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Consulting Engineers Limited

Portland Energy Recovery Facility

Powerfuel Portland Limited

Fire Prevention Plan

ENGINEERING CONSULTING

Document approval

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Contents

1 Introduction

Powerfuel Portland Limited (Powerfuel) is proposing to build the Portland Energy Recovery Facility (the Facility) at a site within Portland Port on the Isle of Portland, Dorset.

The Facility will incinerate refuse derived fuel (RDF) produced from domestic (municipal solid waste) and commercial & industrial (C&I) non-hazardous waste.

This document and the measures to mitigate the risk and impact of fires within the Facility have been (and will continue to be) developed in accordance with the requirements of the following:

- Environment Agency guidance note *'Fire Prevention Plans: Environmental Permits',* Updated 4th May 2018;
- Building Regulations – *Approved Document B (Fire Safety)*;
- ACE Technical Risks, Engineering Information Bulletin, *Guidance document Energy from Waste (EfW) – Fire Systems Issue 4.0* (27 June 2017);
- National Fire Protection Association *'NFPA 850: Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations'*, 2015 Edition; and
- the insurer's requirements where structures or equipment fall outside published guidance or recommended practice.

1.1 Project Description

A detailed description of the Facility is presented in section 1.4 of the Supporting Information.

The Facility would be a single stream waste incineration plant with a nominal capacity of 183,000 tonnes per annum for the processing of mixed municipal non-hazardous and residual wastes, The Facility will export electricity to the National Grid as well as providing ship-to-shore power to boats which dock in the harbour. Furthermore, the Facility will have the potential to export heat to local heat users.

1.2 Objective

The objective of this report is to provide a preliminary Fire Prevention Plan (FPP) for the Facility, identifying the provisions which have been taken into account during the development phase of the Facility. In addition, provisional operational measures have been identified where these are available. This report will be subject to review following completion of the detailed process design. Detailed process design would be programmed following final contract negotiations with the Engineering Procurement and Construction (EPC) contractor who will be undertaking the construction works. The Facility is expected to take up to three years to design, build, commission and commence full operational status.

The requirements of the FPP will be integrated within the emergency plans and procedures for the Facility to ensure that they are consistent and compatible with other management systems associated with the operation of the Facility.

A suite of emergency procedures for the Facility will be written and included in the training package for all staff and contractors. Training of site operatives will commence approximately 6 months prior to commencement of commissioning of the Facility, and all operational personnel will be tested on the fire prevention and emergency procedures.

2 Site Location and Description

2.1 The Site

The site is located on the north eastern coast of the Isle of Portland, approximately 600 m east of the village of Fortuneswell. The site lies within the port and is not publicly accessible. Vehicular access is from the west, through the main Portland harbour complex, via Castletown, Castel Road, Lerret Road and A354.

The site is bordered to the southwest by Incline Road, which is a private road within the port that is actively used by port traffic, and a former railway embankment. Cliffs supporting grassland, scrub and woodland habitats lie to the southwest of the embankment and rise steeply to approximately 125 m above ordnance datum (AOD). Her Majesty's Prison The Verne is approximately 430 m to the south west of the site at the top of the steep slope. The eastern site boundary is formed by the shingle shoreline and overland fuel pipes from Portland Bunkers, which are fuel bunkers in the nearby cliffs used for marine bunker fuel supply. Existing operational port development lies to the north and northwest of the site.

Portland and its harbour were designated as HM Naval Base Portland in 1923. From 1958, Portland was home to Flag Officer Sea Training. During this time, the site was dominated by a weapons research establishment building in the southeast, with other buildings dedicated to mechanical repair facilities for military vehicles. The naval base and two major weapons research establishments were closed in 1995/96 and Portland Port Ltd began the transformation of the harbour into a commercial port. The buildings on site have been demolished to create cargo storage space when they were not used by tenants. In 2016/17, the main road leading to Incline Hill was realigned along the base of the hill / scree, creating the open development area on site. The land has since been cleared and is regarded as 'brownfield' land.

2.1.1 The Activities

The activities covered by this EP application are as follows:

1. single line waste incineration plant processing incoming waste which is delivered to the site from off-site via road or ship;
2. generation of power and export to the national grid, and the potential to export heat;
3. production of inert bottom ash material that will be transferred off-site to a suitably licensed waste treatment facility for recovery or disposal; and
4. generation of an air pollution control residue that will be transferred to a suitably licensed hazardous waste facility for disposal or recovery.

Table 2-1 lists the Schedule 1 activities, from the Environmental Permitting Regulations, and the Directly Associated Activities (DAA's).

Table 2-1: Scheduled and directly associated activities

Type of Activity	Schedule 1 Activity	Description of Activity
Installation	Section 5.1, Part A, (b)	The incineration of non-hazardous waste in a waste incineration plant or waste co-incineration plant with a

Type of Activity	Schedule 1 Activity	Description of Activity
		capacity exceeding 3 tonnes per hour.
Directly Associated Activities		
DAA		The export of electricity to (i) the National Grid and (ii) to local businesses at the port and ships visiting the port (via "shore power" apparatus) and potential to export heat to local heat users.
DAA		Standby electrical generation to provide electrical power to the plant in the event of an interruption in the supply.
DAA		The receipt, storage and handling of non-hazardous waste prior to incineration.
DAA		The handling, storage and transfer off-site of residues.

The Facility includes a single waste incineration lines, waste reception hall, main thermal treatment process, turbine hall, on-site facilities for the treatment or storage of residues and waste water, flue gas treatment, stack, boilers, devices and systems for controlling operation of the waste incineration plant and recording and monitoring conditions.

In addition to the main elements described, the Facility will also include weighbridges, water, auxiliary fuel and air supply systems, site fencing and security barriers, external hardstanding areas for vehicle manoeuvring, internal access roads and car parking, transformers, grid connection compound, firewater storage tanks, offices, workshop, stores and staff welfare facilities.

The nominal operating capacity of the Facility will be approximately 22.8 tonnes per hour of waste, with a nominal calorific value of 11 MJ/kg. The Facility will have an estimated availability of around 8,000 hours.

2.2 Site Plans & Drawings

Included in Appendix A of this report are the:

- site location plan (Appendix A.1);
- Installation boundary drawing (Appendix A.2);
- Materials storage areas plan (Appendix A.3);
- Access points around the perimeter to assist fire-fighting (Appendix A.4);
- Indicative locations of fire hydrants (Appendix A.5);
- Indicative locations of fire walls (Appendix A.6); and
- Firewater Supplies and firewater containment. (Appendix A.7).

As stated in section 1.2, detailed process design will be undertaken following final contract negotiations with the EPC contractor. Therefore, the information in relation to some of the drawings identified above must be considered to be indicative until detailed design has been completed. Following completion of detailed design, the following drawings would be included within the updated FPP;

- the location of drain covers and any pollution control features such as drain closure values and firewater containment systems;
- site drainage plan;
- the location of gas cylinders; and
- the location of plant, protective clothing and pollution control equipment and materials.

Wind roses indicating the direction of prevailing winds for the Facility from 2014 to 2018, as taken from the Isle of Portland, are presented in Appendix B.

2.3 Key Receptors

The key receptors which could be impacted by a fire at the Facility are presented in the following table:

Table 2-2: Fire Prevention Plan Receptors

Receptor Name	Location (at closest point to the installation)		Distance from the stack (m)
	X	Y	
Industrial Building on Inner Breakwater Road	369763	74289	161
Industrial Building 1 on Old Depot Road	369650	74309	75
Industrial Building 2 on Old Depot Road	369626	74318	73
Industrial Building 1 between Old Depot Road and Incline Road	369546	74262	63
Industrial Building 2 between Old Depot Road and Incline Road	369522	74263	86
Industrial Building on Balaclava Road	369820	73989	335
Industrial Building between Main Road and Rotherham Road	369410	74294	202
Residential Building on Castletown	368884	74355	731
Industrial Building off Ayton Drive	368914	74254	693

Receptor Name	Location (at closest point to the installation)		Distance from the stack (m)
	X	Y	
Residential Building on Leet Close	368985	74136	632
Residential Building on Amelia Close	369050	74049	591
Commercial Building off Verne Common Road	369296	73874	486
Industrial Building off Incline Road	369739	73832	436

3 Fire Prevention

3.1 Waste Storage

3.1.1 Waste Reception Area

Waste will be delivered to the Facility as both baled waste and 'loose' RDF, and depending on what form the waste is delivered, there will be separate arrangements for the storage of the incoming waste. To allow for the different forms which incoming waste will be delivered, the Facility will have separate storage areas for the incoming waste – bale storage area and the waste bunker area. The waste reception area will include the tipping hall, bale storage area and the waste bunker area

The non-hazardous waste types to be treated at the Facility, are presented in Table 3-1:

Table 3-1: Waste to be processed in the Facility

EWC code	Description of waste
19	**WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE**
19 12	**wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified**
19 12 10	combustible waste (refuse derived fuel)

Upon arrival at the Facility, delivery vehicles will be weighed and periodically inspected at the gatehouse before being directed to the Waste Reception Area. The Waste Reception Area will be a fully enclosed building, maintained under slight negative pressure to ensure that no odours, dust or litter can escape the building.

Incoming baled waste which is delivered by ship will be offloaded at the 50 tonne berth on the Inner Breakwater, to the north east of the Facility (or other berthing locations as directed by the Port) and transferred to the Facility by HGV. The baled waste will be unloaded from the HGV via a dedicated crane and transferred to the bale storage area. The baled waste will be regularly transferred to the waste bunker, via an overhead crane which will transfer the baled waste from the storage bay to a 'de-baler'. The de-baled waste will then be conveyed to the waste bunker via a dedicated conveyor within the building.

Incoming waste which is delivered via road will be tip into the waste bunker. The waste bunker area will consist of a double bunker arrangement, with a shallow pit (referred to as the waste bunker) which will be used for the unloading of waste deliveries via road and also for the de-baled waste, before being transferred to the waste storage bunker for storage prior to processing within the ERF.

3.1.1.1 Bale storage area

The bale storage area will have a storage capacity of approximately 3,000 m^3, and will be made up of 8 separate bays with fire walls separating each bay. Each bay will have a storage capacity of no more than 450 bales. The incoming baled waste, which will be wrapped off-site for transport, will be stacked in rows up to 4 bales high and 2 bales wide, equivalent to 4 m x 2 m.

A plan showing the location and layout of the waste reception and bale storage area is presented in Appendix A.3.

Documented management procedures will be adopted to ensure that the waste within the bale storage area is rotated and is not stored for extensive periods. Bales will be transferred from the bale storage area using a dedicated crane system for de-baling, the de-baled waste being conveyed to waste bunker. In the event of failure of the crane, a back-up forklift truck system will be available which can be used to transfer the baled waste from the bale storage area to the de-baler.

The baled storage area is designed with a number of storage bays, with fire walls being located between the bays. Water cannons will be installed around the perimeter of the bale storage area, refer to Section 4.8.6. The roof steelwork above the baled storage area will be protected with water sprinklers in the event of a fire. These measures are in in accordance with the requirement of NFPA and insurers for facilities which combust waste.

Thermal imaging cameras will be fixed around the perimeter of the bale storage area to provide the crane driver with a continuous thermal 'map' of the area, refer to section 4.8.2. The crane driver will, therefore, be able to identify and react to hot areas in the bale storage area and use the firewater cannons to extinguish any smouldering/burning waste.

3.1.1.2 Waste storage bunker

Loose RDF is delivered by road vehicle and tipped into the waste bunker. Furthermore, de-baled waste will be conveyed into the waste bunker. All waste which is deposited in the waste bunker will be transferred via gantry crane into the waste storage bunker. This will occur on a continuous basis, and waste will not be 'stored within the waste bunker.

The storage capacity of the waste storage bunker will be approximately 2,700 tonnes. A plan showing the location of the waste reception and bale storage is presented in Appendix A.3.

Bunker management procedures will be adopted to ensure that there is a constant turnover of waste within the waste storage bunker, preventing hotspots or anaerobic conditions within the bunker. The crane will be sized to allow for mixing and rotating the waste within the waste storage bunker, whilst providing appropriate quantities of waste within the feed hopper to maintain operation of the waste combustion process. The regular 'turning over' of the contents of the waste storage bunker, including the regular introduction of 'new' waste from the waste bunker, will ensure that waste does not accumulate within the lower levels of the bunker. The size of the crane will ensure that the mixing of waste is feasible in relation to the amount of waste present in the waste storage bunker. The crane operator will be trained in careful waste handling and crane operation as to maintain the integrity of the waste bunker and the waste storage bunker.

In the event of an unforeseen shutdown of the Facility, a facility has been included within the design which will allow for back-loading of waste from the waste storage bunker to road vehicles for transfer off-site to a suitably licensed waste management facility.

With respect to the potential volume of firewater required, this would be considerably less than the total potential (or 'airspace') volume of the bunker i.e. reduced by the volume taken up by waste at the time of a potential fire.

The waste bunker area is designed with a minimum of 2-hour fire resistance rating. Thermal imaging cameras and water cannons will be installed to scan for areas of hotspots within the waste bunker area (refer to Section 4.8.6). The roof steelwork above the waste bunker area will be protected with water sprinklers in the event of a fire. These measures are in in accordance with the requirement of NFPA and insurers for facilities which combust waste.

Thermal imaging cameras will be fixed around the perimeter of the bunker to provide the crane driver with a continuous thermal 'map' of the bunker, refer to section 4.8.2. The crane driver will, therefore, be able to identify and react to hot areas in the bunker and undertake mixing or feeding

of waste as appropriate, or, in extreme cases, use the firewater cannons to extinguish any smouldering/burning waste. In addition, there would be flame detectors located above the waste feed hoppers, with an associated deluge system.

It should also be noted that the waste bunker will be designed and constructed as a water retaining structure to protect against the leak of contaminated firewater, and to minimise the risk of emissions of pollutants to groundwater. The reinforced concrete floor and walls of the bunker will be of sufficient strength as to maintain integrity in the event of a fire.

3.1.2 Quarantine area for unacceptable waste

Unacceptable waste is waste which does not meet the requirements of the waste specification and waste acceptance procedures for the Facility, refer to section 4.1, or other waste which is unsuitable for incineration and/or not compliant with the EWC codes permitted by the EP, refer to Table 3-1.

A suitable area for the quarantine of unacceptable waste will be designated as part of the detailed design stage. However, it is anticipated that it will be located within the maintenance area for the crane. This area is segregated from all waste facilities with 2-hour rated fire walls.

The quarantine area will be designed to enable unacceptable waste to be segregated from all other incoming waste, allowing it to be collected and loaded into appropriate road vehicles for transfer off-site. It will be used to temporarily store any unacceptable waste (which has been detected prior to being tipped into the waste bunker or identified by the crane driver and removed using the waste crane grab) prior to transfer off-site. The quarantine area will have sufficient storage capacity for the storage of more than 50% of the largest waste delivery.

Appropriate fire detection and protection measures, including a deluge system, will be installed in the quarantine area. The final design of the quarantine area will be subject to detailed design and agreed with fire risk insurers.

Additionally, for unacceptable waste identified within the waste bunker, it will be able to be back-loaded from the bunker for examination and/or removal from the site to a licensed disposal facility.

3.1.3 Incinerator Bottom Ash

Bottom ash from the waste incineration process will be transferred to the IBA storage area. The size of the IBA storage area will be subject to detailed design, but it is estimated that it will have a capacity to store approximately 4 – 5 days of IBA, this is equivalent to approximately 510 tonnes of IBA.

3.1.4 Air Pollution Control Residues

Air Pollution Control residues (APCr) will be stored within silo(s). The design of the silos is subject to detailed design, however it is expected that the capacity of the storage will be approximately 95 tonnes of APCr which is equivalent to 4 – 5 days of storage. The silos will be elevated above-ground level so that APCr can be discharged into road tankers from above. Removal of the APCr will be by sealed tankers, with telescopic chutes used to discharge the APCr into the road tankers.

3.2 Storage Duration

3.2.1 Waste Reception Area

3.2.1.1 Bale Storage Area

The storage capacity of the bale storage area will have the equivalent storage to a maximum of up to 30 days of storage. Therefore, the maximum period of time which waste will be retained within the bale storage area will be up to 30 days. Bales will be transferred from the bale storage area to the bunker for processing on a continuous basis. The baled waste storage area would be subject to an electronic stock rotation system with the bales being recorded on a bay-basis. This will ensure that the bales are processed on a 'First-in-First-out' basis to prevent the waste from being stored for extensive periods. It is anticipated that the typical period that baled waste will be stored within the bale storage area will be between 5 - 10 days prior to transfer to the waste bunker.

The quantity of waste stored within the bale storage area would be significantly reduced prior to a planned shut-down, with deliveries of baled waste being reduced prior to the shutdown, and the waste within the bale storage area being transferred to the waste bunker for processing.

All deliveries of waste would be halted during periods of shutdown.

3.2.1.2 Waste Reception Area

The storage capacity of the waste storage bunker is equivalent to up to 3 days of waste processing capacity. However, the quantity of waste stored within the waste storage bunker would be significantly reduced prior to a planned shut-down.

The waste in the waste bunker will be continuously turned and mixed with 'new' incoming waste, which will ensures that 'old' waste is not 'buried' within the waste storage bunker.

All deliveries of waste would be halted during periods of shutdown.

3.2.2 Quarantine Area for Unacceptable Waste

The quarantine area will be used for the inspection and storage of unacceptable waste. After inspection and verification, depending on whether the waste was deemed unacceptable or not, the waste will either be:

- transferred to the waste bunker; or
- transferred off-site to a suitably licensed waste management facility.

3.2.3 Incinerator Bottom Ash

The IBA storage area will have sufficient capacity for the equivalent of 4 – 5 days of storage, assuming that the Facility operates continuously at the nominal design capacity.

3.2.4 Air Pollution Control Residues

APCr would be stored in silos. The APCr silos will have sufficient capacity for the equivalent of 4 – 5 days of storage, assuming that the Facility operates continuously at the nominal design capacity.

3.3 Monitoring of Stores for Waste and Recovered Materials

In accordance with the waste acceptance procedures, which will be developed for the Facility prior to commencement of operation, the unloading of all waste deliveries will be supervised by operational staff.

CCTV will be installed in all areas where waste delivery vehicles unload waste within the waste reception area, and also all areas where wastes and recovered materials are discharged from the processes. The design of the CCTV systems would be undertaken during detailed design of the Facility.

Within the Facility, the baled storage area and waste bunker will be continuously monitored by the fully automatic thermal imaging system linked to the water cannons. During daytime operation, the waste bunker will be visually monitored by control personnel. At night time, the control personnel will visually monitor the thermal imaging system as part of their responsibilities for operating the Facility.

3.4 Actions to Limit Self-Heating

3.4.1 Waste Reception Area

3.4.1.1 Bale storage area

The thermal imaging cameras will be used to identify hotspots within the bale storage area. In the event that hot spots are identified the bales can be removed via the crane or fork-lift truck and either transferred to the de-baler and bunker for processing; or they can be transferred to the quarantine area.

3.4.1.2 Waste storage bunker

During operation, the turning of waste within the bunker is standard practice at UK plants that combust waste. As well as helping to mix the waste (to produce a more homogenous fuel which is better for control of the combustion process), it helps to prevent the formation of hotspots. Turning helps to release heat that has built up in the waste. By taking grabs of waste and then spreading over a wider area, turning dissipates entrained heat and removes thermal inertia within the waste. It also increases the evaporation of water, which is a heat absorbing process. These factors help to minimise the risk of self-heating and ignition. In addition, mixing the waste with the crane enables waste from the base of the bunker to be brought to the surface.

In extreme cases, if the heat does not dissipate as expected, the firewater cannons or sprinkler system will be used to extinguish any smouldering/burning waste, with the cannons providing the principal method of extinguishing the smouldering/burning waste.

Prior to periods of extended plant shutdown, the volumes of waste within the waste bunker will be reduced with the bunker being ‘empty’ during periods of planned shutdown. During the planned shutdown, assumed to be annual, deposits/residues retained within the base and corners of the bunker will be removed, as far as practicable, and processed when the Facility starts-up.

3.4.2 IBA Storage

Due to the high thermal temperatures in which the IBA has been combusted, it will not be expected to contain any combustible materials which are able to self-combust from the elevated temperatures within the IBA.

3.4.3 APCr Storage

The APCr is not expected to contain any combustible materials which would self-combust from elevated temperatures within the APCr.

3.5 Contingency

In the event that the Facility is not able to receive waste due to an unplanned incident forcing a full shutdown of the Facility, incoming waste will be diverted to a suitably licenced waste management facility.

If there is a significant fire, which requires a full shutdown of the Facility, the Facility will not restart operations until the relevant regulatory authorities (Fire Service, Health and Safety Executive, Environment Agency, etc.), as well as the fire insurers, have advised that it is safe to do so. During a complete shutdown of the Facility, the fire detection systems will remain operational. The thermal imaging cameras for the waste storage bunker and baled waste storage area will be set with two trigger alarms at different temperatures within the waste receptions areas, with the fire water cannons activated if the high-high temperature alarm is reached (refer to section 4.8.2).

Dependent on the nature and scale of any incidents, it may be necessary to notify local residents and businesses of the incident. Prior to commencement of operation of the Facility, and as part of the development of the documented management systems associated with the operation of the Facility, communication procedures will be developed and implemented.

For periods of planned maintenance, the waste levels within the bunker would be maintained to ensure that the quantities of waste within the bunker can be combusted. Prior to the planned shutdown of the Facility, waste deliveries will be diverted to alternative waste management facilities, and the waste within the bunker will be combusted to minimize the quantity of waste remaining in the waste bunker area prior to the shutdown commencing. This will ensure that there is only a small residue in the waste storage bunker during the period of shutdown.

The temperature of waste in the waste storage bunker would continue to be monitored by the thermal imaging system during a planned shut-down. Therefore, the crane operators or the control room would be able to continue to mix waste to prevent excessive temperatures in the bunker, or if necessary, use the fire-fighting cannons.

If the Facility was not available due to a period of extended unplanned maintenance, facilities will be provided for the waste within the waste bunker area to enable waste to be back-loaded from the bunker for transfer off-site to a suitably licensed waste management facility. Extended unplanned shutdowns would rarely exceed 14 days, after which waste will begin to be removed from the Facility, based upon the status of operation.

3.6 Seasonality

The operation of the Facility is not expected to follow any seasonal variations in the demand for incoming wastes to be treated or the resulting residues generated.

3.7 Arson or Vandalism

Security measures will prevent access by members of the public and thereby prevent the risk of arson attacks or vandalism.

As the Facility is located within a working Port complex, it is not possible to provide security fencing around the perimeter of the site. However, the Port complex is as area of private land enclosed with security fencing. The Port complex has a dedicated 24-hour security/police force on site at all times which operates the gatehouse restricting access to the complex, as well as undertaking regular security patrols across the complex on a 24-hour basis. Security at Portland Port complies with government regulations concerning port and maritime security and has site-wide CCTV coverage and recording. Pedestrians and vehicles cannot access the complex without approval from the gatehouse.

In addition to the gatehouse, there will be an access control system for vehicles to access the Facility. Access barriers will be provided on the roadways to access the Facility, with vehicle access only being obtained via approval access cards or via intercom to the Control Room. Only authorised vehicles will be able to access the Facility.

All external doors will be locked, with an intercom system to the Control Room being required to obtain access to main the building and office areas. Therefore, only authorised personnel and visitors will be able to access the buildings.

The Facility will be operational and manned 24 hours a day, 7 days a week. The gatehouse for the Port will be manned 24-hours by the site security. The CCTV system will also be monitored by the facilities operational staff. The Port Authority will be responsible for security on the site, including delivery vehicles as they travel around the Port.

Emergency response procedures will be developed for the Facility, prior to the commencement of operations, as part of the detailed Environmental Management System (EMS). The procedures will detail the response to a number of different emergency situations on site, including unauthorised personnel accessing the Facility.

3.8 Plant and Equipment

An operating and maintenance manual (O&M manual) will be developed and completed through the commissioning phase of the installation. The O&M Manual will set out detailed operating and maintenance instructions for all the plant and equipment which requires maintenance.

Maintenance procedures and work instructions will be developed to cover all plant and equipment within the Facility. As part of such work instruction development, the risk of fire will be considered, and appropriate activities included within the work instruction to reduce the risk of fire in all plant and equipment.

As part of the maintenance system, responsibilities for retaining records of all maintenance undertaken and any actions taken following a problem will be defined.

3.9 Infrastructure and Site Inspections

Regular site inspections will be undertaken which will cover all operational areas as part of the normal operating procedures. Records of site inspections will be retained on-site. Inspections will be carried out on a continuous basis, but as a minimum an inspection of the main operational areas will be carried out during every operating shift with maintenance work instructions raised for any items identified.

3.10 Electrical Faults

The risk of electrical faults on site will be minimised by the use of qualified electricians and will comply with the relevant British Standards for the design and installation of electrical equipment and supplementary bonding/earthing.

Electrical equipment will be checked and maintained as part of the planned maintenance regime as required in the detailed operating manuals for each piece of equipment.

3.11 Ignition Sources

A review under the Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) will be completed during the detailed design of the Facility, with any risk areas identified on DSEAR zonal drawings.

Vehicles and electrical items necessary for the operation of the Facility will be regularly inspected for electrical faults. All mobile plants serving the Facility will be fitted with fire extinguishers and dust filters.

Naked sources of ignition will be controlled through a hot work management system. This system will cover both staff and contractors working at the Facility. The hot work management system will also include requirements to train and authorise 'hot work risk assessors' for the purposes of eliminating, reducing and managing the risks associated with hot work. The hot work system will include for a period of fire watch following the hot works being undertaken.

As part of the hot work management system, the potential for sources of ignition to cause fires will be managed on a case-by-case basis. Where feasible, the guidance of keeping all sources of ignition at least 6 metres away from any combustible or flammable waste would be followed as part of this management system. This will include ensuring that mobile plant storage locations will be stored at least 6 metres away from combustible wastes. It should be noted that the location of mobile plant storage locations is subject to detailed design of the Facility.

The guidance of keeping sources of ignition at least 6m away from any combustible or flammable waste will be followed as part of this management system. Potential sources of ignition are covered in more detail below.

3.12 Industrial Heaters

It is currently not expected that industrial heaters will be installed at the Facility, however, this will be confirmed during detailed design. If applicable, the hot work management system would be extended to include the use of industrial heaters and the necessary safeguards required in each instance would be assessed and implemented to ensure their use is safe.

3.13 Leaks and Spillages of Oils and Fuels

Emergency response procedures will be developed as part of the emergency procedures for the Facility. The procedures will include actions to be undertaken to respond to spills and leaks of chemicals. This will include actions to be undertaken to prevent liquids leaking or trailing from site vehicles.

3.14 Build-up of Loose Combustible Waste, Dust and Fluff

The Facility would be designed to prevent the accumulation of dusts by designing structural members such that their shape or method of installation minimizes the surface area where dust can settle.

As part of the detailed design of the Facility, the control of dust and fluff will be considered. This includes:

- the use of an enclosed fuel reception/unloading building under negative pressure with air extraction;
- mechanical ventilation of waste storage areas to prevent fugitive emissions from the building façade; and
- electrical panels will be located away from inherently dusty areas. The panels will be enclosed and sealed.

These systems will be checked as part of the planned maintenance regime as required in the detailed operating manuals for each piece of equipment.

Initially it is proposed to undertake site wide inspections on a monthly basis, to identify the build-up of loose combustible waste, dust and fluff. Where inspections identify that there has been a build-up of loose combustible waste, dust and fluff, appropriate cleaning will be undertaken to clean this material from the surfaces.

Therefore, it is proposed to undertake annual inspections of these areas as part of the annual maintenance regime.

In the event that inspections identify a regular build-up of loose combustible waste, dust and fluff in certain areas of the Facility, the frequency of inspections will be increased.

3.15 Hot Exhausts

A fire watch system will be implemented to detect signs of fires from dusts settling on hot exhausts. This would be developed as part of the operating procedures. This will include daily visual checks of dusts settling on hot exhausts as part of the operational checks by operational staff for each shift.

3.16 No Smoking Policy

A no smoking policy will be adopted and implemented at the Facility. Smoking will be prohibited in operational areas. External areas designated for smoking within the Installation Boundary will be identified, with suitable facilities provided for staff.

3.17 Heat and Spark Prevention

A review under the Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) will be completed during the detailed design of the Facility, with any risk areas identified on zoning drawings.

3.18 Gas Bottle and Other Flammable Items

Gas cylinders will be stored within purpose-built dedicated storage facilities. All facilities for the storage of gas cylinders will be kept locked/secured. The location of gas cylinder storage and other flammable items will be subject to detailed design. A plan showing the location of gas storage

facilities and other flammable items will be included in Appendix A upon completion of detailed design.

A system for the regular inspection of gas storage facilities will be developed as part of the operating and maintenance procedures and the site inspection regime.

3.19 Fire Watch

Operational staff will be briefed on the need for monitoring for the early signs of fires. The waste bunker and all main process areas will have CCTV to allow remote monitoring from the control room and by the crane operator on a continuous basis.

All waste delivered to the Facility will be supervised by operational staff, who will be responsible for the inspection and monitoring of waste deliveries.

3.20 Smoke/Heat/Flame Detectors

The choice of fire detection system (smoke/heat/flame and carbon dioxide detectors) to be installed within the Facility is subject to detailed design. However, it can be confirmed that the fire detection systems will be covered by a UKAS-accredited third-party certification scheme. This will be confirmed prior to the commencement of commissioning of the Facility.

Suitable detection systems will be installed in each area dependant on the fire risks associated with the area. A plan showing the location of the fire detection system in each area will be presented in Appendix A upon completion of detailed design.

4 Management and Storage of Waste

4.1 Unacceptable Waste/Hot Loads

Waste supply contracts will be agreed with waste suppliers/producers, which will include specifications for the supply of incoming waste. The waste specifications will require that the fuel has been pre-processed with incompatible and unstable wastes, such as batteries and other unacceptable materials, being removed from the incoming waste at the pre-processing facility. Whilst this will limit the likelihood of unacceptable wastes being transferred to the Facility, the Operator will also undertake periodic checks/audits of waste suppliers to ensure that the waste is being pre-treated to ensure that it is in accordance with the required waste specifications.

Waste acceptance procedures will be developed for the Facility. These will include considerations for unacceptable wastes and hot loads.

Upon arrival at the waste reception area and unloading of the waste, it will be subject to inspection by operational staff. Loads which are identified as containing unacceptable waste, including hot loads, will not be accepted at the Facility. Furthermore, if unacceptable waste is identified within the baled storage area and bunker it would be able to be removed from the bunker using the crane grab. Unacceptable wastes, including hot loads, will be transferred to a dedicated quarantine area (refer to sections 3.1.2, 3.2.2 and 4.5).

Where feasible, unacceptable waste will be returned to the waste processing facility which has transferred the waste to the Facility.

4.2 Waste Acceptance – Permitted Waste

Prior to commencement of operations, waste acceptance procedures will be developed and implemented for the Facility. This fire prevention plan will be updated following development of the procedures. The procedures will include arrangements for the management of wastes which are permitted to be treated.

4.3 Waste Storage – Separation Distance

Following previous discussions with the Environment Agency, it is understood that the storage requirements relating to pile separation distance only applies to external storage of wastes. As detailed in section 3.1, all wastes which are delivered or stored within the Facility will be within enclosed buildings.

As explained in section 3.1.1.1, the baled storage area will be divided into 8 separate bays. Furthermore, as detailed within section 4.4, fire walls will be installed to minimise the spread of fire between the separate bays.

4.4 Fire Walls

Suitable fire walls will be installed within the appropriate areas within the Facility. The location and specification for fire walls would be subject to detailed design of the Facility, and dependent on the layout as proposed by the EPC contractor. Therefore, at this stage it is not feasible to provide a layout drawing showing the location of all fire walls. A drawing showing the indicative location of the known fire walls is presented in Appendix A.

Subject to the location of the process equipment, operational areas would be segregated into fire zones (the "Fire Zones"). In accordance with NFPA 850, certain specific Fire Zones such as the waste bunker and boiler hall, as well as within the baled waste storage area, will be separated from each other by fire barriers with a minimum of 2-hour fire resistance rating, spatial separation, or by other approved means. The specific Fire Zones to which this applies, and the means of separation will be subject to agreement with the fire risk insurers.

As part of the detailed design process, a fire risk assessment will be undertaken for each Fire Zone to identify the appropriate fire detection and protection systems in association with appropriate civil work design principles to control:

- the risk of fire propagation;
- the spread of fumes and smoke;
- firewater flooding; and
- to maintain the integrity of dedicated fire partition walls in the event of fire.

The fire zoning will be subject to the agreement of Powerfuel and the fire risk insurers.

The dividing wall between the waste reception area and the boiler hall will be suitably constructed in concrete, block work or a suitably rated cladding system up to roof level to form a continuous 2-hour fire rated barrier for the full width and height of the building structure. In addition, the base of the waste bunker area and the bale storage area will be constructed of reinforced concrete, and the waste bunker area has been designed as a water retaining structure. Any doors within the dividing wall between the waste reception area and the boiler hall will be fire rated. The structural design and construction of this dividing wall will be such that the integrity of the fire barrier is maintained in the event of the collapse of the roof of the waste reception area due to a fire in the waste reception area. The walls and the base of the waste storage bunker will be resistant to crane grab impact and the impingement of water cannon jets. Therefore, the structure of the waste storage bunker itself will have adequate fire resistance.

The fire walls separating the bays within the baled waste storage area will provide a 2-hour fire rated barrier between the adjacent bays. The thermal imaging cameras located on top of the fire walls will continually monitor the temperature of the bales within the bale storage area and identify hotspots. The bales will then be removed via the crane or fork-lift truck and either transferred to the de-baler and bunker for processing; or they can be transferred to the quarantine area.

Any exposed steel columns located at the front of the waste bunker and the waste storage bunker will be protected against structural damage caused by fire or mechanical damage. This protection will be provided by concrete encasement or other acceptable means and will extend from the base of the column to the level of the waste feed hopper.

All openings in fire barriers will be provided with fire doors, including (if feasible) airlock systems, fire dampers, penetration seals (fire stops), or other approved means having a fire protection rating consistent with the designated fire resistance rating of the barrier. Windows in fire barriers (e.g. control rooms, observation windows, computer rooms, etc.) will be provided with appropriate fire protection to maintain the integrity of the fire barrier, e.g. by means of a fire shutter, automatic water curtain, window sprinkler system, etc. All cable trays or piping systems passing through fire barriers will be fitted with fire stops.

The fire walls separating the bays within the baled waste storage area will provide a 2-hour fire rated barrier between the adjacent bays. The thermal imaging cameras located on top of the fire walls will continually monitor the temperature of the bales within the bale storage area and identify hotspots. The bales will then be removed via the crane or fork-lift truck and either transferred to the de-baler and bunker for processing; or they can be transferred to the quarantine area. A

freeboard will be retained at the top and sides of the fire walls to prevent the spreading of fire between the storage bays. In addition to the firewalls separating the individual bays, the individual bays will be separated with removable fire curtains located above the fire walls which will provide additional separations whilst allowing the crane to access the storage areas.

In addition, the glass partition in the control room/crane cabin will be 2-hour fire rated, and hence resistant to fire. The site staff will therefore be able to continue operating the crane for a limited amount of time in the event of a fire, depending on severity.

4.5 Quarantine Areas for Unacceptable Waste

As stated in section 3.1.2, a suitable area for the quarantine of unacceptable waste will be designated as part of the detailed design stage. However, it is expected that it will be located within the tipping hall. In addition, where appropriate, the quarantine area will be in accordance with the requirements of the fire prevention plan (FPP) guidance, i.e. it will:

- hold at least 50% of the volume of the largest pile (excluding the bunker), row or row of baled waste within the bale storage area; and
- where practicable, have a separation distance of at least 6 metres around the quarantined waste.

Following completion of detailed design, plans showing the location of all quarantine areas will be developed. The plans will show the size of the quarantine area, clearance areas around the perimeter, and the associated fire detection and suppression infrastructure associated with the quarantine areas.

Fire detection and protection measures (e.g. smoke / flame detectors, hose reel, sprinklers, or water cannon) will be installed in this area, the final design being subject to the recommendations of the final fire strategy completed during the detailed design phase of the project and agreed with the fire insurers.

4.6 Storage within Buildings

The detailed arrangements for waste storage are explained within section 3.1, but it can be confirmed that all incoming wastes and residues generated by the Facility will be stored within buildings.

As part of the detailed design and construction of the Facility, the fire system design will be designed and installed by a suitably qualified and experienced fire engineering company, which employs appropriately qualified persons. The system will be developed in accordance with NFPA 850 (the recognised industry standard, in the UK, for fire protection systems for power generating facilities), the local fire officer, the fire risk insurers and any relevant standards and codes of practice. Where appropriate, waste storage areas will be designed with automatic fixed fire detection and suppression systems to enable a fire to be supressed in less than 2-hours.

4.7 Shutdown

The duration of planned shutdowns will vary significantly, dependent on the nature of the work required, and typically will not extend beyond two weeks. The nature of a planned shutdown allows the Facility to minimise waste deliveries prior to the shutdown. During periods of shutdown, the waste within the waste storage bunker will be maintained at suitable levels. Facilities will be in place to back-load waste from within the waste storage bunker for transfer off-site to a suitably licensed waste management Facility. In the event that the Facility is not able to receive waste, due to an

unplanned incident forcing a full shut-down of the Facility, incoming waste deliveries will be diverted to a suitable waste management facility.

When the Facility is shutdown, whether it is planned or unplanned, both engineered fire detection controls and management procedures will be implemented to minimise the risk of a fire within all waste storage areas. The controls implemented during shutdown will be dependent on whether combustion fans are operational, and will include either the opening or closing of louvers in the waste reception area.

The frequency of inspection of waste storage areas (and other parts of the site) will be increased during a full shutdown, and a checklist utilised to ensure a complete record of issues and comments that may require further action, assessing the presence of dust, odours and hotspots. The operation of all thermal monitoring equipment will be maintained during all periods of shutdown where there is waste within the waste storage areas.

4.8 Active Fire Fighting

The fire fighting system for the Facility will be subject to detailed design and the insurer's requirements. The main features of the fire fighting systems, and how they will be utilised in the event of a fire, are described in the following sections.

4.8.1 Fire Prevention Standards

Where appropriate, the Facility will be designed and operated in accordance with the following fire prevention and detection standards, or alternative recognised international standards where they are available:

- BS EN 671: Fixed fire-fighting systems;
- BS 5266: Emergency Lighting;
- BS 5446: Automatic Fire Alarm Systems;
- BS 5839: Fire Detection and Alarm systems for buildings;
- ISO 6182: Fire Protection – Automatic Sprinkler Systems;
- ISO 6183: Fire Protection Equipment – Carbon Dioxide Systems;
- CIBSE Guide Volume E, Fire Engineering, 2003;
- BS EN 15004: Fixed Firefighting systems – Gas extinguishing systems;
- BS EN 12845: Fixed firefighting systems – Automatic sprinkler systems – Design, installation and maintenance;
- BS 5306: Fire extinguishing installations and equipment on premises;
- BS 5588: Fire Precautions in the design, construction and use of buildings (only in as much as referred to in the Building Regulations);
- BS 9990: Non-automatic fire-fighting systems in buildings – Code of practice;
- BS 9999 - Code of Practice for Fire Safety in the design, management and use of Buildings; and
- Building Regulations, in particular Approved Document B, Volume 2 – Buildings other than dwelling houses, Section B5, Access and facilities for the fire service.

All staff, visitors and contractors will be informed about the fire safety precautions as part of the induction procedures.

4.8.2 Fire Detection Systems

There will be a fire detection and alarm system which will cover all of the waste processing areas within the Facility. The fire alarm systems will include the following:

- local detectors/transducers and call points;
- sounders/high intensity flashing beacons;
- cabling and containment systems;
- local control and indication panels; and
- remote control and indication panel (incorporating integral printers) would be in the control room.

All fire detection systems will be installed in accordance with BS 5839, Part 1 2002 and subsequent amendments to give level P1 + M coverage in accordance with the Loss Prevention Council ("LPC") Rules for Automatic Fire Detection and Alarm Installations for the Protection of Property. In low fire risk areas e.g. the boiler house, the requirements for a P1 detection system may be relaxed. In areas which are identified as having a low fire risk, proposed detection method(s) would be agreed with the requirements of the fire service and fire risk insurer. The fire detection, protection and alarm systems will comply with the requirements of the fire service and fire risk insurer. All fire detection systems will be design, installed and maintained in accordance with an appropriate UKAS-accredited third-party certification scheme.

The following fire detection systems will be incorporated into the design of the Facility:

1. Waste reception area fire detection will be provided by flame detectors in accordance with an appropriate risk study.
2. Fire detection within the baled waste storage area and waste bunker will be provided by thermal imaging cameras and flame detectors which will be fixed around the perimeter of each area, and will include automatic scanning of the entire area of both fire zones. The thermal imaging cameras will provide a continuous thermal ‘map’ of the surface of the waste within the baled storage area and waste bunker area. The thermal mapping will be displayed in the control room and will be used by the crane operator to manage temperatures within the waste storage areas.

   The staff within the control room, as well as the crane operator, will be trained in the identification and implementation of corrective measures in the event of elevated temperatures within the waste reception area. The thermal imaging cameras will enable the crane operator and/or the control room staff to identify and react to hot areas in the waste storage areas to undertake mixing of the waste within the waste bunker using the crane to dissipate heat (refer to section 3.4.1.2), or, if in the baled waste storage area, transferring waste to the de-baler, bunker or quarantine area, using the overhead crane, or forklift truck if safe to do so (refer to section 3.1.1.1). In extreme cases, the use of firewater cannons to extinguish any smouldering/burning waste may be required.

   – Water cannons and manual fire hoses are considered to be the primary means of fighting a fire in the waste bunker or the baled waste storage area.
   – To proactively prevent fires, the system will be configured to alarm based on certain conditions. The thermal imaging cameras would be set with two triggers/alarms at different temperatures (described below). As indicated in insurer guidelines, high temperature sprinkler heads would be installed, and temperature set-points would be determined during detailed design and in consultation with the fire insurers.
   – Following activation of the high temperature alarm in an area within the bunker, the area with an elevated temperature will be readily identified and, if possible, extinguished based

on operator action through mixing within the bunker or fed into the hopper to be incinerated. High temperature alarms in other UK waste incineration plants operate with a trigger temperature of approximately 90 °C. For the Facility, this is subject to detailed design, and will be set in consultation with the Fire Service and the fire insurers.

- Following activation of the high-high temperature alarm in an area within the waste bunker or baled waste storage area, the area with an elevated temperature will be targeted and the firewater cannons would be activated to reduce the temperature in the area where self-heating has occurred. High-high temperature alarms in other UK waste incineration plants operate with a trigger temperature of approximately 120°C. For the Facility, this is subject to detailed design, and will be set in consultation with the Fire Service and the fire insurers.
- The control system will be designed so that the trigger temperatures for the fire detection systems can be amended from operational experience, if required.
- Furthermore, the crane will be sized appropriately so that the time for waste mixing, feeding and management is within an acceptable time range for feeding waste to the feed hopper.

3. Feed hopper area fire detection will be provided by the waste feed hopper supervision camera and a deluge system to flood the feed hoppers if required.
4. In the boiler house the boiler auxiliary burner fuel supply valve train will have a wire and fusible link system or heat detector and solenoid valve such that in the event of an external fire the local fuel supply isolation valve (fuel oil) is automatically closed.
5. Electrical rooms with significant concentrations of electrical equipment such as switchgear rooms, low voltage rooms, control system rack room, uninterruptible power supply (UPS) and crane control cabinet rooms will be fitted with suitable fire detection systems.
   - The fire detection will be by means of a 'double knock' system composing of ionisation (or heat and smoke) detectors to minimise the risk of false activation. In addition, manual call points will be installed in all areas. The fire detection systems will be designed for ease of regular testing to demonstrate correct operation. Suitable automatic fire protection systems will be located within the rooms. The electrical equipment would be installed within rooms of blockwork construction.
6. Transformer protection would provide complete water spray impingement on all exposed exterior surfaces, in accordance with fire insurers requirements. Typically, this requires that water is applied at a net rate not less than 10.2 mm/m^2 of projected area of rectangular prism envelope for the transformer and its appurtenances, and not less than 6.1 mm/m^2 on the expected non-absorbent ground surface area of exposure. Water spray application will include the conservator tanks, pumps, etc.
7. The turbine-generator and ancillaries will be protected by a dedicated fire detection and automatic sprinkler fire protection system. The area will be segregated into 3 fire zones: turbine, generator and lubricating oil skid. The fire detection and protection system will be installed such that detectors cover all potential areas of fire risk.
   - Automatic actuation of the fire protection systems via a double knock system with manual operation from the control room will be provided
   - The fire detection systems would be installed in accordance with NFPA 850. In addition, in accordance with NFP850 all areas beneath the turbine-generator operating floor that are subject to oil flow, oil spray, or oil accumulation would be protected by an automatic sprinkler or foam-water sprinkler system.
   - Whilst it is subject to detailed design, if the turbine generator is housed in an enclosure, then an automatic total flooding water mist system, or inert gas fire suppression system will be installed.

  - A 'double knock' system will be used with a dry glass bulb for 1st knock and dedicated heat detectors as the 2nd knock. Break glass units will be installed at each entrance to the turbine hall. These detection and protection systems will be segregated from the main fire detection and protection system. Locations of pipes and equipment will be designed to minimise the risk of oil fires spreading. Passive fire protection to the generator and the cooling system will be designed in accordance with the requirements of the fire insurer.

8. Procedures will be developed in the operation of the fire detection systems. Training will be provided to the relevant staff in the different fire detection systems. Training records in the operation of the fire detection systems would be retained on-site.
9. All automatic fire detection and alarm systems will be designed and maintained by a suitably qualified, experienced and registered fire protection engineer.
10. Detailed design calculations, risk assessments and system drawings to demonstrate compliance with the requirements of the building control officer, fire officer and the insurer's requirements will be produced during detailed design.
11. It would be the responsibility of the shift managers to monitor fire alarms.

4.8.3 Fire Suppression Systems

There will be a fire suppression system installed in the locations considered by the fire strategy and NFPA 850 to be at risk of fire. The fire suppression systems will include the following:

- automatic sprinkler/water deluge systems for the baled waste storage area, waste bunker, waste feed hopper, step-up transformer area, 33 kV series circuit reactor, fire pump container and the emergency diesel generator;
- automatic foam systems for the turbine generator and lube oil systems, auxiliary burners;
- inert gas suppression for the electrical rooms and CEMS container; and
- carbon dioxide gas suppression system for the bag filters in the flue gas treatment system.

The automatic fire suppression systems will be designed and maintained by a suitably qualified, experienced and registered fire protection engineer. The fire suppression systems will be covered by a recognised (typically UKAS) third party certification scheme.

Detailed design calculations, risk assessments and system drawings to demonstrate compliance with the requirements of the building control officer, fire officer and the insurer's requirements will be produced following detailed design.

4.8.4 Alternative Fire Detection and Suppression Measures

In addition to the fire detection and suppression systems identified in sections 4.8.2 and 4.8.3, the design of the Facility will include a number of 'additional measures' to prevent the spread of fire, such as fire walls (section 4.4), fire hose reels and wet riser system (section 4.8.7), and fire extinguishers (section 4.8.9).

In addition, in the event of a significant fire within the waste storage bunker, the Facility will initiate a full shutdown which will include inhibiting the induced draft (ID) fan and the extraction of combustion air from within the waste reception area. The shutdown will reduce the risk of fire spread between the 'fire compartments' within the Facility.

4.8.5 Provision of Firewater

The Facility will have a firewater storage tank designed in accordance with the requirements of BS 5306.

The firewater storage tank would be connected to the local water supply and would be installed with a suitable system to prevent freezing. The tank would be fitted with a local external water level indicator as well as with remote water level control and level alarm indication to the distributed control system (DCS).

The automatic fixed fire suppression systems for the Facility would be designed in accordance with the requirements of the fire insurers and NFPA 850. The fire water tank will be designed with sufficient capacity based on the fire protection systems providing a 2-hour supply based on the flow rate requirements for the sum of items (a) and (b) as:

a. the greater of items (i) or (ii) below:
    i. the largest fixed fire suppression system demand; or
    ii. any fixed fire suppression system demands that could reasonably be expected to operate simultaneously during a single event e.g. turbine under-floor protection in conjunction with other fire protection system(s) in the turbine area; and
b. a reasonable assessment of anticipated hose stream demand at not less than 1,890 l/min for 10 minutes.

The firewater tank would be designed to ensure the required firewater capacity is available for fire protection at all times.

If the EA's guidance for fire water provision is followed this would require provision of a fire water tank significantly larger than the largest volume of waste stored at the Facility, i.e. for a single bay in the baled waste storage area up to 2,700 m^3 of fire water provision would be required.

The exact size of the firewater tank would be confirmed following detailed design, and would take into consideration the worst-case fire scenario, i.e. a fire in the largest volume of wate stored at the Facility, and will need to be agreed with fire insurers. When specifying the sizing for the firewater tank, it would be based on early fire detection and automatic fire suppression systems in the waste reception and storage areas such that any fire can be rapidly contained and extinguished. The use of foam as an additive in the firewater system would reduce the quantity of water required for firefighting. However, the use of foam would be subject to detailed design. It is estimated that the size of the firewater tank would be approximately 1,000 to 1,200 m^3 to provide fire provision for up to 2 hours in accrodnace with the requirements of NFPA 850.

In addition to the firewater tank, the harbour is a further source of available water which would be used for firefighting. The arrangements for the use of water from the harbour for firefighting purposes will be examined during detailed design of the Facility.

It is acknowledged that the EA's FPP guidance requires a supply of water for firefighting purposes of 2000 litres/minute for 3 hours. With the proposed firewater tank and also the availability of water from the harbour the provision of the fire prevention and fire-fighting measures detailed within this FPP are considered to be in accordance with the requirement of the FPP guidance.

It is proposed that the designs of the systems for the provision and containment of firewater are confirmed via a pre-operational condition.

4.8.6 Fire Water Cannons

As described in section 4.8.2, the cannons will activate following the activation of a high-high temperature alarm. The cannons will also, following the detection of a hot spot using the thermal cameras, automatically operate when the temperature of the hot spot exceeds a defined set-point (subject to agreement with the fire risk insurers). The water cannons will also be designed to be operated and controlled manually from the control room.

The cannons will be located in positions to optimise the horizontal and vertical coverage of the water spray(s) for total firefighting suppression across the entire area of the bale storage area and the waste bunker area.

Through detailed design of the baled storage area and the waste bunker area, the number and position of the fire monitors and cannons will be established, alongside the automatic and remote-control systems. Thermal imaging screens will be installed within the control room.

4.8.7 Fire Hose Reel System and Wet Riser System

Hose stations will be designed in accordance with NFPA 14, Standard for the Installation of Standpipe, Private Hydrants and Hose Systems, or equivalent standard as required by fire insurers. Fire hydrant systems equipment will be provided at strategic positions within the Facility for firefighting in fire risk areas.

For firefighting purposes, hose reels and extinguishers where appropriate will be provided within the buildings. Upstream connection of fire hose reels shall be as a minimum with 80 mm diameter pipe. A minimum 2.5 barg pressure will be maintained at all times in the fire hose piping system with 4 fire hose reels in simultaneous operation.

The positioning of hose points will take into account the following:

- location and physical protection as to avoid potential damage by vehicles;
- size and number to be determined for the specific works layout (e.g. push wall positions);
- ease of use, maintenance, and storage, such as through the use of continuous-flow, non-collapsible hose reels; and
- protection from freezing in unheated areas.

Following detailed design of the Facility, a plan identifying the location of the fire hose reels will be developed.

4.8.8 Fire Hydrants and Mains

Fire hydrants will be designed in accordance with NFPA 14, Standard for the Installation of Standpipe, Private Hydrants, and Hose Systems, or equivalent standard as required by fire insurers. The fire hydrants will be connected to a ring main at strategic positions around the Facility to provide firewater supplies to external fire risk areas. The fire hydrants would be designed in accordance with the requirements of the Building Regulations and the fire service; and spaced at no greater than 90 metres apart and within 12 metres of the building.

The positioning of fire hydrants would take into account:

- location and physical protection as to avoid potential damage by vehicles;
- size and number to be determined for the specific layout; and
- protection from freezing.

The fire hydrants will be fed from the fire water storage tank and maintain the required pressure in accordance with the requirements of the fire service.

The location of hose reels and hydrants will be subject to detailed design and will be agreed with the fire insurers and the fire officer. Following completion of detailed design, a plan identifying the location of the fire hose reels and hydrants will be developed. An indicative drawing showing the location of the fire hydrants is presented in Appendix A.7.

4.8.9 Fire Extinguishers

Fire extinguishers will be strategically located throughout the operational areas in accordance with the requirements of BS 5306: Part 3.

The location of the fire extinguishers will be subject to implementation of the recommendations of the fire officer for the Facility. Following completion of detailed design, a plan identifying the location of the fire extinguishers will be developed and presented in Appendix A.

4.8.10 Containment of Firewater

The containment systems for firewater will be designed by the appointed EPC contractor. However, at this stage, it can be confirmed that drainage and prevention of flooding of equipment and the fire retention would be accomplished by installation of one or a combination of:

- floor drains;
- floor trenches;
- open doorways or other wall openings;
- kerbs for containing or directing drainage;
- equipment pedestals;
- pits, sumps, and sump pumps; and
- underground fire containment tanks.

The provisions for drainage and any associated drainage facilities, and in particular drainage for the turbine hall deluge system would be sized to accommodate the concurrent flow due to operation of the following components:

- the spill of the largest single container of any flammable or combustible liquids in the area, where the bund around oil tanks should be large enough to contain the oil and the water from suppression systems;
- the maximum expected number of fire hose lines operating for a minimum of 10 minutes; and
- the maximum design discharge of fixed fire suppression systems operating for a minimum of 10 minutes.

There are four different types of firewater flows which would be required to be contained if there was a fire at the Facility:

1. Firewater resulting from treating fires in the waste bunker area and tipping hall area. This firewater is routed to the waste bunkers which are watertight and hence can contain large amounts of firewater.
2. Firewater from the bale storage area. A penstock valve will prohibit the discharge of potentially contaminated surface water off-site. Firewater from the bale storage area would be contained in the site drainage systems and diverted to an underground fire water containment tank and be retained on-site.

3. Firewater from inside any of the process buildings. Such firewater is expected to be extremely rare and small in quantity so only small amounts of firewater will arise. This drainage would be contained, to prevent contaminated water discharging off-site.
4. Firewater from outside any building. A penstock valve will prohibit the discharge of potentially contaminated surface water off-site. Firewater from any outside buildings would be contained in the site drainage systems and diverted to an underground fire water containment tanks and be retained on-site.

Following the fire, the used fire-fighting water would be sampled and analysed to identify whether it is suitable to be used as process water, or if treatment/disposal is required. If the firewater is considered to be contaminated, it will be discharged to sewer if the composition is in accordance with the constraints of the trade effluent consent, or if the effluent is unsuitable for discharge to sewer, it will be pumped out, and transferred off-site to a suitably licensed waste management facility.

4.8.11 Contingency During the Incident

Emergency procedures would be developed during the construction and commissioning phase. The emergency procedures will include, but not be limited to:

- fire identification and reporting procedures;
- an evacuation plan;
- emergency communication procedures;
- responding to chemical spillages;
- containment of firewater;
- requirements for diverting incoming waste; and
- notification of any adjacent residential properties and businesses which may be impacted by the incident.

All staff and contractors would be trained in the emergency response procedures for the Facility, as well as the site-wide emergency procedures. Where specific responsibilities are given to specific staff, training would be provided to those employees. Training records in the emergency response procedures for all staff and contractors would be retained on-site.

The effectiveness of the emergency response procedures would be reviewed following any emergency incidents on-site. Where appropriate the procedures would be updated, and staff trained in the updated procedures.

A copy of the emergency procedures would be maintained at the gate house, or other suitable location, and will include the fire system mimic panel to allow co-ordination of the emergency response to a fire in the event that the main offices are unavailable.

On a periodic basis, assumed to be twice a year, tests of the emergency procedures would be undertaken. The intention of the tests is to verify that all staff and contractors are aware of the emergency procedures. Following all tests, the implementation of the procedures would be reviewed. If appropriate, the procedures would be amended, or additional training provided to all staff and contractors.

In the event of an incident resulting in the Facility not being capable to receive waste, waste deliveries to the Facility would be diverted to a suitably licensed waste management facility.

Deliveries of waste to the Facility will not be recommenced until it has been deemed safe for the Facility to be restarted following the incident.

4.8.12 Actions Following a Fire

Following a fire which requires the presence of the emergency services; materials, building structures, furnishings, vehicles, equipment and raw materials could be damaged. Once the fire has been fully extinguished and the emergency services given approval to enter the Facility, an assessment will be undertaken by the management team for the Facility, insurance assessors, structural engineers and fire damage/salvage specialists to assess the extent of the damage.

Once a full inventory of the damage and equipment has been completed under the strict supervision of specialist structural engineers, any building or structure will be made safe. Severely damaged equipment or building materials would be removed from site by a licenced waste/scrap company.

Building structures that are deemed safe would be cleaned, as necessary.

Waste within the waste bunker area, and/or baled waste within the baled storage area, which is not suitable to be incinerated would be backloaded into HGV's and transferred off-site to a suitably licensed waste management facility for disposal/treatment. Affected process areas would be cleaned and washed before equipment and structural repairs would take place.

Incoming waste deliveries would be prevented, with incoming wastes diverted to alternative waste management facilities, until it can be concluded that it is safe to start-up the Facility.

Appendices

A Plans and Drawings

A.1 Site location plan

A.2 Installation boundary drawing

A.3 Materials storage areas plan

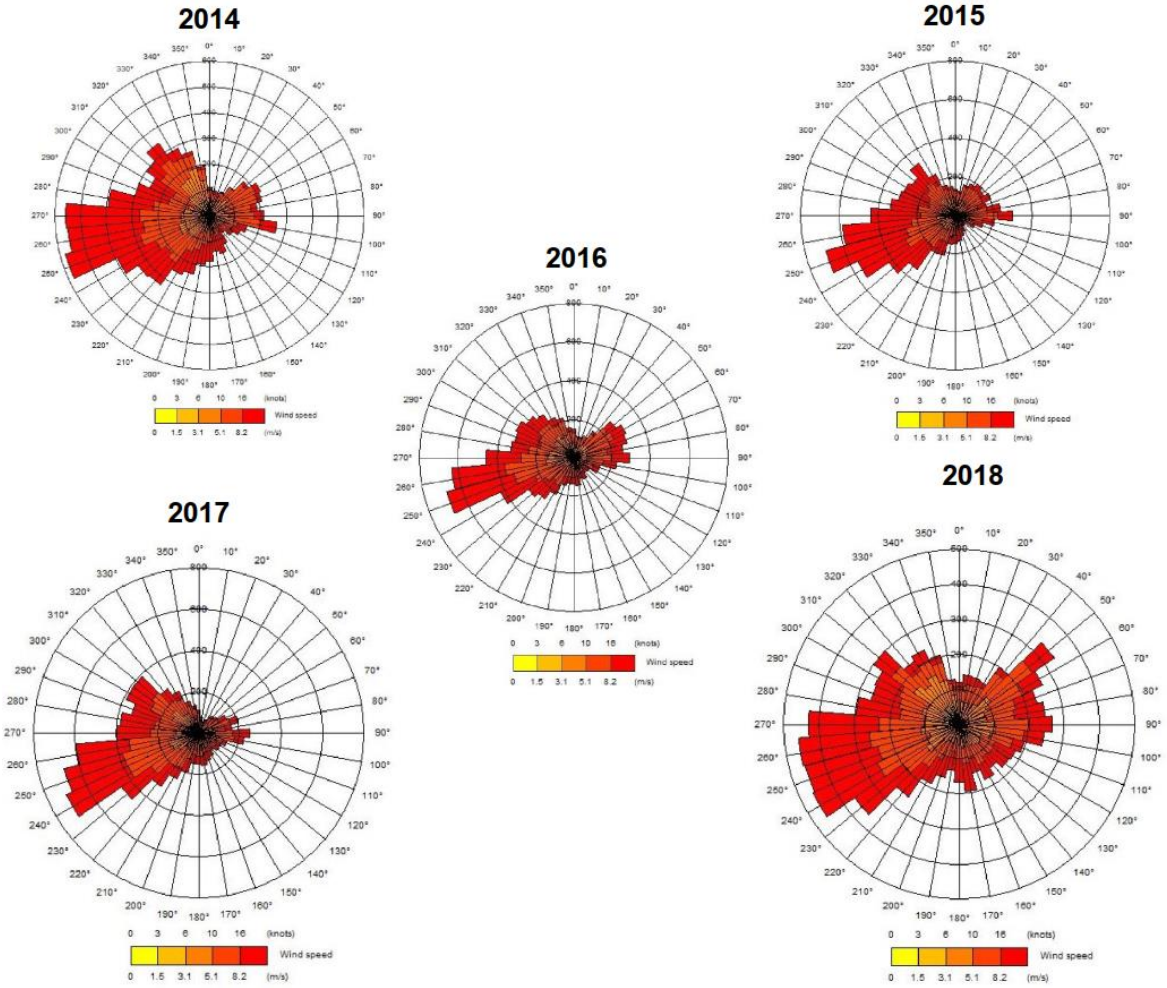
A.4 Access points around the perimeter to assist fire-fighting

A.5 Indicative locations of fire hydrants

A.6 Indicative locations of fire walls

A.7 Firewater Supplies and firewater containment

B Isle of Portland wind roses



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