

St. Lucie SLRA: Breakout Questions

SLRA Section 4.2

TRP:

Note: Breakout Questions are provided to the applicant and will be incorporated into the publicly-available audit report.

Technical Reviewer	On Yee Carol Moyer Isaac Anchondo-Lopez	Date
Technical Branch Chief	Angie Buford (NVIB)	Concurrence Date
Breakout Session	Date/Time	To be filled in by PM

Applicant Staff	NRC staff
<i>To be filled out by PM during breakout</i>	

Question Number	SLRA Section	SLRA Page	Background / Issue (As applicable/needed)	Discussion Question / Request	Outcome of Discussion
#	Cite Section #	Cite Pg #	Description of issue and/or background <ul style="list-style-type: none">Optional link to regulatory basis or code, as applicableIf the question pertains to a document, cite the document and page number.Could resemble RAI, but not as detailedDescribe the purpose and/or need for the question (i.e., the nexus between the question and aging management)	Actual question here	<i>PM takes notes during audit breakout, documenting next steps (ie: resolved, supplement, ePortal request, etc.).</i> <i>For complex technical issues, the TR should also take notes.</i>
1			WCAP -18609-NP – Table 3-1 (Unit 1) <ul style="list-style-type: none">Upper Shell Plates C-6-1, C-6-2 and C-6-3 WCAP -18609-NP – Table 3-2 (Unit 2) <ul style="list-style-type: none">Upper Shell Plates M-604-1, M-604-2 and M-604-3	Were all the shell plates from Luken the same material/specification? Per FSAR Table 5.2-4 – shell materials were “SA-533 Grade B, Class 1 Steel.” Does this	

			<p>Cu content was not available for these plates in CMTRs – so data for all plates provided by Luken to St Lucie were used to determine Cu content, per footnote “(f)” and footnote “(d)” in Tables 3-1 and 3-2, respectively.</p>	<p>description apply to all “shell” materials for Unit 1 and 2 RPVs?</p> <p>Foot note (f) and (d) from tables 3-1 and 3-2, respectively – indicate there are 14 plates total supplied by Luken. What are the 14 plates? I see 3 lower plates, and 3 intermediate plates from each RPV that do NOT cite footnote “(f)” and footnote “(d)”.</p> <p>How was the nickel content of 0.53 determined for Unit 1? Footnotes in Table 3-1 seem to indicate they were from the CMTRs – Confirm?</p> <p>How were the various nickel contents determined for Unit 2? Footnote points to WCAP-18275, which was part of the recent PT limit LAR – but I was not able to find discussion of the source information (e.g., fabrication records, CMTR, etc.) from either WCAP docs.</p> <p>Was RTndt Unirradiated from the CMTRs?</p> <p>Is the source data/document used to determine Cu content available for review/audit?</p>	
2			<p>WCAP -18609-NP – Table 3-2</p> <ul style="list-style-type: none"> Upper Shell Axial Weld Seams 101-122 A & C - 101-122 B 	<p>CE-NSPD-1119 is 20+ years old. Has an effort/evaluation/check been done to see if there is any additional information/data that would impact this material/weld?</p>	

			<ul style="list-style-type: none"> Hot Leg Nozzle to Shell Weld Seam 105-121A <p>For these materials foot note (e) states - Cu and Ni from CE-NPSD-1119 [Ref. 14), Table 5.</p>	<p>If it is – was it accounted/incorporated into the values reported in WCAP - 18609-NP?</p> <p>If not – discuss whether something does need to be done (why or why not) to see if there is any additional info for these materials.</p> <p>Can supporting documentation on how these values were determined/calculated be provided on portal as appropriate?</p>	
3			<p>WCAP -18609-NP – Table 3-2</p> <ul style="list-style-type: none"> Hot Leg Nozzle to Shell Weld Seam 105-121B. <p>For this material foot note (k) states This nozzle weld material was fabricated with six distinct shielded metal arc welds (SMAWs), specifically Heat #'s EACAE, FAOJE, GABFE, HABIE, IAOCE, and KAOCE. The reported chemistry, RTNoT, and USE reported are the maximum values taken from the weld fabrication records for each of the welds. 0-1 = 0° F because RTNoT is based on measured data for each weld.</p>	<p>Unit 2 - Hot Leg Nozzle to Shell Weld - Seam 105-121B – can you provide the source data/document of the six SMAW welds cited in footnote (k) of table 3-2?</p> <p>For these six SMAWs – use of max Cu, Ni and RTndt would be conservative – but isn't using the max USE non-conservative? From reading footnote (k) it seems there would be initial USE values that could be lower than the reported value in Table 3-2 (i.e., 128 ft lbs). Am I misunderstand/mis-reading the footnote?</p> <p>Can supporting documentation on how these values were determined/calculated be</p>	

				provided on portal as appropriate?	
4			<p>WCAP -18609-NP – Table 3-2</p> <p>Intermediate to Lower Shell Girth Weld Seam 101-171</p> <p>For this material/weld – the original LRA had three entries for this material/weld in LRA Table 4.2-2 – looks like copper content and initial USE varied.</p> <p>Table 3-2 of WCAP -18609-NP and SLRA Table 4.2.3-2 only has one entry (for two heats 83637 / 3P73 I 7)</p>	<p>Was there a third heat that was included as part of the 60-year LRA? If so, why wasn't it included in the 80-year SLRA?</p> <p>It does not look to be limiting in comparison to the two heats discussed in the SLRA – is this true?</p>	
5			<p>WCAP -18609-NP – Table 3-2</p> <ul style="list-style-type: none"> Hot Leg Nozzle A M-4103-2 Hot Leg Nozzle B M-4103-1 <p>Copper content of 0.127 was taken from PWROG-15109 – per footnote “(j)”</p> <p>Nickel content is 0.66 and 0.68, respectively for the two nozzles.</p> <p>PWROG-15109 – assumed a nickel content of 0.9% for the forgings</p>	<p>Where did the nickel content information come from? Was it from a CMTR or some other data/document?</p> <p>If it was from a CMTR - was the copper content information available – and the use of 0.127 from PWROG-15109 conservative?</p> <p>Why only use the Cu from PWROG-15109 but not the Ni content of 0.9% too?</p>	
6			<p>WCAP -18609-NP – Table 3-1 and Table 3-2</p> <p>Nickel content values for “beltline” and “extended beltline” materials <u>WITHOUT</u> footnotes. Source information for these values is not clear for Units 1 and 2.</p> <p>WCAP-18275-NP (supports recent PT limit LAR) for Unit 2 has nickel values for reactor vessel</p>	<p>What is the source information for nickel content values for materials <u>without</u> footnotes in WCAP -18609-NP – Table 3-1 and Table 3-2?</p>	

			materials consistent with SLRA – But source for nickel content values was not described in this report either.		
7			<p>WCAP -18609-NP – Table 3-1</p> <p>St Lucie 1 - Upper to Intermediate Shell Girth Weld Seam 8-203 – Heat number 21935</p> <ul style="list-style-type: none"> CE-NSPD-1119 is cited as the source document for Cu and Ni content (0.183 and 0.704, respectively). <p>Based on the information on RVID2 (https://www.nrc.gov/reactors/operating/ops-experience/reactor-vessel-integrity/database-overview.html), there appears to be additional data for Heat number 21935 that varies from the information in WCAP-18609.</p>	<p>Is the additional information in RVID2 applicable to Heat number 21935?</p> <p>CE-NSPD-1119 is 20+ years old. Has an effort/evaluation/check been done to see if there is any additional information/data that would impact this material/weld?</p> <p>If there was – was it accounted/incorporated into the values reported in WCAP - 18609-NP?</p> <p>If not – discuss whether something does need to be done (why or why not) to see if there is any additional info for these materials.</p>	
8			<p>WCAP -18609-NP – Table 3-1</p> <p>St Lucie 1 - Upper Shell Axial Weld Seams 1-203 A, B & C – Heat number 21935/12008</p> <ul style="list-style-type: none"> CE-NSPD-1119 is cited as the source document for Cu and Ni content (0.213 and 0.867, respectively). 	<p>CE-NSPD-1119 is 20+ years old. Has an effort/evaluation/check been done to see if there is any additional information/data that would impact this material/weld?</p> <p>If there was – was it accounted/incorporated into the values reported in WCAP - 18609-NP?</p> <p>If not – discuss whether something does need to be done (why or why not) to see if there is</p>	

				any additional info for these materials.	
9			<p>WCAP -18609-NP – Table 3-1 and Table 3-2</p> <p><u>Extended beltline</u> materials for Unit 1</p> <ul style="list-style-type: none"> Upper Shell Plate C-6-1, C-6-2, and C-6-3 <p><u>Extended beltline</u> materials for Unit 2</p> <ul style="list-style-type: none"> Everything <u>EXCEPT</u> Hot Leg Nozzle to Shell Weld Seam 105-12 IB <p>Footnotes indicate that RTndt (u) are measured values</p>	<p>Discussion on source documents that measured values came from?</p> <p>Discussion on search/evaluation/assessment to determine these values?</p> <p>Can supporting documentation on how these values were determined/calculated be provided on portal as appropriate?</p>	
10			<p>WCAP -18609-NP – Table 3-1</p> <ul style="list-style-type: none"> St Lucie 1 - Upper to Intermediate Shell Girth Weld Seam 8-203 – Heat number 21935 St Lucie 1 - Upper Shell Axial Weld Seams 1-203 A, B & C – Heat number 21935/12008 <p>Footnote (g) - USE for Heat# 21935 is from Diablo Canyon I (WCAP-17315-NP [Ref. 16]), Intermediate to Lower Shell Weld Seam 9-442. Both materials were made with Heat #21935 and Linde 1092 flux.</p> <p>Footnote (h) - RTNDT(U) for Heat# 21935/ 12008, Linde 1092, Lot 3869 is from identical material at Diablo Canyon 2 (WCAP-17315-NP [Ref. 16]).</p> <p>Footnote (i) - USE for Heat# 21935/ 12008, Linde 1092, Lot 3869 is from identical material at Diablo</p>	<p>Is it normal practice to use “initial” values from the same weld material at another plant? Any other examples that this was done in the industry?</p> <p>Use of info from another plant makes sense for chemistry values (i.e., Cu and Ni), since this would be tied to the weld material content, but for initial RTndt and USE (i.e., material properties that could be impacted by actual welding and post- weld activities, etc.), wouldn't these initial values vary from plant to plant depending on the weld process, qualification, post weld heat treatment, fabricator, time of fabrication, etc?</p>	

			Canyon 2 (WCAP-17315-NP [Ref. 16]), specifically Intermediate Shell Axial Welds 2-201 A/B/C.	What is the basis to use “initial” material properties from another RPV?	
11			<p>WCAP-18609-NP – Table 3-2</p> <p>Extended beltline materials – everything except Hot leg nozzle to shell weld Seam 105-121B – Footnote (a) indicates that values for RTndt initial came from WCAP-18275</p> <p>The method for calculating these values does not appear to be documented in WCAP-18275 or WCAP-18609.</p>	<p>Discussion and basis for these for RTndt initial values of extended beltline materials – everything except Hot leg nozzle to shell weld Seam 105-121B.</p> <p>Can supporting documentation on how these values were determined/calculated be provided on portal as appropriate?</p>	
12			<p>WCAP-18609-NP – Table 3-2</p> <p>Footnote (g) states - “The weld fabrication records contain no shear data for these materials. For Heat# 5P5622 and Heat# 4P6519, the USE is the average of all available Charpy V-notch energy data points. For Heat# 2P5755, the USE is the average of all data points tested at 10°F.”</p>	<p>Discussion/confirmation – This method to determine USE is conservative – and likely grossly conservative – correct?</p> <p>Looking for confirmation that I understand/read/interpreted footnote (g) properly.</p> <p>Can supporting documentation on how these values were determined/calculated be provided on portal as appropriate?</p>	
13	SLRA Section 4.2	USE, ART and PTS tables in SLRA Section 4.2	<p>The tables provided in SLRA Section 4.2 for USE, ART and PTS values – in particular they provide details for USE, ART and PTS values when surveillance data is and is NOT used.</p> <p>Since values with/without surveillance data are provided – it’s not clear which one is being “credited.”</p>	Confirmation/discussion of which “value” is being credited in these SLRA tables.	

		<p>PTS values - 50.61 would require the surveillance data be used if it is deemed credible – Based on SLRA – it seems like credible data changed which material would be limiting for PTS, so it appears data was incorporated.</p> <p>ART and USE – since it is in the Reg Guide and not regulation it would be at the discretion of the licensee if they don't want to take advantage of the "benefit" – looking for confirmation.</p> <p>EXAMPLE – not limited to this example – see footnote (d) in Table 5-4 of WCAP-18609-NP – Position 1.1 CF is conservative compared to Position 2.1 CF (from BV data) – It is not clear which "value" is being credited.</p>		
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