

What is the abnormality?	
Main engine number 01-unit exhaust temperature low – 321.97° C. All unit temperature- 323.28, 324.99, 325.86, 325.76, 321.46 (°C)	
Action	Remarks
Duty engineer was told to check the local exhaust temperature of no-01-unit main engine & report.	Reported local exhaust temperature of no.01-unit main engine 321.97° C, confirmed low.
Duty engineer was told to check the free movement of VIT & Fuel rack of main engine no.01 unit & report back.	Reported that both are free to move and not stuck i.e., in good working order.
Call-up bridge and inform about the abnormality and on-going investigation being carried out and will report when more information area available.	Bridge acknowledged.
Out of phase diagram taken and all relevant parameters are also taken.	Observed that the Pmax of the main engine no-01 unit high as compared another cylinder which is in normal condition.
Requested bridge to reduce the RPM by 2.	Control taken over by the engine control room.
Reduced main engine RPM by 2 and informed	Bridge acknowledged.
After finding the problem, bridge informed and requested to stop main engine (to prevent any further damage)	Bridge reported to reduce the main engine RPM but not to stop main engine due to traffic.
Main engine reduced by another 2 RPM and informed bridge. Engine staff ordered to prepare the engine for manoeuvring.	Bridge and engine staff acknowledged.

Parameters	Main Engine (Affected Unit No.1)		Observations
	Normal	Abnormal	
SPEED (RPM)	74	74	NORMAL
INDEX (%)	56.56	56.56	NORMAL
MIP (BAR)	15.97	16.22	INCREASED
IKW (KW)	3656	3711	INCREASED
FUEL OIL SYSTEM			
FUEL FLOW RATE(kg/hr)	630	630	SAME (NORMAL)
TIGN (DGR)	3.09	2.49	ADVANCED
Pmax (BAR)	132.3	133.8	INCREASED
PINJM (BAR)	718.0	718.0	REDUCED SLIGHTLY
PINJO (BAR)	420.0	420.0	SAME (NORMAL)
TINJO (DGR)	-1.94	-2.54	ADVANCED

LINJO (DGR)	15.27	15.27	ADVANCED (SLIGHTLY)
SCAVENGE SYSTEM			
SCAVENGE (PRS./ TEMP.) (BAR/DGR)	2.06/46.33	2.06/46.33	NO REMARKABLE CHANGES
T/C SPEED (1/2) (RPM)	7251.4	7251.4	NO REMARKABLE CHANGES
T/C FILTER (ΔP)	113.81	113.81	NO REMARKABLE CHANGES
½ (mmWC)	113.81	113.81	NO REMARKABLE CHANGES
AIR COOLER (ΔP)	170.86	170.86	NO REMARKABLE CHANGES
½ (mmWC)	170.86	170.86	NO REMARKABLE CHANGES
SCAVENGE AIR FLOW (BAR)	31.55	31	NO REMARKABLE CHANGES
Pcom (BAR)	108.6	108.6	NO REMARKABLE CHANGES
MECHANICAL SYSTEM			
CYLINDER EXHAUST TEMPERATURE (DGR)	321.97	325.96	REDUCED
PISTON RING SEALING (%)	86 ~ 93	88	NO REMARKABLE CHANGES
PISON RING MOVEMENT(%)	86 ~ 95	90	NO REMARKABLE CHANGES
CYLINDER COVER TEMP (DGR)	197.63	194.73	NO REMARKABLE CHANGES
JACKET MEAN TEMP (DGR)	79.99	79.97	NO REMARKABLE CHANGES
GAS DETECTION	NORMAL	NORMAL	NO REMARKABLE CHANGES

1. From your analysis of the parameters, suggest the possible sources of trouble.

Based on above parameters,

All scavenge air supply system parameters are normal and hence no scavenge problem.

Mechanical system is in good working order and hence air tight integrity of combustion space is intact & no problem with mechanical system. Based on the fuel oil system parameters, main engine no-01-unit, exhaust temperature dropped to 312° C, Pmax increased to 133.1, TINJO is advanced to -4.0° C. TIGN is also advanced to 3.6° C. Fuel pump flow rate is same, PINJM & PINJO is almost same

So, from above the most probable cause would be fuel pump early injection as the timing is advanced.

2. Assuming faulty component can not be rectified to original condition or otherwise issue the required standing order for ER staff pertaining to the abnormalities which have arisen, and state the necessary action and/or precautions to be observed by the watch keepers to ensure safety of operation.

C/E standing Orders to E.O.W pertaining to abnormality:

All engineers read, understand & sign:

→ Engine room to be 'manned' until the fault is rectified.

→ Monitor M/E cylinder exhaust temperature both locally and remotely. Especially No.01 unit and all other units and other parameters.

→ Any deviation in temperature more than 10° C, call C/E and inform bridge for further slowdown.

→ Keep close communication with bridge as M/E control is in engine control room.

→ Any special instruction from bridge, inform C/E immediately

→ Any doubt call C/E.

→ Prepare relevant tools for cam adjustment, if required.

Acknowledge: 2/E 3/E 4/E C/E

Necessary precaution to be observed by E.O.W for Safe Operation:

→ E.O.W to take proper round of engine room.

→ Keep bridge informed and communicate with them regarding safety and traffic condition.

→ E.O.W to closely monitor M/E No.01-unit exhaust temperature as well as other parameters of main engine.

→ In case of any abnormalities or any doubt call C/E & 2/E.