NORSOK STANDARD Z-015

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Temporary equipment

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Foreword

The NORSOK standards are developed by the Norwegian petroleum industry to ensure adequate safety, value adding and cost effectiveness for petroleum industry developments and operations. Furthermore, NORSOK standards are as far as possible intended to replace oil company specifications and serve as references in the authorities' regulations.

The NORSOK standards are normally based on recognised international standards, adding the provisions deemed necessary to fill the broad needs of the Norwegian petroleum industry. Where relevant, NORSOK standards will be used to provide the Norwegian industry input to the international standardisation process. Subject to development and publication of international standards, the relevant NORSOK standard will be withdrawn.

The NORSOK standards are developed according to the consensus principle generally applicable for most standards work and according to established procedures defined in NORSOK A-001.

The NORSOK standards are prepared and published with support by The Norwegian Oil Industry Association (OLF) and Federation of Norwegian Manufacturing Industries (TBL).

NORSOK standards are administered and published by Standards Norway.

Annexes B, C, E, F, G, H and I are normative, while Annexes A and D are informative.

Introduction

This revision is a minor adjustment related to Rev 2, January 2004, which was a major change related to Rev 1, July 1998. Some requirements have been made more precise with a special attention to requirements related to battery systems. Also minor adjustments on the checklists for "U05-Steam generator" and "U06-Mobile crane" have been carried out.

Rev 2 was not issued in English.

Due to extensive modifications, this NORSOK standard is published without references to changes made to Rev 1 and 2.

1 Scope

This NORSOK standard defines the minimum technical and safety-related requirements for temporary equipment used on installations on the Norwegian continental shelf.

2 Normative and informative references

The following standards include provisions and guidelines which, through reference in this text, constitute provisions and guidelines of this NORSOK standard. Latest issue of the references shall be used unless otherwise agreed. Other recognized standards may be used provided it can be shown that they meet or exceed the requirements and guidelines of the standards referenced below.

2.1 Normative references

DNV 2.7.1,	*Certificate note no: 2.7.1: "Offshore freight containers design and certification".* *NOTE – The reference to regulations from classification societies only applies to the technical content. Any requirements in these regulations in terms of classification, certification or third-party verification do not form part of this NORSOK standard and can therefore be considered as a separate service.*
EN 3-6,	*Fire fighting equipment – Portable fire extinguishers.*
EN 418,	*Safety of machinery – Emergency stop equipment, functional aspects – Principles for design.*
EN 1834-1,	*Reciprocating internal combustion engines - Safety requirements for design and construction of engines for use in potentially explosive atmospheres – Part 1: Group II engines for use in flammable gas and vapour atmospheres.*
EN 12079,	*Offshore containers – Design, construction, testing, inspection and marking.*
EN 12874,	*Flame arresters - Performance requirements, test methods and limits for use.*
Regulations for high pressure cleaning	*Regulations relating to the Working Environment Act, High Pressure Cleaning (no. 515), issued by the Directorate for Labour Inspection.*
Regulations for compressed air systems,	*Regulations relating to the Working Environment Act, Compressed Air Systems (no. 192), issued by the Directorate for Labour Inspection.*
Machinery regulations,	*Regulations relating to the Working Environment Act, Machinery (no. 522), issued by the Directorate for Labour Inspection.*
FUSEX 1996,	*Regulations relating to equipment and safety systems in hazardous areas.*
IEC 60092-350/NEK 410,	*Electrical installations in ships – Part 350: Shipboard power cables – General construction and test requirements.*
IMDG code,	*International Maritime Dangerous Goods Code (IMO).*
Frame regulations,	*Regulations relating to health, safety and the environment in the petroleum activities, issued by the Norwegian Petroleum Directorate.*
Management regulations,	*Regulations relating to management in the petroleum activities, issued by the Norwegian Petroleum Directorate.*
Facilities regulations,	*Regulations relating to design and outfitting of facilities etc. in the petroleum activities, issued by the Norwegian Petroleum Directorate.*
NEK IEC 61892-7,	*Mobile and fixed offshore units – Electrical installations – Part 7: Hazardous area.*
NORSOK C-001,	*Living quarters area.*
NORSOK C-002,	*Architectural components and equipment.*
NORSOK D-002,	*System requirements, well intervention equipment.*
NORSOK E-001,	*Electrical systems*.
NORSOK H-001,	*HVAC (Heating, ventilation and air conditioning)*.
NORSOK R-001,	*Mechanical equipment*.
NORSOK S-001,	*Technical Safety*.
NORSOK S-002,	*Working environment*.
NORSOK S-003,	*Environmental*.
NORSOK Z-002,	*Coding system*.
NORSOK Z-010,	*Electrical, instrumentation and telecommunication installation.*

NS 3910, *Fire fighting equipment – Maintenance of portable fire extinguishers*
NS 4210, *Colours used in warnings and warning signs.*

2.2 Informative references

EN 792, *Hand-held non-electric power tools – Safety requirements – (all parts).*
SINTEF report no. TR A4596, *Bruk av enlederkabel under brønnintervenering (Use of single core cable during well intervention operations, available only in Norwegian).*
SINTEF report no. TR F4975, *Use of electric high power equipment during well interventation with DC current.*

3 Terms, definitions and abbreviations

For the purposes of this NORSOK standard, the following terms, definitions and abbreviations apply.

3.1 Terms and definitions

3.1.1
temporary equipment
equipment intended for use on installations for a limited time and which requires hook-up and/or is a potential source of ignition

3.1.2
shall
verbal form used to indicate requirements strictly to be followed in order to conform to this NORSOK standard and from which no deviation is permitted, unless accepted by all involved parties

3.1.3
should
verbal form used to indicate that among several possibilities one is recommended as particularly suitable without mentioning or excluding others, or that a certain course of action is preferred but not necessarily required

3.1.4
can
verbal form used for statements of possibility and capability, whether material, physical or causal

3.1.5
could
verbal form used to indicate an allowable course of action within the limits in this NORSOK standard

3.1.6
hot work
all work operations which make use of or create sources of ignition

NOTE – These sources are normally divided into groups A and B, whereby group B sources of ignition are easier to control.

- Examples of type A sources of ignition include welding, hot tapping of pipes and tanks, use of open flame for heat shrinking, preheating, annealing, use of cutting torch and grinding.
- Examples of type B sources of ignition include heat shrinking by means of electric heat gun, sandblasting, electrical hand tools, megger testing, soldering, use of flash camera, non-Ex-proof electrical equipment and use of chisel or nail gun.

3.1.7
permanently manned
manned at least 8 h every day for at least 50 % of the installation or unit’s operating time

NOTE - For containers this is according to the time it is hooked up.

3.1.8
periodically manned
manned during inspections, maintenance or other work with a planned duration of at least 2 h per day

3.1.9
normally unmanned
neither permanently nor periodically manned

3.1.10
the company
main company on the installation

NOTE - See "Frame regulations", section 44.

3.2 Abbreviations

ABC	fire extinguishers approved for application on wood, cloth, paper, flammable liquids, gasoline, grease and electrical equipment up to 1000 V
AC	alternating current
ATEX	Regulations relating to equipment and safety systems for use in hazardous areas
BOP	blowout preventer
CCR	central control room
DSB	Directorate for Civil Protection and Emergency Planning
DC	direct current
EMC	electromagnetic compatibility
ESD	emergency shutdown system
EEA	European Economic Area
FKE	Regulations relating to qualifications for electricians
FSH	Regulations relating to safety in connection with work in and operation of high voltage systems
FSL	Regulations relating to safety in connection with work in and operation of low voltage systems
HVAC	heat, ventilation and air conditioning
IE	instrument and telecommunications earth
IEC	International Electrotechnical Commission
IMDG	International Maritime Dangerous Goods
IS	intrinsically safe
LEL	lower explosion limit
MER	main earthing reference
NEK	Norwegian Electrotechnical Committee
NC	normally closed
PA	public address system
PE	protective earth
PSV	pressure safety valve
ROV	remotely operated vehicle or equipment
SINTEF	Foundation for Scientific and Industrial Research at the Norwegian Institute of Technology
TN-S	3-phase system with earthed neutral point
TPU	Regulations relating to pressurised equipment
UPS	uninterruptible power supply

4 Technical requirements

4.1 Introduction

4.1.1 Technical requirements and checklists

4.1.1.1 Technical requirements in this NORSOK standard

Clause 4 contains the detailed technical requirements for temporary equipment.

Subclause 4.2 describes various types of container that are defined and also includes special requirements that can apply to various types of container. Technical requirements for a container are the sum of the requirements for the relevant container stated in 4.2.

Subclause 4.3 describes various types of equipment and includes special requirements for this equipment. The equipment can be installed on a skid or in a container. Technical requirements for a temporary piece of equipment are the sum of the requirements for the relevant piece of equipment stated in 4.3.

Subclause 4.4 is divided into further subclauses for different disciplines and contains general discipline requirements.

The technical requirements for a temporary equipment are the sum of the requirements for the relevant container in 4.2, the equipment in 4.3 and discipline area stated in 4.4.

In addition the general requirements for Ex-protection (see 4.5), marking and tagging/labelling (see 4.6), interface with the installation (see 4.7) and documentation (see 4.8) also apply.

4.1.1.2 Other technical requirements

In addition to the requirements in this NORSOK standard, authorities' requirements (regulations) and other recognised standards relating to the relevant equipment also apply. Where appropriate, this NORSOK standard therefore refers to other documents for more detailed descriptions of the requirements. See also section 8, third last paragraph of the guidelines to the "Frame regulations", which states:

"Practices or customs in the industry, requirements and specifications stated in other documents such as industry standards, which are nationally and internationally recognised within a discipline area, for example standards prepared under the direction of CEN, CENELEC, ISO and IEC will also be normative. The same applies to industry standards prepared under the direction of NORSOK and API, etc. In addition, classification societies and other government bodies have prepared regulations that do not apply directly to the petroleum activities but are nevertheless relevant to the discipline area. The same applies for authorities' requirements that do not directly apply to the petroleum activities but regulate equivalent or overlapping areas, for example requirements issued by the Norwegian Maritime Directorate, Directorate for Labour Inspection etc."

4.1.1.3 Checklists

In connection with the dispatch and receiving control of temporary equipment, checklists as shown in Annex C shall be used. A description of the requirements in connection with the items on the checklist, and the extent to which these requirements apply to a specified piece of equipment is provided in this NORSOK standard. The reference stated in the checklist indicates where the requirement is described.
Note that only some of the most actual requirements are included on the checklist for verification.

4.1.2 Overview of equipment and requirements with references

Types of container described in this NORSOK standard - References (4.2):

Type	Description	Subclause
A	Accommodation container	4.2.1
B	Office, coffee bar, laboratories, etc.	4.2.2
C	Workshop for hot work	4.2.3
D	Compressor, waste handling	4.2.4
E	Workshop for cold work	4.2.5
F	(Vacant)	4.2.6
G	Container for diesel engine	4.2.7
H	(Vacant)	4.2.8
I	Stores for flammable material	4.2.9
J	Stores for non-flammable material	4.2.10
K	(Vacant)	4.2.11
L	Painters' workshop	4.2.12
M	Refrigeration/freezer container	4.2.13
N	Radio and communications room	4.2.14
O	Toilet container	4.2.15
P	Motor control centre	4.2.16
Q	(Vacant)	4.2.17
Y	Other container with ignition sources	4.2.18
Z	Other container without ignition sources	4.2.19

Types of equipment described in this NORSOK standard - References (4.3):

Type	Description	Subclause
U01	Diesel engine	4.3.1
U02	Compressor	4.3.2
U03	Tanks	4.3.3
U04	High pressure cleaning equipment	4.3.4
U05	Steam generator	4.3.5
U06	Mobile crane	4.3.6
U07	Well service equipment	4.3.7
U98	Non-Ex-proof equipment on frame	4.3.8
U99	Ex-proof equipment on frame	4.3.9

Discipline requirements described in this NORSOK standard - references (4.4):

Topic	Subclause
Structure	4.4.1
Fire protection and alarms	4.4.2
Gas and explosion protection	4.4.3
Signals to/from central control room	4.4.4
Telecommunication	4.4.5
Electrical systems	4.4.6
HVAC	4.4.7
Health, safety and the environment	4.4.8

4.1.3 Temporary equipment used on mobile installations

See chapter V of the "Facilities regulations" for the integration of the EEA regulations, which states that certain directives do not apply to mobile installations.
For mobile installations, see also section 3 of the "Frame regulations".

4.2 Containers

4.2.1 Type A: Accommodation containers

Description of container:

a) Cabins and corridors.
b) Mess and recreation rooms.
c) Sanitary rooms, changing rooms and laundries.
d) Galley, bakery and kitchen.
e) Other rooms used for accommodation purposes.

Special requirements:

a) Accommodation containers shall be designed in accordance with NORSOK C-001 and NORSOK C-002.
b) Accommodation containers shall be located in a non-hazardous area. No doors, windows or openings shall face a hazardous area.
c) Accommodation containers shall have fire dampers. Duct penetrations in fire class A building components and which are minimum 750 cm^2 in cross-section shall be fitted with an approved automatic fire damper.
   A fire damper is not necessary if the duct penetration has a cross-section of less than 750 cm^2, in which case the duct penetration shall be no less than 3 mm gauge steel for a continuous length of 900 mm. This length shall be insulated to the same fire resistance as the adjoining building component.
d) For fire class requirements in accommodation containers, see the fire class specification in the regulations (see section 30 of the "Facilities regulations").
e) Accommodation containers shall be fitted with firewater, fire hoses and automatic sprinkler system.

4.2.2 Type B: Offices, coffee bar, laboratory, control room container for ROV, well service etc.

Examples of manned containers having potential sources of ignition:

a) Laboratories
b) Offices
c) Well service containers.
d) ROV control room containers.
e) Test/calibration container.
f) Container for calibrating PSVs.
g) Coffee bar.

Special requirements:

a) Offices, laboratories and coffee bars shall be designed in accordance with NORSOK C-001 and NORSOK C-002.
b) Coffee bars shall always be located in non-hazardous areas.

4.2.3 Type C: Workshop for hot work

Description of container:
Workshops for different types of work operations, including hot work.

Special requirements:

a) Spot extractors shall be installed if the work causes air pollution.
b) Type A hot work (see 3.1.6) shall not be carried out in containers located in hazardous areas.

4.2.4 Type D: Compactor and waste storage

Description of container:
Waste containers connected to a compactor.

Special requirements:

a) The equipment shall always be located in a non-hazardous area.
b) The equipment shall be fitted with a "dead man" emergency stop button.

4.2.5 Type E: Workshop for cold work

Description of container:

a) Container for different types of work operations without the use of ignition sources or ignition potential.
b) Manned tool shop container for non-flammable material or tools.

4.2.6 Type F: Vacant

4.2.7 Type G: Container for diesel engine

Description of container:
Container with diesel engine, driven equipment (generator, pump, compressor etc.) and auxiliary equipment.

Special requirements:

a) For requirements to diesel engines, see 4.3.1.
b) For requirements to air inlets, see 4.4.7.
c) Diesel engines shall have an emergency stop on the outside of the container, see 4.4.8.
d) Machinery designed for unmanned operation shall be fitted with an alarm for condition monitoring in a manned control room, see 4.4.4 a).
e) For containers with diesel engines that do not meet zone 2 requirements (see paragraph below), see 4.3.1.4 for the conditions that shall be satisfied in order for these to be used on board.
f) A permanent fire extinguishing system with automatic release shall be installed in addition to a manual release located on the outside, see 4.4.2 (room extinguishing system).

Additional requirements for containers with built-in diesel engine approved for zone 2:

a) For general requirements to Ex-rating, see 4.5.
b) Alternative 1 or 2 below shall be fulfilled:
   Alternative1: All equipment in the container shall as a minimum is approved for use in zone 2. For special requirements to the diesel engine, see 4.3.1.4.
   Alternative 2: The container shall have pressurised mechanical ventilation and gas warning system.
   The ventilation shall be designed for cooling the container.
   The diesel engine shall have a separate air inlet for combustion air.
   Ignition sources shall be disconnected and the diesel engine shall be stopped when gas is detected or pressurisation in the container is lost.
c) Engine exhaust temperature shall not exceed 300 °C. The engine or exhaust pipe surface temperature shall not exceed 200 °C (T3). The test journal that documents this shall form part of the documentation.

4.2.8 Type H: Vacant

4.2.9 Type I: Stores for flammable materials

Description of container:

a) Container for storing flammable material, paint and hazardous products.
b) Container for storing products in sealed, original wrapping and other products that cannot emit solvent vapours. All opening of paint product wrapping or storage of products that can emit solvent vapours shall be carried out in container type “L”, see 4.2.12.

4.2.10 Type J: Stores for non-flammable materials

Description of container:

a) Container for storing non-flammable material.
b) Tool container not manned or equipped for work operations.

4.2.11 Type K: Vacant

4.2.12 Type L: Painters’ workshop

Description of container:
Container where open contact with paint and solvents is possible.

Special requirements:

a) Container shall always be located in a non-hazardous area.
b) Inside the container is classified as a hazardous area. Zone category shall be determined based on the product’s emissions of flammable and explosive gases, and the exposure time if emissions occur.
c) Electrical equipment shall be approved for group II B and temperature rating T3 (200 °C).
d) Requisitioner shall specify HVAC requirements. The area surrounding a possible ventilation outlet shall be classified as a hazardous area, see NEK IEC 61892-7, Clause 4.
e) Containers shall have lockable doors with signs warning of toxic and flammable gases.

4.2.13 Type M: Refrigeration and freezer containers

Special requirements:
Refrigeration and freezer containers shall always be located in a non-hazardous area.
It shall be possible to open the door from inside.
An alarm shall be provided for personnel who may get trapped inside, see 4.4.4.

4.2.14 Type N: Radio and communications

Special requirements:
Container shall be located in a non-hazardous area

4.2.15 Type O: Toilet container

No special description or requirements.

4.2.16 Type P: Containers for electrical equipment

Description of container:
Container for electrical panels, switchboards and/or other electrical equipment.

Special requirements:
Doors shall be lockable, preferably with a padlock.

4.2.17 Type Q: Vacant

4.2.18 Type Y: Other containers with ignition sources

Description of container:
Other containers that are fitted with systems or equipment, which are not Ex-proof (potential ignition sources).

Special requirements:

a) If the container contains flammable substances, the requirements for container type I apply.
b) The container shall be fitted with ventilation (see 4.4.7) and gas detection, see 4.4.2. See 4.5.2 for details.

4.2.19 Type Z: Other containers without ignition sources

Description of container:
Other containers in which all systems and all equipment is Ex-approved (no ignition sources) and where it is not possible to use tools and equipment that are potential sources of ignition.

Special requirements:
If the container contains flammable substances, the requirements for container type I apply.

4.3 Other types of temporary equipment

4.3.1 Type U01: Diesel engines

4.3.1.1 General requirements

a) For requirements to electrical equipment, see 4.4.6.
b) For requirements to frames and lifting equipment, see 4.4.1.
c) Noise suppression shall be in accordance with NORSOK S-002, 5.5.
d) Satisfactory vibration reducing measures shall be implemented.
e) The exhaust pipe on the engine shall have an approved spark arrester.
f) Use of threaded or welded connections on the exhaust pipe is preferred. Flanged connections shall be fitted with fireproof gaskets.
g) Pneumatic start of engines is preferred. In the event of electric start, the battery shall be fitted with a circuit breaker connected to the installation's system for disconnection of ignition source, see 4.4.3.
h) Excess diesel shall be routed back to the diesel tank, not to the pump feed chamber. The return area in the tank shall be separated and ventilated to avoid continuous agitation of diesel and pressure build-up in the tank.
i) A drip tray for collecting any oil or diesel leaks shall be placed under the engine.
j) All oil and diesel lines shall be made of hydrocarbon-resistant material (reinforced hose or piping).
k) The cap and dipstick for lube oil shall be secured against coming loose when the engine is running.
l) Diesel tanks that are located such that the diesel is gravity-fed to the engine shall be fitted with a manual shut-off valve.
m) Diesel tanks shall be designed, built, maintained and tagged in accordance with the IMDG code.

4.3.1.2 General stop and safety functions

The automatic shut-off mechanisms shall as a minimum satisfy the requirements below, unless there are requirements for emergency shutdown level 'c' in accordance with 4.4.3, see 4.3.1.3.

The following are obligatory:

a) Gas detector in the air inlet, see 4.3.1.5 for alternative to gas detector in combustion air inlet. For critical operations, see 4.3.1.3.
b) Local emergency stop, see 4.4.8.
c) Remote-controlled stop, e.g. the installation's ESD.
d) Overspeed protection.
e) Engine protection devices shall cover as a minimum
   - lube oil pressure,
   - cooling water temperature,
   - exhaust temperature.
f) Fire detector (requirements to diesel engine located in room or container). For critical operations, see 4.3.1.3.

	a) Gas detection in air inlet	b) Local emergency stop	c) ESD from control room	d) Overspeed protection	e) Engine protection devices (see NOTE)	f) Fire protection
Stop engine	X	X	X	X	X	X
Close fire dampers in combustion air inlet	X		X	X		X
Close diesel supply valve	X		X	X		X
Disconnect el. power supply	X		X			X
Isolate ignition sources	X		X			X

NOTE – On continually manned units an alarm can replace the automatic stop. If this is the case, it shall be cleared and approved by the responsible person in the company in connection with the requisition.
This approval shall be added to the checklist from the supplier.

4.3.1.3 Critical equipment and operations when using diesel engines

When carrying out certain operations with temporary well operations equipment, automatic shutdown can lead to increased risk. Emergency shutdown level 'c' (see 4.4.3) can apply in such circumstances.

Examples of equipment and operations that can be defined as critical are as follows:

- power pack for cable units;
- power pack for coiled tubing;
- power pack for pressure pipe;
- pump units for special pumping operations (fracturing, well stimulation, sand control, cementing).

Before the machine is shut down a safe well condition is essential. Compensating measures shall be covered by the procedure for manual shutdown in the event of an alarm or gas leakage signal. This procedure shall be attached to the documentation that accompanies the equipment, see 4.7.2.
If a diesel engine without an automatic shutdown in the event of gas is not located a satisfactory distance away from a hazardous area (see 4.3.1.4 b), it shall be equipped with a flame arrester in the air inlet and exhaust outlet.
Use of critical equipment with manual shutdown shall be cleared and approved by the responsible person in the company in connection with the requisition. This approval shall be added to the checklist from the supplier.

4.3.1.4 Ex-proof requirements for diesel engines

a) Additional requirements for zone 2-approved diesel engines

For detailed requirements for zone 2-approved diesel engines, see EN 1834-1.

The following requirements also apply:

a) For diesel engines located in containers special requirements in 4.2.7 apply.
b) Electrical systems for diesel engines not installed in containers shall be Ex-proof, see 4.4.6.
c) Refer to EN 1834-1, 5.3. The engine's exhaust temperature shall not exceed 300 °C. The engine's surface temperature and the exhaust pipe temperature shall not exceed 200 °C. The test journal that documents this shall form part of the documentation.
d) Refer to EN 1834-1, 5.6, 5.7 and Figure1. The engine's air inlet and exhaust outlet should be located in an unclassified area.
e) For requirements to flame arresters, see EN 12874.

b) Non-Ex-proof diesel engines

Diesel engines with associated equipment not Ex-proof shall only be used at a adequate distance from hazardous areas, and shall always be connected to the installation's emergency shutdown system for ignition sources.

An "adequate distance" means that any gas leakage shall be detected by the installation's gas detection system before explosive gas can reach the diesel engine.
This assessment shall be carried out and approved by the responsible person in the company in connection with the requisition.
This approval shall be added to the checklist from the supplier.

Dispensations can be made for "cold" installations free from hydrocarbons (e.g. building or removing the installation) as described in the table under 4.3.1.5.

4.3.1.5 Alternative to gas detector in the combustion air inlet

Application of this subclause requires prior approval by company.

Diesel engines not equipped with a gas detector and associated shutdown functions can be used if the requirements below are met.

The table shows these requirements using key words.

	A) Cold installation (e.g. building or removing the installation)	B) Located at a adequate distance from classified areas	C) Located in or near zone 2 classified area
Diesel engine for non-critical equipment	a) No gas detector on the equipment. b) No ignition source shutdown.	a) Gas detectors in adjacent area(s), no gas detector on equipment. b) Automatic ignition source shutdown. c) Automatic closure of air inlet (overspeed protection). d) Location and use approved by responsible person.	a) Gas detectors in adjacent area(s), no gas detector on equipment. b) Automatic ignition source shutdown. c) Automatic closure of air inlet (overspeed protection). d) Ex-approved equipment (approved for zone 2 as a minimum).
Diesel engine for critical equipment	a) No gas detector on the equipment. b) No ignition source shutdown.	a) Gas detectors in adjacent area(s), no gas detector on equipment. b) No automatic ignition source shutdown. Procedure for manual shutdown in the event of detected gas.	a) Gas detectors in adjacent area(s), no gas detector on equipment. b) No automatic ignition source shutdown. Procedure for manual shutdown in the event of detected gas.

	A) Cold installation (e.g. building or removing the installation)	B) Located at a adequate distance from classified areas	C) Located in or near zone 2 classified area
		c) Automatic closure of air inlet (overspeed protection). d) Ex-approved equipment (approved for zone 2 as a minimum).	c) Automatic closure of air inlet (overspeed protection). d) Ex-approved equipment (approved for zone 2 as a minimum).

Explanation of terminology used in the table with reference to the letter used:

a. Gas detectors
"Gas detectors in adjacent area(s)" means that the installation is fitted with gas detection equipment in areas where there are potential sources of leakage and/or where gas from these potential sources of leakage will disperse. Any gas leakage shall be detectable before reaching the diesel engine.

b. Ignition source shutdown
"Ignition source shutdown" means that the diesel engine is connected to an ignition source control or shutdown system that shuts down the engine automatically when a low level of gas is detected (usually 10 % LEL) anywhere on the installation. This requirement applies to diesel engines that are used in non-critical activities.

For critical equipment and activities with diesel engines, see 4.3.1.3.

c. Automatic closure of air inlet
Diesel engines shall be fitted with the following safety devices:

- overspeed protection;
- automatic rapid closing valve in combustion air inlet;
- rapid closing valve in fuel inlet.

Should gas reach the combustion air inlet without being detected this arrangement will ensure a rapid shutdown of the engine.

d. Ex-approved equipment
It is recommended that diesel engines are located in non-hazardous areas. If diesel engines are located closed to or in zone 2, the engine and all equipment on the machinery shall be approved for installation in zone 2, see 4.3.1.4.

4.3.2 Type U02: Air compressors

Description of equipment:
Diesel operated or electrically operated compressor unit for the supply of compressed air.

Equipment requirements:

a) For requirements to diesel engines, see 4.3.1.
b) For requirements to electric motors, see 4.4.6.1.
c) For general requirements to Ex-rating, see 4.5.
d) For requirements to frames and lifting equipment, see 4.4.1.
e) Noise suppression shall comply with NORSOK S-002, 5.5.
f) Supply air shall be taken from non-hazardous areas. Supply air duct shall be secured against leaks (all-welded or flanged with seals).
g) Fan belts shall be antistatic.
h) Drip tray for collecting oil or diesel leaks shall be installed.
i) The compressor shall be fitted with different stop and safety functions, including
   - gas detector in air inlet, see paragraph below the table,
   - local emergency stop, see 4.4.8,
   - remotely controlled emergency shutdown from control room,
   - various protection devices for the compressor. These shall as a minimum protect against low oil pressure and excessive cooling fluid temperature.

The functions shall as a minimum meet the requirements in the table below.

	Gas detection in air inlet (automatic)	Local emergency stop (manual)	Remote-controlled ESD from control room	Engine protection (automatic)
Compressor shutdown	X	X	X	X
Power disconnection	X		X	
Isolation of ignition sources	X		X	

Gas detector requirements for compressor

If the compressor air inlet is located in a container or other room with mechanical ventilation with a gas detector in the ventilation air inlet, there is no requirement for a gas detector in the compressor air inlet. The compressor shall be shut down when gas is detected on the installation (ignition source shutdown).

For compressors with air inlet located in naturally ventilated areas, gas detector is requirement. Dispensations from this requirement can be handled in accordance with the same criteria as described for diesel engines in 4.3.1.5.

Air compressors that are part of the start-up system for temporary diesel engines are exempt from the gas detector requirement.

Other references
The "Regulations for compressed air systems" also apply.
If specified by the requisitioner, the requirements in NORSOK R-001, 2.3 and 5.3, shall be met for larger units.

4.3.3 Type U03: Vessels/tanks

Equipment requirements:

a) Vessels/tanks shall be approved, maintained and tagged/labelled in accordance with the IMDG code.
b) For requirements to frames and lifting equipment, see 4.4.1.
c) Vessels/tanks shall have earthing boss.
d) The hook-up interface for shall comply with the requisition.

4.3.4 Type U04: High pressure cleaning equipment

Equipment description:
Equipment with fluid, fluid and steam or fluid and abrasive/polishing medium under pressure is released into the atmosphere as a jet spray through a pipe or nozzle.

Equipment requirements:

a) For requirements to frames and lifting equipment, see 4.4.1.
b) For general requirements to Ex-rating, see 4.5.
c) If chemicals are used as an additive to the cleaning fluid, the nozzle assembly shall be earthed.
d) The equipment shall be fitted with safety devices such as pressure safety valves, pressure regulator and by-pass valve.
e) Equipment shall have an emergency stop device, which is easily visible.
f) Should the high pressure nozzle be dropped, an operating device shall automatically shut off the jet (dead man’s device).
g) The same principle applies to a foot pedal operated unit.
h) The reaction force of hand held equipment shall not exceed 250 N.
i) Heated equipment shall be fitted with two safety devices to prevent overheating.
j) Heating of fluid or steam by electric power is preferred.

The "Regulations for high pressure cleaning" also apply.

4.3.5 Type U05: Steam generator

Description of equipment:

a) Boiler for the supply of superheated water or steam (above 100 °C) normally heated by electrical heater or diesel burner.
b) Boiler will normally be placed in a container (type Y: other container with ignition sources).

General requirements:

a) For requirements to frames and lifting equipment, see 4.4.1.
b) Boilers shall be designed and built to comply with the regulations issued by the DSB.
c) Safety valves shall be certified and maintained.
d) The unit shall be fitted with an alarm for low water level. In special hot pipe boilers this can be replaced with a dry-out alarm (excess temperature). Any feed tank if installed shall have an alarm for low water level.
e) For general requirements to Ex-rating, see 4.5.

Requirements for boilers with diesel burner:

a) Boilers with diesel burners shall not be placed in hazardous areas.
b) Exhaust pipes shall have fireproof seals between flanged joints. Threaded or welded joints are preferred.
c) Excess diesel shall be routed back to the diesel tank, not to the pump feed chamber. The return area in the tank shall be separated and ventilated to avoid continuous agitation of diesel and pressure build-up in the tank.
d) Drip tray shall be installed below burner unit to collect any diesel leaks.
e) All oil and diesel lines/hoses shall be made of hydrocarbon-resistant material (armoured/reinforced hose or pipe).
f) A permanent fire extinguisher system with automatic release and external manual release shall be installed, see 4.4.2. In addition there shall be at least one fire extinguisher type ABC, minimum 12 kg provided.
g) Use of diesel burner shall be clarified and approved by the responsible person in the company in connection with the requisition. This approval shall be added to the checklist from the supplier.

Ex- requirements for diesel burners:
Diesel burners are not Ex-proof, but unless conditions for dispensation as described in 4.5.1 are fulfilled, the following requirements apply:

a) The exhaust temperature shall not exceed 300 °C. Surface temperature shall not exceed 200 °C. Test readings shall form part of the required documentation. If this requirement cannot be fulfilled, the conditions for dispensation in 4.5.1 shall be fulfilled.
b) An approved spark arrester shall be fitted in the exhaust pipe. The spark arrester shall satisfy the requirements in EN 1834-1, 5.10.
c) The diesel burner shall have a gas detector in the air inlet (when placed in a container with mechanical ventilation, the gas detector shall be placed in the container's air inlet).

Requirements for stop and safety functions:
The automatic shutdown mechanisms shall as a minimum fulfil the requirements below and in the table:

a) For requirements to gas detector in the air inlet, see paragraph above on Ex-proof requirements.
b) For requirements to local emergency stop device, see 4.4.8.
c) For requirements to remote-controlled stop device (e.g. the installation's ESD, see 4.4.3).
d) Equipment protection devices shall as a minimum include those described in applicable regulations relating to boilers, issued by DSB.
e) Fire detector (requirements to diesel burner located in room or container).

	a) Gas detection in air inlet	b) Local emergency stop	c) Remote-controlled ESD from control room	d) Equipment protection	e) Fire detector
Stop diesel burner	X	X	X	X	X
Close diesel supply valve	X	X	X		X
Disconnect el. power supply	X		X		X
Isolate ignition sources	X	X	X		X
Pressure relief of unit	X	X	X		X

4.3.6 Type U06: Mobile cranes

Equipment requirements:
For requirements to diesel engines, see 4.3.1.

4.3.7 Type U07: Well service equipment

Description of equipment:
All equipment used in connection with preparations for and performance of well interventions (wireline, coiled tubing, snubbing, well testing etc.).

These types of operation require a system that usually comprises several units, such as those shown in the table below (first column).
For the different units (first column), the special requirements for container or equipment listed in column two apply.

Unit	Checklist, special requirements
Wireline winch w/operator cabin (see NOTE)	Equipment type U07
Wireline logging unit/data collection container	Container type B
Wireline mast	Equipment type U07
Coiled tubing spooler (reel unit)	Equipment type U07
Coiled tubing injector	Equipment type U07
Control cabin	Container type B
Remotely-operated BOP control panel	Equipment type U07
Power pack, diesel	Container type G, Equipment type U01
Power pack, electrical	Container type Z, Equipment type U07
Workover control container for subsea operations	Container type B

NOTE – A typical wireline winch w/operator cabin is a winch with a simple cabin where all internal and external equipment is Ex-proof (no ignition sources). The cabin is ventilated for periodic manning, see 4.4.7.

Special requirements:

a) For requirements to frames and lifting equipment, see 4.4.1.
b) For detailed requirements to different types of drilling equipment, see NORSOK D-002.

4.3.8 Type U98: Other non-Ex-proof equipment in frame

Description of equipment:
Various equipment installed in a frame in which some of the equipment is not Ex-proof (ignition sources).

4.3.9 Type U99: Other Ex-proof equipment in frame

Description of equipment:
Various equipment installed in a frame in which all of the equipment is Ex-proof (no ignition sources).

4.4 Special technical requirements for temporary equipment

4.4.1 Structural

Lifting devices
DNV 2.7.1, EN 12079 or equivalent standard shall be used for design verification, testing and approval of all types of devices attached to a lifting device's lifting hook, such as containers, steel baskets, frames, lifting yokes, chains and wire rope slings.

There is no drop-test requirement for devices that are not used for the transport of dangerous goods. Such devices can be tested and approved by an authorised company. A definition of what constitutes dangerous goods is provided in the IMDG code.

Fire classification

- For containers that are normally unmanned and do not contain flammable material, there is no requirement for fire classification provided that the container is of steel or aluminium construction.
- Other containers shall satisfy the general requirement to fire classification A0.
- Containers in which equipment is in operation during emergency situations shall satisfy the requirement to fire classification A-60 (unless the company has specified otherwise), such as diesel operated emergency generators (type F) and emergency MCC room (type P). For accommodation containers, see 4.2.1.

There is no requirement to fire dampers in containers fire with class rating A0 or lower. However, there is a requirement for fire dampers for accommodation containers. For other containers requirements for fire damper are to be specified by requisitioner, if applicable.

Emergency exit
Containers that are permanently or periodically manned, and either have an internal area exceeding 20 m^2 or the distance to the exit door exceeds 5 m (if there are several rooms or air locks this means the furthest distance to the outer door), shall have a separate emergency exit. The emergency exit shall have a minimum size of 800 mm x 800 mm and be possible to open from both sides.

Doors
All personnel access doors shall be self-closing. This requirement does not apply to transport doors or emergency exits.
In general, doors shall open outwards (away from the container).
For containers with pressurisation ventilation, doors shall open inwards (into the container). Alternatively the door can open outwards if the container is fitted with an overpressure protection device (not a flow switch).

Air locks
There are no requirements for an air lock in containers placed in non-hazardous areas.
Containers approved for use in zone 2, and which contain ignition sources (non-Ex-proof), shall have pressurisation ventilation and should have an air lock.
Containers approved for use in zone 1, and which contain ignition sources (non-Ex-proof equipment), shall have pressurisation ventilation and air lock.
See NEK IEC 61892-7, Clause 8.
In an air lock the inner door should open into the container and the outer door outwards.

Attached lifting devices
Containers and frames shall have lifting devices fitted. For prolonged stays offshore the lifting devices may be removed for storage in a dry place.

Mechanical protection of attached equipment
External location of components (junction boxes, control panels, pipe connections, fans, etc.) should be avoided. Components that have to be located externally shall be installed within the equipment’s outer frame.

4.4.2 Fire protection and alarms

Fire detection
A fire detection and alarm system shall quickly, safely and unambiguously detect and warn of fire or potential outbreak of fire. Fire detection and alarm is required in cases where there is a real possibility that a fire can arise or be sustained.

Automatic fire alarm systems shall satisfy the requirements in NORSOK S-001, Annex F.
The system shall be complete with a dedicated control cabinet (preferably combined with the systems for monitoring gas and pressurisation in ventilated containers) and detectors. The detectors shall be located according to the most probable causes of fire.

If fire is detected the local alarm in the container shall be activated. In noisy areas (over 85 dbA) there shall be a yellow flashing light in addition to the local alarm in the container, see NORSOK S-001, 9.5. A local emergency shutdown system in the container shall also be provided for safe and controlled shutdown of the equipment. The control panel shall have an output signal for alarm to CCR, see 4.4.4.

Portable extinguishers
Portable extinguishers are required in cases where there is a real possibility that a fire can arise or be sustained, as well as in all normally manned containers. Portable fire extinguishers of adequate size and quantity suitable for the anticipated course of fire shall accompany the equipment.
Permanent brackets for such appliances shall be provided.

The following standards shall be met:

- For portable fire extinguishers: EN 3-6.
- For location and quantity: DSB: Fire Protection Act with regulations and guidelines, section 4-3 relating to manual fire extinguishers.
- For control and maintenance: NS 3910.

Fire extinguishing systems for rooms
Containers in which equipment has a particularly high risk of fire (flammable material, flammable liquids and hot surfaces) or where a fire can arise and will have a particularly high safety risk for personnel, shall be fitted with a room fire extinguishing system. This applies for example for accommodation and diesel containers.
When this requirement applies to permanently and periodically manned containers, the fire extinguishing system shall be an automatic release sprinkler system. The sprinkler system shall be protected against frost. In other containers, other systems can be used.

Requirements for room fire extinguishing systems also apply in cases where equipment with an extra high risk of fire is installed on a skid and enclosed as a ‘closed room’ due to noise emission, fire requirements and environmental requirements.

4.4.3 Gas and explosion protection

Gas detector
The gas detection and alarm system shall provide a quick and reliable alarm of explosive gases. The system shall be complete with a dedicated control cabinet (preferably combined with the systems for monitoring fire and pressurisation in ventilated containers) and detectors, and shall be capable of shutting down the equipment locally. This system and the system for ventilation shall always be Ex-proof accepted for zone 1.

Automatic gas alarm systems shall meet the requirements in NORSOK S-001, 9.2, and Annex F.

Gas detectors shall be installed in all air inlets to mechanically ventilated containers, in all air inlets on combustion engines and compressors, and in all ventilation outlets from classified areas. If the air inlet goes to several containers it is only necessary to monitor the common inlet. In general, it is acceptable to have a detector in the air inlet without voting system, see NORSOK S-001, Annex F.
In containers where all installation is Ex-proof and where the use of tools or equipment will not create any ignition potential, gas detectors are not necessary in any air inlets.
For alternatives to gas detectors and further details, see s 4.3.1.5 (combustion engines), 4.3.2 (air compressor) and 4.5.2 (air inlet, general).

If gas is detected the local alarm in the container shall be activated. In noisy areas (over 85 dbA) there shall be a yellow flashing light in addition to the local alarm in the container, see NORSOK S-001, 9.5. The control panel shall have an output signal for alarm to CCR, see 4.4.4.

The alarm to the CCR shall always be given at 10 % LEL.

Local ignition source disconnection
In containers where gas detectors are installed, a local ESD shall provide a safe and controlled shutdown of the equipment (disconnection of all sources of ignition).

Emergency shutdown level (disconnection of ignition sources):

a) If the container does not contain important equipment, disconnection shall occur at 10 % LEL.
b) If the container contains important equipment, disconnection shall occur at 30 % LEL (if two or more detectors, when the first reaches 30 % LEL). Emergency shutdown level "B" shall be agreed between the supplier and the company.
c) If automatic shutdown of the equipment increases the risk to personnel, the emergency shutdown system shall warn the operator in a permanently manned control station. For such alerts the operator shall immediately commence shutdown of the equipment in accordance with approved procedures.
For emergency shutdown level "c", the procedure for shutdown of the equipment shall form part of the documentation that accompanies the equipment, see 4.8.2. This shall include the procedure for manual shutdown in the event of gas. The implementation of manual shutdown shall be clarified with and approved by the responsible person in the company in connection with the requisition.
The approval shall be added to the checklist from the supplier.
This requirement applies for equipment, which contain power sources, e.g. diesel engine or battery. The requirement does not apply for minor battery systems which are Ex-proof (for example emergency light) or other power systems, e.g. accumulator with compressed gas.

Central ignition source disconnection
Most installations also have a system for shutting down the power supply to temporary equipment.
Especially for equipment mentioned in b) and c) above, checks shall be carried out to ensure that the power supply from the installation is not shut down at lower levels.
There is also a general requirement that containers or equipment that are not approved for zone 1 shall have a power supply from the installation that is connected to the ignition source disconnection system, e.g. the installation's electrical sockets. See 4.5 for details.

Shutdown of UPS and battery systems
For battery systems which can be disconnected when main power is lost, the installation main power voltage is used as the disconnect signal, see description of emergency stop in 4.4.4. See 4.4.6.4.

4.4.4 Signals to/from central control room

a) Signal from container or equipment to CCR

Depending on the configuration of the container or equipment, the following signals shall be transmittable:

- Gas alarm (always for equipment fitted with a gas detector).
- Fire alarm (always for equipment fitted with a fire detector).
- Manual alarm.
- Loss of pressurisation (always for equipment fitted with a device for monitoring air supply or pressurisation, see 4.4.7.
- Condition monitoring alarms (can be connected to a common alarm to the CCR).

Signals from containers to the CCR shall be voltage-free contacts, where the activated signal (alarm) shall be a closed contact. These signals shall be available individually inside a local panel or in a junction box inside the container or on the equipment.

The connection interface will vary on different installations. In many cases there is a requirement for ohm resistors in parallel and in series with signal contact for circuit monitoring. "Z-015 Data Sheets for installation" shall therefore be checked in every case, see Annex B.

Output alarms shall not be activated due to loss of power to the temporary equipment control panel.

Manual alarm
Temporary equipment that cannot be left unattended and where operator may need to call for assistance shall be fitted with a manual alarm for attracting attention if other arrangements have not been made for calling for assistance in work operations.

Condition monitoring alarms
This means alarms from monitoring systems for machinery, processes and similar. Temporary equipment, which has this local monitoring system, shall have a condition monitoring signal output to the control room if the equipment can be operated unmanned.

b) Signals from CCR to container or equipment

Depending on the configuration of the container or equipment, the following signals shall be transmittable:

- Emergency stop (e.g. rotating machinery).
- Shutdown, e.g. battery systems.
- Information via the installation's alarm system (PA system).

Signals from CCR to container shall be as follows:

Emergency stop
230 V AC signal, emergency stop activated through loss of voltage (e.g. diesel engine shutdown). This 230 V AC signal will normally come from a socket on the installation, whereby the socket is connected to the lowest level ignition source disconnection system.

Shutdown
Voltage-free contact, activated signal (disconnection) is open circuit, e.g. battery system, see 4.4.3.

Information via installation's alarm system
The PA system, telephones and flashing lights can be used. The alarm system shall satisfy the requirements in 4.4.5 and in NORSOK S-001.

4.4.5 Telecommunications

Telephone
Containers that are permanently manned shall be fitted with a telephone that can be connected to the telephone network on the installation.

Public address system (PA)
Containers that are permanently or periodically manned shall be fitted with a PA system that can be connected to the installation's loudspeaker system. PA systems shall be adapted to the system on the installation such that the installation's status alarms, including fire, gas and evacuation alarms as well as PA announcements, are communicated inside the containers.

Loudspeakers
Loudspeakers shall have a built-in transformer for volume control.
Two types of loudspeaker can be used:

a) In areas with noise level above 83 dbA
Loudspeaker shall have a characteristic average acoustic pressure of 104 dbA at 1 m and 1 W electrical power input, effective frequency range minimum from 500 Hz to 6000 Hz. Normal power output is 10 W, but can vary from 2,5 W to 20 W.

b) In areas with noise level below 83 dbA
Loudspeaker shall have a characteristic average acoustic pressure of 98 dbA at 1 m and 1 W electrical power input, effective frequency range minimum from 500 Hz to 6000 Hz. Normal power output is from 0,25 W to 8 W.

Loudspeakers and telephones shall not share the same cable.

Alarm lamps
In particularly noisy rooms, light signals shall be installed in accordance with NORSOK S-001. The lamp should preferably be a xenon strobe (gas discharge tube) with about 30 flashes per minute. The lamp shall be controlled on/off by a built-in control system operated by the installation's PA system. A separate interface (connections) to the lamp will therefore be avoided.

4.4.6 Electrical systems

4.4.6.1 Detailed requirements for electrical systems

For detailed requirements for electrical systems and electrical installation see the references to NORSOK standards in the table below.

Requirements for electrical systems

Topic	Description	NORSOK E-001	NORSOK Z-010
Earthing	System earth, earth reference PE, IE, bonding, earth clamp	5.4	10
Lighting system	Lighting equipment	5.5	5.1
Sockets		5.6	5.3
Heating cable		5.8	6
Ignition source disconnect		5.13	
Generators	Generators	5.6	
Motors	IP, Ex-rating	6.5	
Motor protection	Protection	7.4	
Circuits in distribution boards	Protection of various circuits	7.6	
Ex-proof rating	Applications for various Ex-ratings		4.1
IP rating			4.2
EMC	Electromagnetic compatibility	4.0	4.5
Cabling	Type, segregation, installation, fastening, nipples, termination		9
Mono cable	See Annex F		
Fastening arrangements	Cable trays, equipment		11
Marking	Cable trays, equipment, cables, wires, colour coding, earth		12

4.4.6.2 Additional requirements

Emergency lighting
Containers that are permanently or periodically manned shall be fitted with emergency lighting. The emergency light shall be zone 1 Ex-approved. A light fitting with integral battery and battery capacity for at least 30 min should be used.

Internal equipment and installations
Internal equipment and installations shall be Ex-approved for use in Zone 1, IIA-T3. If they are not, the container shall be mechanically ventilated (see 4.4.7) with gas detector and ignition source disconnection (see 4.4.3). See 4.5 regarding requirements to Ex-proof containers in terms of location (zone).

External equipment and installations
External equipment and installations shall be Ex-approved for use in Zone 1, IIA-T3 (exceptions are described in 4.5. See table in 4.5.2, item 8).

Short circuit level
Maximum allowable short circuit level for the temporary equipment shall be stated on the data sheet, see Annex H. This short circuit level shall not be lower than the maximum short circuit level at the connection point on the installation (see the installation's data sheet).

If any special considerations are to be taken due to high or low short circuit level on electrical systems, this shall be stated on the requisition.

High voltage equipment and installations
High voltage equipment and installations shall be marked with signs as shown in NS 4210, sign no. C.6. The signs shall have the following text: "Høyspenning - livsfare" (or for example in English "High voltage – danger").
Rooms that contain high voltage equipment shall be fitted with lockable doors and shall not be accessible to unauthorised personnel.
Switchgear for high voltage or high voltage equipment shall be fitted with lockable circuit breakers.
This also applies to equipment which is supplied from low voltage plant.
High voltage windings on transformers, switchboards bus bars etc. shall be fitted with connector for portable earthing equipment. Alternatively the high voltage equipment can be equipped with earthing switch.

4.4.6.3 Earthing

Earthing shall be carried out as stated in the NORSOK standards referred to in the table in 4.4.6.1. The following also apply:

Main earth reference (MER):
The installation's main structure is used to establish different earthing systems. In a container, the container's structure can be used (see paragraph below).

Instrumentation and telecommunication earth (IE):
IE earth is the earth reference for IS, non-IS and telecommunications circuits etc. For local instrument earthing systems in a container, the container's structure can be used as the MER. For instrument systems in the container which are integrated with the installation systems, the associated earth system on the installation shall be used. Interface points can include a junction box with dedicated, separated, isolated and tagged terminals for the earth system(s) used.

The requisitioner shall specify earthing systems if special requirements are needed.

Protective earth (PE):
The PE connection to the container shall be a part of the power cable (or cables) from the junction box or socket on the installation. The PE earth connection can be the cable armour or a separate wire in the cable.

Bonding:
Where the PE wire from the installation terminates in a terminal in a junction box, cabinet or other equipment in the container, a bonding connection shall be established from the terminal in the equipment to an earthing point on the container structure. This will ensure that the container with electrical equipment has an equalising connection to the installation. If there are several power supplies from the installation, bonding shall be performed for each power supply. In cases where the installation has special bonding requirements, this shall be stated on the requisition.
All temporary equipment shall have external earthing boss for local bonding to platform structure.

4.4.6.4 Battery system

Non-Ex-proof battery system should be avoided. "Battery system" means all circuits, which can be powered by a battery.

Non-Ex-proof battery circuit breaker can be used if the battery system is located inside a ventilated container and with shutdown level a) and the battery system shuts down with loss of AC power supply and with loss of ventilation.

Non-Ex-proof battery circuit breaker (not zone 1 approved) shall be controlled by a shutdown system, see 4.4.3 and 4.4.4.

After shut down only Ex-proof circuits and equipment are allowed to be energised (except terminals on battery and breaker).
Non Ex-proof battery systems which do not shuts down with loss of AC power supply, shall have terminals for external shutdown signal from the platform ESD system. The signal from platform will normally be voltage free NC contact (contacts opens on activated ESD).
Use of non Ex-proof battery systems shall be cleared and approved by the responsible person in the company in connection with the requisition.
This approval shall be added to the checklist from the supplier.

4.4.7 HVAC

For requirements to ventilation, see NEK IEC 61892-7, Clause 8, and NORSOK H-001.

Mechanical ventilation
The following containers require mechanical ventilation:

a) Containers in which ignition sources are present (in order to secure ignition source disconnection in the event of gas).
b) Containers that are permanently or periodically manned (for requirements to fresh air, see NORSOK S-002).
c) Containers in which equipment emits large amounts of heat (cooling requirement).
d) Containers in which equipment emits gases or other pollution.

There shall be at least six air changes per hour.
In general all containers in which ignition sources are present shall have mechanical ventilation. Exceptions will only be allowed for containers that fulfil the requirements in the table in 4.5.2. item 8, NOTE. Natural ventilation can be used if it results in a satisfactory indoor climate for situations b), c) and d) above (e.g. for container type E).

Air inlet
All air inlets shall be fitted with a gas detector, see 4.4.3. In containers where all installation is Ex-proof and where the use of tools or equipment will not create any ignition potential, a gas detector is not required.

For combustion air to diesel engines, see 4.3.1.4 a), item d).

All other combustion air inlets (e.g. for boilers and all air inlets for pressurised rooms) shall be located in non-hazardous areas and at least 3 m from each boundary with zone 2 areas. Air inlet ducts where leakages can occur shall have an overpressure system.

Pressurisation
For containers with mechanical ventilation that are located in non-hasardous areas, there is no requirement for minimum pressurisation with monitoring system. However, the ventilation system shall be in operation to ensure that non-Ex proof equipment can be energized (electrical interlock). See 4.5 regarding requirements to Ex-proof containers in terms of location (zone) and approval prior to shipment.
Containers with mechanical ventilation containing ignition sources shall have self-closing doors. All other hatches and doors shall be closed when the container is energised.

Containers having ignition sources (for example non-Ex proof equipment) located in hazardous area, shall have overpressure with monitoring.

The pressurisation monitoring system shall be fitted with a dedicated control cabinet (preferably combined with the fire and gas monitoring systems).
In the event of pressurisation loss (air flow), all ignition sources shall be disconnected (time delay, for example 30 s). The control panel shall have an output signal for alarm to CCR (see 4.4.4.), activated when disconnection takes place. The system should also have an local audible alarm that is activated immediately upon loss of pressurisation.
For requirements to air locks, see 4.4.1.

4.4.8 Health, safety and the environment

Prior to choosing, usage and location of temporary equipment, an assessment shall be carried out taking into account the results of risk analyses and how the equipment might affect this result. This applies in particular to containers which are intended for accommodation or workplace purposes, or in which ignition sources and/or flammable materials are present. For permanently manned containers, the assessment shall be summarised and transferred to the data sheet for temporary equipment, part 5, based on the "Working environment area chart" (WEAC) form.

Containers or equipment that are required to have an emergency stop shall be fitted with a stop pushbutton designed and functioning according to EN 418.

Health, safety and environment

Function	Description	NORSOK S-002
Layout	Dimensions (l x b x h), access, lighting, planning of workplace	5.1
Workplace, design and outfitting	Organisation, design, furnishings, choice of equipment, work order processing	5.2
Hot and cold surfaces	Protection against hot and cold surfaces	5.3.2
Chemicals	Handling, storage, use of personal protective equipment	5.4
Noise, vibrations	Requirements to noise and vibrations in different areas	5.5 and Annex A
Lighting	Requirements to quality of lighting and light level for different work tasks	5.6 and Annex A
Internal climate	Requirement to air quality	5.7 and Annex A
Operation	Planning and use	
Drains	Connection to drain (open drain)	NORSOK S-003

4.5 Ex-rating requirements for equipment in terms of location (zone division)

4.5.1 General requirements to Ex-approved equipment/installation

In general, temporary equipment shall not have ignition source potential. The equipment or the fitted out container shall be Ex-proof. Electrical equipment and components shall be Ex-proof for use in zone 1, IIA-T3. Non-electrical equipment (placed on the marked first time after July 1, 2003) shall be approved for the zone in which the equipment can be located.
Equipment approved for zone 2 can be used in zone 2 and in non-hazardous areas, provided that it is powered from a source controlled by ignition source control system (for critical equipment this can be manual shutdown based on approved procedures).
In addition containers with no ignition sources of type A (see 3.1.6) and equipped with mechanical ventilation and gas detector as described in 4.4.7 (see "Pressurisation"), can be located in non-hazardous area.

Dispensations from this requirement are allowable if the following conditions are met:

- The temporary equipment has power supply from sockets on the installation that are connected to the system for ignition source control at the lowest level.
- The temporary equipment is only used indoors in mechanically ventilated modules (non- hazardous), or in naturally ventilated areas at an adequate distance from hazardous areas. "At an adequate distance" means that any gas leakage shall be detected by the installation’s gas detection system before the explosive gas can reach the container or equipment.
- Location and use of temporary equipment is cleared and approved by the responsible person in the company in connection with the requisition. This approval shall be added to the checklist from the supplier.

4.5.2 Requirements to Ex-approved containers in terms of location (zone)

For containers with internal equipment that is not Ex-approved, the general requirements in 4.5.1 can be satisfied through a combination of mechanical ventilation and gas alarm system.

The table below shows the zones containers can be placed in, based on

- Ex-rating of the equipment inside the container (lowest Ex-rating for electrical or mechanical equipment),
- mechanical ventilation,
- gas detector in air intake.

Hot work in the container is equivalent to Ex-rating "none".

NOTE - Class A hot work is not allowed in containers located in hazardous areas.

Pressurised ventilation means that the container shall be protected by overpressure. Where there is a requirement for pressurisation or gas detection, a system for automatic disconnection of ignition sources shall be installed in the event of gas detection or the failure to meet the requirement for overpressure (or air flow).

For Ex-rating requirements, see the regulations for equipment and safety systems in hazardous areas (FUSEX 1996)
For ventilation requirements, see 4.4.7.
For requirements to gas alarm system, see 4.4.3.

Container location

	Container configuration/fittings			Approved locations		
Item	**Equipment Ex-rating**	**Mechanical ventilation**	**Gas detection**	**Zone 1**	**Zone 2**	**Unclass.**
1	Approved zone 1	None	No	x	x	x
2	Approved zone 2	Yes, with pressurisation and air lock	Yes	x	x	x
3	Approved zone 2	Yes (alt. natural vent.)	No		x	x
4	Approved zone 2	None (sealed design)	No			x
5	None	Yes, with pressurisation and air lock	Yes	x	x	x
6	None	Yes, with pressurisation	Yes		x	x
7	None	Yes	Yes			x
8	None	None	No			See NOTE

NOTE – Conditions for dispensation in 4.5.1 shall be met.

4.5.3 Requirements to Ex-proof equipment that shall function in a gas emergency situation

Equipment that shall be used in an emergency situation, for example after shutdown following gas detection, shall be approved for use in zone 1, gas group IIA, temperature rating T3, irrespective of its location (in a hazardous or non-hazardous area).

4.6 Marking and tagging

4.6.1 General notes on marking

a) Where necessary to ensure the health and safety of personnel, warning devices and instruction signs shall be provided.
b) External signs shall be made of non-corroding material.
c) Signs shall be in Norwegian with English translation where necessary.
d) Equipment supplied in accordance with EEA directives shall be CE marked and be in accordance with relevant regulations.
e) Equipment and components shall be marked with the tag number to the extent required for unambiguous identification in documentation and maintenance programmes.
NORSOK Z-002 should be used for numbering equipment and components.
f) Signs shall be in accordance with NS 4210.
g) If gas bottles are stored in the container, warning signs shall be installed outside, next to the entry door.

4.6.2 EEA regulations and CE marking

See chapter V of the "Facilities regulations" for the integration of EEA regulations, which states that certain directives do not apply for mobile installations.
For mobile installations, see also section 3 of the "Frame regulations".

Containers or equipment units that contain items that are CE marked, are considered to be a separate (combined) product that shall also be CE marked. This applies to containers or frames which contain, for example, Ex-proof equipment (ATEX), machinery (see the "Machinery regulations") or items that emit or are affected by electromagnetic noise.

4.6.3 Temporary equipment identification markings

a) A sign shall be placed on the outside, preferably on the container door, with the following information: Maximum gross weight; payload; tare mass; supplier or manufacturer; container description or equipment type (in accordance with the table in 4.1.2, e.g. "Workshop for cold work"); month and year built; manufacturer's serial number; and certificate number.
b) Markings, preferably in paint, shall be provided externally on the sides and roof with the following information: Maximum gross weight; tare weight; and container identification number.
c) The height of letters and digits on the sides shall be a minimum of 75 mm, and on the roof a minimum of 300 mm.
d) To make the container more visible it should be marked at the corner posts and edges around the top of the frame with stripes. Stripe width shall be 50 mm with 45-degree angle of alternate orange or red and yellow reflective paint.
e) Marking of lifting equipment shall comply with DNV 2.7.1 or other harmonised standard and in accordance the "Machinery regulations".

4.6.4 Special signs and marking

Emergency exits
Emergency exits shall be marked with signs both inside and outside as follows: "NØDUTGANG - EMERGENCY EXIT", "MÅ IKKE TILDEKKES - DO NOT BLOCK" (in both Norwegian and English).
Indoor emergency exit signs shall be luminescent.

Pressurised containers
If the container is pressurised, the following signs shall be placed both on the inside and outside of the door:
"ADVARSEL – TRYKKOVERVÅKET ROM – HOLD DØREN LUKKET"
(WARNING – PRESSURISED ROOM - KEEP DOOR CLOSED).

Identification marking of electrical equipment
To the extent that electrical equipment is tagged, this should be carried out in accordance with NORSOK Z-010, Clause 13.
High voltage equipment and components shall be tagged in accordance with NS 4210.

Marking of interface for hook-up to installation
All hook-up points on the temporary equipment shall have special markings (see 4.7). The markings shall state all the rated values for the system that is to be hooked up to.

Fire-fighting equipment
Supplier shall mark portable fire extinguishers with type and size.

4.7 Hook-up interface

Different interfaces
To ensure correct and suitable connections to the container, the requisitioner shall specify all relevant interfaces between the temporary equipment and the installation. These interfaces may include

- hook-up of electric power supply,
- hook-up of telephones and loud speaker systems,
- hook-up of signal to and from control room, see 4.4.4,
- hook-up of air,
- hook-up of nitrogen,
- hook-up of steam,
- hook-up of hydraulics,

- hook-up of water,
- hook-up of drains,
- other hook-up (diesel, etc.)

The specification of interface shall be sufficiently detailed and unambiguous so that the equipment can be safely and correctly hooked up to the permanent utilities on the installation. Since hook-up possibilities on the installations are not standardised, the company should record irregularities encountered on the data sheet in Annex B.

Cable for hook-up to installation
For power supply to the equipment, a sturdy, rubber-insulated cable type NMHVO (H07RN-F), at least 35 m long, with a temperature rating of 85 °C (or other cable with equal or better properties), shall accompany the equipment. The same also applies for hook-up of telephones, PA systems, signals to/from main control room, etc., if installed. All cable penetrations shall have the same fire classification and approval as the walls. Exposed cables shall have additional protection to avoid damage.

4.8 Documentation

4.8.1 Documentation onshore

The temporary equipment supplier shall establish and maintain a file of documentation to verify that the temporary equipment has been designed, tested, certified and maintained in accordance with this NORSOK standard. This documentation shall be available for review upon request.

The supplier’s documentation can include the documents described below.

Structure

- Valid certificate for offshore container and lifting gear.
- Documentation that complies with DNV 2.7.1 or other harmonised standard and with the "Machinery regulations".

Electrical, instrumentation, mechanical:

- Location, arrangement and specification of hook-up connections.
- Single line diagrams (voltage levels, power consumption, function description).
- Control and connection schematics.
- Layout drawings showing location of equipment in panels and container.
- Technical data for electrical components such as motors, circuit breakers (current/time curves) etc.
- Manufacturer, type, model, measurement range and recommended settings for all protective systems.
- Certificates for all certified equipment, including Ex-approved equipment.
- Schematic of intrinsically safe equipment showing intrinsically safe equipment and other connections in hazardous and non-hazardous areas, with associated cabling.
- Schematic for instrument and utility air systems with requirements for pressure and air volume, and any purity requirements for instrument air (oil, water, dust content etc).
- Layout drawings for ventilation systems with details of area classification, pressure over/below atmospheric pressure, dampers, air volumes, fans, etc.
- All necessary data for main components with part numbers.
- Test certificates.
- Trouble-shooting documents.
- Nozzle selection tables (high pressure cleaning equipment).
- Layout drawings showing location of all equipment.
- Start-up procedures (diesel engines, compressors, etc).
- Emergency stop procedures.
- User manuals and other documents necessary to install, operate and maintain the equipment.
- Maintenance programme and maintenance intervals.
- Maintenance journal showing maintenance carried out (history) on all equipment requiring periodic maintenance. In general all maintenance over the past 2 years shall be included. Refer to Annex I for further details.

Health and environment

- Noise data for noise sources.
- Product data sheets for substances used in equipment systems and which represent an environmental, toxic, or health hazard.
- Analyses in accordance with section 17 of the "Management regulations".

4.8.2 Documentation that shall accompany the equipment

The documentation that shall accompany the equipment shall be attached to the container or equipment, in a safe place, which is easy to locate (such as a dedicated marked cabinet designed for offshore climate). The documentation shall be sufficient to ensure safe transport, lifting, installation, hook-up, operation, maintenance etc, and will therefore cover several of the points mentioned in 4.8.1.

The following documents shall always accompany the equipment:

- Overview of all available documentation for the equipment.
- Declaration of conformity and data sheets for the container and equipment, see Annex G and Annex H.
- Document that describes all the hook-up connections, including test documentation that confirms that the equipment is suitable for the installation's interface, see 4.7.
- User manuals and other documentation that is necessary for installing, operating and maintaining the equipment.
- Certificate for equipment with special requirements [e.g. EEx … x (i.e. Ex-certificates with special conditions), PSV, etc.].
- Maintenance programme with maintenance intervals.
- Maintenance journal showing maintenance carried out (history) on all equipment requiring periodic maintenance.
- Procedure for manual shutdown of critical equipment with level "c" emergency shutdown as described in 4.4.3.
- List of deviations from requirements in this NORSOK standard and other relevant requirements. Deviations shall be approved in advance by the responsible person in the company.

4.8.3 Requirements to prior approval of responsible person in the company

In the following circumstances the responsible person in the company (see 3.1.10) shall have given his approval in connection with the requisition, prior to shipment:

- Use of diesel engine in connection with critical activities, without automatic shutdown from the installation's systems, see 4.3.1.3.
- Use of manned diesel engine unit with protective devices that give an alarm instead of automatic stop, see 4.3.1.2.
- Use of diesel engine that is not approved for use in hazardous areas, see 4.3.1.4.
- Use of diesel engine without gas detector in combustion air inlet, see 4.3.1.5.
- Use of steam generator with diesel burner, see 4.3.5.
- Use of other critical equipment where emergency shutdown level "c" in 4.4.3 applies.
- Use of non Ex-proof battery system, see 4.4.6.4.
- Use of containers with ignition sources without mechanical ventilation and gas detector, or other skid mounted equipment that is not approved for use in hazardous areas, see 4.5.1.
- Use of container or equipment that does not comply with the requirements in this NORSOK standard or other relevant requirements.

On the checklist that is submitted to the coastal base before shipment, the supplier shall, in all cases, add the name of the person in the company who has given approval, the telephone number of this person and the date the approval was received.

Annex A
(Normative and informative)
Administrative guidelines

A.1 Introduction

This annex provides a description of typical administrative routines for dealing with temporary equipment. The scope and content of the administrative routines shall comply with the routines and procedures that apply to the requisitioner's organisation.

Below is a flow chart, which illustrates a typical and recommended process, from the requisitioner's order to the return arrival at the hire company.

Reference A.2.1 Requisitioner	A.2.2 Contract dept.	A.2.3 Base	A.2.4 Organisation on the installation	A.2.5 Supplier
Functional/technical operational requ. Arrival date Rental period Responsibilities Hook-up interface				
	Enquiry			
				Check requ. if deviation: - upgrading - non-conformance Tender
	Issue order. Contractual liability for maintenance etc.			
				Carry out necessary maintenance. Check documentation. Send approved equipment to customer.
		Together with discipline depts: -control equipment -control doc. Transport to install.		
			Before use:	
			Update overview of temp. equipment. Correct location on board. Receiving control of equipment. Check documentation. Hook-up and testing.	
			Operating phase:	
			Maintenance in accordance with contract Update maint. log Evaluate permanent installation.	
			End of rental period:	
			Disconnect. Update overview of temp. equipment. Transport to land.	
		Return to hire comp.		
				Receiving control Repairs/improvem.

A.2 Flow chart explanation

A.2.1 Order

At the same time as the temporary equipment is ordered, the requisitioner shall

a) specify relevant technical requirements, including requirements relating to Ex-proof rating for equipment (zone 1 or zone 2) or non-hazardous area,
b) specify functional and operational requirements,
c) state location for the equipment on board, hazardous or non-hazardous area,
d) state required date and expected duration,
e) specify interfaces for hook-up to the installation's permanent systems (electric power, telecommunications, instrumentation, compressed air, air connections, water etc.),
f) state the department(s) that are responsible for the equipment, including responsibility for spare parts and maintenance,
g) state requirements for personnel assistance from rental company for operating the equipment on the installation,
h) assess climate conditions.

A.2.2 Contract department

The contract department shall

a) control that the requisition is filled out completely,
b) send out enquiries and receive tenders from suppliers,
c) coordinate tender evaluation with the requisitioner and/or technical discipline department and supplier
d) be responsible for stipulating in the contract
   - responsibility for maintenance,
   - responsibility for supply of spare parts,
   - responsibility for operating the equipment (if supplier),
   - guarantee liability,
   - any non-conformance handling.

A.2.3 Control at coastal base or port before transport to offshore installation

a) Equipment can be controlled either at the supplier or at the coastal base/port. The control shall include documentation and equipment, and shall be carried out before shipping in order to prevent the need for repairs or improvements offshore.
   For documentation review, see 4.8.2.
   Verification of equipment should include
   - visual inspection,
   - control of equipment against specifications,
   - control in accordance with any checklists that accompany the equipment,
   - control of interfaces for hook-up to installation systems, see 4.7.

   The control results are documented on the checklist from the supplier (see 4.1.1 and Annex C) and filed.
b) Notification of approved equipment is to be sent to the requisitioner and supplier.
c) Freight note issued, equipment packed and prepared for transport to the offshore installation.

A.2.4 User

Prior to use offshore, it is recommended to check that

a) equipment is placed correctly and the location is controlled in respect of the installation's area classification (see also NORSOK S-001, 6.4) and escape routes. Open doors shall not block escape routes. Emergency exits in units shall be taken into account when positioning the unit,
b) the installation's overview of temporary equipment is updated,
c) equipment received is visually inspected for any damage during transport,
d) the documentation received is checked against the order,
e) the condition of the equipment received is checked against the specifications in the order,
f) all interfaces for equipment hook-up are located and checked. Hook-up should be carried out and tested before the equipment is used.

During operation

a) the equipment shall be maintained as described in the maintenance programme,
b) the maintenance log shall be kept up to date, e.g. following service and repairs,
c) the operator should after one-year's use consider upgrading the hook-up of the temporary equipment to the permanent installation, such as replacing rubber cable with approved installation cable. The equipment can still be treated as temporary equipment.

At the end of the rental period and return to land

a) the equipment is disconnected and made ready for transport to land. A transport manifest shall accompany the equipment back to the rental company,
b) notification of the end of the hire and return to base shall be sent to the requisitioner and supplier,
c) the overview of temporary equipment on the installation shall be updated,
d) an experience report to assess the suitability of the equipment shall be prepared and copied to the user's and the supplier's onshore support departments.

A.2.5 Supplier

General
The supplier shall carry out conformance measurements of all its rental units (for use offshore) and keep data sheets for all the units updated, see Annex G and Annex H.

Prior to the delivery, the following shall be carried out:

a) Upon receipt of the enquiry and prior to preparing a tender, the supplier shall verify that the equipment conforms to the customer's requirements. For equipment or parts of equipment that do not satisfy the requirements, the supplier should consider and implement measures to satisfy the customer's requirements. Such measures can include alterations or replacements. Alternatively, a deviation request from the customer's requirements can be submitted to the customer. Non-conformances relating to statutory requirements e.g. regulations are not normally acceptable.
b) The supplier shall check that the requirements to technical documentation are fulfilled, see 4.8.2.
c) Certification requirements shall be fulfilled. This includes lifting gear, Ex-approved electrical equipment and other certification requirements (pressure bottles etc.).
d) The supplier's tender shall include detailed information about the equipment, the supplier's guarantee liabilities including maintenance responsibility and spare parts following the delivery.
e) The supplier shall carry out the necessary maintenance, see Annex I. Maintenance programmes and maintenance journal shall accompany the equipment, see 4.8.2.
f) Prior to the delivery, the supplier shall carry out a thorough inspection of the equipment. The inspection shall be documented on the checklist (see Annex C), which shall be submitted to the contact person in the company (normally at the coastal base).
g) For qualification requirements to electricians, see Annex E.

When received after use

a) the supplier inspects the returned equipment for any damage and defects,
b) the supplier reviews the experience report and condition report from the user of the equipment in order to carry out any improvements to the relevant equipment or improve the design of new equipment.

Annex B
(Normative)
Z-015 Data Sheet for installation

Data sheets for installations are only available in English.

ELECTRICAL

Power	Volt	Freq.	Phase curr.	Neut. loaded	System earth	Short circuit level		Distribution protection		Connection platform	Connection temp. equip.	Area
*	[V]	[Hz]	[A]	Yes/No	[S/I/R] **	min [kA]	max [kA]	Fuse [A]	Earth fault [mA]	Description/ Type	Description/ Type	Module No. /Room No.
Rows can be added to the table as necessary												

*	**	
Main - Main Power	S = Solidly (direct earth)	
Emg - Emergency Power	I = Isolated (isolated)	
Ess - Essential Power	R = Resistor (resistance earth)	
UPS - UPS Power		

INSTRUMENT

Function	**Signal type**	**Connection platform**	**Connection temp. equip.**	**Area**
		Description/Type	Description/Type	Module No./Room No.
Loss of pressure				
Fire				
Gas				
Other				
ESD battery systems				

TELECOM

Function	Signal type	Connection platform	Connection temp. equipment	Area
		Description/Type	Description/Type	Module No./Room No.
PA				
Telephone				
Other (insert)				

UTILITIES

Function	Pressure	Amount/flow	Connection			Area
	(bar)	Max. capac.	Type	Diameter	Material	Module No./Room No.
Plant air						
Instr. air						
Sprinkler						
Seawater						
Freshwater						
Drain						
Other						

LIFTING CAPACITY OFFSHORE CRANES

Crane	1 m significant wave heightmax. load/max. radius	2 m significant wave height max. load/max. radius	3 m significant wave height max. load/max. radius
Rows can be added to the table as necessary			

Rev:_____

Date:_____

Annex C
(Normative)
Checklist matrixes

See explanation of checklists in 4.1.1.

Control items	Checklist matrixes	Containers																Equip.								
	Type of container and equipment	Z-015	(A) Accommodation container	(B) Office, coffee bar, lab, ROV, well service, etc.	(C) Workshop for hot work	(D) Compactor and waste storage	(E) Workshop for cold work	(G) Container for diesel enginer	(I) Stores for flammable materials	(J) Stores for non-flammable materials	(L) Painters' workshop	(M) Refrigeration and freezing containers	(N) Radio and communications room	(O) Toilet container	(P) Electrical equipment container	(Y) Non-Ex-proof equipment container	(Z) Ex-proof equipment container	U01 Diesel engines	U02 Air compressors	U03 Tanks	U04 High pressure cleaning equipment	U05 Steam generator	U06 Mobile crane	U07 Well equip., wireline, logging, coiltubing	U98 Non-Ex-proof equipment on skid	U99 Ex-proof equipment on skid
	Shall not be placed in hazardous area		X			X					X	X	X												X	
	1. MECHANICAL																									
1.1.	Signs tagging/labelling	4.6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1.2	Annual control (lifting equipment, cert.)	4.4.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1.3	Mech. cond. (lifting eyes/points, structure)	4.4.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1.4	Fire classification	4.4.1	X	X	X		X		X		X	X	X	X	X	X	X									
1.5	Air lock	4.4.1		X	X										X	X										
1.6	Self-closing doors	4.4.1	X	X	X		X	X	X	X	X	X	X	X	X	X	X									
1.7	Emergency exits	4.4.1	X	X	X		X				X		X	X												
1.8	Mechanical ventilation	4.4.7	X	X	X		X	X			X		X	X	X	X							X			
1.9	Noise	4.4.8	X	X		X		X										X	X		X		X	X		
	2. FIRE, GAS AND SAFETY																									
2.1	Gas detector in air inlet	4.4.3	X	X	X		X	X			X		X	X	X	X		X	X		X	X	X	X		
2.2	Fire/smoke detector	4.4.2	X	X	X		X	X	X		X		X		X	X	X	X	X		X	X	X	X		
2.3	Fire hose	4.2.1	X																							
2.4	Portable fire extinguisher	4.4.2	X	X	X		X	X	X		X		X	X	X	X	X	X	X		X	X	X	X		
2.5	Fire damper	4.2.1	X																							
2.6	Alarm and shutdown if loss of pressurisation/ventilation	4.4.7	X	X	X		X	X			X		X	X	X	X										
2.7	Room fire extinguishing system	4.4.2	X					X										X	X			X	X	X		
	3. ELECTRICAL																									
3.1	Cables, nipples, equipment etc.	4.4.6.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.2	Insulation resistance - megging	4.8.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.3	Earthing (NB bonding of structure)	4.4.6.3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.4	All external installation Ex-proof	4.4.6.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.5	All internal installation Ex-proof	4.4.6.2					X	X	X	X	X	X	X	X	X	X	X						X	X		X
3.6	Emergency lighting	4.4.6.2	X	X	X		X	X			X		X	X	X								X	X		
	4. HOOK-UP TO INSTALLATION																									
4.1	Power supply (voltage, freq., plugs)	4.7	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4.2	Telephone with plug	4.7	X	X									X	X	X								X			
4.3	PA with plug	4.7	X	X	X		X				X		X	X	X								X	X		
4.4	Alarm signal to control room with plug	4.7	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
4.5	Shutdown (ESD) from CCR (for battery system etc.)	4.4.3 4.4.6.4	X	X	X			X					X		X			X					X	X		

Control items	Checklist matrixes Type of container and equipment		Containers																Equip.								
		Z-015	Accommodation container (A)	Office, coffee bar, lab, ROV, well service, etc. (B)	Workshop for hot work (C)	Compactor and waste storage (D)	Workshop for cold work (E)	Container for diesel enginer (G)	Stores for flammable materials (I)	Stores for non-flammable materials (J)	Painters' workshop (L)	Refrigeration and freezing containers (M)	Radio and communications room (N)	Toilet container (O)	Electrical equipment container (P)	Non-Ex-proof equipment container (Y)	Ex-proof equipment container (Z)	Diesel engines U01	Air compressors U02	Tanks U03	High pressure cleaning equipment U04	Steam generator U05	Mobile crane U06	Well equip., wireline, logging, coiltubing U07	Non-Ex-proof equipment on skid U98	Ex-proof equipment on skid U99
	5. EQUIPMENT																										
5.1	Manual emergency stop	4.4.8				X		X										X	X		X	X	X	X		
5.2	Manual shutdown of diesel supply	4.3.1						X										X	X		X	X	X	X		
5.3	Drip trays	4.3.1						X										X	X		X	X	X	X		
5.4	"Rig saver" in combustion air inlet	4.3.1						X										X	X		X	X	X	X		
5.5	Shutdown if loss of oil pressure	4.3.1						X										X	X		X		X	X		
5.6	Shutdown if high cooling water temperature	4.3.1						X										X	X		X	X	X	X		
5.7	Shutdown if overspeed	4.3.1						X										X	X		X		X	X		
5.8	Diesel engine approved for zone 2	4.3.1						X										X	X		X		X	X		
5.9	Gas detector in combustion air inlet	4.3.1						X										X	X		X	X	X	X		
5.10	Flame arrester in exhaust pipe	4.3.1						X										X	X		X	X	X	X		
5.11	Spark arrester in exhaust pipe	4.3.1						X										X	X		X	X	X	X		
5.12	Safety valve	4.3.5																	X	X	X	X				
5.13	Flame guard	4.3.5																				X				
5.14	Low water level alarm	4.3.5																				X				
5.15	Control of limit switches	4.3.6																					X	X		
	6. DOCUMENTATION																										
6.1	Lifting certificate	4.8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6.2	Other technical doc. (drawings, data.)	4.8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6.3	Certificate for equip. with special requ.	4.8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6.4	Maintenance programme	4.8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6.5	Maintenance journal	4.8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6.6	User manual	4.8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Example of checklist structure for type "X" container

Type "X" – Container	
Container ID number:	Approved for location in zone: Zone 1 □, Zone 2 □, Non-hazardous area □
Supplier:	Contact person supplier/telephone:
Company/installation container intended for:	Contact person/requisitioner in the company:

Person in the company responsible for prior approval, see 4.8.3:		
Name:	Telephone:	Date approval received:

	Status: OK=Approved, NA=Not Applicable, NC=Not Checked, D=Defective or missing	Ref. Z-015	Status supplier	Receiving control (company)	Remarks
	1-MECHANICAL				
1.1	Signs and tagging/labelling	4.6			
1.2	Annual control (lifting equipment, certificate) **supplier shall enter last control date**	4.4.1			
	…..				
	2-FIRE, GAS AND SAFETY				
	…..				
	3-ELECTRICAL				
3.1	Cables, nipples, equipment etc.	4.4.6			
	…..				
	4-HOOK-UP (INTERFACE) WITH INSTALLATION				
4.1	Power supply (voltage, frequency and plugs)	4.7			
	…..				
	6-DOCUMENTATION				
6.1	Lifting certificate	4.8			
6.2	Other technical documentation (drawings, data sheets etc.)	4.8			
	…..				

Competent person for lifting gear/mechanical devices		**Supplier electrician**		**Company receiving control**	
Date:	_____ Signature _____ Name in capitals	Date:	_____ Signature _____ Name in capitals	Date:	_____ Signature _____ Name in capitals

Annex D
(Informative)
Equipment not registered as temporary equipment

D.1 Distribution boards

Equipment description
Temporary electrical power distribution and mobile socket units which are used in connection with major modifications, inspections, turnarounds or similar.

Equipment requirements

a) Temporary distribution panels shall normally be equipped with a socket unit for outgoing circuits.
b) In general, temporary distribution boards or socket units shall be connected to circuit in the distribution panel on the installation which has ignition source control shutdown at the lowest level.
c) The connections between the permanent installation (e.g. platform) and temporary installation shall normally be a plug and socket.
d) Temporary distribution panels or socket units intended for outside use (including in naturally ventilated areas) or in classified areas, shall be Ex-approved.
e) All outlets in temporary distribution panels shall be fitted with earth fault protection with trip current 30 mA.

D.2 Hand tools

Hand tools shall fulfil the requirements in the "Machinery regulations" and relevant standards, e.g. EN 792.

Electrical equipment, hand tools, requirements and checklist

a) All portable lamps, temporary lighting, electrical hand tools, extension cables and adaptors that belong to the supplier shall be labelled with the owner's name, year and month of last inspection.
b) Extension cables shall be made of oil-resistant material.
c) Temporary lighting, portable lamps and extension cables for use outside (including in naturally ventilated areas) or in hazardous areas shall be Ex-proof.
d) Use of non-Ex-proof tools is restricted to non-hazardous areas. In zone 2 areas, non-Ex-proof tools can be used (class B hot work, see 3.1.6) if necessary measures are taken (check the company's procedures).
e) At the workplace a short adapter can be used (maximum 1 m), consisting of Ex-approved plug and non Ex-proof socket (industrial type), where non-Ex proof electrical tools can be connected.
f) When using temporary electrical equipment, protection from electric shock in normal use and in the event of fault, shall be assessed. Factors that can influence the choice of safety measure can be air humidity, contact with earth potential and the possibility of evacuation. Solutions that may be relevant include rapid automatic disconnection (earth fault protection) or protection through the use of extra low voltage for safety.
g) The tool shall normally be connected to the socket that has ignition source shutdown at the lowest level.

Pneumatic tools, requirements and checklist

a) The correct hose shall be used in terms of type, dimension and pressure rating.
b) The inlet air pressure to the tool shall not exceed 7 bar. If the tool has a lower pressure specification, this pressure shall not be exceeded.
c) Approved hose connectors and hose clamps shall be used (U-bolts are not allowed).
d) Crow's foot connections shall be secured with safety pins.
e) If the air hose to the tool is made up of several lengths, each connection shall also be secured with "Chinese fingers" wire or similar.

It is important to be aware that pneumatic tools are not normally insulated against electric shock.

Annex E
(Normative)
Qualification requirements to supplier personnel who operate, maintain and repair electrical equipment

The following requirements apply:

a) The supplier or user of the equipment is obliged to ensure that requirements to qualifications are in accordance with FKE.

b) For work in and operation of low voltage installations and low voltage equipment, FSL applies.
For work in and operation of high voltage installations and high voltage equipment, FSH applies.

c) The supplier or user of the equipment shall have a qualified electrical contractor (high voltage or low voltage, depending on the installation and equipment) in his company, or agreement with an external qualified electrical contractor for the installation and maintenance of the electrical equipment.
For containers or equipment that do not include high voltage equipment, the supplier's electrician can carry out this work.

d) For personnel who carry out installation and maintenance of the equipment, specific reference is made to FKE, §13 or §14 (additional competence relating to the particular systems.)

Also required:
- valid training in accordance with FSL and FSH (if high voltage equipment) – (requirement to annual renewal),
- training in the design of the equipment, in particular hazard factors, functions and maintenance,
- training in the maintenance of Ex-proof equipment where applicable.

e) ROV with voltage level > 1000 VAC
- In connection with work on and operation of such equipment, FSH shall apply.
- Procedures shall be available for work on, and operation of, the equipment.
- Personnel who carry out installation and maintenance of the equipment shall have a basic electrician's education and documented training for the equipment and safety procedures.

f) Skills requirements for personnel without an electrician's education and who shall operate the equipment and be present in rooms with electrical equipment having operating voltage over 500 V and with an enclosure rating lower than IP 4X.

The training shall include
- hazards relating to electricity,
- examples of injuries following accidents with electrical systems,
- IP enclosure rating in terms of human protection,
- how to respond in the event of short-circuiting or fire,
- responsibilities relating to operation and maintenance of the system,
- procedures for accompanying unqualified personnel in the room.

g) Documentation of the individual person's qualifications or training shall be made available to the electrical supervisor for the electrical systems on the installation.
Electrical supervisor for the electrical systems on the installation shall ensure that the supplier's personnel satisfy the qualification requirements.

Annex F
(Normative)
Mono cable

F.1 Safety measures in connection with the use of mono cable with shut-in well

These measures are intended to provide users with guidelines when hooking-up well intervention equipment which requires electrical power cable and where one of the cable's conductors is the uninsulated wire layer that encircles the insulated conductor(s).

The measures are based on experiences from previous operations and the SINTEF report no. TR A4596 and SINTEF report no. TR F4975.

Typical activities in which these measures shall be implemented are the use of well tractor or "Patch Flex".

F.2 Current and voltage limits

The technical surveys performed by SINTEF were aimed at assessing and establishing limits for current and voltage in combination with other safety measures, there shall be no danger to personnel (electric shock), or ignition of any gas mixtures in the area.

The following current and voltage limits are fixed:

Alternating current (AC) = 1000 V and 10 A
Direct current (DC) = 1500 V and 25 A

F.3 Earthing and equipotential contacts

Earthing and equipotential contacts shall ensure the prevention of hazardous voltages and/or currents that can represent ignition sources for any gas mixtures, or represent an electric shock hazard for personnel.

Measurement results and calculations in the SINTEF reports no. TR A4596 and TR F4975 show that by carrying out earthing or equipotential connections as described in this NORSOK standard, currents and voltages between the circuit and well equipment or structure in the area will be lower than the values set for explosion-proof equipment rated Exi (intrinsically safe).

Most of the current travels through the structure of the installation, a small part flows into the grease head/flow tubes and returns to the current source via the earth cable from the well to the slipring/winch, while only a minor part returns to the current source via the cable's armouring. The sum of these currents is the total; based on the measurements carried out, no undefined current paths have been identified.

F.4 Non-conformances to regulations or standards, and compensating measures

1 Regulations - Standard FEA-M § 1811.2 The sheet of multi-core cables is normally to have an outer external protective sheet of non-metallic material. NEK IEC 61892-7, 7.4.1a) All cables in hazardous areas shall be sheathed by at least one of the following: a) a non-metallic impervious sheath in combination with braiding or other metal covering for earth faults detection and mechanical protection.		
Remarks The requirements shall be read in the context of these applications and are related to induced voltages in the armouring or screen where a voltage potential between the armouring and the well's structure potential can occur.	**Potential risk** That the transition resistance causes dangerous voltage potential. Measurements show that maximum driving current is 240 mV and that the current travels along defined current paths. Ignition source potential is therefore not likely. There is no shock hazard (maximum 240 mV).	**Compensating measures** Equal potential connections as shown in diagram 1 and diagram 2. In order to take into account the fact that the installation or equipment is non-Ex-proof, work permits are used for ignition source class B.
2 Regulations - Standard FEA-M 1301.2. Return wire via steel structure or hull is not allowed. NEK IEC 61892-7, 5.7.2.1. If a power system with earthed neutral point is used, the type TN-S system, with separate neutral (N) and protective conductor (PE) throughout the system shall be used. The neutral and the protective conductor shall not be connected together, or combined in a single conductor, in hazardous area.		
Remarks The requirement shall ensure clearly defined current paths. The current paths are defined and documented through the tests SINTEF has carried out.	**Potential risk** That the transition resistor causes dangerous voltage potential.	**Compensating measures** Safety measures as described in pt. 1 (FEA-M § 1811.2)
3 Regulations - Standard FEA-M § 1801.1 Cables are to be of manufacture and type approved for installation on board ships and mobile units. NEK IEC 61892-4, (see IEC 60092-350/NEK 410) Cables and wires shall be from an approved manufacturer and of approved type for application on mobile and stationary offshore installations.		
Remarks The requirements shall ensure the minimum quality of cables. Documentation for mono cables is considered satisfactory.	**Potential risk** None.	**Compensating measures** Compensating measures are not considered necessary.
4 Regulations - Standard FEA-M § 1801.2 Cables for permanent installation are usually approved on the basis of current specifications for cables on board ships given by the IEC.		
Remarks Shall ensure the minimum quality of cables. There is no IEC standard for such special cables. The cable is considered satisfactory for its special application.	**Potential risk** None.	**Compensating measures** Compensating measures are not considered necessary.
5 Regulations - Standard		

FEA-M § 1805 Conductors are to be of copper. NEK IEC 61892-4 (se IEC 60092-350 /NEK 410) Conductors shall be made of non-alloyed or metallized tempered copper.		
Remarks Shall ensure environmental durability and conductibility. These are controlled operations and the intention of the regulations is considered addressed.	**Potential risk** This cable uses steel wire armouring as return wire.	**Compensating measures** Compensating measures are not considered necessary.
6 Regulations - Standard FEA-M § 1831.5 The minimum cross section permitted is 1,5 mm^2.....		
Remarks Shall ensure conductibility and mechanical strength for wires in cables. Conductibility is satisfactorily documented within the given current limits and the cable's mechanical strength satisfies static and dynamic applications.	**Potential risk** Overheating and mechanical failure.	**Compensating measures** Compensating measures are not considered necessary.
7 Regulations - Standard FEA-M § 1812 The manufactures type designation, size and rated voltage is to be marked on the outer protective sheath of the cable. NEK IEC 61892-4 (se IEC 60092-350/NEK 410) It shall be possible to identify cables in respect of their origin (manufacturer) and their rated voltage.		
Remarks The requirement shall ensure that cables can be identified and documented. The mono cable is documented and mix-ups or doubt about specification is unlikely.	**Potential risk** None.	**Compensating measures** Compensating measures are not considered necessary.
8 Regulations - Standard FEA-M § 3105 Allowable distribution systems (in general, the hull shall not serve as return conductor).		
Remarks Reference is made to NEK IEC 61892-7, 5.7.2.1, above. The intention is to prevent undefined current paths and consequent ignition sources. The current paths are defined and documented through the tests SINTEF has carried out.	**Potential risk** That the transition resistance causes dangerous voltage/ignition source potential.	**Compensating measures** Safety measures as described in pt. 1 (FEA-M § 1811.2)

F.5 Measures to be taken at the installation work area

The following measures shall be implemented at the installation work area:

1) The equipment shall be controlled in accordance with the standard procedure for temporary equipment.

2) Work permit for class B hot work is obligatory when voltage is applied.

3) Check the operator's professional qualifications. If the operator does not have the minimum qualifications (group L), all electrical work shall be performed by, or under the supervision of, a qualified electrician.

4) Check that the surge protection is set at the correct value (maximum 1000 VAC or 1500 VDC). This is controlled through measuring voltage at the maximum setting of the voltage limiter. Surge protection shall be adjusted if necessary.

5) Check that the overload protection is set correctly (maximum 10A AC or 25A DC).

6) Check that the short-circuit protection is set in accordance with the circuit's maximum resistance (the length of the cable shall be included in the calculation).

7) Check that the well equipment is adequately earthed during testing on deck.

8) Check that the system is earthed in the following manner:

a) 70 mm^2 earth cable from the earth bus bar on the winch and to the deck or structure.
Cable terminal connection to the earth bus bar on the winch and to the structure shall be used.
It is recommended to use existing hook-up arrangements to the structure or possibly drill an appropriate bolthole in a support or similar, where this is allowable.

b) 16 mm^2 earth cable between the earth terminal on the winch and the slipring unit (cable shoe connections).

c) 70 mm^2 earth connection between the power supply's earth bus bar and grease head/flow tube.

With distances exceeding 50 m, the cross-section shall be increased. Two 70mm^2 cables can, for example, run in parallel. The power supply's earth bus bar can either be in or on the control container or on the winch, depending on the composition of the system (see figure F.1 and figure F.2).

For coiled tubing, earthing is considered to be ensured by the slipring and winch substructure connection to the main earth bus bar and the platform's structure. An earth cable is therefore not necessary up to the point where the tubing enters the well.

9) Check that the power supply to the well equipment is disconnected and shortcircuited while running in and pulling out of the well.

10) The equipment shall be connected to a power outlet with defined ESD function.

Checklist when using mono cable
The responsible electrician on the installation should ensure that the guidelines and measures described above are followed.

Suggested checklist:

Item	Description	Result
1	Check that the equipment is entered into the installation's temporary equipment journal	
2	Check work permit	
3	Check that the person who is to carry out the electrical hook-up is qualified to work on low-voltage electrical systems	
4	Check that the surge protection is set at the correct value	
5	Check that the overload protection is set correctly	
6	Check that the short-circuit protection is set in accordance with the circuit's maximum resistance	
7	Check that the well equipment is adequately earthed during testing on deck	
8	Check that the system is earthed in accordance with the description and Figure F.1 and Figure F.2	
9	Check that the power supply to the well equipment is disconnected and shorted while running in and pulling out of the well	
10	Check that the equipment is connected to a power outlet with defined ESD function	

Figures:
Figure F.1 and Figure F.2 show different methods of system earthing and definition of main earth bar.

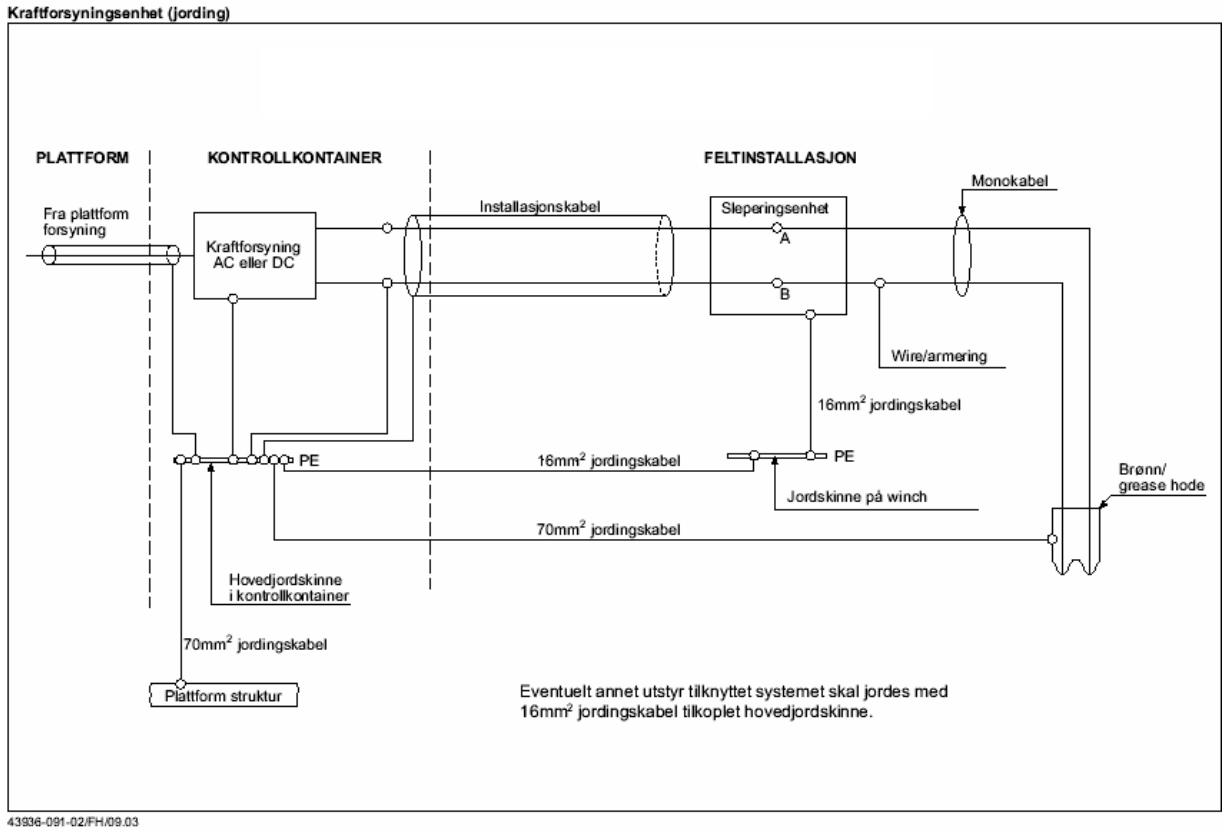

Figure F.1 – Power supply unit is earthed in control container

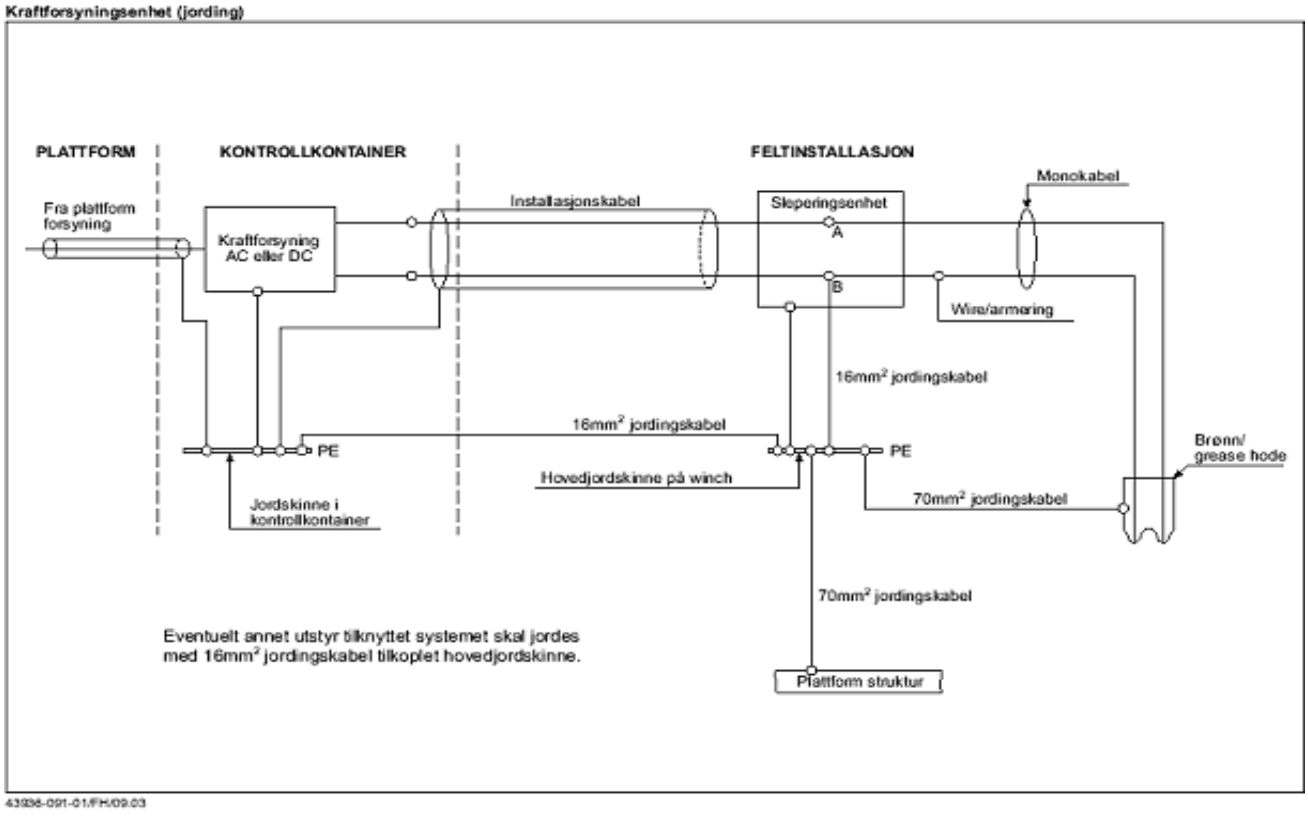

Figure F.2 – Power supply is earthed in slipring unit

Text on Figure F.1 – Power supply unit is earthed in the control container

Kraftforsyningsenhet (jording)	**Power supply unit (earthing)**
Plattform	Platform
Kontrollkontainer	Control container
Installasjonskabel	Installation cable
Feltinstallasjon	Field installation
Fra plattform forsyning	From platform supply
Kraftforsyning AC eller DC	AC or DC power supply
Hovedjordskinne i kontrollkontainer	Main earth bus bar in control container
70 mm^2 jordingskabel	70 mm^2 earth cable
Plattform struktur	Platform structure
16 mm^2 jordingskabel	16 mm^2 earth cable
70 mm^2 jordingskabel	70 mm^2 earth cable
Sleperingsenhet	Slipring unit
Monokabel	Mono cable
Wire/armering	Wire/armour
16 mm^2 jordingskabel	16 mm^2 earth cable
Jordskinne på winch	Winch earth bar
Brønn/grease hode	Well/grease head
Eventuelt annet utstyr tilknyttet systemet skal jordes med 16 mm^2 jordingskabel tilkoplet hovedjordskinne.	Any other equipment connected to the system shall be earthed using 16 mm^2 earth cable connected to the main earth bar.

Text on Figure F.2 – Power supply is earthed in the slipring unit

Kraftforsyningsenhet	**Power supply unit**
Plattform	Platform
Kontrollkontainer	Control container
Installasjonskabel	Installation cable
Feltinstallasjon	Field installation
Fra plattform forsyning	From platform supply
Kraftforsyning AC eller DC	AC or DC power supply
Jordskinne i kontrollkontainer	Earth bus bar in control container
70 mm^2 jordingskabel	70 mm^2 earth cable
Plattform struktur	Platform structure
16 mm^2 jordingskabel	16 mm^2 earth cable
70 mm^2 jordingskabel	70 mm^2 earth cable
Sleperingsenhet	Slipring unit
Monokabel	Mono cable
Wire/armering	Wire/armour
16 mm^2 jordingskabel	16 mm^2 earth cable
Hovedjordskinne på winch	Main earth bus bar on winch
Brønn/grease hode	Well/grease head
Eventuelt annet utstyr tilknyttet systemet skal jordes med 16 mm^2 jordingskabel tilkoplet hovedjordskinne.	Any other equipment connected to the system shall be earthed using 16 mm^2 earth cable connected to the main earth bar.

Annex G
(Normative)
Z-015 Declaration of conformity

The supplier shall prepare a "Z-015 DECLARATION OF CONFORMITY". The supplier is free to design his own layout for the document including logo, frame, colours, etc.

Example of document; "Z-015 DECLARATION OF CONFORMITY":

Z-015 DECLARATION OF CONFORMITY			
Supplier	**ID**	**Type**	**Description**

This container/equipment is designed in accordance with NORSOK Z-015,
without non-conformance □, with non-conformance (see list below) □
Date / name / company / position / signature:

This container/equipment is approved for location in Ex-zone:
Zone 1 □, Zone 2 □, Non-hazardous area □,
Date / name / company / position / signature:

This container/equipment is CE tagged, based on the following regulations (EEA directives, enforcement date for when the regulations apply without transition period):

- Simple pressure vessels (07.07.1994) □
- EMC (15.08.1995) □
- ATEX (01.07.2003) □
- TPU (29.11.1999) □
- Machinery regulations (19.08.1994) □

Non-conformance:

No.	Reference requirement doc. (doc. no. and section)	Description of non-conformance	Compensating measures/remarks

Restrictions or special requirements for use of container/equipment:

No.	Area of validity (see NOTE)	Description	Name and date (responsible person)

NOTE - Can for example be installation, company or all.

Annex H
(Normative)
Z-015 Data sheet for temporary equipment

Supplier shall prepare data sheet for the temporary equipment. The data sheet shall contain the elements shown in the tables below, but other information may be added. The supplier is free to design his own layout for the document including logo, frame, colours, etc.

Z-015 DATA SHEET FOR EQUIPMENT/CONTAINER, part 1 (shall always be completed)				
Supplier	**ID**	**Type**	**Description**	
Data sheet: Latest revision, date, name, signature:				
Outer dimensions (l x h x b)	Net weight (N)/ Max. weight (N)	Approved for location in Ex-zone	Year of manufacture	Latest modification
Hook-up to permanent installation				
El. power (maximum), (U, f, In, kW, I_{kmax}): ... V, …Hz, .. A, .. kW, …kA)				
Signal (which, type):				
Telecommunications (phone, PA):				
Manned when hooked-up to installation Permanent □ Periodic □ Normally unmanned □				

DATA SHEET, part 2, equipment data (relevant parts shall be completed)				
Supplier	**ID**		Revision date	
Diesel engine (4.3.1)				
Type, manufacturer	Output capacity	Ignition source emergency shutdown (230 V)	Gas detector	
Ex-rating	Exhaust temp. (maximum)	Surface temp. (maximum)	Combustion air inlet arrangement	Exhaust pipe arrangement
Spark arresters	Flame arresters	Overspeed protection	Air dampers	
Safety functions (stop):				
Start system type	Cooling system type	Diesel day tank (volume)		
Compressor (4.3.2)				
Type, manufacturer	Output capacity (m^3/h, p_{bar})	Safety functions (stop)	Design code	Operating pressure
Type, manufacturer	Output capacity (power)	Ignition source emergency shutdown (230 V)	Gas detector	Monitoring and safety systems
Spark arresters				
Tanks (4.3.3)				
Type, manufacturer	Design code pressure rating	Scope of use/ restrictions	Safety valve last tested	Potential ignition sources
Temperature range				
High pressure cleaning equipment (4.3.4)				
Type, manufacturer	Design code pressure rating	Safety valve last tested	Power supply (electrical/diesel, for diesel, see diesel engine)	Operating temperature range
Ignition source emergency shutdown (Compressor's monitoring and safety devices)				
Diesel burner (4.3.5)				
Type, manufacturer	Output capacity (power)	Ignition source emergency shutdown (230 V)	Gas detector	
Spark arresters	Flame arresters	Flame protection	Choke	
Ex-rating	Exhaust temp. (maximum)	Surface temp. (maximum)	Combustion air duct	Exhaust duct
Safety functions (stop):				
Boiler (4.3.5)				
Type, manufacturer	Output capacity (power)	Safety functions (stop):	Design pressure	Operating pressure
				Safety valve

DATA SHEET, part 3, discipline data (relevant parts shall be completed)				
Supplier	**ID**		Revision date	
Mechanical (4.4.1)				
Lifting devices	Fire classification	Main door (dimensions, inward or outward opening, self-closing mechanism)	Emergency exit (dimensions, inward or outward opening, self-closing mechanism)	
Fire (4.4.2)				
Fire alarm panel (type)	Detectors: Type, number, location	Portable fire extinguishers (number, type, size)	Room fire extinguishing system (description)	
Gas (4.4.3)				
Gas alarm panel (type)	Detectors: Type, number, location	Alarm level (LEL)	Disconnect level (LEL)	Gas type

Electrical systems (4.4.6)					
Battery or UPS requiring special shutdown:					
Electrical equipment, permanently installed consumers:					
Tag	Description	Voltage, Un (V)	Current, In (A)	Power Pn (kW)	Remarks

Ventilation (4.4.7)				
Size of fan motor (W)	Air volume fan (m^3/h)	Air changes (per hour)	Pressurisation (Pa)	Shutdown in event of pressurisation loss (time delayed, local alarm type)

DATA SHEET, part 4, Ex-data (list of Ex-approved equipment)			
Supplier	**ID**		Revision date
Tag no.	Description	Approved zone	Certificate no.

DATA SHEET, part 5 Working Environment Area Chart (WEAC)			
Supplier	**ID**		Revision date
Use form in NORSOK S-002, Annex F. Shall be completed for all permanently manned containers (see data sheet part 1).			

Annex I
(Normative)
Maintenance

A maintenance programme shall be available for temporary equipment (containers and other equipment). All equipment requiring function and condition control shall be described separately in the maintenance programme, e.g.:

- Ex-approved equipment
- Lifting equipment
- Protective devices for electrical equipment
- Fire and gas detectors with associated panels
- Shutdown systems and safety systems
- Electrical equipment and cable isolation tests
- Compressors
- Steam generators
- Drive couplings and belts
- Diesel engines
- Safety valves
- Emergency light fittings

The maintenance programme shall describe the preventive maintenance, with descriptive text and time interval. The programme shall take into account the manufacturer's recommendations, requirements in norms and standards, and the user's or owner's experience.

The supplier shall provide a maintenance journal for documenting the maintenance carried out, see 4.8.2.