বসু বিজ্ঞান মন্দির

BOSE INSTITUTE

P-1/12, C.I.T. Scheme VII-M, Kolkata 700 054

BIDDING DOCUMENTS

For Tender Notice No.

BI-K/E-TEND/09/2020-21

To be addressed to:

Registrar (Officiating)

Bose Institute, Centenary Building,

P-1/12, CIT Scheme – VII -M

Kolkata – 700054 (INDIA)

CHAPTER - I

INVITATION TO BIDS

Bose Institute, Kolkata, West Bengal, India invites ***online*** offers in INR only from **Indian manufacturers** for **development, manufacture and testing** of the following item:

Sl. No.	Name of the items	Qty.	**Bid security (EMD)**
1.	**SHIELDED HIGH CURRENT FLEXIBLE LSZH SHEATHED CO-AXIAL COPPER CABLE**	196 km.	Bid Security Declaration to be submitted as per format mentioned under Sl no. 6.

- ***Details of specifications are enclosed in Annexure (I, II, III)***

Sl. No.	Particulars	Date & Time
1.	Date of uploading of NIT & other documents (Online)	18.01.2021
2.	Documents download start date (Online)	19.01.2021 (10:30 hrs.)
3.	**Clarification Start date** **Queries to be sent to the mail id: *bipurchase@jcbose.ac.in* / *registrar_office@jcbose.ac.in* / *sougato_ban@yahoo.co.in***	**19.01.2021** **(11:00 hrs.)**
4.	**Clarification End date**	**25.01.2021 (14:00 hrs.)**
5	**On line Pre-bid Conference**	**02.02.2021 (15:30 hrs.)**
6	Amendment (if any) (On line)	09.02.2021 (18:00 hrs.)
7	Bid submission start date (On line)	10.02.2021 (10:00 hrs.)
8	Documents download end date (Online)	22.02.2021 (18:00 hrs.)
9	Bid Submission closing (On line)	22.02.2021 (18:00 hrs.)
10	Bid opening date for Technical Proposals (Online)	24.02.2021 (14:00 hrs.)
11	Date of uploading list for Technically Qualified Bidder (online)	To be notified later
12	Date for opening of Financial Proposal (Online)	To be notified later

GENERAL INSTRUCTION TO BIDDERS

The procurement will be made by Bose Institute in compliance with the Govt. of India rules framed for public procurement from time to time.

General guidance for e-Tendering : Instructions / Guidelines for electronic submission of the tenders have been annexed for assisting the vendors to participate in e-Tendering.

1. **Registration of Vendors :**Any vendor willing to take part in the process of e-Tendering will have to enrol and get registered in the Central Public Procurement (CPP) Portal, NIC, GOI through logging on to http://eprocure.gov.in/eprocure/app and the vendor is to click on the link for e-Tendering site as given on the above.

2. **Digital Signature certificate (DSC)**:Each vendor is required to obtain a Class-II or Class-III Digital Signature Certificate (DSC) for submission of tenders as applicable from the approved service provider of the National Informatics Centre (NIC) on payment of requisite amount. Details are available at the Web Site stated in Clause A.1. above. DSC is given as a USB e-Token.

3. The vendor can search & download N.I.T. & Tender Document(s) electronically from computer once they log on to the website mentioned in Clause A.1. using the Digital Signature Certificate. This is the only mode of collection of Tender Documents.

4. **Submission of Tenders**: Tenders are to be submitted through online as stated in Clause A.1. in two folders at a time for each bid, one in Technical Proposal & the other is Financial Proposal before the prescribed date & time using the Digital Signature Certificate (DSC). The uploaded documents are to be virus scanned and duly Digitally Signed. The documents will get encrypted (transformed into non readable formats).

5. A. **Technical Proposal:** The Technical proposal should contain scanned copies of the following in two covers (folders).

   (a) **Statutory Cover** containing the following documents :
   NIT (upload the published NIT accepted using digital signature)

   (i) Bidders' Information Form
   (ii) Bid Form
   (iii) Techno-Commercial Bid Form
   (iv) Bidder's Performance Statement Form
   (v) Service Support Details Form
   (vi) Technical Compliance Statement Form
   (vii) Fall Clause Certificate
   (viii) Integrity Pact

   (b) **Non-statutory Cover** containing the following documents :

   The bidder has to upload requisite registration / tax certificate like TAN, PAN, Factory License, CIN, GST etc.

B. **Financial Proposal :**

   a. The financial bid should contain the Bill of Quantities (BOQ) corresponding to this tender, which is available on the tender webpage as an MS-Excel file.

b. This file must be downloaded and opened with MS-Excel. The rate being quoted by the bidder must be entered in the space marked for this purpose in the file. **Quoted rate** will be encrypted under BOQ. **In case quoting any rate in Tender Form, the tender is liable to be summarily rejected**.
c. All fields in the BOQ file other than those allocated for the name of the bidder and the rate(s) being quoted are non-editable.
d. The BOQ file must be saved after this and should be uploaded using digital signature.

- **Bidders are requested <u>not to put</u> any percentage (%) in any column of the BOQ.**
- **As per Govt. Notification # 45/2017 dt.14th November, 2017, Scientific Research Institute funded by the Govt. of India, GST will be applicable @5% for the goods used for research purpose, for the bids where GST will be applicable, against DSIR Certificates to be provided by the Institute.**

6. Bid Security:

<u>As per recent govt circular (OM no No. F.9/4/2020-PPD dated 12 Nov 2020, Dept of Expenditure, Ministry of Finance) the bidders have to sign "Bid Security Declaration" in their letterhead accepting that if they withdraw or modify their bids during period of validity etc., they will be suspended for the time specified in the tender documents."</u>

THE ABOVE STATED STATUTORY / NON-STATUTORY DOCUMENTS

SHOULD BE ARRANGED IN THE FOLLOWING MANNER

Click the check boxes beside the necessary documents in the My Document list and then click the tab " Submit Non Statutory Documents' to send the selected documents to Non-Statutory folder.

Next Click the tab "Click to Encrypt and upload" and then click the "Technical" Folder to upload the Technical Documents.

Note: Failure to submit any of the above mentioned documents listed under 5(a) & (b) as well as 6, even after asking for shortfall documents as per rule, may render the bid liable to be summarily rejected for both statutory and non-statutory cover.

BOSE INSTITUTE

Centenary Building,
P-1/12, CIT Scheme VII-M
Kolkata - 700054 (INDIA)

Bose institute, Kolkata, an autonomous R&D Institute, registered under Societies Registration Act, under administrative control of Department of Science & Technology, Ministry of Science & Technology, Government of India, has been designated as the Indian shareholder in the Facility for Antiproton & Ion Research (FAIR) Company, GmbH, Germany and the nodal Indian Institution for the management of FAIR programme in India.

Bose Institute Indo-FAIR Co-ordination Centre (BI-IFCC) established at Bose Institute, Kolkata jointly by the DST and the DAE, Govt. of India, is the implementing body of the Indo-FAIR Programme.

Bose Institute (for BI-IFCC), invites tender online through CPP portal from renowned, experienced and established Indian manufacturers (based in India) with highly skilled engineering & technological background in **design, development, manufacture and testing of shielded high current LSZH sheathed flexible co-axial copper cable. The product as required in this NIT needs to be delivered to FAIR, GmbH, Darmstadt, Germany.**

Total quantity of shielded high current LSZH sheathed co-axial copper cable will be required of total length of **196 kilo-meter** of four different types as given below.

TABLE-1

Shielded High current LSZH Sheathed flexible co-axial copper cable	**Cable type**	**Req. Length (kilo meter)**
Cross Sectional area 50 sq. mm.	1x50RM/50	**8**
Cross Sectional area 95 sq. mm.	1x95RM/95	**2**
Cross Sectional area 150 sq. mm.	1x150RM/150	**160**
Cross Sectional area 185 sq. mm.	1x185RM/185	**26**
Total Length		**196 km**

Bidder shall have to quote for 100% of the above quantity.

The evaluation of bids and the process of selection of bidder/vendor will be done based on pre-qualification criteria and fulfilling the eligibility criteria and all terms and conditions of the tender. Bidders are requested to submit their offer online in the folders as mentioned in the tender invitation. Technically suitable offers only will be considered in financial evaluation. The lowest quoted technically qualified bidder will be finally selected and a provisional purchase order will be issued.

After placing the Provisional Purchase Order, the manufacturer shall first prepare the required documentations (CDR, FDR etc.) as per Annexure-I for the approval from FAIR GmbH,

Germany. Once the approval of the documents is received, the manufacturer will manufacture pre-series of 200m length of all four types as per the technical specifications. After that, Factory Acceptance Tests (FAT) at manufacturer's site shall be performed. Only after successful FAT testing, final approval shall be given to the manufacturer with final Purchase Order (PO) to start bulk production for all sizes of cables. The acceptance criteria of the pre series cables will be same as the cables of all types mentioned in purchase order. **Detailed Specifications of the cable is mentioned in Annexure-I. General specifications for all the systems including the cable, quality check and their regulations are mentioned in Annexure-II.**

In the event of rejection of the pre series (prototype) cables by FAIR/GSI Germany, the purchase order of the products shall be deemed to have been automatically cancelled without any liability to the purchaser and the selected bidder cannot claim for any kind of payment in case of such event. Any payment will be made only after successful FAT test of the pre-series cables of all types.

In order to meet the urgency and timeline of the project, the Institute reserves the right to select L2 bidder in the event of failure of L1 to meet the FAT of the pre-series production subject to matching of L1 rate by L2 bidder. In case L2 bidder does not match the L1 price, subsequent technically compliant bidders may be approached with L1 price.

1. DELIVERY SCHEDULE

Time is the essence of the contract. Pre-series (prototype) of the cable of length 200m of all four sizes of the co-axial cables shall be manufactured for Factory Acceptance Test (FAT) **within 5 months time** from the date of placing Purchase Order (PO). FAT testing shall be conducted at their factory/manufacturing site by a duly constituted team comprising of engineers from Germany and India. After successful FAT only, approval will be given for bulk production of remaining cables as mentioned in PO.

Completion time for the remaining part of cable (bulk) for FAT testing shall be **not more than 4 months** from the date of final purchase order for bulk production. **Periodic status reports on monthly basis are mandatory during the phases of production.** During the bulk production, stage inspection shall be carried out by our engineers and experts at manufacturing site.

2. BRIEF TECHNICAL SPECIFICATIONS OF CO-AXIAL CABLES

Technical details with applicable standards and testing procedures are mentioned in Annexure-I & Annexure-II, for co-axial cables Some of the salient features are mentioned as follows-

a) All technical requirements and parameters of the coaxial cables are mentioned in Table-3, Table-4 and Table-5 of Annexure-I. All the parameters of offered cables should be clearly mentioned within tolerable limit as per the compliance sheet attached in Annexure-III.

b) Co-axial cable must be designed for a life time of minimum 40 year and must be suitable for continuous operation exposing to the atmospheric ambient temp range -15 ^{O}C to +30^{O}C and relative humidity around 80%.

c) The cable should have resistant to abrasion, crushing, oil, water, fire and radiation.

d) The cables shall be tested for Low Smoke Zero Halogen (LSZH) as type test for each cable type as per the applicable standard, refer to the details as mentioned in the section 5.2.1, Annexure-1. **A certificate approving successful completion of Fire Test should be**

provided by the manufacturer.

e) These cables shall be used in radioactive area and because of that, the insulation properties of all non metallic materials ie, XLPE, HDPE and LSZH should withstand the dose limit as mentioned in sec 5.2.2, Annexure-I. **Radiation Test Certificates meeting the compliance of the dose rate for all non metallic materials must be provided before start of production of cables**.

f) The **Annexure-II ("General Specifications")** is a comprehensive set of definitions and prescriptions for all accelerators and storage rings, technical systems and components of the FAIR project including the co-axial Cables. Only the relevant guidelines to safety and quality assurance should be considered.

3. SUMMARY OF DELIVERABLES

Development, manufacture, testing and supply of **shielded high current LSZH sheathed co-axial copper cables** as per the Purchase Order (PO) with specified dimensions, technical requirements and quality standard mentioned in the Annexure-I.

i) Conceptual Design Review (CDR) and Final Design Review (FDR) with drawings for the approval from purchaser before manufacturing pre series cable.
ii) Pre series and bulk co-axial cables in sea worthy packed drums as per the specifications mentioned in PO.
iii) FAT and SAT Test reports of all cable types
iv) Certificates approving Fire Test and Radiation Test
v) Documentation

4. ACCEPTANCE TESTS

a) Factory Acceptance Test (FAT)

The Factory Acceptance Tests (FAT) shall be carried out at manufacturer's site after fabrication of pre series sample as well as complete production of the co-axial cables as per the details mentioned in "Detailed specifications of co-axial cable" in section 5 of Annexure-I attached. Annexure-II(**"**General Specifications") is also attached for some safety guidelines and quality assurance. FAT tests shall be witnessed by a team of engineers from FAIR/GSI, Germany and India authorised by BI-IFCC and final acceptance will be given by the team. The manufacturer must have to inform the due date of FAT well in advance.

ii) Site Acceptance Test (SAT)

After the FAT, the cable should be transported to FAIR/GSI at Darmstadt, Germany. Final acceptance of the delivered cables will take place after successful completion of the Site Acceptance Test (SAT Ab) at FAIR site as per section 5.7, Annexure-I and the relevant sections in Annexure-II.

5. QUALITY ASSURANCE PLAN (QAP)

The manufacturer has to establish a quality management system as per ISO 9001, ISO 14001 and

OHSAS 18001 and quality assurance plan as per section-5, Annexure-I.

6. SPECIFIC POINTS ON PACKING AND MARKING

Bidder should note that the packing of the each type of co-axial cable shall be in accordance with as mentioned in Annexure-I.

a. Sequential labelling and marking of length should be done at every running meter. At every 3-4 m length of cable, there should have marking of Type, cable cross section, voltage rating and year of manufacturing.
b. All the cables shall be suitably packed in drums so as not to suffer any kind of damage and breakage during transit to the customer's site and for safe storage.
c. Cable drums should be covered by protection foil (sea worthy covering)for the protection from environmental effect including ultra violet radiation and sea water.
d. Each package shall be stencilled in bold character with indelible paint & shipping marks, package numbers, content, gross weights in kg and purchase order no. to identify the particular components.
e. Each drum should contain continuous length of the cable of length 1000 m for each type with tolerance $\pm$ 2%.

7. TRANSPORTATION AND SHIPMENT

After the cables successfully pass THE FAT tests as per sec-5, shall have to be shipped to the FAIR site in Darmstadt, Germany and delivery to the designated space at site. Following points are important for bidder:-

a. Materials shall be dispatched/shipped only after obtaining a prior approval or a shipping release from the purchaser. The purchaser will carry out necessary inspection in this regard before giving approval for release of shipment.
b. The supplier shall be fully responsible for protective measures to ensure the safe delivery of the materials. The supplier shall arrange for necessary insurance of the items at his own cost against damage/loss during transportation.
c. The suppliers should, at his responsibility check and ascertain the mode of transport of the material to the site.
d. Packaging of the materials shall be properly done. Each package shall be limited to size and weight that are permissible under the existing ship/rail/road limitations. All lifting points shall be clearly marked.

Annexure-I, II and III are given in the later in this document.

Bose Institute reserves the right to accept or reject any or all tenders either in part or in full. The reasons for rejecting the tender of the bidder will be disclosed only when enquiries are made.

Registrar (Officiating)
Bose Institute

CHAPTER –II: INSTRUCTION TO BIDDERS

A. INTRODUCTION

1. **Cost of Bidding**

1.1 The Bidder shall bear all costs associated with the preparation and submission of its bid, and "the Purchaser", will in no case be responsible or liable for these costs, regardless of the conduct or outcome of the bidding process.

B. THE BIDDING DOCUMENTS

2. **Bid Document**

2.1 Tender documents are available at Bose Institute website http://www.jcbose.ac.in/tenders and www.eprocure.gov.in **Bidder shall submit the bid documents online through CPP portal.**

2.2 **The present bid document consists of instructions and criteria mentioned in various chapters including annexures. All conditions mentioned in the document including the annexures are to be satisfied as a part of the bidding. Confusions, if any on any criterion will have the technical specifications mentioned in Annexure-I as the final one.**

3. **Contents of Bid Document**

3.1 The goods required, bidding procedures and contract terms are prescribed in this Bid Document which includes the following:

S. No.	Title	Chapter No.
01.	Invitation to Bid	I
02.	Instructions to Bidder (ITB)	II
03.	General Conditions of Contract (GCC)	III
04.	Special Conditions of Contract (SCC)	IV
05.	Bid Form	V
06.	Techno-Commercial Bid Form	VI
07.	Performance Security Form	VII
08.	Bidder's Performance Statement Form	VIII
09.	Pre Qualification Requirements changed	IX
10.	Technical Compliance Statement Form	X
11.	Detailed Technical Specifications	Annexure-I
12.	General technical specifications	Annexure-II
13.	List of technical compliance tables	Annexure-III

3.2 The Bidder is expected to examine all instructions, forms, terms (ITB/GCC/SCC etc.), and specifications in the bidding documents. Failure to furnish all information required by the bidding documents or submission of a bid not substantially responsive shall result in rejection of the bid.

4. **Amendment To Bid Document**

4.1 At any time prior to the deadline for submission of bids, the Purchaser may, for any reason modify the Bid Document by amendment. Such amendments shall form an integral part of bid documents and it shall amount to an amendment of relevant clauses of the Bid Document.

Online Pre-bid conference would be held on 05.02.2021 (15:30 hrs.). The bidders are requested to keep a watch in the Bose Institute website/CPP portal regarding any announcement on pre-bid conference.

Normally no interim queries are entertained. However, for any specific clarifications on any aspect of the tender, the bidders may refer to the table mentioned in Chapter – I.

4.2 All bidders are required to keep a watch on Bose Institute website http://www.jcbose.ac.in and/or CPP portal about any amendment to the tender document or any clarification to the queries raised by the bidders. The Purchaser reserves the right to reject the bids if the bids are submitted without taking into account these amendments/clarifications. In order to allow the bidders reasonable time in which to take the amendment into account in preparing their bids, and also with the objective of obtaining more number of competitive bids, the Purchaser, at its discretion, may extend the deadline for the submission of bids.

C.PREPARATION OF BIDS

5. **Language of Bid**

5.1 The Bid prepared by the Bidder and all correspondence and documents relating to the bid exchanged by the bidder and the purchaser shall be written in English language, provided that any printed literature furnished by the bidder may be written in another language but it is to be accompanied by an English translation of its pertinent passage(s) duly signed and verified as true English translation. The responsibility for the correctness of the translation will be solely and completely on the bidder and the Purchaser will not be responsible for any loss/likely loss due to error in translation whatsoever. In such cases, for the purpose of interpretation of the bid, the English translation shall only prevail.

6.1 Documents Comprising the Bid

(i) The Tender Documents should be completed in all respects. Wherever the information is not relevant, the space should be appropriately filled with **'NA or NIL'**. No space shall be left blank. All pages of the tender form should be duly stamped &signed by the bidder and uploaded in the CPP portal.

(ii) The bid is liable to be set aside if complete information as specified in the techno-commercial bid is not given.

(iii) If the given space is insufficient to give required information, additional sheets may be added and uploaded.

(iv) Attention should be paid to the delivery dates, technical specifications and the terms and conditions of the tender notification.

(v) The bid is required to be submitted in multiple folders online. Necessary instructions in this regard will be given in the CPP portal.

(vi) The bidder may give additional commercial terms, if any, in their techno-commercial bid only, and price bid should contain only price details. The break up prices, as applicable should be separately indicated in the Financial Bid as additional folder and uploaded.

(vii) Profile of the organization with the organization chart of the company and details of shop floor engineers, QA personnel and other staffs members.

(viii) Latest bank Solvency Certificate of minimum **Rs. 70 Crores** to assess solvency/financial capability.

(ix) The bidder shall have **average annual turnover of Rs 100 crore** during the last 3 years ending 31 March,2020. The bidder shall provide the Audited Annual Accounts for the last 3 financial years ending March 2020.

(x) The manufacturers shall not have incurred loss during last 3 consecutive financial years. So, the bidders shall have to submit an audited balance sheet and profit/loss statement/account for last 3 financial years ending March 2020.

(xi) PAN Reference of the bidder/manufacturer.

(xii) List of heavy machineries indicating type, capacity, duty, year of manufacture etc. with valid calibration certification and infrastructural facilities of the manufacturer.

(xiii) A brief description of the proposed plan for the execution of this work.

(xiv) The bidder shall furnish documentary evidence about technical and production capability to perform the contract without delay.

(xv) Valid Goods and Services Tax (GST) Registration Certificate as documentary proof of GST Registration.

(xvi) Certificate of manufacturing experience of 5 years or more for the LSZH sheathed cables and should furnish satisfactory feedback reports for the materials supplied to the reputed clients.

(xvii) List of valid IS/ISO certifications and approvals with documentary evidence.

Note:- All the documents submitted by the bidders/manufacturers should be signed with company's stamp and uploaded in the CPP portal.

6.2 **Techno-Commercial Un-priced Bidshall include the following**:

(i) Bid Form;

(ii) Techno-Commercial Bid Form;

(iii) Technical Compliance Statement Form;

(iv) Bid Security declaration as specified

(v) Performance Statement Form;

(vi) Relevant documents mentioned in section 6.1 "Documents comprising the Bid".

(vii) Each points of Technical compliance sheet as per Annexure-III.

6.3 The Financial/Price folder shall include only the Financial/Price Bid Form with price indicated in it. The price break up to be uploaded as separate pdf file in the Financial cover.

7. **Bid Prices**

7.1 Bidders are requested to give their final and best offer. Techno-Commercial Discussions will be held with the Lowest Technically compliant Bidder only, if necessary.

7.2 Bidder, who do not accept our standard commercial terms are liable to be ignored. **A categorical confirmation of acceptance of all our terms and conditions in toto will have to be observed which enable speedy processing of the offers.**

7.3 Pre-conditioned, incomplete offers, not in line with the terms and conditions of the tender documents, are liable to be rejected.

7.4 The Bidder shall indicate the unit prices with detail break-up and total bid prices of the goods it proposes to supply under the order in the Financial cover

7.5 (i) **Price:** The price of the goods, quoted should include (ex-works, ex-factory, ex-showroom, ex-warehouse, or off-the-shelf, as applicable),

including all applicable duties, taxes , already paid or payable along with the shipment cost.

(ii) **Taxes**: The amount payable on account of Excise Duty, Customs Duty and other applicable taxes should be mentioned clearly. **If there is no explicit mention of taxes in your offer then quoted price will be deemed inclusive of such taxes. No other charges except those mentioned clearly in the quotation will be paid**.

(iii) Rates should be quoted **onsite FAIR/GSI, Germany,** inclusive of packing, forwarding, etc. Break-up of ex-works prices are to be quoted with packing, forwarding, documentation, freight and insurance charges. Vague terms like "packing, forwarding, transportation etc. extra" without mentioning the specific amount/percentage of these charges will **NOT** be accepted. Such offers shall be treated as incomplete and rejected. **Where there is no mention of packing, forwarding, freight, insurance charges, then it will be assumed that same is already included in the quoted price.**

7.6 Prices quoted by the bidder shall remain fixed during the entire period of contract and shall not be subject to variation on any account. A bid submitted with an adjustable price quotation will be treated as non – responsive and rejected.

8. **Bid Currencies**

8.1 Prices shall be quoted in Indian Rupees only.

9. **Documents Establishing Bidder's Eligibility and Qualifications**

9.1 Pursuant to instruction to Bidder, the bidder shall furnish, as part of its bid, documents establishing the bidders' eligibility to bid and its qualification to perform the contract if its bid is accepted.

10. **Documents Establishing Goods' Eligibility and Conformity to Bid Document**

10.1 The documentary evidence of the goods and services eligibility shall consist of a statement on the country of origin of the goods and services offered which shall be confirmed by a certificate of origin at the time of shipment.

10.2 **Specifications are basic essence of the product**. It must be ensured that the offers are strictly as per our specifications. At the same time it must also be kept in mind that merely copying our specifications in their quotation shall not make firms eligible for consideration. The documentary evidence of conformity of the goods and services to the Bid Document may be in the form of literature, drawings and data, and shall consist of:

(i) A detailed description of the essential technical and performance characteristics of the goods;

(ii) An item-by-item commentary on the Purchaser's Technical Specifications

demonstrating substantial responsiveness of the goods and services to those specifications or a statement of deviations and exceptions to the provisions of the Technical Specifications.

10.3 For purposes of the commentary to be furnished pursuant to above, the Bidder shall note that standards for workmanship, material and equipment, and references to brand names or catalogue numbers designated by the Purchaser in its Technical Specifications are intended to be descriptive only and not restrictive. Technically unsuitable offers, and/or, offers not conforming to tender schedule, shall be rejected.

10.4 In case the bidder furnishes wrong or false information willfully in the technical compliance chart, such action shall be viewed strictly and the bidders may be blacklisted.

11. Bid Security declaration must be submitted as mentioned earlier (see item 6.2).

12. **Period of Validity of Bids**

12.1 **Bids shall remain valid at least for 120days after the date of opening of technical bid by the Purchaser**. A bid valid for a shorter period may be rejected by the Purchaser as non-responsive.

12.2 In exceptional circumstances, the Purchaser may solicit the Bidder's consent to an extension of the period of validity. The request and the responses thereto shall be made in writing , fax or e mail). A Bidder granting the request will neither be required nor permitted to modify its bid.

12.3 Bid evaluation will be based on the bid prices without taking into consideration the above correction.

13. **Deadline for Submission of Bids(as per CPP portal schedule)**

13.1 The Purchaser may, at its discretion, extend this deadline for submission of bids by amending the bid documents in accordance with Clause 4 of ITB, in which case all rights and obligations of the Purchaser and Bidders previously subject to the deadline will thereafter be subject to the deadline as extended.

D. OPENING AND EVALUATION OF BIDS

14 **Opening of Bids by the Purchaser**

14.1 The Purchaser will open all Techno Commercial Un-priced Bids as per the schedule given in invitation to bids.

14.2 In the event of the specified date of Bid opening being declared a holiday for the Purchaser, the Bids shall be opened at the appointed time and location on the next working day.

14.3 The firm is at liberty to be present or authorise a representative to be

present during opening of Techno-Commercial bid at the time and date as specified. .

14.4 Bose Institute (for BI-IFCC) reserves the right to call for techno-commercial/price negotiations, if required. The company should depute competent representative for such discussion/ negotiations whenever called for and the representative should be competent to take on the spot decisions.

14.5 No correspondence/discussions/visits whatsoever will be entertained on the subject unless specifically called by this office after opening the tenders for technical discussions/ price negotiations. Any violation of this will render the bid invalid and the firm is liable to be blacklisted.

15. **Clarification of Bids**

15.1 To assist in the examination, evaluation and comparison of bids, the Purchaser may, at its discretion ask the bidder for any clarification(s) of its bid. The request for clarification and the response shall be in writing and no change in the price substance of the bid shall be sought, offered or permitted. However no post-Bid clarifications at the initiative of the Bidder shall be entertained.

16. **Preliminary Examination**

16.1 The Purchaser will examine the bids to determine whether they are complete, and whether the bids are generally in order.

16.2 Arithmetical errors in the priced bids will be rectified on the following basis. If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected. If there is a discrepancy between the price quoted in words and figures, the amounts in words shall prevail.

16.3 The Purchaser may waive any minor informality, non-conformity, or irregularity in a bid, which does not constitute a material deviation, provided such a waiver, does not prejudice or affect the relative ranking of any Bidder.

16.4 Prior to the detailed evaluation, the Purchaser will determine the substantial responsiveness of each bid to the Bid Document. For purposes of these Clauses, a substantially responsive bid is one, which conforms to all the terms and conditions of the Bid Document without material deviations. Deviations from or objections or reservations to critical provisions such as those concerning Bid Security, Warranty, Force Majeure, Applicable law and Taxes & Duties will be deemed to be a material deviation. The Purchaser's determination of a bid's responsiveness is to be based on the contents of the bid itself without recourse to extrinsic evidence.

16.5 If a bid is not substantially responsive, it will be rejected by the Purchaser and may not subsequently be made responsive by the Bidder by correction

of the non-conformity.

16.6 The language of standard clauses etc. mentioned in this 'Bid Document' should not be tampered with/ changed/modified in any manner whatsoever. If any such modification etc. comes to our knowledge at any stage, the bid shall be rejected immediately.

17. **Evaluation & Comparison of Bids**

17.1 Evaluation of the bids will be made in two stages.

A bid must satisfy the Pre-qualification Requirements (PQR) as mentioned later in this document (Chapter IX) to be qualified for evaluation of the Technical Proposal.

17.2 For the bids surviving the technical evaluation which have been found to be responsive the evaluation & comparison of the financial proposal shall be made as under:

The final landing cost of purchase taking into account, freight, forwarding, insurance, taxes, etc. onsite **at FAIR, Darmstadt, Germany** shall be the basis of evaluation.

17.3 **Conditional tenders etc. shall not be accepted.**

17.4 Where there is no mention of packing, forwarding, freight, insurance charges, taxes etc. such offers shall be rejected as incomplete.

18. **Contacting the Purchaser**

18.1 Subject to ITB clause 16, no Bidder shall contact or attempt to contact the Purchaser or anyone related to the Purchaser on any matter relating to its bid, from the time of the bid opening to the time the Contract is awarded. If the bidder wishes to bring additional information to the notice of the Purchaser, it should do so in writing.

18.2 Any effort by a Bidder to influence the Purchaser in its decisions on bid evaluation, bid comparison or contract award may result in rejection of the Bidder's bid.

19. **Post Qualification**

19.1 The Purchaser will determine to its satisfaction whether the Bidder that is selected as having submitted the lowest evaluated responsive bid is qualified to perform the contract satisfactorily, in accordance with the criteria listed in Instruction to Bidder Clause 9.

19.2 The determination will take into account the Bidder's financial, technical and production capabilities. It will be based upon an examination of the

documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB Clause 9, as well as such other information as the Purchaser deems necessary and appropriate.

19.3 An affirmative determination will be a prerequisite for award of the contract to the Bidder. A negative determination will result in rejection of the Bidder's bid.

20. **Award Criteria**

20.1 The evaluation of bids and the process of selection of bidder/vendor will be done based on pre-qualification criteria and fulfilling the eligibility criteria and all terms and conditions of the tender. Bidders are requested to submit their offer online in the folders as mentioned in the tender invitation. Technically suitable offers only will be considered in financial evaluation. The lowest quoted technically qualified bidder (L1) will be finally selected and a provisional purchase order will be issued.

After placing the Provisional Purchase Order, the manufacturer shall first prepare the required documentations (CDR, FDR etc.) as per Annexure-I for the approval from FAIR GmbH, Germany. Once the approval of the documents is received, the manufacturer will manufacture pre-series of 200m length of all four types as per the technical specifications. After that, Factory Acceptance Tests (FAT) at manufacturer's site shall be performed. Only after successful FAT testing, final approval shall be given to the manufacturer with final Purchase Order (PO) to start bulk production for all types of cables. The acceptance criteria of the pre series cables will be same as the cables of all types mentioned in purchase order. Detailed Specifications of the cable is mentioned in **Annexure-I**. General specifications for all the systems including the cable, quality check and their regulations are mentioned in **Annexure-II**.

In the event of rejection of the pre series (prototype) cables in FAT, the purchase order of the products shall be deemed to have been automatically cancelled without any liability to the purchaser and the selected bidder cannot claim for any kind of payment in case of such event. Any payment will be made only after successful FAT test of the pre-series cables of all types.

20.2 ***In order to meet the urgency and timeline of the project, the Institute reserves the right to select L2 bidder in the event of failure of L1 to meet the FAT of the pre-series production subject to matching of L1 rate by L2 bidder. In case L2 bidder does not match the L1 price, subsequent technically compliant bidders may be approached with a condition of matching L1 price.***

20.3 The Institute reserve the right to split the tender and item wise L1 may be considered for selection.

21. **Purchaser's Right to vary Quantities at the Time of Award**

21.1 The Purchaser reserves the right during the tenure of the Contract **to increase or decrease the quantity of goods up to 25%** of the same

originally specified in the Schedule of Requirements without any change in unit price or other terms and conditions.

22. **Purchaser's Right to Accept Any Bid and to Reject any or All Bids**

22.1 The Purchaser reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to award of Contract, without thereby incurring any liability to the affected Bidder or bidders or any obligation to inform the affected Bidder or bidders of the grounds for the Purchaser's action.

23. **Notification of Award**

23.1 Prior to the expiration of the period of bid validity, the Purchaser will notify the successful bidder in writing that the bid has been accepted by way of a Purchase Order for prototyping.

24. **Acceptance of award**

24.1 The successful bidder should submit acceptance of the Purchase Order immediately but not later than 15 days in any case from the date of issue of the Purchase Order failing which it shall be presumed that the vendor is not interested.

25. **Agreement**

25.1 The successful bidder will be required to enter into an agreement with the Purchaser on non-judicial stamp paper of appropriate value within 10 days of order acceptance. The arrangement of the stamp paper and the cost thereof has to be borne by the bidder. The format of the agreement will be provided to the successful bidder only.

26. **Performance Security**

26.1 Within 15 days from the date of acceptance of award, the successful Bidder shall furnish the performance security equivalent to 3% of the total order value, in the form of **Account Payee demand draft, Fixed Deposit Receipt, Bankers Cheque or Bank Guarantee** of any commercial bank as mentioned in Performance Security Form **(Chapter VII)**

26.2 Failure of the successful bidder to accept the order shall constitute sufficient grounds for the annulment of the award and procure the items at the risk and cost of the bidder.

CHAPTER - III: GENERAL CONDITIONS OF CONTRACT (GCC)

1. **Definitions**

1.1 In this Contract, the following terms shall be interpreted as indicated:

(i) "The Order" means the Purchase Order placed by the Purchaser including all the attachments and appendices thereto and all documents incorporated by reference therein;

(i) "The Contract Price" means the price payable to the Supplier under the Order for the full and proper performance of its contractual obligations;

(ii) "The Goods" means all the materials, which the Supplier is required to supply to the Purchaser at indented site under the Contract. Here final destination of the supplies is FAIR site in Germany;

(iii) "Services" means services ancillary to the supply of the Goods, such as transportation and insurance, and any other incidental services, such as installation, commissioning, provision of technical assistance, training and other obligations of the Supplier covered under the Contract;

(iv) “GCC” mean the General Conditions of Contract contained in this section.

(v) “SCC” means the Special Conditions of Contract.

(vii) “The Purchaser” as specified in Special Conditions of Contract.

(viii) “The Purchaser’s country” is **“India”**.

(ix) “The Supplier” means the individual or firm supplying the Goods and Services under this Contract.

(x) “Day” means calendar day

2. **Application**

2.1 These General Conditions shall apply to the extent that they are not superseded by provisions in other parts of the Contract.

3. **Standards**

3.1 The Goods supplied under this Contract shall conform to the standards mentioned in the Annexure-I Detailed Technical Specifications and Annexure-II attached. and, when no applicable standard is mentioned, to the authoritative standard appropriate to the Goods' country of origin and such standards shall be the latest issued by the concerned institution.

4. **Use of Contract Documents and Information**

4.1 The Supplier shall not, without the Purchaser's prior written consent, disclose the Contract, or any provision thereof, or any specification, plan, drawing, pattern, sample or information furnished by or on behalf of the Purchaser in connection therewith, to any person other than a person employed by the Supplier in performance of the Contract. Disclosure to any such employed person shall be made in confidence and shall extend only so

far, as may be necessary for purposes of such performance. The Supplier shall not, without the Purchaser's prior written consent, make use of any document or information except for purposes of performing the Contract.

4.2 Any document, other than the Contract itself, enumerated in GCC Clause 4.1 shall remain the property of the Purchaser and shall be returned (in all copies) to the Purchaser on completion of the Supplier's performance under the Contract if so required by the Purchaser.

4.3 The purchaser may be under obligation to make any document/information submitted by the bidder in response to this bid public if required under the provision of Right to Information Act 2005 or other statutory provisions. Therefore the bidder may explicitly indicate if any document/information in his tender includes information of commercial confidence, trade secrets or intellectual property, the disclosure of which would jeopardize the competitive position of the bidder.

5. **Patent Rights**

5.1 The Supplier shall indemnify the Purchaser against all third-party claims of infringement of patent, trademark or industrial design rights arising from use of the Goods or any part thereof in India.

6. **Submission of the bids**

6.1 All bids complete in every respect must be uploaded in the CPP portal **within the last date and time**. No extension shall be allowed for any reason what so ever. **The bidder has to submit Bid Security Declaration as per format, without which their bids would not be considered**.

7. **Performance Security**

7.1 Within 15 days from the date of acceptance of award the Supplier shall furnish performance security for the amount specified in SCC.

7.2 The proceeds of the performance security shall be payable to the Purchaser as compensation for any loss resulting from the Supplier's failure to complete its obligations under the Contract.

7.3 The Performance Security shall be submitted in following forms:

(i) In the form of **Account Payee demand draft, Fixed Deposit Receipt, Bankers Cheque or** Bank Guarantee issued by a Commercial bank located in India in the format provided in the bidding documents.

7.4 The performance security shall be valid for a period of 60 days following the date of completion of the Supplier's performance obligations, including any warranty obligations, unless specified otherwise in SCC. The performance Security shall be discharged by the Purchaser and returned to the Supplier on expiry.

7.5 In the event of any contract amendment, the supplier shall, within 30 days of receipt of such amendment, furnish the amendment to the performance security, rendering the same valid for the duration of the contract, as amended for further period of 60 days thereafter.

8. **Inspections and Tests**

8.1 The Purchaser or its representative shall have the right to inspect and/or to FAT test at manufacturer's site the Goods to confirm their conformity to the Contract specifications at no extra cost to the Purchaser. SCC, the Technical Specifications and the relevant clause(s) the agreement, shall specify what inspections and tests the Purchaser requires and where they are to be conducted. The Purchaser shall notify the Supplier in writing in a timely manner of the identity of any representative(s) retained for these purposes.

8.2 The inspections and FAT tests shall be conducted on the premises of the Supplier **and only after successful testing and on obtaining purchaser's approval, the bidder shall have to ship the supply to FAIR, Germany. A**ll reasonable facilities and assistance, including access to drawings and production data shall be furnished to the inspectors at no charge to the Purchaser.

8.3 Should any inspected or tested Goods fail to conform to the specifications, the Purchaser may reject the goods and the Supplier shall either replace the rejected Goods or make alterations necessary to meet specification requirements free of cost to the Purchaser.

8.4 The Purchaser's right to inspect, test and, where necessary, reject the Goods after the Goods arrival at Project Site shall in no way be limited or waived by reason of the Goods having previously been inspected, tested and passed by the Purchaser or its representative prior to the Goods shipment.

8.5 Nothing in GCC Clause 8 shall in any way release the Supplier from any warranty or other obligations under this Contract.

9. **Packing**

9.1 The Supplier shall provide such packing of the Goods as is required to prevent their damage or deterioration during transit to their final destination as indicated in the Contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the Goods' final destination and the absence of heavy handling facilities at all points in transit.

9.2 The packing, marking and documentation within and outside the packages shall comply strictly with such special requirements as shall be provided for in the Contract including additional requirements, if any, specified in SCC

and in any subsequent instructions ordered by the Purchaser.

10. **Delivery and Documents**

10.1 Delivery of the Goods shall be made by the Supplier in accordance with the terms specified by the Purchaser in the order within the period as indicated in the SCC. The details of shipping and/or other documents to be furnished by the supplier are specified in SCC. The place of delivery of the equipment is FAIR, GSI, Darmstadt, Germany.

11. **Insurance**

11.1 The Goods supplied under the Contract shall be fully insured in Indian Rupees against loss or damage incidental to manufacture or acquisition, transportation, storage and delivery in the manner specified in SCC. The goods should be insured at 110% of the ordered value. Necessary documents including premium receipt should be submitted to the Institute, before consideration of payment.

12. **Transportation**

12.1 Where the Supplier is required under the Contract to transport the Goods to a specified place of destination / Project site, transport to such place of destination including insurance etc., as shall be specified in the Contract, shall be arranged by the Supplier, and the related cost shall be included in the Contract Price. The transportation cost to the delivery site to be paid as per actual, subject to maximum of the rate quoted in the financial bid.

13. **Warranty**

13.1 The Supplier shall warrants that the Goods supplied under this Contract are new, unused, of the most recent or current models and that they incorporate all recent improvements in design and materials unless provided otherwise in the Contract. The Supplier shall further warrants that all Goods supplied under this Contract shall have no defect arising from design, materials or workmanship or from any act or omission of the Supplier, that may develop under normal use of the supplied Goods in the conditions prevailing in the country of final destination. The warranty should be comprehensive and on site.

13.2 **This warranty shall remain valid for 24 months**. The warranty period of the supply shall start on the day after signing of the final technical acceptance certificate at Facility site by the competent authority of FAIR after supply of all the required materials, but not later than 60 calendar days after delivery of the last component. The supplier continue to warrant for substituted goods, parts provided and for reparation work just as he warrants for the ordered goods quality. For parts of delivery that broke down because of defects in quality and that cannot be used for operation purposes, therefore, a prolongation of the warranty period for the length of operation interruption is to be agreed.

13.3 The cost of correction of faults payable by the supplier include the expenses for packing, freight and carriage etc., the cost for work of removing and installing goods and parts provided, travel expenses as well as the cost to remedy, delivery, deficiencies at the Company.

13.4 The Purchaser shall promptly notify the Supplier in writing of any claims arising under this warranty. Upon receipt of such notice, the Supplier shall immediately, within a reasonable period, arrange to repair or replace the defective goods or parts thereof free of cost at the ultimate destination. The Supplier shall take over the replaced parts/goods at the time of their replacement. No claim whatsoever shall lie on the Purchaser for the replaced parts/goods thereafter. If the supplier having been notified fails to remedy the defects within a reasonable period, the purchaser may proceed to take such remedial action as may be necessary, at the supplier's risk and expenses and without prejudice to any other rights, which the purchaser may have against the supplier under the contract.

14. **Payment**

14.1 The general conditions of payment for the prototypes and bulk supply are 100% payment within 45 days from the date of successful acceptance. Payment will be considered only after satisfactory SAT tests of the same, at Darmstadt, FAIR, GSI, Germany.

14.2 The Supplier's request(s) for payment shall be made to the Purchaser in writing, accompanied by an invoice describing, the Goods delivered and the Services performed, and by documents, submitted pursuant to GCC Clause 10 and upon fulfilment of other obligations stipulated in the contract.

14.3 Payments shall be made promptly by the Purchaser normally within forty five (45) days after submission of the invoice or claim by the Supplier along with all relevant documents. No interest will be paid by the Institute for late payment.

14.4 Payment shall be made in Indian currency.

14.5 TDS, if any, will be deducted as per rule.

15. **Prices**

15.1 Prices charged by the Supplier for Goods delivered and Services performed under the Contract shall not vary from the prices quoted by the Supplier in its bid. Conditional offers indicating changes to price quoted due to price decrease by the principal firm and market fluctuations shall make the bid liable to be cancelled.

16. **Change Orders**

16.1 The Purchaser may at any time, by written notice given to the Supplier pursuant to GCC Clause 28, make changes within the general scope of the Contract in any one or more of the followings:

(i) Drawings, designs, or specifications, where Goods to be furnished under the Contract are to be specifically manufactured for the Purchaser;

(ii) The method of shipping or packing;

(iii) The place of delivery; and/or

(i) The Services to be provided by the Supplier;

(ii) The delivery schedule.

16.2 If any such change causes an increase or decrease of time required for, the Supplier's performance of any provisions under the Contract, an equitable adjustment shall be made in the Contract delivery schedule and the Contract shall accordingly be amended. Any claim by the Supplier for adjustment under this clause must be asserted within fifteen (15) days from the date of the Supplier's receipt of the Purchaser's change order.

17. **Contract Amendments**

17.1 Subject to GCC Clause 16, no variation in or modification of the terms of the Contract shall be made except by written amendment signed by the parties.

18. **Assignment**

18.1 The Supplier shall not assign, in whole or in part, its obligations to perform under the Contract, except with the Purchaser's prior written consent.

19. **Subcontracts**

19.1 No subcontract will be allowed for this supply.

20. **Delays in the Supplier's Performance**

20.1 **Since time is the essence of the contract**, delivery of the prototypes and bulk Goods and performance of the Services shall be made by the Supplier in accordance with the Delivery Schedule mentioned elsewhere in this document.

20.2 If at any time during performance of the Contract, the Supplier or its sub-contractor(s) should encounter conditions impeding timely delivery of the Goods and performance of Services, the Supplier shall promptly notify the Purchaser in writing of the fact of the delay, its likely duration and its cause(s).

20.3 As soon as practicable after receipt of the Supplier’s notice, the Purchaser

shall evaluate the situation and may, at its discretion, extend the Supplier's time for performance with or without penalty, in which case the extension shall be ratified by the parties by amendment of the Contract.

20.4 Except as provided under GCC Clause 23, a delay by the Supplier in the performance of its delivery obligations shall render the Supplier liable to the imposition of penalty pursuant to GCC Clause 21, unless an extension of time is agreed upon pursuant to GCC Clause 20.2 without the application of penalty clause.

21. **Penalty**

21.1 Subject to GCC Clause 23, if the Supplier fails to deliver any or all of the Goods or to perform the Services within the period(s) specified in the Contract, the Purchaser shall, without prejudice to its other remedies under the Contract, deduct from the Contract Price, as penalty, a sum equivalent to the percentage specified in SCC of the delivered price of the delayed Goods or unperformed Services for each week or part thereof of delay until actual delivery or performance, up to a maximum deduction of the Percentage specified in SCC. Once the maximum is reached, the Purchaser may consider termination of the Contract pursuant to GCC Clause 22.

22. **Termination for Default**

22.1 The Purchaser may, without prejudice to any other remedy for breach of contract, by written notice of default sent to the Supplier, terminate the Contract in whole or part:

(i) If the Supplier fails to deliver any or all of the Goods within the period(s) specified in the order, or within any extension thereof granted by the Purchaser pursuant to GCC Clause 20; or

(ii) If the Supplier fails to perform any other obligation(s) under the Contract; or

(iii) If the Supplier, in the judgment of the Purchaser, has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.

22.2 For the purpose of this Clause:

(i) "Corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution.

(ii) "Fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Borrower, and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Borrower of the benefits of free and open competition;"

22.3 In the event the Purchaser terminates the Contract in whole or in part, pursuant to GCC Clause 22.1, the Purchaser may procure, upon such

terms and in such manner, as it deems appropriate, Goods or Services similar to those undelivered, and the Supplier shall be liable to the Purchaser for any excess costs for such similar Goods or Services. However, the Supplier shall continue the performance of the Contract to the extent not terminated.

23. **Force Majeure**

23.1 Notwithstanding the provisions of GCC Clauses 20, 21 and 22, the Supplier shall not be liable for forfeiture of its performance security, liquidated damages or termination for default, if and to the extent that, its delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.

23.2 For purposes of this Clause, "Force Majeure" means an event beyond the control of the Supplier and not involving the Supplier's fault or negligence and not foreseeable. Such events may include, but are not limited to, acts of the Purchaser either in its sovereign or contractual capacity, wars or revolutions, fires, floods, earthquake, epidemics, quarantine restrictions and freight embargoes.

23.3 If a Force Majeure situation arises, the Supplier shall promptly notify the Purchaser in writing of such conditions and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

24. **Termination for Insolvency**

24.1 The Purchaser may at any time terminate the Contract by giving written notice to the Supplier, if the Supplier becomes bankrupt or otherwise insolvent. In this event, termination will be without compensation to the Supplier, provided that such termination will not prejudice or affect any right of action or remedy, which has accrued or will accrue thereafter to the Purchaser.

25. **Resolution of Disputes**

25.1 The Purchaser and the supplier shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract.

25.2 If, after thirty (30) days from the commencement of such informal negotiations, the Purchaser and the Supplier have been unable to resolve amicably a Contract dispute, either party may require that the dispute be referred for resolution to the formal mechanisms specified in the SCC. These mechanisms may include, but are not limited to, conciliation mediated by a third party, adjudication in an agreed national or international forum, and national or international arbitration.

26. **Governing Language**

26.1 The contract shall be written in English language. Subject to GCC Clause 28, English language version of the Contract shall govern its interpretation. All correspondence and other documents pertaining to the Contract, which are exchanged by the parties, shall be written in the same language.

27. **Applicable Law**

27.1 The Contract shall be interpreted in accordance with the laws of the Union of India and all disputes shall be subject to place of jurisdiction as specified in SCC.

28. **Notices**

28.1 Any notice given by one party to the other pursuant to this contract/order shall be sent to the other party in writing or by, FAX or e mail and confirmed in writing to the other party's address specified in the SCC.

28.2 A notice shall be effective when delivered or on the notice's effective date, whichever is later.

29. **Taxes and Duties**

29.1 Supplier shall be entirely responsible for all taxes, duties, license fees, road permits, etc., incurred until delivery of the contracted Goods to FAIR site.

CHAPTER - IV: SPECIAL CONDITIONS OF CONTRACT (SCC)

The following Special Conditions of Contract shall supplement the General Conditions of Contract. Whenever there is a conflict, the provisions herein shall prevail over those in the General Conditions of Contract. The corresponding clause number of the General Conditions is indicated in parentheses.

1. **Definitions (GCC Clause 1)**

1.1 The Purchaser is 'Bose Institute (for BI-IFCC), Kolkata (WB), INDIA'.

2. **Performance Security (GCC Clause 7)** Substitute clause 7.1 of the GCC by the following:

2.1 Within 15 days from the date of award for the bulk supply, the Supplier shall furnish Performance Security to the Purchaser for an amount of 3% of the contract value, valid up to 60 days after the date of completion of performance obligations including warranty obligations. The period therefore includes the warranty period of 24 months plus sixty days.

2.2 If the performance security is not furnished within the stipulated time as per 2.1 above, the contract shall be deemed terminated in pursuance of GCC Clause 22.

3. **Inspection and Tests:** Inspection and tests prior to shipment of Goods and at final acceptance are as follows:

3.1 After the goods are manufactured and assembled, inspection and testing of the goods (FAT) shall be carried out at the supplier's plant by a duly constituted committee of the Purchaser in presence of the supplier, prior to shipment to check whether the goods are in conformity with the technical specifications attached to the purchase order. Manufacturer's test certificate with data sheet shall be issued to this effect and submitted along with the delivery documents. The Representative(s) of Purchaser/FAIR, GSI shall be present at the supplier's premises during such inspection and testing. The location where the inspection is required to be conducted should be clearly indicated. The supplier shall inform the purchaser about the site preparation, if any, needed for installation of the goods at the purchaser's site at the time of submission of order acceptance.

3.2 The site acceptance test (SAT) will be conducted by the Purchaser / FAIR, GSI, their consultant or other such person(s) nominated by the Purchaser / FAIR, GSI before the equipment is installed at FAIR, GSI site in the presence of supplier's representative(s). The SAT will involve trouble free operation and ascertaining conformity with the ordered specifications and quality. There shall not be any additional charges for carrying out site acceptance test. No malfunction, partial or complete failure of any part of the equipment is expected to occur. The Supplier shall maintain necessary log in respect of the result of the test to establish to the entire satisfaction of the Purchaser / FAIR, GSI, the successful completion of the test specified.

3.3 In the event of the ordered item failing to pass the site acceptance test, the supplier needs to rectify the defect at the earliest in consultation with the end user and clear the acceptance test, failing which the Purchaser reserve the right to get the item replaced by the Supplier at no extra cost to the Purchaser.

3.4 The final acceptance shall take place when the equipment is transported to the FAIR Facility site at Germany. The final acceptance (in the case of SAT) test will be formally documented by a final acceptance protocol. The final acceptance shall be deemed to be completed, when all conditions are met due to the given technical specification and the Company (FAIR/GSI) has detected no defect or when all defects have been successfully remedied. With successfully final acceptance the equipment shall become the property of the Company.

3.5 Successful conduct and conclusion of the site acceptance test for the installed goods and items shall also be the responsibility and at the cost of the Supplier.

4. **Manuals and Drawings**

4.1 Before the items are taken over by the Purchaser / FAIR, GSI, the Supplier shall supply operation and maintenance manuals. These shall be in such details as will enable the Purchaser / FAIR, GSI to operate, maintain, adjust and repair all parts of the works as stated in the specifications.

4.2 The Manuals shall be in the ruling language (English) in such form and numbers as stated in the contract.

4.3 Unless and otherwise agreed, the goods / item shall not be considered to be completed for the purposes of taking over until such manuals and drawing have been supplied to the Purchaser / FAIR, GSI.

5. **Packing (GCC Clause 9)** Add as Clause 9.2 of the GCC of the following:

5.1 Packing Instructions: Each package will be marked on two sides with proper paint/indelible ink, the following:

(i) Item Nomenclature

(ii) Order/Contract No.

(iii) Country of Origin of Goods

(iv) Supplier’s Name and content

(v) Packing list reference number

6. **Delivery and Documents (GCC Clause 10)**

6.1 Delivery of the goods should be made as per the delivery time such that the entire bulk of set of cables shall be ready for dispatch to FAIR, Darmstadt, Germany by **9 months from the date of PO,** duly packed after satisfactory Factory Acceptance Test along with their documents. Within 24 hours of shipment, the supplier shall notify the Purchaser / FAIR, GSI and the insurance company by cable/telex/fax/e mail the full details of the shipment including contract number, railway receipt number/ AWB etc and date, description of goods, quantity, name of the consignee, invoice etc. The supplier shall mail the following documents to the Purchaser / FAIR, GSI with a copy to the insurance company:

(i) 4 Copies of the Supplier invoice showing contract number, goods' description, quantity, unit price, total amount;

(ii) Acknowledgment of receipt of goods from the consignee(s) by the transporter;

(iii) Insurance Certificate.

(iv) Manufacturer's/Supplier's warranty certificate;

(v) Inspection Certificate issued by the nominated inspection agency, if any, and the Supplier's factory inspection report;

(vi) Certificate of Origin; and

(vii) Two copies of the packing list identifying the contents of each package.

6.2 The above documents should be received by the Purchaser / FAIR, GSI before arrival of the Goods (except where the Goods have been delivered directly to the Consignee with all documents) and, if not received, the Supplier will be responsible for any consequent expenses.

7. **Insurance (GCC Clause 11)**

7.1 For delivery of goods at the FAIR, GSI premises, the insurance shall be obtained by the Supplier for an amount equal to 110% of the value of the goods from "warehouse to warehouse" (final destinations) on “All Risks" basis including War Risks and Strikes. The insurance shall be valid for a period of not less than 3 months after SAT (Site Acceptance TEST) at FAIR. .

8. Incidental services (GCC clause 13) - The incidental services also include:

8.1 Furnishing of 01 set of detailed operations and maintenance manual.

9. **Warranty (GCC Clause 13)**

9.1 Warranty period shall be 24 months from date of acceptance of Goods. The Supplier shall, in addition, comply with the performance and/or consumption guarantees specified under the contract. If for reasons attributable to the Supplier, these guarantees are not attained in whole or

in part, the Supplier shall at its discretion make such changes, modifications, and/or additions to the Goods or any part thereof as may be necessary in order to attain the contractual guarantees specified in the Contract at its own cost and expenses and to carry out further performance tests. The warranty should be comprehensive on site.

10. **Payment (GCC Clause 14)**

10.1 Payment will be made after satisfactory SAT test at the designated location at FAIR, GSI, Darmstadt, Germany as mentioned earlier.

11. **Penalty Clause (GCC Clause 21)**

11.1 **<u>For delays</u>: GCC Clause 21.1 -- The applicable rate is 0.5% per week or part thereof and the maximum deduction is 10% of the contract price.**

12. **Resolution of Disputes (Clause 25)**: Add as GCC Clause 27 the following:

12.1 The dispute resolution mechanism to be applied pursuant to GCC Clause 27 shall be as follows:

(i) Save and except the Clause in the agreement, in case of Dispute or difference arising between the Purchaser and Supplier relating to any matter arising out of or connected with this agreement, such disputes or difference shall be settled in accordance with the Indian Arbitration & Conciliation Act, 1996, the rules there under and any statutory modifications or re-enactments thereof shall apply to the arbitration proceedings.

(ii) The venue of the arbitration shall be the place from where the Purchase Order is issued.

13. **Applicable Law (GCC Clause 27)** Add as Clause 27.1 of the GCC the following :

13.1 The place of jurisdiction would be Kolkata (West Bengal) INDIA.

14. **Notices**

14.1 For the purpose of all notices, the following shall be the address of the Purchaser and Supplier.

(i) ***Purchaser****:* Registrar (Officiating),
Bose Institute
P-1/12, CIT Scheme-VII/M,
Kolkata - 700054 (West Bengal) INDIA.

(ii) ***Supplier:*** (To be filled in by the supplier)

_____

_____

_____

15. **Progress of Supply**

Supplier shall regularly intimate progress of supply, in writing, to the Purchaser as under:

(i) Quantity offered for inspection and date;

(ii) Quantity accepted/rejected by inspecting agency and date;

(iii) Quantity dispatched/delivered to consignees and date;

(iv) Quantity where incidental services have been satisfactorily completed with date;

(v) Quantity where rectification/repair/replacement effected/completed on receipt of any communication from consignee/Purchaser with date;

(vi) Date of completion of entire Contract including incidental services, if any; and

(vii) Date of receipt of entire payments under the Contract (In case of stage-wise inspection, details required may also be specified).

16. **Right to Use Defective Goods**

16.1 If after delivery, acceptance and installation and within the guarantee and warranty period, the operation or use of the goods proves to be unsatisfactory, the FAIR, GSI shall have the right to continue to operate or use such goods until rectifications of defects, errors or omissions by repair or by partial or complete replacement is made without interfering with the Purchaser's operation.

17. **Supplier Integrity**

17.1 The Supplier is responsible for and obliged to conduct all contracted activities in accordance with the Contract using state of the art methods and economic principles and exercising all means available to achieve the performance specified in the contract.

PRE CONTRACT INTEGRITY PACT (to be executed on non-judicial stamp paper)

General

This pre-bid pre-contract Agreement (hereinafter called the Integrity Pact) is made on day of the month of 2021, between, on one hand, the Director, Bose Institute acting through Shri……., Designation of the officer, Bose Institute (hereinafter called the

"BUYER", which expression shall mean and include, unless the context otherwise requires, his successors in office and assigns) of the First Part and M/S _____ represented by Shri _____, Chief Executive Officer (hereinafter called the "BIDDER/Seller" which expression shall mean and include, unless the context otherwise requires, his successors and permitted assigns) of the Second Part.

WHEREAS the BUYER proposes to procure (Name of the Stores/Equipment/Item) and the BIDDER/Seller is willing to offer/has offered the stores and WHERAS the BIDDER is a private company/public company/Government undertaking/ partnership/ registered export agency, constituted in accordance with the relevant law in the matter and the BUYER is a Ministry/Department of the Government of India/PSU performing its functions on behalf of the President of India

NOW, THEREFORE, to avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:-

Enabling the BUYER to obtain the desired said stores/equipment at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement, and

Enabling BIDDERs to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and the BUYER will commit to prevent corruption, in any form, by its officials by following transparent procedures.

The parties hereto hereby agree to enter into this Integrity Pact and agree as follows:

Commotment of the Buyer

1.1 The BUYER undertakes that no official of the BUYER, connected directly or indirectly with contract, will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the BIDDER, either for themselves or for any person, organization or their party related to the contract in exchange for an advantage in the bidding process, bid evaluation, contracting or implementation process related to the contract.

1.1.1 The BUYER will, during pre-contract stage, treat all BIDDERs alike, and will provide to all BIDDERs the same information and will not provide any such information to any particular BIDDER which could afford an advantage to that particular BIDDER in comparison to other BIDDERS.

1.1.2 All the officials of the BUYER will report to the appropriate Government office any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.

2. In case any such preceding misconduct on the part of such official(s) is reported by the BIDDER to the BUYER with full and verifiable facts and the same is prima facie found to be correct by the BUYER, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the BUYER and such a person shall be debarred from further dealings related to the contract process. In such a case while an enquiry is being conducted by the BUYER the proceedings under the contract would not be stalled.

Commitments of BIDDERs

3. The BIDDER commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre-contract or post-contract stage in order to secure the contract or in furtherance to secure it and in particular commit itself to the following:-

3.1 The BIDDER will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER, connected directly or indirectly with the bidding process, or to any person, organization or

third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the contract.

3.2 The BIDDER further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favour any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER or otherwise in procuring the Contract or forbearing to do or having done any act in relation to the obtaining or execution of the contract or any other contract with the Government for showing or forbearing to show favour or disfavour to any person in relation to the contract or any other contract with the Government.

3.3 BIDDERs shall disclose the name and address of agents and representatives and Indian BIDDERs shall disclose their foreign principals or associates.

3.4 BIDDERs shall disclose the payments to be made by them to agents/brokers or any other intermediary, in connection with this bid/contract.

3.5 The BIDDER further confirms and declares to the BUYER that the BIDDER is the original manufacturer/integrator/authorized government sponsored export entity of the defence stores and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the BUYER or any of its functionaries, whether officially or unofficially to the award of the contract to the BIDDER, nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.

3.6 The BIDDER, either while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payments he has made, is committed to or intends to make to officials of the BUYER or their family members, agents, brokers or any other intermediaries in connection with the contract and the details of services agreed upon for such payments.

3.7 The BIDDER will not collude with other parties interested in the contract to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the contract

3.8 The BIDDER will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.

3.9 The BIDDER shall not use improperly, for purposes of competition or personal gain, or pass on to others, any information provided by the BUYER as part of the business relationship, regarding plans, technical proposals and business details, including

information contained in any electronic data carrier. The BIDDER also undertakes to exercise due and adequate care lest any such information is divulged.

3.10 The BIDDER commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.

3.11 The BIDDER shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.

3.12 If the BIDDER or any employee of the BIDDER or any person acting on behalf of the BIDDER, either directly or indirectly, is a relative of any of the officers of the BUYER, or alternatively, if any relative of an officer of the BUYER has financial interest/stake in the BIDDER's firm, the same shall be disclosed by the BIDDER at the time of filing of tender.

The term 'relative' for this purpose would be as defined in Section 6 of the Companies Act 1956.

3.13 The BIDDER shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the BUYER.

4. Previous Transgression

4.1 The BIDDER declares that no previous transgression occurred in the last three years immediately before signing of this Integrity Pact, with any other company in any country in respect of any corrupt practices envisaged hereunder or with any Public Section Enterprise in India or any Government Department in India that could justify BIDDER's exclusion from the tender process.

4.2 The BIDDER agrees that if it makes incorrect statement on this subject, BIDDER can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

5. Earnest Money / Bid Security

5.1 Bidder has to submit bid security declaration form as per the clause of condition as mentioned earlie

6. Sanctions for Violations

6.1 Any breach of the aforesaid provisions by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER) shall entitle the BUYER to take all or any one of the following actions, wherever required:-

(i) To immediately call off the pre contract negotiations without assigning any reason or giving any compensation to the BIDDER. However, the proceedings with the other BIDDER(s) would continue.

(ii) Security Deposit/Performance Bond (after the contract is signed) shall stand forfeited either fully or partially, as decided by the BUYER and the BUYER shall not be required to assign any reason therefore.

(iii) To immediately cancel the contract, if already signed, without giving any compensation to the BIDDER.

(iv) To recover all sums already paid by the BUYER, and in case of an Indian BIDDER with interest thereon at 2% higher than the prevailing Prime Lending Rate of State Bank of India, while in case of a BIDDER from a country other than India with interest thereon at 2% higher than the LIBOR. If any outstanding payment is due to the BIDDER from the BUYER in connection with any other contract for any other stores, such outstanding payment could also be utilized to recover the aforesaid sum and interest.

(v) To encash the advance bank guarantee and performance bond/warranty bond, if f urnished by the BIDDER, in order to recover the payments, already made by the BUYER, along with interest.

(vi) To cancel all or any other Contracts with the BIDDER. The BIDDER shall be liable to pay compensation for any loss or damage to the BUYER resulting from such

(vii) cancellation/rescission and the BUYER shall be entitled to deduct the amount so payable from the money(s) due to the BIDDER.

(viii) To debar the BIDDER from participating in future bidding processes of the Government of India for a minimum period of five years, which may be further extended at the discretion of the BUYER.

(ix) To recover all sums paid in violation of this Pact by BIDDER(s) to any middleman or agent or broker with a view to securing the contract.

(x) In cases where irrevocable Letters of Credit have been received in respect of any contract signed by the BUYER with the BIDDER, the same shall not be opened.

(xi) Forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

6.2 The BUYER will be entitled to take all or any of the actions mentioned at Para 6.1(i) to (x) of this Pact also on the Commission by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER), of an offence as defined in Chapter IX of the Indian Penal Code, 1860 or Prevention of Corruption Act, 1988, or any other statute enacted for prevention of corruption.

6.3 The decision of the BUYER to the effect that a breach of the provisions of this Pact has been committed by the BIDDER shall be final and conclusive on the BIDDER. However, the BIDDER can approach the independent Monitor(s) appointed for the purposes of this Pact

7. Fall Clause

7.1 The BIDDER undertakes that it has not supplied/is not supplying similar product/systems or subsystems at a price lower than that offered in the present bid in respect of any other Ministry/Department of the Government of India or PSU and if it is found at any stage that similar product/systems or sub systems was supplied by the BIDDER to any other Ministry/Department of the Government of India or a PSU at a lower price, then that very price, with due allowance for elapsed time, will be applicable to the present case and the difference in the cost would be refunded by the BIDDER to the BUYER, if the contract has already been concluded

8. Independent Monitors

8.1 The BUYER has appointed independent Monitors (hereinafter referred to as Monitors) for this Pact in consultation with the Central Vigilance Commission (Independent External Monitors appointed by CVC for the tender -Dr. Sanjay Kumar Panda, IAS (Retd.) & Shri Amol Prabhakar Joshi, CES (Retd.)

8.2 The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.

8.3 The Monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.

8.4 Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meeting

8.5 As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the BUYER.

8.6 The BIDDER(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the BUYER including that provided by the BIDDER. The BIDDER will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor shall be under contractual obligation to treat the information and documents of the BIDDER/Subcontractor(s) with confidentiality.

8.7 The BUYER will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.

8.8 The Monitor will submit a written report to the designated Authority or BUYER/Secretary in the Department/within 8 to 10 weeks from the date of reference or intimation to him by the BUYER / BIDDER and should the occasion arise, submit proposals for correcting problematic situations.

9. Facilitation of Investigation

In case of any allegation of violation of any provisions of this Pact or payment of commission, the BUYER or its agencies shall be entitled to examine all the documents including the Books of Accounts of the BIDDER and the BIDDER shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

10. Law and Place of Jurisdiction

This Pact is subject to Indian Law. All disputes arising our of this Contract will be subjected to Kolkata jurisdiction.

11. Other Legal Actions

The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

12. Validity

12.1 The validity of this Integrity Pact shall be from date of its signing and extend up to 2 years and sixty days or the complete execution of the contract to the satisfaction of both the BUYER and the BIDDER/Seller, including warranty period, whichever is later. In case BIDDER is unsuccessful, this Integrity Pact shall expire after six months from the date of the signing of the contract.

12.2 Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact shall remain valid. In this case, the parties will strive to come to an agreement to their original intentions.

13. The parties hereby sign this Integrity Pact at on _____

BUYER	**BIDDER**
Name of the Officer:	**CHIEF EXECUTIVE**
OFFICER Designation	
BOSE INSTITUTE	
Witness	**Witness**
1._____	**1.**_____
2._____	**2.**_____

****The bidders may note that they must upload the Integrity Pact signed by both the bidder as well as the buyer/purchaser and upload the same along with the bidding document. Non submission of integrity Pact in the format as above will lead to the cancellation of the submitted bid.**

In this regard, the bidders are requested to approach the Registrar (officiating), BI, to complete the formalities IP on a non-judicial stamp paper of Rs. 100/- denomination. Stamp paper is to be arranged by the interested bidder.

Quote no. Date :

PROFORMA OF FALL CLAUSE
CERTIFICATE

(to be submitted by the bidder in their letter head)

If on any subsequent date after submission of quotation or placing of supply order, the manufacturer (the term manufacturer will also include his authorized distributor / agent) reduces the sale price of such stores or sells such stores to any party at a price lower than the price charged / chargeable against supply order placed by Bose Institute, Kolkata, the manufacturer (including his authorized distributor / agent) as aforesaid in case the quotation is submitted by them and supply / service is also effected by them) will forth-with notify such reduction in sale price to Bose Institute, Kolkata and price payable for the stores to be supplied against the Supply Order after the date of such reduction in sale price coming into force shall reduced **correspondingly and will be reimbursed to the Institute**.

(Signature & Date of Bidders with Rubber Stamp)

CHAPTER - V: BID FORM

(To be submitted on the official letterhead of the bidder)

Registrar (Offcg),
Bose Institute-IFCC
P-1/12, CIT Scheme-VII/M,
Kolkata - 700054 (W.B.) India

Sir,

Having examined the bid documents the receipt of which is hereby duly acknowledged, I/We agree to furnish required supplies/services in conformity with the Techno-Commercial Bid.

I/We agree to hold this offer open until _____ and to supply, install and commission the equipment and complete the whole of the work and hand over to the purchaser within the period of _____y**ear / month**, from the date of receipt of intimation from you regarding acceptance of this tender/receipt of supply order.

I/We agree to submit the bank guarantee as specified in SCC in the form prescribed by your good self for the due performance of the contract, if our bid is accepted.

I/We understand that you are not bound to accept the lowest or any bid you may receive.

Signature of Bidder With Office Stamp

Name & Address

Telephone No.:

FAX No.:

E-mail address:

Name &Designation of the Contact Person:

CHAPTER – VI: TECHNO-COMMERCIAL BID FORM

1. Tender reference No :
_____

2. Date of bid submission:
_____

3. Name and address of Bidder:
_____

_____

_____

4. Main Item:
_____

5. Life Expectancy of the Item (in Years): _____

6. Warranty Period (in Years): _____

7. Delivery Period of the item_____

8. Country of the Origin of the Equipment:
_____

9. Bid Currency:
_____

10. Whether agreeing to all the terms and conditions as mentioned in the bidding documents:.....

11. Port of Shipment: .....

12. Approximate Shipment Weight (chargeable weight) in Kg. of the packed consignment:.....

13. Approximate Dimensions/ Volume of the packed consignment:
.....

Note : (1) Adhering to the format given above is a pre-requisite for considering your

bid.

(2) All columns must be filled up.

(3) Separate list should be attached where required in the same format giving details of each item.

(4) Please indicate applicability.

I/we certify that I/We have completely read and understood and agree to all the terms &conditions given in ITB, GCC & SCC.

Signature of Bidder With Office Stamp

Name & Address

CHAPTER –VII: PERFORMANCE SECURITY FORM

(To be executed by a scheduled Bank in India on non-judicial stamp paper)

Registrar (Offcg)
Bose Institute
P-1/12, CIT Scheme VII/M
Kolkata – 700 054 (W.B.), India

Dear Sir,

Sub: Your Contract No. ..... dated ..... for .....

1. You have entered into a contract with reference no as given above with _____ (hereinafter referred to as the contractor) for the supply of _____ (hereinafter referred to as stores) for the price and on the terms and conditions contained in the said contract.

2. In accordance with the terms of said contract, the contractor has undertaken **to produce a bank guarantee** for Rs. _____ (Rupees _____only) being 10% of the total value of the said stores supplied to you, for the due fulfilment of its obligations to you for due performance as per the contract during warranty period.

3. In consideration thereof, we hereby expressly, irrevocably and unconditionally undertake and guarantee as principal obligator on behalf of the contractor that in the event you submit a written demand to us that the contractor has not performed according to the contractual obligations included in the said contract, we will pay you on written demand, without demur and without reference to the contractor any sum up to a maximum amount of Rs. _____ (Rupees _____ only). Your demand shall be conclusive evidence to us that such payment is due under the terms of the said contract. Payment by us to you will be made within thirty (30) days from receipt of your request making reference to this guarantee and on demand.

4. This guarantee shall not be revoked without your express consent and shall not be affected by your granting any indulgence to the contractor, which shall include but not be limited to postponement from time to time of the exercise of any powers vested in you or any right which you may have against the contractor and to exercise the same in any manner at any time and either to forbear or to enforce any covenant contained or implied in the said contract or any other course or remedy or security available to you, and our Bank shall not be released from its obligations under this guarantee by your exercising any of your rights with reference to matters aforesaid or any of them or by reason of any other act or forbearance or other acts of omission or commission on your part or any other indulgence shown by you or by any other matter or thing whatsoever which under law would, but for this provision, have the effect of relieving our Bank from its obligation under this guarantee.

5. Notwithstanding anything herein contained, our liability under this guarantee is restricted to Rs. _____ (Rupees _____only) and the guarantee shall remain in force up to and including the _____ _____ day of being reported to us by you and returned to us duly discharged.

6. Unless a demand or claim under this guarantee is made on us in writing on or before the aforesaid expiry date as provided above or unless this guarantee is extended by us all your rights under this guarantee shall be prescribed and we shall be discharged from the liabilities hereunder.

7. This guarantee shall not be affected by any change in the constitution of our Bank or of the contractor or for any other reason whatsoever.

Date: Signature .....

Place: Seal of Bankers
(Complete Address/Contact Details with Tel./Fax/email etc)

Witness:

1. .....

2. .....

CHAPTER – VIII: BIDDER'S PERFORMANCE STATEMENT FORM

(For a Period of Last 5 Years)

Name of the Firm .....

Order placed by (full address with Tel. No., Fax No. & emailaddress of purchaser)	Date	Description and quantity of ordered equipment	Date of completion of delivery and commissioning as per Contract/ Actual	Remarks indicating reasons for late delivery, if any	Has the equipment been installed satisfactory? (Attach a certificate from the

Place: Signature :

Date: Office Stamp

CHAPTER IX : Pre-QUALIFICATION REQUIREMENTS

Necessary supporting documents to be provided to substantiate the following PQR

1. The Bidder should be an Indian manufacturer to quote in this tender.

2. That the Bidder will assume total responsibility for the fault-free operation of supply item, during the warranty period. Necessary undertaking to be given on the company letterhead by the bidder.

3. Bidder should be a manufacturer of high current co-axial cable having manufacturing facility located in India and must have experience of cable manufacturing by Electron Beam curing Facility at least for 10 years as on the date of bid submission, out of which at least 5 years' experience in manufacturing cables with LSZH Sheath should be established by providing documentary evidence.

4. Bidder shall submit satisfactory feedback reports for Electron Beam Cross Link LSZH Sheathed material supplied to 2-3 reputed clients.

5. Bidder should have in-house facilities and sufficient infrastructure for design, manufacturing (including corrugated shielding, armouring facility with Copper tape of desired thickness), testing and supplying the offered cable to FAIR Darmstadt (Germany)strictly in conformity with the technical specification. The purchaser reserves the right to verify the set-up of the Bidder to assess their capacity and capability and can reject the offer in case of non compliant.

6. The Manufacturer/bidder should have proper structured organization having departments for important functions like design, drafting, production, inspection, procurements, packaging and quality control (QC) department for all stages of the manufacture.

7. The manufacturers should have valid certification pursuant to IS 9001, ISO 14001, OHSAS 18001 as on the date of bid submission.

8. Indian manufacturers having Atomic Energy Regulatory Board (AERB) approval for Electron beam facilities for a minimum of 10 years from the date of tender due and in operational for manufacturing electron beam crossed linked cables.

9. The bidder should have adequate plant space and manufacturing capacity to manufacture the items offered and supply within the delivery schedule. Manufacturer shall have in-house well-equipped lab for conducting routine test, type test and acceptance tests. Testing equipment should have been calibrated with traceability to NABL accredited laboratory.

10. A notarized declaration on non-judicial stamp paper of appropriate value shall be submitted by the bidder that the bidder or manufacturer is not black listed by any Government organization/GST Authority/Department/PSU at the time of bidding. Any such black listed manufacturer is NOT eligible to participate in this tender. In

addition to this, the Bidder also should not have been disqualified for non-performance in any of the Government Utilities/Department/Undertaking in the past five years as on the date of submission of bid, otherwise the offer shall be rejected.

11. Engineers/ representatives from the purchaser shall have free access during normal working hours to the manufacturing site or testing facilities during the contract period. Written confirmation to that effect on a company letterhead is necessary.

12. Experience of having successfully completed similar works during last 7 (Seven) years ending last day of month previous to the one in which applications are invited should be either of the following **(satisfactory completion certificate issued by the client to be attached)**;

(i) Three similar completed works costing not less than the amount equal Rs. 26 Crore each.

or

(ii) Two similar completed works costing not less than the amount equal to Rs. 39 Crore each.

or

(iii) One similar completed work costing not less than the amount equal to Rs. 52 Crore.

Definition of “Similar Works” i.e. the Manufacturer “shielded high current sheathed co-axial copper cable” during last five years, for any government sector or large reputed private sectors enterprises satisfactorily.

13. Latest bank Solvency Certificate of minimum Rs. 70 Crore to assess solvency/financial capability.

14. The bidder shall have Average annual turnover of Rs 100 crore during the last 3 years ending 31 March, 2020. The bidder shall provide the Audited Annual Accounts of for the last 3 years ending March 2020. ITR copies for the last 3 FY ending March 2020 to be provided.

15. The manufacturers shall not have incurred loss during last 3 consecutive years. So, the bidders shall have to submit an audited balance sheet and profit/loss statement/account for last 3 years ending March, 2020.

16. The manufacturer must submit the following documents:
    i) Factory license
    ii) Certificate of incorporation
    iii) GST registration
    iv) Export license
    v) PAN and TAN

17. Bidder should provide sufficient documentary evidence establishing their capability of manufacturing high current cable, as required in the NIT.

18. **Bidder is required to sign and submit Pre-Integrity pact in prescribed format as per requirement at the time of bid submission. Non-compliance of this would result in rejection of the bid.**

CHAPTER X: TECHNICAL COMPLIANCE STATEMENT FORM

An item-by-item commentary on the Purchaser's Technical Specifications demonstrating substantial responsiveness of the goods and services to those specifications or a statement of deviations and exceptions to the provisions of the Technical Specifications.

ITEM	**NAME**		
Sl. No.	**Tender Specifications**	**Bidder's Specifications**	**Deviation/ Remarks, if any**
	Table-1 of Annexure-III Table-2 of Annexure-III Table-3 of Annexure-III Table-4 of Annexure-III Table-5 of Annexure-III		

(Technical literature/brochures/manuals should be attached along with this format)

Please note:

1. Compliance/Deviation statement comparing the specifications of the quoted model to the required specifications. This statement should also give the page number(s) of the technical literature where the relevant specification is mentioned.

2. Bids must have supporting documents (technical literature or copies of relevant pages from the service manual or factory test data) for all the points noted above, failure regarding which may result in rejection of bid.

3. In case the bidder furnishes wrong or false information wilfully in the technical compliance chart, such action shall be viewed strictly and the bidders may be blacklisted.

Signature and Seal of the manufacturer/Bidder .....

Place :

Date :

Annexure-I

Detailed specification for the co-axial power cable

Abstract

In FAIR, coaxial DC power cables, comprising a primary conductor and a coaxial secondary conductor of the same sizes, will do the connection between most of the power converters and magnets.

Depending on the required current loads these cables will have distinct cross sections. This document details the specific technical requirements of these coaxial DC power cables.

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1. Purpose and classification of the document

This document describes the technical requirements for the coaxial DC power cables to be connected between power converters and the magnets in FAIR.

General technical requirements for all the parts and components, including the cables, of the power converters are given in the Common Specifications for power converters [3]. General issues are explained in the general specifications [1] and legal and technical issues are given in the technical guidelines [2]. *However, statements made in this document override the one in all other documents: the general specifications [1], the common specifications for power converters [3] and the technical guidelines [2].*

This Annexure deals only with the technical aspect of the product. This product is meant for supply to the Facility for Antiproton and Ion Research (FAIR), FAIR GmbH. FAIR is an international company aiming at basic research in physics at the city of Darmstadt, Germany (more information: https://fair-center.eu). Bose Institute (BI) is the Indian shareholder of FAIR GmbH and a contract will be between the shareholder and the selected manufacturer of the product. Any query in this regard must be made through the BI or the Indo FAIR Co-ordination Centre (BI-IFCC), a project of BI.

2. Abbreviations, Terms and Definitions

Table 1: Definitions and abbreviations used in this document

Abbreviated term	Definition
AC	Alternating current
CDR	Conceptual Design Review
CPR	Construction Products Regulations
CR	Collector Ring
E-Cu	Plain E-Copper (Cu-ETP, formerly: E-Cu57)
DC	Direct current
FAIR	Facility for Antiproton and Ion Research
FAT	Factory Acceptance Test
FDR	Final Design Review
FIGRA	Fire Growth Rate
FS	Flame Spread, vertical (in m, to EN 50399)
H	Flame spread, vertical (in mm, to EN 60332-1-2)
HDPE	High Density Polyethylene
HEBT	High Energy Beam Transport
HESR	High Energy Storage Ring
LSZH	Low Smoke Zero Halogen
p-bar	Antiproton Separator
p-Linac	Proton-Linac
Peak HRR	Peak Heat Release Rate
Peak SPR	Peak Smoke Production
PSP	Projekt StrukturPlan
rms	root mean square
SAT	Site Acceptance Test
SIS100	Schwer-Ionen (Heavy-Ion) Synchrotron with maximum bending power of 100 Tm
SFRS	Super FRagment Separator
THR_{1200s}	Total Heat Release over the first 1200 s
TSP_{1200s}	Total Smoke Production over the first 1200 s
XLPE	Cross Linked PolyEthylene

3. Scope of the Technical System

3.1 System Overview

Most of the power converters in FAIR, including SIS100, HEBT, SFRS, CR, HESR, p-Linac and for p-bar separator are planned to power the respective magnetic load via coaxial DC power cables. As per the current rating of different magnets and its power converter, cables with different cross sections and current ratings are needed.

3.2 Extent of Delivery

The Contractor shall deliver:

1. Detailed technical drawings and data sheets of each cable type (ref. **Table 2**), including all requirements as per description and specifications given in **Figure 1**, **Table 3** and **Table 4**
2. CDR and FDR for the approval by the Company, before start of manufacturing
3. Manufacturing pre-series of 200 m of each cable type as given in **Figure 1** to the parameters given in **Table 3** and the specific requirements of **Table 4**.
   These pre-series cables may be used for the final delivery, if all technical requirements and quality standards are fulfilled.
4. Certificates by an internationally approved certifying body testifying a successful completion of the relevant type tests of the pre-series cables (refer section 5)
5. Manufacturing of the cables as per general layout as given in **Figure 1** to the parameters given in **Table 3** and the specific requirements of **Table 4**
6. Certificates approving a successful completion of the relevant sample tests and routine tests (refer section 5)
7. Before delivery, a Factory Acceptance Test (FAT) as detailed in section 5.2.7 shall be performed on all cable types
8. Packaging and transportation of the cables, reeled on cable drums, to Company's site (refer section 7)
9. After reception of the cables, a Site Acceptance Test (SAT) at Company's site, detailed in section 5.2.8, to be performed
10. Details on the requested documentation are given in section 6

Table 2: Types of coaxial DC power cables

No.	Cable Type	PSP[1)] code
1	1×50 RF/50	2.14.1.5.x
2	1×95 RF/95	2.14.1.5.x
3	1×150 RF/150	2.14.1.5.x
4	1×185 RF/185	2.14.1.5.x

3.3 Quantity of delivery

Information regarding exact length of each cable type will be included in the contract itself.

3.4 Spare Quantity

An additional 2% (at least 500 m) of each cable type shall be delivered on separate cable drums.

4. System Specification

All technical requirements of the coaxial DC power cables with different cross sections and requested current ratings etc. are described in Table 3 and 5, while Table 4 describes in detail the cable construction, dimensions and specific requirements.

4.1 References

The text in this document cites other documents for further information or guidance. In case of conflict between the documents referred within this specification, the order of precedence shall be as follows:

1. This specification
2. IEC 60288
3. IEC 60502-1
4. EN 50399
5. EN 60332-1-2
6. EN 60754-2

4.2 Operational Requirements

These cables shall be designed for fixed installations for a lifetime of 40 years. They shall be resistant to abrasion, crushing, water, fire (see Section 5.2.2) and atmospheric condition. The cable shall be suitable for continuous operation with operating currents as given in **Table 5** whilst exposed to any ambient temperature in the range of -15 ^{o}C to +30 °C.

4.3 Radiant resistant

The cable shall withstand a dose limit of X1× 10^6 Gy.X Based on information provided by CERN, a XLPE insulating compound will withstand a dose of about 8 × 10^5Gy, while a co-polymer sheathing compound on the basis of Ethylene-Vinyl Acetate (EVA) will withstand a dose limit of 1 × 10^6 Gy similar to High-Density Polyethylene (HDPE).

In case another co-polymer compound than EVA is utilized for the LSZH sheath, the Contractor shall provide a certificate approving the equivalent radiation resistance of the utilized material.

4.4 Cross-sectional View

The cross-sectional view in

Figure 1 is applicable for all the cable types listed in **Table 2**. Further details about each section and cable setup are described in **Table 4**.

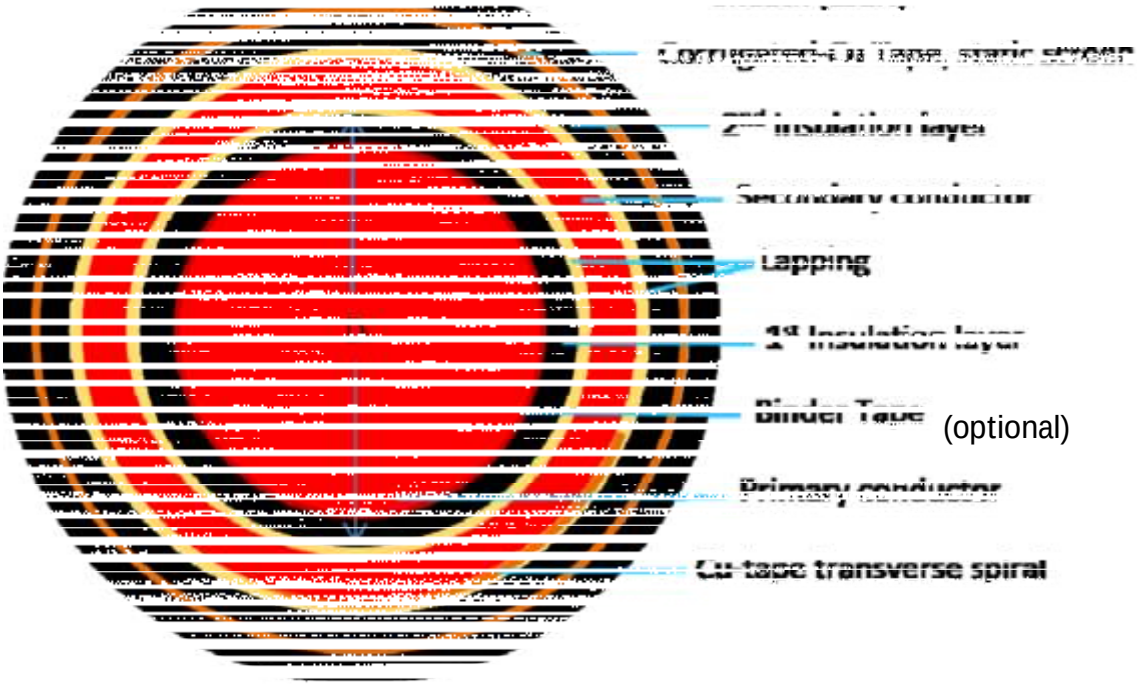


Figure 1: Cross-sectional view applicable for all cable types discussed in this document

Table 3: Electrical and mechanical parameters for coaxial DC power cable (

Figure 1)

No.	Parameter		Specification/ Value
1	**Basic Cable Design**		coaxial cable with primary conductor and secondary conductor of same size, both with XLPE insulation with Electron Beam curing, plus an additional static screen and LSZH sheath
2	**Applicable Cable Standard**		IEC 60502-1
3	**Rated Voltage (rms)**		U_0: 1.8 kV (between primary conductor and secondary conductor as well as between secondary conductor and static screen)
4	**Minimum permissible conductor temperature:** - in normal operation - under short circuit conditions ($t_k \leq 5s$)		90 °C 250 °C
5	**Minimum Bending Radii**		
	I.	Minimum bending radius	15× (outer diameter of the cable)
	II.	Single time bending radius, e.g. after the cable is heated up to 30 °C and the cable is bent by means of a template for laying in end position	½ × (Minimum bending radius)
6	**Maximum allowed pulling force**		50 N/mm² of copper conductor cross section (consider only primary conductor)
7	**Standard continuous length of cable per drum with a tolerance of ± 2%**		1000 m

Table 4: Cable constructions with specific requirements

Cable component	**Dimension / Details**			
Nominal cross section (mm²)	50	95	150	185
Primary conductor Maximum resistance of conductor at 20°C (Ω/km)	plain copper, E-Cu, Class 5 to IEC 60228, Table 3			
Binder tape (optional)	separating foil; approximate thickness 0.1 mm			
1st insulation layer IEC 60502-1 Nominal thickness t_{n1} of 1st insulation layer(mm) Requirements for 1st insulation layer thickness	XLPE with Electron Beam Curing Process, suitable for operating voltage U_0 = 1.8 kV rms Test requirements for mechanical and electrical characteristics of the utilized insulating compound see Table A1 in Annex A to IEC 60502-1, Table 6, last column to IEC 60502-1, Table 6, Sub-Clause 16.5.2 *and additionally* $\frac{t_{max1} - t_{min1}}{t_{max1}} \leq 0.15$ where t_{max1} is the maximum thickness, in millimetres; t_{min1} is the minimum thickness, in millimetres.			
Diameter over insulation D_i (mm)	12 ≤ D_i ≤ 13,5	16 ≤ D_i ≤ 17,5	20 ≤ D_i ≤ 22	21 ≤ D_i ≤ 23
Lapping over core	separating foil, approximate thickness of 0.1 mm.			
Secondary conductor Nominal cross section of secondary conductor (mm²) Individual diameter of secondary conductor wires, D_w (mm) Application	plain copper, E-Cu; maximum resistance of conductor (Ω/km) at 20°C same as of primary conductor to IEC 60228, Table 3 50 / 1.5 ≤ D_w ≤ 1.9 95 / 2.0 ≤ D_w ≤ 2.4 150 / 2.4 ≤ D_w ≤ 2.8 185 / 2.8 ≤ D_w ≤ 3.2 individual diameter of each conductor wire D_w to be chosen accordingly in order to cover the underlying periphery completely			
Cu tape transverse spiral over secondary conductor	Thickness approx. 0.1 mm, tightly wrapped			
2nd Insulation layer	XLPE with electron beam curing process, suitable for operating voltage U_0 = 1.8 kV rms Test requirements for mechanical and electrical characteristics of the utilized insulating compound see Table A1 in Annex A			

Cable component	**Dimension / Details**			
Nominal cross section (mm²)	50	95	150	185
Nominal thickness t_{n2} of 2nd insulation layer (mm)	2.0	2.0	2.0	2.0
Requirements for 2nd insulation layer thickness	$t_{min2} \leq 0.9\, t_{n2} - 0.1$ *and additionally* $\frac{t_{max2} - t_{min2}}{t_{max2}} \leq 0.15$ where t_{n2} is the nominal thickness of 2nd insulation layer, in millimetres, t_{min2} is the minimum thickness, in millimetres, t_{max2} is the maximum thickness, in millimetres.			
Static screen corrugated E-Cu tape Thickness of copper tape (mm) Max. corrugation depth (mm)	The static screen needs not to withstand short circuit current nor provide radially water tightness approximate 0.1 0.8			
Sheath Nominal sheath thickness (mm) Requirements for the sheath thickness marking Approximate diameter over sheath (mm)[1)]	The material of the sheath shall be a polyolefin compound applied uniformly and symmetrically by extrusion. Test requirements for mechanical characteristics of the utilized sheathing compound are listed in Table A2, Annex A, providing adequate protection against fire hazards. The sheath shall be readily removable from the underlying static screen. to IEC 60502-1, Table 6, Sub-Clause 13.3 *and additionally* the nominal thickness shall be not less than 1.8 mm to IEC 60502-1, Table 6, Sub-Clause 16.5.3 Every meter, by embossing or indentation: - cross sections of primary and secondary conductor - voltage rating (i.e.: U_0 = 1.8 kV rms) - year of manufacturing - reference number (see section 5) - meter marking			
	30 ± 2 mm	34 ± 2 mm	38 ± 2 mm	41 ± 2 mm
Fire performance	Cables shall be tested to Fire Class C_{ca} of EN 50399 with additional requirements s1, d2 and a1 (see Table A5)			

[1)] Deviations in the diameter over sheath have to be agreed by the Company.

Table 5: Cable Current Ratings

Cable component	Current ratings			
Nominal cross section (mm^2)	50	95	150	185
Operating currents for continuous operation free in air at ambient 30^o C	215 A	340 A	450 A	540 A

5. Quality Assurance, Tests, and Acceptance

Quality assurance, tests and acceptance are specified in the General Specification [1]. Additional points are being specified here.

In general, cable production consists of the following phases:

- Concept phase
  - Design concept
  - Creation of manufacturing documents
- Realization of the pre-series
- Main production
- Shipping to Company's site

Periodic status reports are mandatory during all the phases. The reporting intervals will be defined in the contract.

The concept phase is divided into two sections:

1. In the first section (design concept), a set of documents, denoted as "Conceptual Design Review" (CDR), shall be delivered by the Contractor. The CDR shall include all the technical details, test procedures, data sheets, transportation specification (dimensions and weights with and without packaging) for the cables. A conjoint agreement (between the Contractor and the Company) about this CDR shall take place before the manufacturing documents are created. Also, the Contractor shall provide evidence of a quality management system according to ISO 9001.

   After this step the Company reserves the right to examine the relevant Contractor's factory by means of an audit before the next steps of the process.

2. In the second section of the concept phase (manufacturing documents), a set of documents, denoted as “Final Design Review” (FDR) shall be delivered by the Contractor. In general, the FDR contains all information which allows an immediate production without any further R&D activities.

After the approval of CDR and FDR from the Company, the Contractor can proceed for the pre-series production. Prior to type testing of these cables, the Contractor shall give for each cable design a unique identification number. These cable designs with their unique identification number shall be registered and get approved from the engineer/third party authorized by the Contractor.

The series production procedure shall begin only after the pre-series cables have successfully passed the tests as per sec. 5.2.1.and 5.2.2 as well as 5.2.5 and 5.2.6, as testified by a certified third party. Also, a unique reference number shall be established for each produced cable, including the unique identification number and respective manufacturing length, and shall individually been marked on the cable sheath (see **Table 4**).

The Contractor notified testing laboratory and/or Company representative shall verify that all the characteristics of each cable type (**Table 2**) of the series production are as per IEC 60502-1 resp. as per the requirements specified in this document. The corresponding routine test results as well as the certificate of conformity shall be attached to each delivered cable drum.

5.1 Cable Production

5.1.1 Pre-Series Cable Production

A pre-series of all cable types listed in **Table 2** must be produced and tested to Section 5.2.1 to 5.2.4.

Before starting the series cable production, the Company will check the compatibility of the pre-series to the requested requirements.

5.1.2 Series Cable Production

Once the Company has declared full compatibility of the type tests requirements for all cable types from the pre-series, the series production of the cables must fulfil all requirements given for sample tests to Section 5.2.5 and routine tests to Section 5.2.6.

During the series cable production, the finalized cables shall be spark tested e.g. to IEC 62230, a sufficient test voltage being applied in order to identify any pinholes or faults in the sheath. The latest calibration date, and its results shall be reported as well as the individually applied voltages (waveforms and levels) and the number and frequency of eventual incidents during the continuous spark testing. Alternatively, the flow of current between the spark voltage source and the static screen shall be registered and hold available on request of the Company.

5.2 Testing and Certification

5.2.1 Type tests

Type tests to IEC 60502-1, Clause 17 resp. as listed in **Tables A3** and **A4** shall be performed on each type of cable at the end of manufacturing process for the pre-series.

The test voltage of 4 U_0 to IEC 60502-1, Sub-Clause 17.3 shall be applied between primary and secondary conductor as well as between secondary conductor and static screen.

Type tests shall be repeated if changes are made in the material, design or manufacturing process, which might influence the performance characteristics of the cable.

A certificate, issued by a certified third party, approving successful completion of these tests, shall be provided by the Contractor. The Company reserves the rights to participate in these tests.

5.2.2 Fire tests

This test is part of the type test and shall be performed once for each cable type listed in **Table 2**.

The cables shall comply to fire class C_{ca} of the CPR as given in EN 50575 and tested according to EN 50399, with additional requirements s1, d2 and a1. The Declaration of Performance (DoP) of the power cables to the fire class C_{ca} with additional requirements s1, d2 and a1 shall be given by the manufacturer as stated in Clause 6 of EN 50575.

The cables shall be tested by a notified laboratory to confirm that all requirements for the specified fire class (see Table A5 in Annex A) are met.

These tests must be repeated, if changes are made in the material, design or manufacturing process which might influence the performance characteristics of fire class C_{ca} of the CPR as given in EN 50575 and tested according to EN 50399, with additional requirements s1, d2 and a1.

A certificate, issued by a notified body to EN 50575, approving successful completion of the test shall be provided by the Contractor.

The Company reserves the rights to participate in this test.

5.2.3 Additional mechanical tests

While special terminations for these cables have been developed, these terminations need to be tested based on IEC 61238-1, Clause 7. The Company will deliver for each cable type (see **Table** 2) ten sets of special terminations and a specific test procedure. The termination shall be fixed to one cable end and a pulling force to **Table 6** shall be applied to the secondary conductor.

Table 6: Additional Mechanical Tests on special terminations

Cable component	**Mechanical stress**			
Nominal cross section (mm^2)	50	95	150	185
Tensile force (kN)	3.0	5.7	9.0	11.1

The tested terminations must withstand this force and must not strip out from the cable.

The Company reserves the rights to participate in these tests

5.2.4 Additional thermal tests

In order to safeguard the reliability of the individual cable types with respect to the rating, thermal tests free in air at an ambient air temperature of 30° shall be conducted on each cable type of the pre-series production. The cables shall be loaded with the relevant maximum currents as per Table 5. The temperature on the primary conductor's surface, on the secondary conductor's surface and on the outer sheath shall be measured. Beyond thermal equilibrium, the temperatures of both conductors are not allowed to exceed the maximum permissible conductor temperature in normal operation of 90 °C as given in **Table 3**.

Alternatively, the Contractor can present detailed numerical calculations, allowing to check the results in a step-by-step way.

The Company reserves the rights either to participate in these tests and alternatively will check and the presented calculation results.

5.2.5 Sample tests

Electrical and physical tests shall be carried out on samples taken from manufactured cables. The Sample tests shall be carried out to IEC 60502-1 Clause 16.

A certificate approving successful completion of these sample tests shall be provided by the Contractor. The Company reserves the rights to participate in these tests.

5.2.6 Routine tests

Routine tests shall be carried to IEC 60502-1, Clause 15 on each manufactured length of cable.

The electrical resistance shall be tested for both primary and secondary conductors.

The test voltage to IEC 60502-1, Table 11, last column, shall be applied between primary and secondary conductor as well as between secondary conductor and static screen.

A certificate approving successful completion of these routine tests shall be provided by the Contractor. The Company reserves the rights to participate in these tests.

5.2.7 Factory Acceptance Test (FAT)

This test shall be performed by the Contractor at the Contractor's or subcontractor's facility to confirm that the cables meet the specified requirements. The Company and/or a representative shall indicate the sample cables (up to three of each cross section) to be tested.

As the FAT shall show compliance of the manufactured cables to the basic requirements of this specification, the following tests are essential:

a) Primary and secondary conductor resistance measurements to Sub-Clause 15.2 of [4]
b) Check of thicknesses to Sub-Clause 16.5 of [4] and as specified in **Table 4** and in manufacturers data sheet (FDR)
c) Check of diameter over primary insulation as given in **Table 4** and in manufacturers data sheet (FDR), ensuring the proper installation of the respective connector sleeves
d) Check of individual diameters of secondary conductor wires as given in **Table 4** and in manufacturers data sheet (FDR)
e) Check of overall diameter as given in **Table 4** and in manufacturers data sheet (FDR)
f) Hot set test of both primary and secondary insulations to Sub-Clause 16.9 of [4], employing the conditions given in **Table A1**

Under FAT, all the cables are to be tested for their insulation.

Electrical test on both primary and secondary insulations to Sub-Clause 15.3 of [4].
This test may alternatively be performed with:
– AC-voltage of $(2.4 \cdot U_0 + 2\ \text{kV}) = 6{,}5\ \text{kV}$ or
– DC-voltage of 15,6 kV
However, the test voltage shall be applied for 5 min. No breakdown shall occur. The insulation will be considered as undamaged respectively intact provided the test current is less than 5 µA.

The Company reserves the rights to participate in FAT.

5.2.8 Site Acceptance Test (SAT)

After delivery of the cables to the Site, a visual inspection will be conducted to ensure that both, the cable drums and the reeled cable have not been damaged during transportation. Additionally, check of dimensions to Sub-Clause 5.2.7, b) to e). may be performed on selected cable samples.

Under SAT, all the cables are to be tested for their insulation.

Electrical test on both primary and secondary insulations to Sub-Clause 15.3 of [4].
This test may alternatively be performed with:
– AC-voltage of $(2.4 \cdot U_0 + 2\ \text{kV}) = 6{,}5\ \text{kV}$ or
– DC-voltage of 15,6 kV
However, the test voltage shall be applied for 5 min. No breakdown shall occur. The insulation will be considered as undamaged respectively intact provided the test current is less than 5 µA

This test shall be performed by the Contractor at the storage location of the Company.

6. Documentation

All the required documents shall be provided

1. in English and
2. both printed and electronic documents (in Microsoft Office documents and in pdf-format).

The documents to be delivered after FAT and before shipping of the cables are:

1. reports of type tests for each cable type
2. reports of sample and routine tests for each cable type
3. FAT protocols
4. FAT acceptance reports and certificates (as-built documentation)

No cable drum will be accepted without these documents.

7. Packaging, Transportation and Delivery to Site

All cable ends must be accessible and sufficiently sealed to prevent ingress of moisture during transport and storage.

The barrel diameter of delivery drums should take account of the permissible bending radii.

The clearance between the outer layers of the cables and the flange of the drum shall be 2 x cable diameter, but minimum 5 cm.

The outer layers of the cables shall be covered by a bubble wrap or similar. Additionally, the drums shall be fully covered by wooden planking and the drums shall be placed and fixed in sealed containers for transport in order to protect the cables from any environmental effects including eventually ultraviolet radiations and sea water.

Final site for delivery will be defined 8 weeks in advance of the start of the delivery.

8. Related Documents

[1] F-GS-F-01e: General Specification

[2] F-TG-ET-01e: Electrical Design Rules and Regulations

[3] Common Specification for Power Converter, F-CS-PC-01e

9. References

[4] IEC 60502-1: Power cables with extruded insulation and their accessories for rated voltages from 1 kV (U_m = 1,2 kV) up to 30 kV (U_m = 36 kV) – Part 1: Cables for rated voltages of 1 kV (U_m = 1,2 kV) and 3 kV (U_m = 3,6 kV), Edition 2.1, IEC, 2009

[5] IEC 60228: Conductors of insulated cables, Edition 3, IEC, 2004

[6] EN 50575: Power, control and communication cables - Cables for general applications in construction works subject to reaction to fire requirements, CENELEC, 2014/2016

[7] EN 50399: Common test methods for cables under fire conditions - Heat release and smoke production measurement on cables during flame spread test - Test apparatus, procedures, results, CENELEC, 2011 + A1:2016

[8] EN 60332-1-2: Tests on electric and optical fibre cables under fire conditions, Part 1-2: Test for vertical flame propagation for a single insulated wire or cable - Procedure for 1 kW pre-mixed flame (IEC 60332-1-2:2004), CENELEC, 2004/2016

[9] EN 60754-2: Test on gases evolved during combustion of materials from cables - Part 1: Determination of the halogen acid gas content (IEC 60754-1:2011 + corrigendum:2013), CENELEC, 2014

Table A1: Test requirements for insulating compound XLPE

Designation of compound	**Unit**	**XLPE**	**Test method**
Minimum conductor temperature in normal operation	**°C**	**90**	
Mechanical Properties			
Before aging			IEC 60811-501
- Tensile strength minimum	N/mm²	12.5	
- Elongation-at-break minimum	%	200	
Aging in air oven			
Treatment			IEC 60811-401
- temperature	°C	135	
- tolerance	K	± 3	
- duration	h	168	
Tensile strength			IEC 60811-501
- variation [a] maximum	%	± 25	
Elongation-at-break			
- variation [a] maximum	%	± 25	
After aging with copper conductor			
Treatment			IEC 60811-401
- temperature	°C	150	
- tolerance	K	± 3	
- duration	h	168	
Tensile strength			IEC 60811-501
- variation [a] maximum	%	± 30	
Elongation-at-break			
- variation [a] maximum	%	± 30	
Physical and chemical properties			
Hot set test			
Treatment			IEC 60811-507
- temperature	°C	200	
- tolerance	K	± 3	
- duration	min	15	
- Mechanical stress	N/cm²	20	
a) elongation under load maximum	%	175	
b) permanent elongation after cooling maximum	%	15	

Table A1: Test requirements for insulating compound XLPE (continued)

Designation of compound	**Unit**	**XLPE**	**Test method**
Maximum conductor temperature in normal operation	**°C**	**90**	
Water absorption ***Gravimetric method*** **Treatment** - temperature - tolerance - duration Maximum increase of mass	 °C K h mg/cm²	 85 ± 2 336 1 [b)]	IEC 60811-402 Sub-Clause 4.4
Shrinkage test Distance *L* between marks **Treatment** - temperature - tolerance - duration Shrinkage maximum	 mm °C K h %	 200 130 ± 3 1 4	IEC 60811-502

a) variation: difference between the median value obtained after ageing and the median value obtained without ageing expressed as a percentage of the latter.

b) An increase greater than 1 mg/cm² is being considered for densities of XLPE greater than 1 g/cm^3

Table A2: Test requirements for LSZH[1)] sheathing compound

Designation of compound		**Unit**	**LSZH[1)]**	**Test method**
Maximum conductor temperature in normal operation		**°C**	**90**	
Mechanical Properties				
Before aging				IEC 60811-501
Tensile strength	minimum	N/mm²	9	
Elongation-at-break	minimum	%	125	
Aging in air oven				
Treatment				IEC 60811-401
- temperature		°C	100	
- tolerance		K	± 2	
- duration		h	168	
Tensile strength				IEC 60811-501
a) value after aging	minimum	N/mm²	9	
b) variation [a)]	maximum	%	± 40	
Elongation-at-break				
value after aging	minimum	%	100	
b) variation [a)]	maximum	%	± 40	
Behaviour at low temperature				
Cold elongation test on dumb-bells:		°C	-15	IEC 60811-505
- temperature		K	± 2	Sub-Clause
- tolerance				
Cold impact test:				IEC 60811-506
- temperature		°C	-15	Sub-Clause
- tolerance		K	± 2	
Pressure test at high temperature				
Treatment				IEC 60811-508
- temperature		°C	80	Sub-Clause 4.4
- tolerance		K	± 2	

Table A2: Test requirements for LSZH[1)] sheathing compound (continued)

Designation of compound	**Unit**	**LSZH[1)]**	**Test method**
Maximum conductor temperature in normal operation	**°C**	**90**	
Water absorption ***Gravimetric method*** **Treatment:** - temperature - tolerance - duration Maximum increase of mass	 °C K H mg/cm²	 70 2 24 10 $_{24}$	IEC 60811-402 Sub-Clause 4.4
Electric water absorption test [2)] **Treatment:** - temperature - duration - test voltage (1min) - Insulation resistance corrugated-Cu tape to water	 °C days V MOhm * km	 24 ± 5 14 500 DC >40	EN60811-402 Sub-Clause 4.3

1) LSZH = sheathing material, which exhibits properties of reduced fire spread, low levels of smoke emission and halogen free gas emission when exposed to fire

a) variation: difference between the median value obtained after ageing and the median value obtained without ageing expressed as a percentage of the latter.

2) To be performed on a fully assembled cable

Table A3: Electrical type test requirements

Components to be tested	**Requirement**	**Test method**
Primary conductor - maximum DC resistance at ambient temperature	IEC 60288 Table 3	IEC 60228 Annex A
Secondary conductor - maximum DC resistance at ambient temperature	IEC 60288 Table 3	IEC 60228 Annex A
Insulation resistance of XLPE compound - minimum volume resistivity ρ at 90 °C	10^{12} Ω · cm	IEC 60502-1 Sub-Clause 17.2

Table A3: Electrical type test requirements (continued)

Components to be tested	**Requirement**	**Test method**

Voltage test for 4 hours Test voltage to be applied between - primary conductor and secondary conductor - secondary conductor and static screen	 no breakdown no breakdown	by analogy with IEC 60502-1 Sub-Clause 17.3
Impulse test Impulse test voltage to be applied between - primary conductor and secondary conductor - secondary conductor and static screen	 no breakdown no breakdown	by analogy with IEC 60502-1 Sub-Clause 17.4

Table A4: Non-electrical type test for insulation and sheath

To be tested	Insulation	Sheath
Dimensions		
- Measurements of thickness	x	x
Mechanical properties		
(tensile strength and elongation-at-break)		
- Without ageing	x	x
- After ageing in air oven	x	x
- After ageing of pieces of complete cable	x	x
Thermoplastic properties		
- Pressure test at high temperature (indentation)	-	x
- behaviour at low temperatures	-	x
Miscellaneous		
- Hot set test	x	-
- Water absorption	x	x
- Shrinkage test	x	-
Fire tests		
- see Table A5	x	

Table A5: Requirements for fire tests

Cables to be tested to CPR, Fire Class C_{ca} plus s1, d2 and a1

Classification criteria C_{ca}				Test method
Definition	**Abbreviation**	**Unit**	**value**	
Basic requirements				
Flame Spread, vertical	FS	m	≤ 2.0	EN 50399 20,5 kW flame source
Total Heat Release	THR_{1200s}	MJ	≤ 30	
Peak Heat Release Rate	Peak HRR	kW	≤ 60	
Fire Growth Rate	FIGRA	W/s	≤ 300	
Flame spread, vertical	H	mm	≤ 425	EN 60332-1-2
Additional requirements				
s1: - Total Smoke Production - Peak Smoke Production	TSP_{1200s} Peak SPR	m² mm²/s	≤ 50 ≤ 0.25	EN 50399 20,5 kW flame source
d2: Flaming droplets		1	--	
a1: - acidity - conductivity		pH µS/mm	> 4,3 < 2.5	EN 60754-2

Annexure-II

General Specifications

Table of Contents

1. Introduction

FAIR, Facility for Antiproton and Ion Research is a new multipurpose accelerator facility for the research with antiprotons and ions. The FAIR accelerator complex provides beams of antiprotons and ions with highest intensities, energies, and power in brilliant quality and for parallel operation. In consequence, FAIR will provide worldwide unique accelerator and experimental facilities allowing for a large variety of unprecedented fore-front research in physics and applied science.

2. Definitions

2.1 Definitions

The contracting body is Bose Institute (for BI-IFCC) called "**Shareholder (or Purchaser)** ", the final use of the product is either the GSI GmbH or the FAIR GmbH defined as the "**Company**".

The "**Contractor (or Supplier)**", the manufacturer of the product, is the provider in case of an in-kind contribution (IKC) or a commercial company, identified by the tendering process by the shareholder, hereinafter referred to as the "Contractor"**.**

The "contract" (and/or **Purchase Order**) is to be concluded between the **Shareholder** and the **Contractor**. A separate contract may be signed between the **Shareholder** and the **Company**. Any correspondence (technical or any other type) by the **contractor** with the **company** must be through the **shareholder**.

2.2 Classifications of Requirements

"Shall" or **"has to"** or **"must"** or **"is required to"** are used to indicate mandatory requirements, strictly to be followed in order to conform to the standard and from which no deviation is permitted.
"Shall not" or **"must not"** means that the definition is an absolute prohibition of the specification.
"Should" or **"is recommended"** is used to indicate that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others or that a certain course of action is preferred but not required.
"Should not" or **"is not recommended"** means that there may exist valid reasons in particular circumstances when the particular behaviour is acceptable or even useful, but the full implications should be understood and the case carefully weighted before implementing any behaviour described with this label.
"May" or "might", which is equivalent to **"is permitted"**, is used to indicate a
course of action permissible within the limits of the standard.

2.3 Systematic of Specifications

A **"Detailed Specification"** specifies the purpose of the component, its detailed features, and information to design and produce it.

A **“Common Specification”** is a set of definitions, prescriptions and rules valid for a technical system (e.g. the magnets, the vacuum system or the cryogenic system). It covers common technical aspects.

The **“General Specifications”** is a comprehensive set of definitions, prescriptions and rules, which is valid for all accelerators and storage rings, technical systems and components of the FAIR project. It covers mainly administrative and organizational topics, e.g. general aspects of safety and quality assurance.
“Technical Guidelines” specify rules of technical aspects which have to be respected by correspondent technical systems.
The ranking of the documents is specified in the contract.

3.2 General German Safety Regulations

3.2.1 Relevant rules to be considered are international and German standards (e.g. ISO, IEC, DIN, VDE) and the Berufsgenossenschaftliche Vorschriften (BGV) and are given in particular but not exclusively in Annex II.

3.3 Internal Safety Regulations

3.3.1 General Remarks

3.3.1.1 The regulations regarding the safety of the accelerator and the human being must be followed by the Contractor; they are given in particular but not exclusively in Technical Guidelines and Specifications.

3.3.1.2 The Contractor shall submit in a document latest after fixing the design of components (CDR accepted, milestone S002.M6 in Table 1) all safety relevant data. The document will be checked by the Company’s safety office.

3.3.1.3 Every device has to adopt a technically safe state in case of fail function. This comprises the contact safety as well as measures against unintended switch on via the control system. Exceptions have to be agreed upon by the Company.
3.3.1.4 The language for all operating panels must be English (preferred) and German if possible. Solutions for a later translation must be prepared.
3.3.1.5 Warning signs and other safety-critical notes must be in German and in English.
3.3.1.6 Devices installed in highly activated areas shall be removable by means of remote handling.

3.3.4 Remarks for Humans and Environment

3.3.4.1 The radiation safety for humans and environment is subject to the German Radiation Protection Ordinance and in particular to the responsible radiation protection authority which is the Hessian Ministry for Environment, Energy, Agriculture and Consumer Protection (HessischesMinisteriumfürUmwelt, Energie, Landwirtschaft und Verbraucherschutz).

3.3.4.2 Workers carrying out work at the FAIR accelerator complex at radiation controlled areas must be educated and trained in radiation protection techniques and fulfil the given radiation protection and entrance requirements.

3.3.4.3 For workers of the Contractor or from other external companies the same rules apply as for employees of the Company. In addition with every external company a contract has to be established which settles the apportionment with Company in terms of radiation protection like personal dosimeter, mutual exchange of dose values, instructions and training.

4. General Design Aspects

4.1 Reliability

4.1.1 The FAIR accelerator system is planned to be operated with only few weeks of interruptions per year. The projected lifetime of the system is about 30 years. The components placed in the accelerator tunnels will not be accessible during operation. Even during shutdown time access to components might be very limited due to remaining activation in the tunnels. Intervention time on accelerator components in service rooms will also be very limited.

4.1.2 Therefore, all components shall be rated for continuous operation (up to 6000 operating hours per year with virtually no interruption for 30 years)3 at all power output levels, taking care of the worst case of mains and environmental conditions and with minimum of maintenance. The Contractor shall therefore rate all components accordingly and use the most appropriate materials.

4.1.3 All equipment shall be designed in accordance with the best existing techniques and recognize good design practices available at the time of design. In particular the worst-case design principle has to be used, that is, the Contractor shall deliver the risk assessments with the components.

4.2 Design Principles

4.2.1 The Contractor guarantees that the materials used and manufacturing processes are in compliance with the Detailed Specifications, the Common Specifications, the Technical Guidelines, the drawings, and the documentation at all stages of the project. Provision of material certificates is not sufficient to discharge the Contractor from his guarantee that the materials used is in compliance with specifications.

4.2.2 The metric system is the mandatory system to be used. Exceptions have to be agreed by the Company.

4.2.3 The colours of accelerator magnets are standardized throughout the Company[1].

4.2.4 Materials near the beam pipe shall have a high level of radiation hardness [2].

4.2.5 In general, uncertified semiconductor components shall not be used in the tunnel or other radiation areas.

4.2.6 The mechanical design must comply with the requirements of the Design Guideline [3].

4.2.7 The electrical design must comply with the requirements of the Electrical Design Rules and Regulations [4].

4.2.8 All components connected to the FAIR Ethernet communication network must comply with the technical guideline [5].

4.2.9 All components to be integrated into or connected to the accelerator control system must comply with the standards defined in technical guidelines [6], [7],[8] and the control system Common Specification [9].

4.3 Maintenance

4.3.1 The FAIR is a unique accelerator facility. Scientists from all over the world will use extensively the experimental opportunities at FAIR. The operating costs of such a complex facility are significant. With respect to the international scientific community and the operating costs, not scheduled shutdown times have to be as short as possible. A significant part of the accelerator complex will be (highly) activated. The safety of the maintenance personnel allows only short time access or remote handling in activated areas. That means that in general replacement times of components should be minimized.

4.3.2 All components used have to be in batch production and likely to be so for at least the next five years. Commercially available components have to be used wherever possible.
Obsolete or specially selected components shall not be used.
All components and spare parts have to be available at least 10 years. The Contractor has to provide a long term strategy to ensure the availability over required time span.

4.4 Design Report

4.4.1 All technical concepts and designs have to be given in form of a design report to the Company and must be approved by the Company before start of construction.

4.4.2 Any approval of the Company does not impact the responsibility of the Contractor to deliver the components as specified and requested.

4.4.3 The Contractor may at any time suggest modifications to the details as found in the drawings and/or specifications. In each case, the Contractor shall inform the Company and seek for a written approval. The Contractor shall remain responsible for the construction, assembly and delivery in compliance with the specifications.

4.4.4 Any work, modification or change of documentation without approval by the Company is not part of the contract.

5. Quality Assurance

5.1 General Remarks

5.1.1 This chapter defines the general FAIR project quality assurance aspects and test strategy for the accelerator facility project.

5.1.2 The quality plan (Q-Plan) [Annex III] is the basic document to achieve the necessary quality. In the contract the relevant aspects of the Q-Plan might be adjusted.

5.1.3 Further individual and specific aspects and tests are described in the relevant Detailed Specifications, Common Specifications, and Technical Guidelines.

5.1.4 General test specifications and test procedures are described in Chapter 5.3

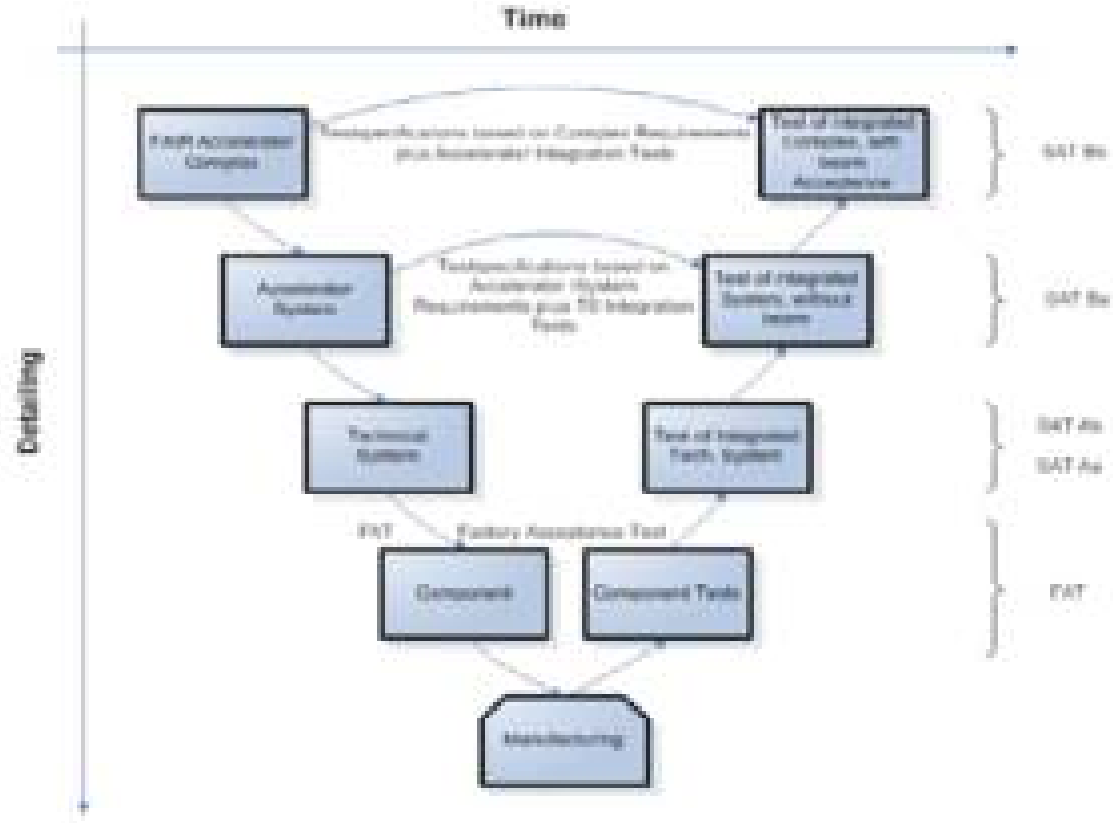


Figure 1: V-Model for quality assurance and test strategy

5.2 Quality Gates

5.2.1 Defined by the Work Breakdown Structure, the complete accelerator complex is divided

into individual accelerator systems. These are made up of various technical systems. The technical systems are built by using a set of components. Quality assurance and test strategy utilises a standard model (c.f.Figure 1).

5.2.2 The next phase in the process can only be started after the acceptance of the previous quality gate[4] by the Company. Quality gates are e.g. the acceptance of the Final Design Review (S002.M7), of the pre-series (S004.M8), of the Factory Acceptance Test (S005.M9), and of the Site Acceptance Tests (S006.M10 and S007.M11). A conditional acceptance is possible.

5.2.3 Tests and quality aspects are defined in the Common Specifications and in the individual Detailed Specifications.

5.2.4Factory Acceptance Tests (FAT) are carried out at the contractor's site.

5.2.5Site Acceptance Tests (SAT) at the Company's site are divided into part A and B.

[4] **A quality gate is a special milestone in a project which focuses on the achievement of pre defined quality goals. Quality gates are located before a phase that is strongly dependent on the outcome of a previous phase.**

SAT Part A includes the tests after delivery to the Company, but before the technical system is integrated in its final installation place.

- SAT Aa is the incoming goods inspection
- SAT Ab contains all the other tests to be carried out to get permission for transport to the final installation place.

5.2.6SAT Part B comprises all tests to be performed at the final installation place.

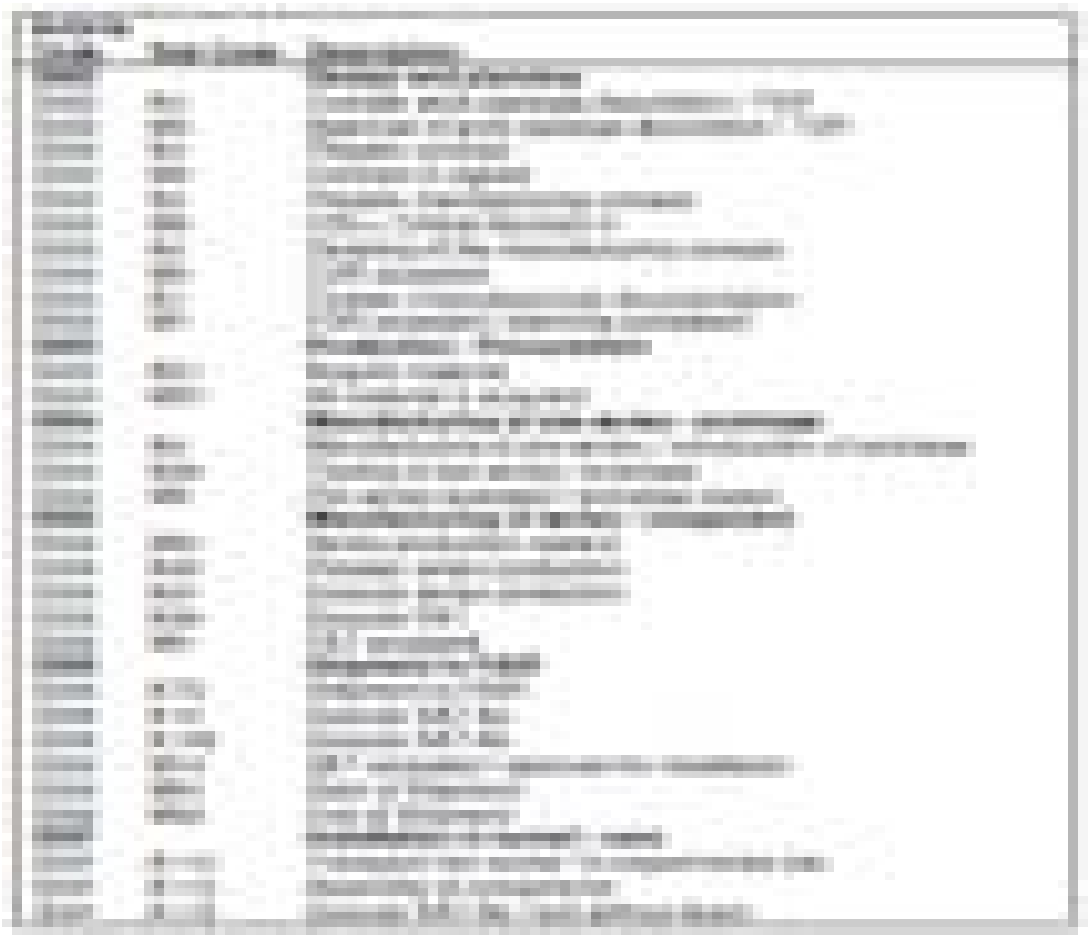
- SAT Ba includes all tests without beam
- SAT Bb addresses the tests with beam.

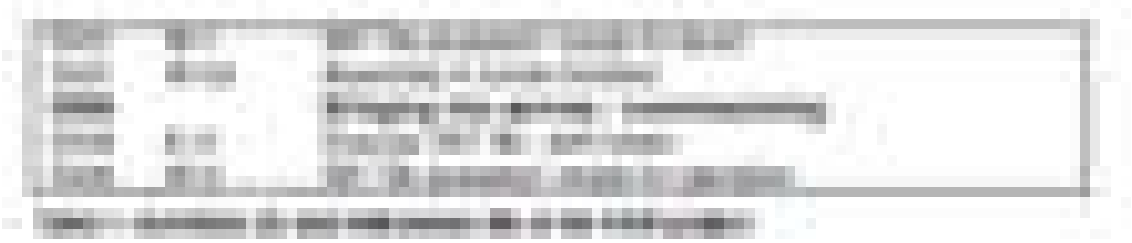
5.2.7 With respect to project milestones and quality gates, the following steps andphases are defined for the FAIR project. If necessary, additional steps will be added in the Detailed Specification of components.

5.2.8 For Schedules the activity codes and sub codes in Table 1 shall be used foreach item to be specified. The activity code divides the different tasks in 7 different groups. The sub code assigns a unique activity (A) or milestone (M) to each step.

Activity

Table 1: Activities (A) and milestones (M) of the FAIR project





In the case of present product the contractor's responsibility ends at SAT Ab.

5.3 Reviews, Inspections and Measurements

5.3.1 General Remarks

5.3.1.1 Factory Acceptance Test (FAT) will take place at the Contractor's site before shipment, to verify the given specifications of the components.

5.3.1.2 All or some of these tests will be repeated after the component has been delivered (SAT A).

5.3.1.3 The final acceptance document will be signed after the component is mounted and has undergone a test operation at its final position in the accelerator complex (SAT Ba).

5.3.1.4 During the acceptance tests, all specified properties of the components have tobe proven and demonstrated. This comprises for example the electrical, mechanical and vacuum properties of the device.

5.3.1.5 Acceptance tests are only valid if they are documented in proper form asagreed in the review meetings, and are accepted by the Company.

5.3.1.6 The Contractor shall be responsible for providing all necessary measurement tools/equipment and devices.

5.3.1.7 Testing of prototype or first of series is defined in the Common Specifications and/or the Detailed Specifications.

5.3.1.8 Testing of serially produced components is defined in the Common Specifications and/or the Detailed Specifications.

5.3.2 Quality Assurance at Contractor's Site

5.3.2.1 Standards in the style of ISO9001 have to be respected. That requires that all modules to be produced are supported by an approved and formal process designed to monitor and record each phase of the design, manufacturing and testing.

The Contractor will hand over to the Company an adequate set of process descriptions and documents which show the adherence of the Contractor's QM system to the ISO9001 (or an equivalent or higher standard).

5.3.2.2A test plan has to be established by the Contractor. Changes to the test plan have to be communicated to the Company and must be agreed by the Company. The test plan describes especially the required FAT tests.

5.3.2.3 The Contractor defines and executes individual sub-assembly inspection and test procedures at each stage. They must be designed to allow basic faults to be rapidly located, identified, and their causes eliminated by the Contractor.

5.3.2.4 The Contractor has to prepare a test protocol of each reached and executed acceptance test.

5.3.3 Tests and Reviews at the Contractor's Site

5.3.3.1 The Contractor shall carry out all specified intermediate acceptance tests and other investigations. The Contractor shall record in protocols the results of the intermediate acceptance tests and other investigations, and shall immediately inform the Company of those.

5.3.3.2 After the completion of a component, a test of all measurable figures and their compliance with the specified tolerances shall be carried out on the Contractor's Site.

5.3.3.3 After receiving notification of readiness for tests, the Company will decide on a case-by-case basis whether the test shall be carried out in the presence of representatives of the Company or whether the issuance of a test certificate insufficient.

5.3.3.4 If the results of the test show that additional work is necessary, compliance with the specified tolerances shall be proven once again in cooperation with the Company.

5.3.3.5 The acceptance tests at the Contractor's Site (FAT) have to be conducted in attendance of a representative of the Company.

5.3.4 Tests and Reviews at the Company's Site

5.3.4.1 A set of tests and quality assurance activities will be executed by theContractor on his own cost at the Company's site (SAT A).

5.3.4.2 Samples of the delivered goods will be functionally tested by using test environments of the Contractor (SAT A).

5.3.4.3 Test material and test equipment for the SATAa and SAT Ab tests have to be delivered by the Contractor together with the components.

5.3.4.4 A set of Site Acceptance Tests (SAT Aa) will be done after delivery to the Company to ensure the integrity of the component.

5.3.4.5 Tests for SAT Ab acceptance can only begin after successful completion of these Site Acceptance Tests (SAT Aa).

5.3.4.6 Either all tests of the FATs or a random sample of the FATs will be repeated at the Company's site. After the successful test SAT Ab the component shall be approved for installation.

5.3.4.7 Tools/equipment and facilities for the tests shall be kept for three years after the final acceptance of all components free of charge and such that they are protected from corrosion, theft, and distraint. Subsequently, they shall be delivered to the Company or shall continue to be stored for a fee. The Contractor shall invoice the storage expenses to the Company along with the main quotation.

5.3.4.8 The Company shall be informed about the Contractor's planned measures three months before the three-year period expires.

5.3.5 High precision geometric measurement services – Fiducialisation

5.3.5.1 All fiducialisation measurements will be performed at GSI.

5.3.5.2 All survey and alignment activities including fiducialisation measurements will be performed by external measurement specialists, authorised and supervised by GSI.

5.3.5.3 Information about which components have to be surveyed has to be taken from the respective Detailed Specifications.

5.3.5.4 A Contractor, whose components have to be fiducialised, surveyed and aligned at their final place in the tunnel, is responsible for the transport to the measuring site for fiducialisation and afterwards into the tunnel (assembly crew of contractor).

5.3.5.5 The Contractor has to adhere to the time limits scheduled for the dedicated components.

5.3.5.6 The Contractor has to transport the component to its place of final destination and has to pre-align it roughly with respect to existing floor markings (accuracy1-5mm).
5.3.5.7 The Contractor agrees to support the measurement specialists in the alignment works.

5.3.6 Site Acceptance Tests

5.3.6.1 The final acceptance test shall be carried out after delivery to the designated
location. The results of the previous tests can be taken into consideration. Afinal acceptance test protocol shall be drawn up. After the successful SAT Btest the component is handed over for operation.

5.4 Quality Assurance Reporting

5.4.1 At the latest upon delivery, the Contractor shall provide all design documents in“as-built” quality, all material certificates, all test and measurement protocol sand all documentation regarding the production/assembly process.
5.4.2 Drawings shall be submitted which document the current status of the component. At the same time all information shall be provided which includes special procedures such as cleaning requirements, special handling requirements or assembly instructions.
5.4.3 The Contractor shall send written quality assurance reports as defined in the Q-Plan. An annex shall include all records related to tests and agreements that have taken place.
5.4.4 The Company shall be informed in writing (e-mail) in due time of any events during construction/assembly which may cause a delay in construction/assembly and delivery.

5.5 Manufacturing Faults

5.5.1 In case of manufacturing faults, modifications, repairs or replacements have tobe carried out on all components affected at the Contractor’s expense.

6. Documentation

6.1 The standard language of all documents is English.
6.2 If the Contractor has to write technical specifications, the use of the specification template provided by the Company is obligatory.
6.3 During production, the Contractor shall assemble production/assembly documentation with photos of the most important devices and processes. The Contractor shall submit comprehensive operating instructions, risk analyses and trouble-shooting documentation for all components and systems.
The following are examples of documentation:

- User manual
- Maintenance manual
- Test protocols

- Protocol set of the Factory acceptance tests (FAT)
- Protocol set of the Site acceptance tests (SAT)
- Instruction protocols
- Drawings, 3D models
- Proof of compliance with regulations and directives
- Material inspection certificate 3.1 acc. DIN EN 10204:2005-01
- Bill of materials
- Lists of spare parts
- Electronic layouts, schematics
- Strength analysis for welded joints
- Acceptance certificate for welded products
- Acceptance certificates from governmental authorities
- TÜV or LGA expert opinions
- Handling requirements for assembly/mounting and lifting equipment.

6.4 The requirements of the standard IEC 82079:2012 (former IEC 62079:2001) shall be complied with in drawing up the technical documentation and its contents. The technical documentation shall be divided into logical sections and shall have a clear structure.

6.5 A change log is generally used so that different versions of a file can be traced. The ISO 6789:2003 is one standard that provides an overview of the compilation of documentation.

6.6 The documentation of the mechanical design must comply with the requirements of the Design Guideline [3] .

6.7 At latest upon delivery the documentation must be completely given to the Company in

- electronic form
    - non-changeable format
    - changeable format
- and one paper copy

6.8 The documentation, especially the sets of drawings to be delivered on digital media, must comply with the requirements of the data exchange standards [10], [11].

7. Shipping / Transportation

7.1 The Contractor shall be responsible for all necessary shipping and/ or transportation of

- Equipment,
- Assembly devices,
- Production or FAT/SAT required items provided by the Company and units

to operate the equipment for the measuring tasks according to the Technical Guideline F-TG-T-01e Transport [12].

7.2 The terms of delivery shall be carried out according to the STC of the Company, the Technical Guidelines (e.g. [12], [13], [14]), and the German Packing Ordinance. All delivery shall be covered by DDP, INCOTERMS 2010.In the case of deviations, they are separately specified in the contract.

7.4 During transport the Contractor carries the responsibility for human safety and for the safety and security of the transported goods.
7.5 The packaging of the shipped components has to be marked on two neighbouring sides with correspondent CIDs.

8. Miscellaneous

8.1 General Remarks

8.1.1 During the execution of the project it might become necessary to adapt thetechnical parameters. If this does not influence the content of the delivery or service the Company is allowed to do this with just information of the Contractor.
8.1.2 The Contractor agrees to inform the Company in due time about any circumstances, which may be a reason to change parameter of the component or which may change the approved “Detailed Time Schedule” in the contract.
8.1.3 Any changes have to be agreed on by the Company according to the change management procedures.

8.2 Provisions of the Company

8.2.1 The Company will develop in due time the personal safety organization on the construction side including writing and communication of the corresponding safety instructions.
8.2.2 The Company will provide the supply of cooling water, technical gases, pressurized air, electrical power and environmental conditions (light, air, temperature) according to the requirements specified for the operation phase(cf. Detailed Specifications).
Any additional requirements needed by the Contractor for the assembly or construction phase are in principle not available. The Contractor may in this case contact the Company in order to elaborate separate agreements for local support.
8.2.3 Every FAIR component has to be labelled with a unique number, called component ID (CID) [15]. The CID will be assigned by the Company.
8.2.4 A nomenclature system is established by the Company to uniquely identify all accelerator systems and sub-systems [16]. The Contractor has to follow the naming convention established by the Company.

8.3 Requirements on Personnel

8.3.1 All components supplied for a system have to be manufactured by trained and qualified people.
8.3.2 If measurement at the Company’s site has been agreed upon, qualified personnel shall be provided and shall receive instruction from the Company.

9. Annexes

II. Regulations of German Statutory Accident Insurance

In particular but not exclusive following documents have to be considered

- BGV A1 Grundsätze der Prävention (Principles of Prevention)
- BGV A3 Elektrische Anlagen und Betriebsmittel (Electrical systems and equipment)
- BGV D6 Krane (Cranes)
- BGV D8 Winden, Hub- und Zuggeräte (Jacks, Lifting and Pulling Equipment)
- BGI 545 Gabelstapler (Forklifter)

A complete set of regulations and information on safety and health of workers at work can be found in http://www.arbeitssicherheit.de/de/html/library/overview (in German)

III. Quality Plan

1. The Contractor shall prepare a comprehensive Quality Plan (Q-Plan) based onISO 9001 for its deliveries and submit it to the Company for approval. The QPlanshall cover the contents given hereafter as a guideline:

1.1. Scope and goals of the Quality Plan
- a. Reference to input documents
- b. Quality objectives (Specification of quality levels of deliverables)

1.2. Responsibilities
- a. Definition and distribution of responsibilities
- b. Project management structure

1.3. Specification and drawings
- a. Review of contractual specifications
- b. Requirements for production drawings

1.4. Resource Management
- a. Personnel
- b. Infrastructure
- c. Machines and equipment

1.5. Communication with Company
- a. Progress reports
- b. Meetings
- c. Project reviews

1.6 Production and Realization
- a. Purchase and procurement process
- b. Control of subcontractors
- c. Manufacturing process maps
- d. Identification and traceability
- e. Tools, techniques, equipment and methods

1.7. Monitoring and Measurements
- a. List and description of quality control steps
- b. List of characteristics to be measured with tolerance range
- c. Validation and verification tests
- d. Process and criteria for final acceptance
- e. Control of measurement tools

1.8. Preservation of Products

a. Handling and storage specifications
b. Packaging and transport specifications

1.9. Control of Document, Data and Records

a. List of documents and records
b. Approval procedure
c. Schedule of transmission to the Company
d. Ways of preservation of records

1.10. Control of Non-Conformity of Products

a. Immediate actions on defective products or product not suitable for its final functionality
b. Corrective actions to eliminate the cause of the problem
c. Preventive actions

1.11. Professional Quality and Certification of Personnel

1.12. Assistance: Technical Support to the Company

1.13. Quality Audits

2. The Contractor shall ensure the complete and correct execution of all measures specified in the Quality Plan.

3. The Contractor shall inform the Company in due time of the detection of a non conformance by issuing a non-conformance report sent to the Technical Coordinator of the Company.

IV. Abbreviations

A	Activity
ACA	Accelerator Construction Agreement
ACC	Accelerator
ACC AAB OB	All Accelerator Board – Operating Board
ArbSchG	Arbeitsschutzgesetz, German act on safety and health of workers at work
ArbStättV	Arbeitsstättenverordnung, German ordinance on safety and health of workers at work
ATEX	Atmosphères Explosives (explosive atmospheres)
AutoCAD®	2D/3D CAD software developed by Autodesk
BGI	BerufsgenossenschaftlicheInformationen, information on measures for safety and health of workers at work
BGV	Berufsgenossenschaftliche Vorschriften, German regulations on measures for safety and health of workers at work
BtrSichV	Betriebssicherheitsverordnung, German ordinance on safety and health of workers at work
CATIA® 3D CAD	software developed by Dassault Systems
CC	Collaboration Contract
CD	0 Critical Decision 0
CDR	Conceptual Design Review
CE	ConformitéEuropéenne (European conformity)
CERN	ConseilEuropéen pour la RechercheNucléaire (European Organization for Nuclear Research)

CF-Flange	Conflat Flange
CID	Component-ID
CR	Collector Ring
CS	Common Specification
DARL	Datenaustauschrichtlinie (Data Exchange Guideline)
DDP	Delivered Duty Paid
DIN	DeutschesInstitutfürNormung (German Institute for Standardization)
DS	Detailed Specification
EC	European Commission
EDMS	CERN Engineering Data Management System
EEC	European Economic Community
EMC	Electromagnetic Compatibility
EMVG	Gesetzüber die elektromagnetischeVerträglichkeit von Betriebsmitteln, German act on EMC
EN	European standard
EU	European Union
EURATOM	European Atomic Energy Community
FAIR	Facility for Antiproton and Ion Research
FAT	Factory Acceptance Test
FBTR	FAIR Baseline Technical Report
FDR	Final Design Report
GS	General Specification
GSI	GSIHelmholtzzentrumfürSchwerionenforschung GmbH (GSI Helmholtz Centre for Heavy Ion Research GmbH)
GUV	GesetzlicheUnfallversicherung, German Statutory Accident Insurance
HEBT	High Energy Beam Transport System
HESR	High Energy Storage Ring
IEC	International Electrotechnical Commission
IKC	In-kind Contribution
INCOTERMS	International Commercial Terms
ISO	International Organisation for Standardization
KRL	Konstruktionsrichtlinie (Design Guideline)
LGA	Landesgewerbeanstalt Bayern, German certification company
LVD	Low Voltage Directive
M	Milestone
p-Bar	Antiproton Target and Separator
PED	Pressure Equipment Directive
PLC	Programmable Logic Controller
PR	Product Readiness
ProdSG	Produktsicherheitsgesetz, German act on product safety
ProdSV	VerodnungzumProduktsicherheitsgesetz, German ordinance on product safety
PSM	Pre Series Module
PSP	Project Structure Plan (code numbers in the cost book)
PSS	Personal Safety System
QA	Quality Assurance
QM	Quality Management
Q-Plan	Quality Plan

RF	Radio Frequency
RöV	Röntgenverordnung, German X-ray protection ordinance
SAT	Site Acceptance Test
SIS 100/300	Schwerionensynchrotron 100/300, heavy ion synchrotron with maximum magnetic rigidity 100/300 Tm
SPVD	Simple Pressure Vessels Directive
STC	Standard terms and conditions of purchase
StrSchV	Strahlenschutzverordnung, German radiation protectionOrdinance
TDR	Technical Design Report
TG	Technical Guideline
TS	Technical System
TÜV	TechnischerÜberwachungs-Verein, German technical inspection association
VDE	Verband der Elektrotechnik, Elektronik und Informationstechnik (Association for Electrical, Electronic and Information Technologies)
VDI	VereinDeutscherIngenieure (Association of German Engineers)

V Literature

[1] F-TG-S-5.2e, "Coloring magnets".

[2] F-TG-B-01e, "Material Selection Radiation".

[3] F-TG-B-04e, "Design Guideline (KRL)".

[4] F-TG-ET-01e, "Electrical Design Rules and Regulations".

[5] F-TG-C-01e, "Ethernet Network Connectivity".

[6] F-TG-C-02e, "Equipment Control Interfaces".

[7] F-TG-C-03e, "Equipment Interlock and Status Signal Interface".

[8] F-TG-C-04e, "Equipment Functional Requirements".

[9] F-CS-C-01e, "Common Specification for the FAIR Accelerator Control System".

[10] F-TG-B-02e, "Data Exchange Guideline I (DARL T1)".

[11] F-TG-B-03e, "Data Exchange Guideline II (DARL T2)".

[12] F-TG-T-01e, "Transport - Transport".

[13] F-TG-T-02e, "Transport - Existing Infrastructure".

[14] F-TG-T-03e, "Transport - Installation".

[15] F-TG-B-0.5e, "Component-Identification and Barcode".

[16] V. R. Schaa, F. Peldzinski, M. Kühne and Bayer, Wolfgang, "System for Nomenclatures of Accelerator Devices at FAIR & GSI," [Online]. Available: https://www-acc.gsi.de/wiki/Accnomen.

ANNEXURE-III

FORMAT OF TECHNICAL DETAILS

Following details in tabular form are either the Check Lists or Compliance Sheets to be filled by the Bidders and must be submitted along with the offer duly stamped and signed. Additionally, the Figures of cross sectional view of co-axial cables (all 4 sizes) and relevant documents are to be submitted along with offer as mentioned earlier in the document.

Table-1- Check list of Certificates and Documents.

SN	Certificates and other documents	Remarks
1	Fire test certificate as per para 5.2 of Annexure-I (To submit after PO)	**Will be / not be provided**
2	Radiation resistant test Certificate as per para 4.3 of Annexure-I (To submit after PO)	**Will be / not be provided**
3	List of tests to be performed at manufacturer's site during FAT (as per Tests details mentioned in para 5 of Annexure-I).	**Will be / not be provided**
4	Cross sectional view of all sizes of cables	**(Attached / Not attached)**
5	Documents to be furnished by the bidders as mentioned in Chapter-II, section 6.1 and Chapter-XI "Pre-Qualification requirements"	**(Attached / Not attached)**
6	5 m length of similar type co-axialCable samples of sizes 50sq.mm and 185 sq.mm.	**(Attached / Not attached)**

Table-2 : Types of Co-axial cables and their quantity offered

No.	Cable Type	PSP code	Area (sq.mm)	Offered quantity
1	1×50 RM/50	2.14.1.5.x	50	
2	1×95 RM/95	2.14.1.5.x	95	
3	1×150 RM/150	2.14.1.5.x	150	
4	1×185 RM/185	2.14.1.5.x	185	

Please Fill up the tables as per the requirements, duly stamped and signed and submit along with the offer

Table 6: Electrical and mechanical parameters for coaxial DC power cable

No.	Parameter		Specification/ Value
1	**Basic Cable Design**		coaxial cable with primary conductor and secondary conductor of same size, both with XLPE insulation with electron beam curing , plus an additional static screen and LSZH sheath
2	**Applicable Cable Standard**		IEC _____
3	**Rated Voltage (rms)**		U_o: ____ kV (between primary conductor and secondary conductor as well as between secondary conductor and static screen)
4	**Maximum permissible conductor temperature:** - in normal operation - under short circuit conditions ($t_k \leq 5s$)		_____ °C _____ °C
5	**Minimum Bending Radii**		
	I.	Minimum bending radius	____ × (outer diameter of the cable)
	II.	Single time bending radius, e.g. after the cable is heated up to 30 °C and the cable is bent by means of a template for laying in end position	____ × (Minimum bending radius)
6	**Maximum allowed pulling force**		____ N/mm² of copper conductor cross section (consider only primary conductor)
7	**Standard continuous length of cable per drum with a tolerance of ± 2%**		_____ m

Table 7: Cable constructions with specific requirements

Cable component	**Dimension / Details**			
Nominal cross section (mm^2)	50	95	150	185
Primary conductor Maximum resistance of conductor at 20°C (Ω/km)				
Binder tape (optional)	separating foil; approximate thickness ____mm			
1st insulation layer IEC 60502-1 Nominal thickness t_{n1} of 1st insulation layer(mm) Requirements for 1st insulation layer thickness	XLPE, suitable for operating voltage U_0 = _____ kV rms Test requirements for mechanical and electrical characteristics of the utilized insulating compound see Table A1 in Annex-I _____ _____			
Diameter over insulation D_i (mm)	_____	_____	_____	_____
Lapping over core	separating foil, approximate thickness of _____ mm.			
Secondary conductor Nominal cross section of secondary conductor (mm^2) Individual diameter of secondary conductor wires, D_w (mm) Application	plain copper, E-Cu; maximum resistance of conductor (Ω/km) at 20°C same as of primary conductor to IEC 60228, Table 3 50 / 95 / 150 / 185 _____ / _____ / _____ / _____ *(individual diameter of each conductor wire D_w to be chosen accordingly in order to cover the underlying periphery completely)*			
Cu tape transverse spiral over secondary conductor	Thickness approx. _____ mm, tightly wrapped			
2nd Insulation layer Nominal thickness t_{n2} of 2nd insulation layer (mm) Requirements for 2nd insulation layer thickness	XLPE, suitable for operating voltage U_0 = 1.8 kV rms Test requirements for mechanical and electrical characteristics of the utilized insulating compound see Table A1 in Annex-I _____ / _____ / _____ / _____ _____			

Cable component	**Dimension / Details**			
Nominal cross section (mm^2)	50	95	150	185
Static screen corrugated E-Cu tape Thickness of copper tape (mm) Max. corrugation depth (mm)	The static screen needs not to withstand short circuit current nor provide radially water tightness _____ _____			
Sheath Nominal sheath thickness (mm) Requirements for the sheath thickness marking Approximate diameter over sheath (mm)[1)]	The material of the sheath shall be a _____compound applied uniformly and symmetrically by extrusion. Test requirements for mechanical characteristics of the utilized sheathing compound are listed in Table A2, Annex-I. ***PI confirm****:- a) It should provide adequate protection against fire hazards (b) the sheath shall be readily removable from the underlying static screen.* _____ _____ ***PI confirm***: Every meter, by embossing or indentation: - cross sections of primary and secondary conductor - voltage rating (i.e.: U_0 = 1.8 kV rms) - year of manufacturing - reference number (see section 5) - meter marking			
	_____ mm	_____ mm	_____ mm	_____ mm
Fire performance	***PI Confirm***:- Cables shall be tested to Fire Class C_{ca} of EN 50399 with additional requirements s1, d2 and a1 (see Table A5)			

[1)] Deviations in the diameter over sheath have to be agreed by the Company.

Table 8: Cable Current Ratings

Cable component	**Current ratings**			
Nominal cross section (mm^2)	50	95	150	185
Operating currents for continuous operation free in air at ambient 30^o C	___ A	___ A	___ A	_____ A

Table 9: Additional Mechanical Tests on special terminations

Cable component	**Mechanical stress**			
Nominal cross section (mm^2)	50	95	150	185
Tensile force (kN)	_____	_____	_____	_____