IFMIF availability oriented design

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The IFMIF project has the aim to provide a neutron source to test and qualify materials for the future fusion reactors. It is based on two high intensity (125 mA) 40 MeV CW deuteron accelerators. The deuterons collide with liquid lithium producing an intense neutron source that irradiates the materials in a test cell. As an irradiation facility, IFMIF is essentially a plant for the production of dpa (displacement per atom) in the corresponding materials at certain conditions. Therefore, availability metrics within IFMIF are directly linked to the production of radiation damage. Besides, a minimum level of such damage has to be accumulated in the materials timely for providing the data which are essential for the development of a demonstration fusion power reactor. Hence, achieving a minimum level of availability is key for IFMIF mission. In order to assure that such a complex facility design is in line with the availability requirement, a RAMI engineering process has been implemented into the project since the early stage. Several iterations, each including requirement definition and allocation, RAMI analysis and design revisions, have been developed.

This talk summarizes the experience of implementing this process during the last years, including the most representative examples of design evolution driven by availability, the main difficulties encountered along the way, as well as the future challenges.

This work is supported by the Spanish Ministry of Economy and Competitiveness.