



## Progress in the Concept Development of the VNS - A beam-driven Tokamak for Component Testing

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The volumetric neutron source (VNS) is a compact beam-driven tokamak with D-T plasma to generate a high neutron flux that will allow the testing and qualification of fusion nuclear components, in particular the breeding blanket. Recently, EUROfusion concluded a feasibility study that confirmed the principal feasibility of the machine and the plant for construction and operation. Also, aspects were identified that require further development and assessment, which have been key subjects of the conceptual design phase that has been on-going since.

This article summarizes the progress made in the design of VNS, including (i) the rationale for the minor modifications of major radius and aspect ratio, (ii) the configuration and performance of the plasma equilibrium coils, (iii) the design of the in-vessel components including their remote handling concepts, (iv) the concepts of the neutral beam and electron cyclotron heating systems, (v) integration concepts of the main plant systems in particular those of the tritium fuel cycle. In addition, the article provides an outlook on the expected operation plan and summarizes the potential of VNS for testing and qualifying the components and technologies required for a fusion power plant.

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