

SCOPE OF WORK

REMOVAL AND REFITMENT OF MTU 16V 1163 TB 93 MAIN ENGINE AND REDUCTION GEAR – INS ABHAY

<u>S. NO</u>	<u>DESCRIPTION OF WORK</u>	<u>QTY</u>
1.	Draining of Lub oil, Fresh water, Sea water and Fuel oil. Degutting of system lines (first connections)	02
2.	Degutting of exhaust system and removal of bellows and blanking the exhaust out let.	02
3.	Removal of air intake filters, air intake housing ('Y' piece) and blanking of system.	02
4.	Removal of heat shields.	02
5.	Disconnection of fuel line first connection hoses.	02
6.	Disconnection of lub oil line hose connection	02
7.	Disconnection of starting air line hose connection.	02
8.	Disconnection of S/Water line, removal of rubber bellows and S/W suction and discharge pipes.	02
9.	Disconnection of F/W lines first connections.	02
10.	Decoupling and removal of Vulcon coupling.	02
11.	Decoupling of Tooth coupling.	02
12.	Breaking of chock fasting after taking main engines and gear boxes on jacks bolts.	02
13.	Fitment of lifting eyes bolts in place if not fabrication/welding of eye bolts and load testing of eye bolts to specified value	02
14.	Loosening of foundation bolts and buffers bolts on locking the engine by welding stop plates on engine foundation.	02
15.	Locking of engine crankshaft with special arrangement provided by OEM.	02

16.	Fitment of transportation clamps on engine mounts.	02
17	Manufacturing of stands to place engines and gear boxes on Jetty and Transport it to shop	02
18.	lifting of engines and Gear boxes	02
19.	Foundation preparation of Main Engine , Gear Boxes which include polishing and grinding to ensure flatness of foundation	02
20.	Drilling of hole for fixing main engine and gear box to foundation and side support to foundation for alignment.	02
21.	Fitment of tooth coupling post surface preparation of foundation and manufacturing of nuts bolts for coupling of gear box to tooth coupling.	02
22.	Alignment of thrust bearing w.r.t. Tail shaft. Preparation of Metallic chock and Torque tightening of tail shaft with thrust bearing using specialized hydraulic torque tightening machines	02
23.	Lowering of Main engines and securing on loose holding down bolts.	02
24.	Lowering of gear box with tooth coupling drum.	02
25.	Alignment of gear box with reference to thrust bearing input shaft, on jack bolts. Ensure lub oil priming of G/B during alignment	02
26.	Preparation of dam for chock fasting.	02
27.	Chock of gear box foundation.	02
28.	Tightening of foundation bolts to specific torque	02
29.	Alignment of Main engine with reference to G/Box input flange according to OEM laid down procedures on jack bolts.	02
30.	Preparation of dam for chock fasting in section.	02
31.	Pouring of chock fast.	02
32.	Tightening of foundation bolts (96 in nos. to specified torque).	02
33.	Fitment of side stoppers and buffer bolts and maintaining specified clearances.	02
34	Fitment of first connections of all system lines.	02
35	Maintaining the proper height of exhaust compensators by welding tie rods and fitment for	02

	exhaust compensator.	
36	Fitment of intake manifold (Y piece) and air filters. Fitment of heat shield.	02
37	Fitment of all system lines and flushing of lines which includes fuel, lub oil, Sea water, Fresh water, Exhaust trunking of Main engine and D/A and Main air trunking of Main engine.	02
38	Fitment of brackets, Grating and frames	02

SOW/SOR (MODE OF QUOTATION)

REMOVAL AND REFITMENT OF MTU 16V 1163 TB 93 MAIN ENGINE AND REDUCTION GEAR – INS ABHAY

1. Price Bid Format (For L-I determination):

The Price Bid Format in general is given below and Bidders are required to fill this up correctly with full details, as required under Part-II of RFP. This format should be filled up with items / requirements as mentioned in Part-II of RFP): -

(To be strictly adhered to. Non-adherence to this format may result in disqualification)

S/N	DESCRIPTION OF WORK	QTY	Unit Rate in (Rs)		Total Rate in (Rs)		Total Material + Services in (Rs)
			Material	Services	Material	Services	
1.	Draining of Lub oil, Fresh water, Sea water and Fuel oil. Degutting of system lines (first connections)	02					
2.	Degutting of exhaust system and removal of	02					

	bellows and blanking the exhaust out let.								
3.	Removal of air intake filters, air intake housing ('Y' piece) and blanking of system.	02							
4.	Removal of heat shields.	02							
5.	Disconnection of fuel line first connection hoses.	02							
6.	Disconnection of lub oil line hose connection	02							
7.	Disconnection of starting air line hose connection.	02							
8.	Disconnection of S/Water line, removal of rubber bellows and S/W suction and discharge pipes.	02							
9.	Disconnection of F/W lines first connections.	02							
10.	Decoupling and removal of Vulcon coupling.	02							

11.	Decoupling of Tooth coupling.	02							
12.	Breaking of chock fasting after taking main engines and gear boxes on jacks bolts.	02							
13.	Ensure the lifting eyes bolts in place if not fabrication/welding of eye bolts and load testing of eye bolts to specified value	02							
14.	Loosening of foundation bolts and buffers bolts on locking the engine by welding stop plates on engine foundation.	02							
15.	Locking of engine crankshaft with special arrangement provided by OEM.	02							
16.	Fitment of transportation clamps on engine mounts.	02							
17.	Manufacturing of stands to place engines and gear boxes on Jetty and Transport it to shop.	02							
18.	lifting of engines and Gear boxes	02							
19.	Foundation preparation of Main Engine , Gear Boxes	02							

	which include polishing and grinding to ensure flatness of foundation								
20.	Drilling of hole for fixing main engine and gear box to foundation and side support to foundation for alignment.	02							
21.	Fitment of tooth coupling post surface preparation of foundation and manufacturing of nuts bolts for coupling of gear box to tooth coupling.	02							
22.	Alignment of thrust bearing w.r.t. Tail shaft. (Preparation of Metallic chock and Torque tightening of tail shaft with thrust bearing using specialized hydraulic torque tightening machines	02							
23.	Lowering of Main engines and securing on loose holding down bolts.	02							
24.	Lowering of gear box with tooth coupling drum.	02							
25.	Alignment of gear box with reference to thrust bearing	02							

	input shaft, on jack bolts. Ensure lub oil priming of G/B during alignment								
26.	Preparation of dam for chock fastening.	02							
27.	Chock of gear box foundation.	02							
28	Tightening of foundation bolts to specific torque	02							
29	Alignment of Main engine with reference to G/Box input flange according to OEM laid down procedures on jack bolts.	02							
30	Preparation of dam for chock fastening in section.	02							
31	Pouring of chock fast.	02							
32	Tightening of foundation bolts (96 in nos. to specified torque).	02							
33	Fitment of side stoppers and buffer bolts and	02							

	maintaining specified clearances.								
34	Fitment of first connections of all system lines.	02							
35	Maintaining the proper height of exhaust compensators by welding tie rods and fitment for exhaust compensator.	02							
36	Fitment of intake manifold (Y piece) and air filters. Fitment of heat shield.	02							
37	Fitment of all system lines and flushing of lines (a) Fuel (b) Lub oil (c) Sea water (d) Fresh water (e) Exhaust trunking of Main engine and D/A. (f) Main air trunking of Main engine	02							
38	Fitment of brackets, Grating and frames	02							

Taxes and all applicable duties as follow								
(a)	Accessories							
(b)	Installation / Commissioning							
(c)	Training							
(d)	Technical Literature							
(e)	Tools							
(f)	Freight							
(g)	Insurance							
(h)	Packaging & Forwarding							
(i)	AMC							
(j)	Any Other Requirement							
Grand total								

ITEMISED LIST OF ANTICIPATORY AND MANDATORY SPARES ALONG WITH COST BREAKUP MUST BE ATTACHED SEPARATELY ALONG WITH PRICE BID.

(Highlighted portion in grey shade should not be quoted)

2. Additional information in Price Bid on Taxes and Duties (Not in scope of L-I determination):

a. Is Excise Duty extra?

b. If Yes, Mention the following:

- i) Total value of items on which Excise Duty is leviable
- ii) Rate of Excise duty (item-wise if different ED is applicable)
- iii) Surcharge on Excise duty, if applicable
- iv) Total value of excise duty payable

c. Is Excise Duty Exemption (EDE) required

d. If Yes, then mention and enclose the following:

- i. Excise notification number under which EDE can be given

e. Is VAT extra

f. If Yes, then mention the following:

- i) Total value on which VAT is leviable
- ii) Rate of VAT
- iii) Total value of VAT leviable

g. Is Service Tax extra

h. If Yes, then mention the following:

- i) Total value of Services on which Service Tax is leviable
- ii) Rate of Service Tax leviable
- iii) Total value of Service Tax leviable

j. Is Custom Duty Exemption (CDE) required

k. If Yes, then mention the following:

- i) Custom notification number under which CDE can be given (enclose a copy)
- ii) CIF value of stores to be imported
- III) Rate of Customs Duty payable
- IV) Total amount of Customs Duty payable

l. Octroi / Entry taxes

m. Any other Taxes / Duties

Note :

1. **"All material and services are to be supplied by the contractor unless specifically mentioned in the SOW."** (All requirements of Welding and Brazing will be in scope of supplier)
2. The bidder, while preparing Q-bid, is to strictly adhere to Mode of Quotation (MOQ) format. No deviation from the MOQ format is expected. The Bidder is to avoid making any changes to the MOQ format and in case of any discrepancy, seek clarification during the pre-bid meeting. A soft copy of Quote/MoQ in excel format on a CD is to be submitted in sealed manner along with the 'Q' Bid. Non adherence to this may render the bid invalid.
3. Bidders must indicate separately the relevant Taxes/Duties likely to be paid in connection with delivery of completed goods specified in RFP. In absence of this, the total cost quoted by them in their bids will be taken into account in the ranking of bids.
4. The evaluation and comparison of responsive bids and finalisation of L-1 Firm shall be done on the prices of the goods offered and other charges such as Packing & Forwarding, Freight and Insurance, AMC, etc, as indicated in the price schedule of the Bid Document but excluding levies, taxes and duties such as excise duty, VAT, Service tax, Octroi/entry tax, etc on final product, which are to be paid extra as per actuals, wherever applicable.
5. In case the Quote runs into more than one page subtotal on each page to be indicated.
6. Bids should be forwarded by Bidders under their original memo / letter pad inter alia furnishing details like TIN number, VAT/CST number, Bank address with EFT Account if applicable, etc and complete postal and e-mail address of their office.
7. Total Number of pages in the Q-bid are to be mentioned on the first page of the Q-bid. Further each page is to be numbered. For example if there are 20 pages in Q bid, first page to be numbered as 1/20 and last page to be numbered as 20/20.
8. Staging, if required, is to be undertaken in accordance with IS 4014 Part I & II (Code of practice for steel tubular scaffolding).
9. **Foreign Exchange Content.** *Foreign Exchange content, if any, is to be clearly specified along with the specific items on which customs duty would be applicable clearly indicating the rates of customs duty applicable. In the absence of complete unambiguous details, following actions will be taken:-*
 - (i) *Loading custom duty at the rate of 25% on entire material cost, when 'Foreign Exchange' content is not specified in the Q bid.*

(ii) Loading custom duty at the rate of 25% when applicable rate of customs duty is not specified in Q bid.

(iii) Further, customs duty exemption certificate will be issued only if the above mentioned particulars are provided unambiguously.

10. Service Tax. Government of India, Ministry of Finance (Department of Revenue) Notification No. 12/2012 – ‘Service Tax’, dated 17 Mar 2012 exempts ‘Service tax’ for repair of ships or boats or vessels belonging to the Government of India. Therefore the firms are requested not to quote for service tax.

NAVAL DOCKYARD, MUMBAI															
QUALITY ASSURANCE PLAN															
DEPT: QC(E) C.No 74	REV No:02	DATE: 14 Aug 13	FORM NO	Q	C	E	0	7	4	R	E	0	1	0	
SHIP : INS Abhay		Job Title : Removal and Refitment of MTU 16V 1163 TB 93 Main Engine and Reduction Gear.													
QAP No : QCE74-490		QAP DATE : 12 Oct 15								No of pages - 04					
Reference Documents		As per OEM Manuals for MTU 16V 1163 TB 93 Main Engine and Reduction Gear													

Ser	Job Description & Activity Description	Inspection			
		P	R	W	H
01	<p align="center"><u>Stage I Inspection</u></p> <p>(a) <u>Job Description.</u> Material inspection (as applicable).</p> <p>(b) <u>Activity Description / Instruction.</u> Check all items / material listed in standard / promulgated bill of material for overhaul / repair kit is available. Check the following:-</p> <ul style="list-style-type: none"> (i) Check quantity and quality of each item and make list of deficient items. (Total list of components and subcomponent to be provided by User Manager / Firm). (ii) Check if deficient items are made available for inspection at a later stage of the work. (iii) Make list of all spares which were reused / used after reconditioned. (iv) Check manufacturer's test certificates / challans / test certificates. 	1	5	3, 5	3
02	<p align="center"><u>Stage 2 Inspection</u></p> <p>(a) <u>Job Description</u> Degutting.</p> <p>(b) <u>Activity Description / Instruction</u> : Disconnecting of the engine accessory lines and removal of engine surrounding platform.</p> <ul style="list-style-type: none"> (i) Draining of Lub oil, Fresh water, Sea water and Fuel oil. Degutting of system lines (first connections). (ii) Degutting of exhaust system and removal of bellows and blanking the exhaust out let. (iii) Removal of air intake filters, air intake housing ('Y' piece) and blanking of system. (iv) Removal of heat shields. (v) Disconnection of fuel line first connection hoses. (vi) Disconnection of lub oil line hose connection. 	1	5	4, 5	5

Ser	Job Description & Activity Description	Inspection			
		P	R	W	H
	(vii) Disconnection of starting air line hose connection. (viii) Disconnection of S/Water line, removal of rubber bellows and S/W suction and discharge pipes. (ix) Disconnection of F/W lines first connections.				
03	<p style="text-align: center;"><u>Stage 3 Inspection</u></p> <p>(a) <u>Job Description</u> Preparation for Removal of Both Engines and Gear Boxes.</p> <p>(b) <u>Activity Description / Instruction</u></p> <p>(i) Decoupling and removal of Vulcon coupling.</p> <p>(ii) Decoupling of Tooth coupling.</p> <p>(iii) Breaking of chock fasting after taking main engines and gear boxes on jacks bolts.</p> <p>(iv) Fitment of lifting eyes bolts in place if not fabrication/welding of eye bolts and load testing of eye bolts to specified value.</p> <p>(v) Loosening of foundation bolts and buffers bolts on locking the engine by welding stop plates on engine foundation.</p> <p>(vi) Locking of engine crankshaft with special arrangement provided by OEM.</p> <p>(vii) Fitment of transportation clamps on engine mounts.</p> <p>(viii) Manufacturing of stands to place engines and gear boxes on Jetty and Transport it to shop.</p> <p>(ix) Lifting of engines and Gear boxes.</p>	1	5	4, 5	5
04	<p style="text-align: center;"><u>Stage 4 Inspection</u></p> <p>(a) <u>Job Description.</u> Preparation of foundation for fitment of engines and gear boxes, post overhaul.</p> <p>(b) <u>Activity Description / Instruction.</u></p> <p>(i) Foundation preparation of Main Engine, Gear Boxes which include polishing and grinding to ensure flatness of foundation.</p>	1	5	4, 5	3, 5

Ser	Job Description & Activity Description	Inspection			
		P	R	W	H
	(ii) Drilling of hole for fixing main engine and gear box to foundation and side support to foundation for alignment. (iii) Fitment of tooth coupling post surface preparation of foundation and manufacturing of nuts bolts for coupling of gear box to tooth coupling.				
05	<p style="text-align: center;"><u>Stage 5 Inspection</u></p> (a) <u>Job Description</u> . Alignment of thrust bearing w.r.t. Tail shaft. (b) <u>Activity Description / Instruction</u> . (i) Alignment of thrust bearing w.r.t. Tail shaft. Preparation of Metallic chock and Torque tightening of tail shaft with thrust bearing using specialized hydraulic torque tightening machines.	1	5	3, 4, 5	3, 5
06	<p style="text-align: center;"><u>Stage 6 Inspection</u></p> (a) <u>Job Description</u> . Lowering of main engines and gear boxes on board, post overhaul. (b) <u>Activity Description / Instruction</u> . (i) Lowering of Main engines and securing on loose holding down bolts. (ii) Lowering of gear box with tooth coupling drum	1	5	4, 5	5
07	<p style="text-align: center;"><u>Stage 7 Inspection</u></p> (a) <u>Job Description</u> . Alignment of gear box w.r.t. thrust bearing. (b) <u>Activity Description / Instruction</u> . (i) Alignment of gear box with reference to thrust bearing input shaft, on jack bolts. Ensure lub oil priming of G/B during alignment.	1	5	3, 4, 5	3, 5
08	<p style="text-align: center;"><u>Stage 8 Inspection</u></p> (a) <u>Job Description</u> Securing of Gear Box. (b) <u>Activity Description / Instruction</u> (i) Preparation of dam for chock fasting. (ii) Chock of gear box foundation. (iii) Tightening of foundation bolts to specific torque.	1	5	3, 4, 5	5

Ser	Job Description & Activity Description	Inspection			
		P	R	W	H
09	<p align="center"><u>Stage 9 Inspection</u></p> <p>(a) <u>Job Description</u> Alignment of Main engine w.r.t. Gear Box.</p> <p>(b) <u>Activity Description / Instruction</u></p> <p>(i) Alignment of Main engine with reference to G/Box input flange according to OEM laid down procedures on jack bolts.</p>	1	5	3, 4, 5	3, 5
10	<p align="center"><u>Stage 10 Inspection</u></p> <p>(a) <u>Job Description</u> Securing of Main Engine.</p> <p>(b) <u>Activity Description / Instruction</u></p> <p>(i) Preparation of dam for chock fastening in section.</p> <p>(ii) Pouring of chock fast.</p> <p>(iii) Tightening of foundation bolts (96 in nos. to specified torque).</p> <p>(iv) Fitment of side stoppers and buffer bolts and maintaining specified clearances.</p>	1	5	3, 4, 5	5
11	<p align="center"><u>Stage 11 Inspection</u></p> <p>(a) <u>Job Description</u> Regutting.</p> <p>(b) <u>Activity Description / Instruction</u></p> <p>(i) Fitment of first connections of all system lines.</p> <p>(ii) Maintaining the proper height of exhaust compensators by welding tie rods and fitment for exhaust compensator.</p> <p>(iii) Fitment of intake manifold (Y piece) and air filters. Fitment of heat shield.</p> <p>(iv) Fitment of all system lines and flushing of lines which includes fuel, lub oil, Sea water, Fresh water, Exhaust trunking of Main engine and D/A and Main air trunking of Main engine.</p> <p>(v) Fitment of brackets, Grating and frames.</p>	1	5	4, 5	5
12	<p align="center"><u>Stage 12 Inspection</u></p> <p>(a) <u>Job Description.</u> Preparation of inspection reports and forwarding of trial/test reports.</p> <p>(b) <u>Activity Description / Instruction.</u> All inspection reports and trial/test reports as per the format to be forwarded to SMQC (E) for promulgation of Inspection Notes / Quality Control Inspection Reports (QCIRs).</p>	1	5	3, 5	3

Ser	Job Description & Activity Description	Inspection			
		P	R	W	H
	<p style="text-align: center;"><u>Remarks</u></p> <p><u>Legend</u></p> <p>(a) 'P'- Perform, 'R'- Review, 'W'- Witness, 'H'- Hold Point. (b) 1 - Firm, 2 - IRS/LRS, 3 - SMQCE 4 - Ship's Staff, 5 - SMDAG (Contract Executing Authority) (c) <u>QC Hold Point (H)</u>. The Dept / Firm / Contractor is not to proceed further till the receipt of approval from QC representative. (d) <u>For Offloaded Jobs</u>. All stages to be QC checked / witnessed as indicated above. (e) In case of any renewal of material is to be undertaken and the composition is not known from OEM manuals / drawings, the certificate of the original / renewal material is required to be submitted. (f) The Firm / dept. is required to undertake inspections, satisfy themselves regarding the quality of the items / jobs prior to offering for QC Checks / inspections. (g) <u>Environmental and Safety Standards</u>. The Dept / Firm / Contactor shall follow all safety norms and IMS (Integrated Management Systems) standards of ND (MB) in accordance with ISO9001:2008, ISO14001:2004 & OHSAS 18001:2007.</p>				