



# GE Nuclear Energy

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### REVISION STATUS SHEET

DOCUMENT TITLE IOP-10. UNIT ON-LINE FROM HOT STANDBY OR HOT SHUTDOWNLEGEND OR DESCRIPTION OF GROUPSTYPE: OPERATING PROCEDUREFMF: K 6 / 7MPL ITEM NO: A80-3020

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1.0 SCOPE/APPLICABILITY

This procedure provides the detailed instructions for proceeding from a Hot Standby or Hot Shutdown condition to a power level where turbine roll and generator synchronization can commence.

2.0 DISCUSSION

The plant conditions of Hot Standby and Hot Shutdown are defined as follows:

<u>Condition</u>	<u>Mode Switch Position</u>	<u>Average Reactor Coolant Temperature</u>
Hot Standby	STARTUP/HOT STANDBY	Any temperature
Hot Shutdown	SHUTDOWN	> 93 °C

This procedure outlines the steps required to take the reactor from a Hot Standby or Hot Shutdown mode as established per IOP-8, "Unit Off-Line to Hot Standby or Hot Shutdown", or IOP-9, "Maintaining Hot Standby or Hot Shutdown".

3.0 PRECAUTIONS AND LIMITATIONS

- 3.1 Reactor coolant system temperature[G33-TE-100] and pressure shall be determined to be within the applicable limits of Technical Specification Figure[ later ] at least once per 30 minutes during heatup and pressurization.
- 3.2 Maintain drywell pressure [B11-PIS-606 A,B,C,D] less than [ 0.06 kg/cm<sup>2</sup> ] in order to prevent inadvertent containment isolation and ECCS initiation.
- 3.3 Maintain drywell average temperature[to be defined later] less than [ 57 °C].



### 3.0 PRECAUTIONS AND LIMITATIONS(continued)

- 3.4 Reactor vessel level [C31-LT-N004A,B,C,D] should be maintained between 425.5 cm and 448.5 cm throughout plant heatup by rejecting water using the Low Flow Control Mode of the Feedwater Control System and the drain flow control valve in the Reactor Water Cleanup System. The rejection rate should be limited so that the CUW filter demineralizer inlet temperature does not exceed [49 °C].
- 3.5 Perform a rod coupling check when a rod is fully withdrawn. If a rod uncoupling annunciator is received, refer to [procedure for Control Rod Uncoupled].
- 3.6 Do not operate the mechanical vacuum pumps [identity, later] at reactor powers greater than [5] %.
- 3.7 Maintain the temperature differential between the core exit coolant (TE-later) and bottom head drain coolant [TE-later] less than [37 °C].
- 3.8 Do not increase reactor power or recirculation flow if temperature differential between steam dome and bottom head drain exceeds [37 °C].

### 4.0 PREREQUISITES

- 4.1 Prior to rolling the reactor feedpump turbine above turning gear speed, it must have been rotating on the turning gear for a minimum of [2] hours. Refer to SOP-[later], "Condensate and Feedwater System".
- 4.2 Prior to rolling the main turbine, it must be rotating on the turning gear for a minimum of [4] hours. Refer to SOP-[later], "Main Turbine System".
- 4.3 Plant conditions are as established per IOP-8, "Unit Off-Line to Hot Standby or Hot Shutdown", or IOP-9, "Maintaining Hot Standby or Hot Shutdown".



## 5.0 PROCEDURE

### 5.1 Unit On-Line from Hot Standby or Hot Shutdown (MSIVs Open)

- 5.1.1 If reactor is subcritical, withdraw control rods to bring the reactor to criticality and into the heating range [ SRNMS indication range later ] per applicable steps of IOP-1, "Approach to Criticality".
- 5.1.2 Establish and maintain a heatup rate of [specified later].
- 5.1.3 If necessary, place the Steam Seal Evaporator into service and shutdown the Auxiliary Boiler. Refer to SOP-[later], "Steam Seal Evaporator System".
- 5.1.4 Place the main SJAEs into service per SOP-[later], "Condenser Evacuation System". Verify that main condenser vacuum is maintained and shut down the startup SJAEs.
- 5.1.5 If RPV pressure exceeds 40 kg/cm<sup>2</sup>, place the motor-driven reactor feed pump into service per SOP-[later], "Condensate and Feedwater System".
- 5.1.6 Continue reactor heatup and pressurization per Subsection 5.7 of IOP-2, "Heatup and Pressurization".



5.2 Unit On-Line from Hot Shutdown ( Reactor Isolated)

- 5.2.1 Establish main condenser vacuum, if necessary, per Subsection 5.1 of IOP-1, "Approach to Criticality".
- 5.2.2 Establish feedwater flow to the reactor vessel as follows:
  - 5.2.2.1 Align the Condensate and Feedwater System provide makeup water to the reactor with and one HPCP in the Low Flow Control SOP-[later], "Feedwater Control System".
  - 5.2.2.2 After establishing makeup to the reactor vessel shutdown the RCIC System to Standby Readiness per SOP-E51, "Reactor Core Isolation Cooling System".
- 5.2.3 Open valve B21-151 to equalize pressure across the Open the outboard MSIVs and then open the inboard Operate the main steamline drain valves in accordance with Subsection 5.0 of SOP B21, "Nuclear Boiler System".
- 5.2.4 Withdraw control rods to bring the reactor to criticality and into the heating range [SRNMS indication range, later] per Subsection 5.2 of IOP-1, "Approach to Criticality".
- 5.2.5 Maintain a specified reactor heatup rate.
- 5.2.6 Commence warmup of a feedpump turbine per SOP-[later], "Condensate and Feedwater Control System".
- 5.2.7 Commence main turbine shell and chest warming per SOP-[later], "Main Turbine System", if necessary.
- 5.2.8 Start the Gland Seal Evaporator and transfer sealing steam from the Auxillary Boiler.
- 5.2.9 Place the main SJAEs into service per SOP-[later], "Main Condenser Evacuation System".
- 5.2.10 Verify that condenser vacuum is maintained with main SJAE operation and shut down the startup SJAEs.



5.2 Unit On-Line from Hot Shutdown ( Reactor Isolated)(continued)

- 5.2.11 At [40 kg/cm<sup>2</sup> ] reactor pressure, or above, start the motor-driven feedpump, and place it into service to control water level in the Low Flow Control Mode in accordance with SOP-C31, "Feedwater Control System".
- 5.2.12 If applicable, remove RHR from the Suppression Pool Cooling Mode when suppression pool temperature is less than [later], and place the system in standby readiness per SOP-E11, "Residual Heat Removal System".
- 5.2.13 Continue reactor startup per Step 5.7.3 of IOP-2, "Heatup and Pressurization".

**6.0 REFERENCES**

None.