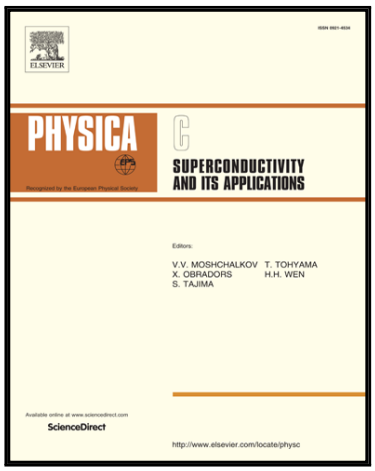

Step-by-step design of a single phase 3.3 kV/200 A resistive type superconducting fault current limiter (R-SFCL) and cryostat

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Highlights

- In our first attempt for a step-by-step design of a single phase R-SFCL in India, we have chosen the typical ratings of a distribution level (3.3 kV_{rms}, 200 A_{rms}, 1Φ) R-SFCL.
- This step-by-step design procedure involves superconductor selection based on their physical properties, fault limiting performance, time dependent electro-thermal simulations and recovery time optimization after fault removal.
- In this paper, fault limiting performance for a fault current of 5kA is simulated for aforesaid R-SFCL using suitable HTS tape which we evaluated in our previous publications.
- Maximum normal state resistance and maximum temperature rise in the coil is estimated using energy balance equation.
- Finally, a liquid nitrogen (LN2) cryostat is designed for the 3.3kV/200A R-SFCL and the total heat load of the R-SFCL system is calculated as an approach towards step-by-step design procedure.