



National
Operational
Guidance

Training specification

Hazardous materials Physical hazards



NFCC
National Fire
Chiefs Council

Developed and maintained by the NFCC



Contents

Hazard - Explosive materials: Not involved in fire 5

- Control measure - Site specific risk information: Explosive materials* 5
- Control measure - ARCHIVED - Emergency response plans* 5
- Control measure - Substance identification: Explosive materials* 6
- Control measure - Control Ammonium Nitrate fertiliser* 8
- Control measure - Eliminate ignition sources* 9
- Control measure - Control explosive materials not involved in fire* 10
- Control measure - Use intrinsically safe equipment* 10

Hazard - Explosive materials: Involved in fire 11

- Control measure - Substance identification: Explosive materials* 11
- Control measure - Control Ammonium Nitrate fertiliser* 13
- Control measure - Cordon control: Explosives* 14

Hazard - Gases under pressure: Involved in fire (e.g. potential Boiling Liquid Expanding Vapour Explosion (BLEVE)) 16

- Control measure - Substance identification: Cylinders and pressurised gas* 16
- Control measure - Consider using thermal imaging or scanning* 17
- Control measure - Cordon control: Cylinders and pressurised gas* 18
- Control measure - Cool pressurised gas containers* 19
- Control measure - Substance identification: Acetylene* 20
- Control measure - Cool pressurised gas containers: Acetylene* 21
- Control measure - Identify and manage Boiling Liquid Expanding Vapour Explosion (BLEVE) situations* 22

Hazard - Combustible dust 23

- Control measure - Substance identification* 23
- Control measure - Cordon control: Combustible dust* 24
- Control measure - Eliminate ignition sources* 25
- Control measure - Reduce the potential for a dust explosion* 26
- Control measure - Use intrinsically safe equipment* 27

Hazard - Flammable vapours: Unignited 27

- Control measure - Substance identification: Flammable vapours* 28
- Control measure - Carry out atmospheric monitoring* 29
- Control measure - Cordon control: Unignited flammable vapours* 30
- Control measure - Eliminate ignition sources* 30
- Control measure - Manage the release of flammable vapours* 31
- Control measure - Use intrinsically safe equipment* 32



Hazard - Flammable vapours: Ignited	33
<i>Control measure - Substance identification</i>	33
<i>Control measure - Cordon control: Ignited flammable vapours</i>	34
<i>Control measure - Prevent firespread</i>	35
<i>Control measure - Select appropriate firefighting media: Flammable vapours</i>	35
Hazard - Flammable liquids: Unignited	36
<i>Control measure - Substance identification</i>	37
<i>Control measure - Manage the release of flammable vapours</i>	37
<i>Control measure - Isolate sources of ignition or heat</i>	38
<i>Control measure - Containment: Flammable liquids</i>	39
<i>Control measure - Use intrinsically safe equipment</i>	40
Hazard - Flammable liquids: Ignited	40
<i>Control measure - Substance identification</i>	41
<i>Control measure - Manage the release of flammable vapours</i>	41
<i>Control measure - Select appropriate firefighting media: Flammable liquids</i>	42
Hazard - Slop-over and boil-over	43
<i>Control measure - Prevent heat transfer to flammable liquid</i>	43
<i>Control measure - Cordon control: Boil-over</i>	44
Hazard - Flammable solids	45
<i>Control measure - Substance identification: Flammable solids</i>	45
<i>Control measure - Manage the release of flammable solids</i>	46
<i>Control measure - Eliminate ignition sources</i>	47
<i>Control measure - Select appropriate firefighting media</i>	48
Hazard - Oxidising materials: Involved in fire	49
<i>Control measure - Substance identification: Oxidising materials</i>	49
<i>Control measure - Cordon control: Oxidising materials</i>	50
<i>Control measure - Select appropriate firefighting media: Oxidising materials</i>	51
Hazard - Oxidisers contaminated with combustibles	52
<i>Control measure - Substance identification: Oxidising materials</i>	52
<i>Control measure - Identify heat reactions within oxidising materials</i>	53
<i>Control measure - Separate oxidising materials from fuel sources</i>	54
<i>Control measure - Apply cooling, considering the potential for reaction with water</i>	55
Hazard - Cryogenic materials	56
<i>Control measure - Substance identification: Cryogenic materials</i>	56
<i>Control measure - Containment: Cryogenic materials</i>	57
<i>Control measure - Personal protective equipment (PPE): Cryogenic materials</i>	57
<i>Control measure - Identify the potential explosive effects due to the failure of a cryogenic gas</i>	



container 58

Control measure - Recognise consequences on processes using cryogenic materials 59

Hazard - Oxygen-enriched atmosphere 60

Control measure - Substance identification 60

Control measure - Manage the release of cryogenic materials 61

Control measure - Identify potential combustible materials in oxygen-enriched atmospheres
..... 61

Control measure - Eliminate ignition sources 62

Control measure - Carry out atmospheric monitoring 63

Control measure - Use intrinsically safe equipment 64



Hazard - Explosive materials: Not involved in fire

Knowledge and understanding

Hazard

Explosive materials: Not involved in fire

Learning outcome

Understand all associated hazard knowledge
See hazard – Explosive materials not involved in fire



Control measure - Site specific risk information: Explosive materials

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Gather and have available risk critical information on explosive materials

Learning outcome

Refer to [Site-Specific Risk Information \(SSRI\) – Operation straining specification](#)

Practical application

Control measure element

Gather and have available risk critical information on explosive materials

Learning outcome

Demonstrate the ability to:

- Gather explosive material information from a number of sources
- Interpret risk information and plan for anticipated outcomes

Refer to [Site-Specific Risk Information \(SSRI\) – Operation straining specification](#)



Control measure - ARCHIVED - Emergency response plans

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Learning outcome

Emergency response plans

Understand:

- The relevant legislation on the production of emergency response plans
- The principles of emergency response and recovery

Practical application

Control measure element

Learning outcome

Access and use emergency response plans to inform operational practice

Demonstrate the ability to:

- Access emergency response plans
- Identify roles and responsibilities of Fire Service within emergency response plans
- Co-operate and share information with other responsible agencies in line with service policy and legal obligations



Control measure - Substance identification: Explosive materials

TRAINING SPECIFICATION



Knowledge and understanding

Control measure element

Gather information and recognise symbols, labels and other markings to identify explosive materials

Learning outcome

Understand:

- Classification of explosive materials
 - Signage identifying explosive materials in the transport environment
 - The information that may be gathered from a vehicle or crafts crew, when explosives are being transported
 - Liaison protocols with military personnel to determine the carriage of explosive materials in unmarked transport
 - Signage identifying sites where explosive materials may be stored
 - Labelling and packaging of explosive substances
 - Recognition features of homemade explosives and CBRNe materials
 - The use of specialist advice to identify homemade explosives and CBRNe materials
- Refer to – Substance identification – Hazardous materials training specification

Practical application



Control measure element

Learning outcome

Gather information and recognise symbols, labels and other markings to identify explosive materials

Demonstrate the ability to:

- Use signs, labels and markings to identify the presence of explosive materials
- Access and interpret explosive materials information from various sources
- Identify the location and physical state of explosive materials and where appropriate use detection equipment
- Identify involvement of explosive materials in fire

Refer to – Substance identification – Hazardous materials training specification



Control measure - Control Ammonium Nitrate fertiliser

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Learning outcome

Control Ammonium Nitrate fertiliser

Understand:

- The use of Ammonium Nitrate
- The use of cordon controls to reduce risk from explosive materials
- How to identify and interpret signage for Ammonium Nitrate
- Actions if Ammonium Nitrate is smouldering or decomposing
- Ammonium Nitrate information to inform tactical planning

Practical application

Control measure element	Learning outcome
Control Ammonium Nitrate fertiliser	<p>Demonstrate the ability to:</p> <ul style="list-style-type: none"> • Establish preventative measures to control the impact of nitrate fertiliser on incidents • Select and implement appropriate operational tactics for use at incidents involving nitrate fertiliser • Monitor and manage the risk from nitrate fertilisers • Access additional support from explosive materials experts



Control measure - Eliminate ignition sources

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element	Learning outcome
Minimise risk by eliminating sources of ignition	<p>Understand the following:</p> <ul style="list-style-type: none"> • Meaning of ignition source • Types of ignition source • Methods to identify ignition sources • Methods to eliminate or minimise the risk of ignition

Practical application



Control measure element

Learning outcome

Eliminate ignition sources

Demonstrate the ability to:

- Identify potential ignition sources
- Select and use appropriate methods to eliminate or control ignition sources



Control measure - Control explosive materials not involved in fire

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Learning outcome

Control explosive materials not involved in fire to prevent them becoming unstable

Understand:

- How explosives may become unstable
- Priority actions to prevent explosives becoming unstable

Practical application

Control measure element

Learning outcome

Control explosive materials not involved in fire to prevent them becoming unstable

Demonstrate the ability to:

- Identify, assess and communicate the likely involvement of explosive materials
- Select and implement appropriate tactics to prevent explosive materials being involved in fire
- Identify where explosive materials present a risk to people, infrastructure and the environment



Control measure - Use intrinsically safe equipment

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Use intrinsically safe equipment to reduce the possibility of explosion

Learning outcome

Understand:
• The importance of using intrinsically safe equipment near explosive materials

Practical application

Control measure element

Use intrinsically safe equipment to reduce the possibility of explosion

Learning outcome

Demonstrate the ability to:
• Use intrinsically safe equipment where there is a risk of explosion



Hazard - Explosive materials: Involved in fire

Knowledge and understanding

Hazard

Explosive materials: Involved in fire

Learning outcome

Understand all associated hazard knowledge
See hazard - [Explosive materials: Not involved in fire](#)



Control measure - Substance identification:



Explosive materials

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Gather information and recognise symbols, labels and other markings to identify explosive materials

Learning outcome

Understand:

- Classification of explosive materials
 - Signage identifying explosive materials in the transport environment
 - The information that may be gathered from a vehicle or crafts crew, when explosives are being transported
 - Liaison protocols with military personnel to determine the carriage of explosive materials in unmarked transport
 - Signage identifying sites where explosive materials may be stored
 - Labelling and packaging of explosive substances
 - Recognition features of homemade explosives and CBRNe materials
 - The use of specialist advice to identify homemade explosives and CBRNe materials
- Refer to – Substance identification – Hazardous materials training specification

Practical application



Control measure element

Learning outcome

Gather information and recognise symbols, labels and other markings to identify explosive materials

Demonstrate the ability to:

- Use signs, labels and markings to identify the presence of explosive materials
- Access and interpret explosive materials information from various sources
- Identify the location and physical state of explosive materials and where appropriate use detection equipment
- Identify involvement of explosive materials in fire

Refer to – Substance identification – Hazardous materials training specification



Control measure - Control Ammonium Nitrate fertiliser

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Learning outcome

Control Ammonium Nitrate fertiliser

Understand:

- The use of Ammonium Nitrate
- The use of cordon controls to reduce risk from explosive materials
- How to identify and interpret signage for Ammonium Nitrate
- Actions if Ammonium Nitrate is smouldering or decomposing
- Ammonium Nitrate information to inform tactical planning



Practical application

Control measure element

Learning outcome

Control Ammonium Nitrate fertiliser

Demonstrate the ability to:

- Establish preventative measures to control the impact of nitrate fertiliser on incidents
- Select and implement appropriate operational tactics for use at incidents involving nitrate fertiliser
- Monitor and manage the risk from nitrate fertilisers
- Access additional support from explosive materials experts



Control measure - Cordon control: Explosives

TRAINING SPECIFICATION

Knowledge and understanding



Control measure element

Learning outcome

Recognise the involvement of explosive materials and implement appropriate cordons

Understand:

- The behaviour of explosives when exposed to fire/heat
 - Factors to consider when risk-assessing explosive materials
 - The dangers associated with firework storage and display operator's sites
 - Secondary explosions and how they may occur
 - Potential hazard areas for explosive related incidents
 - The dangers associated with the strategic placement of improvised explosive devices (IEDs) and secondary devices
 - Actions in the event of discovering IEDs
 - The considerations when using cover to protect from projectiles and blast waves
 - The considerations of using portable communications equipment in the vicinity of explosives
- Refer to – [Establish appropriate cordon controls – Incident command training specification](#)
- Refer to – Cordon controls: hazardous materials – hazardous materials training specification

Practical application



Control measure element

Learning outcome

Recognise the involvement of explosive materials and implement appropriate cordons

Demonstrate the ability to:

- Establish safe control and effective management of resources and the public
- Confirm the involvement of explosive materials and secondary devices
- Implement safe systems of work and control measures near explosive materials
- Use specialist advice to determine appropriate cordons for explosive materials
- Identify and assess the impact of additional related hazards



Hazard - Gases under pressure: Involved in fire (e.g. potential Boiling Liquid Expanding Vapour Explosion (BLEVE))

Knowledge and understanding

Hazard

Learning outcome

Gases under pressure: Involved in fire (e.g. potential Boiling Liquid Expanding Vapour Explosion (BLEVE))

Understand all associated hazard knowledge



Control measure - Substance identification: Cylinders and pressurised gas

TRAINING SPECIFICATION

Knowledge and understanding



Control measure element

Learning outcome

Gather information and recognise symbols, labels and markings to identify cylinders

Understand:

- Classification and labelling of cylinders
- Signage identifying cylinders in the transport environment
- The information that may be gathered from a vehicle or crafts crew, when cylinders are being transported
- The information that may be gathered from a responsible person when cylinders are used/stored on a site
- Signage identifying storage and/or use of cylinders

Refer to – Substance identification – Hazardous materials training specification

Practical application

Control measure element

Learning outcome

Gather information and recognise symbols, labels and markings to identify cylinders

Demonstrate the ability to:

- Use signs, labels and markings to identify the presence of cylinders and pressurised gases
- Access and interpret cylinder and pressurised gas information from various sources
- Identify involvement of cylinders and pressurised gases in fire

Refer to – Substance identification – Hazardous materials training specification



Control measure - Consider using thermal imaging or scanning



TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Learning outcome

Thermal imaging or scanning to ascertain fire information

Understand:

- The purpose of thermal imaging or scanning
- The information thermal imaging can provide
- The limitations of thermal imaging equipment

Practical application

Control measure element

Learning outcome

Thermal imaging or scanning to ascertain fire information

Demonstrate the ability to:

- Effectively use thermal imaging equipment or scanning to ascertain fire information



Control measure - Cordon control: Cylinders and pressurised gas

TRAINING SPECIFICATION

Knowledge and understanding



Control measure element

Learning outcome

Recognise the involvement of cylinders and implement appropriate cordons

- Understand:
- The qualities and features of pressurised gases
 - The importance of quickly identifying gases stored under pressure
 - Factors to consider when assessing the immediate risk from cylinders
 - Hazard areas and exclusion zones from compromised cylinders
 - Safe systems of work and control measures when working in the vicinity of cylinders

Practical application

Control measure element

Learning outcome

Recognise the involvement of cylinders and implement appropriate cordons

- Demonstrate the ability to:
- Establish safe control and effective management of resources and the public
 - Confirm the involvement of cylinders and pressurised gases
 - Identify and implement safe and effective cordons and protection zones
 - Use safe systems of work and control measures to safely and effectively manage cylinders and pressurised gases



Control measure - Cool pressurised gas containers

TRAINING SPECIFICATION



Knowledge and understanding

Control measure element

Cool pressurised cylinders to stop heat source and cool cylinder shell

Learning outcome

Understand:

- How heat may affect cylinders
- Effective methods of cooling cylinders

Practical application

Control measure element

Cool pressurised cylinders to stop heat source and cool cylinder shell

Learning outcome

Demonstrate the ability to:

- Gather and interpret information to confirm hazards from cylinders and pressurised gases
- Select and use appropriate procedures to effectively reduce risk from cylinders and pressurised gases
- Establish safe control and effective management of resources and the public



Control measure - Substance identification: Acetylene

TRAINING SPECIFICATION

Knowledge and understanding



Control measure element

Learning outcome

Gather information and recognise symbols, labels and markings to identify acetylene cylinders

Understand:

- Sources of Information to verify cylinder contents
- Incident information about acetylene cylinders to inform risk assessments and tactical planning
- How to identify signs of heat in acetylene cylinders

Refer to – Substance identification – Hazardous materials training specification

Practical application

Control measure element

Learning outcome

Gather information and recognise symbols, labels and markings to identify acetylene cylinders

Demonstrate the ability to:

- Use signs, labels and markings to identify the presence of acetylene cylinders
- Use detection equipment to identify and monitor involvement of acetylene cylinders



Control measure - Cool pressurised gas containers: Acetylene

TRAINING SPECIFICATION

Knowledge and understanding



Control measure element

Learning outcome

Cool pressurised acetylene cylinders to stop heat source and cool cylinder shell

Understand:

- Specific procedures for cooling and managing acetylene cylinders

Refer to control measure – [Cool pressurised gas containers](#)

Practical application

Control measure element

Learning outcome

Cool pressurised acetylene cylinders to stop heat source and cool cylinder shell

Demonstrate the ability to:

- Apply specific procedures for cooling and managing acetylene cylinders

Refer to control measure – [Cool pressurised gas containers](#)



Control measure - Identify and manage Boiling Liquid Expanding Vapour Explosion (BLEVE) situations

TRAINING SPECIFICATION

Knowledge and understanding



Control measure element

Learning outcome

Identify and manage Boiling Liquid
Expanding Vapour Explosion (BLEVE)

Understand:

- The term 'BLEVE'
- Signs and symptoms that BLEVE may occur
- The hazards caused by BLEVE
- Procedures to manage a BLEVE situation

Refer to control measures – [Cordon control: Cylinders and pressurised gas](#), and [cool pressurised gas containers](#)

Refer to – [Foundation for hazardous materials](#)

Practical application

Control measure element

Learning outcome

Identify and manage Boiling Liquid
Expanding Vapour Explosion (BLEVE)

Refer to control measures – [Cordon control: Cylinders and pressurised gas](#), and [cool pressurised gas containers](#)



Hazard - Combustible dust

Knowledge and understanding

Hazard

Learning outcome

Combustible dust

Understand all associated hazard knowledge



Control measure - Substance identification

TRAINING SPECIFICATION



Knowledge and understanding

Control measure element

Learning outcome

Identify substances to inform situational awareness

Understand:

- Sources of information to identify substances that may cause dust explosions

Refer to – Substance identification – Hazardous materials training specification

Practical application

Control measure element

Learning outcome

Identify substances to inform situational awareness

Demonstrate the ability to:

- Gather information to identify the presence of combustible dust



Control measure - Cordon control: Combustible dust

TRAINING SPECIFICATION

Knowledge and understanding



Control measure element

Learning outcome

Recognise the involvement of dangerous substances that may cause dust explosions and implement appropriate cordons

Understand:

- Types of materials that may present risk of explosion
- How fire service activities may create dust hazards
- The use of specialist advice to determine hazard areas and cordon distances

Refer to – [Establish appropriate cordon controls – Incident command training specification](#)

Practical application

Control measure element

Learning outcome

Recognise the involvement of dangerous substances that may cause dust explosions and implement appropriate cordons

Demonstrate the ability to:

- Confirm the presence of combustible dust and assess the risk of dust explosion

Refer to – [Establish appropriate cordon controls – Incident command training specification](#)



Control measure - Eliminate ignition sources

TRAINING SPECIFICATION

Knowledge and understanding



Control measure element

Learning outcome

Minimise risk by eliminating sources of ignition

Understand the following:

- Meaning of ignition source
- Types of ignition source
- Methods to identify ignition sources
- Methods to eliminate or minimise the risk of ignition

Practical application

Control measure element

Learning outcome

Eliminate ignition sources

Demonstrate the ability to:

- Identify potential ignition sources
- Select and use appropriate methods to eliminate or control ignition sources



Control measure - Reduce the potential for a dust explosion

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Learning outcome

Reduce risk of a dust explosion

Understand:

- How dust explosions may occur
- Secondary dust explosions
- How to reduce risk of dust explosions

Practical application



Control measure element

Learning outcome

Reduce risk of a dust explosion

Demonstrate the ability to:

- Use safe systems of work, control measures and agreed procedures to mitigate risk of dust explosion



Control measure - Use intrinsically safe equipment

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Learning outcome

Use intrinsically safe equipment to reduce the possibility of explosion

Understand:

- The importance of using intrinsically safe equipment where dust explosions may occur

Practical application

Control measure element

Learning outcome

Use intrinsically safe equipment to reduce the possibility of explosion

Demonstrate the ability to:

- Use intrinsically safe equipment where there is a risk of explosion



Hazard - Flammable vapours: Unignited

Knowledge and understanding



Hazard

Learning outcome

Flammable vapours: Unignited

Understand all associated hazard knowledge



**Control measure - Substance identification:
Flammable vapours**

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Learning outcome

Gather information and recognise symbols, labels and other markings to identify flammable vapours

Understand:

- Classification and labelling of flammable liquids
 - Signage identifying the presence of flammable vapours
 - The use of detection equipment to identify flammable vapours
 - The use of specialist advice to interpret physical properties of flammable vapours
- Refer to – Substance identification – Hazardous materials training specification

Practical application



Control measure element

Learning outcome

Gather information and recognise symbols, labels and markings to identify flammable vapours

Demonstrate the ability to:

- Use signs, labels, markings and detection equipment to identify the presence of flammable vapours
- Access and interpret gas cylinder information from a number of sources
- Recognise additional risks from flammable vapours



Control measure - Carry out atmospheric monitoring

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Learning outcome

Carry out atmospheric monitoring to test if air is safe to breathe

Understand:

- When atmospheric monitoring should be carried out
- How atmospheric monitoring is achieved
- Types of atmospheric conditions that can be monitored
- Who should carry out atmospheric monitoring

Practical application



Control measure element

Learning outcome

Carry out atmospheric monitoring to test if air is safe to breathe

Demonstrate the ability to:

- Carry out atmospheric monitoring for a variety of gases to inform the incident plan



Control measure - Cordon control: Unignited flammable vapours

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Learning outcome

Cordon controls to protect from flammable vapours

Understand:

- Methods to identify flammable vapours
- How to determine the extent of a flammable vapour hazard
- The considerations when establishing cordons, exclusion zones and evacuation of the public

Practical application

Control measure element

Learning outcome

Cordon controls to protect from flammable vapours

Demonstrate the ability to:

- Establish safe control and effective management of resources and the public
- Confirm and continually monitor the risk from flammable vapours
- Identify and implement safe and effective cordons and protection zones



Control measure - Eliminate ignition sources

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element	Learning outcome
Minimise risk by eliminating sources of ignition	Understand the following: <ul style="list-style-type: none">• Meaning of ignition source• Types of ignition source• Methods to identify ignition sources• Methods to eliminate or minimise the risk of ignition

Practical application

Control measure element	Learning outcome
Eliminate ignition sources	Demonstrate the ability to: <ul style="list-style-type: none">• Identify potential ignition sources• Select and use appropriate methods to eliminate or control ignition sources



Control measure - Manage the release of flammable vapours

TRAINING SPECIFICATION

Knowledge and understanding



Control measure element

Learning outcome

Manage the release of flammable vapours

- Understand:
- Characteristics of flammable vapours released under pressure
 - How to prevent or reduce vapour release from a container
 - Tactics to manage a vapour release affected by weather conditions and topography
 - The considerations for upper explosive limit (UEL) and lower explosive limit (LEL) when managing flammable vapours

Practical application

Control measure element

Learning outcome

Manage the release of flammable vapours

- Demonstrate the ability to:
- Apply the appropriate action to manage the release of flammable vapours:
 - Isolation
 - Stopping/reducing
 - Ventilating
 - Dilution/dispersion
 - Establish safe systems of work and control measures to reduce risk from flammable vapours



Control measure - Use intrinsically safe equipment

TRAINING SPECIFICATION

Knowledge and understanding



Control measure element

Learning outcome

Use intrinsically safe equipment to reduce the possibility of explosion

Understand:
• The importance of using intrinsically safe equipment near explosive materials

Practical application

Control measure element

Learning outcome

Use intrinsically safe equipment to reduce the possibility of explosion

Demonstrate the ability to:
• Use intrinsically safe equipment where there is a risk of explosion



Hazard - Flammable vapours: Ignited

Knowledge and understanding

Hazard

Learning outcome

Flammable vapours: Ignited

Understand all associated hazard knowledge



Control measure - Substance identification

TRAINING SPECIFICATION

Knowledge and understanding



Control measure element

Learning outcome

Identify substances to inform situational awareness

Understand:

- Sources of information to identify substances that may cause dust explosions

Refer to – Substance identification – Hazardous materials training specification

Practical application

Control measure element

Learning outcome

Identify substances to inform situational awareness

Demonstrate the ability to:

- Gather information to identify the presence of combustible dust



Control measure - Cordon control: Ignited flammable vapours

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Learning outcome

Cordon controls to protect from ignited flammable vapours

Understand:

- The considerations when establishing cordons, exclusion zones and evacuation of the public

Practical application



Control measure element

Learning outcome

Cordon controls to protect from ignited flammable vapours

Demonstrate the ability to:

- Establish safe control and effective management of resources and the public
- Confirm and continually monitor the risk from ignited flammable vapours
- Identify and implement safe and effective cordons and protection zones



Control measure - Prevent firespread

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Learning outcome

Prevent firespread

Understand:

- The need for early intervention to prevent fire spread
- Methods to prevent firespread

Refer to – [External fire protection – Fires in buildings](#)

Practical application

Control measure element

Learning outcome

Prevent firespread

Demonstrate the ability to:

- Assess the need to protect surrounding structures, areas and hazards from ignited flammable vapours

Refer to – [External fire protection – Fires in buildings](#)



Control measure - Select appropriate firefighting

media: Flammable vapours

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Select appropriate firefighting media to extinguish or control fire

Learning outcome

Understand:

- The considerations prior to extinguishing a leak of ignited flammable vapours
- The balance of risk between extinguishing and allowing a controlled burn

Refer to - [Select appropriate firefighting media – Fires and firefighting training specification](#)

Practical application

Control measure element

Select appropriate firefighting media to extinguish or control fire

Learning outcome

Demonstrate the ability to:

- Interpret risk information to determine whether to extinguish or control burning
- Interpret risk information to determine whether to stop or manage vapour release
- Interpret risk information to determine use of appropriate firefighting media

Refer to - [Select appropriate firefighting media – Fires and firefighting training specification](#)



Hazard - Flammable liquids: Unignited



Knowledge and understanding

Hazard

Flammable liquids: Unignited

Learning outcome

Understand all associated hazard knowledge



Control measure - Substance identification

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Identify substances to inform situational awareness

Learning outcome

Understand:

- Sources of information to identify substances that may cause dust explosions

Refer to – Substance identification – Hazardous materials training specification

Practical application

Control measure element

Identify substances to inform situational awareness

Learning outcome

Demonstrate the ability to:

- Gather information to identify the presence of combustible dust



Control measure - Manage the release of flammable vapours



TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Learning outcome

Manage the release of flammable vapours

Understand:

- Characteristics of flammable vapours released under pressure
- How to prevent or reduce vapour release from a container
- Tactics to manage a vapour release affected by weather conditions and topography
- The considerations for upper explosive limit (UEL) and lower explosive limit (LEL) when managing flammable vapours

Practical application

Control measure element

Learning outcome

Manage the release of flammable vapours

Demonstrate the ability to:

- Apply the appropriate action to manage the release of flammable vapours:
 - Isolation
 - Stopping/reducing
 - Ventilating
 - Dilution/dispersion
- Establish safe systems of work and control measures to reduce risk from flammable vapours



Control measure - Isolate sources of ignition or heat



TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Learning outcome

Isolate sources of ignition or heat

Understand:

- The considerations prior to isolating sources of ignition
- Refer to [Eliminate ignition sources – Fires and firefighting training specification](#)

Practical application

Control measure element

Learning outcome

Isolate sources of ignition or heat

Refer to [Eliminate ignition sources – Fires and firefighting training specification](#)



Control measure - Containment: Flammable liquids

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Learning outcome

Contain flammable liquids

Understand:

- Methods, techniques and equipment to manage and reduce flow of flammable liquids
- Methods of vapour suppression
- The hierarchy of control for managing leaks
- The additional hazards caused by a leak of pressurised liquid

Practical application

Control measure element

Contain flammable liquids

Learning outcome

Demonstrate the ability to:

- Assess the spread of vapour clouds, giving consideration to:
 - Buoyancy
 - Weather
 - Environment
- Use methods, techniques and equipment to manage the flow of flammable liquids and vapour release
- Apply the hierarchy of control for managing leaks



Control measure - Use intrinsically safe equipment

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Use intrinsically safe equipment to reduce the possibility of explosion

Learning outcome

Understand:

- The importance of using intrinsically safe equipment near explosive materials

Practical application

Control measure element

Use intrinsically safe equipment to reduce the possibility of explosion

Learning outcome

Demonstrate the ability to:

- Use intrinsically safe equipment where there is a risk of explosion



Hazard - Flammable liquids: Ignited

Knowledge and understanding

Hazard	Learning outcome
Flammable liquids: Ignited	Understand all associated hazard knowledge



Control measure - Substance identification

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element	Learning outcome
Identify substances to inform situational awareness	Understand: • Sources of information to identify substances that may cause dust explosions Refer to – Substance identification – Hazardous materials training specification

Practical application

Control measure element	Learning outcome
Identify substances to inform situational awareness	Demonstrate the ability to: • Gather information to identify the presence of combustible dust



Control measure - Manage the release of



flammable vapours

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Manage the release of flammable vapours

Learning outcome

Understand:

- Characteristics of flammable vapours released under pressure
- How to prevent or reduce vapour release from a container
- Tactics to manage a vapour release affected by weather conditions and topography
- The considerations for upper explosive limit (UEL) and lower explosive limit (LEL) when managing flammable vapours

Practical application

Control measure element

Manage the release of flammable vapours

Learning outcome

Demonstrate the ability to:

- Apply the appropriate action to manage the release of flammable vapours:
 - Isolation
 - Stopping/reducing
 - Ventilating
 - Dilution/dispersion
- Establish safe systems of work and control measures to reduce risk from flammable vapours



Control measure - Select appropriate firefighting



media: Flammable liquids

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element	Learning outcome
Select appropriate firefighting media to extinguish or control fire	Understand: <ul style="list-style-type: none">• The considerations prior to extinguishing a leak of ignited flammable liquids• Methods of containing, controlling and extinguishing flammable liquids Refer to - Select appropriate firefighting media – Fires and firefighting training specification

Practical application

Control measure element	Learning outcome
Select appropriate firefighting media to extinguish or control fire	Demonstrate the ability to: <ul style="list-style-type: none">• Interpret hazard information to determine use of appropriate firefighting media Refer to - Select appropriate firefighting media – Fires and firefighting training specification



Hazard - Slop-over and boil-over

Knowledge and understanding

Hazard	Learning outcome
Slop-over and boil-over	Understand all associated hazard knowledge



Control measure - Prevent heat transfer to flammable liquid

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element	Learning outcome
Prevent heat transfer to flammable liquid	Understand: <ul style="list-style-type: none">• Why a boil-over may occur• How a boil-over may occur• Tactics to monitor and prevent boil-overs

Practical application

Control measure element	Learning outcome
Prevent heat transfer to flammable liquid	Demonstrate the ability to: <ul style="list-style-type: none">• Interpret hazard information to determine a suitable method of limiting heat transfer to flammable liquid• Select and use thermal imaging equipment to monitor flammable liquid storage tanks



Control measure - Cordon control: Boil-over

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Learning outcome

Cordon controls to protect from boil-overs

Understand:

- The considerations when establishing cordons, exclusion zones and evacuation of the public

Refer to – Cordon controls: Hazardous materials

Refer to – [Establish appropriate cordon controls – Incident command training specification](#)

Practical application

Control measure element

Learning outcome

Cordon controls to protect from boil-overs

Demonstrate the ability to:

- Establish safe control and effective management of resources and the public
- Confirm and continually monitor the risk for boil-over or slop-over
- Identify, implement and communicate safe and effective cordons and protection zones



Hazard - Flammable solids

Knowledge and understanding

Hazard

Learning outcome

Flammable solids

Understand all associated hazard knowledge



Control measure - Substance identification: Flammable solids

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element	Learning outcome
Gather information and recognise symbols, labels and other markings to identify flammable solids	<p>Understand:</p> <ul style="list-style-type: none"> • Classification and labelling of: <ul style="list-style-type: none"> - Flammable solids - Spontaneously combustible materials - Substances in contact with water producing flammable gas • Signage identifying the presence of flammable solids • The use of detection equipment to identify flammable solids • The use of specialist advice to interpret physical properties of flammable solids <p>Refer to – Substance identification – Hazardous materials training specification</p>

Practical application

Control measure element	Learning outcome
Gather information and recognise symbols, labels and other markings to identify flammable solids	<p>Demonstrate the ability to:</p> <ul style="list-style-type: none"> • Use signs, labels, markings and detection equipment to identify flammable solids • Access and interpret flammable solids information from a number of sources



Control measure - Manage the release of flammable solids

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element	Learning outcome
Manage the release of flammable solids to prevent ignition or reduce level of hazard	<p>Understand:</p> <ul style="list-style-type: none"> • Methods of active cooling to prevent ignition of flammable solids • The benefits and risks of applying water to reduce likelihood of ignition to flammable solids • Additional considerations when using water to reduce risk of ignition • The use of specialist extinguishers for specific substances • The balance of risk when considering a controlled burn

Practical application

Control measure element	Learning outcome
Manage the release of flammable solids to prevent ignition or reduce level of hazard	<p>Demonstrate the ability to:</p> <ul style="list-style-type: none"> • Establish safe systems of work to assess and control the release of flammable solids • Assess the balance of risk between extinguishing and allowing a controlled burn



Control measure - Eliminate ignition sources

TRAINING SPECIFICATION

Knowledge and understanding



Control measure element

Learning outcome

Minimise risk by eliminating sources of ignition

Understand the following:

- Meaning of ignition source
- Types of ignition source
- Methods to identify ignition sources
- Methods to eliminate or minimise the risk of ignition

Practical application

Control measure element

Learning outcome

Eliminate ignition sources

Demonstrate the ability to:

- Identify potential ignition sources
- Select and use appropriate methods to eliminate or control ignition sources



Control measure - Select appropriate firefighting media

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Learning outcome

Use the appropriate media to effectively and efficiently extinguish fire

Understand the use of the following:

- Water
- Foam
- Dry chemical powders
- Carbon dioxide, vaporising liquids and inert gases

Practical application

Control measure element

Select the correct firefighting media

Learning outcome

Demonstrate the ability to:

- Select appropriate firefighting media for various situations and classifications of fire
- Use water to extinguish fire
- Use foam to extinguish fire
- Use dry chemical powder to extinguish fire
- Use carbon dioxide, vaporising liquids and inert gases to extinguish fire
- Assess the status of other firefighting activities to justify current actions and ensure safe working practices



Hazard - Oxidising materials: Involved in fire

Knowledge and understanding

Hazard

Oxidising materials: Involved in fire

Learning outcome

Understand all associated hazard knowledge



Control measure - Substance identification: Oxidising materials

TRAINING SPECIFICATION

Knowledge and understanding



Control measure element

Learning outcome

Gather information and recognise symbols, labels and other markings to identify oxidising materials

Understand:

- Classification and labelling of oxidising materials including organic peroxides
 - Signage identifying the presence of oxidising materials
 - The use of specialist advice to interpret physical properties of oxidising materials
- Refer to – Substance identification – Hazardous materials training specification

Practical application

Control measure element

Learning outcome

Gather information and recognise symbols, labels and other markings to identify oxidising materials

Demonstrate the ability to:

- Use various sources of information to gather information about oxidising materials
- Use detection equipment to determine the presence of oxidising material



Control measure - Cordon control: Oxidising materials

TRAINING SPECIFICATION

Knowledge and understanding



Control measure element

Learning outcome

Cordon control to protect from oxidising materials

Understand:

- The characteristics of oxidising materials involved in fire
- The use of specialist advice to determine appropriate cordon distances

Refer to hazard – [Explosive materials: Involved in a fire – Control measure – Cordon control: Explosives](#)

Practical application

Control measure element

Learning outcome

Cordon control to protect from oxidising materials

Demonstrate the ability to:

- Establish safe control and effective management of resources and the public
- Identify, implement and communicate safe and effective cordons and protection zones
- Use specialist advice to determine level of risk from oxidising materials



Control measure - Select appropriate firefighting media: Oxidising materials

TRAINING SPECIFICATION

Knowledge and understanding



Control measure element

Learning outcome

Select appropriate firefighting media for oxidising materials

Understand:

- Methods and techniques to minimise risk from oxidising and combustible materials

Refer to – [Select appropriate firefighting media – Fires and firefighting training specification](#)

Practical application

Control measure element

Learning outcome

Select appropriate firefighting media for oxidising materials

Demonstrate the ability to:

- Methods and techniques to minimise risk from oxidising and combustible materials

Refer to – [Select appropriate firefighting media – Fires and firefighting training specification](#)



Hazard - Oxidisers contaminated with combustibles

Knowledge and understanding

Hazard

Learning outcome

Oxidisers contaminated with combustibles

Understand all associated hazard knowledge



Control measure - Substance identification: Oxidising materials

TRAINING SPECIFICATION



Knowledge and understanding

Control measure element

Learning outcome

Gather information and recognise symbols, labels and other markings to identify oxidising materials

Understand:

- Classification and labelling of oxidising materials including organic peroxides
 - Signage identifying the presence of oxidising materials
 - The use of specialist advice to interpret physical properties of oxidising materials
- Refer to – Substance identification – Hazardous materials training specification

Practical application

Control measure element

Learning outcome

Gather information and recognise symbols, labels and other markings to identify oxidising materials

Demonstrate the ability to:

- Use various sources of information to gather information about oxidising materials
- Use detection equipment to determine the presence of oxidising material



Control measure - Identify heat reactions within oxidising materials

TRAINING SPECIFICATION

Knowledge and understanding



Control measure element

Learning outcome

Identify heat reactions within oxidising materials

- Understand:
- The use of thermal imaging to identify increasing temperature in oxidising materials
 - Safety considerations when assessing oxidising materials

Practical application

Control measure element

Learning outcome

Identify heat reactions within oxidising materials

- Demonstrate the ability to:
- Safely monitor and assess the physical state of oxidising materials



Control measure - Separate oxidising materials from fuel sources

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Learning outcome

Separate oxidising materials from fuel sources

- Understand:
- How organic and inorganic oxidisers support combustion
 - Safe and effective methods of separating oxidising materials from fuel sources
 - The use of specialist advice to interpret physical properties of oxidising materials and fuel sources
 - The considerations if water is used to cool, dissolve or extinguish combustible materials



Practical application

Control measure element

Separate oxidising materials from fuel sources

Learning outcome

Demonstrate the ability to:

- Apply safe and effective methods of separating oxidising materials from fuel sources
- Use specialist advice to interpret physical properties of oxidising materials and fuel sources
- Prepare contingency arrangements should containment be compromised



Control measure - Apply cooling, considering the potential for reaction with water

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Apply cooling, considering the potential for reaction with water

Learning outcome

Understand:

- Methods and techniques to minimise risk from oxidising materials and fuel sources
 - The use of specialist advice to interpret physical properties of oxidising materials and fuel sources
- Refer to – [Select appropriate firefighting media – Fires and firefighting training specification](#)

Practical application



Control measure element

Learning outcome

Apply cooling, considering the potential for reaction with water

Demonstrate the ability to:

- Identify and assess the involvement of oxidising material
- Use safe and effective methods to carry out cooling operations



Hazard - Cryogenic materials

Knowledge and understanding

Hazard

Learning outcome

Cryogenic materials

Understand all associated hazard knowledge



Control measure - Substance identification: Cryogenic materials

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Learning outcome

Recognise signage and other markings to identify cryogenic materials

Understand:

- Signage identifying the presence of cryogenic materials
 - The use of specialist advice to interpret physical properties of cryogenic materials
- Refer to – Substance identification – Hazardous materials training specification



Practical application

Control measure element

Learning outcome

Recognise signage and other markings to identify cryogenic materials

Demonstrate the ability to:

- Gather information from a number of sources to confirm presence and understanding of cryogenic materials



Control measure - Containment: Cryogenic materials

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Learning outcome

Contain cryogenic materials

Understand:

- The limitation of fire service intervention once cryogenic material has been released

Refer to hazard – [Flammable vapours: Unignited](#)

Practical application

Control measure element

Learning outcome

Contain cryogenic materials

Demonstrate the ability to:

- Use available information to assess the impact of released cryogenic materials
- Adopt safe systems of work and control measures to contain cryogenic materials





Control measure - Personal protective equipment (PPE): Cryogenic materials

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element	Learning outcome
Use personal protective equipment for cryogenic materials	Understand: <ul style="list-style-type: none">• Capabilities and limitations of PPE during activities involving cryogenic materials Refer to – Personal protective equipment (PPE) – Operations training specification

Practical application

Control measure element	Learning outcome
Use personal protective equipment for cryogenic materials	Demonstrate the ability to: <ul style="list-style-type: none">• Select and use appropriate PPE and RPE for incidents involving cryogenic materials Refer to – Personal protective equipment (PPE) – Operations training specification



Control measure - Identify the potential explosive effects due to the failure of a cryogenic gas container

TRAINING SPECIFICATION



Knowledge and understanding

Control measure element

Learning outcome

Identify the potential explosive effects due to the failure of a cryogenic gas container

Understand:

- How cryogenic gas containers fail
- How to monitor and identify changes to cryogenic gas containers
- How other materials may react with cryogenic materials

Practical application

Control measure element

Learning outcome

Identify the potential explosive effects due to the failure of a cryogenic gas container

Demonstrate the ability to:

- Monitor and identify changes to cryogenic gas containers
- Apply preventative measures to reduce risk of cryogenic materials becoming contaminated
- Gather information from on-site staff to inform incident plan



Control measure - Recognise consequences on processes using cryogenic materials

TRAINING SPECIFICATION

Knowledge and understanding



Control measure element

Learning outcome

Recognise consequences on processes using cryogenic materials

Understand:

- The use of cryogenic materials in industrial processes
- How cryogenic materials may present a hazard in the industrial environment

Practical application

Control measure element

Learning outcome

Recognise consequences on processes using cryogenic materials

Demonstrate the ability to:

- Work effectively and safely with on-site staff to reduce risk from cryogenic materials



Hazard - Oxygen-enriched atmosphere

Knowledge and understanding

Hazard

Learning outcome

Oxygen-enriched atmosphere

Understand all associated hazard knowledge



Control measure - Substance identification

TRAINING SPECIFICATION

Knowledge and understanding



Control measure element

Learning outcome

Identify substances to inform situational awareness

Understand:

- Sources of information to identify substances that may cause dust explosions

Refer to – Substance identification – Hazardous materials training specification

Practical application

Control measure element

Learning outcome

Identify substances to inform situational awareness

Demonstrate the ability to:

- Gather information to identify the presence of combustible dust



Control measure - Manage the release of cryogenic materials

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Learning outcome

Manage the release of cryogenic materials

Refer to [hazard – Cryogenic materials](#)

Practical application

Control measure element

Learning outcome

Manage the release of cryogenic materials

Refer to [hazard – Cryogenic materials](#)





Control measure - Identify potential combustible materials in oxygen-enriched atmospheres

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element	Learning outcome
Identify potential combustible materials in oxygen-enriched atmospheres	Understand: <ul style="list-style-type: none">• The increased risk of ignition/combustion in oxygen enriched atmospheres

Practical application

Control measure element	Learning outcome
Identify potential combustible materials in oxygen-enriched atmospheres	Demonstrate the ability to: <ul style="list-style-type: none">• Identify oxygen enriched atmospheres that may affect combustible materials



Control measure - Eliminate ignition sources

TRAINING SPECIFICATION

Knowledge and understanding



Control measure element

Learning outcome

Minimise risk by eliminating sources of ignition

Understand the following:

- Meaning of ignition source
- Types of ignition source
- Methods to identify ignition sources
- Methods to eliminate or minimise the risk of ignition

Practical application

Control measure element

Learning outcome

Eliminate ignition sources

Demonstrate the ability to:

- Identify potential ignition sources
- Select and use appropriate methods to eliminate or control ignition sources



Control measure - Carry out atmospheric monitoring

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Learning outcome

Carry out atmospheric monitoring to test if air is safe to breathe

Understand:

- When atmospheric monitoring should be carried out
- How atmospheric monitoring is achieved
- Types of atmospheric conditions that can be monitored
- Who should carry out atmospheric monitoring



Practical application

Control measure element

Learning outcome

Carry out atmospheric monitoring to test if air is safe to breathe

Demonstrate the ability to:

- Carry out atmospheric monitoring for a variety of gases to inform the incident plan



Control measure - Use intrinsically safe equipment

TRAINING SPECIFICATION

Knowledge and understanding

Control measure element

Learning outcome

Use intrinsically safe equipment to reduce the possibility of explosion

Understand:

- The importance of using intrinsically safe equipment near explosive materials

Practical application

Control measure element

Learning outcome

Use intrinsically safe equipment to reduce the possibility of explosion

Demonstrate the ability to:

- Use intrinsically safe equipment where there is a risk of explosion