



## **Pressure system written schemes and examination on COMAH sites.**



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## INTRODUCTION

Ensuring mechanical containment integrity is a key responsibility under the Control of Major Accident Hazards Regulations, COMAH. Typically much of the high hazard plant and equipment on a COMAH site will be classed as pressure systems and will fall within the scope of Pressure System Safety Regulations (PSSR). This places key responsibilities on Competent Persons to draw up and/or certify Written Schemes of Examination (WSE) and carry out examinations.

The PSSR only requires the User/Owner to consider the release of stored energy likely to cause danger. This may not be sufficient for the site operator to meet the requirements of Regulation 4 of COMAH - *Every operator shall take all measures necessary to prevent major accidents and limit their consequences to persons and the environment.*

The operator should not assume that a WSE for PSSR will cover the COMAH requirements unless this has been agreed between the Operator and the Competent Person.

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### COMAH sites.

The majority of medium to large chemical plants, fuel storage depots, petrochemical and pharmaceutical plants are likely to fall within the scope of the COMAH regulations. Typical quantities of various substances that would require COMAH to be implemented are given in Table 1. The regulations define two tiers with differing applications of the regulations for each.

Note: Threshold quantities are specified for aggregation of various substances held on site as well as for an individual substance. For further information see L111 a Guide to the Control of Major Accident Regulations 1999.

Where there are quantities of different substances held on site then it is necessary to aggregate the quantities – assess the quantity of each chemical held as a partial fraction of the threshold quantity and if the total exceeds 1 the regulations apply.

### Example of aggregation:

- A site contains the following

2 tonnes of Chlorine = 2/10 of lower tier fraction = 0.2

15 tonnes of Bromine = 15/20 of lower tier fraction = 0.75

3 tonnes of Ethylene Oxide = 3/5 of lower tier fraction = 0.6

Chlorine = 0.2

Bromine = 0.75

Ethylene Oxide = 0.6

Total = 1.55

**Total is greater than 1 therefore the site is classed as a Lower Tier COMAH site.**

**Table 1.**

This is simplified because of the number and quantities of chemicals involved.

1. Certain premises are exempt from the regulations.  
e.g. Offshore installations, temporary storage of tankers or tank containers, MOD sites, mines, quarries or boreholes, landfill sites.
2. The following substances must be present in quantities above the threshold values for lower tier and upper tier sites:

## Named substances

Substance	Lower Tier (tonnes)	Upper Tier (tonnes)
Ammonium Nitrate and Potassium Nitrate fertilisers	Quantities vary between 10 and 10000 tonnes depending on the stability and concentration.	
Arsenic pentoxide, arsenic acid and/or salts	1	2
Arsenic trioxide, arsenious acid and/or salts	0.1	0.1
Bromine	20	100
Chlorine	10	25
Nickel compounds in powder form	1	1
Ethyleneimine	10	20
Fluorine	10	20
Formaldehyde (concentration > 90%)	5	50
Hydrogen	5	50
Hydrogen Chloride (liquefied gas)	25	250
Lead Alkyls	5	50
Liquefied flammable gases including LPG and natural gas	50	200
Acetylene	5	50
Ethylene Oxide	5	50
Propylene Oxide	5	50
Methanol	500	5000
4,4-Methylenebis (2-chloraniline) as powder	0.01	0.01
Methylisocyanate	0.15	0.15
Oxygen	200	2000
Toluene diisocyanate	10	100
Carbonyl dichloride (phosgene)	0.3	0.75
Arsenic trihydride (arsine)	0.2	1
Phosphorus trihydride (phosphine)	0.2	1
Sulphur dichloride	1	1
Sulphur trioxide	15	75
Specific Carcinogens above 5% by weight	0.5	2
Petroleum products: a) gasolines and naphthas b) kerosenes (including jet fuels) c) gas oils (including diesel fuels, home heating oils)	2500	25000

## Substances not specifically named

Categories of dangerous substances	Lower Tier (tonnes)	Upper Tier (tonnes)
1. Very Toxic	5	20
2. Toxic	50	200
3. Oxidising	50	200
4. Explosive (UN/ADR Div 1.4)	50	200
5. Explosive (UN/ADR Div 1.1, 1.2, 1.3, 1.5, 1.6 or risk phase R2 or R3))	10	50
6. Flammable liquids (Flash point $\geq 21^{\circ}\text{C}$ and $\leq 55^{\circ}\text{C}$ )	5000	50000
7. Highly Flammable		
a) Highly flammable liquids (Likely to catch fire in contact with air or under particular process conditions)	50	200
b) Highly flammable liquids (Flash point $< 21^{\circ}\text{C}$ )	5000	50000
8. Extremely flammable gases and liquids	10	50
9. Dangerous for the environment		
a) Very toxic to aquatic organisms	100	200
b) Toxic to aquatic organisms	200	500
10. Other classifications		
a) Reacts violently with water	100	500
b) Liberates toxic gas in contact with water	50	200

### Agreement between operators and competent person.

Unless agreed prior to commencement of the PSSR inspection contract the Competent Person will complete examinations in accordance with the WSE in compliance with the PSSR. This may not meet the requirements of Regulation 4 (COMAH).

Where the operator requires assistance with compliance with Regulation 4 (COMAH) then the scope of the extended service needs to be defined, documented and agreed. e.g.

- Examination of pipework and other parts normally excluded from a PSSR written scheme.
- Detailed reporting of scope, content and results of examinations.
- Examination of non-pressurised equipment, such as storage tanks.
- Provision of detailed Inspection Plans for non-PSSR and PSSR equipment.
- Examination of control devices not covered by PSSR, such as fluid level devices.
- Confirmation for suitability of original design integrity of vessels and tanks.
- Fitness for purpose life assessments.
- Fatigue assessments or high/low temperature assessments.

### High hazard sites not coming within the scope of COMAH (sub COMAH).

Hazards associated with COMAH substances remain despite the quantities stored falling below the COMAH thresholds. Under the Health & Safety at Work Act 1974 a duty remains to provide a safe work place and these hazards may need to be considered further.

The Health and Safety Executive (HSE) may apply similar requirements to sites with thresholds below the COMAH limits.

### Other legislative requirements.

Examinations completed under legislation other than PSSR at COMAH sites may require similar additional consideration. e.g Lifting Operations and Lifting Equipment Regulations (LOLER), Control of Substances Hazardous to Health (COSHH) etc.



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