Zero incidents
Zero harm
Zero compromise
Keeping you healthy and safe, every day at work.

Health, Safety and Wellbeing Manual

Section 8

Control of Significant Hazards

Thames Water

Index

Section Introduction

This section provides advice on additional measures required to safely manage Thames Water processes that present significant hazards.

Significant hazards, if uncontrolled, could affect the surrounding population and/or environment.

This section is a guide for managers to help them ensure significant hazards are managed under controlled conditions.

Significant hazards include:

Part 1 – The handling of toxic gases
(Chlorine, Sulphur Dioxide and Ammonia)

Part 2 – Potentially Explosive atmospheres
(biogas, sewage pumping stations)

Part 3 – Fire
(preventative and protective measures)

Part 4 – Delivery of chemicals

Part 5 – Management of change

Part 6 – How to prepare for possible emergencies

Part 7 – Control of Incidents on COMAH Sites

To control significant hazards, managers and members of their teams have the following key responsibilities:

- Identify significant hazards covered by a local health and safety procedure SHE 4 and toolbox talk.
- Ensure that any health and safety procedure relevant to the hazard are communicated, understood and followed.
- Conduct monthly site inspections using the site observation checklist SHE 6C.

If you require any further information please contact your local Health, Safety and Wellbeing team member.

Part 1 – Managing the Safety of Toxic Gases

All sites that use or store toxic gases must ensure:

- The *cylinder and drum changing risk assessment and toolbox talk form RAG 121*, available from the Health, Safety and Wellbeing section of the SharePoint Portal, has been reviewed, completed and communicated to all relevant staff. Keep local records of this.
- Regular inspections are done, including a six-monthly thorough inspection using the *SHE 6E (Gas)* checklist, available from the Health, Safety and Wellbeing section of the SharePoint Portal. To complete this inspection, you must have specific training available via your Health Safety and Wellbeing Advisor.
- Drum, Valve and Cylinder cards are completed with the correct information.
- Flexible coil have labels with replacement dates.
- Gas room heating is operating and there is no pipework corrosion evident.
- The *Managing Toxic Gas Rooms procedure, HSP 1*, is communicated, understood and followed. This health and safety procedure is available from the Health, Safety and Wellbeing section of the SharePoint Portal.
- Individuals making and breaking connections or responding to a potential leak must have specific training (CTBA) and instructed in specific procedures for normal and abnormal operations.
- Protective equipment (gas suits, breathing apparatus and gas monitors) receive prescribed regular maintenance and are available for use.

Internal delivery of toxic gases

All transportation of dangerous goods by roads is subject to some extent by the ADR regulations. These regulations apply in full to the internal movements of Chlorine and Sulphur Dioxide. The following additional measures for sites that transport toxic gases are required:

- Apply *HSP 33* and ensure all transportation is in accordance with your Road Transport Security Plan
- Keep your Road Transport Security Plan securely and only share with individuals specifically approved in the plan.
- Review, complete and communicate, to all relevant staff, the *transportation of toxic gases risk assessment and toolbox talk form RAG 206*. Keep local records of this.

Part 2 – Explosive Atmospheres

Potentially explosive atmospheres may be encountered at: digester plants, biogas mains, sewage pumping stations waste treatment inlet works and ammoniation facilities. An explosive atmosphere can develop as a mixture, under atmospheric conditions, of air and one or more dangerous substances in the form of flammable gases, vapours, mists or dusts in which, after ignition, combustion can spread to the entire unburned mixture.

Managers are responsible for the following:

- Ensuring the *Potentially Explosive Atmosphere risk assessment and toolbox talk form RAG 131*, available from the Health, Safety and Wellbeing section of the SharePoint Portal, has been reviewed, completed and communicated to all relevant staff. Keep local records of this.
- Ensuring the explosion protection document, for the site (located on Asset Documentum) is completed and accurately reflects the current site status.
- The hazardous area plan (part of the explosion protection document) is displayed and has been communicated to individuals using the *toolbox talk form SHE 13*, available from the Health, Safety and Wellbeing section of the SharePoint Portal.
- Checking that zoned areas identified in your hazardous area plan are marked appropriately on site with Ex Signage.
- Ensuring unauthorized persons are restricted from entering potentially explosive atmospheres.
- Ensuring prohibited items are not introduced into potentially explosive atmospheres (ignition sources)
- Ensuring portable equipment is checked as safe for use prior to use in a potentially explosive atmospheres (e.g. torches, gas detectors and radios)
- Ensuring work in potentially explosive atmospheres is only allocated to persons appropriately trained and competent to do so. See *HSI 32 DSEAR Competency (A framework document for Operational and Project Personnel)* for further guidance.
- Ensuring that the Working in Potentially Explosive Atmosphere's procedure is communicated, understood and followed (including contractors). This Health and Safety Procedure is available from the Health, Safety and Wellbeing section of the SharePoint Portal, reference *HSP 2*.
- Ensuring electrical and instrumentation assets within a potentially explosive atmosphere are identified on the 'High Hat' asset management software.
- Ensuring electrical and instrumentation assets within potentially explosive atmospheres receive specialist competent inspections. (e.g. electrical items, submersible pumps, motors, lighting units, instrumentation, electrical surge protection and lightning protection systems)
- Ensuring a three-monthly inspection of digester sites using the *SHE 6M* available from the Health, Safety and Wellbeing section of the SharePoint Portal. To complete this inspection, you must have specific training available via your Authorised Person (Digestors)

Part 3 – Fire Precautions

All locations must have the required preventative and protective measures to safeguard its employees from the risk of fire.

Fire Risk Assessment

Each location must have an up-to-date Fire Risk Assessment available that has a record of the precautions and controls in place to prevent harm to any occupants, and to ensure the controls are effective.

Health and Safety Procedure *HSP 42 Management of Fire Risk Assessments*, available from the Safety, Health and Wellbeing section of the SharePoint Portal, provides further guidance on the categories of Fire Risk Assessment, who carries out the assessment and how often they should be reviewed.

Fire Safety Log Book

Each location must have an up-to-date Fire Safety Log Book, (FSL) with clear responsibility allocated as to its upkeep. The purpose of the FSL is to have an available record, which must be accessible for inspection by the fire and rescue service. For example:

Fire alarm systems, including weekly alarm tests and periodic maintenance;

Emergency lighting systems testing and maintenance;

Fire extinguishers, hose reels and fire blankets, etc. inspections and maintenance

On site Fire Hydrant servicing and testing records

Any automatic life safety fire suppression systems, such as sprinklers;

Staff instruction and training in fire safety and the evacuation procedure; and

Fire drills (note: fire drills may be recorded on the *emergency exercise record form SHE 6J*, available from the Health, Safety and Wellbeing section of the SharePoint Portal).

Fire warden and marshal's appointment and training

The Fire Risk Assessment will establish the number of fire wardens and marshals a premise requires. The appropriate manager must then arrange for those selected, as fire wardens/marshals, to attend the required training. Training can be found under employee self-service on the SharePoint Portal. The course is entitled Fire Extinguisher/Marshal Training. Post a list of appointed fire wardens and/or marshals for the premises on notice boards throughout the office, along with suitable instruction on what to do in the event of a fire.

Review the local health and safety organisational and arrangements documents, within each location, at least once a year to ensure there are sufficient fire wardens/marshals.

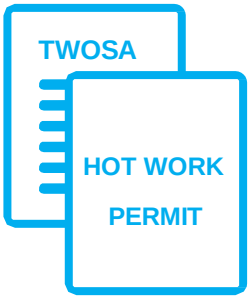
Fire drills

Ensure each location's emergency procedures are adequately tested and monitored. Perform fire drills every six months, ensuring there's a debrief after each one and share any learning points. Keep records of fire drills, and any resulting actions, in the Fire Log Book.

Visitors

Make visitors to the office aware of any fire arrangements e.g. drills, assembly points, etc. during the opening meeting or induction.

Hot Works by Thames Water Staff and Contractors



Control access by contractors carrying out works in the office or on the site by issuing a Thames Water Operational Site Authorisation (TWOSA) form – see section 7, Managing Contractors). If Thames Water staff or a contractor intends to carry out 'Hot Work' under a TWOSA, then a hot work permit must be completed, see *HSP 6 Permits and Authorisations* for further details.

Health and Safety Procedure *HSP 42 Fire Risk Management*, is available from the Health, Safety and Wellbeing section of the SharePoint Portal and provides further guidance.

Part 4 – Chemical Storage and Deliveries.

All sites that use or store bulk chemicals are responsible for ensuring that:

- The *chemical delivery and controlling spillage procedure, HSP 3*, is communicated, understood and followed. This health and safety procedure is available from the Health, Safety and Wellbeing section of the SharePoint Portal.
- The risk assessment guidance, identified below, have been reviewed, completed and communicated as a toolbox talk to all relevant staff involved in chemical delivery and controlling spillage. Keep local records of this.

  — *RAG 207: Use of intermediate bulk containers*
  — *RAG 208: Bulk cryogenic chemical deliveries*
  — *RAG 209: Bulk liquid chemical deliveries*
  — *RAG 210: Bulk powder chemical deliveries*

The above are available from the Health, Safety and Wellbeing section of the SharePoint Portal.

A trained and appointed Thames Water employee must supervise bulk chemical deliveries throughout the delivery recording their checks using the chemical delivery checklist and ensuring that:

- The Consignment note corresponds to the chemical being delivered.
- The bulk storage facilities have capacity to take the delivery.
- The emergency facilities are working (eyewash, shower and wash down hose)
- The containment facilities are effective
- Upon completion of the delivery the consignment note must be filed with the completed chemical delivery checklist, the delivery area rinsed down, fill point secured and the suppliers vehicle escorted off site.

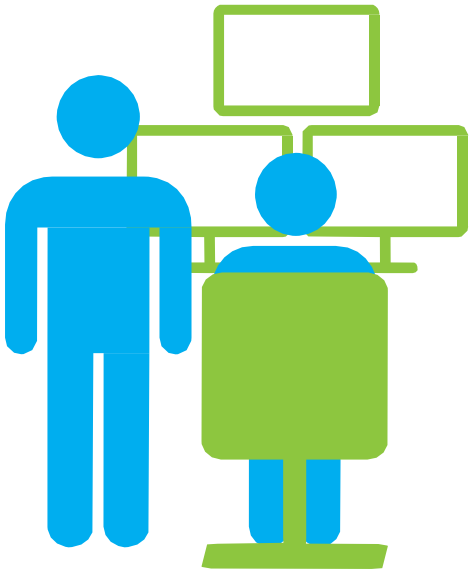
Managers must ensure chemical tanks together with their secondary containment facilities are regularly checked and thoroughly inspected in accordance with *HSP 9 Statutory inspections of plant and equipment*.

Managers must keep an inventory of chemicals stored in bulk on their sites and ensure tanks are appropriately marked with relevant hazard warning signs.

Where more than 25 tonnes of total chemicals (including fuel oil) are stored on site notification to the regulator and specific signage is required in accordance with *HSP 49 Notification and Marking of Sites*.

Part 5 – Management of Change

The transfer of responsibility and information is vital for successfully managing health and safety during periods of change. Managers are responsible for the following:



- Ensuring the management of change health and safety procedure is followed in order to identify and minimise any risk. This health and safety procedure is available from the Health, Safety and Wellbeing section of the SharePoint Portal, reference *HSP 4 management of change*.
- Ensuring that safety roles, identified within the local organisational arrangements documents (LOAD), are part of the change review to ensure that all safety critical roles are clearly allocated to members of staff, and any additional training requirements are identified and planned, see section 4 ‘Managing people’.
- Ensuring that all control room staff follow a structured shift handover to ensure that important site information is transferred accurately. The control room handover is a health and safety procedure and is available from the Health, Safety and Wellbeing section of the SharePoint Portal, reference *HSP 5 control room handover*.

Part 6 – Health and Safety Emergency Arrangements

This part provides advice and guidance on ways to minimise the risk to operators, and others, if there is an emergency. Thames Water has procedures to guide managers in event management and response, available from the Business Resilience and Security Team within health and safety.

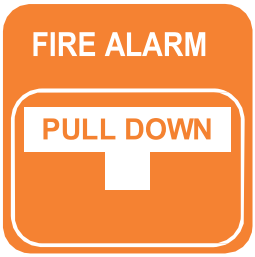
To support these procedures, managers have four key health and safety responsibilities to ensure emergency arrangements are in place for their sites:

- Carry out risk assessments, as outlined within section 3 of the Health, Safety and Wellbeing Manual, to identify the major hazards on-site and ensure emergency arrangements are in place.
- Ensure all persons on-site are briefed on the emergency arrangements, through toolbox talks, including the allocation of key roles (keep local records of this).
- Ensure accurate site information is available for emergency services.
- Test emergency arrangements on a planned basis and capture learning points, and any identified actions. Record these on the *emergency exercise record form, SHE 6J* – available from the Health, Safety and Wellbeing section of the SharePoint Portal.

For any emergency arrangements to work well, managers must understand that it is vital that **all staff** members are aware of the arrangements and participate in testing them.

Emergency type	Description	Potential consequence [1]
Biogas Release	A leak of Biogas from sewage treatment process.	Major consequence, which may affect off-site community.
Chemical gas leak / mixing of incompatible liquid chemicals	A leak of toxic gas (Chlorine, Sulphur Dioxide or Ammonia). Or production of these gasses by inadvertent mixing of bulk liquid chemicals.	Major consequence, which may affect off-site community.
Explosion	Ignition within an explosive atmosphere	Major health, safety and process consequences.
Liquid chemical spill / chemical delivery failure	A spill of chemicals (including fuel oil).	Significant personal harm or environmental damage.
Fire	A fire from any source, and in any location, across the site.	Major fires having significant consequences for health, safety, environment and process.
Flood	Water from external or internal sources that threatens low-lying installations on the site.	Widespread flooding could have major consequences to safety, health, environment and process.
Radioactive source leak	Loss of control of a radioactive emitter	Long term health effects
Serious injury or death	Physical injury to staff, contractors, visitors or trespassers that occur on-site and require more medical treatment than first aid.	Significant health and safety consequences, no environmental consequences.
Structure collapse	Structural collapse of any building or structure on-site.	Significant consequences to health, safety, environment and process.
Security alert	Trespass, terrorism, petty theft, vandalism, bomb threat or security incident.	Major incident that threatens site security and ongoing health and safety of the operation.
Steam Leak	Energetic release at high temperature and pressure.	Significant consequences to health, safety, and process.

[1] *Worst case most likely consequence*



Planning for emergencies

Site managers must ensure all site staff and visitors are aware of the following:

- Methods for raising the alarm and calling the emergency services.
- The assembly points and designated safe havens.
- The importance of not putting themselves colleagues or the community in danger.

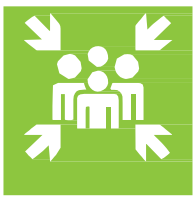
In addition, site staff should also be aware of:

- How to provide the emergency services with necessary information to find the site (e.g. the grid reference and the access points from the main road).
- Any specific role they perform in an emergency (e.g. fire marshal).

The above points should initially be covered within the site induction, but it is important that this information is regularly refreshed using a toolbox talk.

In addition, managers are responsible for ensuring their sites have:

- Written emergency procedures for the major hazards.
- Arrangements for the emergency services to gain access to sites (especially where security gates are present).
- Roll call arrangements and means of reporting missing persons to emergency services.
- The provision of a suitable area for the emergency services to assemble (it is not uncommon for more than six vehicles to attend a major fire).
- The identification and allocation of key roles.
- The provision of evacuation areas in the event of a fire or toxic gas emission. These must be clearly marked and detailed on the emergency information- site plan. It is also advisable to identify an assembly point outside of the site premises for use in a security alert.
- An annual programme of planned exercises.
- The inspection and maintenance of equipment used in emergency response. Keep such equipment readily available.



Roles and responsibilities

As detailed in the company Event Management Arrangements, there are a number of specified roles that need to be assigned to appropriate individuals during an incident. Depending on the scale of an incident, the key roles and responsibilities are:

Event controller

Maintains overall management of the incident, and takes over control from the event responder. They will also liaise with external bodies.

Event responder

Identifies developing emergency events and reports information to the event controller in order to help control and mitigate emergencies.

Fire marshal and chemical assembly leaders

Ensure role calls are completed to identify any missing persons within designated areas.

Operational control duty managers

Provides secondary support to the event controller and/or event responder. They will provide guidance at all stages of the incident and may also perform additional functions such as coordinating extra resources or contacting specialist company professionals.

All incidents /injuries must be reported as per the table in Section 10, which sets out the timescales for reporting and investigating incidents.

Training and exercises

Individuals who act as event controllers or event responders in an emergency must receive training, available on SAP.

These training courses raise levels of awareness with regard to the ever- evolving challenges of event management, and will enhance skills that deal with emergency events.

Exercises

The frequency of exercises should reflect the level of risk for the site. Exercises should focus on the most significant risk on-site, but managers should ensure that all site personnel fully understand the emergency plans for all site hazards.

Site	Minimum exercise frequency
All manned sites – fire drill	Two per year for manned premises
Sites with toxic gas, bulk chemicals or digesters	Two per year
COMAH sites	Twelve per year

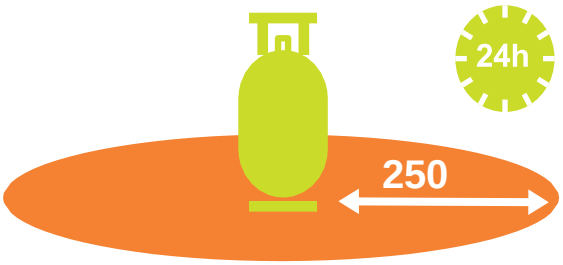
Managers must ensure exercises are recorded and kept, along with all learning points and any identified actions that must also be in the local action plan, with timescales for completion. Record any actions on SpheraCloud and track until completed.

Information	Description	Available on-site[2]	Asset doc
Site location	Post Code / Grid Reference / What Three Words	x	
Site emergency information card (SIC)	Details special hazards and contact arrangements.	x	x
Emergency information-site plan	Plan of site. Scale drawings of buildings.	x	x
Asbestos information	Details of locations of asbestos on-site.	x	x
Roll-call details	Confirmation of any missing persons.	x	

[2] *Information should be available to hand to emergency services upon arrival*

Documentation for emergency services

Key information that managers must provide to the attending emergency services:



All COMAH sites have grab packs containing the above information. These must be maintained in readiness to provide to the emergency services in an accessible but secure location e.g. Control Room.

In addition, when the fire brigade is in attendance they will request locations of any gas cylinders (e.g. Butane or Acetylene). They are likely to impose a 250 metre exclusion zone for 24 hours around any cylinders which have been exposed to fire.

Safe condition and decontamination

- Render spills involving hazardous materials as “safe for disposal” or “further treatment” as appropriate.
- Wash the area with large volumes of water once the material has been removed.
- Assess disposal routes (e.g. drains) of wash water or fire water run off to ensure they will not cause pollution.
- Decontaminate personnel and equipment if required.
- Inspect and replace (if required) any equipment used in an incident as soon as possible.

Post emergency information

Scene preservation and evidence

Preserve the scene and capture all relevant evidence for major incidents. Certain incidents, such as the loss of life, require the scene to be preserved by law.

- Before a scene is preserved, it must first be made stable and pose no further risk.
- It is the role of the event controller to ensure that photographs are taken as soon as possible.
- Witnesses should be escorted to separate rooms and give independent statements as soon as possible after the incident.

Event learning

Once the incident has been contained and the site restored to normal operation, the causes of the incident need to be investigated and the learning points identified. The aim is to ensure that similar incidents do not occur again and to clarify if emergency responses were adequate.

The event controller must gather all information relating to the incident and attempt to identify the root cause and learning points.

Counselling and support arrangements

Some major incidents may involve levels of psychological trauma to those involved, and in these circumstances it is the company’s policy to offer counselling to help them recover from the incident.

The company operates a confidential counselling service as part of its employee assistance programme. This is manned by trained counsellors who can provide advice and assistance on a range of issues and arrange formal face-to-face counselling sessions where necessary.

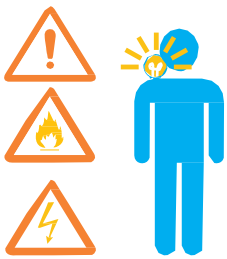
Report any cases requiring formal counselling to the Thames Water occupational health team. This will enable them to follow up on cases and ensure a full recovery. The team will also be able to offer advice and assistance on how to deal with the situation.

Part 7 – Control of Incidents on COMAH Sites

COMAH sites are subject to the Control of Major Accident Hazards Regulations because of the quantities of dangerous substances (the definition of these substances is specific to these regulations) held on such sites. If you are a manager of a COMAH Site or have a role in managing activities on a COMAH site there are certain things you will need to do and records you will need to keep in order to comply with the regulations. This will give you a brief summary of your responsibilities. It also makes reference to supporting documentation on the Health, Safety and Wellbeing section of the SharePoint Portal, which provides further information.

Note: the table in *HSP 34 "Control of Major Accident Hazards"* on the HS&E Section of the SharePoint Portal, gives the criteria for determining whether or not a site falls within the scope of the regulations. If there is any doubt, seek advice from your Health, Safety and Wellbeing Advisor.

Information instruction and training



All managers of COMAH sites must have attended the Managing COMAH training.

It is essential to ensure that all visitors and personnel who work on site receive a general induction and are made aware of hazards. In addition to the Thames Water induction procedure, there is additional information, relevant to COMAH sites and emergency procedures, which must also be passed on during the induction.

A record of persons inducted must be kept and for persons based on a COMAH site this induction must be refreshed annually.

Monitoring

Managers conducting monitoring activities at clean water COMAH sites must define an inspection program that systematically monitors the key risks and activities on their site. Full use of the range of inspection checklists must be made in defining this program. Checklists can be found on the H&S Portal under SHE Forms and completed checklists must be logged on Safeguard together with a record of the actions arising.

Construction and other major works on COMAH sites

Occasionally it will be necessary to carry out construction work on COMAH sites. Depending on the scope, there may be an impact on compliance with the regulations. It is essential to inform your Health, Safety and Wellbeing Advisor about any planned works at an early stage, so that relevant documentation can be amended and any necessary notifications given to the enforcing authorities. Comprehensive guidance on this issue is provided in *HSP 36 "Occupied Buildings and dangerous areas on site"*.

Process safety performance indicators

Process Safety Performance Indicators (PSPI's) have been developed for COMAH sites and these form part of the monthly report to senior management and annual report to the regulator. They measure key activities (e.g. safety critical maintenance) which are crucial to the safe management of COMAH sites. You must ensure that these activities are carried out. More information on PSPI's can be obtained in *HSP 34*.

Notification of changes on COMAH sites

It is essential to maintain an accurate inventory of the dangerous substances on your site. This helps prevent inadvertently creeping above the threshold for total dangerous substances (aggregation rules contained in the regulations), which may trigger the regulations (your Health, Safety and Wellbeing Advisor can provide more information).

It is also essential to remember that if circumstances change (increases or decreases in quantities of hazardous substances, or changes in process, etc. see *HSP 34*) you must tell your Health, Safety and Wellbeing Advisor before the changes are made so that the competent authority can be notified.

Major Accident Prevention Policy (MAPP)

All COMAH sites require a MAPP. It is your responsibility (with the help of your Health, Safety and Wellbeing Advisor) to ensure that this document is updated annually to reflect current practices and procedures that ensure all measures are defined to prevent a major accident on your site.

Quantitative Risk Assessments

For all COMAH sites quantitative risk assessments must be undertaken to empirically demonstrate all measures have been taken to prevent harm to persons or the environment. For the purposes of safety, a quantitative risk assessment must be undertaken that identifies Major Accident Hazards (MAH) and demonstrates that controls are either Broadly Acceptable or As Low As Reasonably Practicable (ALARP) providing further measures for risk reduction cannot be justified. For the purposes of protecting the environment a quantitative risk assessment must be completed that identifies the source pathway and receptors possible on a COMAH site and demonstrate that there is sufficient control to prevent a Major Accident to The Environment (MATTE) and that all foreseeable initiating events are sub-MATTE. The findings of these risk assessments must be incorporated into the MAPP and reviewed annually to include further measures to reduce risks on site.

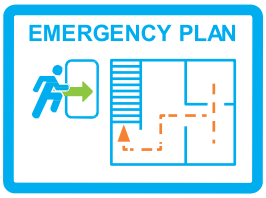
Hazard identification

No capital work on a COMAH site or a site that could become a COMAH due to the nature of this work site is permitted without a formal risk assessment. For significant changes (refer to HSP34) a HAZOP must be undertaken with findings and actions recorded within the CDM health and safety file.

On-site emergency plan

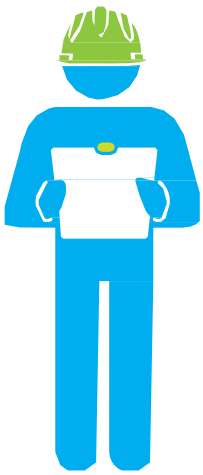
All COMAH sites require an on–site emergency plan. The on-site emergency plan is written to cover the full range of possible major incidents on site. Site managers must ensure the plan is tested every month and reviewed annually. Actions arising from the tests, and the review, must be logged on SpheraCloud and tracked to conclusion.

Off-site emergency plans for top-tier site only



The COMAH off-site emergency plan details the actions and responsibilities for responders in the event of a major incident. Responsibility for production of the off-site plan rests with the Local Authority. For Top tier COMAH sites within Thames Water's Catchment Thames Water is a statutory consultee in the production of these plans, Any enquiries in relation to these plans should be directed to the Health and Safety Assurance Governance and Regulation Manager.

Audit



In keeping with the requirements of HS (G) 65, regular audits of COMAH sites will be completed by the Health, Safety and Wellbeing Team using a specifically-designed audit tool. Four audits are defined:

- Understanding COMAH – to be completed with a newly appointed site manager subsequent to them attending and passing the Managing COMAH training.
- Implementing COMAH – to be completed on a new COMAH site or an existing COMAH site where significant change has recently occurred. This Audit validates procedures to the regulations.
- Delivering COMAH – to be completed on a new COMAH site or an existing COMAH site where significant change has recently occurred. This Audit validates procedures are being implemented.
- Maintaining COMAH – to be completed on existing COMAH sites where no significant change has occurred on an annual basis to ensure high standards are being maintained.