

Overview

This national occupational standard is for gas engineers working on domestic natural gas and defines the competences required to identify, assess, prioritise and minimise risks and hazards to life, property and the environment during upstream gas emergencies. It involves making sure that all the work is carried out safely in accordance with industry specific operational procedures and systems associated with risk reduction and removal.

**This standard does not imply that there is one sequential method of dealing with reported Gas Upstream Emergencies. The nature of gas escapes are unpredictable and need to be dealt with on an individual basis. Priority actions must be undertaken as required with each individual report. The relevant Emergency Service Provider “Policies and Procedures” will be followed when dealing with Gas Upstream Emergencies. However, to meet the standard it is expected that candidates will demonstrate competence in all of the identified skills, competence and knowledge areas.

Respond to Reported Gas Upstream Emergencies

Performance criteria

- You must be able to:*
- Receive, Use and Communicate Information and Data
1. Receive the job information regarding the reported escape noting the details of who reported the escape and the location of it
 2. Confirm the job information details with emergency dispatch control centre to ensure the correct transfer of information
 3. Notify emergency dispatch control centre if unable to get to the reported escape within standards. Vehicle breakdown, traffic problems, etc.
 4. Report arrival on site and make contact with person(s) who reported the escape. Obtain all information about the report from the person(s)
 5. Access maps of utilities plant to establish positions and locations of gas supplies and other services and utilities. Identify IGT sites and areas of special interest
 6. Use the job information when on site to assist in effective location and isolation of the escape
 7. Communicate with emergency dispatch control centre both during and after location of the gas escape to ensure they are kept informed of the situation on site and all the ongoing information
 8. In incident situations summon additional resources and support from police, fire service, ambulance service, local authority, social services, etc, as appropriate
 9. Communicate with the engineering repair team, when handing over to them, to ensure they have all the job information regarding the reported escape including any additional evidence gathered from the work site
 10. Liaise with and update external bodies, the property occupier and other people who will be affected by the work during the upstream gas emergency process to minimise disturbance to the job and work site
 11. Ensure that information provided is clear, concise, accurate and up to date
 12. Advise of any delays to the work to those who require the information
 13. Complete documentation recording the results of testing activities and actions taken using company reporting systems and documentation, and in accordance with statutory requirements
- Use approved Gas Detection and Safety Equipment
14. Check and confirm all materials, tools and test equipment necessary for the upstream gas emergency activities are available as

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required and are fit for purpose

15. Where other gases are identified and involved e.g. LPG, the appropriate actions for gas detection are carried out in accordance with company policies and procedures

16. Select and use the correct tools and equipment for gas emergency activities

17. Check that the gas detection equipment is approved, in date, correctly calibrated and is suitable for the proposed upstream gas emergency activity

Assess Risks to Life, Property and the Environment during Gas Emergencies

18. Proceed to the reported escape or other recognised emergency situation without delay to meet the minimum response standards

19. Position vehicle and equipment to avoid ignition dangers

20. Ensure safety equipment and PPE is available for use in accordance with the work site specific risk assessment

21. Utilise all appropriate PPE and safety equipment throughout the proposed upstream gas emergency activities

22. Carry out visual observations and checks on site

23. Check for smells and gas ingress to all properties and voids adjacent and opposite to the reported escape in accordance with industry standards and procedures

24. Take and record both high and low level atmosphere samples from internal spaces and voids in accordance with industry standards and procedures

25. Following industry procedures evacuate personnel, isolate gas and electricity supplies and ventilate properties as appropriate

26. Take precautionary steps to prevent the unauthorised re-entry to evacuated areas by utilising barriers, tape and warning signs

27. Take and record appropriate gas samples from no access properties and voids in accordance with industry standards and procedures

28. Use company and industry procedures to make a forced entry in order to gain access to locked and unoccupied properties

29. Locate underground plant using plant avoidance tools and equipment. Following these checks make bar holes as required using correct methods and equipment

30. Take and record appropriate external gas samples in all adventitious openings including; from bar holes, in voids, in drains, in ducts, in sewers, in telecommunication ducts, in or around street

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furniture, in or around governor housings and chambers etc., in accordance with industry standards and procedures

31. Ascertain the extent of the escape or other recognised emergency situation) including how many people and properties are affected or potentially affected

32. Identify and assess any hazards, their level of risk and their severity and record findings

33. Locate the escape or handover to engineering repair team

34. Continue to monitor the escape or other recognised emergency situation and check all gas concentrations outside and inside the affected properties during and after the repairs have been carried out

35. Use tightness testing procedures to confirm the integrity of any installed gas system

36. Work safely at all time in accordance with Health & Safety and Environment Regulations, and approved industry practices and procedures including; the individual and others, organisational requirements, regulatory requirements, statutory requirements, company policies and risk assessments

Eliminate, Remove, Minimise Risks to Life, Property and the Environment during Gas Emergencies

37. Prior to any site activity being undertaken a site-specific risk assessment must be undertaken which incorporates safety provisions in the work site, access to the work site, movement of the workforce, members of the public, and the movement and safe storage of materials, tools and equipment for the job

38. Survey the work site prior to upstream gas escape activities, for any damage or defects to existing building features and record them

39. Advise the property occupier of any defects found

40. Protect the work site and the building fabric against possible damage being caused during the upstream gas emergency process

41. Prioritise hazards and take action to minimise the risk, in order of priority Take prompt action to make safe identified hazards that can be safely rectified including; evacuation, forced entry, minimising escapes, ventilating, creating safety zones, preventing smoking, having fire extinguishers ready, utilising all appropriate PPE and safety equipment and wetting the work area (where appropriate)

42. Monitor the effectiveness of the risk control measures and take prompt additional action as necessary

43. Establish and maintain a safe working area

44. Identify both sources and potential sources of ignition and eliminate

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or minimise the risk

45. Ventilate the property(s), voids, ducts, drains, and other street furniture as necessary
46. Monitor and recheck work site regularly and record any additional hazards
47. Locate the escape and follow industry procedures for the handover to engineering repair team
48. Use designated safe isolation methods, tests, and procedures to de-commission unsafe gas systems and components as necessary
49. Take precautionary actions to ensure that temporarily de-commissioned gas systems and components do not present a safety hazard
50. Permanently remove and disconnect unsafe gas systems and components as required
51. Undertake temporary repair(s) as necessary
52. Request assistance as and when required
53. Monitor, recheck and record levels of gas concentration both externally and inside the property(s) or work site regularly as required or requested
54. Report any interruptions to gas supplies and poor pressures
55. Assess the emergency implications, undertake hazard assessment and agree action to be taken in consultation with the appropriate person(s)

Undertake Site Surveys to Determine the extent and levels of Gas Escape Concentrations

56. Establish a site survey and risk assessment of the situation; Determine whether it is Natural Gas or LPG, is it controlled or uncontrolled, spread of gas concentrations and readings, is the escape external to the properties or tracking internally into them, the level of gas concentrations and readings, location of nearest properties, location of any confined spaces, the presence of other utilities where gas can track, density of motorized and pedestrian traffic, gas pipe material, escape history, visual signs of previous work, weather and ground conditions or no trace results
57. From the site survey results, categorise the outcome and take the necessary actions required for escape prioritisation of any unsafe situations in accordance with industry standards and procedures
58. Carry out visual observations and recheck maps of gas system(s)
59. Confirm the location and siting of other services around the work

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site by utilising an appropriate plant location and equipment avoidance survey

Final Investigation, Leaving the Immediate Work Site Safe

60. Check and record levels of gas concentration internally and externally to the property(s) or work site to ensure it is safe to leave site and re-occupy the property(s) as necessary

61. Follow industry procedures and criteria to establish and confirm that the work site is safe to leave following the repair of the work and in cases of no leak detected

62. Report findings, details and actions to senior person on site; team leader, first line manager, etc.

63. Report findings, details and actions to emergency dispatch control centre

Resolve problems within own area of responsibility and competence which could affect the emergency situation

64. Report the details of any deficiencies in the gas system(s) and components and, actions taken to emergency dispatch control centre, senior person on site; team leader, first line manager, etc.

65. Resolve problems in accordance with approved procedures where
a) upstream gas emergency activities reveal gas system or component defects

b) gas system and components cannot be restored to full performance

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Knowledge and understanding

You need to know and understand: General Knowledge

1. Regulations and guidance governing health and safety in the workplace, environmental protection and the use of risk assessments
2. Legislation covering the general responsibilities of the operative for their own safety and that of others
3. The limits of your own autonomy and responsibility

Respond to gas upstream emergencies

4. Knowledge and application of the relevant Operational Procedures for responding to gas escapes and other emergencies
5. The health, safety and environmental factors which need to be incorporated in risk assessment for the upstream gas emergency activities
6. Methods for safe access and working at heights
7. The tools and equipment necessary to provide safe access to work at heights, or in confined spaces
8. The methods of working which protect the building, customer property and existing gas systems and components
9. The care and maintenance requirements of tools and equipment, and checks for safe condition
10. The tools, equipment, materials and components required for the upstream gas emergency activities – ordering, supplying, advising, checking and delivery procedures
11. How to safely secure and store tools, equipment, materials and components to minimise loss or wastage
12. The steps to take should materials, components, tools and equipment not be available at the site to commence the upstream gas emergency activity
13. The potential hazards that could arise from all upstream gas emergency activities and the checks to be carried out before work takes place
14. The company standards of service for attending; uncontrolled and controlled gas escapes and faulty meter jobs
15. The industry practices and procedures for carrying out upstream gas emergency activities on low, medium, intermediate, and high pressure whilst complying with; industry standards and procedures, Gas Safety (Installation & Use) Regulations and British Standards
16. The industry practices and procedures for carrying out upstream gas emergency activities on low, medium, intermediate and high

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pressure including; reported gas escapes, emissions of fumes from gas appliances, fire or explosion where gas is thought to be the cause and loss of gas supply situations

17. The industry practices and procedures relating to “one person working”

18. The Gas Safety (Rights of Entry) Regulations and it’s implementation including; accessing properties, notification to emergency dispatch control centre and line manager and the implications

19. The Confined Spaces Regulations and it’s implementation including working in voids, chambers, pits, trenches, pipes, sewers, flues, wells, etc.

20. Knowledge of Building Construction and plans for both domestic and small commercial properties including types of: foundations; walls; floors; ceilings; roofs; and other services entering properties

21. How and where to access and correctly interpret the required information including. normative documents, industry standards guidance documents, British and European Standards and company procedures for upstream gas emergency activities, to ensure the work is done to the specification and industry standards

22. Health & Safety obligations in line with organisational and legislative requirements

23. Industry practices, procedures and actions to make safe identified hazards that can be safely rectified including; evacuation, forced entry, minimising escapes, ventilating and creating safety zones

24. Precautionary measures and actions to be taken within a potentially gaseous environment including; minimising risk of ignition, maximisation of ventilation, positioning of vehicles and equipment, use of temporary continuity bonds, preventing smoking, having fire extinguishers ready, utilising all appropriate PPE and safety equipment and wetting the work area

25. Recognition of potential sources of ignition; street lighting, electric street signs, motor vehicles, balanced flue chimneys, electric switches, industrial process plant, mobile phones, overhead power lines, etc.

26. The procedures, precautionary measures and actions to be taken within a potentially carbon monoxide environment including CO alarm operations; evacuation, forced entry and maximisation of ventilation

27. The effects and symptoms of carbon monoxide and key advise to be given to people who may be affected by fumes

28. The industry practices, techniques and procedures for carrying out barholing

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29. The requirements of NRSWA after completing barholing activities
30. The selection and operation of gas detection equipment
31. The industry techniques and procedures for:
 - a) use of gas detection equipment
 - b) use of underground plant avoidance tools
 - c) confirmation of electrical safety - Absence of Electricity
 - d) use of electric detection equipment such as “Voltstick”
32. The selection and operation of underground plant avoidance tools and equipment
33. The industry practices and procedures regarding the minimum extent of investigation area when dealing with reported upstream gas escapes
34. Safe isolation methods, tests, and procedures to de-commission gas systems and components
35. The procedures for temporary and permanent de-commissioning of gas systems and components including use of temporary continuity bonds
36. The precautions to ensure that de-commissioned gas systems and components do not prove a safety hazard
37. Measures to prevent de-commissioned gas systems and components being brought into operation utilising safety and warning notices
38. The need to liaise with others whose procedures or routines may be affected by the suspension of the gas system(s) and components
39. Measures to prevent un-commissioned gas systems being brought into operation utilising safety and warning notices
40. The points in the upstream gas emergency activities where co-operation and liaison with emergency services, other trades and property occupiers may be required
41. The procedures and work methods for re-connecting to gas input services
42. The methods of connecting components to gas systems
43. The application, scope, requirements and procedures for tightness testing & purging to approved industry standards
44. The process and procedures, equipment and legislative requirements for applying gas tightness tests and purging to gas systems and components
45. How to record the results of testing activities and actions taken using company reporting systems and documentation, in accordance with statutory requirements for all upstream gas emergency activities
46. The routines and sequences for commissioning gas systems

47. The industry practices and procedures for dealing with fires and explosions that may or may not be as a result of gas escaping including the requirements of RIDDOR
48. The industry practices and procedures for
- a) responding to escapes from National or Local Transmission Systems (high pressure escapes) from both pipelines and above ground installations
 - b) escalation of gas escapes including when, how and who to report to
 - c) re-occupation of properties following evacuations
 - d) correctly responding to with gas clouds
 - e) responding to interruptions to gas supplies and poor pressure reports including water ingress, pipe failure, pipe blockage, human error, equipment failure, external damage
 - f) extraction of water from services including the use of water extraction equipment
 - g) supplying alternative heating and cooking appliances where the conveyance of gas to a property is discontinued
49. The characteristics & properties of LPG
50. The industry practices and procedures for responding to:
- a) gas escapes, fires and explosions from LPG
 - b) interruptions to gas supplies and poor pressure reports on LPG
 - c) gas escapes, fires and explosions at non domestic properties
 - d) interruptions to gas supplies and poor pressure reports at non domestic properties
51. e) suspected theft of gas
- f) no trace situations including re-checks
- g) lack of access to properties
52. h) gas incident investigations
53. The industry practices and procedures for site handover and leaving the site and exchanging emergency control valves (ECV's) and meter inlet control valves (MIV's)
54. The steps to take when problems arise in the work activities
55. How to isolate unsafe gas systems and components and application of the gas industry unsafe situations procedure
56. How to apply the current version of the Industry Unsafe Situations Procedure including the following situations; concern for safety, at risk, immediately dangerous and RIDDOR
57. The statutory requirements for recording the results of testing activities and actions taken and, using company reporting systems and documentation
58. Job management structures and methods of reporting and recording job progress or problems delaying progress
59. How to safely collect and dispose of system contents that may be

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hazardous to health or the environment How and where to access the required information.

Glossary

“Cookers” refers to Freestanding, Built In, Slide Under, Hotplates, Grilles, Range Cookers, and Dual Fuel Cookers

“Leisure Appliances” refers to Greenhouse Heaters, BBQ’s, Patio Heaters, Gas Flambeaux, and Outdoor Gas Lighting

“Upstream” refers to the gas networks from gas terminal to the emergency control valve

“Work Site” refers to the area where the work will take place and all areas affected by the works

“Controlled gas escape” refers to a gas escape which has been stopped by turning off the emergency control valve

“Uncontrolled gas escape” refers to a gas escape where it cannot be ascertained that it has been turned off or controlled

“Recognised emergency situation” refers to gas escapes, explosion or CO/fumes

“Adequate ventilation” refers to sufficient ventilation to ensure that any minor escape does not build up to an explosive mixture

“Fumes” refers to a spillage of products of combustion or carbon monoxide

“LPG” refers to liquefied petroleum gas supplied by either a bulk tank installation or cylinders

“High pressure” refers to pressure exceeding 7bar

“Intermediate pressure” refers to pressures exceeding 2bar but not exceeding 7bar

“Medium pressure” refers to pressure exceeding 75mbar and not exceeding 2bar

“Low pressure” refers to pressure not exceeding 75mbar

“RIDDOR” refers to the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations

“Confined space” refers to any space that has restricted or limited means of entry or exit, is large enough for a person to enter to perform tasks, and is not designed or configured for continuous occupancy e.g., a chamber, pit, trench, pipe, sewer, flue, well, void, etc.

‘Services and Systems’ refers to water, central heating, gas, electricity supply, condensate disposal, chimneys and ventilation systems

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