# TECH SPECS 3.8 – 3.10

504B

# Technical Specifications Sections 3.8 through 3.10

R504B – Chapter 3.0

- 5. Given Improved Standard Technical Specifications and Bases, specific plant conditions and system knowledge, apply the following ISTS sections to determine the required actions by the licensee:
  - a. Definitions in section 1.1
  - b. The use of Logical Connectors in section 1.2
  - c. Completion Time guidance in section 1.3
  - d. Surveillance Frequency guidance in section 1.4
  - e. The Safety Limit guidance of section 2.0
  - f. General LCO guidance of section 3.0
  - g. General SR guidance of section SR 3.0
  - h. The LCO and Surveillance Requirements guidance of section 3.1 through 3.10
  - i. The Design Feature guidance of section 4.0
  - j. The Administrative Controls guidance of section 5.0

### FOR ANY T/S RELATED PROBLEM

#### Review your system understanding

• Of course, critical to this guidance is a sound system understanding.

#### **Review TOC for potential LCO(s)**

• Frequently a given component or issue may have effect on multiple specifications.

#### **Review applicability of LCO(s)**

• It is not infrequent that improper determinations are made due to the plant condition applicability

#### **Review LCO bases**

 A given component having effect on multiple specifications or with different requirements in multiple applicability's may result in inoperability determinations in some but not necessarily all. The LCO bases will clarify these conditions.

#### **Review SR's and bases**

• A given surveillance that fails, cannot be performed or cannot be met does not necessarily result in equipment inoperability.

#### Apply definitions (ALL CAPS)

 Remember that ALL CAPS means some additional detail is contained in the definitions of section 1.1

#### Apply T/S motherhood statements

• The LCO 3.0 and SR 3.0 motherhood statements frequently provide twists to what seems to be black and white.

#### Identify the required actions

• What we are trying to accomplish

## Section 3.8 Electrical Power Systems

- 3.8.1; AC Sources Operating
  - Operating at high reactor power levels requires maximum safety related equipment and thus max reliable power sources.
- 3.8.2; AC Sources Shutdown
  - Lower power level so required power sources are relaxed
- 3.8.3; Diesel Fuel Oil, Lube Oil, and Starting Air
  - Diesel support systems
- 3.8.4; DC Sources Operating
  - Safety equipment requires battery power for logic and control power
- 3.8.5; DC Sources Shutdown
  - Minimum requirements relaxed

## Section 3.8 Electrical Power Systems

- 3.8.6; Battery Parameters
  - Battery cells monitored for voltage, electrolyte level, temperature, etc.
- 3.8.7; Inverters Operating
  - Some plant designs use inverters to supply reliable logic power to RPS and ECCS
- 3.8.8; Inverters Shutdown
  - Minimum safety system requirements relaxed
- 3.8.9; Distribution Systems Operating
  - Covers buses, electrical circuits, load centers, MCCs, distribution panels
- 3.8.10; Distribution Systems Shutdown
  - Minimum safety system requirements relaxed

While in MODE 1, the electrical system dispatcher informs the utility that due to grid instability, one of the two required off-site power sources is no longer qualified to meet the post-accident frequency and voltage requirements. What are the Required Actions in LCO 3.8.1?

- LCO 3.8.1 is applicable in MODE 1.
- Condition A is entered due to one qualified off-site power ckt being inoperable.
- Required Actions A.1 <u>AND</u> A.2 <u>AND</u> A.3
- Action A.1 has two Completion Times, within one hour and 8 hours (from the time of last completion, including the 25% grace) thereafter.

While in MODE 1, the electrical system dispatcher informs the utility that due to grid instability, one of the two off-site sources is no longer qualified to meet the post-accident frequency and voltage requirements. What are the Required Actions in LCO 3.8.1?

- Action A.2 Completion Time has a "from discovery" statement. 24 hours from the time of BOTH a loss of offsite power available to the bus and a redundant required feature declared INOPERABLE, declare the supported feature inoperable
- Action A.3 restore the off-site power circuit to OPERABLE status in 72 hours.

While in MODE 1, the Division I emergency diesel would not start when attempting to perform the monthly surveillance. The cause of the failure is not readily apparent. What are the required actions?

- Emergency diesels are covered by LCO 3.8.1, applicable in MODE 1.
- Condition B is entered.
- Required Actions B.1 <u>AND</u> B.2 <u>AND</u> B.3 (B.3.1 <u>OR</u> B.3.2) <u>AND</u> B.4 are required to be taken.
- Action B.1 has two Completion Times, within one hour and 8 hours (from the time of last completion, including the 25% grace) thereafter.

While in MODE 1, the Division I emergency diesel would not start when attempting to perform the monthly surveillance. The cause of the failure is not readily apparent. What are the required actions?

- Action B.2 Completion Time is "from discovery". 4 hours from the time of BOTH a loss of the diesel and a redundant required feature being declared inoperable, declare the supported feature inoperable.
- Action B.3.1 <u>OR</u> B.3.2 must be completed within 24 hours. Since the cause of the failure is unknown, it would be difficult to determine that it was not due to a common cause.
- Action B.4 is to restore the diesel to OPERABLE status in 72 hours.

While in MODE 1 with the Division I emergency diesel inoperable, SR 3.8.1.1 fails for the Division II required off-site power source. Which Required Actions should the plant be in.

- With the diesel inoperable, the licensee should have already been in Condition B, Actions B.1, B.2, B.3.1 or B.3.2, and B.4.
- When the surveillance failed, the plant will still be in Condition B, and should enter Condition A (loss of the off-site power source) and D (loss of a diesel and an off-site power source).
- Actions A.1, A.2 and A.3 are required.

While in MODE 1 with the Division I emergency diesel inoperable, SR 3.8.1.1 fails for the Division II required off-site power source. Which Required Actions should the plant be in.

- D.1 or D.2 is entered to restore either the diesel or off-site power source to OPERABLE status within 12 hours.
- Note above Condition D Required Actions also states that LCO 3.8.9 should be entered "when Condition D is entered with no AC power source to any division".
- Review of the Bases for this action reveals that the note is applicable when a AC bus is de-energized which is not the case, otherwise LCO 3.0.6 allows entry into the support system LCO (3.8.1) only.

While in MODE 1, a diesel fuel oil tank is discovered to have only 30,000 gallons of fuel, but the FSAR requires 33,000 gallons to complete it's mission time of 7 days. Is the diesel OPERABLE?

- From the Table of Contents, Diesel Fuel Oil is part of LCO 3.8.3.
- LCO 3.8.3 is applicable any time the associated diesel is required to be OPERABLE (referring to LCOs 3.8.1 and/or 3.8.2). LCO 3.8.1 requires all three diesels while in MODE 1.
- Condition A defines the limits for the fuel oil tank. If there is < 33,000 gallons but > than 28,285 gallons, action A.1 allows 48 hours to restore level.
- Therefore, the diesel remains OPERABLE as long as the SFDP of LCO 3.0.6 is completed.

While in MODE 1, a diesel trouble alarm is received and the air start receiver is found to be at 100 psig. What are the required Actions?

- From the Table of Contents, Diesel Starting Air is part of LCO 3.8.3.
- LCO 3.8.3 is applicable any time the associated diesel is required to be OPERABLE (referring to LCOs 3.8.1 and/or 3.8.2). LCO 3.8.1 requires all three diesels while in MODE 1.
- Since pressure is < 125 psig, Condition E (air start receiver < 225 psig but > than 125 psig) is not applicable.
- Condition F is applicable (air start not within limits for reasons other that Condition E): declare the associated diesel inoperable immediately (LCO 3.8.1)

### Section 3.9 Refueling Operations

- 3.9.1; Refueling Equipment Interlocks
  - Prevent inadvertent criticalities during RFO's.
- 3.9.2; Refuel Position One Rod Out Interlock
  - Prevents withdraw of more than 1 control rod from full in position
- 3.9.3; Control Rod Position
  - Ensure all control rods inserted while loading fuel into RPV
- 3.9.4; Control Rod Position Indication
  Need "full-in" position for requirements of LCO 3.9.1
- 3.9.5; Control Rod Operability Refueling
  - During refueling any withdrawn control rod must be operable with full scram capability

### Section 3.9 Refueling Operations

- 3.9.6; RPV Water Level Irradiated Fuel
  - Minimum water level in RPV to limit releases during a fuel handling accident of spent fuel
- 3.9.7; RPV Water Level New Fuel or Control Rods
  - Minimum water level in RPV to limit releases during a fuel handling accident of new fuel or control rods
- 3.9.8; RHR High Water Level
  - SDC requirements with large volume of water present during refueling
- 3.9.9; RHR Low Water Level
  - SDC requirements during refueling when cavity not filled, more stringent than high-water level requirements

During refueling operations, the "full-in" rod position indication for a fully inserted control rod is lost. Can fuel movement continue?

- It should recognize that refueling operation is MODE 5 and covered in Section 9 of the TS.
- From the Table of Contents, Control Rod Position Indication is covered by LCO 3.9.4 (or search the TS for "full-in" to find it).
- With a control rod "full-in" position indication channel inoperable, Condition A should be entered.
- Required Action A.1 <u>OR</u> A.2 must be taken (review Section 1.2 on Logical Connectors).

During refueling operations, the "full-in" rod position indication for a fully inserted control rod is lost. Can fuel movement continue?

- Action A.1 consists of immediately suspending invessel fuel movement (A.1.1), <u>AND</u> suspend control rod withdrawal (A.1.2) <u>AND</u> initiate actions to insert all insertable control rods in core cells containing fuel.
- Action A.2 consists of immediately initiating action to fully insert the control rod with the inoperable position indicator (A.2.1), <u>AND</u> initiating action to disarm the control rod (A.1.2).
- Since the rod is already inserted, fuel movement can continue if action is initiated to disarm it.

The unit has just completed refueling operations and the level is > 23 feet above the RPV flange. The "A" and "C" RHR pumps are OPERABLE and the "A" pump is in operation in shutdown cooling mode. No other RHR pumps are OPERABLE and there is no alternate decay heat removal (ADHR) method available. Can the licensee lower level to < 23 feet above the flange?

- It should recognize that refueling operation is MODE 5 and covered in Section 9 of the TS.
- From the Table of Contents, RHR is covered by LCOs 3.9.8 and 3.9.9.
- Review of the LCOs shows that > 23 feet is high level (LCO 3.9.8) and < 23 feet is low level (3.9.9).

With the "A" and "C" RHR pumps OPERABLE and "A" in operation in SDC mode, can the licensee lower level to < 23 feet above the flange (with no other RHR pumps or ADHR available)?

- At high level, only one RHR SDC subsystem needs to be OPERABLE and in operation, while at low level, two RHR SDC subsystems need to be OPERABLE with one in operation.
- Review of the Bases for 3.9.9 shows that the LCO is met with both pumps in 1 loop or a pump in each loop.
- Therefore with "A" and "C" pumps operable the LCO is met with < 23' above the flange and the plant can lower level.

With no RHR pumps OPERABLE in MODE 5 with < 23 feet above the flange, the alternate decay heat removal system fails. What are the required actions?

- The plant was in LCO 3.9.9, Required Action A, when ADHR fails.
- Condition B should be entered and Action B.1 <u>AND</u> B.2 <u>AND</u> B.3 should be taken.

Although one train of Standby Gas Treatment system is available, SR 3.6.4.3.1 for that train has not been completed for several months. Does the licensee have to perform the surveillance?

 Review of the Bases for LCO 3.9.9, Action B shows that completion of the surveillance is not required. With the mode switch in Refuel position and the RPV head removed, a control has been withdrawn from a cell that contains no fuel. The scram accumulator for that rod bleeds down to 900 psig. What are the required actions?

- It should recognize that refueling operation is MODE 5 and covered in Section 9 of the TS.
- From the Table of Contents, Control Rod Operability is covered by LCO 3.9.5
- Since SR 3.9.5.2 is not met (accumulator < 940 psig), the LCO is not met (SR 3.0.1).</li>
- Required Action A.1 should be taken (immediately initiate action to fully insert the control rod).
- **However**, the licensee may choose to enter LCO 3.10.5 or 3.10.6, when not meeting 3.9.5.

### Section 3.10 Special Operations

- 3.10.1; Inservice Leak and Hydrostatic Testing
  - Allows going above 200° without meeting all Mode 3 LCOs
- 3.10.2; Reactor Mode Switch Interlock Testing
  - Permits positioning of the mode switch to other positions for interlock testing without changing MODES
- 3.10.3; Single Control Rod Withdrawal Hot S/D
  - Allows going to refuel to withdraw CR and not enter MODE 2
- 3.10.4; Single Control Rod Withdrawal Cold S/D
  - Allows going to refuel to withdraw CR and not enter MODE 2
- 3.10.5; Single CRD Removal Refueling
  - Provides relief from CRD operability and CR position TSs under certain instances when a CRD must be removed.

## Section 3.10 Special Operations

- 3.10.6; Multiple Control Rod Withdrawal Refueling
  - Provides relief from several 3.9 TSs when multiple rods must be removed as long as fuel is removed from the CR cells
- 3.10.7; Control Rod Testing Operating
  - Permits positioning of the mode switch to other positions for interlock testing without changing MODES
- 3.10.8; SDM Test Refueling
  - Allows deviating from BPWS (LCO 3.1.6) to determine SDM
- 3.10.9; Recirculation Loops Testing
  - Allows deviation from LCO 3.4.1 (natural circulation) during physics testing
- 3.10.10; Training Startups
  - Allows relief from the LCO 3.5.1 for LPCI requirement for one loop while in MODE 2 conducting startup training.

During Reactor Mode Switch Interlock Testing while in MODE 4, the Mode Switch is placed in Run. What operating mode is the unit now in? What additional plant restrictions need to be implemented during the testing?

- From the Table of Contents, Reactor Mode Switch Interlock Testing is a special operation covered by LCO 3.10.2.
- The LCO allows the unit to remain in MODE 4 with the Mode Switch in Run as long as all control rods are fully inserted in core cells containing one or more fuel assemblies and no CORE ALTERATIONS are in progress.

# Questions?