Stakeholder Meeting for the ongoing Focused Basic Research (FBR) Project

"Sustainable and Reliable Steel Lattice Structures - SaRSS" OLP 22741

28th July, 2023, 10.00AM-1.00PM (IST)
(through MS Teams online)

Link for online MS Teams meeting:

https://teams.microsoft.com/l/meetup-join/19%3ameeting_Njk1ZGRmMDktOTlkNy00YTE0LTkyNWMtZDMyYTZhYzVjMWRm%40thread.v2/0?context=%7b%22Tid%22%3a%22b867f20e-8a9c-4603-b5ab-39c3840dfb64%22%2c%22Oid%22%3a%224443ab44-8489-4515-b9b8-437683769d81%22%7d

Stakeholder Meeting for the ongoing FBR Project
Sustainable and Reliable Steel Lattice Structures (SaRSS)

Need of the Day:

The sustainability of steel buildings could be improved by the use of more efficient steel such as high strength steel (materially efficient design) and improving the life-cycle performance through reliable design leading to minimum repair/rebuild cycles (reliability-based design). The usage of High Strength Steel (HSS) (f_y>460 MPa) enable lighter structural solutions, while being sustainable and economic. Hence there is an urgent requirement to update the design code for steel structures with design guidelines specific to HSS members and connections. Safety and reliability of Transmission Line (TL) lattice towers are important as their failure could result in significant economic and societal impact. To reduce tower failures, there is a need to develop design methodology for TL towers for target reliability based on Load and Resistance Factor Design (LRFD) concepts and progressive collapse analysis methods to identify the critical elements for strengthening.

Objectives:

This project envisages to develop design guidelines specific to HSS truss lattice structures at the level of material, component members and associated welded/bolted connections to avoid unsafe or uneconomical design solutions due to conventional design methods. The load and resistance factors for TL tower components will be determined based on the LRFD concept to achieve target reliability. The design guidelines for the reliability-based design of TL tower components will be developed. The computational technique for progressive collapse analysis of TL towers will be developed to identify the critical /sensitive members of TL towers subjected to broken conductor loads.

Highlights of the project:

- Development of design guidelines for the use of high strength steel for sustainable steel lattice structures
- Integrated approach for determination of reliability-based load and resistance factors for design of components of lattice towers
- Methodologies to identify the progressive failure mechanism of TL towers subjected to broken conductor loads

Outcome:

- Design guidelines for HSS will improve the market for HSS in the country
- Reliability-based design guidelines for TL tower components will help the power transmission industry to produce towers with adequate structural safety
- Progressive collapse analysis will help to prevent the failure of existing towers by retrofitting the identified critical members