

## Proposal of the Confinement Strategy for EU DEMO

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### - Summary slide -

Following the European roadmap to the realisation of fusion energy, an intense research activity has been started for a DEMONstration fusion power plant being in the pre-conceptual design phase until 2020. In this context, an external stakeholder group formulated a nuclear licensed manufacturing and construction (M/C) mission statement as the top level requirement for a DEMO, translating essentially to the confinement of radioactive and hazardous materials as the most fundamental safety function in normal, abnormal and accident situations. The confinement study for the European DEMO has been investigated for the main systems at the plant breakdown structure (PBS) level 1 taking a bottom-up approach. Consequently, a confinement strategy has been proposed, in which two confinement systems and three associated barriers have been defined. For maintenance two confinement systems containing one barrier in each confinement system has been proposed. The main safety systems and devices have also been proposed. The assignment of confinement barriers to the sources shows that not all sources are covered by both passive and active barriers. The confinement function is being identified for sub-systems and components accompanying the development of PBS levels in the EUROfusion safety program. The following open issues need to be resolved in priority from the confinement point of view:

- define inventories for all mobilisable radioactive sources;
- the provision of the helium expansion volume;
- provide discharge capability for the potentially huge amount of magnet energy in accident scenarios;
- select wall and composite liner options for the tokamak building taking into account cost implications;
- define leak rate conditions for the confinements;
- explore additional passive / active methods for confinement barriers;
- maintain confinement for different plant states (including cold and hot standby, and maintenance).

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