

TROUBLESHOOTING SCENARIOS	
FORM NO	GR002. B (SCENARIO 19B)
SCENARIO NAME	What if a wide blackout occurs on a ship in the middle of the ocean? Start emergency generator with different ways (Hydraulic start method)
SYSTEM NAME	Emergency generator operation
MAX TIME	20 min
SYSTEM DESCRIPTION	<p>Emergency generator (EG) on ship provides power (220 and 440 V) in case the main and auxilliary generators of the ship fail and creates a “dead or blackout condition”. Emergency generator (EG) is constructed to supply electric power to some of the most important instruments, devices, and machinery on a ship such as essential sensors and alarm systems, crucial instruments, and other important machinery such as Navigation systems, vessel’s alarm system, emergency pumps, emergency lighting, and steering motor, GMDSS equipment, emergency air compressors, fire detection systems, communication equipment. In other words, an emergency generator (EG) powers essential machinery needed for the vessel to maneuver, communicate, start critical pumps, and send distress signals while the crew repairs the main or auxiliary engines.</p> <p>An emergency generator (EG) is connected to its own emergency switchboard (ESB) connected in parallel with the main switchboard (MSB). This way, they can supply the necessary power for critical functions during a significant electrical failure.</p> <p>Starting method of emergency generator EG must be achieved at least with two ways, manual and automatic. The emergency generator (EG) should come on load automatically within 45 seconds of the power failure. In case that does not kick in automatically, we can start the generator manually. The manual function involves battery start and hydraulic or pneumatic start.</p> <p>Emergency generator is located at a safe place away from the main power source. Ideally above the uppermost continuous deck. Both the emergency generator (EG) and its emergency switchboard (ESB) is located in the same compartment.</p>
DESCRIBE THE PROBLEM	The emergency generator fails to start automatically (as a result essential machinery are not powered supply)
PREPARATION	<ul style="list-style-type: none"> •You will hear heavy sound at Engine room ER, at Engine Control Room ECR and at Emergency Generator Control Panel EGCP • Signal light column for machinery alarm is illuminated •Alarm list, ALR_EG_001
SCENARIO ALGORITHM	<ol style="list-style-type: none"> 1. BEGIN 2. Heavy Alarm sound and visual indicator lights for machinery alarm is illuminated at Emergency Generator Control Panel EGCP, at Engine Control Room ECR and at Engine Room ER 3. Messages on ECR computer panel & at EGCP will appear: (ALR_EG_001) and “EG Automatic Start Failure” with red letters 4. The voltmeter at ECR, at EGCP & at ESB will show “0 Volts” 5. Student will have to press ACKNOWLEDGE BUTTON in ECR computer panel or at EGCP 6. The alarm horns will SILENT and visual indicator lights will go OFF 7. The letters on message on ECR computer panel & at EGCP): “EG Automatic Start Failure” will change color to yellow letters. 8. Student will physically have to go to EGR, in front of EGCP and start the emergency

	<p>generator using Hydraulic start method by changing over the control switch at EGCP from Auto to Manual</p> <ol style="list-style-type: none"> 9. Student must check the hydraulic oil pressure at the manometer which it should be between 120 and 150 bars 10. If it is needed student will pump the hydraulic oil using hand pump until the desired pressure (which is between 120 and 150 bars) 11. After that the student must release the pressure to the hydraulic motor by pressing the outlet valve 12. Student must press the start button at EGCP and the emergency generator will start working 13. When voltage goes to 440V and frequency to 60Hz the ACB at the ESB is going to close automatically and the engine will come on load. That means that the essential machinery-vital consumers are now supplied with voltage. 14. Messages on ECR computer panel & at EGCP, “EG Automatic Start Failure”, will be DELETED 15. For stopping the emergency generator, the student must press the STOP button at EGCP. The ACB at the ESB is going to open automatically and the engine will come off load. The essential machinery-vital consumers aren’t now supplied with voltage. 16. Student must change back the control from Manual to Auto at the EGCP. 17. FINISHED SCENARIO
QUESTIONS	<ul style="list-style-type: none"> - How will you start the emergency generator if a wide blackout occurs? - What’s the meaning of the message “EG Automatic Start Failure”? - How will the engine come on load after starting the emergency generator using Hydraulic start method? - What is the operating voltage and frequency range of the essential machinery-vital consumers? - What is the operating hydraulic oil pressure? - Why you must change back the control from Manual to Auto at the EGCP, after starting the emergency generator using a manual start method?
LEARNING OUTCOMES	<p>Student’s must be able to:</p> <ul style="list-style-type: none"> - Recognize alarm sound and visual indicator lights at Emergency Generator Control Panel EGCP, at Engine Control Room ECR and at Engine Room ER - Recognize the messages on ECR computer panel & at EGCP - Start the emergency generator using Hydraulic start method - Check-read the analog or digital Frequency Meter & Voltmeter indicators - Check the hydraulic oil pressure at the manometer - Pump the hydraulic oil using hand pump - Understand the operation of mode selection at EGCP from Auto to Manual - Understand the importance of supplying the essential machinery-vital consumers with voltage