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**COMAH Competent Authority Policy on
Containment of Bulk Hazardous Liquids at COMAH
Establishments**

Control of Major Accident Hazard Regulations 1999

**Consultation Draft version 1.4
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1. Preface and Consultation Issues

In response to the accident at the Buncefield fuel storage depot in December 2005 and other incidents, we have developed a Containment Policy to set out the key principles relating to the bulk storage of hazardous liquids. We are now consulting on the policy, which describes measures to improve the protection of people and the environment, both on and off-site, as well as the safeguarding the supply of fuels and chemicals to the country as a whole.

The scope of this consultation is installations that store and use large quantities of petrol and other fuels and are subject to the Control of Major Accident Hazards (COMAH) Regulations 1999. The Health and Safety Executive, the Environment Agency and the Scottish Environment Protection Agency act together as the Competent Authority for the implementation of the COMAH Regulations and the public consultation is being hosted on the Environment Agency website. This consultation document and the regulatory impact assessment can be downloaded from

www.environment-agency.gov.uk/yourenv/consultations/1696211/

The consultation started on 27 June 2007 and will last for 12 weeks, so responses should be sent to us by 19 September 2007. At a later date we will consult separately on extending the policy to include COMAH establishments that store and distribute large quantities of chemicals.

The proposed policy measures will apply immediately to any new establishments that are built and they largely confirm and summarise current best practice. Recent incidents including Buncefield have highlighted deficiencies in the containment measures at existing establishments and the harm that such incidents can cause. The incidents have also involved significant financial costs to the operators. Many of the COMAH establishments that store bulk quantities of fuels were built more than 40 years ago, and were designed to the safety and environmental standards of the day. Containment standards have risen since then, but many of the establishments have not upgraded their storage tanks and associated equipment.

We have developed this proposed policy because we believe that existing establishments should be upgraded to meet new plant standards, as far as it is reasonably practicable to do so. This upgrading will involve significant costs to the operators, especially in the fuel storage sector where the tanks are very large. The costs and benefits are described in the Regulatory Impact Assessment. We estimate that it will take 10 to 20 years to implement the required upgrading work.

The development of this policy represents our response to several of the recommendations made by the Buncefield Major Incident Investigation Board in their Design and Operations report, published in March 2007.

We would particularly welcome comments on the following issues:

1. Are the proposed policy measures appropriate for new installations?
2. Do you have any suggestions for alternative measures that will achieve an equivalent level of protection to people or the environment?

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3. To what extent should existing establishments be upgraded to meet the proposed policy measures?
4. Do you agree with the costs and benefits of compliance with the policy on existing establishments, as described in the Regulatory Impact Assessment?
5. Is the proposed implementation timetable achievable?
6. What disproportionate effects will the policy have on small firms in the sector (defined by OECD as having fewer than 50 employees)?

We have contacted the operators of all COMAH establishments and a number of trade associations and invited them to comment on our proposals. We would also welcome comments from any other organisation or person.

Sending us your comments:

If you would like to discuss the technical details of the policy with us, before sending in your comments, please contact:

For primary containment issues – David Pascoe, HSE. Tel: 0151 951 4241. Email: david.pascoe@hse.gsi.gov.uk

For secondary containment issues - Aidan Whitfield, Environment Agency. Tel: 01733 464161. Email: aidan.whitfield@environment-agency.gov.uk

For tertiary containment issues - Roger Ward-Dutton, SEPA. Tel: 01224 248338. Email: roger.ward-dutton@sepa.org.uk

We would prefer you to send responses to us by email at:

COMAH.containment@environment-agency.gov.uk . Alternatively you could send them to Lori Fisher, Environment Agency, Block 1, Government Buildings, Burghill Road, Westbury-on-Trym, Bristol. BS10 6BF. Tel: 0117 914 2820, fax: 0117 915 6840. **The consultation will close on 19 September 2007.**

Useful links:

Further information about the accident at the Buncefield fuel storage depot including the reports produced by the Major Incident Investigation Board can be found at: <http://www.buncefieldinvestigation.gov.uk/> .

The Health and Safety Executive has carried out a public consultation on proposals for revised policies for HSE advice on development and control around large-scale petrol storage sites. This considers the land use planning implications of the accident at the Buncefield fuel storage depot. The consultation closed on 22 May 2007 and details can be found at:

<http://www.hse.gov.uk/consult/condocs/cd211.htm> .

The Health and Safety Executive is carrying out a public consultation on proposals for revised policies to address societal risk around onshore non-nuclear major hazard installations. This considers how societal risk (the risk of there being multiple casualties in a single accident) might be incorporated into land use planning decisions. The consultation will close on 2 July 2007 and details can be found at:

<http://www.hse.gov.uk/consult/condocs/cd212.htm>

2. COMAH Competent Authority Policy

Containment at COMAH Establishments Handling Bulk Hazardous Liquids

Introduction

In response to Buncefield and other incidents, the COMAH Competent Authority (CA) has developed a 'Containment Policy' to set out the key principles relating to the bulk storage of hazardous liquids. The policy describes measures to improve the protection of people and the environment, both on and off-site, as well as the safeguarding the supply of fuels and chemicals to the country as a whole.

The Containment Policy

This Containment Policy applies a holistic approach to preventing and mitigating the consequences of major accidents, and sets a clear benchmark, for the safety of people and the environment. It applies to the bulk storage of hazardous liquids at COMAH sites, and provides a framework from which sector specific principles and standards for achievement of success can be derived.

Primary containment measures have the highest priority in recognition of their importance in preventing accidents. Secondary containment measures are important in preventing the loss of primary containment escalating into a major accident. Tertiary containment measures are an important means of reducing the off-site consequences of an accident and preventing escalation of an accident to become a major accident to the environment (MATTE). Secondary containment measures may require the longest implementation time in recognition of the scale and costs involved in upgrading existing facilities.

The Law

This policy underpins the current COMAH guidance and regulations, which require all COMAH establishments to take all measures necessary with regards to the containment of liquid hazardous substances, to prevent major accidents and limit their consequences to persons and the environment.

Application

The policy will be applied to industry sectors and processes according to risk, and will be implemented on the basis of the hazards of the substances present, taking account of the situation, community and environment where the installations are located. The highest standards will be expected where the risks to people and environment are greatest. Elsewhere the measures will be implemented according to the hazard and risk.

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The measures apply immediately to new establishments and, following discussions between the operator and the regulator, any significant changes in inventory or operation at existing establishments.

The measures will be applied to upgrade existing establishments as far as it is reasonably practicable to do so.

Implementation

The Competent Authority recognises that upgrading existing establishments is disruptive and that the costs to the industry may be substantial. In order to avoid disrupting operations and supplies the upgrading work will need to be phased in over a significant period of time, which could be up to ten to twenty years in some cases.

Operators of existing sites will need to review their compliance with the measures and prepare a plan for implementing improvements, which will need to be acceptable to the COMAH CA. These plans should contain completion dates for each stage of the programme, informed by risk, maintenance programmes and site characteristics, so that the operator can demonstrate to the COMAH CA progress towards achievement of the measures.

The COMAH CA proposes to apply this policy, on the basis of risk, in the following phases:

- (i) Establishments storing Petrol (Gasoline) and similar petroleum products, or other fuels (the subject of this consultation); and
- (ii) Establishments storing flammable and toxic liquids in the chemical manufacturing, storage, and distribution industries (that will be subject to a separate consultation at a later date).

Engagement and Standards

The COMAH CA is consulting interested parties including operators, trade associations, local authorities and the public on the issues involved, including the costs and benefits. Guidance and standards supporting this policy will be developed.

3. COMAH Competent Authority Policy

Containment of Bulk Hazardous Liquids at COMAH Establishments

Expanded Framework for handling Petrol (Gasoline) and similar Petroleum Products, or other Fuels

These measures will apply to new establishments and, following discussions between the operator and the regulator, any significant changes in inventory or operation at existing establishments. These measures will apply to the upgrading of existing establishments as far as it is reasonably practicable to do so.

Part A: Primary Containment

1. Storage vessels

Above ground storage tanks (ASTs) and underground storage tanks (USTs) shall be:

- designed and constructed to a relevant standard to ensure their mechanical integrity compatible with the chemical and physical properties of the liquids to be contained;
- designed to avoid excessive vapour generation created by the consequences of an overfill of product;
- protected against over and under-pressurisation and operated within limits established to ensure that this is achieved;
- designed and constructed to withstand impacts on their integrity from normal operations and foreseeable events;
- designed, constructed and installed to prevent failure due to corrosion or chemical interaction;
- installed on sound foundations; and
- subject to an inspection, testing, and maintenance system sufficient to prevent failure.

2. Pipework (on site)

Pipework within the establishment shall be:

- designed and constructed to a relevant standard to ensure mechanical integrity compatible with the chemical and physical properties of the liquids to be contained;
- designed, constructed, and protected to withstand impacts on its integrity from normal operations, thermal expansion and foreseeable events including where appropriate fire;
- designed, constructed and installed to prevent failure due to corrosion or chemical interaction;

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- subject to an inspection, testing, and maintenance system sufficient to prevent failure, (above ground installation aids this objective);
- of minimum practicable diameter and length with joints reduced as far as possible; and
- properly supported to suit its intended use and layout. Supports within secondary containment areas shall be fire resistant.

3. Pipelines (inter site)

- Product transfers between sites shall be subject to confirmation by the receiving site that they can safely receive the product package before transfer starts.
- Receiving sites shall be able to initiate shut down of transfer in an emergency.

4. Valves

- All tanks shall be capable of being isolated by suitably located fire-safe shut off valves on filling and outlet pipes.
- All isolating valves shall be capable of being closed in an emergency without exposing people to risk.
- Remotely operated shut off valves shall remain operable in the event of power failure or shall fail-safe.
- All isolation valves shall be periodically tested for continued functionality.

5. Control instrumentation

- Tank gauging systems shall be automated.
- High integrity, high level alarms shall be installed, and arranged to stop filling operations, where the guidance shows this to be necessary.
- For substances which can create a vapour cloud an independent high integrity high-high level alarm system shall be provided, linked to an automatic emergency shutdown system or diversion of the flow to a safe place if not promptly acted upon, where the guidance shows this to be necessary.

Part B: Secondary and Tertiary Containment

6. Bunding of above-ground storage tanks (ASTs)

ASTs shall be bunded to provide secondary containment.

The bunds shall:

- be impermeable;
- have adequate corrosion resistance;
- have adequate strength and durability;
- have the minimum number of tanks within each bund in line with good practice;

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- have incompatible materials stored in separate bunds;
- have sufficient capacity to allow for tank failure and firewater management. This will normally be a minimum capacity of either 110% of the capacity of the largest tank or 25% of the total capacity of all the tanks within the bund, whichever is the greater;
- have either no rainwater drain or the drain is into a contained and enclosed system requiring positive action for operation;
- have no pipework that penetrates through the bund floor;
- have no pipework that penetrates through the bund walls as far as reasonably practicable, otherwise it shall be with adequate sealing and support; and
- be subject to periodic inspection and certification by a competent person regarding their condition and performance.

7. Bunding and fire controls

ASTs containing substances that are flammable, highly flammable or extremely flammable shall be banded to provide secondary containment of the dangerous substance as above and in addition shall have:

- adequate capacity and design to allow fire prevention and control measures to be taken;
- fire resistant structural integrity, joints and pipework penetrations; and
- a means of removing fire-water from below the surface of the liquid in the bund (for dangerous substances which are not miscible with water and have a lower density than water).

8. Underground storage tanks (USTs)

USTs shall comply with the appropriate requirements for ASTs and in addition shall:

- be double skinned or banded;
- have any access chambers designed to provide secondary containment; and
- have a primary containment failure monitoring and alarm system.

9. Underground pipework (on site)

Underground pipework shall comply with all the requirements for pipework and in addition shall:

- have a primary containment failure monitoring and alarm system and either be double skinned or have secondary containment trenches;
- not be located in the same secondary containment system as pipelines containing incompatible materials; and
- have the routes of the pipework or trenches clearly marked.

10. Tertiary containment

Tertiary containment plans for establishments storing or using liquid dangerous substances or that may have firewater containing dangerous

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substances shall be prepared, having regard to the ground and location characteristics of the site, to:

- minimise the consequences of a loss of primary containment from equipment that is not provided with secondary containment;
- minimise the consequences of a major incident that causes the failure of or exceeds the storage capacity of secondary containment; and
- enable additional measures to be deployed in time if an incident escalates.

Part C: Common Issues

11. Facility design

The installation shall have sufficient capacity to hold safely the anticipated or foreseeable volume of hazardous liquids, including fire-water, compatible with the intended operational characteristics.

12. Fire fighting

- Fire load risk assessments shall be undertaken to determine optimum methods and equipment for rapid restoration of control and minimisation of water/foam application.
- Fire fighting plans shall be prepared, including multiple tank/bund events.
- Suitable fixed and mobile fire fighting equipment and materials shall be provided or be rapidly available.

13. Maintenance

The establishment shall be managed and operated in accordance with a maintenance, inspection and testing regime, which ensures a sufficient standard of operability for equipment and systems.

14. Change Management

Change management procedures shall be in place to prevent adverse impact on the operation and integrity of the installation.

15. Staffing

The establishment shall be managed and operated by sufficient persons who are competent in respect of the responsibilities to be undertaken by them in connection with the operation of the establishment.

4. Definitions

Primary containment is the most important means of preventing major accidents involving liquid dangerous substances. It is achieved by the equipment that has direct contact with the substances being stored or transported such as storage vessels, pipework, valves, pumps and associated management and control systems. It also includes equipment that prevents the loss of primary containment under abnormal conditions, such as high level alarms linked to shutdown systems.

Secondary containment minimises the consequences of a failure in the primary containment system by preventing the uncontrolled spread of the liquid dangerous substance. Secondary containment is achieved by equipment that is external to and independent of the primary containment system, such as concrete or clay bunds around storage tanks. Secondary containment will also provide limited storage capacity for firewater management.

Tertiary containment minimises the consequences of a failure in the primary and secondary containment systems by providing an additional barrier preventing the uncontrolled spread of the liquid dangerous substance. Tertiary containment is achieved by means external to and independent of the primary and secondary containment systems, such as site drainage and sumps, diversion tanks, impervious liners and/or flexible booms. Tertiary containment will be utilised when there is a small scale loss of primary containment from an area without secondary containment (e.g. a pipe flange leak or an overturned road tanker), and when there is a major incident that causes the failure of the secondary containment (e.g. bund joint failure or firewater overflowing from a bund during a prolonged tank fire).

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