

**INTER–UNIVERSITY ACCELERATOR CENTRE**

**ARUNA ASAF ALI MARG**

**POST BOX NO. 10502**

**NEW DELHI-110067**

**NOTICE INVITING TENDER NO. IUAC/NIT/13/SMK/2017-18**

**FABRICATION OF ALUMINIUM BOBBIN STRUCTURE AND  
EXECUTION OF WINDING OF IUAC DESIGNED COILS USING  
IUAC SUPPLIED WIC NbTi CONDUCTOR FOR  
SUPERCONDUCTING MRI MAGNET**

Last Date and Time of Submission of Tender	8 <sup>th</sup> January, 2017 3:00pm
Date & Time for opening of Tender (Technical Bid, Part-I)	8 <sup>th</sup> January, 2017: 3:30 pm

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**Name of Tender:** Fabrication and supply of integrated Bobbin and Bobbin-Stand for MRI magnet and Winding of superconducting solenoid coils for MRI magnet

1	Technical specifications and scope of work for fabrication of Aluminium bobbin structure and bobbin stand of MRI magnet.	As per Annexure-I
	Technical specifications and scope of work for winding of coils for MRI magnet.	As per Annexure-II
	Drawing of the bobbin structure is not attached with this documents	To avail the design drawing (Annexure-III), bidders need to follow the instruction given in the para XIII in Page no 8
2	Required quantity	1 set
3	Earnest Money Deposit(EMD) in INR  Bidder/vendors registered with NSIC and Foreign bidders quoting directly are exempted from paying EMD	Rs. 140000/-
4	Cost of tender document	Rs.500/- (Rupees Five hundred in the form of D.D. or Cash) for hard copy. Nil if downloaded from IUAC website
5	Last Date and Time of Submission of Tender	8 <sup>th</sup> January, 2017 3:00pm
6	Date & Time for opening of Tender  (Technical Bid, Part-I)	8 <sup>th</sup> January, 2017: 3:30 pm
7	Date & Time for opening of Tender  (Price Bid, Part-II)	The date and time will be intimated to the technically qualified bidders only.
8	Address for submission of Tender	Administrative Officer (S&P),  Inter-University Accelerator Centre, Post Box No. 10502, Aruna Asaf Ali Marg, New Delhi -110067, India
9	Place of the opening of the Tender	Inter-University Accelerator Centre, Aruna Asaf Ali Marg, New Delhi -110067, India

**TERMS AND CONDITION**

1. Director, Inter-University Accelerator Centre (IUAC), New Delhi invites sealed tenders for *Fabrication of bobbin, bobbin stand and winding of solenoid coils on the bobbin for superconducting MRI magnet.* Tender should be submitted directly by the original fabricator. In case of bid by authorized Indian Agent, the manufacturer authorization should be attached with the technical bid.

## **2. Submission of Tender**

Tenders should be submitted in sealed envelopes in two parts separately, i.e. "*Technical Bid*"(Part-I) and "*Price Bid*" (Part-II). Both the parts should be further sealed in an envelope super-scribing Notice Inviting Tender (NIT) No. with Name of work, due date for opening, bidders name & address. The tender duly filled may be sent to above mentioned address either by post/Courier or hand delivered in the Tender Box kept in the area near west side entrance of IUAC, after ensuring that due entries are made in the register kept at the counter. It should not be handed over to any employee of the centre. No tender shall be accepted later than the time schedule specified above.

I. Technical Bid (Part-I): The following criteria/information/documents are essential to qualify the technical bid for the said item

- A. Technical bid should contain the Demand Draft of EMD amount. Vendor registered with NSIC and foreign vendors quoting directly are exempted from paying EMD.
- B. The bidder needs to submit the company profile and organizational setup.
- C. The bidder needs to submit credentials/ capabilities of doing high-precision large volume machining jobs. The bidder needs to submit the details of previously executed large similar type of machining/ welding/fabrication jobs with Aluminium alloy.
- D. The bidder must have CNC machines and automated/robotic welding machines to carry out the job.
- E. The bidder needs to submit a brief list of plants/machinery and tools in his possession.
- F. Coordinate-Measuring Machine (CMM)/Laser based dimensional measurement is an essential tool to be used during acceptance test of the integrated bobbin. The bidder need to submit the brief details of Coordinate-Measuring Machine (CMM) facility/laser based measurement system. The bidder needs to mention if they need to outsource the service of CMM or laser based measurement. The name of the service provider need to be mentioned in the technical bid of the tender.
- G. Bidder needs to have the horizontal winding machine which can handle the bobbin of given size and weight. The bidder needs to submit the detailed specification along with photographs of the winding machine to be used for the winding of the magnet.

The bidder needs to have significant prior experience of winding of large superconducting solenoid magnet using multi-filamentary NbTi conductor /polyester braid insulated wire-in-channel (WIC) conductor NbTi conductor. The bidder needs to submit necessary documents to proof the claim.

- H.** In case the bidder does not possess any winding facility and they do not have any prior experience in winding as mentioned in section para -G, they can outsource/sub-contract the service of winding to any other vendor having suitable horizontal winding machine which can handle the bobbin of given size and weight. The sub-vendor need to have experience in winding of large solenoid coils/magnets. The sub-vendor should have experience in all types of winding e.g. dry or wet. The bidder needs to submit the details of the outsourced vendor along with the details of their winding machine and their past experience.
  - I.** The bidder needs to have necessary equipment and processes for testing the coil during winding: layer by layer insulation testing up to 5kV, resistance measurement, winding diameters etc.
  - J.** The bidder need to submit necessary documents of similar type of works successfully executed in the past 3 years. The Indian bidder should have successfully completed at least one of similar nature of work of more than ₹50lakhs value with reputed organizations, Govt. Dept., Public sector & Autonomous bodies for minimum qualification.
  - K.** The bidder needs to agree to sign a formal Non-Disclosure Agreement (NDA) after receiving the job order.
  - L.** The bidder shall attach entire NIT document (except the price bid part) duly signed & stamped as a token of acceptance to the NIT conditions with this bid.
- II.** Price Bid (Part II): In this bid, the bidder is required to quote the price for the *fabrication of bobbin structure and for the execution of winding of coils* according to the scope of work & technical specifications as per *Annexure-I* and *Annexure-II*. The price should be in breakup for bobbin and winding separately. The Indian bidder needs to separately mention all components of the cost which includes the fabrication cost as per *Annexure -I*, GST, Insurance, packing and forwarding charges up to IUAC Delhi, any other costs etc. The fabrication price should be inclusive of all material, fabrication, material testing, CMM measurement and report, tooling cost, labour, services etc. No overwriting on Price bid is allowed and it should be duly signed by authorized person & stamped on all the pages. The foreign bidder is required to quote their prices both on FOB and CIF ,New Delhi.

### Important Instructions

Tenders to be submitted with following the manner.

Envelope No. 1 (*Technical Bid*): Shall contain “Acceptance of Terms & Conditions”, “*Technical Bid*” and Earnest Money Deposit (EMD) if any, technical Literature/Brochures and a copy of the price bid with *the price columns without any price information* . Vendor needs to put a “tick mark” or write “quoted” on the price column for each quoted items. The technical offer should not contain any price information.

Envelop No.2 ( Price Bid): It has to be sealed. It shall contain price bid only. It needs to be dully signed. The envelopes must be super-scribes with the following information:

- Tender Reference Number i.e. NIT No.
- Due Date of opening ( mentioned in item 6 on the third page of NIT)
- Name of the Bidder

Both the envelops should be further sealed in an envelope super-scribing Notice Inviting Tender (NIT) No. with Name of work, due date for opening, bidders name & address.

- III.** Earnest Money: EMD of ₹ 1,40,000/- has to be enclosed along with the Technical bid (Part-I). The EMD shall be only in the form of Bank Draft in the name of “Inter-University Accelerator Centre”, payable at “New Delhi”. No cheque / cash shall be accepted as EMD. EMD of technically disqualified bidders will be returned within 30 days from the date of evaluation of the technical bids. EMD of successful bidder will be released on successfully delivery of the integrated bobbin structure at IUAC, Delhi. Tender received without earnest money from the bidder other than NSIC/SME and foreign bidders will be rejected.
- IV.** Scope of Work: Detailed scope of work, terms and conditions, specifications etc. are enclosed with this NIT as per Annexure I and Annexure II.
- V.** Completion time: The time will start after receiving the design drawings of the integrated bobbin structure and the winding details from IUAC. The vendor shall convert the design drawings into manufacturing/fabrication drawings and complete it within 4 weeks. IUAC personnel will review the fabrication drawing and necessary approval will be given to the vendor after thorough discussions/meeting. The entire jobs need to be completed within 22 weeks. A tentative time chart has been given as a reference. IUAC personnel will inspect all the components at vendor’s site before delivery. Any delay in completing the work for

reasons attributable to the bidder is liable for liquidated damages as per clause (XVII) of NIT. Under the force-majeure conditions or any delay due to reasons beyond control of the bidder, IUAC may grant suitable time extension for which the supplier has to request along with the justification/ reasons well in advance to the IUAC for approval without any prejudice to price escalation. No time extension request shall be considered after the expiry of completion period/contract. The decision of the IUAC, will be final and binding on the bidder/supplier.

The bidder may submit a detailed time chart along with the details

**VI.**

Task description	Time (week)											
	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	19-20	21-22	23-24
Completion of Fabrication drawing of Bobbin, helium vessel bore and bobbin stand	█	█										
Approval of Fabrication/ Engineering drawing by IUAC			█									
Updating the final fabrication drawing, Fabrication of bobbin, helium vessel bore and bobbin stand				█	█	█	█	█	█			
Finalizing Winding procedure			█	█	█							
Fabrication of Jigs / Fixtures for winding				█	█	█	█	█	█			
Trial Winding on unfinished bobbin and Final machining of bobbin									█			
Completion of final winding of eight coils , screening coil, overbind of the bobbin										█	█	
Packing and forwarding the bobbin integrated with helium bore, bobbin stand, remaining WIC conductors/ overbind conductors												█

Validity of Tender: Tender shall be valid for our acceptance without any change in rates and NIT conditions for a minimum period of 120 days from the date of opening of price bid.

**VII.** Escalation: No escalation over and above items rates quoted by the bidder shall be paid during the execution of contract.

**VIII.** Deviations: No deviation from the stipulated terms and conditions will be allowed. Tenders should be unconditional.

**IX.** Strict compliance with these contract documents is required unless otherwise specifically agreed in writing.

- X.** At the start of the contract, the successful bidder shall assign a person/ persons who will be responsible for the reporting to, and communication with concerned IUAC person.
- XI.** The successful bidder needs to work in close coordination with the designated IUAC person at all stages of the contract in order to resolve any technical issues or problems arise, in the most timely and efficient manner.
- XII.** Correspondence: All the commercial correspondence in respect of tender/contractual obligation shall be made to A.O. (S&P), Inter University Accelerator Centre, Aruna Asaf Ali Marg, New Delhi-110067, India (Email: [joseph@iuac.res.in](mailto:joseph@iuac.res.in)). For any technical query please contact Dr. Soumen Kar ( [kar.soumen@gmail.com](mailto:kar.soumen@gmail.com)).
- XIII.** Interested bidders need to contact to Dr. Soumen Kar ( [kar.soumen@gmail.com](mailto:kar.soumen@gmail.com)) to avail the design and drawing for tendering purpose. The bidders need to sign a non-disclosure agreement before availing the design and drawing for the tendering purpose.
- XIV.** Material Certificate and CMM measurement report: Test certificate for the material used has to be submitted during on-site delivery of the item. In addition to this a complete CMM measurement report of the fabricated item should also be submitted.
- XV.** IUAC reserves the right to accept or reject any tender without assigning any reason and does not bind himself to accept the lowest tender and the decision of the centre in this regard will be binding on all the bidders. Tenders not complying with any of the provisions stated in this tender document are liable to be rejected.
- XVI.** Terms of Payment: All Payment shall be made on submission of bills by the vendor after due certification by the IUAC personnel. For Indian bidder , the payment shall be made by bank transfer after deduction of taxes applicable from time to time. For foreign bidder , the payment will be through letter of credit. A partly payment of 15% of the quoted amount will be done after completion of fabrication drawings of all major components ; bobbin, helium vessel bore and bobbin stand. Next 15% payment will be done after completion of fabrication of bobbin and 10% payment will be done after completion of trial winding on the bobbin and finalizing winding procedure. Rest of the amount will be paid after the delivery of the wound bobbin at IUAC, New Delhi
- XVII.** Liquidated damages: In case the work is delayed beyond the specified completion period for reasons attributable to the bidder, deductions on account of liquidated damages @ 0.5% of the order value per week will be deducted subject to a maximum of 5% of the total works.
- XVIII.** Tender once submitted will remain with the centre and never be returned to the bidders.
- XIX.** The Director, IUAC reserve the right to terminate the contract on account of the failure, poor workmanship, non-compliance of set norms/ specifications for the works, delay in

progress of work, violation of any contract provisions by the Bidder. The contract can also be terminated at the request of bidder. In such cases the supplier is liable to pay liquidation damages @ 5% of tendered value besides security deposit.

**XX.** In case of any ambiguity / dispute in the interpretation of any of the clauses in this Tender Document, the decision of Director, IUAC shall be final and binding on all parties.

**XXI.** Any dispute arising out of this contract will be subjected to jurisdiction of New Delhi/Delhi.

Accepted  
(Bidder's Signature)

Place:

Date:

Name:

Seal:

ANNEXURE- I

**Technical Specifications and Scope of work**

**for**

**Fabrication of integrated Bobbin and stand of superconducting MRI magnet**

**A. Technical Details**

The bidder has to quote for Fabrication and supply of one set of integrated bobbin and stand for superconducting MRI magnet as per drawing given in Annexure III. Figure 1 shows the bobbin structure integrated with the bore of the helium vessel. The major components of the integrated bobbin structure and the corresponding material have been listed in the Table-I.



Figure 1. The integrated bobbin structure.

Table-1. Major components of the bobbin structure

S.N	Major components	Material	Nos.
1	Bobbin for the MRI magnet	Aluminium Alloy (Al 5083 O)	1 set
2	Bore of the Helium Vessel	SS-304L	1 set
3	Bobbin stand	Low carbon steel AISI 1020	1 set

1. The bobbin, bore of the helium vessel and end flanges have already been designed. Hence the design of the bobbin, bore of the helium vessel and end flanges are not within the scope of the vendor. IUAC has given a tentative design of the bobbin stand. If needed, the successful bidder may re-design the bobbin stand to have better mechanical stability and easiness in handling. Bidder may submit the tentative design along with the technical bid.
2. Fabrication/Engineering drawings must be prepared by the vendor based on the drawings provided by IUAC. Vendor needs to provide the fabrication drawing with tolerances for the same in metric unit. A soft copy of the drawings will have to be submitted to concerned technical personnel and after due approval only fabrication can be started. If necessary, IUAC personnel may visit the vendors site for final reviewing of the fabrication drawing. The soft copy of final version of all fabrication/engineering drawing needs to be submitted to IUAC.
3. The successful bidder shall also provide electronic copies of the all the engineering drawings in .pdf format along with SolidWorks or equivalent format. The vendor must keep a record of all the changes, where deviation from the information or dimensions contained in the manufacturing drawing is authorized by the IUAC person during the manufacturing. The vendor should update all the drawings according to the final production.
4. The bidder need to provide the details of methodology/fabrication procedure/ work sequence /quality control in the Technical bid.
5. The offer should accompany a realistic time chart for the various activities from the date of supply order.
6. Minor changes in design should be allowed without any extra cost.
7. Bidders can contact IUAC personnel for any clarification before submitting the quote.

8. The bobbin structure will have to be fabricated with specified tolerances and surface finish. The trial winding of the coils needs to be performed prior to final machining of the bobbin, and the results fed back to IUAC to determine final bobbin dimensions for final machining.
9. The fabricated structure has to be handled carefully so that no grease or dirt is assembled on it.
10. The dimensions given in the drawing are indicative. The actual dimension of the bobbin will be shared to the successful bidder after signing NDA.
11. IUAC will not supply any material to the vendor. A material test certificate needs to be submitted by the bidder at the completion of the fabrication of integrated bobbin structure. The arrangement of fabrication material, fabrication related equipment and fastening equipment (if necessary) will be manufacturer's responsibility. The metallic part of the bobbin stand shall be coated with anti-corrosive and fire-retardant powder in Blue or Yellow paint.
12. The vendor should guarantee the proper welding procedure over Aluminium alloy body. Vendor may indicate the welding procedure to be followed for the job. Vendor may mention any special technique of welding to be used for fabrication of the bobbin.
13. The dimension and tolerances are very critical for the magnet bobbin, so to certify its proper dimensioning and tolerances it is mandatory for the manufacturer to have suitable inspection mechanism ( Laser based measurement or CMM measurement or any equivalent measurement ). The verification of the dimension and geometrical tolerance will be performed in presence of IUAC personnel and inspection report shall be provided.

**B. Quality Control, Inspection and Testing**

1. Quality control

The vendor should have an independent quality control in executing the fabrication of the bobbin structure and its report shall be forwarded to the designated IUAC person. All the materials procured for the bobbin, helium bore shall conform to the material specifications. The material certificates shall be provided to IUAC as and when required.

2. Dimensional Verification

Dimensional accuracy of the bobbin structure shall be checked on the CMM /Laser based measurement in presence IUAC personnel during on-site inspection. The corresponding report shall be generated and submitted to IUAC.

3. Testing of welding joints

Non-destructive weld examination ( Die penetration test/ Ultrasonic/ Radiography) need to be done and the corresponding report to be submitted to IUAC

4. Mass Spectrometer Leak Detection (MSLD) of welding joints

The collar or ring flanges of the helium bore will be welded to the cylindrical shell of the bore. Similarly, there will be seam welding on the cylindrical shell. The welding joints of the helium bore should to be leak tested using Helium MSLD. If require helium leak testing needs to be done in presence of the IUAC personnel during onsite inspection. The vendor need to have a definite plan for the leak testing of the welding joints of the helium bore. Necessary attachment needs to arranged/made by the bidder for temporary blanking off the Helium bore during the leak testing. The bore of the helium vessel should be leak proof up to  $5 \times 10^{-9}$  Torr-l/s.

5. Tentative Assembly plan

A tentative assembly plan has been given as a reference for the bidders. The individual parts of the bobbin can be fabricated and machined separately. This includes three parts of primary bobbin and two shield bobbins. The parts of primary bobbin can be then assembled and welded together using a temporary jig. The helium bore tube can be machined and one of the end flanges can also be welded on. The bore tube can then be slid into the bobbin bore and the second end flange of the bore can be welded. The bobbin can be fixed to the bore tube using the respective attachments and spacers fixed at both ends of bobbin to avoid sagging. The final machining of bobbin and bore will be done together. Special care is taken to maintain the concentricity between the winding surfaces and the reference features on the bobbin flanges. The shield bobbins, separately machined are fixed on to the assembled structure and final machining to be done for the shield bobbins also. The reference features on the shield bobbins are also machined. The shield bobbin can be removed for trial winding. The trial winding can be done for the integrated primary bobbin and bore tube. Final machining of the bobbin needs to be done after trail

winding. The six coils of the primary bobbin can then be wound according to em-design. The shield bobbins are wound separately along with their insulations, heaters and over binding. The wound shield coils are then reassembled on to the integrated primary bobbin. This is a tentative assembly /job sequence. However , the bidder may suggest any alternative sequence.

### **C. Cleaning, Handling, Packing and Shipment**

1. The dimension of the bobbin structure is very crucial in achieving the desired performance of the MRI magnet. Hence, the fabricated structure has to be handled carefully so that no scratches on the winding faces of the bobbin and flanges of the helium bore. The entire structure need to be degreased before delivery. The bobbin structure need to be free from any dirt and traces of oil.
2. Before the shipment of the consignment, the vendor shall make sure that all the items in the scope of the supply are fully included in the packing boxes. Packing cases must be robust enough to take care of the impact during handling and transportation. Packing shall be suitable for storage of items in a tropical climate. Suitable stiffener and cushion should be provided to arrest any movement and vibration during the transportation. Shock and tilt indicators must be fitted to reveal evidence of mishandling during transportation from the vendors site to IUAC.

## **ANNEXURE- II**

### **Technical Specifications and Scope of work for**

## Winding of solenoid coils for MRI magnet

Tender No: IUAC/ NIT/

### **A. Technical details of Bobbin and Winding**

1. The MRI magnet will have eight solenoid coils with six primary coils and two shield coils. There are six winding slots on the primary bobbin. There are two separate bobbins for the shield coils. The basic parameters of the bobbins and winding have been summarized in the following tables.

Table 1. The basic parameters of the primary bobbin

S.N	Detail of primary bobbin	Value
1	Number of Primary bobbin	1
2	Weight (Primary bobbin)	1 ton
3	Weight (Primary bobbin and coil)	2.5 ton
4	Winding slots	6
6	Length	~1.5m
7	Inner diameter	~1m
8	Outer diameter	~1.2m

Table 2. The basic parameters of the shield bobbin

S.N	Detail of shield bobbin	Value
1	Number of Bobbin	2
2	Weight of each Shield bobbin	~0.2 ton
3	Weight of each Shield bobbin and coil	~ 0.8 ton
4	Winding slots	One each
5	Length	~0.2m

6	Inner diameter	~1.5m
7	Outer diameter	~1.7m

Table 3. Winding Parameters

Description	Values
Number of solenoid coil	8
Total no of turns	~13000
Range of turns in each coil	800-1300
Conductor Type	Wire-in-Channel Niobium Titanium (NbTi)
Conductor Insulation	PET braid
Conductor cross-section	Rectangular
Conductor cross sectional area	3-5 mm <sup>2</sup>

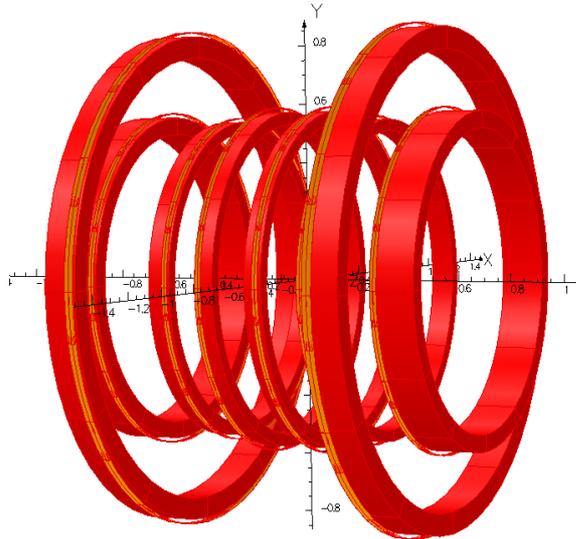


Figure 1. Coil configuration of the magnet.

2. The Horizontal Winding Machine need to have following capacity and features

Capacity

- a. Load capacity~ 3 ton
- b. Max diameter of bobbin: 2m
- c. Max. length~2 m
- d. Winding Tension ~ 10-30 ± 0.1 kg

- e. Forward and reverse operation
- f. winding and unwinding with constant tension during
- g. Automatic wire tension control
- h. No backlash
- i. Accurate pitch adjustment
- j. Turn counter
- k. Ability to maintaining tension during start/stop/hold condition

**B. Deliverables of IUAC**

1. IUAC would provide the em-design with all details of number of turns, number of layers, winding tension for each coil, banding/over-binding details, number of joints and their position, and details of screening coils.
2. IUAC would provide the details of composition of the winding pack for each coils. The winding pack will include wire-in-channel conductor, glass-cloth, Kapton/Mylar insulation, film heaters and dummy wire-in-channel conductor /aluminium overbinds etc.
3. IUAC would provide the details of the wire-run on the bobbin, The details of lead-entry/exit will also be provided. Bidder may suggest better way of wire-run and architecture.
4. IUAC would provide the detailed design of the bobbin including the dimension, surface finish of each winding slots.
5. IUAC would provide the details (i.e. conductor details, number of turns/layers, tension, terminal fixation etc.) of the over binds for the coils.
6. IUAC would provide the spools with polyester (PET ) braided WIC conductors for each coil.
7. IUAC would provide the WIC conductor for trial winding on the bobbin for tuning the winding parameters and winding machine prior to the final winding.
8. IUAC would provide the over-binding wire/strips which can be made of Copper/Aluminium.
9. IUAC would provide the conductor spool details i.e. the size and weight of the spool along with photographs of the spool.
10. IUAC would provide the nomenclature of wire-run and terminals along with complete circuit diagram.
11. IUAC will provide details of all tests to be conducted during the winding process.

**C. Deliverables of the Bidder**

1. Bidder should provide the magnet bobbin in accordance with Annex 1.
2. Bidder shall provide details of any major subcontractor, including bidders relationship (if any) with the subcontractor.
3. Bidder needs to design and make necessary jigs to fix the primary and shield bobbins to the winding machine.
4. Bidder needs to provide the detailed winding procedure consistent with IUACs designated winding method (for internal use only).
5. The bidder needs to design and make small parts or components like screw, clamps if necessary during winding.

6. The bidder needs to provide all the consumable like Mylar sheets, Kapton, glass cloths, resins or epoxy and inter-turn filler materials necessary for winding.
7. The bidder shall perform an initial trial winding on one coil each on primary and shield bobbin to determine the achieved packing factor for the PET insulated WIC conductor. The trial winding will be performed prior to final machining of the bobbin, and the results fed back to IUAC to determine final bobbin dimensions for final machining.
8. The bidder needs to perform and document all necessary diagnostics/ parametric tests like insulation testing, resistance measurement, winding dimensions of the coils during winding, in accordance with IUAC requirements and any other tests advised by vendor.
9. QA report of the winding with all details such as number of turns, dimension of each layer/alternate layers, tension for each coil.
10. Bidder needs to submit the detailed test report of the winding of each coil.
11. Bidder needs to maintain the record for usage or WIC conductor or accounting of the WIC conductor and over binding.
12. The bidders needs to follow the wire-run, wire distribution/termination, nomenclature as prescribed by IUAC. Any deviation needs prior-approval from IUAC personnel before implementation. The bidder may suggest alternate mechanism wire termination or wire-run which needs prior approval by the IUAC personnel before implementation.
13. The bidder needs to maintain the records of deviation in prescribed winding parameters like winding tension and the details needs to be submitted to IUAC after final winding.
14. The vendor should have an independent quality control in executing the winding of the magnet and its report shall be forwarded to the designated IUAC person.
15. Bidder will prepare the wound magnet for shipment ensuring that all wires are secured to preserve winding tension during transportation. All wires will be clearly identified according to the IUAC supplied nomenclature and labelled using cryogenic grade durable label.
16. Bidder need to ship the completely wound magnet. Before the shipment of the consignment, the vendor shall make sure that all the items in the scope of the supply are fully included in the packing boxes. Packing cases must be robust enough to take care of the impact during handling and transportation. Packing shall be suitable for storage of items in a tropical climate. Suitable stiffener and cushion should be provided to arrest any movement and vibration during the transportation. Shock and tilt indicators must be fitted to reveal evidence of mishandling during transportation from the vendors site to IUAC.
17. Vendor shall rectify any bobbin defects and make any small modifications to bobbin to facilitate winding, IUAC to be informed of all such modifications prior to their implementation.

#### **D. General Conditions**

- 1.** The magnet needs to be wound exclusively using horizontal winding machine
- 2.** The successful bidder needs to ensure the safe handling of the bobbin structure to maintain the mechanical integrity and dimension of the bobbin.

- 3.** Any kind of deformation and distortion on the bobbin will not be acceptable and must be reported to IUAC immediately.
- 4.** The bobbin must be handled in horizontal orientation all the time. Vertical orientation during handling/winding is strictly prohibited.
- 5.** Bidder has to agree that the winding of the magnet will be done in presence of IUAC personnel if it is required, and such personnel shall be authorised to take photographs or video as required.
- 6.** The wound magnet will be accepted for shipment by IUAC against review of the winding records and QC documentation.
- 7.** The successful bidder needs to sign a non-disclosure agreement with IUAC prior to receive the design details of the magnet and bobbin.
- 8.** The successful bidder needs to work in close coordination with the designated IUAC person at all stages of the contract in order to resolve any technical issues or problems arise, in the most timely and efficient manner.
- 9.** After finishing the winding, all the surplus WIC conductor will be taken back by IUAC. The successful bidder need to pack the surplus conductors spool for shipment to IUAC.
- 10.** IUAC would take responsibility to ship the material from the vendor's site to Delhi.
- 11.** The successful bidder needs to agree, if required, to have regular Video chat ( SKYPE/Google) with IUAC personnel at mutually convenient time during the contract tenure on technical issues regarding winding.

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