

Loss Prevention Standards – Asset Class

# Tank Farms

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With large quantities of hazardous materials stored on-site, tank farms have a unique fire exposure. However, this can be reduced and managed with the correct measures.



## Introduction

A tank farm or fuel farm is a hazardous storage facility where products are stored in large quantities in fixed bulk tanks above or below ground. Tanks can store anything, but highly flammable, combustible, reactive, toxic or incompatible materials stored in large volumes or in adjacent tanks cause the most concern from a property loss prevention perspective. Specific material, hazard, operability and activity risk assessments will help to reduce all aspects of risk.

For guidance on tanker loading/unloading activities, refer to the Aviva Loss Prevention Standard: *Road Tanker Loading and Unloading*.



## Understanding the Risks

Fires and property losses involving hazardous liquids on tank farms can be caused by:

- Poor maintenance
- Lack of or inadequate training for individuals handling these substances or equipment
- Inappropriate operational procedures and/or design of equipment
- Inadequate control of ignition sources
- Poor housekeeping

This is why a culture of good housekeeping and maintenance is crucial as part of the overall risk management strategy. Risk assessments may need to be enhanced by regulatory requirements such as the Seveso Directives, the Control of Major Accident Hazards ([COMAH](#)) Regulations 2015 and the Dangerous Substances and Explosive Atmospheres Regulations 2002 ([DSEAR](#)).

## Materials Being Stored

Attention should be given to the material being stored, or multiple materials being stored in the same or adjacent tank farms, including:

- The volumes of materials stored, compared to the volumes needed to be stored
- Its physical characteristics at the expected temperature and pressures within the storage tank
- Its physical characteristics if it was released at the expected worst and best-case atmospheric conditions, e.g., deepest winter vs middle of summer

Furthermore, assess whether the materials being stored:

- Are liquid, gas or solid
- Are explosive, combustible, flammable, toxic, corrosive or reactive
- Create static – and if so, whether precautions have been taken to eliminate it
- Are likely to cause erosion or corrosion to the transfer network
- Are incompatible or reactive if there is a release or leak
- Are maintained with specific temperature or pressure requirements
- Are quality controlled to prevent the introduction of contaminants and meet product quality needs

## LOSS PREVENTION STANDARDS

## Sludge

Sludge or sediment build-up is a common problem inside tanks storing materials such as crude oils. Sludge can reduce storage capacity, reduce flows and block pipes and valves. Injecting oil under pressure through a revolving internal jet stream, located centrally at the base of the tank, will break up the sediment. These anti-sludge systems are often built in situ.

## Location and Topography

Regarding the location of tank farms, specific thought should be given to the:

- Nature of the surface and its porosity
- Gradient of the surface (the surface should be firm and level)
- Distance of the station from exposed assets, including buildings, tanks, and equipment
- Distance from any pumps or control features, and the site boundary
- Transport passing by or in close proximity
- Accessibility required for the emergency services
- Drains or sewers nearby
- Rivers or streams exposed
- Nature of the surrounding areas, for example commercial, industrial, or natural

## Environmental Conditions

Materials behave completely differently with different atmospheric and environmental conditions. Risk assessments need to include the maximum and minimum expected:

- Wind conditions
- Temperature
- Rainfall
- Snow
- Humidity

Appropriate environmental monitoring or signalling should be provided, from a basic windsock to rotameter and temperature recording. With this in place, if a loss of containment occurs, the behaviour of the materials being stored may be predicted and acted upon accordingly.

## Tanks

### Bases

Tanks should be located on a liquid sealed surface – normally concrete – to prevent their contents from leeching into the soil, causing environmental contamination and polluting the water table below. To minimise corrosion, tank bases should ideally be on plinths raised above the floor of the spillage containment area.

**Tanks should be physically secured to the ground. If a tank is not secured, a liquid release could cause it to 'float',** depending on the volume being stored in the tank compared to the volume of the retention. Floating tanks can damage piping, infrastructure, and other tanks, and cause incidents to escalate.

## Roofs

Tank roofs can be:

- Fixed – it does not move
- Floating – it moves up and down with content fluctuations

## Separation

The separation and distances between the tanks should vary depending on the type of product stored, the nature of the separation and the arrangements for spillage or release containment. Consider if a release from one tank could escalate an incident with other tanks – including in the event of a delayed ignition and fire or explosion, or a reaction with residues or other spillages on the ground.

## Fire resistance

**The tank's material of construction should be non-combustible** and compatible with the material being stored.

Tanks must be able to withstand direct flame impingement for a period of time based on their construction and protection. Masonry, concrete or protected steel tank supports should have a fire resistance rating appropriate for the risk – either one, two or four hours – and be designed to prevent liquid ingress.

## Labelling

Each tank should have:

- A data plate indicating its year of build, volume, and material of construction
- Clear labels identifying exactly what is stored within
- Instrumentation indicating the quantity of material stored

## Features

- Depending on the materials being stored, the tanks could or should have:
- Breather vents
- Emergency relief valves and vents
  - Discharging to a safe location
  - Designed to relieve over-pressure from an exposing fire
- Flame arrestors
- Evaporators
- Access platforms or walkways
- Associated pipelines, valves and transfer pumps – consider:
  - Their locations
  - Whether they increase or decrease the exposure to the tanks
  - Whether they are accessible in an emergency incident
- Alarming and control equipment with
  - In-built redundancy
  - Hardwired safety interlock or shutdowns, such as:
    - Level monitoring and control
    - High- level alarms and interlocks
    - High-high level alarms and interlocks

- Ancillary equipment, such as compressors
- Separate area for loading and unloading
- Lightning protection
- Lighting and emergency lighting

#### Additional Considerations

A tank may have:

- Internal or external heating, applied with:
  - Hot water
  - Steam
  - Electrical
  - Thermal oil systems
- Externally applied insulation (consider how often this is checked for impregnation)
- Stirrer or internal agitation

These features can:

- **Impact the tank's material characteristics**
- Create failure mechanisms
- Cause corrosion or rust
- Introduce increased fire hazards
- Cause machinery breakdown issues
- Create material ingress and egress exposures

#### Entry

Tanks will be considered as a confined space and regardless of the materials being stored, they should only be accessed internally using a formal confined space entry procedure.

#### Cross-contamination

Tanks may have potential for cross-contamination, impurities or leaching in the material currently being stored. Consider if a tank is used solely for one material, and what it has stored previously.

## Containment

To prevent an uncontrolled material release escaping the confines of the area where the tanks are located, there should be appropriate containment, including:

- At least 110% capacity of the contents of the largest container or 25% of their total storage capacity, whichever is the greater
- Walls of appropriate stability to hold and withstand the static and dynamic forces from a tank liquid release
- Walls of appropriate height and distance from the tanks to prevent a spigot flow over the containment wall

The rationale for the largest expected volume should be clearly understood – it may be in excess of the largest single tank volume.

In addition, containment should be:

- Liquid tight
- Able to be drained of rainwater
- Maintained clear of all materials, waste and vegetation

## Precautions and Controls

The precautions and controls in place on a tank farm should be based on as many different variables as possible. It is unrealistic and unacceptable to assume that activities will always run normally, or that systems will not fail or break down. The most important thing is to ensure that the layers of controls and precautions are consistent and joined-up.

There should be restrictions to entering a tank farm area, including:

- Restricted or prohibited areas
- Visitor and contractor controls
- Control of certain materials
- Restricted equipment and tools, including mobile phones
- Smoking prohibition

Additional issues to consider include:

- Appropriate process controls and hardwired interlocks
- Appropriately located emergency manual shutdown buttons for equipment
- Barrier walls or fire compartment walls between tanks
- Fire retardant or fire-resistant coatings for tank supports, pipe racks, cable trays
- Earthing and bonding for each tank, subject to regular continuity testing
- Ventilation
- Ensuring that activities are always completed by trained personnel
- The use of appropriately rated devices, equipment, vehicles, clothing and footwear, for any area classified as having the potential for an explosive or flammable atmosphere
- The use of temporary barriers to prevent vehicle or personnel movements
- Clear and appropriate signage, such as traffic rules or emergency instructions
- Drain covers
- Appropriate lighting
- Separation distance from other structures and equipment, exposed assets and buildings, including open windows or doors
- Appropriate management controls and permit controls for any work associated with the tank farm
- Control of ignition sources
- Ensuring all storage and waste is housed at least 10 metres away from the tank farm
- Housekeeping, vegetation growth and waste control maintenance

## Fire Detection and Protection Systems

Fixed detection and protection systems are installed to help mitigate a situation when something has already gone wrong. In this case, this will generally be a loss of containment from a tank. Consideration should be given to the nature of the material and its state, the ambient conditions, the exposure, etc., along with the following:

- Volatile organic content detection
- Toxic content detection
- Interlocks to automatically shut down any material transfers safely
- Manual shut down buttons at safe and readily accessible locations for operators
- Automatic fire detection
- Automatic and/or manually activated:
  - Water curtains or water sprays to knock down gases or vapours
  - Sprinklers or deluge systems to extinguish fires
    - For the outside of the tank(s) itself
    - For the wider containment area
    - For associated pumping or transfer equipment
    - For associated piping runs, pipe racks or bridges
    - For exposure protection the recommended arrangement is normally:
      - An automatically and manually actuated deluge system
      - Density of 10mm/min/m<sup>2</sup> over all and any surface area of the tank(s)
    - This can be foam enhanced
  - Depending on the material in the tank, foam injection into the vapour space of the tank may be an option:
    - The nature of the foam has to be specifically based on the material in the tank
    - The method of foam injection has to be based on the foam being used, e.g., above the liquid surface within the tank or below the liquid surface within the tank
  - Foam blankets/foam pouring for the containment area
  - Automatically oscillating monitor nozzles or water canons directed to the tank surfaces
    - These can be foam enhanced
    - If manually activated monitor nozzles or water canons are employed, appropriate consideration should be given to exposure reduction measures for operators
  - Exposure protection for exposing building walls, activities, process equipment, etc.
  - Fire water hydrants in the area generally at least every 75m and available on all sides of the tank farm

Note: In all cases where foam is employed, the foam needs to be appropriate for the materials being stored in the tanks and the design of the protection needs to be based on this foam selection.

## Emergency Response

Formal consideration to various events and appropriate formal emergency response plans should be in place for such activities. These should consider what could fail, what could go wrong and how it could escalate. The plan should be practiced at least annually and should involve the local public resources and any third party organisations or contractors that are used. Depending on the nature of the materials being stored or the volumes involved, these emergency plans may need to meet regulatory criteria such as COMAH.

## Inspection, Testing and Maintenance

Appropriate inspection, testing and maintenance activities for all items associated with the tank farm should be carried out and given formal records, including:

- Process controls
- Control or emergency interlocks
- Tank internal and external surfaces – such as checks for signs of rust and corrosion
- Tank welds
- Tank wall thickness
- Tank sediment or sludge accumulation removal
- Heating or cooling systems
- Insulation
- Agitators or stirrers
- Valves or relief systems
- Containment bund walls and floor surface
- Lightning conduction

## Training

Training for personnel associated with operations involving potentially hazardous materials is a key component, and should cover:

- What is normally expected to happen
- What could happen in a number of emergency situations
- How they are expected to respond
- Own personnel and contractors or third parties
- Hazards associated with the substances being stored

## Checklist

A generic Tank Farms – Fire Safety Checklist is presented in Appendix 1 which can be tailored to your own organisation.



## Specialist Partner Solutions

Aviva Risk Management Solutions can offer access to a wide range of risk management products and services at preferential rates via our network of Specialist Partners.

For more information please visit:

[Aviva Risk Management Solutions – Specialist Partners](#)

## Sources and Useful Links

- Health and Safety Executive (HSE) – [L111: The Control of Major Accident Hazards \(COMAH\) Regulations 2015](#)
- HSE – [HSG176: Storage of flammable liquids in tanks](#)
- HSE – [L138: Dangerous Substances and Explosive Atmospheres Regulations 2002 \(DSEAR\) – Approved Code of Practice and Guidance](#)
- HSE – [HSG244: Remotely operated shutoff valves \(ROSOVs\) for emergency isolation of hazardous substances](#)
- RISC Authority – [RC57: Recommendations for fire safety in the storage, handling and use of highly flammable and flammable liquids: storage in external fixed tanks](#)
- Seveso III Directive – Directive 2012/18/EU
- National Fire Protection Association (NFPA) – [NFPA 11: Standard for Low, Medium and High Expansion Foam](#)
- NFPA – [NFPA 13: Standard for the Installation of Sprinkler Systems](#)
- NFPA – [NFPA 15: Standard for Water Spray Fixed Systems for Fire Protection](#)
- NFPA – [NFPA 16: Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems](#)
- NFPA – [NFPA 30: Flammable and Combustible Liquids Code](#)

## Additional Information

Relevant Loss Prevention Standards include:

- Road Tanker Loading and Unloading
- Flammable Liquids

To find out more, please visit [Aviva Risk Management Solutions](#) or speak to one of our advisors.

Email us at [riskadvice@aviva.com](mailto:riskadvice@aviva.com) or call 0345 366 6666.\*

\*Calls may be recorded and/or monitored for our joint protection.

# Appendix 1 – Tank Farms Checklist



Location	
Date	
Completed by (name and signature)	

	Tank Farms	Y/N	Comments
1.	<p>Have specific risk assessments been completed – and reviewed periodically or when there are changes – in respect of:</p> <ul style="list-style-type: none"> <li>• Hazard?</li> <li>• Material?</li> <li>• Operability?</li> <li>• Activity?</li> </ul>		
2.	Are the materials stored quality checked to ensure they are not introducing contaminants and meet product quality needs?		
3.	Can the volumes stored on site be reduced?		
4.	<p>Are the physical characteristics of the material(s) involved fully understood?</p> <ul style="list-style-type: none"> <li>• At the expected temperature and pressures within the storage tank?</li> <li>• If it was released at expected worst and best case atmospheric conditions?</li> <li>• Is it a liquid, gas or solid?</li> <li>• Is it:                             <ul style="list-style-type: none"> <li>○ Explosive?</li> <li>○ Flammable?</li> <li>○ Toxic?</li> <li>○ Corrosive?</li> <li>○ Reactive?</li> </ul> </li> <li>• Does it create static?</li> <li>• Is it likely to cause erosion or corrosion to the tank or transfer network?</li> <li>• Is it water miscible?</li> <li>• If a gas or a vapour is generated, is it heavier than air?</li> </ul>		

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5.	<p>If multiple different materials are stored in the same tank farm, are any of them reactive or incompatible with each other?</p> <p>Are appropriate precautions taken to minimise interaction if the materials are released?</p>		
6.	<p>Are the materials being stored maintained within specific temperature or pressure requirements?</p>		
7.	<p>Have sources of ignition been removed from the area?</p>		
8.	<p>Is the formation of a sludge/sediment an exposure within the tank?</p>		
9.	<p>If a material is released, can it form a vapour or gas that could contaminate other equipment or any control instrument?</p>		
10.	<p>Does the nature of the tank farm increase the risk posed, due to:</p> <ul style="list-style-type: none"> <li>• Nature of the surface and its porosity?</li> <li>• Gradient of the surrounding ground surface?</li> <li>• Distance from exposed assets, including buildings, other tanks, equipment, and tankers loading and unloading?</li> <li>• Distance from any pumps or control features?</li> <li>• Transport passing by or in close proximity?</li> <li>• Drains or sewers nearby?</li> <li>• Rivers or streams exposed?</li> <li>• Nature of the surrounding areas, for example, commercial, industrial, or natural?</li> </ul>		
11.	<p>Does the activity expose assets and/or buildings, including:</p> <ul style="list-style-type: none"> <li>• Open windows or doors?</li> <li>• Ventilation air intake events?</li> </ul>		
12.	<p>When considering the nature of the materials and the location of the tank farm, do the risk assessments include the maximum and minimum expected:</p> <ul style="list-style-type: none"> <li>• Wind conditions?</li> <li>• Ambient temperature</li> <li>• Rainfall?</li> <li>• Snow or ice?</li> <li>• Humidity?</li> </ul>		

## LOSS PREVENTION STANDARDS

13.	Is appropriate environmental monitoring and signalling equipment provided, such as a windsock or rotameter?		
14.	Are all tanks constructed with materials consistent and compatible with the materials being stored?		
15.	Do all tanks have a data plate indicating year of build, volume, and material of construction?		
16.	Are all tanks constructed of non-combustible materials, such as steel or concrete?  Have they been designed to an appropriate standard?		
17.	Are the tanks: <ul style="list-style-type: none"> <li>• Fixed roof tanks?</li> <li>• Floating roof tanks?</li> </ul>		
18.	Are all tanks located on a liquid sealed surface?		
19.	Are all tanks designed to withstand direct flame impingement?		
20.	Are tanks provided with any supports, and are these protected against fire?		
21.	Are the tanks located on plinths or raised bases?		
22.	Is there an appropriate confined space entry procedure in place and enforced for all tank entry?		
23.	Are all tanks clearly labelled, indicating the: <ul style="list-style-type: none"> <li>• Contents within?</li> <li>• Volume of the tank?</li> </ul> Are all pipelines clearly labelled?  Are tanks fitted with instrumentation controls to indicate the quantity of substance stored within them?		
24.	Are all tanks physically separated or detached from each other?  What is the separation distance?  Are there fire barrier or containment walls?		
25.	Can a release from one tank create or escalate an incident with other tanks?		

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	Is there potential for delayed ignition or detonation?		
26.	<p>Where required, do all tanks have:</p> <ul style="list-style-type: none"> <li>• Breather vents?</li> <li>• Emergency relief valves and vents?</li> </ul> <p>Do relief systems discharge to a safe location?</p> <p>Are relief systems designed to relieve over-pressure from an exposing fire impinging or exposing the tank?</p> <p>Are vents and relief systems fitted with appropriate flame arrestors?</p>		
27.	<p>Are there any associated:</p> <ul style="list-style-type: none"> <li>• Evaporators?</li> <li>• Access platforms or walkways?</li> <li>• Pipelines?</li> <li>• Valves?</li> <li>• Transfer pumps?</li> </ul> <p>Where are these located?</p> <p>Do they increase or decrease the exposure to the tanks?</p> <p>Are they accessible in an emergency incident?</p>		
28.	<p>Is there appropriate process control and alarming equipment?</p> <ul style="list-style-type: none"> <li>• With in-built redundancy?</li> <li>• With hardwired safety interlock/shutdowns?</li> </ul>		
29.	<p>Are there:</p> <ul style="list-style-type: none"> <li>• High-level alarms and interlocks?</li> <li>• High-high level alarms and interlocks?</li> </ul> <p>If applicable, are there alarms and interlocks at:</p> <ul style="list-style-type: none"> <li>• Low and low-low level?</li> <li>• High and high-high temperature?</li> <li>• Low and low-low temperature?</li> <li>• High and high-high pressure?</li> <li>• Low and low-low pressure?</li> </ul>		
30.	Do the tanks and associated equipment have internal or external heating?		

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	<ul style="list-style-type: none"> <li>• How is this applied (hot water, steam, electrical, thermal oil systems)?</li> <li>• Would its failure cause any issues with the material being stored?</li> </ul>		
31.	<p>Do the tanks and associated equipment have externally applied insulation?</p> <ul style="list-style-type: none"> <li>• Is this non-combustible in nature?</li> <li>• Is this checked for impregnation or contamination, and how often?</li> </ul>		
32.	<p>Do any of the tanks have a stirrer or internal agitation?</p> <p>Would its failure cause any issues with the material being stored?</p>		
33.	<p>Are the tanks used solely for a single material, now and/or in the past?</p> <p>Is there potential for cross-contamination from impurities or leaching in the material currently being stored?</p>		
34.	<p>Is there a separate area for tanker loading and unloading?</p>		
35.	<p>Is there appropriate lightning protection?</p>		
36.	<p>Is there appropriate lighting, including emergency lighting for the tank farm area?</p>		
37.	<p>Is appropriate containment provided around the tank farm and tanks?</p> <p>Will this prevent an uncontrolled material release escaping the confines of the area of the tanks?</p> <p>Is this area:</p> <ul style="list-style-type: none"> <li>• At least 110% capacity of the largest expected container or 25% of the overall storage capacity, whichever is the largest?</li> <li>• Liquid tight (for both floor and walls)?</li> <li>• Able to be drained of rainwater?</li> <li>• Maintained clear of all materials, waste and vegetation?</li> </ul>		
38.	<p>Are the containment walls:</p> <ul style="list-style-type: none"> <li>• Of appropriate stability to hold and withstand the static and dynamic forces from a tank liquid release?</li> </ul>		

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	<ul style="list-style-type: none"> <li>• Of appropriate height and distance from the tanks to prevent a spigot flow over the containment wall?</li> <li>• Liquid tight?</li> </ul>		
39.	<p>Are there restrictions to entering a tank farm area?</p> <p>Does this include:</p> <ul style="list-style-type: none"> <li>• Restricted or prohibited areas?</li> <li>• Visitor and contractor controls?</li> <li>• Control of certain materials – and are these identified?</li> <li>• Restricted equipment and/or tools, including mobile phones?</li> <li>• Smoking prohibition, control and restrictions?</li> </ul>		
40.	Are there appropriate management and permit controls for any work to be completed associated with the tank farm, such as confined space or hot work?		
41.	Are there appropriate process controls and hardwired interlocks?		
42.	Have emergency manual shut down buttons been located in two readily accessible and safe locations?		
43.	Do barrier walls or fire compartment walls need to be provided between tanks or tank farms?		
44.	<p>Are fire retardant or resistant coatings required and provided for:</p> <ul style="list-style-type: none"> <li>• Tank supports?</li> <li>• Pipe racks supports?</li> <li>• Cable trays?</li> <li>• Ancillary equipment supports?</li> </ul>		
45.	<p>Are earthing and bonding straps provided?</p> <p>Are they formally inspected, tested and maintained?</p> <p>Is there continuity testing?</p>		
46.	Are activities always completed by trained personnel?		
47.	Are formal recorded inspection, testing and maintenance activities completed for all items in the process?		

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48.	<p>If the area is classified (due to the potential for an explosive or flammable atmosphere), are appropriately rated devices, equipment, vehicles, clothing and footwear used?</p> <p>Is this monitored and audited?</p>		
49.	<p>Are temporary barriers to prevent vehicle or personnel movements used?</p>		
50.	<p>Is there clear and appropriate signage?</p>		
51.	<p>If there is potential for substances to enter drains, are appropriate covers used?</p> <p>What about for an emergency release, or fire water run-off?</p>		
52.	<p>Is housekeeping, vegetation growth and waste control maintained to the highest standards, and not permitted within or outside of the containment bund?</p>		
53.	<p>Is all storage and waste housed at least 10m away from the tank farm?</p>		
54.	<p>If an organic liquid or gas is stored, has appropriate volatile organic content detection been provided?</p>		
55.	<p>Is the area of the tank farm secure?</p> <p>Is it:</p> <ul style="list-style-type: none"> <li>• Within a secure fenced area?</li> <li>• Covered by a CCTV system?</li> <li>• Visited regularly throughout the working day?</li> <li>• Visited regularly during idle periods?</li> </ul>		
56.	<p>If a toxic material is stored, has appropriate toxic material detection been provided?</p>		
57.	<p>Is appropriate automatic fire detection provided?</p> <p>Does this include throughout the containment banded area, and covering all areas?</p>		
58.	<p>Where any detection is installed, have interlocks been provided to safely and automatically shut down operations?</p>		
59.	<p>Does a receipt of any fire or important process alarm elsewhere on-site result in the material transfer activities of the tank farm ceasing automatically and/or manually?</p>		

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60.	If there is concern for gas or vapour escape, have automatically and/or manually activated water curtains or water sprays been provided to knock down or adsorb such materials?		
61.	Have automatically actuated sprinkler or deluge systems been provided to extinguish any potential fires?  Does this include: <ul style="list-style-type: none"> <li>• Within the containment bunded area?</li> <li>• On the external shell of the tanks?</li> <li>• For associated pumping or transfer equipment?</li> <li>• For associated piping runs, pipe racks or bridges?</li> <li>• Is the design of this at least 10mm/min/m<sup>2</sup> surface area?</li> <li>• Is the foam enhanced?</li> </ul>		
62.	Has exposure protection been provided to other assets or buildings nearby?		
63.	If there is potential for a release or a pool fire within a contained area, has appropriate foam or foam blanketing been provided?		
64.	Has foam injection into the vapour space of the tank been provided?		
65.	Are there water or foam/water automatically and manually activated monitor nozzles or water cannons?  Do these cover all areas of the tank farm?  If they are manually activated, are the positions of the monitor nozzles safe for operators in a fire?		
66.	If foam is employed in the fire protection strategy, is it compatible for the materials being stored in the tanks?  Is the design of the protection based on this foam selection?		
67.	Are there appropriate fire hydrants in the area?  Are at least two hydrants located in opposite directions within 75m of the tank farm?  Is the available water supply known and considered acceptable?		
68.	Are formal emergency response plans in place, and do they consider: <ul style="list-style-type: none"> <li>• What could fail?</li> <li>• What could go wrong?</li> <li>• How an incident could escalate?</li> </ul>		

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	<ul style="list-style-type: none"> <li>Compliance with regulations?</li> </ul>		
69.	<p>Are emergency plans practised at least annually?</p> <p>Have the local fire brigade recently visited the site as part of a familiarisation visit?</p>		
70.	<p>Do emergency plans involve:</p> <ul style="list-style-type: none"> <li>Liaison with local public resources?</li> <li>Any contractors or third party delivery organisations?</li> </ul> <p>Do the emergency services have satisfactory access to the tank storage area in the event of an incident?</p> <p>Do emergency plans consider continuity of operations?</p>		
71.	<p>Is there formal recorded training for personnel associated with such operations?</p> <p>Does this cover:</p> <ul style="list-style-type: none"> <li>What is normally expected to happen?</li> <li>Up-to-date Standard Operating Procedures?</li> <li>What could happen in a number of emergency situations?</li> <li>Up-to-date Emergency Operating Procedures?</li> <li>How individuals are expected to respond to an emergency?</li> <li>Own personnel and contractors or third parties?</li> <li>A combination of desktop and practical training?</li> </ul>		

72.	<p>Are appropriate formal and recorded inspection, testing and maintenance activities in place for all items associated with the tank farm?</p> <p>Does this include:</p> <ul style="list-style-type: none"> <li>• Process controls?</li> <li>• Control or emergency interlocks?</li> <li>• Internal and external tank surfaces?</li> <li>• External checks for signs of rust and corrosion?</li> <li>• Tank welds?</li> <li>• Tank wall thickness?</li> <li>• Tank sediment or sludge accumulation removal?</li> <li>• Heating or cooling systems?</li> <li>• Insulation?</li> <li>• Agitators or stirrers?</li> <li>• Any valves or relief systems?</li> <li>• Containment bund walls and floor surface, and their housekeeping?</li> <li>• Lightning conduction?</li> </ul>		
73.	Are formal arrangements and procedures in place for tank decommissioning?		
74.	Additional comments:		

## Please Note

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## LOSS PREVENTION STANDARDS