedures require updating?					
10.2	Mitigation actions to protect the environment implemented and effective					
10.3	Resources available for restoration of the environment					
10.4	Recovery phase within local community					
10.5	Company 'Hot' de-brief carried out with all parties					
10.6	Structured Multi agency debrief carried out					
11	OTHER ISSUES					
11.1	Site Familiarisation Visits: Carried out					
11.2	i. Police					
11.3	ii. Fire Brigade iii.					
11.4	iv. Ambulance v.					
11.5	vi. Emergency Planning / Local Authority					

Recommendation 8 Appendix 1 – Example communications plan

Message: Emergency instructions / tests

AUDIENCE	METHOD	FREQUENCY	REQUIREMENTS	PARTNERS	FEEDBACK
Residents	Direct Mailing	Annual	Letter, Card, Envelope Addresses Lingual translation Large print/Braille	LA and LRF	*X* calls to confirm advice
Residents	Residents forum - evening	Annual	Date, time & location Advertisement Include in annual letter Invites Agenda Speakers	LA Emergency planners, the Emergency services, HPA, EA, local leaders	Changes to be made to card for 09/10
Businesses	Direct Mailing	Annual	Letter, Card, Envelope Addresses Lingual translation Large print/Braille	LA – Business continuity and Emergency planning advice LRF - emergency planning	LA received *X* queries about business continuity
Businesses	Local business forum – breakfast	Annual	Date, time & location Advertisement Include in annual letter Invites Agenda Speakers	LA – Business continuity and Emergency planning advice, Emergency services, HPA, EA, local leaders	
Schools	Visit	Annual		LA - Emergency planning	
Shops	Direct Mailing	Annual		LA – Business continuity and Emergency planning advice	
Wider Community	Press release	Annual			

Recommendation 8 Appendix 2 – Example letter to local householders

COMPANY
SITE NAME
ADDRESS

Dear Occupier

SAFETY INFORMATION FOR *AREA X* RESIDENTS
COMPANY at *SITE* regularly issue information on safety to local householders. I am pleased to enclose your copy of the Emergency Instructions Card/calendar.

This document is important for your safety. Please read it carefully and keep the Emergency Instructions Card in a safe place where you can quickly and easily refer to it should the need arise.

Please make sure that everyone in this building is aware of the emergency alarm and what actions they need to take. Think about what you would have to do and how you would do it in an emergency.

Safety at *SITE*
Safety is the number one priority for the *COMPANY* at *SITE* and we take all reasonable steps to prevent accidents of any type. We have emergency plans in place to minimise the effects of any incident. If necessary, our on-site resources would be supplemented by the emergency services and special provisions made by *X* County Council. More information on the response to emergencies can be found at http://www.ukresilience.gov.uk/response.aspx

Further Information
Call *XXXXX XXXXXX* free to hear a recording of the Emergency Instructions and the alarm sound. You can also leave a message to request a large print version of this leaflet. *CONTACT DETAILS FOR TRANSLATION INTO OTHER LANGUAGES*. Please contact us by *phone/post/e-mail*, if you have any questions or concerns.

Yours sincerely
NAME
POSITION
CONTACT DETAILS incl. E-MAIL ADDRESS
TIME AVAILABLE FOR CALLS

WEBSITE FOR FURTHER INFORMATION

ON THE REVERSE, include the details required under COMAH Schedule 6, covering points 3, 4, 5 and 6.

Recommendation 8 Appendix 3 – Example letter to local businesses

COMPANY
SITE NAME
ADDRESS

Dear Business

SAFETY INFORMATION FOR *AREA X* BUSINESSES
COMPANY at *SITE* regularly issue information on safety to local businesses. I am pleased to enclose your copy of the Emergency Instructions Card.

This document is important for your safety. Please read it carefully and keep the Emergency Instructions Card in a safe place where you can quickly and easily refer to it should the need arise.

As a business you have a responsibility for your staff and customers on sites. You must ensure that all are aware of the emergency alarm and what actions they need to take. In the event of an emergency, access to your premises maybe restricted so it is important that you consider what impact an emergency will have on your business and how it can be minimised through business continuity planning. *NAME, POSTION, LA* will advise you on how to develop your business continuity plan. Please call/e-mail *NAME* on *CONTACT DETAILS*. For further information on business continuity, visit http://www.preparingforemergencies.gov.uk/bcadvice/.

Safety at SITE
Safety is the number one priority for the COMPANY at SITE and we take all reasonable steps to prevent accidents of any type. We have emergency plans in place to minimise the effects of any incident. *X LA* have an emergency plan which covers the response to an emergency by the emergency services, local authority and other organisations to help minimise the effect of an emergency and to keep you informed of what is happening and what to do.

Further Information
Call XXXXX XXXXXX free to hear a recording of the Emergency Instructions and the alarm sound. You can also leave a message to request a large print version of this leaflet. *CONTACT DETAILS FOR TRANSLATION INTO OTHER LANGUAGES*. Please contact us by *phone/post/e-mail*, if you have any questions or concerns.

Yours sincerely
NAME
POSITION
CONTACT DETAILS incl. E-MAIL ADDRESS
TIME AVAILABLE FOR CALLS

WEBSITE FOR FURTHER INFORMATION

ON THE REVERSE, include the details required under COMAH Schedule 6, covering points 3, 4, 5 and 6.

Recommendation 8 Appendix 4 – Example of message on outside of envelope for mailings

COMPANY NAME(S) _AND SITE

To the Occupier

This envelope contains safety information
and your Emergency Instructions Card

Keep this in a safe place
where you can easily refer to it

Updated: *MONTH YEAR*

Recommendation 8 Appendix 5 – Example Emergency Instructions Card - Preferably in form of a laminated A5 leaflet

COMPANY NAME
SITE NAME

Please read this card carefully

If a major accident happens at SITE, you will hear the emergency alarm.

The **alarm** will be a two-tone warble.
The **all clear** will be a single tone.

Make sure everyone in this property know and understand these instructions.

Keep this card in an accessible place and pass onto subsequent occupiers.

Display this card in a prominent place in business/community premises.

Test
The alarm is tested annually on the first Tuesday in October at 2.30pm and again at 7.00pm.

This card is produced in accordance with the Control of Major Accident Hazards (COMAH) regulations to advise you what to do in the unlikely event of a major accident on our premises that could affect you and people near you.
Additional copies may be obtained from:
COMPANY
ADDRESS
CONTACT DETAILS

EMERGENCY INSTRUCTIONS FOR YOUR SAFETY
SITE NAME

GO IN, STAY IN, TUNE IN

1. On hearing the alarm, go inside immediately with everyone and pets
2. Shut all outside doors and windows
3. Pull curtains/blinds across windows facing the SITE
4. Turn off any ventilation system or air conditioning unit that draws in air from the outside.
5. Stay in a room that does not face the SITE.
6. Tune in to **BBC Radio XXX (FREQUENCY)**, which will broadcast information and instructions.
7. Remain indoors until you hear the “all clear” or until you receive instructions from the Police.
8. If children are at school – do not collect them – they will be looked after until it is safe to go outside.
9. Please co-operate with the emergency services and follow their instructions
10. An ‘all clear’ will be given when it is safe to go outside

For your safety, access to the area will be restricted during a major accident.

If you hear the emergency alarm, call XXXXX XXXXXX to hear a tape recording of these instructions and to confirm the sound of the alarm is not a test.