

N.1: Handover of indigenous high-RRR Niobium sheets for accelerator development

In a significant step toward self-reliance in advanced accelerator technology, Dr. Ajit Kumar Mohanty, Chairman of the Atomic Energy Commission, handed over the first batch of indigenously developed high-Residual Resistivity Ratio (RRR) niobium sheets to Shri Unmesh D. Malshe, Director of RRCAT, on 22nd October 2025. This achievement stems from a collaborative effort between the Nuclear Fuel Complex (NFC), Hyderabad, and RRCAT to establish a domestic supply chain for high-purity niobium. These sheets, produced through rigorous melting, rolling, and annealing processes, are critical for manufacturing high-gradient superconducting cavities while ensuring minimal power loss. RRCAT performed RRR measurements at each stage of development.



Indigenously built first high-RRR niobium sheet handed over to Shri Unmesh D. Malshe, Director, RRCAT by Dr. Ajit Kumar Mohanty, Chairman, AEC & Secretary, DAE, at NFC, Hyderabad

These materials are critical to the development of Superconducting Radiofrequency (SCRF) niobium cavities, which achieve high efficiency by operating with negligible electrical resistance at 2 K. RRCAT employs specialized facilities for precision machining, forming, and electron beam welding (EBW) to fabricate diverse cavity structures, including single-spoke resonators and multi-cell elliptical cavities.

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N.2: DAE-Fermilab quality interaction meeting at RRCAT, Indore

A two-day DAE-Fermilab quality interaction meet was organized at RRCAT Indore during October 29-30, 2025 under the Indian Institution Fermilab Collaboration (IIFC). Objective of the meet was, to discuss the quality assurance/quality control (QA/QC) processes adopted by participating units of DAE with respect to the deliverables to the construction phase of PIP-II project of Fermilab, USA. Fermilab team comprising of Matthew Joseph Luedke, Quality Engineering Specialist II, Office of Performance Assurance and Hema Ramamoorthi, Director of International Engagements, Fermilab were present at RRCAT to conduct

the meet. DAE QA team comprising of members from RRCAT, BARC and VECC attended the meeting offline at RRCAT. Sub-Project Managers and other system experts from Fermilab attended the meeting through video conferencing on Microsoft teams. Sub-Project Coordinators and other officials from DAE units working on the deliverables also attended the meeting online. Meeting was held from 18:30 to 20:30 hrs on both the days. During the day time Fermilab team visited various scientific laboratories/facilities of RRCAT involved in the activities related to deliverables under IIFC.



Participants attending the quality interaction meet

At the start of two-day meet, Shri Sanjay Chouksey, Overall Coordinator of DAE QA activity and Mr. Matthew Joseph Luedke from Fermilab gave a brief overview of the IIFC deliverables and explained the purpose of holding the interaction meeting. On the first day six presentations were made by QA team members from RRCAT/BARC/VECC. On the second day six presentation from DAE QA team members and one presentation by Fermilab expert were made. DAE team members gave presentations on topics such as QA/QC requirements of each deliverable item. It is to be noted here that composition of QA team is such that each participating units of DAE is checking QA requirements of deliverables executed by the other unit. Interactive discussions were made amongst the participants during the meet. The final talk was given by Mr. Matthew Joseph Luedke on the QA/QC Fermilab expectations, in which he covered the topics such as Non-conformance Handling, Document Handling, Quality Control Alignment Matrix, System Acceptance Review etc. Closing remarks were given by Shri Prashant Khare, Director, PAG and Matthew Joseph Luedke. They expressed satisfaction over the progress made regarding the Quality Assurance activities being under taken for IIFC activities. At the end of Quality meet, action items for DAE and Fermilab were summarized. Some of the major action items are as follows:

- Detailed Non-conformance process to be added to DAE QA plan
- Cavity shipping configuration to be clarified.
- Manufacturing inspection Plan for Amplifiers showing required tests at vendor to be finalized
- All Acceptance Check Lists to be completed and released by Fermilab

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