

SAFETY ALERT



Safety Alert No. 432

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Contact: bseepublicaffairs@bsee.gov

Phone: (800) 200-4853

BSEE Identifies Maintenance and Certification Issues of Rental Generators

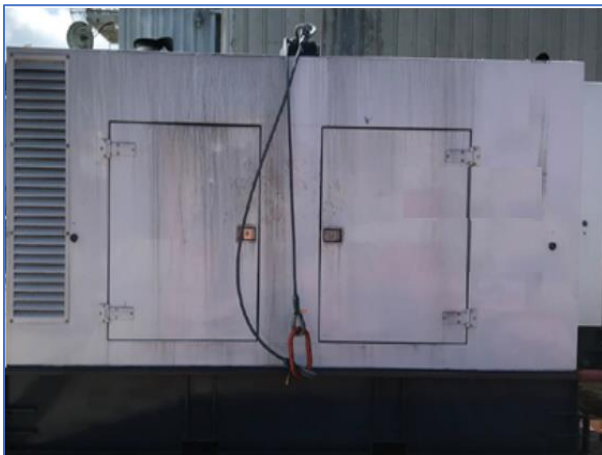


Fig. 1. Rental Generator



Fig. 2. Burnt Stator Winding of Generator

During start-up and commissioning, several rental generator incidents occurred on the U.S. Outer Continental Shelf (OCS) in 2021. These incidents involved rental generator failures resulting in fires, arc flashes, and work stoppages. Lack of certifying rental equipment integrity (e.g., inadequately/improperly maintained generator) has been shown to be one of the key indicators leading to these incidents.

Contributing Factors:

A review of the investigation reports for rental generator incidents indicate that many are attributed to the following:

- Lack of quality control commissioning checks to identify risks.
- Crews were unfamiliar with the detailed system specifications, and there were no formal handover processes between construction/installation and operations.

- There was worn defective main-stator windings and insulation disintegration.
- Moisture ingress in the windings terminal enclosure resulting in the short-circuiting of the rental generator.
- A short-circuit developed into a line-to-ground fault, resulting in a fire and arc flash within the rental generator.
- Corrosion and rust build-up in the generator's internal components caused an electrical short.

Therefore, BSEE recommends that operators consider:

- Checking to confirm that rental generators are recertified for service by reviewing preventive maintenance records and documents before usage.
- Ensuring quality control inspections during installations and commissioning of equipment are sufficient to verify that equipment and components meet approved Original Equipment Manufacturer (OEM) specifications.
- Ensuring equipment suppliers provide adequate documentation, including specifications, drawings, and commissioning procedures.
- Ensuring offshore personnel are engaged early in the project to enhance system familiarization.
- Providing thorough instructions, training, competency assessment, and supervision to equipment operators and maintenance personnel.
- Operations should perform insulation resistance testing on windings before commissioning to ensure windings are free of moisture and be prepared to dry windings if moisture is detected.
- Operations should develop an installation and commissioning checklist that includes steps to ensure consistent, safe operation of rental equipment.
- Establishing and documenting monitoring procedures to identify potential problems associated with moisture ingress/build-up and overheating (e.g., periodic visual inspection, use thermal vision inspections, resistance checks, and cleaning).
- Conducting insulation resistance measurements to verify there are no shorts or deterioration in the insulation (after installation).

- Ensuring operation, maintenance, and safety information is readily available before usage.
- Ensuring the knowledge, skills, and experience of electricians and technicians involved with the installation and start-up of the rental generator before the equipment arrives on-site and during the Job Safety Analysis (JSA).
- Ensuring installation practices are documented and meet fundamental electrical safety principles, including protection against overcurrent and ground-fault current per API RP14F & 14FZ.
- Ensuring compliance with 30 CFR 250.867(d) temporary quarters and temporary equipment and 250.842(a)(2) & 250.842(a)(3) - Approval of safety systems design and installation features.
- Ensuring rental generators are suitable for the area classification in which they are installed per API 500 & API 505.

– BSEE –

A **Safety Alert** is a tool used by BSEE to inform the offshore oil and gas industry of the circumstances surrounding a potential safety issue. It also contains recommendations that could assist avoiding potential incidents on the Outer Continental Shelf.

Category: Rental Generators