

Conceptual design of Neutron Activation System for IN-LLCB TBM

Wednesday, 24 October 2018 08:30 (4 hours)

Neutron Activation System (NAS) is the primary neutron diagnostics for Indian Lead-Lithium Ceramic Breeder (LLCB) Test Blanket Module (TBM) in ITER. The main objective of NAS is to measure spatial distribution of neutron flux and energy spectra and in-situ measurement of tritium production rate inside the TBM. These measurements will be utilized for validation of neutron transport tools (software codes) and tritium breeding predictions used for breeding blanket systems design.

NAS for LLCB TBM mainly consists of transfer station, capsule loader, transfer lines, foil gamma activity measurement system and irradiation ends. The irradiation of capsules consisting of foils is positioned inside the LLCB TBM at mid-plane location. The conceptual design of TBM along with NAS irradiation piping has been developed and its engineering design is in progress. All the components of NAS will be kept inside tritium building level L-2 of ITER building. The capsules are pneumatically transferred to irradiation end of piping located inside the TBM. After irradiation, the capsules are transferred back to counting station for foil activation measurement. This paper will present the conceptual design of NAS system along with preliminary engineering analysis and sequence of operations.

Country or International Organization

India

Paper Number

FIP/P3-28

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Session Classification: P3 Posters

Track Classification: FIP - Fusion Engineering, Integration and Power Plant Design