



Entergy Nuclear South  
Entergy Operations, Inc.  
17265 River Road  
Killona, LA 70057-3093  
Tel 504-739-6715  
Fax 504-739-6698  
rmurill@entergy.com

Robert J. Murillo  
Manager, Licensing  
Waterford 3

W3F1-2008-0073

November 11, 2008

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555-0001

Subject: Technical Specification Bases Update to the NRC for the Period  
February 16, 2008 Through November 10, 2008  
Waterford Steam Electric Station, Unit 3  
Docket No. 50-382  
License No. NPF-38

Dear Sir or Madam:

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 W3F1-2008-0016, dated February 20, 2008. This TS Bases update satisfies the requirement 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 Robert Murillo, Manager, Licensing at (504) 739-6715.

Very truly yours,

A handwritten signature in black ink, appearing to read "Robert J. Murillo".

RJM/RLW/

Attachment

Waterford 3 Technical Specification Bases Revised Pages

A001  
LRR

cc: Mr. Elmo E. Collins, Jr.  
Regional Administrator  
U. S. Nuclear Regulatory Commission  
Region IV  
612 E. Lamar Blvd., Suite 400  
Arlington, TX 76011-4125

NRC Senior Resident Inspector  
Waterford Steam Electric Station Unit 3  
P.O. Box 822  
Killona, LA 70066-0751

U. S. Nuclear Regulatory Commission  
Attn: Mr. N. Kalyanam  
Mail Stop O-07D1  
Washington, DC 20555-0001

Wise, Carter, Child & Caraway  
ATTN: J. Smith  
P.O. Box 651  
Jackson, MS 39205

Winston & Strawn  
ATTN: N.S. Reynolds  
1700 K Street, NW  
Washington, DC 20006-3817

Morgan, Lewis & Bockius LLP  
ATTN: T.C. Poindexter  
1111 Pennsylvania Avenue, NW  
Washington, DC 20004

**ATTACHMENT 1**

**To W3F1-2008-0073**

**Waterford 3 Technical Specification Bases Revised Pages**

T.S. Bases Change No.	Implementation Date	Affected TS Bases Pages	Topic of Change
54		B 3/4 6-2	Change No. 54 to TS Bases section 3/4.6.1.5, Containment Air Temperature, was implemented by EC-7193. TS Bases changes were made to reflect the approved changes as documented in License Amendment 214. Specifically, Amendment 214 changed the TS 6.9.1.11.1, Core Operating Limits Report (COLR), TS 3.5.1, Safety Injection Tanks, and TS 3.6.1.5, Containment Air Temperature. The change modified the containment average air temperature and safety injection tank to support the implementation of Next Generation Fuel.
55		B 3/4 8-1	Change No. 55 to TS Bases section 3/4.8.1, 3/4.8.2, and 3/4.8.3 A.C. Sources, D.C Sources, and Onsite Power Distribution Systems was implemented by EC-1735. TS Bases Section 3/4.8.1, 3/4.8.2, and 3/4.8.3 was changed to reflect the installation of new level instrumentation to each of the two 7-day emergency diesel fuel oil storage tanks (FOSTs).
56		B 3/4 8-1 B 3/4 8-1a B 3/4 8-1b (new page) B 3/4 8-1c (new page) B 3/4.8-1d (new page)	Change No. 56 to TS Bases section 3/4.8.1, 3/4.8.2, and 3/4.8.3 A.C. Sources, D.C Sources, and Onsite Power Distribution Systems was implemented by EC-10752. TS Bases Section 3/4.8.1, 3/4.8.2, and 3/4.8.3 was revised to reflect the approved changes as documented in License Amendment 216. In summary, the changes approved by the NRC via Amendment 216 relocated the quality and quantity requirements associated with the EDG fuel oil within the TS through the creation of a new TS Limiting Condition for Operation and the Diesel Fuel Oil Testing Program. In addition, two surveillance requirements associated with periodic draining, cleaning and visual inspection of the fuel oil storage tanks were deleted.

**TECHNICAL SPECIFICATION BASES**  
**CHANGE NO. 54 REPLACEMENT PAGE(S)**  
(1 page)

Replace the following page of the Waterford 3 Technical Specification Bases with the attached page. The revised page is identified by Change Number 54 and contains the appropriate EC number and a vertical line indicating the areas of change.

**Remove**

B 3/4 6-2

**Insert**

B 3/4 6-2

## CONTAINMENT SYSTEMS

### BASES

---

#### 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

→(DRN 04-1243, Ch. 38; EC-7193, Am. 54)

The limitation on containment minimum average air temperature ensures that the ECCS is capable of maintaining a peak clad temperature (PCT) less than or equal to 2200 °F under LOCA conditions. A lower containment average air temperature results in a lower post accident containment pressure, a lower reflood rate, and therefore a higher PCT. The containment minimum average air temperature limit is only applicable above 70% rated thermal power. At power levels of 70% or below and a containment minimum average air temperature of less than 95 °F, ECCS is capable of maintaining the peak clad temperature (PCT) less than or equal to 2200 °F under LOCA conditions. Core Operating Limits Report (COLR) requires that the linear heat rate be reduced by 0.2 kw/ft when the containment air temperature is less than 95 °F but greater than or equal to 90 °F.

←(DRN 04-1243, Ch. 38; EC-7193, Am. 54)

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; 04-1243, Ch. 38; EC-7193, Am. 54)

The 95 °F minimum and 120 °F maximum indicated values specified in the TS are the values used in the accident analysis.

←(DRN 02-1904; 04-1243, Ch. 38; EC-7193, Am. 54)

#### 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.

**TECHNICAL SPECIFICATION BASES**  
**CHANGE NO. 55 REPLACEMENT PAGE(S)**  
(1 page)

Replace the following page of the Waterford 3 Technical Specification Bases with the attached page. The revised page is identified by Change Number 55 and contains the appropriate EC number and a vertical line indicating the areas of change.

**Remove**

B 3/4 8-1

**Insert**

B 3/4 8-1

## 3/4.8 ELECTRICAL POWER SYSTEMS

### BASES

#### 3/4.8.1, 3/4.8.2, and 3/4.8.3 A.C. SOURCES, D.C. SOURCES, and ONSITE POWER DISTRIBUTION SYSTEMS

The OPERABILITY of the A.C. and D.C. power sources and associated distribution systems during operation ensures that sufficient power will be available to supply the safety-related equipment required for (1) the safe shutdown of the facility and (2) the mitigation and control of accident conditions within the facility. The minimum specified independent and redundant A.C. and D.C. power sources and distribution systems satisfy the requirements of General Design Criterion 17 of Appendix A to 10 CFR Part 50.

→(DRN 04-1243, Ch. 38; EC-1735, Ch. 55)

The Limiting Condition for Operation (LCO) ensures that each diesel generator storage tank contains fuel oil of a sufficient volume to operate each diesel generator for a period of 7 days. An administrative limit of greater than 40,033 gallons assures at least 39,300 usable gallons storage in the tank, accounting for volumetric shrink and instrumentation uncertainty. This useable volume is sufficient to operate the diesel generator for 7 days based on the time-dependent loads of the diesel generator following a loss of offsite power and a design bases accident and includes the capacity to power the engineered safety features in conformance with Regulatory Guide 1.137 October 1979. The minimum onsite stored fuel oil is sufficient to operate the diesel generator for a period longer than the time to replenish the onsite supply from the outside sources discussed in FSAR 9.5.4.2.

An additional provision is included in the LCO which allow the diesel generators to remain operable when their 7 day fuel oil supply is not available provided that at least a 6 day supply of fuel oil is available. This provision is acceptable on the basis that replacement fuel oil is onsite within the first 48 hours after falling below the 7 day supply. An administrative limit of greater than 37,696 gallons assures at least 37,000 usable gallons storage in the tank, accounting for volumetric shrink and instrumentation uncertainty. This useable volume is sufficient to operate the diesel generator for 5 days based on the full continuous load (4400kW) of the diesel generator and is sufficient to operate the diesel generator for greater than 6 days based on the time dependent loads of the diesel generator following a loss of offsite power and a design basis accident.

←(DRN 04-1243, Ch. 38; EC-1735, Ch. 55)

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the safety analyses and are based upon maintaining at least one redundant set of onsite A.C. and D.C. power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss-of-offsite power and single failure of the other onsite A.C. source. When one diesel generator is inoperable to perform either preplanned maintenance (both preventive and corrective) or unplanned corrective maintenance work, the allowed-outage-time (AOT) can be extended from 72 hours to 10 days, if a temporary emergency diesel generator (TEDG) is verified available and aligned for backup operation to the permanent plant EDG removed from service. The TEDG will be available prior to removing the permanent plant EDG from service for the extended preplanned maintenance work or prior to exceeding the 72-hour AOT for the extended unplanned corrective maintenance work. A Configuration Risk Management Program (CRMP) is implemented to assess risk of this activity when applying this ACTION. The TEDG availability is verified by: (1) starting the TEDG and verifying proper operation; (2) verifying 24 hour onsite fuel supply; and (3) ensuring the TEDG

**TECHNICAL SPECIFICATION BASES**  
**CHANGE NO. 56 REPLACEMENT PAGE(S)**  
(5 pages)

Replace the following pages of the Waterford 3 Technical Specification Bases with the attached pages. The revised pages are identified by Change Number 56 and contain the appropriate EC number and a vertical line indicating the areas of change.

**Remove**

B 3/4 8-1  
B 3/4 8-1a

**Insert**

B 3/4 8-1  
B 3/4 8-1a  
B 3/4 8-1b  
B 3/4 8-1c  
B 3/4 8-1d

## 3/4.8 ELECTRICAL POWER SYSTEMS

### BASES

#### 3/4.8.1, 3/4.8.2, and 3/4.8.3 A.C. SOURCES, D.C. SOURCES, and ONSITE POWER DISTRIBUTION SYSTEMS

The OPERABILITY of the A.C. and D.C. power sources and associated distribution systems during operation ensures that sufficient power will be available to supply the safety-related equipment required for (1) the safe shutdown of the facility and (2) the mitigation and control of accident conditions within the facility. The minimum specified independent and redundant A.C. and D.C. power sources and distribution systems satisfy the requirements of General Design Criterion 17 of Appendix A to 10 CFR Part 50.

→(DRN 04-1243, Ch. 38; EC-1735, Ch. 55; EC-10725, Ch. 56)

←(DRN 04-1243, Ch. 38; EC-1735, Ch. 55; EC-10725, Ch. 56)

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the safety analyses and are based upon maintaining at least one redundant set of onsite A.C. and D.C. power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss-of-offsite power and single failure of the other onsite A.C. source. When one diesel generator is inoperable to perform either preplanned maintenance (both preventive and corrective) or unplanned corrective maintenance work, the allowed-outage-time (AOT) can be extended from 72 hours to 10 days, if a temporary emergency diesel generator (TEDG) is verified available and aligned for backup operation to the permanent plant EDG removed from service. The TEDG will be available prior to removing the permanent plant EDG from service for the extended preplanned maintenance work or prior to exceeding the 72-hour AOT for the extended unplanned corrective maintenance work. A Configuration Risk Management Program (CRMP) is implemented to assess risk of this activity when applying this ACTION. The TEDG availability is verified by: (1) starting the TEDG and verifying proper operation; (2) verifying 24 hour onsite fuel supply; and (3) ensuring the TEDG is aligned to supply power through a 4.16 kV non-safety bus to the 4.16kV safety bus. A status check for TEDG availability will also be performed at least once every 72 hours following the initial TEDG availability verification. The status check shall consist of: (1) verifying the TEDG equipment is mechanically and electrically ready for manual operation; (2) verifying 24 hour onsite fuel supply; and (3) ensuring the TEDG is aligned to supply power through a 4.16 kV non-safety bus to the 4.16 kV safety bus. If the TEDG becomes unavailable during the 10 day AOT and cannot be restored to available status, the EDG AOT reverts back to 72-hours. The 72 hours begins with the discovery of the TEDG unavailability, not to exceed a total of 10 days from the time the EDG originally became inoperable. The A.C. and D.C. source allowable out-of-service times are based on Regulatory Guide 1.93, "Availability of Electrical Power Sources," December 1974. When one diesel generator is inoperable, there is an additional ACTION requirement to verify that all required systems, subsystems, trains, components, and devices that depend on the remaining OPERABLE diesel generator as a source of emergency power are also OPERABLE, and that the steam-driven auxiliary feedwater pump is OPERABLE. This requirement is intended to provide assurance that a loss-of-offsite power event will not result in a complete loss of safety function of critical systems during the period one of the diesel generators is inoperable. The term verify as used in this context means to administratively check by examining logs or other information to determine if certain components are out-of-service for maintenance or other reasons. It does not mean to perform the Surveillance Requirements needed to demonstrate the OPERABILITY of the component.

## ELECTRICAL POWER SYSTEMS

### BASES

---

#### 3/4.8.1, 3/4.8.2, and 3/4.8.3 A.C. SOURCES, AND ONSITE POWER DISTRIBUTION SYSTEMS (Continued)

→(DRN 03-375, Ch. 19)

The OPERABILITY of the minimum specified A.C. and D.C. power sources and associated distribution systems during shutdown and refueling ensures that(1) the facility can be maintained in the shutdown or refueling condition for extended time periods and (2) sufficient instrumentation and control capability is available for monitoring and maintaining the unit status. With the minimum AC and DC power sources and associated distribution systems inoperable the ACTION requires the immediate suspension of various activities including operations involving positive reactivity additions that could result in loss of required SHUTDOWN MARGIN (MODE 5) or boron concentration (MODE 6). Suspending positive reactivity additions that could result in failure to meet the minimum SHUTDOWN MARGIN or boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than that what would be required in the RCS for minimum SHUTDOWN MARGIN or refueling concentration. This may result in an overall reduction in boron concentration, but provides acceptable margin to maintaining subcritical operation. Introduction of temperature changes, including increases when operating with a positive moderator temperature coefficient, must also be evaluated to ensure they do not result in a loss of required SHUTDOWN MARGIN. Suspension of these activities does not preclude completion of actions to establish a safe conservative condition.

←(DRN 03-375, Ch. 19)

→(EC-10752, Ch. 56)

#### LCO 3.8.1.3

#### ACTION a

This ACTION ensures that each diesel generator fuel oil storage tank (FOST) contains fuel oil of a sufficient volume to operate each diesel generator for a period of 7 days. An administrative limit of greater than 40,033 gallons assures at least 39,300 usable gallons storage in the tank accounting for volumetric shrink and instrumentation uncertainty. This useable volume is sufficient to operate the diesel generator for 7 days based on the time-dependent loads of the diesel generator following a loss of offsite power and a design bases accident and includes the capacity to power the engineered safety features in conformance with Regulatory Guide 1.137 October 1979. The minimum onsite stored fuel oil is sufficient to operate the diesel generator for a period longer than the time to replenish the onsite supply from the outside sources discussed in FSAR 9.5.4.2.

An additional provision is included in the ACTION which allows the diesel generators to remain operable when their 7 day fuel oil supply is not available provided that at least a 6 day supply of fuel oil is available. This provision is acceptable on the basis that replacement fuel oil is onsite within the first 48 hours after falling below the 7 day supply. An administrative limit of greater than 37,696 gallons assures at least 37,000 usable gallons storage in the tank,

←(EC-10725, Ch. 56)

## ELECTRICAL POWER SYSTEMS

### BASES

---

#### 3/4.8.1, 3/4.8.2, and 3/4.8.3 A.C. SOURCES, AND ONSITE POWER DISTRIBUTION SYSTEMS (Continued)

→(EC-10752, Ch. 56)

##### LCO 3.8.1.3 (Continued)

##### ACTION a (Continued)

accounting for volumetric shrink and instrumentation uncertainty. This useable volume is sufficient to operate the diesel generator for 5 days based on the full continuous load (4400kW) of the diesel generator and is sufficient to operate the diesel generator for greater than 6 days based on the time dependent loads of the diesel generator following a loss of offsite power and a design basis accident.

##### ACTION b

This ACTION is entered as a result of a failure to meeting the acceptance criterion of particulate limits. Normally, trending of particulate levels allows sufficient time to correct high particulate levels prior to reaching the limit of acceptability. Poor sample procedures (bottom sampling), contaminated sampling equipment, and errors in laboratory analysis can produce failures that do not follow a trend. Since the presence of particulates does not mean failure of the fuel oil to burn properly in the diesel engine and particulate concentration is unlikely to change.

##### ACTION c

With the new fuel oil properties defined in the Bases for SR 4.8.1.1.2.c not within the required limits, a period of 30 days is allowed for restoring the stored fuel oil properties. This period provides sufficient time to test the stored fuel oil to determine that the new fuel oil, when mixed with previously stored fuel oil, remains acceptable, or restore the stored fuel oil properties. This restoration may involve feed and bleed procedures, filtering, or combinations of these procedures. Even if a diesel generator start and load was required during this time interval and the fuel oil properties were outside limits, there is a high likelihood that the diesel generator would still be capable of performing its intended function.

##### ACTION d

This ACTION is entered as a result of the failure to meeting any of the other ACTIONS.

←(EC-10725, Ch. 56)

## ELECTRICAL POWER SYSTEMS

### BASES

---

#### 3/4.8.1, 3/4.8.2, and 3/4.8.3 A.C. SOURCES, AND ONSITE POWER DISTRIBUTION SYSTEMS (Continued)

→(EC-10752, Ch. 56)

##### SR 4.8.1.3.1

This SR provides verification that there is an adequate inventory of fuel oil in the storage tanks to support each EDG's operation for 7 days at full load. The 7 day period is sufficient time to place the unit in a safe shutdown condition and to bring in replenishment fuel from an offsite location. The 31 day Frequency is adequate to ensure that a sufficient supply of fuel oil is available, since low level alarms are provided and unit operators would be aware of any large uses of fuel oil during this period.

##### SR 4.8.1.3.2

SR 4.8.1.3.2 provides a means of determining whether new fuel oil is of the appropriate grade and has not been contaminated with substances that would have an immediate, detrimental impact on diesel engine combustion. If results from the tests are within acceptable limits, the fuel oil may be added to the storage tanks without concern for contaminating the entire volume of fuel oil in the storage tanks. The tests are to be conducted prior to adding the new fuel to the storage tanks, but in no case is the time between receipt of the new fuel and conducting the tests to exceed 31 days. The tests, limits and applicable ASTM Standards are as follows:

- a. Same the new fuel oil in accordance with ASTM D4057-06.
- b. Verify in accordance with the tests specified in ASTM D975-7b that the sample has a kinematic viscosity at 40°C of  $\geq 1.9$  centistokes and  $\leq 4.1$  centistokes, and a flash point  $\geq 125^\circ\text{F}$ ,
- c. Verify in accordance with ASTM D1298 or ASTM D4052 that the sample has an absolute specific gravity of 60/60°F of  $\geq 0.85$  and  $\leq 0.885$  or an API gravity at 60°F of  $\geq 28.4^\circ$  and  $\leq 35^\circ$  and
- d. Verify that the new fuel oil has a clear and bright appearance with proper color when tested in accordance with ASTM D4176-04 or water and sediment content within limits when tested in accordance with ASTM D2709-96.

Failure to meet any of the above limits is cause for rejecting the new fuel oil, but does not represent a failure to meet the LCO since the fuel oil is not added to the storage tanks.

Within 31 days following the initial new fuel oil sample, the fuel oil is analyzed to establish that the other properties specified in Table 1 of ASTM D975-7b are met for Grade 2-D

←(EC-10725, Ch. 56)

## ELECTRICAL POWER SYSTEMS

### BASES

---

#### 3/4.8.1, 3/4.8.2, and 3/4.8.3 A.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS (Continued)

→(EC-10752, Ch. 56)

##### SR 4.8.1.3.2 (Continued)

new fuel oil when tested in accordance with ASTM D975-7b. The 31 day period is acceptable because the fuel oil properties of interest, even if they were not within stated limits, would not have an immediate effect on diesel generator operation. This Surveillance ensures the availability of high quality fuel oil for the diesel generators.

Fuel oil degradation during long term storage shows up as an increase in particulate, due mostly to oxidation. The presence of particulate does not mean the fuel oil will not burn properly in a diesel engine. The particulate can cause fouling of filters and fuel oil injection equipment which can cause engine failure.

Particulate concentrations will be determined in accordance with ASTM D6217-98. This method involves a gravimetric determination of total particulate concentration in the fuel oil and has a limit of 10 mg/l. It is acceptable to obtain a field sample for subsequent laboratory testing in lieu of field testing.

The frequency of this test takes into consideration fuel oil degradation trends that indicate that particulate concentration is unlikely to change significantly between test intervals.

←(EC-10725, Ch. 56)