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Waterford 3

W3F1-2003-0002
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PR

January 15, 2003

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Subject: Waterford 3 SES
Docket No. 50-382
License No. NPF-38
Technical Specification Bases Update to the NRC for the Period October 1, 2002 through January 7, 2003

Gentlemen:

Pursuant to Waterford Steam Electric Station Unit 3 Technical Specification 6.16, Entergy Operations, Inc. (EOI) hereby submits an update of all changes made to Waterford 3 Technical Specification Bases since the last submittal per letter W3F1-2002-0090, dated October 14, 2002. This TS Bases update is well within the update frequency listed in 10 CFR 50.71(e).

There are no commitments associated with this submittal. Should you have any questions or comments concerning this submittal, please contact Ron Williams at (504) 739-6255.

Very truly yours,

for K. Peters
K.J. Peters
Director, Nuclear Safety Assurance

KJP/RLW/cbh

Attachment Waterford 3 Technical Specification Bases Revised Pages

cc: E.W. Merschoff (NRC Region IV), N. Kalyanam (NRC-NRR), J. Smith, N.S. Reynolds, NRC Resident Inspectors Office

A001

ATTACHMENT 1
TO W3F1-2003-0002

Waterford 3 Technical Specification Bases Revised Pages

T.S. Bases Change No.	Implement Date	Affected TS Bases Pages	Topic of Change
15	11/21/02	B 3/4 7-3b New page B 3/4 7-3c New page B 3/4 7-3d	Relocated TRM 3/4.7.1.6.2 and 3/4.7.1.6.3 and associated TRM Bases on credited non-safety related support systems Reactor Trip Override and Auxiliary Feedwater Pump High Discharge Pressure Trip for MFIV operability to the TS Bases section 3/4.7.1.6, Main Feedwater Isolation Valves. This TS Bases change was implemented by ER-W3-2002-0587.
16	12/30/02 Reissued correction on 1/7/03	B 3/4 5-1d B 3/4 5-2	The change to TS Bases section 3/4.5.2 incorporated design basis information on LPSI Train "A" that states the piping has been qualified for voids up to 0.7cu ft. Therefore, LPSI Train "A" will be considered operable and full of water with these size voids in each of the discharge legs. This TS Bases change was implemented by ER-W3-2002-0468.
17	12/23/02 Reissued correction on 1/7/03	B 3/4 6-2	The change to TS Bases sections 3/4.6.1.5 incorporated a statement to acknolwledge that the 120 Deg Containment air temperature limit in the TS should not be used directly as it does not accommodate required instrument uncertainty. This TS Bases change was implemented by ER-W3-2002-0513.

TECHNICAL SPECIFICATION BASES
CHANGE NO. 15 REPLACEMENT PAGES
(3 pages)

Replace the following pages of the Waterford 3 Technical Specification Bases with the attached pages. The revised pages are identified by Change Number 15 and contain the appropriate DRN number and a vertical line indicating the areas of change.

Remove	**Insert**
B 3/4 7-3b	B 3/4 7-3b
	B 3/4 7-3c
	B 3/4 7-3d

3/4.7.1.6 MAIN FEEDWATER ISOLATION VALVES (con't)

The TS is annotated with a 3.0.4 exemption, allowing entry into the applicable MODES to be made with an inoperable MFIV closed or isolated as required by the ACTIONS. The ACTIONS allow separate condition entry for each valve by using "With one or more MFIV...". This prevents immediate entry into TS 3.0.3 if both MFIVs are declared inoperable.

The Surveillance Requirement to verify isolation in less than or equal to 5 seconds is based on the time assumed in the accident and containment analyses. The static test demonstrates the ability of the MFIVs to close in less than or equal to 5 seconds under design basis accident conditions. The MFIVs should not be tested at power since even a partial stroke exercise increases the risk of a valve closure with the plant generating power and would create added cyclic stresses. The Surveillance to verify each MFIV can close on an actual or simulated actuation signal is normally performed when the plant is returning to operation following a refueling outage. Verification of valve closure on an actuation signal is not required until entry into Mode 3 consistent with TS 3.3.2. The 18 month frequency is based on the refueling cycle. Verification of closure time is performed per TS 4.0.5. This frequency is acceptable from a reliability standpoint and is in accordance with the Inservice Testing Program.

→(DRN 02-1684)

Credited Non-Safety Related Support Systems for MFIV Operability

Reactor Trip Override (RTO) and the Auxiliary Feedwater (AFW) Pump High Discharge Pressure Trip (HDPT) are credited for rapid closure of the Main Feedwater Isolation Valves (MFIVs) during main steam and feedwater line breaks. Crediting of these non-safety features was submitted to the NRC as a USQ and approved. (Reference letter dated September 5, 2000 from the NRC to Charles M. Dugger, "Waterford 3 Steam Electric Station, Unit 3 - Issuance of Amendment RE: Addition of Main Feedwater Ioslation Valves to Technical Specifications and Request for NRC Staff Review of an Unreviewed Safety Question.")

The feature of RTO that is credited for MFIV closure is the rapid SGFP speed reduction upon reactor trip initiation. This feature reduces the differential pressure across the valve disc at closure, thus allowing rapid valve closure. Therefore, the RTO feature must be able to decrease SGFP speed to minimum on a reactor trip during SGFP operation for OPERABILITY of the MFIVs.

The AFW Pump HDPT reduces the differential pressure across the valve disc at closure during AFW Pump operation. Therefore, this feature must be functional during AFW Pump operation for OPERABILITY of the MFIVs. When the AFW pump is not running, this trip is not required.

In MODES 1, 2, 3, and 4, the MFIVs are required to be OPERABLE. Because the MFIVs are required to be OPERABLE in MODES 1, 2, 3, and 4, RTO must be able to decrease SGFP

←(DRN 02-1684)

3/4.7.1.6 MAIN FEEDWATER ISOLATION VALVES (con't)

→(DRN 02-1684)

speed to minimum on a reactor trip and the AFW Pump HDPT must be functional, to support closure of the valve. If RTO is unable to decrease running SGFP(s) speed to minimum on a reactor trip with the SGFPs running, both MFIVs must be declared INOPERABLE, and Technical Specification 3.7.1.6 must be entered. If the AFW Pump HDPT is non-functional with the AFW pump running, the AFW pump should be secured immediately or both MFIVs must be declared INOPERABLE, and Technical Specification 3.7.1.6 must be entered.

RTO and AFW Pump HDPT Test Requirements

The RTO and AFW pump high pressure trip are subjected to a testing program similar to comparable safety related instrumentation to provide assurance of the reliability of these non-safety related functions credited to support the MFIV safety related closure function.

The testing requirements for the RTO credited function should demonstrate the ability of RTO to reduce SGFP speed upon an actual or simulated actuation signal. The test requirements do not require timing the response because in the limiting FWLB scenario, RTO is required for compliance with a 5 second Technical Specification closure; however, the containment analyses allow longer closure times during this event. Even if RTO were to fail, the MFIV would eventually close as the pressure across the valve equalizes to the available actuator thrust, the nitrogen pressure equalizes, and finally as the SGFP speed reduces due to a loss of steam after the MSIV closes. The expected maximum closure time would be less than one minute due to SGFP speed decrease. This phenomenon would act to close the valve within the appropriate time to preserve the safety function. The RTO feature should not be tested at power since it increases the risk of a feedwater transient with the plant generating power, but should normally be performed when the plant is returning to operation following a refueling outage. The testing criteria shall verify functionality of the RTO system, with SGFP pump response, by verifying that the feedwater control system sends the control signal corresponding to minimum speed to the pump upon an actual or simulated RTO signal at least once per 18 months. The functionality of the RTO system shall be verified through the performance of Instrumentation & Controls functional test procedure, "Functional Test of Reactor Trip Override, High Level Override, and Level Channel Deviation FWCS." The 18 month frequency is based on the refueling cycle, similar to testing performed per TS 4.0.5. This frequency is acceptable from a reliability standpoint.

The testing requirements for the AFW Pump HDPT should demonstrate the ability of the pump to trip upon receiving an actual or simulated high pressure signal. The AFW Pump HPDT feature can be tested at power since the AFW pump is not required during normal operations, however, the test is normally performed when the plant is returning to operation following a refueling outage. The testing criteria shall verify functionality of the AFW Pump HDPT by (1) verifying pump trip on an actual or simulated actuation signal at least once per 18 months and (2) verifying that the delay time of Relay AFWEREL 1419-3, the most time critical element of

←(DRN 02-1684)

3/4.7.1.6 MAIN FEEDWATER ISOLATION VALVES (con't)

→(DRN 02-1684)

the trip circuitry, is less than the setpoint specified in the Component Database plus the specified tolerance at least once per 18 months. The AFW pump trip shall be verified through the performance of Operations surveillance test procedure, "AFW High Discharge Pressure Trip Test." The relay delay time shall be verified through the performance of an Electrical Maintenance task document for relay AFWEREL 1419. The 18 month frequency is based on the refueling cycle, similar to testing performed per TS 4.0.5. This frequency is acceptable from a reliability standpoint to detect degradation.

←(DRN 02-1684)

3/4.7 2 STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION

The limitation on steam generator secondary pressure and temperature ensures that the pressure induced stresses in the steam generators do not exceed the maximum allowable fracture toughness stress limits. The limitation to 115°F and 210 psig is based on a steam generator RTNDT of 40°F and is sufficient to prevent brittle fracture. Below this temperature of 115°F the system pressure must be limited to a maximum of 20% of the secondary hydrostatic test pressure of 1375 psia (corrected for instrument error). Should steam generator temperature drop below 115°F an engineering evaluation of the effects of the overpressurization is required. However, to reduce the potential for brittle failure the steam generator temperature may be increased to a limit of 200°F while performing the evaluation. The limitations on the primary side of the steam generator are bounded by the restrictions on the reactor coolant system in Specification 3 4.8.1.

3/4.7.3 COMPONENT COOLING WATER AND AUXILIARY COMPONENT COOLING WATER SYSTEMS

The OPERABILITY of the component cooling water system and its corresponding auxiliary component cooling water system ensures that sufficient cooling capacity is available for continued operation of safety-related equipment during normal and accident conditions. The redundant cooling capacity of these systems, assuming a single failure, is consistent with the assumptions used in the safety analyses.

TECHNICAL SPECIFICATION BASES
CHANGE NO. 16 CORRECTION
REPLACEMENT PAGE(S)
(2 pages)

Replace the following pages of the Waterford 3 Technical Specification Bases with the attached pages. The revised pages are identified by Change Number 16 and contain the appropriate DRN number and a vertical line indicating the areas of change.

Remove	**Insert**
B 3/4 5-1d	B 3/4 5-1d
B 3/4 5-2	B 3/4 5-2

ECCS SUBSYSTEMS (Continued)

When in mode 3 and with RCS temperature greater than or equal to 500°F two OPERABLE ECCS subsystems are required to ensure sufficient emergency core cooling capability is available to prevent the core from becoming critical during an uncontrolled cooldown (i.e., a steam line break) from greater than 500°F.

With the RCS temperature below 500°F and the RCS pressure below 1750 psia, one OPERABLE ECCS subsystem is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the limited core cooling requirements.

The trisodium phosphate dodecahydrate (TSP) stored in dissolving baskets located in the containment basement is provided to minimize the possibility of corrosion cracking of certain metal components during operation of the ECCS following a LOCA. The TSP provides this protection by dissolving in the sump water and causing its final pH to be raised to greater than or equal to 7.0. The requirement to dissolve a representative sample of TSP in a sample of water borated to be representative of post-LOCA sump conditions provides assurance that the stored TSP will dissolve in borated water at the postulated post-LOCA temperatures. A boron concentration of 3011 ppm boron is postulated to be representative of the highest post-LOCA sump boron concentration. Post LOCA sump pH will remain between 7.0 and 8.1 for the maximum (3011 ppm) and minimum (1504 ppm) boron concentrations calculated using the maximum and minimum post-LOCA sump volumes and conservatively assumed maximum and minimum source boron concentrations.

→ (DRN 02-1635)

With the exception of systems in operation, the ECCS pumps are normally in a standby, nonoperating mode. As such, flow path piping has the potential to develop voids and pockets of entrained gases. Maintaining the piping from the ECCS pumps to the RCS full of water ensures that the system will perform properly, injecting its full capacity into the RCS upon demand. This will prevent water hammer, pump cavitation, and pumping noncondensible gas (e.g., air, nitrogen, or hydrogen) into the reactor vessel following an SIAS or during SDC. The LPSI train "A" system has been evaluated for voids up to 0.7 ft^3 in each leg of the discharge piping. The piping system has been qualified for the hydraulic transient. In addition, the reactor has been qualified for an intrusion of a small gas bubble. Therefore, from a design basis standpoint, for injection capacity and prevention of water hammer, pump cavitation, and pumping noncondensible gas the LPSI train "A" will be considered operable and full of water with the existence of up to 0.7 ft^3 in each of the discharge legs. The 31 day frequency takes into consideration the gradual nature of gas accumulation in the ECCS piping and the adequacy of the procedural controls governing system operation.

← (DRN 02-1635)

ECCS SUBSYSTEMS (Continued)

The Surveillance Requirements provided to ensure OPERABILITY of each component ensure that at a minimum, the assumptions used in the safety analyses are met and that subsystem OPERABILITY is maintained. Surveillance Requirements for throttle valve position stops and flow balance testing provide assurance that proper ECCS flows will be maintained in the event of a LOCA. Maintenance of proper flow resistance and pressure drop in the piping system to each injection point is necessary to: (1) prevent total pump flow from exceeding runout conditions when the system is in its minimum resistance configuration, (2) provide the proper flow split between injection points in accordance with the assumptions used in the ECCS-LOCA analyses, and (3) provide an acceptable level of total ECCS flow to all injection points equal to or above that assumed in the ECCS-LOCA analyses.

The requirement to verify the minimum pump differential pressure on recirculation flow ensures that the pump performance curve has not degraded below that used to show that the pump exceeds the design flow condition assumed in the safety analysis and is consistent with the requirements of ASME Section XI.

TECHNICAL SPECIFICATION BASES
CHANGE NO. 17 CORRECTION
REPLACEMENT PAGE(S)
(1 page)

Replace the following pages of the Waterford 3 Technical Specification Bases with the attached page. The revised pages are identified by Change Number 17 and contain the appropriate DRN number and a vertical line indicating the areas of change.

Remove	**Insert**
B 3/4 6-2	B 3/4 6-2

3/4 6.1.4 INTERNAL PRESSURE

The limitations on containment internal pressure ensure that (1) the containment structure is prevented from exceeding its design negative pressure differential with respect to the annulus atmosphere of 0.65 psid, (2) the containment peak pressure does not exceed the design pressure of 44 psig during either LOCA or steam line break conditions, and (3) the minimum pressure of the ECCS performance analysis (BTP CSB 61) is satisfied.

The limit of +27 inches water (approximately 1.0 psig) for initial positive containment pressure is consistent with the limiting containment pressure and temperature response analyses inputs and assumptions.

The limit of 14.275 psia for initial negative containment pressure ensures that the minimum containment pressure is consistent with the ECCS performance analysis ensuring core reflood under LOCA conditions, thus ensuring peak cladding temperature and cladding oxidation remain within limits. The 14.275 psia limit also ensures the containment pressure will not exceed the containment design negative pressure differential with respect to the annulus atmosphere in the event of an inadvertent actuation of the containment spray system.

3/4.6.1.5 AIR TEMPERATURE

The limit of 120°F on high average containment temperature is consistent with the limiting containment pressure and temperature response analyses inputs and assumptions. The limits currently adopted by Waterford 3 are 269.3°F during LOCA conditions and 413.5°F during MSLB conditions.

→ (DRN 02-1904)
The 120°F maximum value specified in the TS is the value used in the accident analysis and does not contain any allowance for temperature measurement instrument uncertainty. Instrument uncertainty is addressed in the surveillance procedure.
← (DRN 02-1904)

3/4 6 1 6 CONTAINMENT VESSEL STRUCTURAL INTEGRITY

This limitation ensures that the structural integrity of the containment steel vessel will be maintained comparable to the original design standards for the life of the facility. Structural integrity is required to ensure that the containment vessel will withstand the maximum pressure resulting from the design basis LOCA and main steam line break accident. A visual inspection in conjunction with Type A leakage test is sufficient to demonstrate this capability.

3/4 6 1.7 CONTAINMENT VENTILATION SYSTEM

The use of the containment purge valves is restricted to 90 hours per year in accordance with Standard Review Plan 6.2.4 for plants with the Safety Evaluation Report for the Construction License issued prior to July 1, 1975. The purge valves have been modified to limit the opening to approximately 52° to ensure the valves will close during a LOCA or MSLB;and therefore, the SITE BOUNDARY doses are maintained within the guidelines of 10 CFR Part 100. The purge valves, as modified, comply with all provisions of BTP CSB 6-4 except for the recommended size of the purge line for systems to be used during plant operation.