



LONE WORKING

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1 Introduction

Whilst at European level there is no specific legislation addressing lone working, the general obligations on employers under the worker safety directive, requiring task risk assessment, should consider the lone working aspects.

This publication describes and discusses tasks specific to the industrial and medical gases industry and how they can be performed safely, by a lone worker.

2 Scope and purpose

2.1 Scope

The publication introduces the concept of lone working and outlines the employer's obligations to provide safe systems of work.

Normal office activities, business travel, driving cars, trucks and other vehicles on public roads are all outside the scope of this publication.

Service technicians, engineers and delivery drivers will typically attend customer sites alone, possibly on call or out of hours, to respond to equipment issues. The gas company will not be in direct control of the work area so a risk assessment should be documented including lone work aspects.

2.2 Purpose

Generally lone working situations should be avoided where possible.

This publication shares good practices and principles that should be applied where lone working activities are necessary. This publication provides examples of tasks that may be performed by lone workers so that companies can identify lone work tasks and implement safe systems of work.

3 Definitions

For the purpose of this publication, the following definitions apply.

3.1 Publication terminology

3.1.1 Shall

Indicates that the procedure is mandatory. It is used wherever the criterion for conformance to specific recommendations allows no deviation.

3.1.2 Should

Indicates that a procedure is recommended.

3.1.3 May

Indicates that the procedure is optional.

3.1.4 Will

Is used only to indicate the future, not a degree of requirement.

3.1.5 Can

Indicates a possibility or ability.

3.2 Technical definitions

3.2.1 Forbidden

In this document “forbidden” is used as a succinct synonym for “shall not” (refer also to 3.1)

3.2.2 Person working alone

Someone who is on company premises or carrying out company business at a third-party location and who is **not in frequent visual or verbal contact with other persons** (for example other employees, contractors, customer personnel or members of the general public).

3.2.3 Lone Worker

A person who is working alone **and** is exposed to hazards either because of the tasks they perform or from the workplace.

3.2.4 Lone Work

A task or activity when performed by a lone worker.

3.2.5 Risk assessment

A systematic procedure for identifying and managing hazards. It encompasses thorough examination of the entire work environment, processes and equipment to determine any hazard to the health of the employees in the short or long term and implementing remedies.

3.2.6 Lone Work Risk assessment

Recognises the additional factors if the person is or may be working alone. Lone work hazards could be included in the normal task risk assessment, or it could be documented as a specific task risk assessment, especially recognising where the work locations are not in the control of the employer.

3.2.7 Dead man’s handle/switch

A device (switch, push button, knob, handle, paddle) which requires continuous pressure from a person to confirm ongoing safe operation. If the person becomes unconscious or dies, then the body relaxes, and the system will be shutdown. The person can also choose to release the switch to interrupt operation.

There are variants which require a worker to press the switch intermittently to confirm ongoing safe operation and that the worker remains near to the operation. If the switch is not pressed within the prescribed time, for any reason the operation will stop.

3.2.8 Man down system

A device (usually incorporating a tilt switch) which registers movement. When person stops moving, for example if they are unconscious or asleep, the device will send a communication to a pre-defined call centre. Man down systems can be incorporated into smartphones, personal gas monitors, and some include global positioning functions.

Man down systems are an example of automated personal safety systems.

4 Lone working introduction

Companies shall provide a safe work environment through a combination of policies, procedures, practices, training, and engineering controls. The risks to lone workers shall be managed. Providing a safe working environment for lone workers may include additional factors compared to managing the health and safety of other employees.

In most countries it is not the company's responsibility to protect individuals working alone from illness or the consequences of their underlying health conditions resulting in emergency situations.

High risk tasks on company sites shall not be performed by persons working alone. Those tasks shall be scheduled when more people are present.

Where shift patterns, on a site which is normally staffed with several people, result in a person working alone at the start or end of day, then some activities may meet the definition for lone worker, at these times.

The task risk assessments should recognise where lone work is performed and the additional stress load that is brought from lone work. It is important to include lone working as part of psychosocial (stress) risk assessments and to recognise that some individuals will thrive in these situations while others are unwilling or unsuited to working alone.

It is important for all workers to be able to speak to others; having the option or ability to communicate with others about concerns significantly reduces the stress of a person doing lone work.

Company procedures on lone working should typically comprise the following:

- define management and employee responsibilities regarding lone working;
- identify lone working situations;
- require risk assessment to include additional factors for lone work;
- document and communicate tasks that are forbidden to be performed as lone working tasks;
- require implementation of safeguards, procedures and training;
- document how medical and other emergency assistance is summoned, where required by the task risk assessment;
- require periodic review of compliance with prescribed safeguards, feedback from workers; and
- require review of the risk assessment after any accidents or near misses.

5 Identify lone working situations

Workplace risk assessments should identify the possible lone working situations and define required precautions.

5.1 Hazardous tasks – forbidden for lone workers

Company procedures shall define those hazardous tasks which shall never be performed by lone workers. Examples of such hazardous tasks include, but are not limited to:

- confined space entry operations;
- hot work in hazardous areas (for example work requiring fire watch or in ATEX zones);
- high voltage works;
- work at height with risk of fall greater than 2m;
- intrusive maintenance on toxic or flammable systems;

NOTE: Intrusive means opening piping or vessels containing toxic or flammable substances with the risk of exposure.

- Larger lifting operations;
 - Mobile crane operations
 - Fixed overhead cranes
- Any activities requiring supplied air breathing apparatus (self-contained breathing air and/or from hose); and
- transfilling of toxic gases.

5.2 Hazardous activities and work areas for lone worker risk assessments

The lists below give examples of activities (5.2.1) and potentially hazardous work areas (5.2.2) where there could be lone work.

5.2.1 Examples of hazardous activities for Lone Workers

- loading and unloading cryogenic liquids, liquified gases or gas cylinders
- cylinder filling (excluding toxics)
- transfilling of cryogenic liquids
- welding and grinding
- dry ice manufacturing
- work at height with risk of fall less than 2m,

5.2.2 Examples of hazardous work areas for lone workers

- ATEX-zones;
- areas with a risk of release of;
 - toxic substance
 - oxygen (enrichment)
- areas with a risk of oxygen deficiency or asphyxiation.

6 Lone Work risk assessment (employees)

When documenting risk assessments for lone working, additional considerations should include:

- The potential severity of foreseeable injury, its effect on the mobility and ability of the injured person to call for help and the response time for help or medical assistance to arrive. (See Appendix A);
- How the location of the injured person is communicated and how help or medical assistance can access that location.

For all lone work tasks, it is assumed that all standard established layers of protection, policies, procedures, practices, training for personnel, and engineering controls are in place.

An important point in the risk assessment is the evaluation of the physical and mental ability of the worker who is assigned lone working tasks. Some pre-existing conditions may exclude a person from being a lone worker.

The documented risk assessment must demonstrate that the risk including required technical and organisational controls is acceptable, or that the task should not be performed as lone work.

For example, using the injury response table in Appendix A, a company may conclude for a cryogenic liquid delivery driver that the technical protection (hardware) installed to prevent a major liquid release is sufficient to make the risk acceptable and therefore no lone worker communication is required.

6.1 Controls and procedures

Written procedures should be implemented for each lone working task. The risk assessment should include the requirement, if any, for effective means of communication, such as:

- mobile phone to enable the person to call for help
- automatic monitoring systems such as man-down systems, dead man's switches;
- manually operated alarm systems which can include fixed or mobile panic buttons, walkabout push button systems; or
- pre-agreed intervals of regular contact between the lone worker and supervisor/colleague, using communication systems, such as mobile phones, walkie-talkies / radios, intercoms;
- a system to ensure a lone worker has returned to their home base within expected time, after the task is completed;
- two-way visual and voice communications, for example camera systems worn by the lone worker (Augmented Reality)
- active (not passive) monitoring by camera of the person working alone

The risk assessment should identify severity and type of foreseeable injuries and their probability. The severity of injury defines the required response time for first aid and rescue. See Appendix A for examples of injuries known in industrial gas industry (whether working alone or not), suggested response times and lone working communication or call out requirements.

The risk assessment may also indicate that a lone worker should have a first aid kit available.

Monitoring systems and safeguards should be agreed with work councils or unions. Monitoring and surveillance may also be subject to data protection and privacy laws, requiring privacy impact assessments in some countries.

6.2 Training

Training is particularly important where there is limited supervision to control, guide and help in uncertain situations. Lone workers need to be sufficiently experienced and fully understand the hazards and precautions involved in their work tasks and the locations that they work in. There should also be instructions on the circumstances in which it is appropriate to stop work.

All personnel involved in lone working activities shall be trained and competent in lone work procedures, including responsible supervisors and those colleagues with obligations to respond. A formal training program shall be developed, implemented, documented and regularly updated. Personnel involved in lone working shall undergo formal competence checks.

Lone workers should also have some basic first aid training to address minor injuries.

7 Lone Work risk assessment (contract worker)

NOTE: the responsibility for documenting a risk assessment legally belongs to the employer. This is an important distinction for contract workers such as haulier drivers, cleaners or security guards.

The industrial gas company is responsible to;

- inform the contracting company of relevant hazards in the work place,
- support the contractor company to define relevant measures to address those hazards,
- verify that the contractor workers are trained in the specific lone work procedures and requirements for the industrial gas company sites
- inform (in some countries it is even a training requirement) contractor workers directly, usually through site induction, about the plan for response to emergencies of the gas companies' site

8 References / Bibliography

Unless otherwise specified, the latest edition shall apply.

Lone working policy and procedures, <https://www.staysafeapp.com/guide-lone-working/policy-tips/>

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EIGA Doc 189, *The Calculation of Harm and No-harm Distances for the Storage and Use of Toxic Gases in Transportable Containers* www.eiga.eu

EIGA Doc 188, *Safe Transfer of Toxic Liquefied Gases* www.eiga.eu

EIGA Doc 44, *Hazards of Oxygen Deficient Atmospheres* www.eiga.eu

APPENDIX A: INJURY RESPONSE TABLE ¹

Injury	Caused by	Consequence of injury (mobility, able to escape, life changing effects?)	min	Response time for first aid and rescue	EIGA Guidance/Comments	Lone worker communication (recommended)
Fatality or fracture of the spine or pelvis	Fall from vertical ladder	Spinal injury: person is no longer mobile, possibly still limited ability to act.	0	None	lone work with risk of fall > 2m is forbidden	Not applicable
Fatality; toxic gas release /poisoning	Gross release toxic gas (line opening)	Person is no longer mobile, possibly still limited ability to act.	0	None	Transfiling toxic gas forbidden in lone work situations. Intrusive maintenance on toxic and flammable systems is forbidden in lone work situations.	Not applicable
Fatality asphyxiation	Exposure to oxygen deficient atmosphere from: entry into confined space, or entry into enclosed area with product leak	Person is no longer mobile, possibly still limited ability to act.	0	None	Entry into confined spaces and other very high-risk activities are forbidden for lone workers	Not applicable
Cryoburn – major; Significant area of skin burns or involving eyes	Major release of cryogenic liquid	Person is no longer mobile, possibly still limited ability to act.	15	Up to about ¼ hour	When technical protections (hardware) to prevent major liquid release etc are implemented the likelihood of such injury outcome is very low, the risk is	No lone worker communication required.

¹ Adapted from: Alleinarbeitsplätze (AAP) Beispielsammlung, Bundesministerium für Arbeit, Soziales und Konsumentenschutz, Zentral-Arbeitsinspektorat, Favoritenstraße 7, A-1040 Wien
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Injury	Caused by	Consequence of injury (mobility, able to escape, life changing effects?)	min	Response time for first aid and rescue	EIGA Guidance/Comments	Lone worker communication (recommended)
					considered acceptable.	
Severe head injury or severe abdominal injury	Trailer hose whip	Person is no longer mobile, possibly still limited ability to act.	15	Up to about ¼ hour	When technical protections (hardware) to prevent hose whip (e.g. anti whip cables,..) are implemented, the likelihood of such injury outcome is very low, the risk is considered acceptable.	No lone worker communication required.
Severe head injury or severe abdominal injury	Cylinder fill hose whip/release	Person is no longer mobile, possibly still limited ability to act.	15	Up to about ¼ hour	When technical protections (hardware) to prevent hose whip (e.g. anti whip cables,..) are implemented the likelihood of such injury outcome is very low, the risk is considered acceptable.	No lone worker communication required.

Injury	Caused by	Consequence of injury (mobility, able to escape, life changing effects?)	min	Response time for first aid and rescue	EIGA Guidance/Comments	Lone worker communication (recommended)
Concussion, unconsciousness	Fall due to loss of visibility when walking through vapour cloud (cold, not necessarily release) from filling	Person is no longer mobile, possibly still limited ability to act.	15	Up to about ¼ hour	When technical (hardware) protections and organizational (instruction) are implemented the likelihood of such injury outcome is very low, the risk is considered acceptable.	No lone worker communication required.
Exposure to low oxygen atmosphere (not fatal)	Gas release in enclosed space (e.g. compressor house).	Person is able to exit area.	15	Up to about ¼ hour	Fixed gas detection and alarms to give warning to person to not enter or to exit urgently.	No lone worker communication required.
Significant (2 nd or 3 rd degree) burns to face/arms/torso	Violent oxygen burnout which splatters hot metal.	Person remains mobile and able to act.	15	Up to about ¼ hour	When technical (hardware) protections and organizational (instruction) are implemented the likelihood of such injury outcome is very low, the risk is considered acceptable.	No lone worker communication required.
Crushed, cut, fractured fingers or hands	Hand caught between cylinders, ratchet strap, use of knives	Person remains mobile and able to act. Concern is loss of blood or risk of infection if untreated.	120	Up to about 2 hours		A personal safety system (PSS) such as mobile phone to allow the injured person to call for help.

Injury	Caused by	Consequence of injury (mobility, able to escape, life changing effects?)	min	Response time for first aid and rescue	EIGA Guidance/Comments	Lone worker communication (recommended)
Severe cut to leg or arm(Requires medical /hospital treatment such as stitches)	Cut from sharp guard or valve, use of knives	Person remains able to act, but with leg injury only has limited mobility. Concern is loss of blood or risk of infection if untreated.	120	Up to about 2 hours		A personal safety system (PSS) such as mobile phone to allow the injured person to call for help.
Less severe cut or large bruising First aid only; does not require medical/hospital treatment	Less severe cut from sharp guard or valve, Bruising from falling cylinder	Person remains mobile and able to act (could still drive).	240	Up to about 4 hours		A personal safety system (PSS) such as mobile phone to allow the injured person to call for help.
Breathing difficulties, and/or irritation of mucous membranes (eyes/nose)	Exposure to toxic/corrosive gas (chlorine, ammonia, or carbon monoxide from incomplete combustion)	Breathing and vision may be affected.	240	Up to about 4 hours	Gas detection and alarms to give warning to person to escape. Very low likelihood in storage or delivery. Transfilling toxic gas is forbidden in lone work situations.	No lone worker communication required.
Fracture or sprain of ankle/foot/ metatarsal	Climb and slip in or out of vehicle. Mis-stepping; down steps or ladder, kerb, uneven ground or slippery surface. Falling cylinder.	The person remains able to act, but some limited mobility.	360	Up to about 6 hours		A personal safety system (PSS) such as mobile phone to allow the injured person to call for help.

Injury	Caused by	Consequence of injury (mobility, able to escape, life changing effects?)	min	Response time for first aid and rescue	EIGA Guidance/Comments	Lone worker communication (recommended)
Fracture arm, shoulder	Pressure release from CO2 trailer (no hose). Fall due to loss of visibility when walking through vapor cloud (cold, not necessarily release)	The person remains able to act, but some limited mobility.	360	Up to about 6 hours		A personal safety system (PSS) such as mobile phone to allow the injured person to call for help.
Head injury, facial bone fracture (nose, teeth)	Cylinder fill hose whip/release Hit from loose cylinder guard if used to lift or move cylinder. Power tools Slip, trip, fall	The person remains able to act, but some limited mobility.	360	Up to about 6 hours		A personal safety system (PSS) such as mobile phone to allow the injured person to call for help.
Hurt back	Catching falling cylinder Ratchet straps releasing/failing; Fall when spanner (wrench) slipped; Slip, trip, fall	Person remains mobile and able to act.	480	Up to about 8 hours		No lone worker communication needed.
Cut to head /face	Walking into protruding objects (pipe, obstruction, under vehicle). Pallet bar dropping	Person remains mobile and able to act.	480	Up to about 8 hours		No lone worker communication needed.
Cryogenic burn – small. Hand or arm	Splash of liquid, tightening leaking connections	Person remains mobile and able to act.	480	Up to about 8 hours		No lone worker communication needed.
Scratch to cornea, Particle in eye, Eye irritation	Dust Gas from cylinder valve	Person remains mobile and able to act.	480	Up to about 8 hours		No lone worker communication needed.

Injury	Caused by	Consequence of injury (mobility, able to escape, life changing effects?)	min	Response time for first aid and rescue	EIGA Guidance/Comments	Lone worker communication (recommended)
Skin Burns - minor	Exposure to Lime/slurry Splash from cooling water chemicals, sulphuric acid, contact with hot surfaces or oxygen burnout	Person remains mobile and able to act.	480	Up to about 8 hours		No lone worker communication needed.
Hearing damage (burst ear drum or sudden, temporary loss of hearing), Shock and disorientation	Burst disk, RV lifting, cylinder fill hose rupture	Person remains mobile and able to act.	480	Up to about 8 hours		No lone worker communication needed.

APPENDIX B: FLOWCHART DECISIONS

