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## P2.174 Systems Engineering approach in support to the breeding blanket design

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Nowadays the Systems Engineering (SE) methodology is strongly applied in several fields of engineering such as Chemical and Process Industries, Civil and Enterprise application as well as Service and Healthcare systems. Furthermore, the SE represents a powerful interdisciplinary mean to enable the realisation of complex systems taking into account the customer and Stakeholder's needs by defining the main functions and the associated requirements.

Also in the fusion community, this theme is becoming increasingly pressing and the implementation of the SE approach, from the early stage of the fusion reactor design, is now a must. Indeed, within the framework of EUROfusion activities, the SE method has been selected for capturing the system and interface requirements and for their management and verification with particular focus to the Breeding Blanket (BB) System of the European Demonstration Fusion Power Reactor (DEMO).

Specifically, various levels of functions and requirements have been elicited and a sophistication of the BB SE model, set-up using the Systems Modeling Language (SysML), has been performed. Indeed, a dedicated BB SysML model is also an integrating part of the SE methodology in order to support architecture development and requirements trade-off studies.

This paper describes the advantages of applying a SE approach to the BB design considering, in particular, the BB requirement development and management and the definition of the interfaces between the BB and the major interconnected systems, including Remote Maintenance, Balance of Plant, Vacuum Vessel attachment, Heating and Current Drive and Fuelling Lines Systems.

An effective application of the SE technique to the pre-conceptual design phase of the BB is also provided in this paper. The obtained results are herewith reported and critically discussed.

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