

TROUBLESHOOTING SCENARIOS	
FORM NO	BUL003
SCENARIO NAME	STARTING AIR COMPRESSOR FAILURE
SYSTEM NAME	COMPRESSED AIR SYSTEM
Max Time	10 min
SYSTEM DESCRIPTION	<p>The Compressed Air system is designed to generate and supply compressed air for ship systems by:</p> <ul style="list-style-type: none"> ■ Compressed Starting and Service Air System. ■ Control Air System. <p>To ensure the functionality of the components in the compressed air system, the compressed air has to be dry and clean from solid particles and oil.</p> <p>The Starting Air System produces and supplies compressed air for starting ME and DEs. All engines are started by means of compressed air with a nominal pressure of 3 MPa (30 bar). The start is performed by direct injection of air into the cylinders through the starting air valves in the cylinder heads. The master starting valve is built on the engine and can be operated both manually and electrically.</p> <p>In automatic operating mode, when the pressure in the main receivers drops <25 bar the duty compressor automatically starts. If the pressure continues to reduce then the second compressor starts. When the pressure reaches 28 bar the stand-by compressor stops. The duty compressor stops when the pressure reaches 30 bar.</p> <p>The compressors can be also operated manually from the LOP.</p> <p>The control air pressure range is 4-10 bar. The pressure is regulated by pressure reduction valves working in parallel and linked with an interconnecting valve (V3).</p>
Describe the problem	<p>(Pressure: (logic 0/1 – below 2 bar – low pressure alarm above 3 bar – high pressure alarm) Cooling water system pressure range</p>
Preparation	<ul style="list-style-type: none"> Get familiar with compressed air system functionality Check safety measure
SCENARIO ALGORITHM	<p>Scenario chronology:</p> <ol style="list-style-type: none"> 1. Heavy Alarm sound and Signal light column for machinery alarm is illuminated (Fig.6.) 2. Heavy Alarm sound and “Low pressure cooling water ALR_CA_009”. 2. Student will have to press ACKNOWLEDGE BUTTON in ECR computer panel (Fig.5). 3. The alarm horn will SILENT (not power off? Just Silent but still there is the power!!) and light on signal column will stop blinking but continuously ON (Fig.6.) 4. The letters on message on ECR computer panel: alarm messages with change color to yellow letters (Fig.2. and Fig.3.) 5. The starting air compressor No2 is the duty compressor and runs continuously. 6. On the engine control console the operator changes the leading compressor to No1 and stops No2 (fig.7 – from pos.3 to pos.1). 7. The operator proceeds to the engine room and checks the main air compressors (fig.9). 8. The operator examines the starting air compressor No2. He opens the drain valve (V10) and notices water leakage. 9. The operator cuts out the water cooling for the compressor (closes V6 and V7) and examines the first and second stage air coolers. 10. The operator rectifies the water cooler breakage 11. FINISHED SCENARIO

QUESTIONS	<ol style="list-style-type: none"> 1. How is it cooled the air compressor? 2. What was the exact alarm message? 3. How to cut out air compressors locally?
LEARNING OUTCOME	<p>To understand fail mode of starting air compressors and how to act accordingly to such cases.</p> <p>To be aware of weak points of the pressurized passages of the compressor stages.</p>