

Discussion and Proposed Resolution of NRC AIT URI (unresolved issue) Relating to Charging Pump "E" Operation (Unit 2 6/14/04 LOOP trip)

This summary is based on review of the PMS typer, ERFDADS information, personnel statements including CRDR 2716521 sequence of events, and follow-up discussion with some of the U2 crew members. Times are provided where readily available.

Sequence of Events

07:41:19 LOP/LOOP - CH pump breakers opened on load shed

07:41:24 DG "A", DG "B" power respective 4160VAC Vital busses

07:41:46 DG "A" problem – PBAS03 LOP. PBBS04 remains energized.

07:43:17 RO starts CH 'B', suction path remains aligned from VCT through NO MOV CH-501. Due to loss of PBA-S03, neither 501 nor (boration path) NC MOV CH-536 have 480VAC. Letdown is isolated and VCT makeup is unavailable due to LOOP.

CRS reaches LOOP (40EP-9EO07) step 11 (VCT makeup not available). CRS determines that, without power to CH-501/536, step 11b is not a viable success path. CRS directs performance of step 11a, CH pump alignment through alternate suction from the RWT. (CRDR on decision/EOP procedure use, 2716521)

AO receives 'expedited' briefing and is provided Attachment 10A. AO accesses RCA after approx. 10 minutes' delay (CRDR 2716806). Attachment 10A is incorrectly performed (CRDR 2716521). AO notifies RO of 10A completion.

08:05:48.5 RO starts CH "E" and verifies adequate 2-pump flow

08:05:52.2 RO secures CH "B".

08:05:58.9 CH "E" trips.

RO contacts AO who verifies CH "E" has tripped.

AO investigates CH "E" trip, no abnormalities found at pump or breaker.

08:06:22.2 RO starts CH "B" which is still aligned to VCT.

Crew assesses success path. With SM involvement, CRS returns to LOOP Step 11b and directs local operation of CH-536 and CH-501.

08:10:45.8 VCT level ~ 10%, RO stops CH "B"

CH-536 is locally opened

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ChE.doc

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08:11:31.0 RO starts CH "B" after CH-536 reported open. RO verifies good CH flow.

08:13 CH-501 is locally closed.

AO enters CR for brief. RO has annotated 'V327' by CH "E" B03 handswitch. AO recognizes that he did not open V327 as part of alternate suction path alignment. After crew discussion, decision is made to perform CH "E" 'mini' fill/vent using portions of existing Ops TD. SM discusses condition with Mechanical Maintenance Engineer. RO starts CH "E" with no abnormalities noted locally or from CR.

Potential corrective/enhancement actions
(expected completion time – end of July 2004)

Two human performance errors were made during the implementation of LOOP/LOFC EOP and standard appendix 10. These errors were discussed with the operators involved. One contributing cause was a mind-set that the use of the CH-536 path was not available since 536/501 had lost power. Another contributing cause was the AO became narrowly focused on the CH-E section of Appendix 10 and missed the preceding step to open CH-327 on the preceding page. These procedures are technically correct as written, however, some human factors improvements may be possible.

- 1) Evaluate 40EP-9EO07 (LOFC) Step 11. The current procedure allows use of V327 only if below or approaching 73% RWT Level. This restriction is not necessary. Recommend the following approach – the preferred path should be (536) as it can normally be performed quickly and easily and doesn't require securing your CH pump. The alternate path (327) is an acceptable approach at any (analyzed) RWT level.
 - *11. IF VCT makeup is NOT available, then perform the following:
 - a. IF RWT level is above 73% (CH536/501 steps follow)
 - b. IF RWT level is below or approaching 73% OR at CRS discretion, perform...(Appendices 10 & 11 follow).
- 2) Evaluate 40EP-9EO10 (Standard Appendices) Appendix 10 – may also apply to Appendix 11, which I have not reviewed. Step 1 of Appendix 10 should be evaluated per CRDR 2716806. The 'RP step' should be moved to Attachment 10-A as the AO should have 10-A in hand but probably won't have Appendix 10 in hand. Attachment 10-A format should be changed such that the step for each CH pump includes all valve manipulations required for success.

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- 3) Include discussion on this CRDR in LOCT/NLOCT. CH "E" ran for about 10 seconds with good flow indicated even though V327 had not been opened. The low-pressure suction trip is around 10 psia.
- 4) Consider a change to the applicable EOP Technical Guides to recognize that either suction path is acceptable with RWT level above 73%.

David A. Oakes 6/30/04

Don Vogt 7/2/04

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Date: 07/02/2004 16:40:21

Reason: I am approving this document

Location: PVNGS

