

Waterford 3

Risk-Informed Allowed Outage Time (RIAOT)

License Amendment Request

NRC Pre-submittal Meeting

December 17, 2020



Participants

Entergy

- Ron Gaston, Director Fleet Regulatory Assurance
- Paul Wood, Waterford 3 Manager, Regulatory Assurance
- Billy Steelman, Waterford 3 Manager, Design Engineering
- Richard French, Waterford 3 Project Manager
- Wes Johnson, Corporate PRA Supervisor
- Mark Thigpen, Waterford 3 PRA Engineer
- Remy DeVoe, Waterford 3 Regulatory Assurance
- Alan Harris, Jensen Hughes, Licensing Consultant
- Andy Spotts, Jensen Hughes, PRA Consultant

Agenda

- ✓ Introduction/Opening Remarks
- ✓ Waterford 3 LAR Overview
 - ✓ TSTF-505 Revision 2 *
 - ✓ Waterford 3 Applicability
 - ✓ Technical Specifications (TS) to Include
- ✓ Probabilistic Risk Assessment (PRA) Status
- ✓ Schedule
- ✓ Closing Remarks

* TECHNICAL SPECIFICATIONS TASK FORCE TRAVELER TSTF-505, REVISION 2
“PROVIDE RISK-INFORMED EXTENDED COMPLETION TIMES – RITSTF INITIATIVE 4B”

Waterford 3 LAR Overview

TSTF-505 Revision 2

- ✓ Revision 2 issued November 2018
- ✓ Removes provision for total loss of function
- ✓ Less detailed explanations provided on why certain Limited Conditions for Operation (LCOs) are excluded from previous revisions.
- ✓ Section 2.3 scope criterion 18 referenced in LAR for site-specific LCOs:
 - ✓ Restored to OPERABLE
 - ✓ Channel placed in TRIP
 - ✓ Isolate Inoperable isolation valve

Waterford 3 Applicability

- ✓ Waterford 3 is a Combustion Engineering Custom Tech Spec plant.
- ✓ Many LCOs match NUREG-1432 Revision 4, “Standard Technical Specifications – Combustion Engineering Plants”
- ✓ Some LCOs have corresponding LCOs in Standard Technical Specification (STS), with minor differences
- ✓ Some LCOs are site-specific with no STS counterpart

Technical Specifications (TS) to Include

The following slides will show which TS are in the scope of LAR, separated into 4 groups:

1. Identical or nearly Identical to LCO in scope of TSTF-505 Rev 2.
2. LCO in scope of TSTF-505 Rev 2, with some differences, while still meeting scope criteria
3. LCO is excluded from scope of TSTF-505 Rev 2, but reason for exclusion does not apply to Waterford 3 LCO.(for example, 30 day completion time in STS)
4. Waterford 3 site specific LCO that meets criteria

Technical Specifications (TS) to Include

Identical or nearly Identical to LCO in scope of
TSTF-505 Rev 2.

Technical Specification LCO	LCO Title
3.4.3.1	Pressurizer
3.5.2	ECCS Subsystems – Modes 1, 2, and 3
3.7.1.5	Main Steam Line Isolation Valves (MSIVs)
3.7.12	Essential Services Chilled Water System

Technical Specifications (TS) to Include

Identical or nearly Identical to LCO in scope of TSTF-505 Rev 2 (EXAMPLE)

TSTF-505, Rev. 2

ECW
3.7.10

Comment: Condition B is a default Condition and therefore excluded.

3.7 PLANT SYSTEMS

3.7.10 Essential Chilled Water (ECW)

LCO 3.7.10 [Two] ECW trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ECW train inoperable.	A.1 Restore ECW train to OPERABLE status.	7 days <u>OR</u> In accordance with the Risk Informed Completion Time Program]
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours
	<u>AND</u> B.2 Be in MODE 5.	36 hours

PLANT SYSTEMS

3/4.7.12 ESSENTIAL SERVICES CHILLED WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.12 Two independent essential services chilled water loops shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTION:

With only one essential services chilled water loop OPERABLE, restore two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.



Technical Specifications (TS) to Include

LCO in scope of TSTF-505 Rev 2, with some differences, while still meeting scope criteria

Technical Specification LCO	LCO Title
3.3.1	Reactor Protective Instrumentation
3.3.2	Engineered Safety Features Actuation System Instrumentation
3.6.1.3	Containment Air Locks
3.6.1.7	Containment Ventilation System
3.6.3	Containment Isolation Valves
3.6.2.1	Containment Spray System
3.6.2.2	Containment Cooling
3.7.1.2	Emergency Feedwater System
3.7.1.7	Atmospheric Dump Valves
3.7.3	Component Cooling Water and Auxiliary Component Cooling Water Systems
3.8.1.1	A.C. Sources
3.8.2.1	D.C. Sources
3.8.3.1	Onsite Power Distribution Systems

Technical Specifications (TS) to Include

LCO in scope of TSTF-505 Rev 2, with some differences, while still meeting scope criteria-EXAMPLE

Comment: Condition B is a default Condition and is excluded.

TSTF-505, Rev. 2
CCW System
3.7.7

3.7 PLANT SYSTEMS

3.7.7 Component Cooling Water (CCW) System

LCO 3.7.7 Two CCW trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CCW train inoperable.	<p>A.1</p> <p>-----NOTE----- Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," for shutdown cooling made inoperable by CCW.</p> <p>Restore CCW train to OPERABLE status.</p>	<p>72 hours</p> <p>OR</p> <p>In accordance with the Risk Informed Completion Time Program]</p>

PLANT SYSTEMS

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

LIMITING CONDITION FOR OPERATION

3.7.3 At least two independent component cooling water and associated auxiliary component cooling water trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

With only one component cooling water and associated auxiliary component cooling water train OPERABLE, restore at least two trains to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

Technical Specifications (TS) to Include

LCO is excluded from scope of TSTF-505 Rev 2, but reason for exclusion does not apply to Waterford 3 LCO.

Technical Specification LCO	LCO Title
3.7.1.3	Condensate Storage Pool
3.7.6.1	Control Room Emergency Air Filtration System
3.7.6.3	Control Room Air Temperature - Operating

Technical Specifications (TS) to Include

LCO is excluded from scope of TSTF-505 Rev 2, but reason for exclusion does not apply to Waterford 3 LCO.-EXAMPLE

CREATCS
3.7.12

3.7 PLANT SYSTEMS

3.7.12 Control Room Emergency Air Temperature Control System (CREATCS)

LCO 3.7.12 Two CREATCS trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, 4, [5, and 6,]
During movement of [recently] irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CREATCS train inoperable.	A.1 Restore CREATCS train to OPERABLE status.	30 days

PLANT SYSTEMS

CONTROL ROOM AIR TEMPERATURE - OPERATING

LIMITING CONDITION FOR OPERATION

3.7.6.3 Two independent control room air conditioning units shall be OPERABLE.

APPLICABILITY*: MODES 1, 2, 3, and 4.

ACTION:

- a. With one control room air conditioning unit inoperable, restore the inoperable unit to OPERABLE status within 7 days or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

Technical Specifications (TS) to Include

Waterford 3 site specific LCO that meets criteria

Technical Specification LCO	LCO Title
3.4.3.2	Auxiliary Spray
3.7.1.6	Main Feedwater Isolation Valves
3.7.4	Ultimate Heat Sink

Technical Specifications (TS) to Include

Waterford 3 site specific LCO that meets criteria- EXAMPLE

TSTF-505, Rev. 2

Comment: RA B.1 requires the periodic performance of an action and Condition C is a default Condition. Therefore, these are excluded.

UHS
3.7.9

3.7 PLANT SYSTEMS

3.7.9 Ultimate Heat Sink (UHS)

LCO 3.7.9 The UHS shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. [One or more cooling towers with one cooling tower fan inoperable.	A.1 Restore cooling tower fan(s) to OPERABLE status.	7 days] [OR In accordance with the Risk Informed Completion Time Program]

Technical Specifications (TS) to Include

Waterford 3 site specific LCO that meets criteria-
EXAMPLE

PLANT SYSTEMS

3/4.7.4 ULTIMATE HEAT SINK

LIMITING CONDITION FOR OPERATION

3.7.4 Two independent trains of ultimate heat sink (UHS) cooling towers shall be OPERABLE with each train consisting of a dry cooling tower (DCT) and a wet mechanical draft cooling tower (WCT) and its associated water basin with:

- a. A minimum water level in each wet tower basin of 97% (-9.77 ft MSL)
- b. An average basin water temperature of less than or equal to 89°F.
- c. Fans as required by Table 3.7-3.

TABLE 3.7-3

ULTIMATE HEAT SINK MINIMUM FAN REQUIREMENTS PER TRAIN ⁽¹⁾

ALLOWABLE FAN COMBINATIONS
 1 hour / 3 day average dry bulb temperature restrictions

OPERABLE WCT Fans	OPERABLE DCT Fans					
	15		14		13	
	1 hour	3 day	1 hour	3 day	1 hour	3 day
8	No Temperature Restrictions				≤88 °F	≤77 °F
7					≤87 °F	≤77 °F

(1) With any DCT tube bundle isolated, at least 14 DCT fans and 7 WCT fans shall be OPERABLE.

Technical Specifications (TS) to Include

Complete List of TS included in LAR

Technical Specification LCO	LCO Title
3.3.1	Reactor Protective Instrumentation
3.3.2	Engineered Safety Features Actuation System Instrumentation
3.4.3.1	Pressurizer
3.4.3.2	Auxiliary Spray
3.5.2	ECCS Subsystems – Modes 1, 2, and 3
3.6.1.3	Containment Air Locks
3.6.1.7	Containment Ventilation System
3.6.3	Containment Isolation Valves
3.6.2.1	Containment Spray System
3.6.2.2	Containment Cooling
3.7.1.2	Emergency Feedwater System
3.7.1.3	Condensate Storage Pool
3.7.1.5	Main Steam Line Isolation Valves (MSIVs)
3.7.1.6	Main Feedwater Isolation Valves
3.7.1.7	Atmospheric Dump Valves
3.7.3	Component Cooling Water and Auxiliary Component Cooling Water Systems
3.7.4	Ultimate Heat Sink
3.7.6.1	Control Room Emergency Air Filtration System
3.7.6.3	Control Room Air Temperature - Operating
3.7.12	Essential Services Chilled Water System
3.8.1.1	A.C. Sources
3.8.2.1	D.C. Sources
3.8.3.1	Onsite Power Distribution Systems

Probabilistic Risk Analyses (PRA) Status

PRA Peer Reviews

RG 1.200 PRA Peer Review (Westinghouse Owner's Group August 2009).

Fire PRA Peer Review Against Section 4 of the ASME/ANS Standard (Westinghouse Owner's Group February 2011)

Focused Scope Fire PRA Peer Review Against Section 4 of the ASME/ANS Standard (URS Corporation – September 2012)

2nd Focused Scope Fire PRA Peer Review of Fire PRA Against Section 4 of the ASME/ANS Standard (URS Corporation – May 2013)

Waterford 3 Finding Level F&O Independent Technical Review (October 2017)

Waterford 3 Internal Flood/LERF Focused Scope Peer Review (August 2019)

Probabilistic Risk Analyses (PRA) Status

PRA Baseline Values

Hazard	Model	Baseline	Baseline
		CDF	LERF
At Power Internal Events	Rev6	3.03E-06	3.04E-08
Internal Fire	Rev6 Fire	2.01E-05	2.05E-07
Internal Flood	Rev6 Flood	1.49E-06	7.47E-09
Seismic	Bounding Estimate	3.20E-06	3.20E-07
Total		2.78E-05	5.63 E-07

Schedule

Schedule

Plan to submit LAR January 2021
Requesting 12 month approval



Closing Remarks