

2nd IAEA Technical Meeting on the Collisional-Radiative Properties of Tungsten and Hydrogen in Edge Plasma of Fusion Devices

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Overview of Thailand's Tokamak 1 Experimental Studies

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Thailand is one of the countries that recognizes the importance of fusion technology and has a national plan for its implementation. The Thailand Institute of Nuclear Technology (TINT) has been engaged in the development of a tokamak device known as Thailand Tokamak-1 (TT-1) since 2015. This device is derived from the HT-6M, a previous tokamak device developed by the Chinese Academy of Science (ASIPP) in China. The TT-1 tokamak is scheduled to be the inaugural fusion device to be installed at the Thailand Institute of Nuclear Technology (TINT), located at the Ongkharak location in Nakhonnayok province. The objective of the TT-1 is to provide researchers from Thailand and surrounding areas an opportunity to access a facility that facilitates scientific investigation of fusion technology and design. Additionally, it provides a platform for human resource training in plasma control, experimental planning, tokamak operation, and the conduct of fusion-related research. The TT-1 exhibits a compact form, characterized by a major radius (R) of 0.65 m and a minor radius (a) of 0.20 m. The plasma current (I_p), and the toroidal magnetic field strength (Bt) have the potential to be enhanced to values of 150 kA and 1.52 T, respectively. The main parts of the device were assembled at ASIPP before being shipped and installed at Thailand Institute of Nuclear Technology (TINT). In terms of hydrogen plasma discharge, it will be initiated with ohmic heating in the first phase of plasma operation, which is expected to start in 2024. In the next operating phase, the TT-1 will be equipped with the neutral beam injection (NBI) system in order to generate plasmas characterized by high temperatures and density. Based on the on-site discussion of the device design, the diagnostics that will be developed and installed as planned for the first phase are introduced in this paper. In addition, a schematic overview of the sites for installing the diagnostics is reported.

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