

Major Accident Hazard Regulatory Overview for the Emerging Hydrogen Sector

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Making
Sustainability
Happen

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Hydrogen Enthusiasm

"I am convinced that hydrogen must be at the heart of our plans to grow the economy and to become net zero by 2050.

Low carbon hydrogen has a unique role to play in supporting the decarbonisation of power and in transitioning vital UK industries away from fossil fuels"

Sarah Jones MP, Minister of State for Industry

Hydrogen Strategy Update to the Market: December 2024, Department for Energy Security & Net Zero



What is a Major Accident Hazard (MAH)?

COMAH defines a MAH as:

- A hazard with the potential to cause a major emission, fire, or explosion
- Leading to serious danger to human health or the environment
- Involving one or more dangerous substance (under COMAH)



Pipework Failure:
Cyclohexane VCE



Water Ingress:
Toxic Cloud &
Groundwater
Contamination



Mixing of Incompatible
Materials: Evolved H_2
Explosion



Thermal Runaway
(Li-Battery):
Evolved H_2



Planning Hazardous Substance Consent (PHSC)

- Enforced by Planning (Hazardous Substances) Regulations 2015 in England or equivalent in Scotland and Wales.
- Approval required for storage of hazardous substances above threshold
- Thresholds are provided in Schedule 1 of the regulations:
 - Hydrogen is a named substance: **2 tonnes** (5 tonnes for aggregation)
 - Several named substances and hazard groups (e.g., H1, P2, E1, O2)
- Applications are sent to the Hazardous Substance Authority (HSA)



Key Requirements of PHSC

- Applicant must provide:
 - Detailed description of the facility (including plans)
 - Maps and description of surrounding environment
 - Maximum quantities of hazardous materials
 - Description of process conditions and equipment
 - Description of how materials are transported
 - Proposed measures to mitigate major accident hazards
- Hazardous Substance Authority has the right to deny an application



Control of Major Accident Hazards (COMAH) 2015

- Hydrogen is a named dangerous substance under COMAH
 - Lower-tier threshold: **5 tonnes**
 - Upper-tier threshold: **50 tonnes**
- COMAH aims to prevent and mitigate major accidents
- Harm to the environment is considered as serious as harm to people
- COMAH is enforced by the Combined Authority (CA)





Key Requirements of COMAH



- COMAH Notification including identification of intended COMAH status (Upper Tier or Lower Tier). This leads to specific requirements:
 - Upper Tier & Lower Tier – MAPP, SMS and Emergency Response Plan
 - Upper Tier Only – COMAH Safety Report
- It is a requirement to demonstrate All Measures Necessary
- COMAH Safety Report is reviewed:
 - After a major accident or new knowledge, or significant change; or
 - At least every five years.



Other Safety Regulation Considerations

- Dangerous Substances Explosive Atmospheres Regulations (DSEAR) 2002
 - Regulations apply whenever a dangerous substance is present
 - Dangerous substances in scope cause fires, explosions, metal corrosion.
 - Creation and regular update of DSEAR risk assessments
 - Identification of release points and classify hazardous zones.
 - Implement control measures and provide information and training.



Other Safety Regulation Considerations

- The Dangerous Substances (Notification and Marking of Sites) Regulations (NAMOS) 1990
 - Requirement to notify Fire Authority and Enforcing Authority if **25 tonnes** or more of dangerous substances are stored on site.
 - Requires relevant safety signs to be displayed at access points and within the site (as directed by the inspector)
 - Ensure signage is clean and free from obstruction



FLAMMABLE GAS



SLR-SA Service Offerings

1. Detailed review of dangerous substance quantities against COMAH and P(HS)C requirements, and other similar regulations. Providing guidance and support on required actions and notifications.
2. Detailed and bespoke risk assessments (e.g. DSEAR, FRA, HAZOP, HAZID, LOPA, SQRA [OBRA], NATECH [flooding, climate change])
3. Support for all COMAH Regulations 2015 requirements: MAPP, SMS, COMAH Safety Report authorship and training.
4. Full leadership and experienced communication with relevant authorities



Don't overlook regulatory requirements!

- Understand relevant regulations
- Set a realistic timeline
- Design with safety in mind