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Waterford 3

W3F1-2002-0005
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PR

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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 September 1, 2001 Through January 15, 2002

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 W3F1-2001-0083, dated September 4, 2001. This TS Bases update is consistent with the update frequency listed in 10 CFR 50.71(e).

This letter does not contain any commitments. Should you have any questions or comments concerning this submittal, please contact Ron Williams at (504) 739-6255.

Very truly yours,

Robert D Peter for
A.J. Harris
Director
Nuclear Safety Assurance

AJH/RLW/ssf
Attachment Waterford 3 Technical Specification Bases Revised Pages

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

A001

ATTACHMENT 1
TO W3F1-2002-0005

Waterford 3 Technical Specification Bases Revised Pages

T.S. Bases Change No.	Implement Date	Affected TS Bases Pages	Topic of Change
Bases Change No. 7	11/8/01	B 3/4 7-2, B 3/4 7-2a, and the following new pages B 3/4 7-2b, B 3/4 7-2c, B 3/4 7-2d, B 3/4 7-2e, and B 3/4 7-2f	Implemented concurrently with TS Amendment 173 to clarify TS 3.7.1.2 expanded LCO ACTION STATEMENTS, which addressed various combinations of inoperable EFW System equipment, and changes to TS 4.7.1.2 surveillance requirements.
Bases Change No. 8	12/6/01	B 3/4 6-2	Implemented concurrently with TS Amendment 174 to reflect the reduction in the allowable containment internal pressure lower limit contained in TS 3.6.1.4.
Bases Change No. 9	12/20/01	B 3/4 3-1c	Implemented concurrently with TS Amendment 175 to reflect changes in TS definitions 1.12 and 1.25. Amendment allowed either an allocated or a measured response time to be utilized for specified sensors in the Reactor Protective System and Engineered Safety Features Actuation System instrument loops per Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements."

TS BASES CHANGE NO. 7 REPLACEMENT PAGES

(7 pages)

Replace the following pages of the Waterford 3 Technical Specifications Bases with the attached pages. These changes are being made to the Bases concurrent with the implementation of TS Amendment 173. The revised pages are identified by Change No. 7 and contain vertical lines indicating the areas of change.

Remove	Insert
B 3/4 7-2	B 3/4 7-2
B 3/4 7-2a	B 3/4 7-2a
----------	B 3/4 7-2b
----------	B 3/4 7-2c
----------	B 3/4 7-2d
----------	B 3/4 7-2e
----------	B 3/4 7-2f

3/4.7.1.2 EMERGENCY FEEDWATER SYSTEM

The OPERABILITY of the emergency feedwater (EFW) system ensures the Reactor Coolant System (RCS) can be cooled down to shutdown cooling (SDC) system entry conditions from normal operating conditions.

The EFW system consists of two (50% capacity) motor-driven pumps (A and B), one (100% capacity) steam turbine-driven pump (AB) and two diverse flow paths. One flow path supplies steam generator #1 and the second flow path supplies steam generator #2. A flow path consists of the piping, valves and components from the common pump discharge header through two parallel legs to the respective steam generator. Each parallel leg contains an isolation valve and a flow control valve. One flow path supplying one steam generator is capable of cooling the unit to SDC entry conditions. Either of the two parallel legs in a steam generator flow path is capable of supplying 100% of the flow required for the heat removal safety function. Both parallel legs in a flow path are required for OPERABILITY of a flow path. Two independent suction paths exist between the Condensate Storage Pool (CSP) and the EFW common pump suction header. Each suction path alone can supply enough flow to assure sufficient net positive suction head for all three EFW pumps. Both suction paths from the CSP are required for EFW system OPERABILITY. Both steam supplies are required for OPERABILITY of the turbine-driven EFW pump. The turbine-driven EFW pump with one OPERABLE steam supply is considered to be able to supply 100% OPERABLE pumping capacity. A turbine-driven EFW pump inoperable for other reasons is considered to supply 0% capacity. Inoperable motor-driven EFW pumps are considered to supply 0% capacity.

The accident analysis requires an EFW flow of 575 gpm be delivered to the intact steam generator at a pressure of 1102 psig (lowest main steam safety valve set pressure plus 3%) within the time required by TRM Table 3.3-5. The two motor-driven EFW pumps combined are capable of delivering 575 gpm at a pressure of 1102 psig to the entrance of the steam generators and the turbine-driven EFW pump is capable of delivering 575 gpm at a pressure of 1102 psig to the entrance of the steam generators. The EFW system is operated whenever an EFAS is generated or the system is manually actuated, during surveillance testing, and infrequently during shutdown conditions to fill the steam generators.

The flow control and isolation valves in the parallel flow legs are fail open pneumatic valves. Safety-related nitrogen accumulators serve as a backup to the instrument air system for these pneumatic valves. Each nitrogen accumulator supplies a pair of EFW valves (one flow control valve and one isolation valve in separate parallel flow legs to the same steam generator). With a nitrogen accumulator inoperable, for example, the associated flow path would be considered inoperable (but still capable of delivering 100% of the required EFW flow) and therefore ACTION "d" would be implemented and would provide an allowed outage time of

3/4.7.1.2 EMERGENCY FEEDWATER SYSTEM (Continued)

Limiting Conditions for Operation

72 hours for this condition. Specification 3.6.3 would also be implemented for the affected isolation valve. ACTION "d" would also apply if both flow paths were inoperable but capable of delivering 100% of the required EFW flow to their respective steam generator.

The LCO requires three EFW pumps and two flow paths be OPERABLE to ensure the EFW system will perform the design safety function to mitigate the consequences of accidents that could result in overpressurization of the reactor coolant system pressure boundary. Three independent EFW pumps, utilizing two flow paths, ensure availability of residual heat removal capability for all events. This is accomplished by powering two pumps from independent emergency busses. The third EFW pump is powered by a steam-driven turbine supplied with steam from a source not isolated by the closure of the MSIVs.

ACTIONs

a. If one of the two steam supplies to the turbine-driven EFW pump steam turbine is inoperable, action must be taken to restore OPERABLE status within 7 days. The 7 day completion time is reasonable based on the redundant OPERABLE steam supply to the turbine-driven EFW pump steam turbine, the availability of redundant OPERABLE motor-driven EFW pumps, two OPERABLE flow paths, and the low probability of an event requiring the inoperable steam supply to the turbine-driven EFW pump.

b. ACTION (b) addresses the situation when a steam supply for the turbine-driven EFW pump steam turbine is inoperable concurrent with one motor-driven EFW pump being inoperable provided the flow paths are able to deliver at least 100% flow to their respective steam generators. One of the primary bases for allowing a 7 day completion time for an inoperable steam supply for the turbine-driven EFW pump steam turbine is the operability of both motor-driven EFW pumps. While in this ACTION the EFW system is able to support a cooldown of the RCS to SDC entry conditions but may not be able to mitigate a main steam line break or feedwater line break accident. Due to the seriousness of this condition the completion time will be limited to 24 hours when a steam supply for the turbine-driven EFW pump steam turbine is inoperable concurrent with one motor-driven EFW pump being inoperable. The 24 hour completion time is reasonable based on the redundant OPERABLE steam supply to the turbine-driven EFW pump steam turbine, an OPERABLE motor-driven pump, and the low probability of an event requiring the inoperable steam supply to the turbine-driven EFW pump.

3/4.7.1.2 EMERGENCY FEEDWATER SYSTEM (Continued)

Limiting Conditions for Operation (Continued)

c. ACTION (c) addresses the situation when a steam supply for the turbine-driven EFW pump steam turbine is inoperable concurrent with both motor-driven EFW pumps being inoperable provided the flow paths are able to deliver at least 100% flow to their respective steam generators. Due to the seriousness of this condition, the ACTION requires the unit be placed in HOT STANDBY in 6 hours and in HOT SHUTDOWN within the following 6 hours.

d. By maintaining OPERABLE pumping capacity capable of delivering 100% of the required EFW flow and flow paths capable of delivering 100% of the required EFW flow to either (i.e., their respective) steam generator the EFW system is capable of performing its design function of residual heat removal for all events assuming no single active failure. While discussed separately below, this ACTION addresses concurrent pump and flow path inoperabilities.

With the EFW pumps inoperable for reasons other than those described in ACTION (a), (b), or (c), action must be taken to restore OPERABLE status within 72 hours. This condition includes:

- An inoperable turbine-driven EFW pump including the loss of both steam supplies, or
- one or two inoperable motor-driven EFW pumps,

With one or both flow paths inoperable, but each still capable of delivering 100% of the required EFW flow to either (i.e., their respective) steam generator, action must be taken to restore the flow path(s) to OPERABLE status within 72 hours. This condition includes:

- an inoperable valve not capable of opening (e.g., flow isolation valve required to be gagged closed to comply with Technical Specification 3.6.3) in one flow leg of one or both flow paths, or
- the loss of one train of DC power to the valves in one or both flow paths, or
- the loss of a single nitrogen accumulator in one or both flow paths, or
- any combination of inoperable valves in one or both flow paths provided that the valves in at least one flow leg of each flow path can open to deliver 100% flow and one valve in that flow leg remains OPERABLE to prevent steam generator overfill.

ACTION "d" would also be entered for an inoperable suction path from the CSP to the common pump suction header or for one steam supply inoperable concurrent with inoperable flow paths able to deliver 100% flow to their respective steam generators.

3/4.7.1.2 EMERGENCY FEEDWATER SYSTEM (Continued)

Limiting Conditions for Operation (Continued)

The 72 hour completion time is reasonable based on the redundant capabilities afforded by the EFW system, the time needed for repairs, and the low probability of a design basis event occurring during this period.

e. By maintaining OPERABLE pumping capacity capable of supplying 100% of the required EFW flow and flow paths capable of delivering 100% of the required EFW flow to the steam generators the EFW system is capable of supporting a unit cooldown but may not be capable of performing its design function of residual heat removal for all events. Due to the seriousness of this condition, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 4 within the following 6 hours. The allowed completion time is reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

This ACTION primarily addresses flow path inoperability when the system no longer has the ability to deliver 100% of the required EFW flow to one or both steam generators. For example, with one flow path inoperable and not able to provide 100% flow to its respective steam generator this ACTION would be entered. Similarly, if both flow paths were inoperable and only one of the inoperable flow paths could provide 100% of the required EFW flow to its respective steam generator this ACTION would be entered. Also, if both flow paths were inoperable and neither could provide 100% of the required EFW flow to its respective steam generator but together both flow paths could provide 100% of the required EFW flow to the steam generators (e.g., 50% to one and 50% to the other (or some combination equaling 100%)) this ACTION would be entered.

f. ACTION (f) indicates that all required MODE changes or power reductions are suspended until the EFW system is capable of delivering 100% of the required EFW flow to the steam generators.

With pumping capacity unable to supply 100% of the required EFW flow and/or two flow paths not capable of delivering 100% of the required EFW flow to the steam generators in MODEs 1, 2, and 3, the unit is in a seriously degraded condition with no safety-related means for conducting a cooldown. In such a condition, the unit should not be perturbed by any action, including a power change that might result in a trip. The seriousness of this condition requires that action be started immediately to restore the ability to deliver at least 100% of the required EFW flow to the steam generators combined as soon as possible. This ACTION is modified to indicate that all MODE changes or power reductions are suspended until the ability to deliver 100% of the required flow to the steam generators combined can be restored because they could force the unit into a less than safe condition.

3/4.7.1.2 EMERGENCY FEEDWATER SYSTEM (Continued)

Surveillance Requirements

a. Verifying the correct alignment for manual, power operated, and automatic valves in the EFW water and steam supply flow paths provides assurance that the proper flow paths exist for EFW operation. This Surveillance Requirement (SR) does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves are verified to be in the correct position prior to locking, sealing, or securing. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position.

b. The SR to verify pump OPERABILITY pursuant to Specification 4.0.5 ensures that the requirements of ASME Code Section XI are met and provides reasonable assurance that the pumps are capable of satisfying the design basis accident flow requirements. Because it is undesirable to introduce cold EFW into the steam generators while they are operating, testing is typically performed on recirculation flow. Such in-service tests confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance.

   This SR is modified to indicate the SR should be deferred until suitable test conditions have been established. This deferral is required because there is an insufficient steam pressure to perform post maintenance activities which may need to be completed prior to performing the required turbine-driven pump SR. This deferral allows the unit to transition from MODE 4 to MODE 3 prior to the performance of the SR and provides a 24 hour period once a steam generator pressure of 750 psig is reached to complete the required post maintenance activities and SR. If this SR is not completed within the 24 hour period or fails, then the appropriate ACTION must be entered. The twenty-five percent grace period allowed by TS 4.0.2 can not be applied to the 24 hour period.

c. The SR for actuation testing ensures that EFW can be delivered to the appropriate steam generator in the event of any accident or transient that generates EFAS and/or MSIS signals, by demonstrating that each automatic valve in the flow path actuates to its correct position and that the EFW pumps will start on an actual or simulated actuation signal. This Surveillance covers the automatic flow control valves, automatic isolation valves, and steam admission valves but is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The 18 month frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. The 18 month frequency is acceptable, based on the design reliability and operating experience of the equipment.

3/4.7.1.2 EMERGENCY FEEDWATER SYSTEM (Continued)

Surveillance Requirements (Continued)

This SR is modified to indicate that the SR should be deferred until suitable test conditions have been established. This deferral is required because there is an insufficient steam pressure to perform post maintenance activities which may need to be completed prior to performing the required turbine-driven pump SR. This deferral allows the unit to transition from MODE 4 to MODE 3 prior to the performance of the SR and provides a 24 hour period once a steam generator pressure of 750 psig is reached to complete the required post maintenance activities and SR. If this SR is not completed within the 24 hour period or fails, then the appropriate ACTION must be entered. The twenty-five percent grace period allowed by TS 4.0.2 can not be applied to the 24 hour period.

d. The SR for flow testing ensures that the EFW system is aligned properly by verifying the flow paths from the condensate storage pool (CSP) to each steam generator before entering MODE 2 operation after being in MODE 4, 5, 6, or defueled, for 30 days or longer, or whenever feedwater line cleaning through the emergency feedwater line has been performed. Various combinations of pumps and valves may be used such that all flow paths (and flow legs) are tested at least once during the Surveillance.

OPERABILITY of 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 paths from the CSP to the steam generators are properly aligned.

3/4.7.1.3 CONDENSATE STORAGE POOL

The OPERABILITY of the condensate storage pool (CSP) with the minimum water volume of 173,500 gallons (170,000 gallons for EFW system usage and 3,500 gallons for CCW makeup system usage), plus makeup from one Wet Cooling Tower (WCT) basin, ensures that sufficient water is available to cool the Reactor Coolant System to shutdown cooling entry conditions following any design basis accident. This makeup water includes the capability to maintain HOT STANDBY for at least an additional 2 hours prior to initiating shutdown cooling.

The combined capacity (CSP and one WCT) provides sufficient cooling for 24 hours until shutdown cooling is initiated in the event the ultimate heat sink sustains tornado damage concurrent with the tornado event.

3/4.7.1.3 CONDENSATE STORAGE POOL (Continued)

If natural circulation is required, the combined capacity (CSP and one WCT) is sufficient to maintain the plant at HOT STANDBY for 4 hours, followed by a cooldown to shutdown cooling entry conditions assuming the availability of only onsite or only offsite power, and the worst single failure (loss of a diesel generator or atmospheric dump valve). This requires approximately 303,000 gallons of EFW and complies with BTP RSB 5-1.

The CSP contained water volume limit (91% indicated in MODES 1, 2, and 3) includes an allowance for water not usable because of vortexing and instrumentation uncertainties. This provides an assurance that a minimum of 170,000 gallons is available for the EFW system and that 3,500 gallons is available for the CCW makeup system. The CSP contained water volume limit (11% indicated in MODE 4) also includes an allowance for water not usable because of vortexing and instrumentation uncertainties. This provides an assurance that minimum of 3,500 gallons is available in the CSP for the CCW makeup system.

TS BASES CHANGE NO. 8 REPLACEMENT PAGE

(1 page)

Replace the following page of the Waterford 3 Technical Specifications Bases with the attached page. This change is being made to the Bases concurrent with the implementation of Amendment 174. The revised page is identified by Change number 8 and contains vertical lines 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.

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.

TS BASES CHANGE NO. 9 REPLACEMENT PAGE

(1 page)

Replace the following page of the Waterford 3 Technical Specifications Bases with the attached page. This change is being made to the Bases concurrent with the implementation of TS Amendment 175. The revised page is identified by Change number 9 and contains vertical lines indicating the areas of change.

Remove	Insert
B 3/4 3-1c	B 3/4 3-1c

3/4.3.1 and 3/4.3.2 REACTOR PROTECTIVE AND ENGINEERED SAFETY FEATURE ACTUATION SYSTEMS INSTRUMENTATION (Continued)

Response time may be verified by any series of sequential, overlapping, or total channel measurements, including allocated sensor response time, such that the response time is verified. Allocations for sensor response times may be obtained from records of test results, vendor test data, or vendor engineering specifications. Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements," provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the topical report. Respose time verification for other sensor types must be demonstrated by test. The allocation of sensor response times must be verified prior to placing a new component in operation and reverified after maintenance that may adversely affect the sensor response time.

TABLE 3.3-1, Functional Unit 13, Reactor Trip Breakers

The Reactor Trip Breakers Functional Unit in Table 3.3-1 refers to the reactor trip breaker channels. There are four reactor trip breaker channels. Two reactor trip breaker channels with a coincident trip logic of one-out-of-two taken twice (reactor trip breaker channels A or B, and C or D) are required to produce a trip. Each reactor trip breaker channel consists of two reactor trip breakers. For a reactor trip breaker channel to be considered OPERABLE, both of the reactor trip breakers of that reactor trip breaker channel must be capable of performing their safety function (disrupting the flow of power in its respective trip leg). The safety function is satisfied when the reactor trip breaker is capable of automatically opening, or otherwise opened or racked-out.

If a racked-in reactor trip breaker is not capable of automatically opening, the ACTION for an inoperable reactor trip breaker channel shall be entered. The ACTION shall not be exited unless the reactor trip breaker capability to automatically open is restored, or the reactor trip breaker is opened or racked-out.