DECAY TIME

LIMITING CONDITION FOR OPERATION

3.9.3 The reactor shall be subcritical for at least:

a. 100 hours

b. 148 hours

APPLICABILITY: Specification 3.9.3.a - From September 15 through June 15, during movement of irradiated fuel in the reactor pressure vessel.

Specification 3.9.3.b - From June 16 through September 14, during movement of irradiated fuel in the reactor pressure vessel

ACTION:

With the reactor subcritical for less than the required time, suspend all operations involving movement of irradiated fuel in the reactor pressure vessel. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.9.3 The reactor shall be determined to have been subcritical as required by verification of the date and time of subcriticality prior to movement of irradiated fuel in the reactor pressure vessel.

3/4.9.1 BORON CONCENTRATION

The limitations on reactivity conditions during REFUELING ensure that: 1) the reactor will remain subcritical during CORE ALTERATIONS, and 2) a uniform boron concentration is maintained for reactivity control in the water volume having direct access to the reactor vessel. These limitations are consistent with the initial conditions assumed for the boron dilution incident in the accident analyses. The value of 0.95 or less for K_{eff} includes a 1 percent delta k/k conservative allowance for uncertainties. Similarly, the boron concentration value of 2000 ppm or greater includes a conservative uncertainty allowance of 50 ppm boron. The boron concentration requirement of specification 3.9.1.b has been conservatively increased to 2400 ppm to agree with the minimum concentration of the RWST.

3/4.9.2 INSTRUMENTATION

The OPERABILITY of the source range neutron flux monitors ensures that redundant monitoring capability is available to detect changes in the reactivity condition of the core.

3/4.9.3 DECAY TIME

The minimum requirement for reactor subcriticality prior to movement of irradiated fuel assemblies in the reactor pressure vessel ensures that sufficient time has elapsed to allow the radioactive decay of the short lived fission products. The 100-hour decay time is consistent with the assumptions used in the fuel handling accident analyses and bounds the 148-hourdecay time.

The minimum requirement for reactor subcriticality also ensures that the decay time is consistent with that assumed in the spent fuel pool cooling analysis. Including specific dates for applicability supports the lake temperature assumptions. The 100-hour decay time is based on a lake temperature of 77.8°F, whereas the 148-hour decay time is based on a design basis lake temperature of 85°F. Lake temperature data from 1968 through 1998 show that the lake temperature was below 77°F from September 15 through June 15. This supports the temperature of 77.8°F that is assumed in the spent fuel pool cooling analysis. Use of thirty years of data to select maximum temperature is consistent with Regulatory Guide 1.27, "Ultimate Heat Sink for Nuclear Power Plants." Since core offload is a controlled evolution, applying a calendar time frame for applicability is acceptable.

A core offload has the potential to occur during both applicability time frames. The following guidance is provided to ensure the correct decay time is applied. For September outages, the date of initiation of core offload should be used to determine the required decay time. For June outages, 148 hours should be added to the date and time of reactor subcriticality. The resulting date should be used to determine the required decay time. This is to prevent initiating a core offload on June 15 after 100 hours and inadvertently continuing to offload on June 16 with the reactor having been subcritical less than 148 hours. In all other cases, the logged subcriticality date should be used to determine applicability.

3/4.9.4 CONTAINMENT BUILDING PENETRATIONS

The requirements on containment building penetration closure and OPERABILITY ensure that a release of radioactive material within containment will be restricted from leakage to the environment. The OPERABILITY and closure restrictions are sufficient to restrict radioactive material release from a fuel element rupture based upon the lack of containment pressurization potential while in the REFUELING MODE.

The specific guidelines to allow both airlock doors to remain open during CORE ALTERATIONS were developed to ensure that the assumptions for restricting radioactive leakage to the environment remained valid. The guidelines established for maintaining both airlock doors open include: 1) one door in each airlock is OPERABLE, 2) refueling cavity level is greater than 23 feet above the fuel, and 3) a designated individual is continuously available to close an

3/4.9.4 CONTAINMENT BUILDING PENETRATIONS (Continued)

airlock door (if required). An OPERABLE airlock door consists of a door capable of being closed and secured. Additionally, cables or hoses transversing the airlock must be designed in a manner that allows timely removal (e.g., quick disconnects). The requirement that the refueling cavity level is greater than 23 feet above the fuel ensures consistency with the assumptions of Specifications 3/4.9.10 and 3/4.9.11.

Containment penetrations that provide direct access from containment atmosphere to the outside atmosphere must be isolated on at least one side. Isolation may be achieved bv an OPERABLE automatic isolation valve, or by a manual isolation valve, blind flange, or equivalent. Equivalent isolation methods must be approved in accordance with plant procedures and may include use of a material that can provide a temporary, atmospheric pressure, ventilation barrier during fuel movements.

The LCO is modified by a Note allowing penetration flow paths with direct access from the containment atmosphere to the outside atmosphere via the auxiliary building vent to be unisolated under administrative controls. Administrative controls ensure that 1) appropriate personnel are aware of the open status of the penetration flow path during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment, and 2) specified individuals are designated and readily available to isolate the flow path in the event of a fuel handling accident.

3/4.9.5 COMMUNICATIONS

The requirement for communications capability ensures that refueling station personnel can be promptly informed of significant changes in the facility status or core reactivity conditions during CORE ALTERATIONS.