



Emergency power system: Will it work in a blackout?

Findings from the Tokyo MoU and IACS indicate that routine testing may not reflect how emergency power systems perform during a real loss of main power. Inadequate testing can leave critical systems unproven and create a false sense of readiness among crew when it matters most.

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What the rule says

All SOLAS ships must have a self-contained emergency source of electrical power that connects automatically to the emergency switchboard if the main power supply fails. Where this source is an emergency diesel generator (EDG), it must start automatically so that essential safety systems continue to operate without delay. SOLAS further requires arrangements to be in place for periodic testing of the *complete* emergency power system. These requirements are set out in SOLAS Chapter II-1 Regulations 42 and 43 for passenger and cargo ships, respectively.

Where testing falls short

The [Tokyo MoU](#) first raised the issue after Port State Control (PSC) inspections, which found several EDGs performing as expected during routine tests but failing to respond correctly when tested under more realistic conditions. When a controlled blackout was initiated by opening the main switchboard bus tie, some emergency generators did not start automatically, supply transitional power, or connect to the emergency switchboard. This indicates that simulated blackout testing using devices such as “sequential test” selectors or “routine test switches” may not reflect how the emergency power system will respond during an actual loss of main power.

[IACS](#) subsequently carried out a Concentrated Inspection Campaign (CIC) on emergency power supply in 2025, covering more than 36,000 ships. While deficiencies were identified on a relatively small proportion of ships, the campaign highlighted three areas of concern:

- **Equipment failures:** Recurring and critical failures were identified in components such as quick-closing valves, control units and circuits, and EDG starting arrangements. These point to potential weaknesses in equipment maintenance, installation quality, or component reliability, and may compromise the automatic activation of the emergency power supply required under SOLAS.
- **SMS and test procedures:** Non-equipment deficiencies included the absence of controlled blackout test procedures in company and shipboard Safety Management Systems (SMS). This is significant, as SOLAS requires periodic testing of the complete emergency power system. As highlighted by the Tokyo MoU, commonly used simulated blackout tests may not verify the actual circuit paths and automatic functions required during a real loss of main power. In IACS' words, this “gives ship's engineers a false sense of readiness of the ship's emergency systems.”
- **Crew familiarity:** The findings also point to gaps in crew familiarity with EDG operation, including incorrect selection of starting switch modes. This underlines that emergency power readiness depends not only on equipment condition and test design, but also on crew competence and safety culture.

Recommendations

Ship operators should use the campaign findings to critically review whether emergency power testing, maintenance and inspection, and crew training are sufficient to demonstrate that the complete system will work during a real blackout. Testing must verify system-level functionality in line with SOLAS requirements. In particular, operators should liaise with their classification societies and ensure that:

- controlled blackout test procedures are sufficiently detailed in company and shipboard SMS,
- critical components such as valves, control systems and generator starting arrangements are maintained and tested at appropriate intervals, and
- crew are familiar with emergency generator operation in practice, including correct configuration and response during a blackout scenario.

In Gard's experience, realistic blackout testing should not stop at confirming that the emergency diesel generator starts and connects to the emergency switchboard. Tests should also demonstrate that the generator can run reliably and carry the required load for a sufficient period. Particular attention should be paid to the type and condition of fuel in the EDG service tank, ensuring that it remains suitable for use under expected operating conditions. Experience shows that an EDG may start as intended but fail or stop after a short period, or be unable to run at rated load, due to clogged fuel oil filters.

We also recommend that operators review uninterruptible power supply (UPS) systems that support power management, control and monitoring systems during the transition to emergency power, particularly on modern vessels with advanced power management systems (PMS), where several UPS units may be installed. Batteries should be properly maintained and replaced before degradation affects capacity or performance. On PMS-controlled ships, a reliable UPS supply is critical for blackout recovery, as loss of UPS power can disrupt control and monitoring functions and delay restoration of emergency power.

While realistic testing of emergency power systems is essential, preventing blackouts remains the first line of defence. Operators should also refer to Gard's previous insight, [The importance of blackout awareness and prevention](#) , for further guidance.