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Pressure Drop Test for 5x5 Fuel Assembly

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The pressure loss of coolant by fuel assemblies affects on the reactor power performance. The pressure drop test is to predict and evaluate the pressure loss characteristics of fuel assembly in simulated hydraulic conditions with a 5x5 fuel assembly specimen.



< Pressure Drop Test Equipment >

Description

● Purpose and Necessity

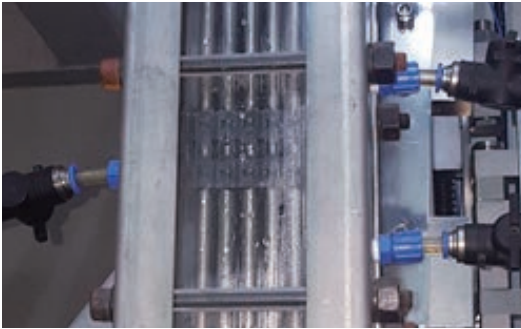
- The pressure drop test is needed to predict the hydraulic characteristics of spacer grids and to compare the relative hydraulic performance between fuel assemblies for a new design or modification.

● Test Method

- A partial fuel assembly is used as a test specimen.
- The pressure drop is measured in a specified span of the test specimen under simulated conditions including coolant flow rate, pressure, and temperature.

● Composition of Equipment

- The pressure drop tester consists of a test loop to provide simulated coolant conditions such as flow rate, pressure and temperature, and a control system to operate and control it with a computer program.
- **Test loop**
 - The test loop consists of a water tank and piping, a circulation pump and a test section, and the coolant temperature is maintained by heater and chiller.



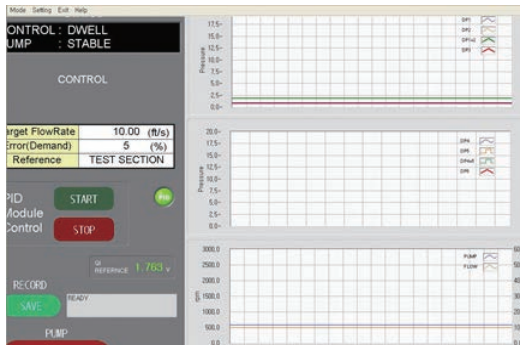
< Hydraulic Loop-1 >



< Hydraulic Loop-2 >



< Control System Equipment >



< Control System Configuration >

- The test section is to measure the pressure drop and the position of specimen, and it is made of transparent acrylic plates so that the test status can be checked.
- The pressure tap in the test section is connected to differential pressure meter to measure the pressure drop at each area.

• **Control System**

- The Control system monitors the signals of flow rate, temperature, and pressure in real time and controls the coolant flow rate.

● **Benefits**

- To predict the pressure drop characteristics of fuel assembly or spacer grid, and to obtain feedback for enhancing its hydraulic performance.

Experience

- To evaluate the pressure drop characteristics of spacer grid for new development or modification.

Distinctiveness

● **Characteristics**

- To measure and evaluate the amount of pressure difference of 5x5 fuel assembly specimen or spacer grid under controlled flow conditions.

Deliverables

- Pressure drop test report of 5x5 fuel assembly

Technology Readiness Level (TRL)

Component validation in relevant environment

Business Model

Technology Transfer

Licensing

Joint Search

Service Execution

Others