

INDIAN INSTITUTE OF TECHNOLOGY, ROORKEE
(Department of Mechanical and Industrial Engineering)

Dated: May 02, 2023

ADVERTISEMENT TO FILL UP PROJECT POSITIONS*

Applications are invited from Indian nationals only for project position(s) as per the details given below for the consultancy/research project(s) under the Principal investigator (**Prof. Indra Vir Singh**), Dept./Centre: **Department of Mechanical and Industrial Engineering, Indian Institute of Technology, Roorkee.**

1. Title of project: **Modelling of Creep and Rolled Joint Leak Tightness in Pressure Tubes**
2. Sponsor of the project: **Board of Research in Nuclear Sciences (BRNS), DAE, Mumbai**
3. Project position(s) and number: **JRF (02)**
4. Qualifications
 - (a) **ME/M.Tech in Mechanical Engg./Machine Design/Applied Mechanics/Aerospace Engg./Equivalent**
 - (b) **The candidate must be GATE qualified.**
5. Emoluments: **Rs. 31,000/month**
6. Duration: **18/04/2023 – 17/04/2026 (3 Years)**

7. Job description
The main aim of the project to develop an accurate FE framework based on elasto-plastic constitutive relation along with proper hardening model to estimate the residual stresses. The FE model will be validated with the stress distribution measured using XRD. This model will be extended to simulate the actual rolled joint between Zr-2.5%Nb pressure tube (PT) and end fitting (EF). The model will be used to predict the contact pressure and associated effect on the leak tightness in PT-EF rolled joint. The FE model developed for the PT-EF rolled joint will be used for a parametric study to find the residual stresses in PT with different parameters such as clearances between EF and PT and variability in the strength of the PT. A suitable creep model (considering thermal and irradiation creep rate) will be applied to the FEM model and change in contact pressure due to creep (reactor life) will be evaluated. The rolled joint leak tightness will be evaluated as a function of contact pressure as per the previously developed methodology. Leak tightness as a function of contact pressure will be predicted using a range of creep relaxation rates to capture the change in leak tightness with reactor life.

1. Candidates before appearing for the interview shall ensure that they are eligible for the position. Only the shortlisted candidates will be notified through email for interview.
2. Candidates should submit their applications with the following documents to the office of Principal Investigator through email as a **Single pdf** file in following order:
 - Application in a plain paper with detailed CV including chronological discipline of degree/certificates obtained.
 - Experience including research, industrial field and others.
 - Attested copies of degree/certificate and experience certificate.
3. Preference will be given to SC/ST candidates on equal qualifications and experience.
4. Interview will be held online through Webex or MS Teams.

Note: Selected candidate may get an opportunity to pursue PhD (Once project is over, he/she will be given MHRD fellowship as per Institute Policy)

The last date for application to be submitted by email to Principal Investigator is **May 24, 2023 by 5 PM.** The interview will be held online on **May 29, 2023.** The shortlisted candidates will be informed about the interview through email.

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*To be uploaded on IIT Roorkee website and copy may be sent to appropriate addresses by PI for wider circulation.

APPROVED
Abhishek 31/5/23
डीन (सिक)/(Dean SRIC)
भा. प्रौ. सं. रुड़की/IIT Roorkee
31/5/23

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