

ALARMS AND AUTOMATIC SHUT DOWNS



Dublin 27 September 2017





ABOUT US



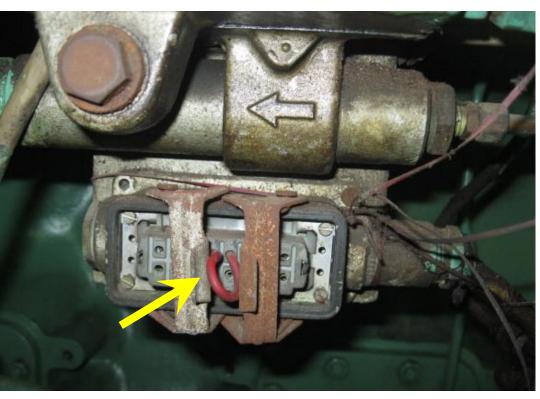


- LOC
- 30 locations, 400 Staff, 300 Technical, 36 Nationalities and 29 Languages
- Broad Range of Disciplines:
 - Marine Engineers
 - Naval Architects
 - Master Mariners
 - Marine Civil Engineers
 - Offshore Engineers
 - Structural Engineers
 - Subsea & Pipeline Engineers
- Richard A. Bailey
- Hull and Machinery Manager, Middle East.
- <u>r.bailey@loc-group.com</u>
- **+971** (0)50 55 4610



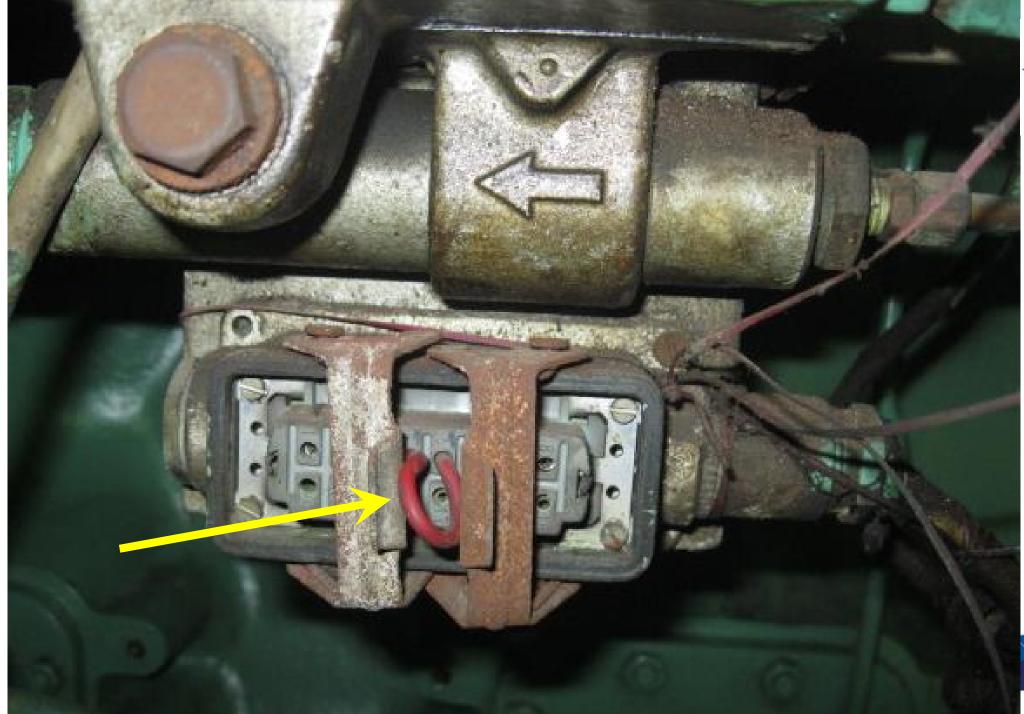
SUMMARY





- Alarms
 - Systems
 - Why, what, how
- Three systems
 - Control, Safety and Monitoring
 - Shut downs, Slow downs and overrides
- Testing
- Records
 - Analysis, fraud
- Unmanned Machinery spaces

LOC







ALARM SYSTEMS





- Sensors
 - Temperature
 - Pressure
 - Level
- Processor(s)
 - Control
 - Display
 - Record
- Alarm indicators
 - Engine Control Room
 - Engine room
 - Bridge



WHY





- Prevent damage
- Protect machinery, and the ship
- Often intertwined with monitoring systems
- Flag / Classification requirement
- Client / Charterer requirement



WHAT





- Primary machinery
 - Main engines
 - Generator engines
 - Steering gear
- Secondary systems
 - Boilers
 - Cargo systems
 - Hotel services



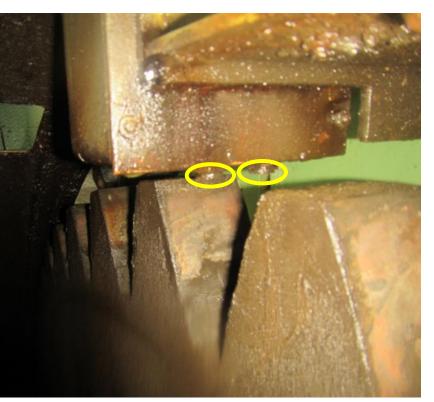






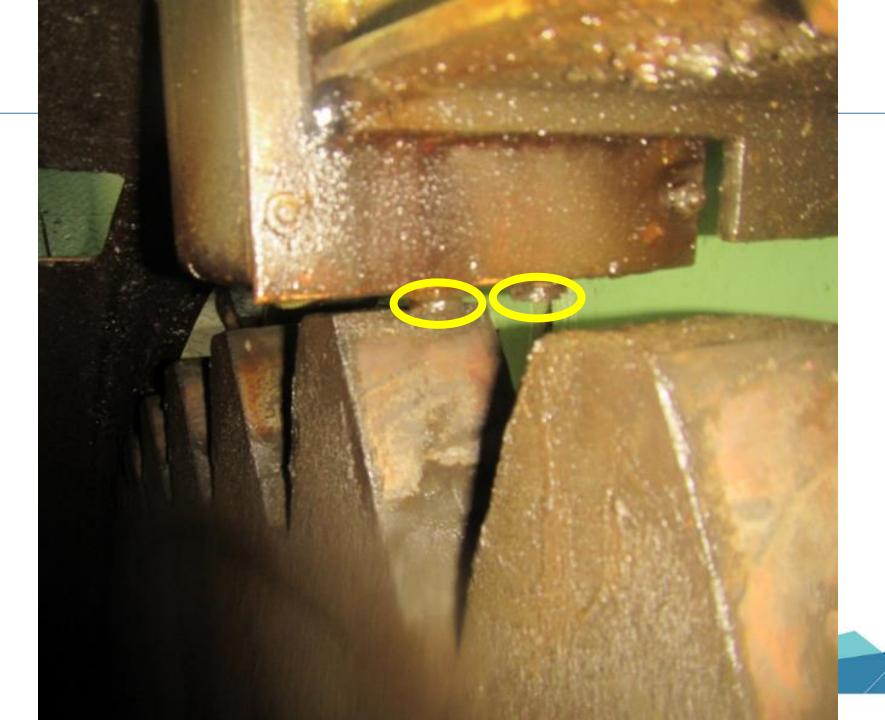
HOW





- Measure distinct values
- Sensors
 - Temperature sensors, PT100 etc.
 - Pressure transducers
 - Level / float switches
 - Limits / proximity switches
- Processor converts the signals
- Processor controls the alarms.









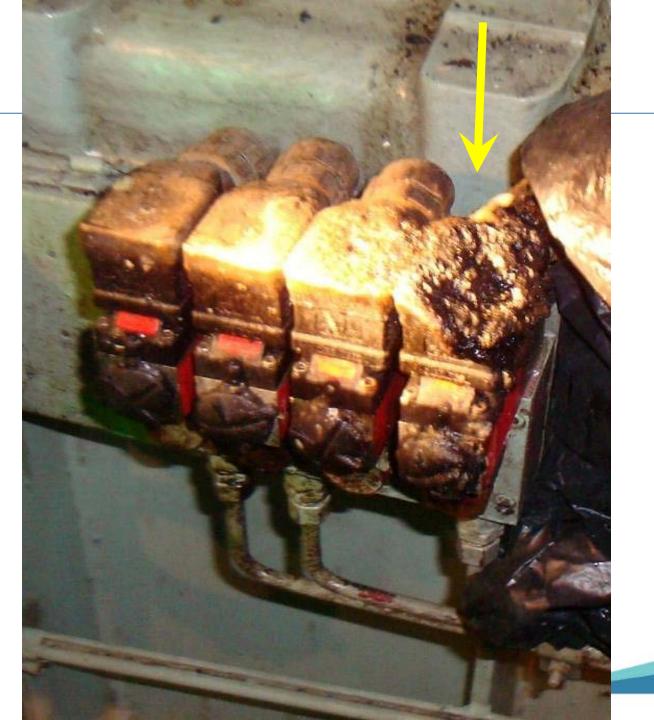
THREE SYSTEMS





- Control
- Safety (shut downs / slow downs)
- Monitoring (UMS) and recording
- Independent from each other









CONTROL



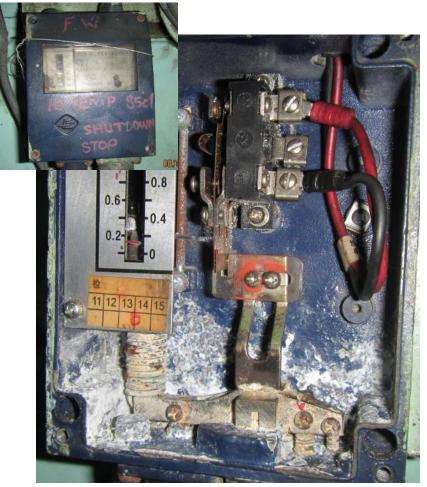


- Bridge control
 - Direct control from conning position
- Engine control room
 - Control in engine room
 - More control over engine load
 - Better awareness of engine systems
- Local
 - Mechanical at engine side
 - Not as simple with modern engines



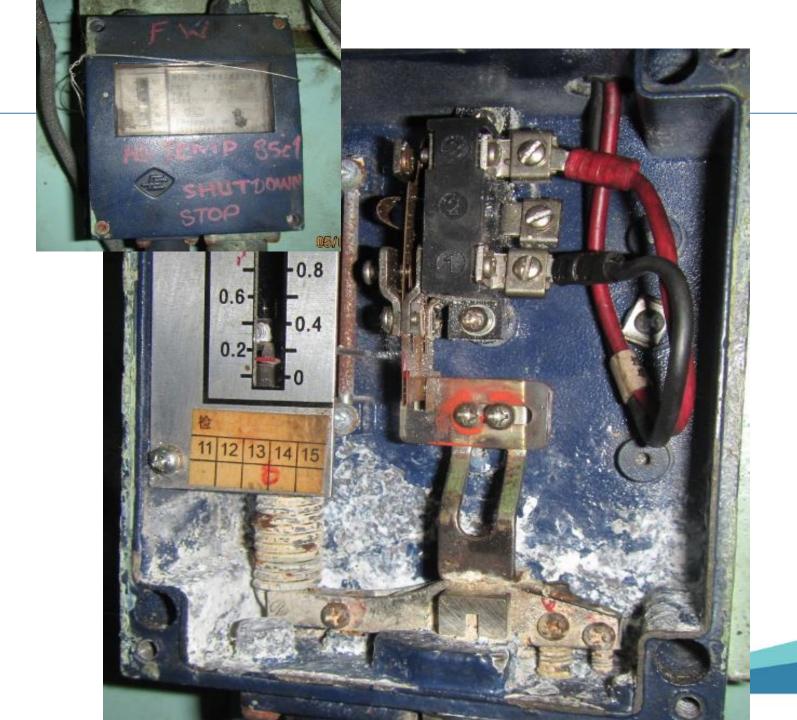
SHUT DOWNS





- Alarms that cause automatic engine shut down
 - Main engine Low lubricating oil pressure
 - Engine over speed
 - Exhaust valve failure
- Sometimes emergency overrides fitted
- Extent required determined by class









SLOW DOWNS



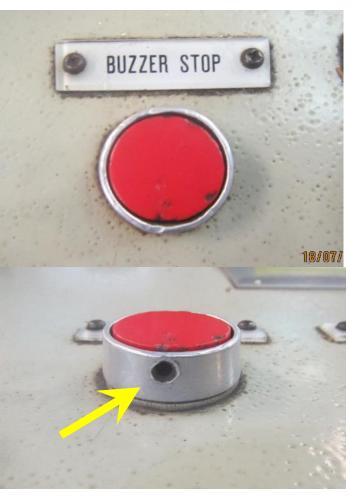


- Alarms that cause automatic engine slow downs
 - Crankcase oil mist
 - Scavenge fire
 - Exhaust gas temperature deviation
 - Cylinder lubricating oil failure
 - Cooling water jacket temperature
- Sometimes emergency overrides fitted
- Extent required determined by class



OVERRIDES AND AUTO STARTS





- Overrides
 - Dependent on system
 - Fitted to prevent greater loss.
- Auto starts
 - Standby generators
 - Pumps









MONITORING





- Displays live data
- Mimic diagram
- Connected to the record system
- Often connected to the secondary equipment controls



TESTING



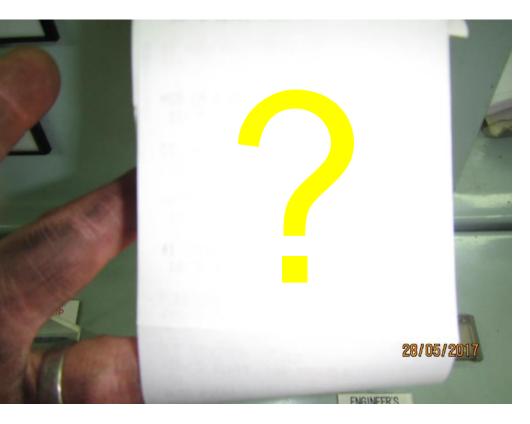


- All sensors and system require regular testing
- Test tools
 - Calibrated heater
 - Pressure test
 - Hand pumps
 - Deadweight tester
- Class requirement
 - Testing of alarms
 - Calibration of test equipment



RECORDS





- Alarm printers
- Records history
 - Time / date
 - Value
 - Alarm state
- UMS Alarm record book
- Engine room log



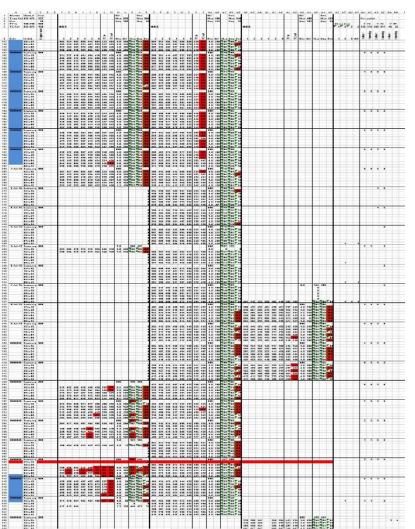






ALARM ANALYSIS





- Shows trends
 - Onboard review
 - Post incident review
- Identify start date / time
- Forensic study of records

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FRAUD





- Alarm records
- Errors and omissions
- DC MERWESTONE
 - Bilge alarm
 - Fraudulent device
 - Claim rejected
 - Overturned at Supreme court



UNMANNED MACHINERY SPACES





- Unmanned Machinery spaces
 - Class notation, E0, UMS, AUT, ACCU
- Engine room not manned
 - Non duty hours
 - Suitable / safe location
 - Not during critical operations
 - Option to reduce manning
 - Systems need to be operating correctly









UNMANNED MACHINERY SPACES





- Increased automation ie.
 - Shut downs / slow downs
 - Preferential trips
 - Auto starts
- Alarm repeated in duty cabins and common spaces
 - Alarm cascades
- Final watch keeping round
- Deadman alarm for single man entry



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