

ตารางแสดงวงเงินงบประมาณที่ได้รับจัดสรรและราคากลาง(ราคาอ้างอิง)  
ในการจัดซื้อจัดจ้างที่มีใช้งานก่อสร้าง

๑. ชื่อโครงการ.....การจัดหา Integrated Platform Management System (IPMS)  
กิจกรรม.....การจัดหา Integrated Platform Management System (IPMS) ตราอักษร  
Servowatch แบบ Marine Automation & Integrated Ship Solution จำนวน ๑ ระบบ  
/หน่วยงานเจ้าของโครงการ สำนักโครงการเรือตรวจการณีกองทัพเรือ ลำที่ ๒ บริษัท อุ้งกรุงเทพ จำกัด
๒. วงเงินงบประมาณที่ได้รับจัดสรร ๔๑,๐๐๐,๐๐๐ บาท (ไม่รวมภาษีมูลค่าเพิ่ม ๗%)
๓. วันที่กำหนดราคากลาง (ราคาอ้างอิง) วันที่ ๑๔ ตุลาคม ๒๕๕๙  
เป็นเงิน ๘๗๐,๖๐๐ ปอนด์ (ไม่รวมภาษีมูลค่าเพิ่ม ๗%)  
(คิดเป็นเงินไทยโดยประมาณ ๓๗,๘๘๑,๓๗๓.๐๘ บาท อัตราแลกเปลี่ยน ณ วันที่ ๑๔ ตุลาคม ๒๕๕๙)
๔. แหล่งที่มาของราคากลาง (ราคาอ้างอิง)  
จากการสืบราคาปัจจุบัน จากบริษัทผู้ผลิต ดังนี้  
๔.๑ Servowatch Systems Limited
๕. รายชื่อเจ้าหน้าที่ผู้กำหนดราคากลาง (ราคาอ้างอิง)  
๕.๑ นายวิทยา เลิศบัวสิน หัวหน้าแผนกบริหารงานพัสดุ (ปฏิบัติหน้าที่)  
๕.๒ นายวิศรุฒ อนันตเดโชชัย พนักงานพัสดุ ๒

**Term of Reference (TOR)**  
**INTEGRATED PLATFORM MANAGEMENT SYSTEM (IPMS)**  
**for the Royal Thai Navy Offshore Patrol Vessel**

**1. Objective**

The Bangkok Dock Company (1957) Limited (Buyer) wishes to announce this Term of Reference (TOR) for procuring Integrated Platform Management System (IPMS) for the construction of the Royal Thai Navy Offshore Patrol Vessel (OPV)

**2. Requirement**

2.1 Goods shall be 1 (one) set of SERVOWATCH Integrated Platform Management System (IPMS), Marine Automation & Integrated Ship Solution type including Factory Acceptance Test (FAT) Commissioning, Setting to Work, Harbour Acceptance Trial, Sea Acceptance Trial and Operation Training (including Intermediate Training, Depot Training, and On the Job Training).

2.2 Marine Class approval by Lloyd's Register for IPMS shall be provided.

2.3 The detail and scope of supplies are in ANNEX A: Technical Requirement Specification and ANNEX B: Scope of Supply.

2.4 Goods shall be assembled in the Thailand.

2.5 Goods shall be new and never been used.

**3. Condition of Bidding**

3.1 The bid price shall include all costs, expenses, fees, insurance, (currently), and cost for all transportations. For imported goods, transportation shall be CIF LaemChabang Port, Chonburi, Thailand in accordance with Incoterms 2010 (by vessel with Thai flag or same privilege).

3.2 This bid price shall exclude customs duty for the list of materials imported into the Kingdom of Thailand.

3.3 The enumeration of the bid price must be provided in Total Price

3.4 The price shall be separated per items as required in 2.1 and validity shall be until 31<sup>st</sup> December 2016.

**4. Qualification of Bidder**

4.1 Bidder must be a professional to sell goods in this bid.

4.2 Bidder has never been on the blacklist of the Thai Government, or as a result of not receiving orders to another entity or person who is blacklisted by the Thai Government.

4.3 Bidder must act as principal for its own account and not as agent or broker. If any Bidder has a coordinator in Thailand, the name and contact details of such coordinator must be clearly specified in the proposal.

4.4 Bidder must have own bank account where receive/payment shall be made, except, if each payment is not over 30,000 Bath, the counter party may receive/paid by cash.

**5. Document for Consideration**

**5.1 Bidder's Qualification Document**

5.1.1 Copy of Company Registration/Affidavit1 and certified true copy.

5.1.2 Letter of power of attorney, in case of the bidder is authorized the behalf to bid, sign in the bid, or in the other cases. The letter shall be affixed the duty and enclosed with the copy of the identity card or passport and/or household registration, which declare both of the authorizer and behalf. Notarisation is required.

**5.2 Technical Specification Document**

- 5.2.1 The details of specification of goods in this bid must meet the buyer's requirements. The bidder must clearly identify the manufacturer profile and the country of origin.
- 5.2.2 Copy of List of document showing that the bidder sold similar system to install in the Royal Thai Navy Offshore Patrol Vessel.
- 5.2.3 If the Technical Specification documents do not comply with item 5.2.1 - 5.2.2, the buyer reserves the right not to consider the bidder.

## **6. Delivery and Acceptance**

- 6.1 If the goods are transported via sea freight that has Thai flag or the same privilege vessel in operation, Thai flag or the same privilege vessel shall be used. Relevant Bill of Lading shall also be provided.
- 6.2 In the event that the delivery will be delayed due to the non-availability of a Thai Registered Vessel, the bidder shall request an exemption from Bangkok Dock and will be responsible for any such costs incurred seeking such an exemption from the relevant authorities in Thailand. The bidder shall give a minimum of 30 days' notice of a request for an exemption.
- 6.3 The bidder must declare document and/or evidence of delivered goods that meet the specification and standard which specified in Contract or purchase order (PO) as stated in all respects.
- 6.4 If the delivered goods from bidder do not meet the requirements, buyer reserves the right to reject those goods. And in this case, the bidder must immediately take the right to change immediately.
- 6.5 The imported goods shall be CIF Laem Chabang Port, Chonburi, Thailand during normal working hours within 336 days (48 weeks) after receiving Purchasing Order (PO) or Contract Effective Date (CED).
- 6.6 Goods which successfully pass FAT shall be delivered to the Bangkok Dock Warehouse, Sattahip, Chonburi.

## **7. Warranty**

Warranty period shall be 12 months from nominated System acceptance date, or 25 months from hardware delivery whichever is sooner

## **8. Assurance**

Integrated Platform Management System (IPMS) shall be according to class rules subjected to class approval. Bidder shall provide the class certificates in original. In some single cases only copies of class certificates could be accepted.

The bidder shall confirm the quality assurance by issuing a copy of its quality plan that complies with ISO (latest standard) at no extra cost to the buyer.

## **9. Penalty**

If the bidder cannot deliver on time as buyer's scheduled, bidder must pay on a daily rate penalty of 0.1 percent of the goods value that are not delivered from the date of delivery until the date that the bidder has fulfilled the conditions in the contract or PO.

When the penalty reaches the maximum of 5% and if the equipment is still not delivered after this period then buyer shall be entitled to terminate the contract and seek further recompense if buyer has to source an alternative supplier for the equipment. In addition buyer would expect a refund of all payments made.

## **10. Performance Guarantee**

At the time of execution of the contract, the bidder shall submit to buyer a Performance Guarantee in an amount of five percent (5%) of the contract value in favour of the buyer by a first class bank operating in Thailand. The Performance Guarantee shall valid until the end of the agreed warranty period.

In the event the bidder requires an advance payment, the bidder shall issue an Advance Payment Guarantee via a first class bank operating in Thailand and remain valid up to the point of delivery. No advance payment will be made until the Advance Payment Guarantee has been issued to buyer.

## **11. Condition of Payment**

11.1 Payments shall be;

- 15% of the contract price upon submission of the preliminary design documentation packs.
- 15% of the contract price upon completion of a Preliminary Design Review.
- 20% of the contract price upon completion of a Critical Design Review.
- 40% of the contract price at notice of readiness to deliver, post successful Factory Acceptance Test.
- 5% of the contract price upon completion of a successful Harbour Acceptance Trial and system sign off.
- 5% of the contract price upon completion of a successful Sea Acceptance Trial and system sign off.

11.2 Payments by this condition shall be made out of an Irrecoverable and Confirmed Letter of Credit. The bidder is responsible for any other charges related to the transfer of the bank levy, and consent to such deductions from the amount transferred in that period.

11.3 The bank must be a first class bank operating in Thailand.

## **12. Export Licenses/End User Certificate**

In the event of the bidder's equipment requires bidder's Government to issue an Export License before the equipment can be shipped to Thailand, the bidder must advise buyer immediately and provide the required format of the End- User Certificate needed to satisfy its authorities. It should be noted that the issuing of an End-User certificate can take up to 90 days and this should be taken into consideration when requesting such a document from buyer.

## **13. Law of the Contract**

The contract shall be subjected to the Laws of the Kingdom of Thailand with the right to go to Arbitration in the event a dispute cannot be resolved. Arbitration shall be in accordance with current ICC rules and shall take place in Bangkok, Thailand.

## **14. Technical Requirement**

ANNEX A: Technical Requirement Specification

ANNEX B: Scope of Supply

**ANNEX A**  
**Technical Requirement Specification**  
**INTEGRATED PLATFORM MANAGEMENT SYSTEM (IPMS)**  
**For the Royal Thai Navy Offshore Patrol Vessel**

**1. Requirement**

1 (one) set of SERVOWATCH Integrated Platform Management System (IPMS), Marine Automation & Integrated Ship Solution type including Factory Acceptance Test (FAT) Commissioning, Setting to Work, Harbour Acceptance Trial, Sea Acceptance Trial and Operation Training(including Intermediate Training, Depot Training, and On the Job Training.

**2. Technical Date**

**2.1 Workstations**

- 2.1.1 Installed at FWD. DCS. 1 set
- 2.1.2 Installed at AFT. DCS. 1 set
- 2.1.3 Installed at FWD. MSB. 2 set

**2.2 LPUs**

2.2.1 LPU 1 Installin FWD. DCS.

Sensors of the followings connected to LPU1: Bilge / Ballast, Doors / Hatch, Fresh Water, Fuel Oil transfer, Grey Water, HVAC and Refrigeration system

2.2.2 LPU 2 Installin FWD. MDB.

Sensors of the followings connected to LPU2: Bilge/Ballast, Doors/Hatch, Fire Detection System, Fresh Water, Fuel Oil transfer, Grey Water, HPSW System, HVAC and Sewage

2.2.3 LPU 3 Installin FWD. MDB.

Sensors of the followings connected to LPU3: Bilge/Ballast, Doors/Hatch, Fire Detection System, Fresh Water, Fuel Oil transfer, Grey Water,HPSW System, HVAC and Sewage

2.2.4 LPU 4 Installin main engine room.

Sensors of the followings connected to LPU4: Bilge/Ballast, Doors/Hatch, Fuel Oil Service, Compressed Air, Generator No.4, HVAC and Fuel Oil-Fill & Transfer

2.2.5 LPU 5 Installin main engine room.

Sensors of the followings connected to LPU5: CPP and Fuel Oil Service

2.2.6 LPU 6 Installin main engine room.

Sensors of the followings connected to LPU6: CPP and Fuel Oil Service

2.2.7 LPU 7 Installin generator room.

Sensors of the followings connected to LPU7: Fuel Oil transfer, Generator No.1, 2, 4 and Rotary Converter

2.2.8 LPU 8 Installin AFT. MDB.

Sensors of the followings connected to LPU8: Bilge/Ballast, Doors/Hatch, Fire Suppression, HVAC

2.2.9 LPU 9 Installin AFT. DCS.

Sensors of the followings connected to LPU9: Bilge/Ballast, Doors/Hatch, HPSW System, HVAC and Steering Gear

**2.3 System in IPMS**

- 2.3.1 Propulsion: 4 Systems
  - Main Engines
  - Gear Box
  - CPP
  - Steering System

2.3.2 Damage Control: 8 Systems

- Fire Detection System
- Fire Main System
- Water Mist System
- RRSS
- Flooding / Bilge
- Ballast
- Doors & Hatches
- Fire Dampers

2.3.3 Auxiliaries: 12 Systems

- Stabilizer System
- FO Filling/Trans System
- Aviation Fuel System
- Lube Oil System
- HPSW
- Fresh Water System
- Start/Working Air System
- Sewage System
- Gray Water System
- HVAC
- Ventilation system
- Refrigeration System

## 2.4 IOs

Hardware IOs: not less than 1102 IOs

Serial IOs: not less than 1004 IOs

### Tools

Drill tool for installation: 1 pc.

### Design

Comply to Servowatch or newer standard.

### Certificates

Works Test Certificate from factory

### Additional Requirement

- This supply excluded: other material needed for installation such as resin compound with hardener, rubber to avoid resin to flow and releasing fluid.

## 3. Technical Documentation

The following documents are required:

- 3.1 Instruction Manual for Operating and Maintenance
- 3.2 Part Lists
- 3.3 Planned Maintenance System Manual
- 3.4 Test Results record

## 4. Spare part and Consumable

The Bidder shall provide spare part list and consumables to be sufficient for 45 days operation, according to manufacturer standards (If applicable)

## 5. Technical Services

The Bidder shall provide support services of installation guidance including Commissioning, Setting To Work (STW), Harbour Acceptance Test (HAT) and Sea Acceptance Trials (SAT).

## 6. Training

The Bidder shall provide Operation Training, Intermediate Training, Depot Training, and On the Job Training.

## **7. Factory Acceptance Test**

Buyer and the Royal Thai Navy (RTN) reserve the right to attend Factory Acceptance Tests. The bidder will be responsible for all costs in their country, including provision of test fuel and labour in the event that we wish to attend Factory Acceptance Tests. Costs of personnel travel and accommodation shall be responsible of the buyer. If there is a failure of the equipment not to pass the Factory Acceptance Test, the bidder shall be responsible for all additional costs incurred by the party attending the tests.

The bidder shall give 90 days' notice of the intended date for the Factory Acceptance Test of the equipment to enable adequate planning to be made for a team to visit. The bidder shall provide all assistance required to obtain any visa that may be required to enter the bidder's country.

**ANNEX B**  
**Scope of Supply**

<b>Workstations</b>	
<b>Item</b>	<b>Qty Fitted</b>
Console Unit, custom designed, based upon independent single modules (Bridge console supplied by others)	7
Console Mount Workstation Processor c/w Win7 OS	7
Console Workstation Mount Bracket	7
Console Mount 19" Display	7
Console Mount Trackball	7
USB Keyboard	7
UPS	7
UPS Filter	1
Isolation Transformer - 230VAC - 1:1 - 1kVA	7
Breakers	2
Bulkhead Mount Operator Workstation c/w 19" LCD Colour Screen, Touchscreen	2
Winmon Application Software Licence	9
<b>RTU - I/O</b>	
Enclosure	7
Earth Bar	7
B172 Processor	7
B172 Processor RS-485 Card	7
Network Switches	18
Module. Logic Coupler, Ethernet TCP	18
Module, Power Supply Filter Module	18
Module, Termination	18
Supply Module	18
Input module, switch - direct wire 24V	203
Input module, analogue, 4-20mA, SE	22
PT100/RTD 3 wire analogue	10
Passive power supply	9
Digital output card	56
Power Supply Dual DC (24vDC)	7
Power Supply DC-DC	7
Bridge Rectifier	7
7" RAID Screen, Win7 OS	7
Winmon Application software	7
<b>RAID</b>	
Hardware	
7" RAID Screen, Win7 OS	1
Serial Port Relay	1
Buzzer	1
Winmon Application Software Licence	1



<b>Propulsion Control LPU</b>	
<b>Hardware</b>	
Earth Bar	2
B172 Processor	2
Power Supply Dual DC (24vDC)	2
Power Supply DC-DC	2
Bridge Rectifier	2
12 WAY BASE UNIT	2
PSU	2
CPU	2
MODBUS	2
CC LINK	4
DIGITAL I/P	6
DIGITAL O/P	8
ANALOGUE I/P	4
ANALOGUE O/P	2
SIGNAL CONVERTOR PT100	4
SIGNAL CONVERTOR MINI PT100	2
SIGNAL CONVERTOR RESISTANCE	4
SIGNAL CONVERTOR ISOLATION	2
4 POLE RELAY	10
DOUBLE TERMINAL	238
DOUBLE TERMINAL END PLATE	6
5mm 4 POSITION TERMINAL	18
5mm 4 POSITION TERMINAL END PLATE	2
5mm 2 POSITION TERMINAL	36
5mm 2 POSITION TERMINAL END PLATE	2
(24VDC) FUSED LEVER TERMINAL	4
FUSED TERMINAL END PLATE	4
END STOP	12
HMI DISPLAY	2
HMI DISPLAY CABLE	2
FUSE PACK	4
<b>Propulsion Control Panels</b>	
<b>Hardware - Drop in panel – Bridge</b>	
SWITCH LENS – GREEN	40
SWITCH LENS – RED	18
SWITCH LENS – YELLOW	8
SWITCH LENS – BLUE	1
INDICATOR (COMPLETE)	22
MOMENTARY PUSH BUTTON (COMPLETE)	43
MAINTAINED PUSH BUTTON (COMPLETE)	2

SWITCHING ELEMENTS FOR PUSHBUTTON (2 NO)	45
FILEMENT LAMP (28VDC / 30mA)	59
BUTTON GUARD	2
BUZZER	1
CONTROL UNIT TYPE BUK C EXT (PORT)	1
CONTROL UNIT TYPE BUK C EXT (STBD)	1
ILLUMINATED METER - ANALOGUE MOVING COIL (ENGINE RPM 0-1200 Rpm)	2
ILLUMINATED METER - ANALOGUE MOVING COIL (PROP PITCH 35-0-35 Deg)	2
ILLUMINATED METER - ANALOGUE MOVING COIL (PROP RPM 0-300 Rpm)	2
37 WAY D-TYPE INTERFACE MODULE	2
9 WAY D-TYPE INTERFACE MODULE	2
37 Way D-Type Connector Male	4
9 Way D-Type Connector Male	4
DIMMER	1
CC-LINK INPUT MODULE	2
CC-LINK OUTPUT MODULE	2
<b>Hardware - Drop in panel – MCR</b>	
SWITCH LENS – GREEN	40
SWITCH LENS – RED	18
SWITCH LENS – YELLOW	8
SWITCH LENS – BLUE	1
INDICATOR (COMPLETE)	22
MOMENTARY PUSH BUTTON (COMPLETE)	43
MAINTAINED PUSH BUTTON (COMPLETE)	2
SWITCHING ELEMENTS FOR PUSHBUTTON (2 NO)	45
FILEMENT LAMP (28VDC / 30mA)	59
BUTTON GUARD	2
BUZZER	1
CONTROL UNIT TYPE BUK C EXT (PORT)	1
CONTROL UNIT TYPE BUK C EXT (STBD)	1
NON-ILLUMINATED METER - ANALOGUE MOVING COIL (ENGINE RPM 0-1200 Rpm)	2
NON-ILLUMINATED METER - ANALOGUE MOVING COIL (PROP PITCH 35-0-35 Deg)	2
NON-ILLUMINATED METER - ANALOGUE MOVING COIL (PROP RPM 0-300 Rpm)	2
37 WAY D-TYPE INTERFACE MODULE	2
9 WAY D-TYPE INTERFACE MODULE	2
37 Way D-Type Connector Male	4
9 Way D-Type Connector Male	4
CC-LINK INPUT MODULE	2
CC-LINK OUTPUT MODULE	2
TELEGRAPH CONTROLLER (PORT)	1
TELEGRAPH CONTROLLER (STBD)	1
37 WAY D-TYPE INTERFACE MODULE	2
9 WAY D-TYPE INTERFACE MODULE	2
FUSED TERMINAL	2

FUSED TERMINAL END PLATE	1
LEVER TERMINAL	2
LEVER TERMINAL END PLATE	1
4-Way TERMINAL	38
4 Way TERMINAL END PLATE	2
DIODE TERMINAL	4
DIODE TERMINAL END PLATE	2
RELAY TERMINAL	2
RELAY TERMINAL END PLATE	1
TELEGRAPH CONTROLLER (PORT)	1
TELEGRAPH CONTROLLER (STBD)	1
37 WAY D-TYPE INTERFACE MODULE	2
9 WAY D-TYPE INTERFACE MODULE	2
FUSED TERMINAL	2
FUSED TERMINAL END PLATE	1
LEVER TERMINAL	2
LEVER TERMINAL END PLATE	1
4-Way TERMINAL	68
4 Way TERMINAL END PLATE	2
DIODE TERMINAL	4
DIODE TERMINAL END PLATE	2
RELAY TERMINAL	2
RELAY TERMINAL END PLATE	1
PSU AC-DC	1
PSU DC-DC	1
DIODE RECTIFIER	1
(115VAC) FUSED TERMINAL	2
FUSED TERMINAL END PLATE	1
(24VDC) FUSED TERMINAL	1
FUSED TERMINAL END PLATE	1
6mm TERMINAL	9
TERMINAL END PLATE	1
RELAY TERMINAL	2
RELAY TERMINAL END PLATE	1
TRANSPARENT PROTECTIVE COVER	1
COVER CARRIER	2
PSU Mounting Brackets	4
Engine Room Telegraph Units	2
<b>Software</b>	
Workstation MS Win7 Licence	9
Workstation Winmon Licence	9
RAID Panel Winmon Licence	1
RTU Embedded Processor Winmon WLGate Licence	7
RTU LOP Winmon Licence	9

PMS Algorithms and IPMS interface Licence	1
CCTV Video Interface	1
<b>Alarm Terminal Rail</b>	
<b>Hardware</b>	
Diode	1
5mm Terminal	46
5mm Terminal End Plate	2
5mm Jumper Links	33
4 Way Relay Base	1
4 Way Relay	1
Lever Terminal	2
Lever Terminal End Plate	1
<b>Printer</b>	
<b>Hardware</b>	
Printer, Tractor Feed, 24-Pin, A4	2
Cable, Serial, Null Modem, 9w fem - 25w male	2
<b>Cabin Call System</b>	
<b>Hardware</b>	
Extension Alarm Panel	6
Modbus I/O Module	1
Digital Input Module	1
Digital Output Module	2
Relay Terminal	1
Relay Terminal End Plate	1
Double Terminal	5
Double Terminal End Plate	1
Jumper Links	3
End Stop	2

<b>Network Termination Hardware</b>	
<b>Hardware</b>	
Module, Din Rail Mount, 1 Snap -in Cat-7, Grey	54
Side Cover, Din Rail Mount, Cat-7, Grey	15
<b>CCTV System</b>	
<b>Hardware</b>	
PTZ Camera	4
MicroServer with Recorder	1
Software Licence	5
Network Switch, Gigabit	1
Operator Control Panel	1
CCTV Display Unit	1
Integration to IPMS mimic	1 Lot