**Technical Evaluation Plan**

# **1. Reminder for Manufacturers regarding the Tender Notice**

1. All manufacturers participating in the tender shall undergo a technical evaluation ( "Evaluation") carried out by NFRI (National Fusion Research Institute), Any manufacturer failing to participate in the Evaluation will be disqualified.
2. In principle, all the Evaluations shall be conducted in the form of an evaluation interview. Under unavoidable circumstances, however, submitted documents may be an alternative basis for such Evaluation. In this case, NFRI assumes no responsibility for any disadvantages that may be caused by not attending the evaluation interview.
3. All necessary documents must submitted to the contract division at least ten days ahead of the Evaluation date. Documents arriving after the deadline will not be considered.
4. The contract division will notify the Evaluation results to each bidder, but will not make the scores public. The bidders shall not raise any objections to the results of the technical or price evaluations, which will be determined by the Technical Evaluation Committee.
5. NFRI can conduct an on-site inspection of a manufacturer participating in a tender.

# **2. Evaluation**

1. NFRI shall organize the Technical Evaluation Committee ("TEC").
2. A contract division shall assist in the technical evaluation by offering the necessary documents to the TEC, but will not provide the TEC with any information regarding the proposed price.
3. The TEC shall evaluate the technical proposal of a bidder according to the criteria and shall transfer the result to the contract division.
4. Apart from a technical proposal, bidders may join technical evaluation interview for discussing the issues - technical capability, design and manufacturing capability, delivery performance, and so on. The TEC shall evaluate the technical proposal and the interview according to the criteria, and transfer the result to the contract division.

※ The presentation time is up to 40 minutes, and the question and answer session shall be finished within 30 minutes.

1. The contract division shall conduct a price evaluation, combine the result with that of the technical evaluation only for those bidders that have qualified through the technical evaluation, and thereby determine a list of preferred bidders. The bidder with the highest score shall be identified as the first preferred bidder.
2. Because a small difference in the technical level will create a significant difference in price, the Evaluation results shall be combined at a weight of 70:30 (70% for the technical evaluation, and 30% for the price evaluation).

# **3. Organization of the Technical Evaluation Committee**

1. To maintain the objectivity of the Evaluation, an experienced expert among the TEC members shall be elected as the chairperson.
2. The TEC shall be composed of persons concerned with NFRI or an external organization, who possess expertise in heating systems and the high-voltage/large-power supply for nuclear fusion research.
3. In principle, the TEC shall consist of of five members or more, all of whom are from either NFRI or an external organization. The TEC may organize and run an on-site inspection team composed of staff members working in the evaluation areas.

※ Attachment

5-1. Technical evaluation criteria

5-2. Specific criteria for each item of a technical evaluation

5-3. Documents to be submitted for a technical evaluation

5-4. On-site inspection team for supporting a bidder evaluation (draft)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Division | : |  |
|  | Author | : | (Signature) |
|  | Project manager | : | (Signature) |

**【Attachment 5-1】**

**Technical Evaluation Criteria**

1. Condition for passing the technical evaluation: The mean score given by the TEC members shall be 85 or more. However, if more than 1/3 of the TEC members give a score of less than 60, the manufacturer will be disqualified.
2. Table of technical evaluation criteria

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Area | Item | Specific criteria | Weight (A) | Grade (B) | | | | | Score  (A×B) |
| 5 | 4 | 3 | 2 | 1 |
| I.  Technical capability  (60) | Understanding of job range and relevant standards  (10) | Understanding of technical items in specifications and applicability of detailed specifications of supplied goods (5) | 1 |  |  |  |  |  |  |
| Validity of the entire process and schedule (5) | 1 |  |  |  |  |  |  |
| Subtotal |  |  |  |  |  |  |  |
| Design/Technical capability  (30) | Design of high-voltage high-speed power supply (10) |  |  |  |  |  |  |  |
| Suitability and reliability of protection circuit (10) |  |  |  |  |  |  |  |
| Design method of control system (10) |  |  |  |  |  |  |  |
| Subtotal |  |  |  |  |  |  |  |
| Fabrication  (5) | Fabrication of apparatus (5) |  |  |  |  |  |  |  |
| Subtotal |  |  |  |  |  |  |  |
| Inspection  (10) | Suitability of contents and FAT process (5) |  |  |  |  |  |  |  |
| Suitability of contents and SAT process (5) |  |  |  |  |  |  |  |
| Subtotal |  |  |  |  |  |  |  |
| Maintenance (5) | Warranty and maintenance plan (5) |  |  |  |  |  |  |  |
| Subtotal |  |  |  |  |  |  |  |
| **Total** |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Area | Item | Specific criteria | Weight (A) | Grade (B) | | | | | Score  (A×B) |
| 5 | 4 | 3 | 2 | 1 |
| II.  Possession of technical staff members and equipment (10) | Possession of techniques related to design and fabrication (5) | \* Possession of circuit design and analysis programs (2)  \* Possession of experienced technicians in circuit design, fabrication, and installation (3) | 1 |  |  |  |  |  |  |
| Subtotal |  |  |  |  |  |  |  |
| Related equipment /apparatus (5) | Possession of inspection and test equipment/apparatus (5) | 1 |  |  |  |  |  |  |
| Subtotal |  |  |  |  |  |  |  |
| **Total** |  |  |  |  |  |  |  |  |
| Ⅲ.  Delivery history (20) | Delivery history  (20) | Delivery history of high-voltage DC power supply (10) | 2 |  |  |  |  |  |  |
| **Delivery history of high-voltage power supply system with PSM technology for mega-watt gyrotron or equivalent load (10)** | 2 |  |  |  |  |  |  |
| Subtotal |  |  |  |  |  |  |  |
| **Total** |  |  |  |  |  |  |  |  |
| IV.  Financial stability (10) | Credit rating (10) | Credit rating  (Ratings certified by a credit-rating agency) (10) |  | Based on specific rating criteria  (contract division) | | | | |  |
| **Total score (100)** | | | |  | | | | |  |

|  |  |
| --- | --- |
| Evaluation opinion |  |
| Evaluator | Organization : Name: (sign) |

**【Attachment 5-2】**

**Specific Criteria for Each Item of Technical Evaluation**

|  |  |  |
| --- | --- | --- |
| **Area** | **Item** | **Specific evaluation criteria** |
| I.  Technical capability  (60) | Understanding of job range and relevant standards (10) | ◎ Understanding of the technical items in the specifications and applicability of the detailed specifications of the supplied goods (5)  - Clear description of supply scope (2)  - Detailed specifications and operation characteristics of each power supply and auxiliary equipment (3)  ◎ Validity of the entire process and schedule (5) |
| Design/technical capability  (30) | ◎ Design of high-voltage DC power supply (10)  - Design of power supply reflecting all matters (operation characteristics, space utilization, and maintenance efficiency) (5)  - Validity of simulation results considering the main operation specifications (5)  ◎ Suitability and reliability of protection circuit (10)  - Configuration of apparatus for protecting loads from arc, and verification through simulation (5)  - Arc detection and adequacy of interlock system configuration (3)  - Adequacy and reliability of personal safety system (2)  ◎ Design method of control system (10)  - Design of control system based on reliability and stability (4)  - System design with user accessibility (4)  - Design adequacy of monitoring system (2) |
| Fabrication  (5) | ◎ Fabrication of apparatus (5)  - Process planning of each apparatus, which considers the fabrication completion schedule (2)  - Completeness of in-plant fabrication for minimizing the installation work (3) |
| Inspection and testing  (10) | ◎ Suitability of contents and factory acceptance test (FAT) process (5)  - Validity of inspection/test items and contents (2)  - Validity of test process and method (3)  ◎ Suitability of contents and site acceptance test (SAT) process (5)  - Validity of inspection/test items and contents (2)  - Validity of test process and method (3) |
| Maintenance  (5) | ◎ Warranty and maintenance plan (5)  - Accurate technical check and quick and stable reaction plan for anomalies (2)  - Technical support plan after fabrication and installation (3) |

|  |  |  |
| --- | --- | --- |
| **Area** | **Item** | **Specific evaluation criteria** |
| II. Possession of technical staff members and equipment  (10) | Possession of techniques related to design and fabrication (5) | ◎ Possession of circuit design and analysis programs (2)  - Both circuit design and structural/thermal analysis programs (2)  - Either circuit design or structural/thermal analysis programs (1)  - Neither (0)  ◎ Possession of experienced technicians in circuit design, fabrication, and installation (3)  - (Circuit design) Minimum of three persons with at least five years of experience (2); otherwise, (1)  - (Fabrication and installation) Minimum of three persons with at least five year of experience (1); otherwise, (0) |
| Related equipment/apparatus (5) | ◎ Possession of incoming power capability (2)  - 3 MVA or above (2), 1 MVA or above (1), below 1 MVA (0)  ◎ Possession of inspection and test equipment/apparatus (3)  - 10 points or above (3), 5 points or above (2), less than 5 points (1)  \* For the test apparatus and measuring instrument, see ※ below |
| Ⅲ. Delivery history and relevant certificates  (20) | Delivery history (20) | ◎ Delivery history of high-voltage DC power supply (10)  - 50 kV or above (10), 30 kV or above (5), below 10 kV (2)  ◎ **Delivery history of high-voltage power supply system with PSM technology for mega-watt gyrotron or equivalent load (10)**  - PSM technology (10), other technology (5), no performance (0) |
| IV. Financial stability  (10) | Financial statement  (10) | ◎ Financial structure rating (certified by a credit-rating agency)  \* In case of domestic company  ◎ Evaluated by credit-rating agency in KOREA  \* In case of overseas company |

* Test apparatus: high-voltage DC power supply (DC 100 kV or above), dielectric tester, testing load for high-voltage power supply, etc.
* Measuring instrument for inspection and testing: high-voltage probe (DC 60 kV or above), current probe (60 A or above), oscilloscope, etc.

**Credit Rating Table of Enterprises**

|  |  |  |  |
| --- | --- | --- | --- |
| Rating of corporate bond | Rating of corporate bill | Credit rating | Point distribution |
| AAA | - | Equivalent to AAA corporate bond | 10.0 |
| AA+,AA0,AA- | A1 | Equivalent to AA+, AA0, or AA- corporate bond | 9.5 |
| A+ | A2+ | Equivalent to A+ corporate bond | 9.0 |
| A0 | A20 | Equivalent to A0 corporate bond | 8.5 |
| A- | A2- | Equivalent to A- corporate bond | 8.0 |
| BBB+ | A3+ | Equivalent to BBB+ corporate bond | 7.5 |
| BBB0 | A30 | Equivalent to BBB0 corporate bond | 7.0 |
| BBB- | A3- | Equivalent to BBB- corporate bond | 6.5 |
| BB+,BB0 | B+ | Equivalent to BB+ or BB0 corporate bond | 6.0 |
| BB- | B0 | Equivalent to BB- corporate bond | 5.5 |
| B+,B0,B- | B- | Equivalent to B+, B0, or B- corporate bond | 5.0 |
| CCC+ or below | C or below | Equivalent to or below CCC+ corporate bond | 4.5 |

1. The credit rating of a company, which has not been expired and was assessed prior to the Evaluation date by a credit information dealer that provides one of the services prescribed through the Article 4(1) or (4) of the Credit Information Use and Protection Act, is used as the evaluation criterion. In this case, the credit rating can be inquired either through the credit rating inquiry system of the Public Procurement Service, or through the small and medium business public procurement information network, and the inquiry result from the system may be used for the Evaluation.
2. A credit rating evaluation sheet, which is valid according to the above article ①, shall be submitted once a year, except when the sheet is expired, and a new sheet should therefore be submitted.
3. Notwithstanding paragraph ① of the foregoing, if a company wants to be evaluated based on the credit rating of its corporate bond or bill, the latest credit rating of either the corporate bond or bill, which has not been expired, may be evaluated.
4. If a company does not submit its credit rating certificate, the lowest rating will be given. If the expiry date of the certificate is the same as the date of the tender notice, the certificate shall be considered valid.
5. A merger company shall be evaluated on the basis of a new credit rating that has been assigned for the new, post-merger company. If such a new rating does not exist, the latest credit rating of one of the merged companies shall apply
6. In the case of a consortium, the evaluation shall be conducted by combining the products of each company’s management evaluation score and its investment or share ratio.

**【Attachment 5-3】**

**Documents to be Submitted for Technical Evaluation**

1. Any company that wishes to participate in a technical evaluation shall submit technical proposal with appendixes regarding the evaluation items to NFRI.

2. Preparation of the technical proposal: The proposal shall be grounded on the distributed data including the technical specifications, and technical evaluation criteria.

3. The proposed price shall be written on a separate document so that it will not be exposed on other necessary documents. If the price is exposed, and thus the fairness of the technical evaluation seems to be compromised, the company cannot be qualified from being a preferred bidder.

4. Contents of the appendixes of the technical proposal shall be as following.

(Attachments shall be prepared according to the evaluation areas and items.)

**Ⅰ) Technical capability**

(1) General

◎ Outline (including a general description of the specifications and power supply operation)

◎ Scope of supply (including detailed specifications to be supplied)

◎ Supply schedule and process

- Method of organizing the project

- Order and contents of the process

(2) Technical specifications of the gyrotron power supply system

◎ Detailed specifications and design

◎ Simulation results

- Include analysis results of a simulation applying the main operation parameters

- Include results of the main characteristics, such as rise/fall time and voltage/current ripple.

(3) Protection circuit design

◎ Include performance results verified through the configuration of a protection circuit and a simulation

◎ Configuration of interlock system (detection method, configuration of interlock system, etc.)

◎ Method of ensuring personal safety

(4) Draft design of power supply control system

◎ Configuration of power supply control system

- The system configuration shall be expressed using a concept diagram.

◎ Method of constructing a data acquisition system for power supply debugging

◎ Method of designing a control system with user accessibility

(5) Fabrication

◎ Fabrication process plan

- Method of minimizing the volume of power supply system

- Method or plan of ensuring complete in-plant fabrication

- Work scope of on-site installation

- Design method for high-voltage transmission line, ground, and return line

(6) Inspection and testing

◎ Factory acceptance test (FAT)

- Inspection items and contents

- Test items, process, and method

◎ Site acceptance test (SAT)

- Inspection items and contents

- Test items, process, and method

(8) Maintenance

◎ Method of minimizing the required maintenance work

◎ Technical check and quick reaction plan for anomalies

◎ Technical support plan after fabrication and installation

**Ⅱ) Possession of technical staff members and equipment**

(1) Techniques related to design and fabrication

◎ Circuit design and analysis programs

◎ Related technicians (including license, technical qualification certificate, career certificate, etc.)

(2) Related equipment and facility (including evidence materials)

◎ Power-receiving system

◎ Related test equipment and measuring instrument

**Ⅲ) Delivery history and certificate thereof**

(1) Experience in fabricating a similar system:

◎ Performance in fabricating and delivering a high-voltage power supply system (including evidence materials)

◎ Performance in fabricating and delivering a mega-watt gyrotron high-voltage power supply system (including evidence materials)

**Ⅳ) Financial stability**

1. Credit rating regarding the financial structure and evidence materials (rating certified by a credit rating agency)

◎ In case of overseas company : no need to submit the references ( If the credit-rating agency in Korea need more information, NFRI requests to submit the references

**【Attachment 5-4】**

**On-site Inspection Team for Supporting Bidder Evaluation (Draft)**

**# The technical evaluation committee can organize and run an on-site inspection team for supporting bidder evaluations if necessary.**

1. Organizing the on-site inspection team for technical evaluations

󰏅 To support the technical evaluation committee for high-voltage power supply system, an on-site inspection team for technical evaluations can be organized, which shall be composed of technical and financial staff members.

󰏅 Financial staff members are selected from contract or financial division of NFRI. If necessary, an external expert may be appointed

󰏅 Organization of technical evaluation system (draft)

|  |  |
| --- | --- |
| **Technical Evaluation Committee**  **◦ Chairperson:**  **◦ Committee member:**  - Approximately two members from external organizations  - Approximately four members from NFRI | |
|  |  |
| **On-site Inspection Team**  ◦ **Manager**:  - Designated by the chairperson of the committee  ◦ **Staff**:  - Technical part - 2–3 staff members working in the area  - Financial part - 1 staff member from the contract or financial division | |

2. Duty of on-site inspection team

󰏅 Conduct preliminary review of technical proposals in advance of the technical evaluation committee.

󰏅 Write technical and financial reviews, and submit them to the technical evaluation committee.

󰏅 The technical evaluation committee uses reports from the on-site inspection team for their evaluation.