

ACME NucPower Procedure		OPS-N-0003-A	
Title:	ACME NucPower Unit 1 Reactor Cool down		
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Review Date:	1 January 2025	Date Authorised:	1 January 2025
Associated Documents:	None		

Rev	Date	Author	Authorised By	Modification	Status
A	1 Jan 2025	R.J.Smith	J. Hancock	First draft	Draft

Summary

This procedure provides a step by step instruction for ACME NucPower Unit 1 Reactor cool down from Mode 3 condition (Hot Standby) until Mode 5 condition (Cold Shutdown) has been achieved. It shall be used as a reference each time this plant is started and a record kept of plant start up progress and any issues, events or error for future improvements.

The reactor has 5 operating modes as described below;

Mode 5 Cold shutdown - reactor is sub-critical with 0% power output and primary coolant average temperature < 95 degC.

Mode 4 Hot shutdown - reactor is sub-critical with 0% power output and primary coolant average temperature is > 95 degC and < 176 degC.

Mode 3 Hot standby - reactor is sub-critical with 0% power output and primary coolant average temperature > 176 degC.

Mode 2 Startup - reactor is critical with power output < 5%

Mode 1 Power operations - reactor is critical with power output > 5%

Reactor Cool Down procedure

1. SELECT Pressuriser heater controller (01JEF10AH002) to OFF.
2. Monitor primary circuit Pressure (01JKA10CP001) and Temperature (01JEC10/20/30/40CT001) as it slowly decreases.
3. STOP Reactor Coolant Pump (RCP) 3 (01JEB30AP001).
4. CLOSE SI isolation valves 01JNG60/70/80/90AA001 when primary circuit pressure (01JKA10CP001) is <140 but >125 bar.
5. STOP Reactor Coolant Pump (RCP) 4 (01JEB40AP001) when primary circuit pressure (01JKA10CP001) is < 100 bar.
6. STOP Reactor Coolant Pump (RCP) 2 (01JEB20AP001) when primary circuit pressure (01JKA10CP001) is < 60 bar.
7. START Residual Heat Removal pump (01JNA10AP001) when primary circuit pressure (01JKA10CP001) is < 30 bar.

8. STOP Reactor Coolant Pump (RCP) 1 (01JEB10AP001).
9. SELECT CVCS mode to FILL. This will increase the Pressuriser level to its Wet Storage level.
10. STOP Residual Heat Removal pump (01JNA10AP001) when primary circuit pressure (01JKA10CP001) is < 1 bar.
11. When Turbine Rotor temperature < 100 deg C.
 - STOP Turbine turning gear (01MAK10AH001). Turbine rotor speed will decrease to ZERO rpm.
 - STOP Auxiliary Lube Oil Pump (01MAV10AP001) when Turbine rotor is at standstill.
 - SELECT Lube Oil Heater (01MAV10AH001) to OFF.

Cold Shutdown (Mode 5) Achieved

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The sole purpose of this document is to provide a guide to the accompanying application.

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