HELO STARTING CONVERTOR TRIALS

OCCASION OF TRIALS – _____

TRIALS DATE - _____

HELO STARTING FREQUENCY CONVERTOR
LOAD TRIAL REPORT – CONVERTOR NO___ (200V, 400HZ, 3 PH, 30/ 75 KVA)
SHIP – INS _____

1. **Trial Details**.

(a)	Presented by*	
(b)	Trial date*	
(c)	Occasion of current trial*	
(d)	Date of last trial carried out on*	
(e)	Proposal reference*	
(f)	File reference*	
(g)	Reference document for trial	**EED-Q-267(R4)**

2. **Test Equipment Used**.*

3. **Equipment Details**.

Motor		
(a)	Make and rating**	
(b)	Serial no.**	
(c)	RPM**	
(d)	Bearing details**	
(e)	Input supply**	

Alternator		
(a)	Make and rating**	
(b)	Model & serial no.**	
(c)	Rated voltage**	
(d)	Rated frequency**	
(e)	Rated kVA/ kW**	
(f)	Rated current**	
(g)	Bearing number**	

AVR		
(a)	Make and type**	
(b)	Serial no.**	

4. **Insulation Resistance of MG Set (iaw NES 502(Issue 4))**.

(a)	Alternator (>1MΩ)*	
(b)	Motor (>1MΩ))*	

5. **Protection Checks**.

Ser	**Protection**	**Calibration Date***	**Calibration Certificate Provided (Yes/No)***	**Tripping Value**	**Observed Value***	**Status (Sat/ Unsat)***
(a)	Over voltage protection			With a time delay of 2 Sec when		

				terminal voltage exceeds 110% of rated voltage		
(b)	Over load protection			125% of full load current		
(c)	Single phase protection			NA	NA	
(d)	Winding temperature protection			NA	NA	

6. **Instrumentation**.

Ser	Meter	Ops/ Non Ops*	Calibration Date*	Calibration Certificate Provided (Yes/ No)*	Status (Sat/ Unsat)*
(a)	Voltmeter				
(b)	Frequency meter				
(c)	Ammeter				

7. **Motor Health Checks**.

(a)	SPM*	
(b)	Starting current*	
(c)	Running current*	
(d)	Phase balance*	

8. **Alternator Health Checks**.

(a)	SPM*	
(b)	Resistance of windings (should be approximately same for all the windings)***	
(c)	Inductance of windings (should be approximately same for all the windings)***	

9. **Miscellaneous**.

(a)	Past history of the equipment, if any**	
(b)	Lighting and ventilation of compartment (Sat/ Unsat)*	
(c)	Cooling (Natural air/ Forced Cooling)*	
(d)	Earthing of MG set and control panel (Sat/ Unsat)*	
(e)	Condition of cables (Sat/Unsat)*	

(f)	Cleanliness (Sat/ Unsat)*	
(j)	Indication lamps and switches (Sat/ Unsat)*	
(k)	Equipment tallies*	

Note: For Para 1 to 9, following to be followed while filling the details mentioned in sub serials:-

(i) "*" - To be checked/ filled/ measured by ETMA trial member.
(ii) "**" - To be provided by SS.
(iii) "***" - To be checked/ provided by Yard.

10. **Voltage Regulation**.

Load	**Observed from AVR**		**Observed from HVR**		**Permissible (+-5% of Rated Voltage) 190 to 210V**	**Remarks**
	Min.	**Max.**	**Min.**	**Max.**		
No load						
Full load						

11. **Voltage Balance Test**.

Load	**Voltage Observed**			**Difference (Between Max & Min of Three values)**	**Permissible Limit**	**Remarks**
	RY	**YB**	**BR**			
No load					3V RMS	
Full load					3V RMS	

12. **Steady State Trials**.

(a) Voltage. Nominal voltage is **200 Volts.**

Load %	**kW/kVA**	**Volts**		**PF**	**Voltage Modulation (less than 2%)**
		Observed	**Permitted Limits**		
100			190 to 208 V		
75					
50					
25					
0					

Note:

(i) The load to be gradually reduced in quarter load steps from full load to no load and when the voltage has stabilised after each load change the steady state voltage to be recorded.

(ii) Voltage Modulation. Voltage Modulation is the periodic voltage variation of single line to line user voltage. The periodicity of voltage modulation should be considered to be longer than 1 cycle time at nominal frequency and less than 10 seconds. Voltage used in the below mentioned equation is RMS voltage.

$$\text{Voltage Modulation(Percent)} = 100 \times \frac{(V_{max} - V_{min})}{(2 \times V_{nominal})}$$

(b) Frequency Nominal Frequency – **400Hz**

Load %	**kW/kVA**	**Observed**	**Permissible Limit**	**Frequency Modulation (less than 4Hz/ 1%)**
100			393 - 407Hz Constant load tolerance - ± 0.5%	
75				
50				
25				
0				

Note: Frequency Modulation. Frequency Modulation is the periodic variation in frequency. The periodicity of Frequency modulation should be considered to be longer than 1 cycle time at nominal frequency and less than 10 seconds.

$$\text{Frequency Modulation(Percent)} = 100 \times \frac{(F_{max} - F_{min})}{(2 \times F_{nominal})}$$

13. **Voltage Transient Response Test**.

Load %		**Initial Value**	**Momentary Value**	**Final Value**	**% Peak Variation**		**Recovery Time**	
					Observed	**Permissible Limit**	**Observed**	**Permissible Limit**
From	**To**							
100	**75**					7.5%		1 Sec to recover to 0.5% of the final steady state value
75	**50**							
50	**25**							
25	**0**							
0+M						15%		
25+M								
50+M								
94+M								

Note: When the frequency converter set is supplying any load up to 94 % of the rated load at 0.8 lagging power factor and a load equal to 50% of KVA at any power factor between zero and 0.4 lagging is suddenly applied, the momentary voltage change must not exceed 15 % of the rated voltage.

14. **Waveform Harmonic Content**.

(a)	Maximum total harmonic content of waveform (not to exceed 5 % of the amplitude of fundamental)	

15. **Recommendations**. Following recommended: -

( ) ( )

Trial Team Member Trial Officer