

TROUBLESHOOTING SCENARIOS	
FORM NO	GRE003. (<i>Scenario 17</i>)
SCENARIO NAME	No indication of the smoke density equipment
SYSTEM NAME	Steam production-water boiler
Max Time	4 min
SYSTEM DESCRIPTION	The smoke density monitor is designed to continuously monitor the smoke density and observation in the flue gas. The system includes a transmitter head TH, a receiver head RH, and a control unit CU, see illustration of the smoke density monitoring system. The system can display in readings of either, smoke density, transmission, extinction (linear), extinction (log), or Ringelmann effect. The sensing heads are installed in the flue gas funnel after the boiler.
Describe the problem	The measurement system uses a LED red light source to transmit a visible red-light beam from the transmitter head TH to the receiver head RH. As the light path is increasingly obscured, less light falls on the receiver. In order to compensate for small variations in the transmitted light amplitude, due to the effects of temperature and ageing, a compensation photocell is fitted in the transmitter head. To avoid problems with ambient light upsetting the photocell, the light source is modulated (switched on and off) at a specific frequency of electricity. The electronics responds only to light which is at this frequency and rejects other light. The glass window (transmitter side TH) and lens (receiver side RH) are prevented from becoming contaminated by a purge air flow. The air is directed at the window-lens and then turned around and vented into the duct to which the heads are attached.
ALARM TYPE	As well as lighting the fault indicator LED on the front panel and activating the fault relay, a fault condition recognized by the instrument will cause the unit to flash up one of the following fault messages: Hi S - the control unit is getting too much signal from the receiver head. Lo S - the control unit is getting low signal from the receiver head. Hi C - the measurement circuit is in danger of becoming saturated. Head - indicates that the control unit has lost communications with RH.

SCENARIO CHRONOLOGY	1. Alarm sound and Signal light column for machinery alarm is illuminated. 2. Message on ECR computer will appear “The control unit it is getting low signal from the RH” and flash up the “HEAD” message (on the measurement reading window of the boilers control panel). 3. We will have to press ACKNOWLEDGE BUTTON in ECR computer panel (Does it means just a mute alarm) 4. The alarm horn will SILENT (not power off, just Silent but still there is the power). The letters on message on ESC MOP-A change color to yellow letters. 5. We check the communication with the RH head. 6. We realize that with the receiver head RH through the connection cable was damaged. We repair or replace the cable. 7. After cable replacement the function restored. 8. Message on boiler’s control panel will DELETE 9. Messages on ECR computer panel will DELETE. 10. FINISHED SCENARIO
QUESTIONS	What was exact alarm message? What is alarm message (head) on the main control panel? What is the correct procedure to change the cable?
OUTCOMES	To inspect and identify damaged cable, and replace them to restore system functionality. To recognize how loss of communication between system components can impact system performance. To identify the root cause of issue in smoke density monitoring system.