TERMS OF REFERENCE FOR THE R&D PROJECTS

1. **Title of the Project**: Study of performance and constructional requirements of covered conductor for voltage rating upto 110KV

2. **Background:**

    a) Covered conductors consist of a conductor surrounded by a covering made of insulating material as protection against accidental contacts with other covered conductors and with grounded parts such as tree branches, etc.
    b) In comparison with insulated conductors, this covering has reduced properties, but is able to withstand the phase-to-earth voltage temporarily. Since covered conductors are not touch-proof, i.e. they must be treated as bare conductors with respect to electric shock.
    c) These types of conductors are majorly used in forest area to avoid contact with tree branches and electrocution of wildlife (mainly elephants, peacock, flamingos etc.)
    d) In absence of standard document there is no uniformity in technical requirements in the tenders issued by various departments of State/Central Govt. for procurement.
    e) To maintain uniformity in safety/performance parameter, quality and to ensure protection, it is necessary to undertake a research and development project on above subject.

3. **Objective:** The objective of the product is to collect technical data and scientific evidence for performance parameters of covered conductor based on literature review/desktop study, industry visit, testing results of the samples and feedback from the user.

4. **Scope**: Scope of this research project includes–
    - Calculation of Insulation thickness.
    - Conductor operating temperature.
    - Carbon content test/UV resistance test requirements.
    - Current rating under standard installation system.

5. **Expected Deliverables**:

- A comprehensive research report detailing the methodologies, findings, and conclusions of research.
- Detailed technical specifications for covered conductor, which can include size, design, materials used, and manufacturing processes.
- Data from experiments and testing conducted to assess the performance, safety, and reliability.
- A performance analysis report that quantifies the effectiveness and efficiency.

- Documentation showing comparison with industry standards and regulations.

6. Research Methodology:

The project will involve the following research methodologies:

- Literature Review: Conduct an extensive literature review to gain an understanding of the existing research, technologies, and best practices along with related National/International Standards available.
- Requirements mentioned in various tender documents issued by State/Central Govt.
- Laboratory experiments to assess the performance.
- Exploring the manufacturing base of the product in the country with focus on the role of MSMEs and Start-ups.
- Visit to at least two manufacturing units and a laboratory to understand the manufacturing processes and technologies in use for production and quality control.
- Preparation of the report highlighting all the aspects as given above.

6. Criteria for Identification of Proposer to conduct Research work:

- Proposer shall be a member of the Sectional Committee or the academic institution and universities having MoU with BIS and having experience in testing of cables/conductors.

7. Timeline and Method of Progress Review:

The review will be carried out in each month along with consultation of other experts if required.

Timeline	**Progress in project**
0 to 1st month	Literature review
1st to 4th month	Visit to industry which includes testing of product, visit to testing lab, and preparation of analytical report
Upto 6th month	Final report

7. Support BIS will provide:

- BIS will provide access to latest editions of standards required for the project.
- BIS will also provide details of manufacturers, labs, etc.

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