

Gas Pipelines: Inspecting Safe Control of Operations on Live Distribution Mains and Services

Open Government status

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Target audience

HID Energy Division Unit 5 inspectors

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Summary

This guidance outlines the key areas to include and ratings to apply in HSE Safe Control of Operations (SCO) inspections of live gas operations carried out on gas distribution mains and services by gas distribution networks (GDNs) or independent gas transporters (IGTs).

Introduction

This guidance provides inspectors with a framework to judge compliance, assign performance ratings and decide what enforcement action is necessary should legislative breaches exist. It complements and supports HSE's [Enforcement Management Model](#) (EMM) and [Enforcement Policy Statement](#). It does not cover live gas operations carried out on Major Accident Hazard Pipelines (MAHPs) as defined by the Pipelines Safety Regulations 1996 (PSR).

Ensuring safety during live gas operations is of critical importance because of the risk of major accidents and loss of network pressure. For example:

- poorly controlled live gas operations carried out in public areas may endanger members of the public as well as workers
- the pressure of gas in the network may be compromised and consumer supply lost
- gas quality may be adversely affected by substandard purging at the commissioning stage
- inadequate purging at decommissioning may leave pipelines 'live'

Network activities giving rise to live gas operations SCO inspections include:

- iron mains decommissioning and replacement
- laying new gas mains and services
- making new connections
- planned maintenance and repair work
- other network decommissioning activities

Action

The purpose of SCO inspections is to check issues relevant to the control of major hazards arising from work on the live gas network

In SCO inspections covered by this guidance, inspectors should:

- check the key issues against their success criteria in Appendix 1;
- use the generic performance descriptors in Appendix 2 and the worked example in Appendix 3 to:
 - determine the appropriate performance rating and
 - the initial enforcement expectation to use alongside the EMM.
- consider how and when the issues raised during an inspection are to be closed out and recorded using the COIN issues tab;
- assess the extent to which senior management leadership influences front line safety
- where occupational health, safety and welfare concerns are encountered during an SCO inspection, deal with such issues as a matter of routine and apply existing standards to determine what action to take in each case according to HSE's EPS and EMM. See Appendix 4 for examples

Background

The safe control of risk during live gas operations is achieved by competent and adequately supervised personnel correctly following operational procedures tailored to a particular job. These procedures should provide an accurate description of the job (including plans and diagrams) and necessary measures to ensure safety, including any that may be site specific.

Management controls should also be in place to ensure that the correct approval route is taken when procedures are drafted. Should conditions on site differ from those expected, then procedures should be modified as necessary and authorised by appropriate personnel.

Organisation

Targeting

SCO inspections should be carried out in accordance with dutyholder intervention plans. The risk ranking arrangements used by Energy Division Gas & Pipelines may also be used to assist inspectors when deciding intervention frequency and targeting with dutyholders.

Timing

SCO work is transient. Inspectors should request work schedules from the dutyholder and then carry out unannounced SCO inspections.

Rating and recording

It is important to understand the differences between SCO and the other performance rating topics on the Inspection Rating Form (IRF) tab of the Intervention Plan Service Orders (IPSOs) for GDN operators.

SCO ratings recorded on COIN will be based upon the major hazard risks associated with work on, to, or around the network. SCO ratings should not reflect the occupational health, safety or welfare standards associated with the site operations. Appendix 3 illustrates how performance rating should be applied.

The following topics may be encountered during an SCO inspection and should be rated separately:

- PE integrity management - separate guidance covers this topic. Where PE integrity issues are encountered during SCO inspections this guidance should be consulted and an appropriate performance rating entered in the 'PE integrity management' line on the IRF tab.
- Mains replacement - this is only relevant to the GDN operators whose iron mains risk management programmes are approved by HSE under Regulation 13A of the Pipelines Safety Regulations 1996 (PSR). Further information on this topic is available on the HSE website's [iron mains replacement pages](#)
- Selection and management of contractors - this performance score is a reflection of the adequacy of the dutyholders' management system for contractor selection and management. Inspectors should use the [HID CI SI inspection manual](#) to determine a performance rating for this topic.

Appendix 1: SCO inspection issues for live gas operations on distribution mains and services

SCO Key Areas		Notes
Issue	Topic	
Procedures	Suitable and sufficient procedures are provided and are proportionate to the potential risks	Routine operation (RO) procedures are generally carried out on up to 12" diameter low pressure (LP) gas mains. Non-routine operational procedures are usually required for operations at larger diameters and elevated pressures.
	Procedures are accurate, with supporting plans and diagrams readily available to workers on site reflecting the conditions on site	
	Procedures are properly authorised and filled out	For example: <ul style="list-style-type: none"> correct date and time of work are given
	Any modifications to procedures are authorised at the correct level and are properly recorded	
	The competent persons named on a procedure are present on site when work is in progress	
General site conditions	Equipment specified in the procedure is available on site or is sufficient to allow the procedure to be correctly followed	
	Excavations are large enough to accommodate the equipment specified in the procedure	
	Exposed gas pipes and fittings are adequately supported and protected, e.g. not vulnerable to damage from trench collapse	
	Testing and monitoring equipment (eg. Gasco seekers, pressure gauges) are in good condition and within their calibration date	
Isolations	Isolations are carried out in accordance with recognised mains laying standards (eg. the appropriate GDN work procedures or IGEM standard TD3)	For example: <ul style="list-style-type: none"> LP PE pipeline up to 180mm - isolate by single squeeze off

		<ul style="list-style-type: none"> LP cast iron - isolate using double bags and vent
	The specific method of isolation to be used is described fully in the procedure	
Maintaining system pressure	Effective steps are taken to ensure correct pressure is maintained in live mains during operations	<p>For example:</p> <ul style="list-style-type: none"> active monitoring of pressure gauges is undertaken correctly sized and installed bypasses are used locked-down squeeze-offs on hydraulic units are applied
Purging	Processes for commissioning and decommissioning purges are described fully in the procedure	
	Evidence of compliance with the procedure is found on site	<p>For example:</p> <ul style="list-style-type: none"> an appropriate number of accessible purge points are found in the correct locations <p>See Appendix 5 for examples showing evidence of poor practice</p>
Venting	Vents are installed as required by the procedure and at correct height above ground level given the local conditions	
	Ignition sources are excluded from the vicinity of vents	
Service standards	Correct procedures are followed where 'no-gas' conditions can't be reasonably achieved	<p>For example:</p> <ul style="list-style-type: none"> breathing apparatus is used where it is necessary to 'snatch' a service tee
Supervision	Supervisors have the necessary technical competence, interpersonal skills and diligence to ensure procedures are correctly followed and to challenge unsafe site issues and conditions	
	Frequency of visits is proportionate to site risk	
	Arrangements are made to cover supervisor absences	
	General site standards provide evidence of effective supervision	

Appendix 2: Performance assessment criteria

Performance Assessment descriptors and risk ranking - All specified criteria for a topic must be satisfied to score 20 or 10.					
60	50	40	30	20	10
Unacceptable	Very Poor	Poor	Broadly Compliant	Fully Compliant	Exemplary
<p>Unacceptably far below relevant minimum legal requirements.</p> <p>Most success criteria are not met.</p> <p>Degree of non-compliance extreme and widespread.</p> <p>Failure to recognise issues, their significance, and to demonstrate adequate commitment to take remedial action.</p>	<p>Substantially below the relevant minimum legal requirements.</p> <p>Many success criteria are not fully met.</p> <p>Degree of non-compliance substantial. Failures not recognised, with limited commitment to take remedial action.</p>	<p>Significantly below the relevant minimum legal requirements.</p> <p>Several success criteria are not fully met.</p> <p>Degree of non-compliance significant.</p> <p>Limited recognition of the essential relevant components of effective health and safety management, but demonstrate commitment to take remedial action</p>	<p>Meets most of the relevant minimum legal requirements.</p> <p>Most success criteria are fully met.</p> <p>Degree of non-compliance minor and easily remedied.</p> <p>Management recognise essential relevant components of effective health and safety management, and commitment to improve standards.</p>	<p>Meets the relevant minimum legal requirements.</p> <p>All success criteria are fully met.</p> <p>Management competent and able to demonstrate adequate identification of the principal risks, implementation of the necessary control measures, confirmation that these are used effectively; and subject to review.</p>	<p>Exceeds the relevant minimal legal requirements.</p> <p>All success criteria are fully met.</p> <p>Management competent, enthusiastic, and proactive in devising and implementing effective safety management system to 'good practice' or above standard. Actively seek to further improve standards.</p>
EMM Risk Gap					
EXTREME	SUBSTANTIAL	MODERATE	NOMINAL	Not applicable	Not applicable
Initial Enforcement Expectation					
Enforcement Notice and/or Prosecution	Enforcement Notice/Letter	Letter/IN	Verbal instruction/letter	Verbal instruction may be appropriate	No further action is necessary
Initial Enforcement Expectation depends on the authority of the relevant standards applicable.					
Actual enforcement conclusion depends on Duty holder and Strategic factors as per HSE's Enforcement Management Model .					

Appendix 3: Performance rating example

At a SCO inspection the following concerns are identified:

- a) Poor excavation safety standards posing a risk to personnel on site
- b) Mis-aligned, contaminated or mis-timed weld joints affecting the integrity of PE pipelines
- c) Lack of appropriate routine operational supervision of workers undertaking work on the gas network.

The rating expectation is:

- a) Although not a matter affecting network safety, this issue should be pursued . No SCO rating should be entered on the basis of this intervention.
- b) Although this might affect network safety at some point in the future it is matter of PE installation quality rather than SCO. As such, a rating should be entered against the PE integrity IRF line.
- c) This is a matter that has a direct effect on SCO and a rating should be entered against the SCO IRF line.

In all cases, if contractors are involved, these matters may justify a further intervention or rating under the Selection and Management of Contractors IRF line.

Appendix 4: Examples of general health and safety issues encountered during SCO inspections

- contact with live services
- poorly supported/unsupported trenches
- undermining buildings, roads, footpaths, etc during excavation
- poorly guarded directional drilling equipment
- vehicle movement hazards (heavy plant and on the public highway)
- overhead power lines hazards (contact by mobile plant and equipment)
- hazardous substances (or agents) exposure, e.g.:
 - . noise, vibration, silica dust, cement
- manual handling injuries ,e.g.:
 - from handling kerbs
- pressure testing hazards (uncontrolled release of stored energy)
- inadequate welfare facilities
- failing to exclude public from open excavations

Appendix 5: Poor practice - examples of 'snatched' connections

Figure 1. New mains connection.

A pressure point has been installed to ensure connection to the correct main. However, the fittings used could not have been installed in a gas free way as required by procedures.



Figure 2. New service connection.

The tee could not have been installed in the main using a gas-free procedure.

