TERMS OF REFERENCE FOR R&D PROJECT

1. **Title of the project: Revision of IS 1416:1972** --Specification for stationary, portable single phase safety transformers with extra low output voltage with a rated supply voltage not exceeding 250 V and a rated output voltage not exceeding 5 kVA.

2. **Background:**

Safety transformers are used to supply distribution circuits, appliances or any other equipments at extra low voltage. IS 1416:1972 covers the general, safety and performance requirements for safety transformers with extra low output voltage with a rated supply voltage not exceeding 250 V and a rated output voltage not exceeding 5 kVA. to ensure personal safety against electric shock , safety against the effects of excessive temperature and fire and reliable operations .

This research project aims to ***review and update the existing Indian standard IS 1416:1972***. The rationale behind this project is to ensure that the standard is in line with the current technological advancements, industry requirements, and safety regulations. The revision of this standard will address any gaps, improve safety measures, and enhance the performance of safety transformers in accordance with the present scenario.

3. **Scope for R&D:**

The project's scope encompasses a comprehensive study of the existing Indian standard IS 1416:1972, along with a literature survey to identify relevant advancements and updates in safety transformers. It will also involve an analysis of the current manufacturing facilities available, focusing on MSMEs and startups. Additionally, the project will explore the testing facilities related to safety transformers. The research will primarily concentrate on the revision of the specification for safety transformers with extra low output voltage, considering a rated supply voltage not exceeding 250 V and a rated output voltage not exceeding 5 kVA to address any gaps, improve safety measures, and enhance the performance of safety transformers in accordance with the present scenario.

4. **Expected Deliverables:**

a. A revised version of Indian standard IS 1416:1972, incorporating relevant updates and advancements in line with current requirements and safety regulations.

b. Documentation of the research findings, including an analysis of literature surveys, manufacturing facilities (MSMEs, startups, etc.), and testing facilities for safety transformers.

c. Recommendations for enhancing the role and relevance of safety transformers in the current scenario, based on the research conducted.

5. **Research Methodology:**

The project will involve the following research methodologies:

a. Conduct an extensive literature survey to review previous studies, research papers, and relevant publications related to safety transformers, standards, and technological advancements.

b. Gather data through surveys, interviews, or questionnaires to assess the manufacturing facilities, specifically focusing on MSMEs and startups involved in safety transformer production.

c. Explore testing facilities for safety transformers and evaluate the current testing methodologies and parameters.

d. Analyze the collected data and identify gaps, shortcomings, and areas requiring improvement in the existing standard.

e. Visit to at least two manufacturing units and a laboratory to understand the manufacturing processes and technologies in use for production and quality control.

f. Propose necessary revisions and modifications to the standard, considering the research findings and industry best practices.

g. Prepare a comprehensive report documenting the research methodology, findings, recommendations, and the revised version of the standard.

h. Preparation of the Draft document.

i. Submission of the final project document

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

- Proposer shall be a technologist with experience in manufacturing/testing of electrical appliances/equipments.
- Proposer shall be a member of the Sectional Committee or the academic institution and universities having MoU with BIS.

Note: The acceptance of proposal is subjected to the approval of Sectional Committee and Screening Committee of BIS based on the BIS norms.

7. **Timeline and Method of Progress Review:**

The review will be carried out in each month along with consultation of other experts if required. The literature review after 1 month, the first draft after 4 months and the final draft along-with report at the end of 6 months.

8. Support BIS will Provide:

- BIS will provide access to latest editions of standards, magazines, Research Journals etc required for the project.