LCU MK- IV CLASS OF SHIP ENGINEERING EQUIPMENTS TRIAL PROTOCOL

1. **MAIN ENGINE**

(a) **SAFETY DEVICE CHECKS FORMAT**

Ser	Description	Unit	Design Value	PME		SME		Remarks
				LOP	Remote	LOP	Remote	
Cold checks								
(i)	High Coolant Water temp Alarm	°C	101					
(ii)	High Coolant Water temp Slow Down	°C	103					
(iii)	High Coolant Water temp Trip	°C	106					
(iv)	High Lub Oil temp Alarm	°C	99					
(v)	High Lub Oil temp Slow Down	°C	101					
(vi)	High Charge Air temp Alarm	°C	75	-	-	-	-	
(vii)	High Charge Air temp Slow Down	°C	85	-	-	-	-	
Hot Checks								
(viii)	Low Coolant Water Pressure Alarm (at 1200 RPM)	Bar	1.6					
(ix)	Low Coolant Water Pressure Alarm (at 1800 RPM)	Bar	4.2					
(x)	High Coolant Water temp Alarm (at 650 RPM)	°C	101					
(xi)	High Coolant Water temp Slow Down (at 650 RPM)	°C	103					
(xii)	High Coolant Water temp Trip (at 650 RPM)	°C	106					
(xiii)	Low Lub Oil Pressure	Bar	3.7					

Ser	Description	Unit	Design Value	PME		SME		Remarks
				LOP	Remote	LOP	Remote	
	Alarm (at 1200 RPM)							
(xiv)	Low Lub Oil Pressure Trip (at 1200 RPM)	Bar	3.4					
(xv)	Low Lub Oil Pressure Alarm (at 1800 RPM)	Bar	4.7					
(xvi)	Low Lub Oil Pressure Trip (at 1800 RPM)	Bar	4.4					
(xvii)	Low Fuel Pressure Alarm (at 650 RPM)	Bar	3.9					
(xviii)	High Exhaust temp Alarm for A & B Bank (at 650 RPM)	°C	651					
(xix)	Very High Exhaust temp Alarm for A & B Bank (at 650 RPM)	°C	680					
(xx)	Low Crankcase Pressure Alarm (at 1200 RPM)	Bar	25					
(xxi)	Low Crankcase Pressure Trip (at 1200 RPM)	Bar	40					
(xxii)	Low Crankcase Pressure Alarm (at 1800 RPM)	Bar	30					
(xxiii)	Low Crankcase Pressure Trip (at 1800 RPM)	Bar	50					
(xxiv)	Low Sea Water Pressure Alarm (at 1200 RPM)	Bar	1.2					
(xxv)	Low Sea Water Pressure Alarm (at 1800 RPM)	Bar	3.2					
(xxvi)	High Crankcase temperature Alarm (at 650 RPM)	°C	250					
(xxvii)	Overspeed Trip	RPM	2070					

(b) **BASIN TRIAL SCHEDULE.**

SER	ERPM	DURATION	REMARKS
(i)	IDLE	15 MIN	ONE SET OF PARAMETER
(ii)	PME DSAH SME DSAS (650 ERPM)	15 MIN	ONE SET OF PARAMETER
(iii)	SME DSAH PME DSAS (650 ERPM)	15 MIN	ONE SET OF PARAMETER
(iv)	PME SAH SME SAS (750 ERPM)	15 MIN	ONE SET OF PARAMETER
(v)	SME SAH PME SAS (750 ERPM)	15 MIN	ONE SET OF PARAMETER
TOTAL		**01.15 HRS (APPROX)**	

(c) **FULL POWER TRIAL (SEA TRIAL) SCHEDULE.**

SER.	ERPM	DURATION	REMARKS
(i)	IDLE RPM	15 MIN	ONE SET OF PARAMETER
(ii)	25 % ENGINE POWER (1130 ERPM)	30 MIN	ONE SET OF PARAMETER
(iii)	50 % ENGINE POWER (1430 ERPM)	30 MIN	ONE SET OF PARAMETER
(iv)	75% ENGINE POWER (1630 ERPM)	30 MIN	PARAMETER AND VIBRATION TRIALS
(v)	MAX SUSTAINABLE ERPM	02 HOUR	PARAMETER AND VIBRATION TRIALS
(vi)	ASTERN TRIALS (1340 ERPM)	30 MIN	ONE SET OF PARAMETER
(vii)	SINGLE ENGINE AT 75% LOAD (1630 ERPM)	30 MIN	ONE SET OF PARAMETER
(viii)	STEERING GEAR TRIALS AT 50% LOAD	30 MIN	ONE SET OF PARAMETER
TOTAL		**5 HRS 45 MIN** (APPROX**)**	

(d) **PARAMETER SHEET OF SEA TRIAL MCR**

SER	DESCRIPTION		UNIT	PME	SME
(i)	TIME		HRS		
(ii)	MODE		AH/AS		
(iii)	PCL POSITION				
(iv)	ERPM		RPM		
(v)	SHAFT RPM		RPM		
(vi)	LOADING		%		
(vii)	SHAFT TORQUE		kNM		
(viii)	SHAFT POWER		kW		
(ix)	INJECTION QTY		%		
(x)	ENGINE OIL PRESSURE		Bar		
(xi)	COOLANT PRESSURE		Bar		
(xii)	CHARGE AIR PRESSURE		Bar		
(xiii)	RAW WATER PRESSURE		Bar		
(xiv)	FUEL PRESSURE		Bar		
(xv)	LUB OIL TEMP		°C		
(xvi)	COOLANT TEMP		°C		
(xvii)	CHARGE AIR TEMP		°C		
(xviii)	PRESSURE CRANKCASE		mbar		
(xix)	INTAKE AIR TEMP		°C		
(xx)	EXHAUST MEAN A/B		°C		
(xxi)	EXHAUST TEMP	A1 CYL.	°C		
		A2 CYL.	°C		
		A3 CYL.	°C		
		A4 CYL.	°C		
		A5 CYL.	°C		
		A6 CYL.	°C		
		A7 CYL.	°C		
		A8 CYL.	°C		
		B1 CYL.	°C		
		B2 CYL.	°C		
		B3 CYL.	°C		
		B4 CYL.	°C		
		B5 CYL.	°C		
		B6 CYL.	°C		
		B7 CYL.	°C		
		B8 CYL.	°C		
(xxii)	CHARGE AIR SEQ. TEMP		°C		
(xxiii)	ETC1 SPEED		RPM		
(xxiv)	ETC2 SPEED		RPM		

SER	DESCRIPTION	UNIT	PME	SME
(xxv)	G/BOX L.O. PRESSURE	Bar		
(xxvi)	GB CONTROL OIL PRESS	kg/cm^2		
(xxvii)	PLUMMER BLOCK TEMP	°C		
(xxviii)	STERNTUBE LUB OIL TEMP	°C		
(xxix)	FWD SEAL TEMP	Bar		
(xxx)	FUEL OIL TEMPERATURE	°C		
(xxxi)	STARTING AIR PRESSURE / AIR BOTTLES PRESSURE	Bar		

(e) **PARAMETER READINGS OF HEAT EXCHANGERS / COOLERS BY NON CONTACT TEMPERATURE GUN**

SER	DESCRIPTION	UNIT	PME	SME
(i)	MODE	AH/AS		
(ii)	ERPM	RPM		
(iii)	SRPM	RPM		
(iv)	L.O. TEMP. ENGINE INLET	°C		
(v)	L.O. TEMP. ENGINE OUTLET	°C		
(vi)	F.W. TEMP. ENGINE INLET	°C		
(vii)	F.W. TEMP. ENGINE OUTLET	°C		
(viii)	FW INLET TEMP TO L.O. COOLER	°C		
(ix)	FW OUTLET TEMP. FROM L.O. COOLER	°C		
(x)	FW INLET TEMP. TO H/E	°C		
(xi)	FW OUTLET TEMP. FROM H/E	°C		
(xii)	SW INLET TEMP. TO INTER COOLER	°C		
(xiii)	SW OULET TEMP. FROM INTERCOLER	°C		
(xiv)	GB L.O. INLET TEMP. TO COOLER	°C		
(xv)	GB L.O. OUTLET TEMP. FROM COOLER	°C		
(xvi)	STERNTUBE LUB OIL TEMP	°C		
(xvii)	FWD SEAL TEMP	°C		
(xviii)	ERPM BY STROBOSCOPE	RPM		
(xix)	SRPM BY STROBOSCOPE	RPM		

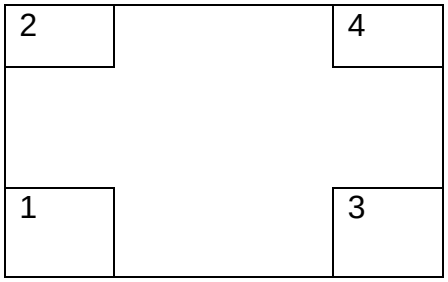
(xx)	GB LUB OIL PR AFTER PP	kg/cm2		
(xxi)	CLUTCH OIL PR AHEAD	kg/cm2		
(xxii)	CLUTCH OIL PR ASTERN	kg/cm2		
(xxiii)	COLLECTIVE EXH TEMP	°C		
(xxiv)	PLUMMER BLOCK TEMP.	°C		

(f) **VIBRATION READINGS OF BME, G/B AND SHAFTING.**

SER	MEASURING POINTS	DIRECTION	AT 75% LOAD		AT 100% LOAD		REMARKS
			PME	SME	PME	SME	
(i)	ENGINE FREE END	V					
		A					
		H					
(ii)	ENGINE DRIVE END	V					
		A					
		H					
(iii)	GEAR BOX IN	V					
		A					
		H					
(iv)	GEAR BOX OUT	V					
		A					
		H					
(v)	GEAR BOX TOP	V					
(vi)	STERN TUBE 1	V					
		A					
		H					
(vii)	STERN TUBE 2	V					
		A					
		H					

(g) **ATTENUATION OF BME AT 75% AND 100% LOAD**

FWD



AFT

SER	EQUIPMENT	LOAD	MOUNT	TOP	BOTTOM	ATTENUETION % (70-100)	REMARKS
1	PME	75%	MOUNT 1				
			MOUNT 2				
			MOUNT 3				
			MOUNT 4				
2	SME		MOUNT 1				
			MOUNT 2				
			MOUNT 3				
			MOUNT 4				
3	PME	100%	MOUNT 1				
			MOUNT 2				
			MOUNT 3				
			MOUNT 4				
4	SME		MOUNT 1				
			MOUNT 2				
			MOUNT 3				
			MOUNT 4				