

MORMUGAO PORT TRUST  
MARINE DEPARTMENT, SE[M]-Section

Notice Inviting Budgetary Offers

Budgetary Offer no: **DC/SE(M)/63/06B/2021**

Name of Work	<b>Revamping of Electronic control automation system</b> on board tug Tiracol-II at MPT, Goa.
Date of submission of offers	on or before <b>05/07/2021 at 1430 Hrs.</b>
Address for communication:	Superintending Engineer (M) Marine department, 1 <sup>st</sup> floor, AO Bldg, Headland Sada, Mormugao Port Trust, Mormugao Goa – 403804.
Contact Details	Phone :0832-2594816 / 0832-2594804 E-mail: <a href="mailto:dc@mptgoa.gov.in">dc@mptgoa.gov.in</a> , <a href="mailto:hm@mptgoa.gov.in">hm@mptgoa.gov.in</a> <a href="mailto:nixondomingos.gomes@mptgoa.gov.in">nixondomingos.gomes@mptgoa.gov.in</a>
Website	<a href="http://www.mptgoa.com">www.mptgoa.com</a>

Dy. Conservator  
MORMUGAO PORT TRUST

## TECHNICAL SPECIFICATIONS

### 1.1. General

Mormugao Port Trust, Goa, has proposed to have Revamping of Electronic control automation system on board tug Tiracol-II at Mormugao Harbour , Goa.

### 1.2. Scope of work (Services required)

#### A. DESCRIPTION OF THE TUG

Name of the Craft	Tug Tiracol-II
Capacity	45T bollard-pull
Date of Build	16-Apr-2003
Registration	Visakhapatnam
IMO No	9219109
Light Ship	521T
NRT	131
Overall Length	31.746 m
LBP	29.927 m
Breadth	11.235 m
Depth	4.378 m
Draught	4.94 m
Speed	12 Knots
Propulsion system	Voith Schneider Propulsion(PORT & STBD)
Main Engine Make	Wartsila
Main Engine Model	W6L26 (02 nos x 1910 kw each)
Main engine serial no	26499 STBD and 26500 PORT

#### B) Outline of Automation system of Tug:

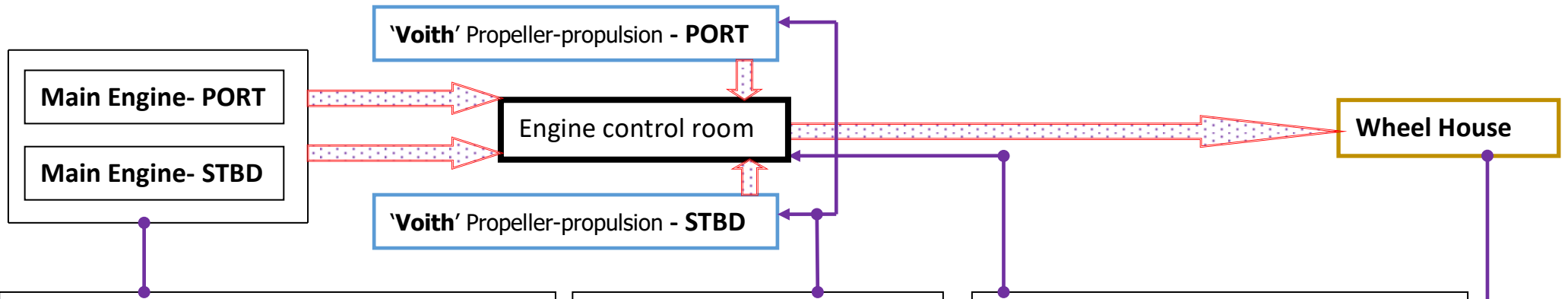
i) PRAXIS G-Data ship automation system (G-MOWS) was installed on the main engines, all automation control, safeties and cutoffs were controlled by PRAXIS system, and was in service from 2003 till 2008.

ii) In 2008 PRAXIS G-Data ship automation system was decommissioned and replaced by M/s Wartsila with new system called Integrated Alarm System (**IAS**) consisting of Allen-Bradley system.

iii) **WECS 2000** system is mounted on both main engines.

iv) Presently STBD main engine starts independently (local and emergency mode). Port main engine does not start independently (local mode or emergency mode). To start the port main engine, the starboard main engine needs to be started and simultaneously the port main engine to be started.

## C) General Layout of Existing system



### Main Engine

- 1) Has a digital display which indicates RPM, lube oil pressure, Fresh Water temperature, Low lube oil pressure cut off, High water temperature cut off controlled by **engine control unit (ECU)**
- 2) The above parameters (sr. no **01**) which are controlled by engine ECU are integrated with the engine room automation system with additional parameters which includes Running hours, HT & LT water temp & pressure, water/Fuel/Lubrication oil temp & pressure, Main Bearings/Exhaust/Exhaust gas T-C temperature, Turbo charger/Engine RPM ,charge air/Start air pressure and Chief RPM limit of main engine are displayed on digital display unit located in Engine room and wheel house

### Voith Propeller-propulsion-VPPS

Various VPPS parameters which includes CP-control/ CP-lube pressure, CP bearing temp 1/2/3/4/5, CP prop lube oil & CP Turbo Coupler bearing temp are displayed on digital display unit located in Engine control room and wheel house

**Engine control room** includes the following components:

- 1) Allen Bradley display panel-01 no. for displaying all parameters of main engines, Voith propulsion, common engine room alarms also displays activated alarms and trips.
- 2) Allen Bradley Flex Logix processor unit-02 no's
- 3) Viking 22 speed control panel, make Alstom- 02 no's
- 4) UPS unit-01 no's

**Wheel house** has Allen Bradley display panel-01 no. for displaying all parameters of main engines, Voith propulsion, common engine room alarms also displays activated alarms and trips.

**D) The new automation system should incorporate following parameter's that need to be monitored /controlled**

**I) Main Engine (PORT & STBD)**

<b>1)</b> Starting Air pressure (Alarm -low@ 15 bar)	<b>2)</b> Stop lever in stop position.
<b>3)</b> Main Engine running hour indicator.	<b>4)</b> Engine speed sensor failure.
<b>5)</b> Stop lever in stop position (Alarm indication)	<b>6)</b> Turning gear engage (Alarm indication)
<b>7)</b> Control air pressure (Alarm - low@ 15bar)	<b>8)</b> RPM indicator
<b>9)</b> Exhaust i) Gas temp. Unit 1,2,3,4,5,6 , alarm-high @ 490°C	<b>10)</b> Lube oil i) Low Pressure,inlet ,alarm @2.0 Kg/cm2 ii) High Temp ,inlet,alarm @70°C iii) sump level- low , alarm @82%
<b>11)</b> Fuel oil pressure low, inlet (alarm@ 2.0 kg/cm2)	<b>12)</b> HT water temp, outlet alarm ,high @80°c
<b>13)</b> Parameters that need to be triggered with an ALARM followed by both Main engines CUT OFF are:	
a) Engine Start c) Lube oil pressure, Inlet, Cut off @ 1.5 kg/cm2 e) Engine over speed trip (0-1200rpm)-stop @118%	b) Engine Stop d) HT-water temp., outlet (Cut off @100°C) f) Emergency stop

**II) Voith Propeller propulsion system (PORT & STBD) ALARMS**

<b>1)</b> Control Oil Pressure (high-35 bar / LOW-17 bar)	<b>2)</b> L.O. Pressure-LOW 0.5 bar
<b>3)</b> Bearing temperature 1,2,3,4,5 –HIGH @ 85°C	<b>4)</b> L.O. temp -HIGH@ 85°C
<b>5)</b> Turbo coupling bearing temp (HIGH@ 85°C)	<b>6)</b> Elevated oil tank low level

**III) Engine Room General Alarm**

<b>1)</b> High level bilge alarm	<b>2)</b> F.O. day service tank level (PORT & STBD) High
<b>4)</b> Main Engine Expansion Tank Low Level	<b>3)</b> F.O. day service tank level (PORT & STBD) LOW

**E)** Our requirements is for Revamping of existing “electronic control automation system” which includes designing, programming, software, supply of spares and installation of automation system of PLC based or Relay based system.

**i)** The tenderer shall undertake full responsibility for providing a complete and State of Art Scalable automation system meeting the objectives, functional and specific requirement.

**ii)** Supply of all items including all accessories, console desks, system cabinets, special tool, test equipment's, Software, Installation Material, Spares etc. required to execute the project in all respects. However if any additional items are required to meet the functionality of the automation System as per this budgetary offer, vendor shall highlight along with offer or otherwise during execution vendor shall supply the same without any cost and time implication.

**iii)** Performing all works required for Designing, Engineering, Testing, Supply, Installation, Interfacing & establishing with Communication system on dedicated Channels, PLC, Dispenser Cards, Odorizer unit, instrumentation & electrical system etc. Commissioning(with supply of commissioning spares including consumables), Site Testing, Test Run and putting into operation of the system complete in all aspects.

**iv)** Tenderer shall ensure that system support for maintenance, upgradation and enhancement/expansion of the automation system/software shall be available on payment basis for minimum of 5 years from the installation.

**v)** Training of Company's personnel in operation, maintenance, system internals, expansion/modification and any other details required for trouble free operation of installed automation system along with communication system as proposed.

**vi)** All technical personnel assigned to the site must be fully conversant with the specific system and its software packages. The field personnel shall have both hardware and software capability to bring the system online quickly and efficiently and with a minimum of interference with other concurrent construction and commissioning activity.

**vii)** The vendor Shall include adequate test equipment and tools for testing and calibration of all equipment supplied by him.

**viii)** All installation material such as AC and DC cables, both digital and analog Instrumentation cables, telecom interface cable, serial interface cables, data cables, cable trays/conduits, relays, connectors, switches, fuses, terminations, distribution boxes and other items required shall be provided by vendor.

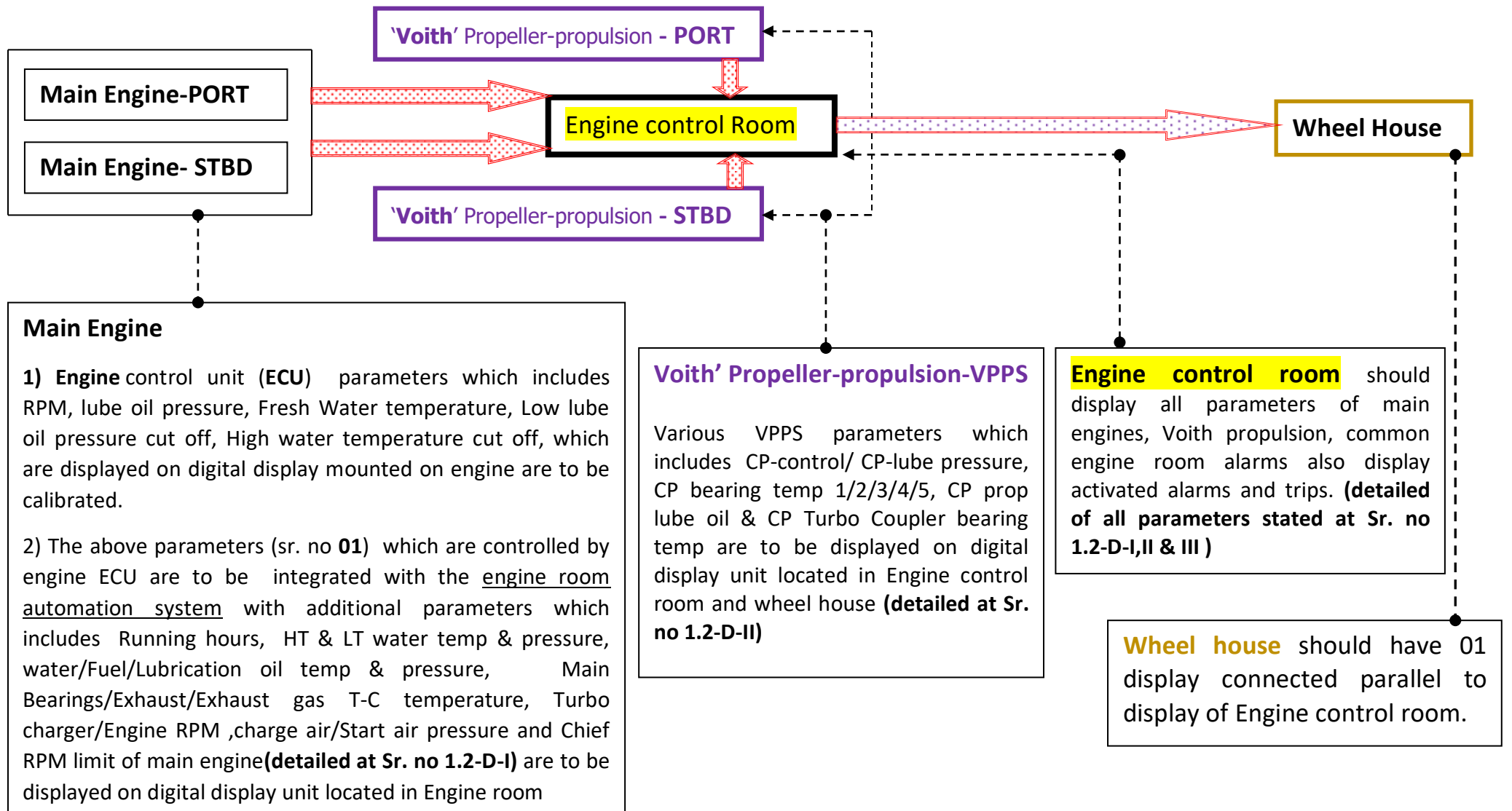
**ix)** Automation should be such that both PORT and STBD engines should start independently in local and emergency mode

**x)** The quality of materials used shall be of the highest order and shall conform to the international standards and safety standards as per relevant hazardous area classification.

**xi)** The tenderer shall provide the necessary software free of cost for online diagnosis, troubleshooting and obtaining online support and monitoring the Tug automation system. Necessary training for the same to be provided to the Port staff at no extra cost

Main engine (local display unit {engine control unit-ECU}) & ECR alarm panel and connected machinery sensors, transmitters, panel meters for monitoring of engine parameters to be calibrated and calibration certificate to be issued. All safety cut outs and alarm system to be checked and satisfactory functional operation to be shown to Ship-staff.

## F) Outline of new system-PLC based



## 1.3 BILL OF QUANTITIES

### 1) PLC based Automation system

Sr No	Description	Unit	Qty	Rate	Amount
A) <b>Service charges</b> for removing existing system, designing, installation testing and commissioning of new "Automation system"					
1)	Isolating existing system				
2)	Designing, of new <b>PLC based Automation system</b>				
3)	Installation testing and commissioning of new <b>PLC based Automation system</b>				
B) <b>Supply of spares</b> required for new "Automation system"(Spares should be from reputed manufacturers)					
1)	Details of spares required for <b>PLC</b> based system and manufacturer				
<b>GRAND TOTAL</b>					

(In words Rupees \_\_\_\_\_ )

**Note:**

- 1) The quantities mentioned in the BOQ (Bill of Quantities) are indicative but not exhaustive. The payment shall be made at actual.
- 2) The offered rates shall be **exclusive of GST**.

Date:

Signature:

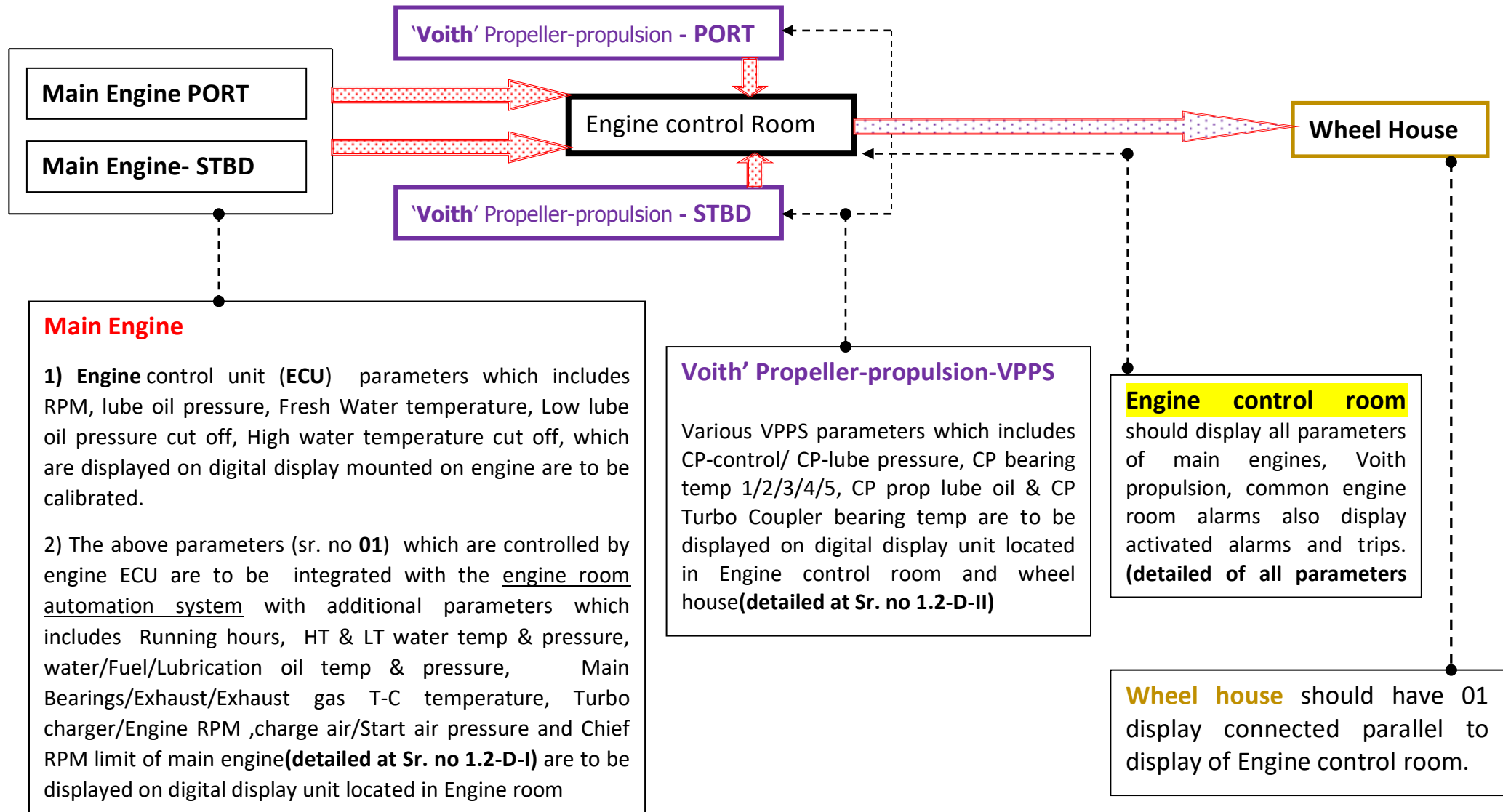
Place:

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## 1.4 Outline of new system- Relay Based





## 1.5 BILL OF QUANTITIES

### 1) Relay Based Automation system

Sr No	Description	Unit	Qty	Rate	Amount
A) <b>Service charges</b> for removing existing system, designing, installation testing and commissioning of new "Automation system"					
1)	Isolating existing system				
2)	Designing, of new <b>Relay based Automation system</b>				
3)	Installation testing and commissioning of new <b>Relay based Automation system</b>				
B) <b>Supply of spares</b> required for new "Automation system"(Spares should be from reputed manufacturers)					
1)	Details of spares required for <b>Relay</b> based system and manufacturer				
<b>GRAND TOTAL</b>					

(In words Rupees \_\_\_\_\_ )

**Note:**

- 1) The quantities mentioned in the BOQ (Bill of Quantities) are indicative but not exhaustive. The payment shall be made at actual.
- 2) The offered rates shall be **exclusive of GST**.

Date:

Signature:

Place:

Name:

Address:

Office Seal of firm