

NRR-DRMAPEm Resource

From: Mahoney, Michael
Sent: Wednesday, June 5, 2019 1:18 PM
To: Edwards, Nicole
Subject: Catawba - ESPS Clarifications
Attachments: Catawba ESPS Clarifications.docx

Nicole,

the attached should help facilitate the 1pm call tomorrow.

Mike

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Subject: Catawba - ESPS Clarifications
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From: Mahoney, Michael

Created By: Michael.Mahoney@nrc.gov

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"Edwards, Nicole" <nicole.edwards@duke-energy.com>
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Catawba ESPS Clarifications

We are aware that you already know the following statements, but for the sake of communication and for you to know our thought process, we state the following:

To meet the TS 3.7.8 LCO, the TS Bases states:

While the NSWS is operating in the normal dual supply and discharge header alignment, an NSWS train is considered OPERABLE during MODES 1, 2, 3, and 4 when:

- a.
 1. Both NSWS pumps on the NSWS loop are OPERABLE; or
 2. One unit's NSWS pump is OPERABLE and one unit's flowpath to the non-essential header, AFW pumps, and Containment Spray heat exchangers are isolated (or equivalent flow restrictions); and
- b. The associated piping, valves, and instrumentation and controls required to perform the safety related function are OPERABLE.

This operability requirement makes provision for a single failure in any NSWS loop to have a remaining NSWS loop which has two NSWS pumps capable of supplying a unit 1 and a unit 2 NSWS train for accident mitigation and opposite unit cooldown. Two pumps/loop are necessary since the flowpath isolations described in a.2 above are not enacted.

The conclusion we draw from this is that 4 pumps must be operable to ensure each unit has two NSWS trains OPERABLE. The TS 3.7.8 LCO requirements account for the automatic MOV lineups that occur depending whether Lake Wylie is available and what unit experiences the DBA. If any NSWS Pump single failure would occur after a DBA, the two NSWS pumps on the NSWS loop that has two OPERABLE NSWS pumps ensures that each unit has one operable NSWS Train for accident mitigation and opposite unit cooldown. For example, if the A NSWS loop has the two operable NSWS pumps (1A and 2A) then the two NSWS trains 1A and 2A perform the necessary safety functions.

Your draft response for Required Action C.2

The purpose of Required Action C.2, as you stated in your draft response, and is also stated in your TS 3.8.1 Bases and is also described in the Standard Technical Specifications is to “provide assurance that an event coincident with a single failure of the associated diesel generator (DG) will not result in a complete loss of safety function.”

In your response to question 1, you addressed the case where “If the NSWS pumps were added to proposed Required Action C.2.” The scenario you discussed (1B offsite circuit is inoperable and the 2A NSWS pump became inoperable) concludes that the 1A and 2B NSWS pumps remain operable. You also stated the 1B NSWS pump although declared inoperable because of the RA C.2, still has emergency power (1B DG). We agree so far. But, now consider the scenario that RA C.2 is in place to address, i.e. “provide assurance

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that an event coincident with a single failure of the associated diesel generator (DG) will not result in a complete loss of safety function.” If an event occurred, i.e. a DBA and a single failure of the 1B DG, the only NSWS pumps running would be NSWS pumps 1A and 2B. The question now is, “with neither NSWS loop having two NSWS pumps (as the TS 3.7.8 Bases says is necessary), is there a loss of safety function?” The TS Bases statement above that require two NSWS pumps in a loop to make the associated unit 1 and unit 2 NSWS trains operable, strongly imply that one NSWS pump each in loops A and B, although capable of supplying the same GPM as two NSWS pumps in the same loop, may not distribute the flow as needed. If this case is a loss of safety function, then RA C.2 should include the NSWS pumps.

We are aware that you stated in your October 8, 2018 letter that the 1B and 2A NSWS pumps supplied all necessary NSWS flow to mitigate a DBA in one unit and cooldown the opposite unit and that you included a change to the TS 3.7.8 Bases stating that “one operable NSWS pump on each loop has sufficient capacity to supply post LOCA loads on one unit and shutdown and cooldown loads on the other unit.” Your October 8, 2018 letter also stated that the loops were isolated from each other when stating that the 1B and 2A NSWS pumps were sufficient. We understand the capacity of any two NSWS pumps would be sufficient, but the necessary valve lineup would also have to be achieved.

Your draft response for Required Action D.3

The purpose of Required Action D.3, as you stated in your draft response, and is also stated in your TS 3.8.1 Bases and is also described in the Standard Technical Specifications is to “provide assurance that a loss of offsite power, during the period the LCO 3.8.1 d DG that is necessary to supply power to a train of shared systems is inoperable, does not result in a complete loss of safety function.”

In your response to question 1, you addressed the case where “If the NSWS pumps were added to proposed Required Action D.3.” The scenario you discussed (1B DG is inoperable and the 2A NSWS pump became inoperable) concludes that the 1A and 2B NSWS pumps remain operable. You also stated the 1B NSWS pump although declared inoperable because of the RA D.3, still has and normal power (1B offsite power). We agree so far. But, now consider the scenario that RA D.3 is in place to address. i.e., “provide assurance that a loss of offsite power, during the period the LCO 3.8.1 d DG that is necessary to supply power to a train of shared systems is inoperable, does not result in a complete loss of safety function.” If a loss of offsite power occurred, the only NSWS pumps running would be NSWS pumps 1A and 2B. The same question stated above for proposed RA C.2 exists for this scenario, RA D.3. If this case is a loss of safety function, then RA D.3 should include the NSWS pumps.

Consider one unit in Mode 5

TS Bases 3.7.8 states:

“One NSWS loop containing one OPERABLE NSWS pump has sufficient capacity to maintain one unit indefinitely in MODE 5 (commencing 36 hours following a trip from

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RTP) while supplying the post LOCA loads of the other unit. Thus, after a unit has been placed in MODE 5, only one NSWS pump and its associated emergency diesel generator are required to be OPERABLE on each loop, in order for the system to be capable of performing its required safety function, including single failure considerations.”

One NSWS pump operable in each NSWS loop satisfies the LCO requirements of TS 3.7.8. If the DG associated with one of those NSWS pumps became inoperable, and the other NSWS pump became inoperable the operating unit would be in a 72-hour Completion Time in TS 3.7.8 and TS 3.8.1. But it could possibly lose all NSWS and safety function if there were a loss of offsite power. This would suggest that NSWS pumps should be included in RA D.3. Similar reasoning would apply for proposed RA C.2