D10 Electrical installations

(1979)
(Rev 1 1987)
(Rev 2 1990)

D10.1 General

D10.1.1 The following Requirements apply to electrical equipment essential to the safe operation of the unit. They do not apply to electrical equipment and systems used solely for the drilling operation except in so far as safety is concerned. Attention should, however, be given to any relevant statutory regulation of the National Authority of the country in which the unit is to be registered.

D10.2 Design and construction

D10.2.1 Every unit is to be provided with a main source of electrical power which is to include at least two generators. Electrical propelling machinery and associated equipment together with auxiliary services essential for the safety of the unit are to be constructed and installed in accordance with the relevant requirements of the Rules and as specified herein. The following equipment is regarded as essential:

(i) Ventilation of hazardous areas and those areas maintained at an overpressure to exclude the ingress of dangerous gases.
(ii) Navigation and special purpose lights.
(iii) Lights for all machinery spaces, control stations, alleyways, stairway and exits.
(iv) Fire pumps.
(v) Propulsion equipment.
(vi) Bilge pumps.
(vii) Ballast pumps for column stabilized units.

D10.2.2 The design and installation of other equipment including that used for drilling operations is to be such that there is minimal risk of fire due to its failure. It must, as a minimum, comply with an acceptable specification, standard or code, revised where necessary, for ambient conditions.

D10.2.3 Essential lighting should be supplied from at least two final sub-circuits in such a way that failure of any one of the circuits does not leave the space in darkness. For lighting in hazardous areas or spaces, switches are to be of the two-pole type and wherever practicable located in a non-hazardous area.

D10.3 Cables and types of electrical equipment permitted in hazardous areas

D10.3.1 Electrical equipment in hazardous areas

(a) Zone 0 Areas:
Certified intrinsically safe circuits or equipment and associated wiring.
(b) Zone 1 Areas:
Certified intrinsically safe circuits or equipment and associated wiring.
Certified flameproof (explosion proof) equipment.
Certified increased safety equipment; for increased safety motors due consideration should be given to the protection against overcurrent.
Pressurized enclosure type equipment which is acceptable to the Society.
Through runs of cables.
(c) Zone 2 Areas:
All equipment approved for Zone 1 Areas.
Any equipment of a type which ensures absence of sparks or arcs and of “hot spots” during normal operation and which is acceptable to the Society.

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D10.3.2 Cables in hazardous areas

(a) Zone 0 Areas:
Cables associated with intrinsically safe circuits.
(b) Zone 1 Areas – all cables shall be sheathed as follows:
Nonmetallic impervious sheath plus metal screening or braiding for earth detection.
Copper sheath plus nonmetallic outer sheath for earth detection (for mineral insulated cable only).
(c) Zone 2 Areas – all cables are to be sheathed as follows:
As for Zone 1 areas.
Nonmetallic sheath without metal screening or braiding, provided the cable is adequately protected against mechanical damage.

D10.4 Emergency source of power

D10.4.1 A self-contained emergency source of power is to be installed in a non-hazardous space and should be located on or above the uppermost continuous deck and above the worst damage waterline and inboard of the damage conditions specified in D3.7.3. Its location and arrangement in relation to the main source of electric power is to be such as to ensure that a fire, flooding or other failure in the space containing the main source will not interfere with the supply or distribution of emergency power.

D10.4.2 The power available is to be sufficient to supply for at least 18 hours all services necessary for the safety of all on board in an emergency, particular attention being given to:

(i) Navigation and special purpose lights and warning system.
(ii) Emergency lighting for machinery spaces, control stations, alleyways, stairways and exits.
(iii) General alarm and communications systems.
(iv) Fire and gas detection systems and their alarms.
(v) Fire extinguishing systems.
(vi) Permanently installed diving equipment necessary for the safe conduct of diving operations, if dependent upon the unit's electrical power.
(vii) Abandonment systems dependent on electric power including lighting for embarkation stations.
(viii) Emergency lighting for personnel lift cars and personnel lift trunks.
(ix) Emergency lighting in all spaces from which control of the drilling process is performed and where controls of machinery essential for this process, or devices for emergency switching-off of the power plant are located.
(x) Emergency lighting at the storage position(s) for firemen's outfits.
(xi) Emergency lighting at the sprinkler pump if any, at one of the fire pumps if dependent upon the emergency generator for its source of power, at the emergency bilge pump if any, and at their starting positions.
(xii) Emergency lighting on helicopter decks.
(xiii) The capability of closing the blow-out preventer and of disconnecting the unit from the well head arrangement, if electrically controlled, unless it has an independent supply from an accumulator battery suitably located for use in an emergency and sufficient for the period of 18 hours.
(xiv) On Column Stabilized Units: Ballast valve control system, ballast valve position indicating system, draft level indicating system, tank level indicating system, and the largest single ballast pump required by D9.5.1.

D10.4.3 Where the emergency source of power is a generator not fitted with an automatic starting device and an automatic connection to the emergency switchboard, a transitional source of emergency power is to be installed.

This is to be storage batteries of sufficient capacity to supply for at least 30 minutes:

Emergency lighting
Fire detection system
General alarm and communications systems

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Blow-out preventer.

D10.4.4 Arrangements are to be such that the transitional source of emergency power will come into operation automatically in the event of failure of the main electrical supply.

D10.5 Emergency shutdown facilities

D10.5.1 Emergency conditions due to drilling operations

In view of exceptional conditions in which the explosion hazard may extend outside the areas defined in D8, special arrangements should be provided to facilitate the selective disconnection of shutdown of :

Ventilating system
All electrical equipment outside Zone 1 areas, except where of a certified safe type for Zone 1 applications.
Main electrical generators and prime movers.
Emergency equipment except those items listed in D10.5.2.
Emergency generators.

Initiation of the foregoing shutdown of facilities will be the operator's responsibility. The initiated action may vary according to the nature of the emergency. A recommended sequence of shutdowns should be included in the Operating Booklet (see D1.3.4).

D10.5.2 Equipment to remain operational after emergency shutdown.

At least the following facilities are to be operable after an emergency shutdown. Equipment which is located in spaces other than enclosed spaces and arranged to be operated after complete shutdown as given D10.5.1 is to be suitable for installation in Zone 2 locations. Such equipment, when located in enclosed spaces, is to be suitable for its intended application to the satisfaction of the society:

Emergency lighting required by D10.4.2 for half an hour;
Blow-out preventer control system;
General alarm system;
Public address system; and
Battery supplied radio communication installations.

D10.6 Earthing (grounding) arrangements

D10.6.1 Where not obtained through normal construction, arrangements are to be provided to effectively earth (ground) all machinery, metal structures of derricks, masts and helicopter platforms.

D10.6.2 Cathodic protection
Details of impressed-current cathodic protection systems, including installation and locations, are to be submitted when such systems are installed. ◀◀