

Applies to: <b>Gas Storage</b>	<b>Environmental Accident Management Plan</b>	<b>WI-UGGS-SHE-011-008</b>
Classification: <b>Internal</b>	Uncontrolled if printed	<b>Rev:1.03</b>

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## Summary

### Why do we need this Instruction?

The SSE Hornsea Ltd Accident Management Plan procedure applies to both major hazards and accident scenarios covered by the Control of Major Accident Hazards Regulations (COMAH), and those which are below the classification threshold for major accidents under COMAH. This procedure details the identification of hazards posed by the installation and the operational activities; assessment of the risks of accidents and their possible consequences; and the implementation of measures to reduce the risk of accidents and contingency plans for accidents that may occur.

## Scope, Deviation and Review

<b>Scope</b>	This Work Instruction applies to Gas Storage.
<b>Deviation</b>	Deviations from this Instruction shall be agreed in writing with the Director of Gas Storage.
<b>Review</b>	The Environmental Engineer shall review the working and current applicability of this instruction every three years as a minimum.

## Definitions

The following definitions are adopted by Gas Storage in addition to those in REF-GEN-SHE-001-102.

<b>Competent Authority</b>	In England and Wales, COMAH is enforced by the Health and Safety Executive (HSE) and the Environment Agency. The competent authority for associated planning issues (defined in the Planning (Control of Major Accident Hazards) Regulations 1999) is the local emergency planning authority.
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## Process

### Requirements

#### 1. Accidents

There is potential during the operation of the installation for accidents to occur whose consequences may result in a detrimental impact on the environment. This may include abnormal operation of the installation or isolated incidents. The site operates a number of procedures and physical measures to control these potential releases. A process of identification and assessment of potential accident scenarios that could occur within the installation was undertaken and the associated control procedures put in place.

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## 2. COMAH

Due to the inventory of natural gas stored at the sites (> 200 tonnes) the sites are classed under COMAH as upper-tier sites, and as part of these regulations, SSE has developed a SHE Policy PO-SHE-001, which covers major accident prevention. As upper-tier COMAH sites, the Atwick and Aldbrough sites are regulated by the Health and Safety Executive and the Environment Agency.

## 3. Accident Management Plan

Environmental accidents are controlled using formal procedures and in the event of a major incident at the installation, a series of intervention and protection measures are implemented as part of the internal emergency response. These measures are detailed as part of the internal emergency plans WI-ATW/ALD-SHE-011-001 and associated instructions. These emergency instructions may be initiated by and at the discretion of the Duty Production Engineer on shift, or any other employee, if one of the following major accidents is detected or reported:

- Any incident which has, or may lead to injury of personnel
- Any incident which has or may cause damage to the environment
- Any incident causing serious damage to plant or equipment
- Any incident causing serious damage to the reputation of the Gas Storage business
- Any incident requiring assistance from the Emergency Services
- Any other incident which, in the opinion of the Production Engineer on Shift can be classified as a major emergency
- A major accident as defined by the COMAH Regulations

Additional procedures for other non-major emergencies on site (below the threshold for COMAH) are listed below:

- Fire
- Gas Leaks
- Methanol Spill
- Diesel Spill
- Bottle Emergency
- Hydrocarbon Containment;
- Plant Interceptors and Spillage Control;
- Bomb threat response;
- Postal Threat;
- Containment of Leakages;

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- Waste Management;
- Waste Segregation, Storage and Disposal;
- Incident Management;
- Emergency Planning and Response;
- Oil/Chemical Spillage Procedure.

#### 4. Identification of Hazards

The sites' emergency procedures were written to control the incidents that were identified through the site's major hazard identification (HAZID) study. The HAZID study considered the consequences of a series of initiating events for major accidents involving sections of the site containing either hazardous substances, or plant items in which process conditions render materials harmful. The emergency procedures also cover the identified significant accidental environmental impacts, specifically loss of containment of diesel and methanol.

#### 5. Assessment of Risks

As part of the sites' COMAH applications, a major hazard identification (HAZID) study was conducted in accordance with the SSE procedure for Identification of Potential Major Accident Hazards and Initiating Events. The study also facilitated the assessment of risks below the threshold for COMAH. The results of the study were as follows:-

- Divide the site into the following functional areas for the study
  - Natural Gas Storage Cavities
  - Central Processing Area (Natural Gas Pipework)
  - Methanol Storage
  - Diesel Storage
  - Gas Compression and Standby Power Generation
- Apply the Keywords representing the initiating events for major accidents to each area in turn and identify, where appropriate, additional causes that could lead to the initiating events.
- Examine the consequences of each cause e.g. potential releases, quantities, frequency of release, final destination etc.
- Examine means of detection and safeguards against the initiating event or its effects.
- Identify any further studies needed to clarify details, or consider additional safeguards, as necessary.

The original HAZID study was performed by operations staff and specialists and was reviewed as part of the five year COMAH review process. The identified major accident hazards are considered to represent a comprehensive range of

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hazards for each section of plant. The major accident scenarios chosen for detailed consequence are listed below:

#### **Natural Gas System:**

- Decapitation of cavity wellhead.
- Failure of above or below ground natural gas pipework with initial pressure of 240bar.
- Failure of above ground natural gas pipework with initial pressure of 70bar.
- Failure of absorber vessel.
- Failure of fuel gas pipework.
- Release of Natural Gas at 240 bar from vent pipe for planned operation and accidental damage.
- Discharge from natural gas relief streams with a diameter of 450mm and 150mm.

#### **Flammable Storages**

- Failure of Methanol storage tanks.
- Failure of Diesel storage tanks (Static and portable).
- **Failure of Condensate storage tanks (Atwick only),**
- Failure of Process Water Tank (Aldbrough only).
- Failure of Closed Drains Drum (Aldbrough only).

#### **Environmental**

- Major Accident to the Environment.

Vapour Cloud Explosions are considered as a potential consequence of the above scenarios rather than as a separate scenario.

The major accident scenarios selected were subject to detailed consequence analysis to determine the degree of potential harm to people, property and the environment and frequency analysis to determine the frequency or probability of occurrence. The risks to people, property and the environment were assessed against available benchmarks from the Competent Authority (CA) and where no such benchmarks exist, risk were assessed against industry or in-house benchmarks.

## **6. Protection Measures and Techniques to Reduce Risk**

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In addition to the assessment of the potential risks, and associated control and protection systems to prevent / reduce the risks, as discussed above, the installation also employs more 'basic' protection measures to prevent any environmental impacts from accidents below the threshold for COMAH.

The potential risks and associated control and protection systems are summarised as follows, with reference to the indicative BAT requirements outlined in section 2.8 of the Sector Guidance Note:

- a) A full inventory of dangerous substances used and quantities stored at both sites is detailed in the Aldbrough and Atwick Chemical Storage Registers: REF-ALD/ATW-SHE-206-001. Safety Data Sheets for all products are filed electronically in: L:\HEALTH & SAFETY\BOTH\COSHH\Safety Data Sheets. All materials used on-site are purchased from reputable suppliers in accordance with the Raw Materials Review and Selection instruction WI-UGGS-SHE-001-204.
- b) Operational Instructions are in place, trained personnel are used and materials are appropriately stored to ensure incompatible raw materials and wastes do not come into contact. When new or replacement chemicals are purchased the relevant Safety Data Sheets are obtained and task specific COSHH assessments generated. Materials handled by third parties is controlled via the Safe System of Work (PR-UGGS-SHE-005 and associated procedures / instructions), which identifies materials/substances and release of contaminants to the environment, with suitable method statements, risk assessments and control measures.
- c) Storage areas for raw materials, products and wastes are designed and operated to minimise risks to the environment. This has been achieved through several techniques including using internal storage facilities where practicable, installing appropriate secondary containment systems (e.g. bunding) and operational areas are provided with impervious concrete or surfaces.
- d) Physical protection in the form of barriers is in place where appropriate to prevent damage to equipment from the movement of vehicles.
- e) Appropriate secondary containment systems, e.g. bunds and impervious surfaces, are in place across the sites in order to minimise, as far as practicable, the risk and consequence to the environment of accidents at the site.
- f) Procedures are in place to prevent the overfilling of tanks. The diesel and methanol tanks are fitted with contents gauges and the methanol tanks have high-level alarms and automated valve closure systems (Atwick site only) which are activate alarms in the controls rooms. All filling is carried out as per site operating instructions with the procedure including tank level checks prior, during and after delivery/transfer.
- g) The water table is known to be high in the area surrounding Atwick and parts of three of the well heads are located within a Zone 3 (flooding from river without defences) and Zone 2 (extreme flooding from rivers and seas without defences) EA classified flood zones. However, there has been no historical evidence of flooding and the cavity areas are raised above the level of the surrounding land. The diesel and methanol tanks are raised

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above their surrounding bunds so it is considered not possible for flooding to result in the release of these materials from storage.

- h) Comprehensive systems and procedures are in place for the reporting, response and investigation of incidents, near misses and abnormal events.
- i) The roles and responsibilities of personnel involved in accident management are specified in the appropriate instructions. The Incident Controller, who will normally be the Duty Production Engineer or the appointed deputy in case of absence, will be in overall charge on site in the event of an emergency.
- j) For each major accident scenario identified, the site emergency plan details formal instructions of how the incident should be managed e.g. containment or dispersion. In addition, where relevant Operational and Work Instructions also provide instructions regarding managing certain emergency situations e.g. diesel spillage.
- k) Prevention of accidents due to poor staff communication during shift changeover is dealt with in accordance with Shift Handover instruction WI-UGGS-SHE-005-100.
- l) Safe plant start-up and shutdown procedures are in place in the form of operating instructions.
- m) Communications are opened and maintained during a major emergency using a radio system which is available for use by the on-site personnel and the fire brigade whose own system is not cleared for use on site. The Atwick control room is in direct communication with National Gas Control Centre at Warwick by telephone. The Control Room also has two direct telephone lines giving access to different telephone exchanges. Intrinsically safe portable radios are available on site to operations staff and emergency services as necessary. The radios have the ability to access the telephone network, so that contact by telephone can be made from anywhere on site.
- n) Appropriate control techniques are in place at the site to limit the consequences of an accident, e.g. bunds, spillage procedures, emergency plan.
- o) Training needs are identified and relevant training is provided and recorded for SSE Hornsea Ltd personnel in accordance with WI-UGGS-SHE-008-001 'Personnel Training and Performance'. Training needs are identified for all personnel via the SHE Competency Skills Matrix.
- p) In accordance with instruction WI-UGGS-SHE-301-002 'Emptying Bunds and Culverts', the site interceptors are monitored on a weekly basis for the presence of contaminants.
- q) A preventative maintenance programme covering all plant (including standby plant), who's failure could lead to an impact on the environment is implemented through the sites' "Maximo" maintenance system. As discussed above spill procedures are in place examples include Methanol Spill procedure and Diesel Spill procedure.
- r) In the event of a major fire, firewater would either be caught in bunds or by the site drainage system where it could be contained in the site interceptors

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as procedures are in place to ensure that the outlet valves from the interceptor pits are shut off in the event an incident and remain shut.

- s) The potential for accidental emissions from vents and safety release valves is limited. Emergency relief valves vent gas direct to atmosphere as they do not contain hydrocarbon liquids. Containment systems could create backpressure and so reduce the effectiveness of these critical safety items. Safety relief valves on liquid pump systems are contained, by venting to pump suction or feed tank.

**Recommendations**      • None

## Accountabilities

**Intent**      To define roles and responsibilities to help ensure that individuals understand the roles required and their involvement to ensure compliance with this instruction.

**Requirements**      The **Director of Gas Storage** is responsible for:

- The correct implementation of this instruction on Gas Storage sites.

**The Environmental Engineer** is responsible for:

- Assessing potential risks to the environment resulting from changes to the operation of the installation, and updating the Accident Management Plan accordingly.

## Reference

**Key references required to follow this instruction.**

<b>MS-SHE-011</b>	SSE	Emergency Planning and Response
<b>WI-UGGS-SHE-001-204</b>	SSE Gas Storage	Raw Materials Review and Selection
<b>WI-ATW-SHE-005-100</b>	SSE Gas Storage	Shift Handover
<b>WI-ALD / ATW-SHE-011-001</b>	SSE Gas Storage	Emergency Operational Response (Bronze Command)
<b>WI-ALD / ATW-SHE-300-003</b>	SSE Gas Storage	Waste Segregation, Storage and Disposal

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<b>WI-ALD / ATW-SHE-302-001</b>	SSE Gas Storage	Containment of Spillages and Leaks
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