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## P3.140 Assessment on DEMO Water Cooled Lithium Lead alternative design configuration

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One of the most critical components in the design of DEMO Power Plant is the Breeding Blanket (BB). Currently, four candidates are investigated as options for DEMO. One of these is the Water Coolant Lithium Lead (WCLL) Breeding Blanket (BB). During the previous years a conceptual design of WCLL BB has been developed. At the current state some open issues related to the manufacturability and design of the WCLL BB in 2016 configuration are still under evaluation. Since DEMO project is still in the pre-concept phase, the design team of WCLL BB decided to investigate, in parallel with the current studies, an alternative design of the WCLL BB internal structure, all that according to the Systems Engineering Approach. As such as in 2016 configuration, the alternative design is based on the single module approach. The main drivers in developing the alternative design consisted on reducing the complexity of the internal structure itself and increasing the performances of the single module in terms of neutron shielding, tritium self-sufficiency, heat extraction and transportation to the primary heat transfer system. All that, taking into account the lesson learned by the studies carried out in the last three years. In particular, the segment has been conceived as a box in which the lithium lead flows directly inside the module. The rear part of the module is entirely dedicated to the cooling water manifold. A first 3d model of the alternative design has been provided, structural analyses have been carried out to optimize the internal structure against an over pressurization scenario. The results and the optimized design of the alternative WCLL BB design are here presented and discussed.

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