

Hypothetical Operation Model for the Tokamak Exhaust Process System and Isotope Separation System of the Tritium Plant based on the Scheduling Approach

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We developed the Hypothetical Operation Model (HOM) for the Tokamak Exhaust Process (TEP) system and Isotope Separation System (ISS) of the tritium plant. In the tritium plant, control and estimation of trace amount of tritium is critical for the safety issues. Thus, the model determines timing, duration, and size of task of each system given the information of a cryopump regeneration schedule for each Tokamak operation mode. Also, the inventory level of each system is calculated. Inductive operation scenarios are presented to illustrate the applicability of the proposed model. The operation model is formulated as a Mixed Integer Linear Program (MILP) model base on the State Task Network (STN) representation.