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Guidance on Industry Standard for Emergency Generators (IEC)

GIS 12-851

BP GROUP
ENGINEERING TECHNICAL PRACTICES

Foreword

This is the first issue of Engineering Technical Practice (ETP) GIS 12-851. This Guidance on Industry Standard (GIS) is based on the following heritage documents from merged BP companies:

BP

GS 160-1

Emergency Generator Package

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1. Scope

This GIS document specifies requirements for emergency generator packages comprising generator, diesel engine driver, coupling, starting system, control system and, required enclosure. It is intended, primarily, for use on hydrocarbon production, processing, and exporting facilities offshore.

2. Normative references

The following normative documents contain requirements that, through reference in this text, constitute requirements of this technical practice. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this technical practice are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies.

British Standards (BS)

BS 4999-140	General requirements for rotating electrical machines — Part 140: Specification for voltage regulation and parallel operation of a.c. synchronous generators
BS 4999-143	General requirements for rotating electrical machines — Part 143: Specification for tests
BS 4999-145	General requirements for rotating electrical machines — Part 145: Specification for winding terminations
BS 5000-3	Specification for Rotating electrical machines of a particular types or for particular applications — Part 3: Generators to be driven by reciprocating internal combustion engines

International Electrical Commission (IEC)

IEC 60034-1	Rotating electrical machines — Part 1: Rating and performance.
IEC 60034-5	Rotating electrical machines — Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code) – Classification.
IEC 60034-6	Rotating electrical machines — Part 6: Methods of cooling (IC code).
IEC 60034-7	Rotating electrical machines — Part 7: Classification of types of construction, mounting arrangements and terminal box position (IM code).
IEC 60034-8	Rotating electrical machines — Part 8: Terminal markings and direction of rotation.
IEC 60034-9	Rotating electrical machines — Part 9: Noise limits.
IEC 60034-11	Rotating electrical machines — Part 11: Built-in thermal protection Chapter 1: Rules for protection of rotating electric machines
IEC 60034-14	Rotating electrical machines — Part 14: Vibration limits.
IEC 60034-22	Rotating electrical machines — Part 22: AC generators for reciprocating internal combustion (RIC) engine driven generating sets
IEC 60051	Direct acting indicating analogue electrical measuring instruments and their accessories — All Parts
IEC 60072-1	Dimensions and output series for rotating electrical machines — Part 1: Frame numbers 56 to 400 and flange numbers 55 to 1080.



IEC 60072-2	Dimensions and output series for rotating electrical machines — Part 2: Frame numbers 355 to 1000 and flange numbers 1180 to 2360.
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International Standards Organization (ISO)

ISO 3046-1	Reciprocating internal combustion engines — Performance — Part 1: Declarations of power, fuel and lubricating oil consumptions, and test methods — Additional requirements for engines for general use
ISO 3046-2	Reciprocating internal combustion engines — Performance — Part 2: Test Methods

3. Service conditions

Emergency generators shall be designed for outdoor operation without protective shelter in 65°C maximum to -30°C minimum ambient temperatures at an altitude of 1000 metres or lower.

4. Enclosure

- a. Enclosure shall be designed as an integral part of the package.

Outdoor installations would normally be supplied with a weatherproof enclosure. Indoor locations may be specified without enclosures and may involve separate mounting of the cooler radiator, master fuel tank and exhaust system.

Offshore installation enclosure walls shall have a minimum fire rating of A 60 and shall comply with local regulations.

- b. Enclosures shall be designed to allow adequate access for routine maintenance and operation and shall be equipped with lighting, lifting points, overhead lifting beams and drainage as a minimum.
- c. Diesel generator packages with integral enclosures shall be provided with ventilation to maintain temperature of enclosure at an acceptable level during operation.
- d. Enclosure ventilation fans shall be driven by one of the following methods:
 1. Directly driven by the engine.
 2. Hydraulic transmission.
 3. An electric motor drive with power derived direct from the generator via a local starter.

5. Diesel engine

5.1. Performance

- a. The engine continuous net brake power, fuel and lubricating oil consumption, and overload power shall be in accordance with ISO 3046-1.

Although declared under ISO conditions it is to be recognised that the unit should be capable of the Emergency Duty as required at the Site maximum ambient conditions. This site rating should be a known value regardless of nameplate declared values.

- b. The engine continuous net brake power at all operating conditions shall enable the generator to produce power as specified in the nameplate rating.

Contingencies will be considered when sizing the generator.

