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Simulation System for the Wendelstein 7-X Safety Control System

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The Wendelstein 7-X (W7-X) Safety Instrumented System (SIS) ensures personal safety and investment protection. The development and implementation of the SIS are based on the international safety standard for the process industry sector, IEC 61511. The SIS exhibits a distributed and hierarchical organized architecture consisting of a central Safety System (cSS) on the top and many local Safety Systems (ISS) at the bottom. Each technical component or diagnostic system potentially hazardous for the staff or for the device is equipped with an ISS. The cSS is part of the central control system of W7-X. Whereas the ISSs are responsible for the safety of each individual component, the cSS ensures safety of the whole W7-X device. For every operation phase of the W7-X experiment hard- and software updates for the SIS are mandatory. Finally, the safety programs of the central and local safety systems have to be verified for every development stage and validated against the safety requirement specification.

This contribution focuses on the application of a model based simulation system for the whole SIS of W7-X. A brief introduction into the development process of the SIS and its technical realization will be given followed by a description of the design and implementation of the SIS simulation system using the framework SIMIT (Siemens). Finally, first application experiences of this simulation system for the preparation of the SIS for the upcoming operation phase OP 1.2b of W7-X will be discussed.

Description

Simulation for Control

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Yes

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