PLANT SYSTEMS

CONDENSATE STORAGE TANK

LIMITING CONDITION FOR OPERATION

3.7.1.3 At least one condensate storage tank (CST) shall be OPERABLE with a minimum contained water volume of either:

a. 160,000 gallons in either 2T41A or 2T41B, or

b. A minimum of 267,000 gallons of water is available in condensate storage tank, T41B, when required for both units. A minimum of 160,000 gallons of water is available in T41B when only required for Unit 2.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

With the required condensate storage tank inoperable, within 4 hours either:

a. Restore at least one CST to OPERABLE status or be in HOT SHUTDOWN within the next 12 hours, or

b. Demonstrate the OPERABILITY of the service water system as a backup supply to the emergency feedwater pumps and restore at least one condensate storage tank to OPERABLE status within 7 days or be in HOT SHUTDOWN within the next 12 hours.

SURVEILLANCE REQUIREMENTS

4.7.1.3.1 The above required condensate storage tank shall be demonstrated OPERABLE at least once per 12 hours by verifying the contained water volume is within its limits when the tank is the supply source for the emergency feedwater pumps.

4.7.1.3.2 The service water system shall be demonstrated OPERABLE at least once per 12 hours by verifying that at least one service water loop is operating and that the service water system - emergency feedwater system isolation valves are either open or OPERABLE whenever the service water system is the supply source for the emergency feedwater pumps.

3/4.7.1.2 EMERGENCY FEEDWATER SYSTEM

The OPERABILITY of the emergency feedwater (EFW) system ensures that the Reactor Coolant System can be cooled down to Shutdown Cooling (SDC) entry conditions from normal operating conditions in the event of a total loss of off-site power.

The EFW system is designed to supply sufficient water to the steam generator(s) to remove decay heat with steam generator pressure at the setpoint of the MSSVs. Subsequently, the EFW system supplies sufficient water to cool the unit to SDC entry conditions, and steam is released through the ADVs.

SR 4.7.1.2.b.1 verifies that each EFW pump's developed head at the flow test point is greater than or equal to this required developed head. This test ensures that EFW pump performance has not degraded during the cycle. Flow and differential head are normal tests of pump performance required by Section XI of the ASME Code. Because it is undesirable to introduce cold EFW into the steam generators while they are operating, this testing is performed on recirculation flow. This test confirms one point that is indicative of pump overall performance. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. Performance of inservice testing, discussed in the ASME Code, Section XI, satisfies this requirement. The SR for the turbine driven EFW pump is allowed to be deferred for up to 24 hours after exceeding 700 psia in the steam generators. This allowance will ensure the test is completed within a reasonable period of time after establishing sufficient steam pressure to perform the test.

SR 4.7.1.2.c ensures that EFW can be delivered to the appropriate steam generator, in the event of any accident or transient that generates an EFAS signal. This is assured by demonstrating that each automatic valve in the flow path actuates to its correct position on an actual or simulated actuation signal. The 18 month frequency is based on the need to perform the SRs under the conditions that apply during a unit outage and the potential for an unplanned transient if the SRs were performed with the reactor at power.

SR 4.7.1.2.d ensures that the EFW System is properly aligned by verifying the flow path from the condensate storage tank (CST) to each steam generator prior to entering MODE 2 operation, after more than 30 days below MODE 3. OPERABILITY of the EFW flow paths must be verified before sufficient core heat is generated that would require the operation of the EFW System during a subsequent shutdown. The Frequency is reasonable, based on engineering judgment, and other administrative controls to ensure that flow paths remain OPERABLE. To further ensure EFW System alignment, the OPERABILITY of the flow paths is verified following extended outages to determine that no misalignment of valves has occurred. This SR ensures that the flow path from the CST to the steam generators is properly aligned.

3/4.7.1.3 CONDENSATE STORAGE TANK

The design of the ANO-2 condensate storage system includes two non-seismic condensate storage tanks (2T41A and 2T41B). In addition, ANO-2 is capable of being aligned to the seismically qualified condensate storage tank (T41B). Each of these tanks is designed to provide condensate-grade water to the suction of the emergency feedwater system (EFW) pumps. The service water system (SWS) provides the assured source of water for EFW.

The allowance to align to the non-safety, non-seismically-qualified condensate storage tanks (2T41A and 2T41B) has been retained for operational flexibility. The minimum volume for 2T41A/B is consistent with the original technical specification (TS) requirements. In the event of a failure of one of these tanks in conjunction with an emergency feedwater actuation, EFW pump suction will be automatically re-aligned to draw from the SWS. Should the EFW be aligned to the Unit 1 tank (T41B), the automatic suction re-alignment to SWS may be disabled. Therefore, the OPERABILITY requirements for the service water system - emergency feedwater system isolation valves listed in SR 4.7.1.3.2 do not include the automatic re-alignment to SWS capability when EFW is aligned to T41B.

The T41B condensate storage tank is seismically qualified and a portion of the tank is protected from tornado missiles. The protected volume of water in the tank can provide a source of EFW for both units for at least 30-minutes. Thirty minutes is adequate for the operators to manually switch the EFW suction alignment to the SWS, if required.

The TS volume requirements for the condensate storage tank are based on the EFW systems of both units being aligned to T41B simultaneously or only Unit 2 being aligned. The minimum TS volume requirements are sufficient to support several hours of cooling flow for both units. During this time, the need for EFW will be determined. Alignment to available water sources will be performed as necessary to ensure adequate heat removal is maintained. The LCO volume requirements are nominal values. In the conversion of the required volumes to indicated level, instrument uncertainty need not be applied.