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Naval Trials and Acceptance Authority
c/o Fleet Mail Office
Mumbai 400001

NATAA/300/Policy/RH

15 Jan 21

The Chief of Naval Staff
(for Commodore (Marine Engineering))
Directorate of Marine Engineering
IHQ MoD(N)
New Delhi - 110011

**SOP FOR RUNNING HOUR EXTENSION TRIALS OF
AUXILIARY ENGINEERING MACHINERY**

1. Refer to the following:-
 - (a) NO(Str) 11/16 regarding extension of running hours of Diesel Engines.
 - (b) INBR 3000 Articles 0335 & 1602 on Maintenance & Repair and Life Assessment Trials.
 - (c) NATAA letter NATAA/300/Policy/RH dated 25 Nov 20 (not addressed to all).
2. **Background.** The extension of running hours on machinery is sought by the ships from the Administrative Authority as and when major routines fall due during the operational phase. Running Hours Extensions for various equipment are normally proposed to cater for the ship's operational requirements and to converge the maintenance requirement of a particular equipment with scheduled refits / maintenance periods. Additionally, unforeseen and sustained operational requirements have posed an overarching need to sustain various equipment onboard ships through suitable running hour extensions. Such extensions are granted based on recommendations of the concerned trial agency.
3. In order to ensure operational availability of the equipment onboard ships, the authority to grant extension of running hours **up to 10%** is exercised by the respective Headquarters. Extensions beyond 10% are forwarded to IHQMoD(N)/DME for approval. Further, this provision is to be exercised only in unavoidable circumstances and not as a matter of routine, subject to satisfactory performance parameters and vibration trials of the equipment. The guidelines in this regards are enumerated in INBR 3000 articles 0335 and 1602. Navy Order (NO(Str)11/16 for running hours extension of diesel engines is also relevant on this regard. It is pertinent to mention that extension of running hours should not be construed as routine permission for over-exploitation of the equipment without maintenance. Laid down norms for exploitation of the equipment depending on the permissible hours per operational cycle (as in case of Main Engines/ Generators) should be strictly adhered to.
4. **Existing Procedure for Running Hour Extension Trials.** It has been observed that ship's staff forward requisition for running hours extension with certain details wrt equipment performance status. Presently, there are no specific directives in vogue, which clearly define the extent of technical details required to be forwarded by

ship staff while seeking running hours extension. The ship staff decides the extent of information that needs to be shared with all concerned. Considering that the ship's staff has a holistic picture of the status of equipment and its associated systems, it is prudent that the ship's staff forwards a comprehensive status of equipment and the associated system, highlighting any known defects, limitations, vibration trend, lub oil parameters trend, SPM, capacity performance etc. Currently, no such procedure or proforma exists which can capture the details of the equipment and its associated systems and studied by trial agencies prior deputing teams onboard for holistic trials.

5. **Gap Analysis.** In order to comprehensively and holistically assess the health of an equipment for recommending extension of running hours or deferment of a routine, the trial agency needs to study the past performance, undertake trials/checks, study vibration signatures, study CBPM trends etc. Accordingly, there is a need to issue specific guidelines on procedure for running hour extensions of auxiliary engineering machinery. Towards, arriving at a plausible solution, NATAA vide letter ibid has collated comments and recommendations from all MTUs/ CTT(Pbr) and the same have been incorporated towards formulating SOP for running hours extension trials.

6. **Proposed Procedure.** For smooth conduct of the running hours extension trials, few procedural reforms needs to necessarily undertaken. Towards this, it is proposed that the ship's staff forward a filled proforma for conduct of running hours/ life extension trials as per the copy placed at **Enclosure 1** to the respective trial agency capturing all the relevant technical details of the equipment for which the running hours extension is being sought. On receipt of the filled proforma and directive for conduct of trial by the Administrative Authority, the respective trial team conducting these trials or assessing the performance using the trial sheets forwarded by ships, are to diligently undertake the trials and analyse the parameters before forwarding the recommendations to the Administrative Authority. Further, following should be ascertained to holistically evaluate all the parameters before recommending running hours extension:-

(a) **Study of Past Performance of Equipment.** The trial teams are to study the past performance of the equipment along with running parameters prior conduct of trials as this would enable a more comprehensive assessment of the equipment during the conduct of trials.

(b) **Equipment Trials.** The following trials / checks should be undertaken by concerned trial agencies: -

- (i) SDCs
- (ii) Performance
- (iii) Vibration (NBA of safety copy)
- (iv) SPM (where applicable)
- (v) Attenuation across mounts
- (vi) Capacity Trials (where applicable)
- (vii) Service logs and running log books inspection

(c) **Installation & System Trials.** Running hours extension trials include the equipment as well as its associated auxiliaries and systems which needs to be assessed in order to consider further exploitation beyond the running hours stipulated for planned maintenance. As part of the installation checks, the associated systems are to be checked for leaks and proper securing. Rubber durites, bellows, SV mounts etc are to be checked for their satisfactory material state.

(d) Conduct of Trials. The running hours extension performance trials are to be undertaken after satisfactory completion of the pre-trial requirements. Any deficiency should be reflected in the trial report and liquidated at the earliest available opportunity. The performance trials may be conducted at sea / harbour depending on the type of equipment and should be discontinued in case of any abnormality.

(e) Vibration Trend. The past vibration trend should be checked on the e-CBPM software and the same needs to be correlated with the current vibration readings.

(f) Lub Oil Parametric Trend. The past basic and advance lub oil reports should be checked for its parametric trend. A fresh oil sample should be drawn from the equipment while equipment is running during trials and sample landed for analysis on urgent basis. The lub oil report is to be checked and details to be forwarded to Administrative Authority by the trials unit concerned.

(g) MAINTOPs. MAINTOPs for the equipment should be scrutinised and the following should be recommended:-

(i) MAINTOP routines (for which the running hours extension is being recommended) that can be carried out by ship staff must be undertaken. For example, replacement of lub oils, filters, cleaning of filters, etc.

(ii) Routines which can be undertaken by ship's staff with assistance from Yard, within the available time frame and operational limitations, must be recommended in the report.

(iii) Balance routines requiring prolonged downtime of equipment / ship may be deferred, if performance of equipment is satisfactory.

(h) Extension Beyond 10% Running Hours. The trial teams while undertaking running hours extension trials beyond 10% (i.e., additional 10% running hours which is forwarded to IHQMoD (N) for consideration) should specifically assess the performance of the equipment in terms of performance parameters, vibration trend, lub oil parameters etc. since the approval of the previous 10% running hours extension. It is important that the performance of the equipment is correctly assessed for the past extension period and any increasing trend should be captured and analysed prior recommending further running hours extension.

7. Way Ahead. At present there are no clear directives which define the extent of technical details required to be forwarded by ship staff while seeking running hours extension for engineering auxiliary equipment. In addition, the trial agencies do not follow a standard proforma for recommending running hours extension. The extent of checks / trials being followed by different trial agencies are at variance. It is imperative that all trial teams undertake the trials holistically and diligently along with thorough assessment of the past and current performance of the equipment as brought out in para 6 above. A draft proforma to be forwarded by the trial units is placed at **Enclosure 2** clearly bringing out the following aspects and not limited to :-

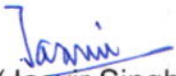
(a) Clear recommendations on further exploitation of the equipment for which running hours extension trials were conducted.

(b) A list of routines / health assessment checks to be undertaken by ship's staff / Yard prior to approval of the required running hours extension is to be indicated.

(c) Known limitations, if any, which has been brought out by the ship (along with details of waivers accorded by the approving authority) need to be clearly spelt out as part of the recommendations.

(d) As part of performance monitoring, on grant of running hours extension, monthly feedback is to be forwarded by the ship to the respective trial team wrt the performance and vibration characteristic of the equipment during the preceding month.

8. **Recommendations.** In view of the above, it is requested that the contents of this letter be perused and a Navy Order / policy letter be issued by IHQMOD(N) for adherence by all ships and trial agencies.


(Jasvir Singh)
Captain
Director
for Director General

Encl. As above

Copy to:-

The Flag Officer Commanding-in-Chief
(for CEO)
Headquarters, Western Naval Command
Mumbai – 400023

The Flag Officer Commanding-in-Chief
(for CEO)
Headquarters, Eastern Naval Command
Visakhapatnam – 530014

The Flag Officer Commanding-in-Chief
(for CEO)
Headquarters, Southern Naval Command
Kochi – 682004

The Commander-in-Chief
(for CTO (Marine))
Headquarters, A & N Command
Port Blair – 744102

PROFORMA FOR RUNNING HOURS / LIFE EXTENSION TRIALS
OF ENGINEERING AUXILIARY EQUIPMENT - TO BE FILLED BY SHIP'S STAFF

SNO.	DESCRIPTION	REMARKS
1.	Ship	
	Name of Equipment	
	(a) Type & Make	
	(b) Serial No.	
	(c) Rated Maximum RPM	
2.	(d) Starting Current (mA)	
	(e) Running Current (mA)	
	(f) SPM reading of the Motor (dBm/ dBc)	
	(g) Type of Coupling (Rigid/ Flexible/ Belt/ Gear)	
	(h) Lub Oil Used (Indicate last change date)	
	Running Hours :-	
3.	(a) Since Installation	
	(b) Since Last Major Routine	
4.	Vibration Trial Details (copy of the latest recorded values to be attached with date) :-	
	(a) By MTU	
	(b) By SS	
5.	Last Major Routines Undertaken	
6.	LO Report (Latest Basic/ Advance Test Results to be attached)	
7.	Past History of Equipment (Indicate major defects observed/ assemblies replaced during the operational period)	
8.	State of Safety Devices (Date last checked & present Ops status) Attach last SDC report.	
9.	State of Instrumentation & Controls (Indicate deficiency, if any)	
10.	Condition of associated systems (leakages, instrumentation, pipes, rubber durites, flexible bellows, etc)	
11.	State of SV mounts	
12.	Details of ship's staff routines completed	
13.	Safety Copy (to be forwarded to MTU if vibration trials not feasible due to operational commitments)	
14.	Tentative dates for :-	
	(a) Installation, Instrumentation and Safety Device checks	
	(b) Load Trials/ Sea Trials	
15.	Hours proposed for extension	
16.	Attach parameter sheet corresponding to the max load/ ERPM achieved in the last one month.	
Date:		Commanding Officer

PART - A

PROFORMA FOR SUMMARY OF RUNNING HOURS/ LIFE EXTENSION TRIALS
TO BE FILLED UP BY THE TRIAL UNIT

<u>SNO</u>	<u>EQUIPMENT</u>	<u>DESCRIPTION / PARAMETERS</u>	<u>REMARKS</u>
1.	Trials & Checks	(a) SDC (b) Instrumentation (c) Control Panel (d) Performance (e) Capacity (f) Vibration (g) SPM (h) Attenuation (j) Service/ Running Log	(a) (b) (c) (d) (e) (f) (g) (h) (j)
2.	Associated System Checks	(a) System Audit (b) SV Mounts (c) Rubber Durites (d) Flexible hoses (e) Rubber/ Metallic bellows (f) Clamping (g) Instrumentation	(a) (b) (c) (d) (e) (f) (g)
3.	Safety Copy	To be sought and NBA to be undertaken if vibration trials not feasible due to ship's operational commitment prior submission of RH extension.	
4.	Vibration Analysis Trend	Analyse past trend and substantiate with the present readings recorded.	
5.	LO Analysis Trend	Analyse past basic and advance LO reports, if required draw fresh sample during trials and land for analysis.	
6.	MAINTOP	<u>The following should be listed :-</u> (a) Routines which can be undertaken by SS should be completed (b) Routines which can be undertaken by SS with assistance from Yard (c) Balance routines requiring prolong downtime of equipment/ ship to be deferred	(a) (b) (c)

PART - B**RECOMMENDATIONS OF RUNNING HOURS / LIFE EXTENSION TRIALS**

(Serials to be covered as part of the Trial Team recommendations)

1. The recommendations of the running hours extension trials being undertaken by the respective trial agency should be covered under the following serials:-

- Equipment cleared for exploitation without conduct of schedule routines.
- Limited exploitation at selective regimes, if so deemed, based on the parameters.
- List of routines to be undertaken by SS / Yard prior grant of RH extension.
- Limitations in the equipment, if any.
- Defect rectification prior to normal/ limited exploitation.

2. Post recommendations of the running hours extension, a monthly feedback is to be sought from the ship wrt the performance and vibration characteristic of the equipment during the period.