

भारत सरकार/GOVERNMENT OF INDIA  
अंतरिक्ष विभाग/DEPARTMENT OF SPACE  
विक्रम साराभाई अंतरिक्ष केंद्र/VIKRAM SARABHAI SPACE CENTRE  
तिरुवनंतपुरम/THIRUVANANTHAPURAM – 695 022

संदर्भ / Ref: VSSC/PRSO/RPP/CCTV-PHASE-II/EOI-2017

तिथि/Date : 14/07/2017

**अभिरुचि की अभिव्यक्ति (ईओआइ) / EXPRESSION OF INTEREST (EOI)**

Vikram Sarabhai Space Centre [VSSC] / ISRO invites Expression of Interest from prospective bidders for the Augmentation of IP based Camera Network.

Interested parties can furnish their Expression of Interest quoting our reference No. VSSC/PRSO/RPP/CCTV-PHASE-II/EOI-2017 on or before 16.08.2017 [04:00 PM] to the following address:

वरि. क्रय एवं भंडार अधिकारी / Sr. Purchase & Stores Officer,  
क्रय यूनिट III पीआरएसओ /Purchase Unit- III, PRSO  
आरएफएफ क्षेत्र, इसरो पीओ/ RFF Area, ISRO. PO,  
तिरुवनंतपुरम/Thiruvananthapuram- 695022.  
फोन/Ph: 0471-256 3775

हस्ताक्षरित/Sd/-

प्रधान, क्रय एवं भंडार/ Head, Purchase & Stores

AUGMENTATION OF IP BASED EXPLOSION PROOF CCTV CAMERA AND NETWORK FOR  
RPP PHASE 2

RPP/VSSC, ISRO proposed to augment the Explosion Proof IP based Surveillance Camera and Network to meet the requirements of safety surveillance in RPP Phase 2 area. The work involves the establishment of fiber optic network, installation and commissioning of 14 Nos. of camera and other associated systems spread across 9 facilities and interfacing the system with the existing camera, server, VMS and storage systems

The total work has to be executed on a TURN KEY basis. More details are available in our website [www.isro.gov.in](http://www.isro.gov.in) or [www.vssc.gov.in](http://www.vssc.gov.in).

VSSC reserves the right to reject any or all EOIs without assigning reason whatsoever.

**Expression of Interest (EOI) is invited from reputed Original Equipment Manufacturers(OEMs) / System Integrators to undertake the project “Augmentation of IP based camera network” along involves the following:-**

### **1. Introduction:**

Rocket Propellant Plant in PRSO Entity of VSSC has given the responsibilities of delivering solid propellant motors for supporting the various ISRO projects. It is planning to install IP cameras for surveillance of all the propellant processing buildings in Phase 2 area

- 1.1) Phase 1 area is already installed with 41 camera and Phase 2 area is proposed to be installed with 14 Nos of camera by augmentation CCTV camera and network systems. The Phase 2 area camera systems needs to be interfaced with Phase 1 camera, server and storage system.
- 1.2) The existing server and storage systems, VMS and centralised monitoring system will be used as a common for both Phase 1 and Phase 2 system.

### **2. Objective:**

The Invitation for Expression of Interest (EOI) is basically for understanding the existing camera network in Phase 1 area, firming up the requirement for Phase 2 area and integrating both Phase 1 and Phase 2 network. The brands of the camera may be preferably Axis/Acti /Videotec/Infinova/Bosch/Honeywell should have the compatibility to the existing system.

VSSC is looking for vendors who have expertise in installing the above systems and established themselves in this field.

## **2. Scope of work**

### **3.1 Functional Requirements**

Live monitoring of activities in the different propellant process facilities of RPP from the point of view of safety angle as well as checking alertness of employees engaged in the activities.

### .3.2 The make and model number of existing camera and other systems.

| Sl.No | Items  | Make/model number                                |
|-------|--|--|
| 1     | Explosion proof PTZ camera   | Infinova-V1631MN-20T29T-2                        |
| 2     | Video management software  | Infinova-V2217 license available for 100 cameras |
| 3     | Storage solution 32TB  | HP store easy 3840                               |
| 4     | Network fabric for storage   | HP 5500-24G-SFP EI                               |
| 5     | Core switch  | Alcatel Lucent- OS6850EU24X                      |
| 6     | Distribution switch  | Alcatel Lucent- OS6850EU24X                      |
| 7     | 8 Port switch  | Alcatel Lucent-OS6450-P10                        |
| 8     | Rack server  | HP,Model:DL380P Gen8                             |
| 9     | Passive Items used for meeting networking requirements such as fibre cable, LIU, patch cord,CAT6A/7 cable,fibre distribution units,pig tails etc | AMP  |
| 10    | 55"LED display   | Samsung DM-55D                                   |
| 11    | Work station   | HP Z420  |
| 12    | Surge protector for power line and network   | OBO  |

### 3.3. Pre-qualification criteria

1. The existing camera system project was executed by M/s TCS Trivandrum. Vendor should interact with TCS for understanding and clearing all the doubts before submitting their offer.
2. Vendor should have been in existence for atleast 10 Years with regard to Explosion Proof Camera Installations.
3. Vendor should have valid registrations for GST. Vendor should submit GST Registration details.
4. Vendor should submit PAN Card Details.

5. Vendor should submit Bankers details..
6. Vendor should be registered with ISRO e procurement portal for Participation of this Tender and should also be empanelled for Security Systems.
7. Vendor should have executed orders for similar Explosion Proof environments and should submit the proof for the same along with their EOI.
8. Vendor should submit a letter from OEM confirming their support to the Vendor specific to this requirement.
9. Vendor should have executed at least two orders with explosion proof PTZ and Cameras in ISRO Establishment or Central Government entity with more than 30 cameras in the location. – PO Copies to be enclosed
10. Vendor should have AMC for orders executed with latest satisfactory performance endorsement from end-user.
11. Vendor should have sound knowledge in IP Surveillance, IT and Networking fields.
12. Vendor should submit letter that their firm is not blacklisted by any PSU/Govt body.
13. Confirmation letter from OEM for availability of Spares/support for a period of minimum of 5 years during the life of the equipment

भारत सरकार/GOVERNMENT OF INDIA  
अंतरिक्ष विभाग/DEPARTMENT OF SPACE  
विक्रम साराभाई अंतरिक्ष केंद्र/VIKRAM SARABHAI SPACE CENTRE  
तिरुवनंतपुरम/THIRUVANANTHAPURAM – 695 022

संदर्भ / Ref: 6012 2017 00062301

तिथि/Date : 14/07/2017

**अभिरुचि की अभिव्यक्ति (ईओआइ) / EXPRESSION OF INTEREST (EOI)**

विक्रम साराभाई अंतरिक्ष केंद्र (वीएसएससी) /इसरो, भारत सरकार, S139 मोटर केस खंड हार्डवेयर के संविरचन व आपूर्ति हेतु इच्छुक निर्माण उद्योग से अभिरुचि की अभिव्यक्ति आमंत्रित करते हैं।

Vikram Sarabhai Space Centre [VSSC] / ISRO, Govt. of India invites Expression of Interest from interested manufacturing Industry, for fabrication and supply of S139 Motor case segment hardware.

इच्छुक संभाव्य निर्माता, अपनी संदर्भ सं. 6012 2017 00062301 का उद्धरण करते हुए, दिनांक 16.08.2017 (04:00 बजे अपराह्न) को या उससे पहले निम्नलिखित पते पर अपनी अभिरुचि की अभिव्यक्ति दे सकते हैं:

Interested prospective Manufacturers can furnish their Expression of Interest quoting our reference No. 6012 2017 00062301 on or before 16.08.2017 [04:00 PM] to the following address:

वरि. क्रय एवं भंडार अधिकारी / Sr. Purchase & Stores Officer,  
क्रय यूनिट V, एमएमई/Purchase Unit- V, MME  
आरएफएफ क्षेत्र, इसरो पीओ/ RFF Area, ISRO. PO,  
तिरुवनंतपुरम/Thiruvananthapuram- 695022.  
फोन/Ph: 0471-256 2831 / फैक्स/Fax: 0471 256 2021

हस्ताक्षरित/Sd/-

प्रधान, क्रय एवं भंडार/ Head, Purchase & Stores

## Expression of Interest

1. Attention of manufacturing Industry within the country is drawn for fabrication and supply of S139 Motor case segment hardware viz.
  - (i) Head End segment (HES)
  - (ii) Middle segment (MS) and
  - (iii) Nozzle End segment (NES)out of Maraging steel M250 grade material. Required raw material will be supplied by VSSC as Free Issue Materials (FIM).
2. It is proposed to develop a new vendor for the fabrication and supply of these hardware. Hence, existing vendors for these products will not be considered for this purpose.
3. VSSC is looking for the prospective vendors to take up this work, having expertise and experience either in Aerospace manufacturing or in pressure-vessels manufacturing (3 metre class) with required manufacturing facilities and exclusive teams specialised in PPC, Tool engineering, Quality control and inspection, Material handling etc.,
4. Scope of work: Fabrication of S139 HES, MS and Nozzle End segment as shown in Figure-1 needs to be carried out by the vendor.  
One set of S139 Motor segment hardware consists of
  - HES : 1 No.
  - MS : 3 Nos.
  - NES : 1 No.
5. Qualified FIM required for fabricating the above hardware will be supplied by VSSC, against furnishing bank guarantee to VSSC to the value of FIM.

### **6. Raw material**

For making S139 segments, Maraging steel (250 grade), a high strength material with very low carbon content is used. Maraging steels have high hardenability and high strength combined with good fracture toughness.

Following are the nominal chemical composition and mechanical properties:

| Element | Nickel      | Molybdenum | Aluminum   | Cobalt  | Titanium | Iron    |
|---------|-------------|------------|------------|---------|----------|---------|
| %       | 17.5 – 18.5 | 4.6 - 5.2  | 0.05 -0.15 | 7.5-8.5 | 0.4-0.6  | Balance |

## 6.1 Mechanical properties

### 6.1.1 Annealed Condition

| 0.2% proof stress, MPa | Tensile Strength (UTS), MPa | Elongation (50mm, GL), % | Reduction in area, % | Hardness (HRC) |
|------------------------|-----------------------------|--------------------------|----------------------|----------------|
| 830                    | 1050                        | 19                       | 72                   | 32             |

### 6.1.2 Aged Condition

| Direction    | 0.2% proof stress, MPa | Tensile Strength (UTS), MPa | E (50mm GL) % | R <sub>A</sub> , % | Hardness HRC | Plane strain fracture toughness, MPa √m |
|--------------|------------------------|-----------------------------|---------------|--------------------|--------------|---|
| Longitudinal | 1725                   | 1765                        | 8             | 40                 | 52           | 90                                      |
| Transverse   | 1725                   | 1765                        | 5             | 25                 |              | 90                                      |

6.2 Segment as weld assembly shall be subjected to Ageing heat treatment as given below.

| Treatment | Temperature, °C | Soaking time   | Cooling Media |
|-----------|-----------------|----------------|---------------|
| Aging     | 485±10          | 3 to 3 ½ hours | Air           |

## 7. Fabrication process (in brief)

In general, the segments are manufactured in the following sequence.

### (i) Head End Segment

Crown and Domes are formed to the required dimensions and profile by pressing. For Domes, the free ends are welded by auto TIG welding. Skirt shell and the shell are made by rolling the plates to cylinder and long seam is welded to get the component. Mismatch of long-seam joint shall be within 0.4 mm. Machining of forgings is done to get Ignitor boss, Skirt flange, Y-ring, and Grooved ring components. All the above components (Ignitor boss, Crown, Dome, Y-ring, skirt shell, skirt flange, Shell and Grooved ring) are positioned in a welding fixture, trued and circ. seam welded to form segment weld



assembly; Mismatch of circumference-seam joint shall be within 0.8 mm. The hardware weld assembly is heat treated (aged at 485 °C) to obtain required mechanical properties; PT, RT and UT are carried out on all weld joints (100%) before and after aging of the assembly; after aging, the hardware is set on lathe and finish machined at Ignitor boss, skirt flange and grooved ring to achieve required interface features within the geometric and dimensional tolerances; the segment pin holes (Dia. 20 mm) – 144 Nos. are drilled and reamed using interchangeability drill jig at Groove ring side on a drilling station. Holes on Ignitor boss and Skirt flange are drilled using qualified drill jigs and threaded holes are formed to the specified size within 4H tolerance by tapping.

(ii) Middle Segment

A shell is made by rolling 7.8mm thick plate, placed in fixture and long seam welded using auto TIG; Mismatch of long-seam joint shall be within 0.4 mm. The Shells and pre-machined Tongued Ring & Grooved Ring are positioned in a welding fixture, trued and circ. seam welded to form segment weld assembly; Mismatch of circumference-seam joint shall be within 0.8 mm. The hardware weld assembly is heat treated (aged at 485 °C) to obtain required mechanical properties; PT, RT and UT are carried out on all weld joints (100%) before and after aging of the assembly; after aging, the hardware is set on lathe and finish machined at grooved ring and tongued ring sides to achieve required interface features within the geometric and dimensional tolerances; the segment pin holes (144 Nos.) are drilled and reamed using interchangeability drill jig at both TR and GR side on a drilling station.

Segment pin holes and the pins are having H7g6 class of Fit.

(iii) Nozzle End Segment

Dome is formed to the required dimensions and profile by pressing and the free ends are welded by auto TIG welding. Skirt shell and the Shell are made by rolling the plates to cylinder and long seam is welded to get the components. Mismatch of long-seam joint shall be within 0.4 mm. Machining of forgings is done to get Nozzle end flange, Skirt flange, Y-ring and Tongued ring components. All the above components (Nozzle end flange, Dome, Y-ring, Skirt shell, Skirt flange, Shell and Tongued ring) are positioned in a welding fixture, trued and circ. seam welded to form segment weld assembly; Mismatch of circumference-seam joint shall be within 0.8 mm. The hardware weld assembly is heat treated (aged at 485 °C) to obtain required mechanical

properties; PT, RT and UT are carried out on all weld joints (100%) before and after aging of weld assembly; after aging the hardware is set on lathe and finish machined at Nozzle end flange, Skirt flange and Tongued ring to achieve required interface features within the geometric and dimensional tolerances; the segment pin holes(144 Nos.) are drilled and reamed using Interchangeability drill jig at Tongued ring side on a drilling station. Holes on Nozzle end flange and Skirt flange are drilled using qualified drill jigs and threaded holes are formed to the specified size within 4H tolerance by tapping.

8. Required Fixtures for welding and machining shall be realised, qualified and used during respective operations. Interchangeability Drill jig shall be provided as FIM or it is to be made by the vendor and used for drilling segment pin holes. Other Drill jigs shall be realised, qualified and used for drilling/reaming respective holes at interface features.
9. All the details of the processes, quality control procedures and inspection observations, right from raw-material to the finished product, shall be documented and recorded. Traceability of every hardware being manufactured shall be available at any time and easily verifiable.

## **10.0 Facilities**

- 10.1 All facilities required for realization of the segments hardware shall be either available or have to be established by the vendor before taking up this work.

### **10.2 Major facilities required**

- i Pillar-less bay (at least 1000 sq. m area, height under crane hook: 10m) with crane facility
- ii Rolling facility adequate for rolling of 8mm thick M250 plate material (equivalent to 25mm thick Mild Steel) to form a cylindrical shell of diameter 2.8 metres.
- iii Hydraulic press of 1200 Tonnes capacity for forming Domes and Crown.
- iv Auto TIG Welding stations: Long seam and circ seam with necessary fixtures to handle 2.8 metre diameter.
- v X-ray radiography to be done within the company premises
- vi UT scanning - Supplier must have in-house qualified manpower and equipment for UT flaw detection
- vii Skilled operator to carry out LPT on all weld joints  
(for UT and radiography, professionals of Level-III are required)

- viii Electrical Heat treatment furnace of 3.2 m diameter and 4 m height / depth for ageing treatment of weld assembly; calibration of the furnace upto 600° C within  $\pm 5^\circ$  C.
- ix CNC Lathe of 3.2 metre dia. and 4 m admit between centres for final machining of segment and Uni master for measuring diameter of 2.8 m size.
- x Dedicated drilling station with 3.0 m diameter rotating table and horizontal drilling station for drilling / reaming.
- xi 3 m diameter Vertical Turning Lathe(VTL) for machining rings like Skirt flange, Tongue ring and Groove Rings
- xii For storing FIM, sufficient space with covered roof and handling facilities.
- xiii Mechanical testing facility (Tensile and Fracture Toughness)

Vendor needs to have essential facilities (Sl. No. i. to xii) within the company premises and sub-contracting is not allowed. For (xiii), in case vendor doesn't have testing machines, they need to get the specimens tested at Centres accredited by NABL.

Vendor while submitting the EoI shall furnish the details of facilities available with them and proposed to be established by them indicating the time-frame required.

## **11. Experience and Technical expertise**

Experience and expertise of the vendor in fabricating Rocket Motor cases or other products for Aerospace applications including Defence sector if any shall be brought out in EoI. Alternately, if their experience is in making pressure vessels, the same may be stated in their EoI.

Nature of products made so far, for whom the products were made, the criticality of products and length of experience in this domain shall also be brought out in detail.

### **12.0 Quantities proposed to be manufactured and supplied by the vendor**

The initial requirement of S139 hardware will be 4 sets per annum. In case the vendor is successful in meeting this requirement, the quantity is likely to increase in future.

## **13. Delivery**

13.1 Delivery of the first segment shall not be later than eighteen months from placement of order or twelve months from the date of supply of free issue

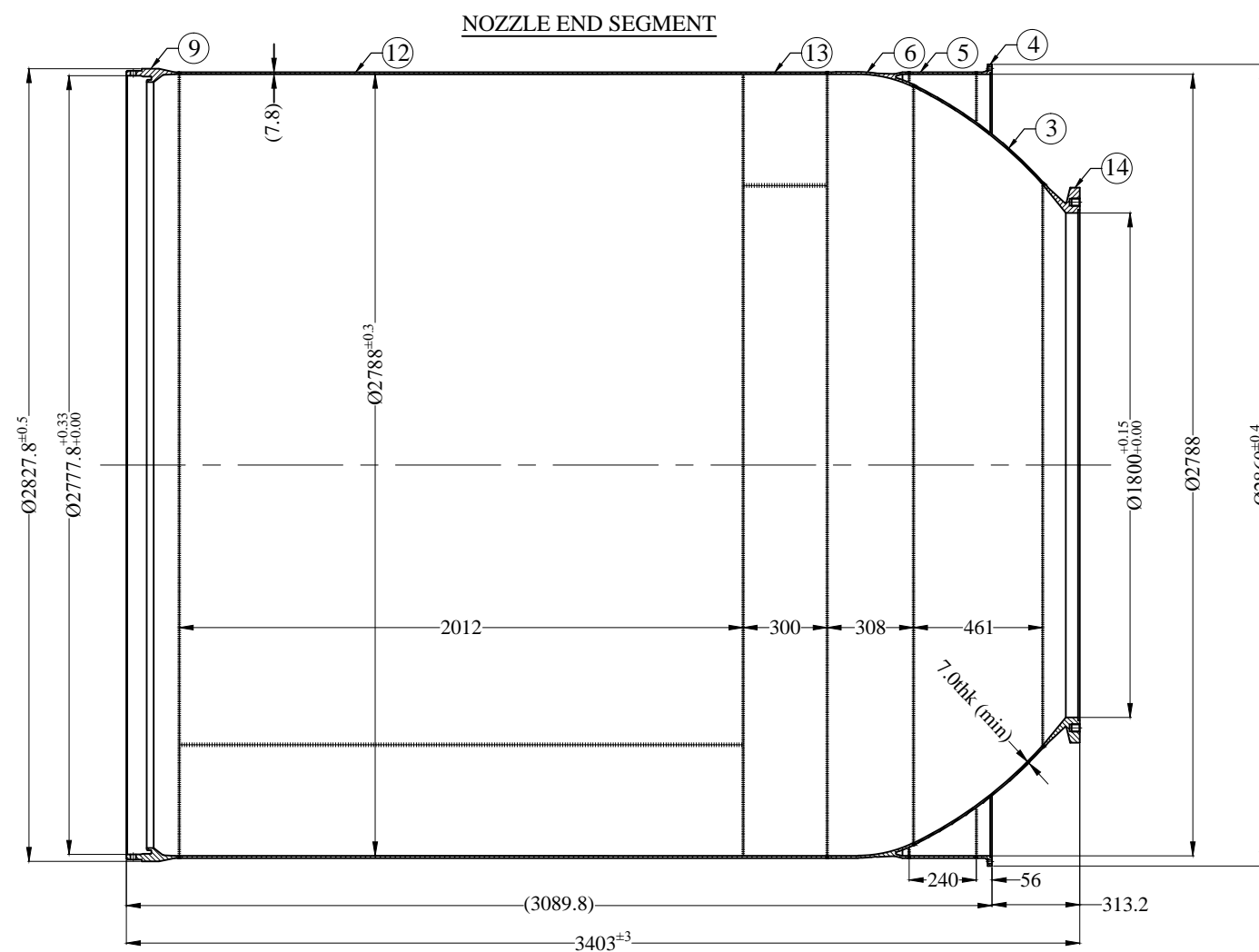
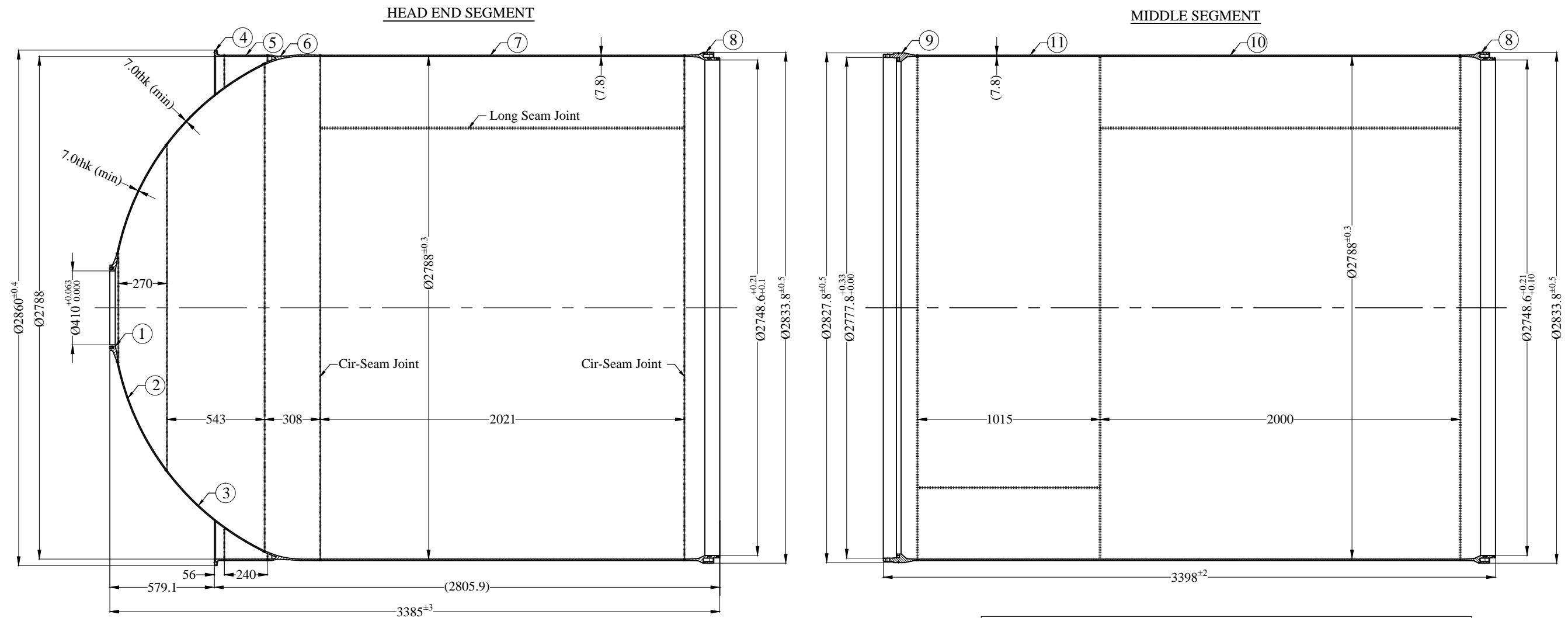
material for the segment whichever is later.

- 13.2 Delivery of the subsequent segments shall be at the rate of one segment in sequence at intervals not exceeding one month after the scheduled delivery of the first segment. Sequence indicates a set meaning 1 HES, 3 MS and 1 NES.
14. The vendor shall provide the details of their financial position for the last 5 years by including annual turn-over, higher value P.Os executed and the customers being served. They may also indicate the length of their service in the field.
15. EoI shall be comprehensive giving all the required details mentioned above enabling VSSC to assess the capabilities of the vendor.

\*\*\*\*\*

Note : Conditions relating to Commercial points like IT Certificate, Pan Card, Account No., Balance sheet, Clientele list etc. shall be forming part of EoI documents.

# S-139 SEGMENTS (Figure-1)



| HEAD END SEGMENT |              |                                   |
|------------------|--------------|-----------------------------------|
| Part.No.         | Component    | Process                           |
| 1                | IGNITER BOSS | Machining                         |
| 2                | CROWN        | Pressing                          |
| 3                | DOMES        | Plate rolling, welding & pressing |
| 4                | SKIRT FLANGE | Machining                         |
| 5                | SKIRT SHELL  | Plate rolling & welding           |
| 6                | Y RING       | Machining                         |
| 7                | HES SHELL    | Plate rolling & welding           |
| 8                | GROOVED RING | Machining                         |

| MIDDLE SEGMENT |              |                         |
|----------------|--------------|-------------------------|
| Part.No.       | Component    | Process                 |
| 8              | GROOVED RING | Machining               |
| 9              | TONGUED RING | Machining               |
| 10             | MS SHELL-I   | Plate rolling & welding |
| 11             | MS SHELL-II  | Plate rolling & welding |

| NOZZLE END SEGMENT |                   |                                   |
|--------------------|-------------------|-----------------------------------|
| Part.No.           | Component         | Process                           |
| 3                  | DOMES             | Plate rolling, pressing & welding |
| 4                  | SKIRT FLANGE      | Machining                         |
| 5                  | SKIRT SHELL       | Plate rolling & welding           |
| 6                  | Y RING            | Machining                         |
| 9                  | TONGUED RING      | Machining                         |
| 12                 | NES SHELL-I       | Plate rolling & welding           |
| 13                 | NES SHELL-II      | Plate rolling & welding           |
| 14                 | NOZZLE END FLANGE | Machining                         |

| Part.No. | Material                   |
|----------|----------------------------|
| 1 to 14  | MARAGING STEEL (250 Grade) |