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ITR/P5-24: ITER Fuelling and Glow Discharge Cleaning System Overview

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The ITER Fuelling and Wall Conditioning System plays a key role in plasma operation. It consists of 4 major sub-systems: the Gas Injection System (GIS), Pellet Injection System (PIS), Disruption Mitigation System (DMS) and Glow Discharge Cleaning System (GDC). This paper describes the design status of these four systems and the challenges associated with each.

The ITER fuelling system is capable of delivering fuel particles (H₂, D₂ and T₂) at average and peak throughputs of 200 Pa•m³s⁻¹ and 400 Pa•m³s⁻¹ respectively in the form of gas or pellets, as well as impurities such as Ne, Ar and N₂ with average and peak throughputs of 10 Pa•m³s⁻¹ and 100 Pa•m³s⁻¹. The DMS injects particles (e.g. Ne and/or D₂) into the plasma preemptively or repetitively to mitigate thermal and electromagnetic loads onto the in-vessel components and to suppress runaway electrons. The GDC reduces and controls impurity (e.g. oxygen) and hydrogenic fuel out-gassing from plasma-facing components.

The GIS and GDC will be procured by the Chinese Domestic Agency (CN DA) and the PIS and DMS by the United States Domestic Agency (US DA).

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