Record of Revision

Revision No.	Pages/Sections/ Paragraphs Changed	Brief Description / Change Authorization
000	All	Initial Release
001	All	The purpose of Revision 001 is to incorporate customer comments. See revision bars in left hand margin for specific changes made.
002	All	The purpose of Revision 002 is administrative only to: 1. Remove the Export Control Information on page 1. 2. Update the revision level of Reference 9.g to the latest version.

Legibility of content in Appendix A is not essential to the information presented and recorded in the FDMS system.

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1.0 EXECUTIVE SUMMARY

In 2024 inspections were performed on the Palisades steam generators (SGs) to evaluate their condition in anticipation of restarting the plant. Work performed in 2024 is designated as outage 1D28, where the "D" refers to "defueled". Degradation exceeded what was expected, but through eddy current testing and in-situ pressure testing, it was established that the SGs satisfied performance criteria for structural integrity and accident-induced leakage. This is fully detailed in the 1D28 Condition Monitoring report [9.g]. The 1D28 outage ended in fall of 2024

In the spring of 2025, work resumed with a focus on in-situ pressure testing and repairs (tube de-plugging, tube plugging and sleeving). The 2025 outage is designated as 1D28R, where the "R" refers to "repairs".

The 1D28R repair outage includes the following SG activities :

- In-situ pressure test was completed on 17 tubes (this is discussed in the CM report [9.g])
- 500 previously out-of-service (OOS) tubes were de-plugged and evaluated to be returned-to-service (RTS) [10.k]
    - 275 previously OOS tubes were RTS, of which only 42 tubes required sleeves
    - All de-plugged tubes that could not be RTS were re-plugged with alloy 690 rolled plugs.
- 283 tubes in-service at 1D28 were plugged with alloy 690 rolled plugs
- 94 stabilizers installed
- 2979 sleeves installed in tubes planned to be RTS
    - 8 sleeves in 4 tubes were removed from service after installation
- Steam generator chemical cleaning scheduled to be performed in October 2025

This operational assessment performed for cycle 29 of 1.5 EFPY evaluates steam generator tube degradation mechanisms which were identified in 1D28 as well as those identified during prior inspections but not during 1D28. For the projected cycle length of 1.5 EFPY all damage mechanisms are predicted to not exceed structural integrity or leakage integrity limits based on a probability of burst and probability of leakage of 0.05 where probabilistic models were used.

2.0 PURPOSE

The purpose of this report is to show that there is reasonable assurance that the performance criteria will be met over the next operating cycle 29 for an assumed length of 1.5 EFPY. The performance criteria are based on NEI 97-06 [1] and summarized in the CM document reference [9.g, Section 6.0]. An operational assessment (OA) must be performed to ensure that steam generator tubing will meet the technical specification performance criteria throughout the upcoming operating cycle. The OA herein projects and evaluates steam generator tube degradation mechanisms that were identified during the 1D28 outage as well as those identified during prior inspections but not during 1D28.

3.0 SCOPE

This evaluation pertains to the Palisades Unit 1 replacement steam generators (CE Model 2530), which are reactor coolant system components. In accordance with [2.a], the CM assessment document [9.g] should be completed prior to plant entry into Mode 4 during start up following the SG inspection. NEI 97-06 [1] and [2.a] require that an OA is performed after each SG inspection and completed within 90 days after Mode 4. This evaluation includes all tube plugging/stabilization and sleeving as well as the operational assessment for the next operating cycle.

4.0 ASSUMPTIONS

There are no assumptions requiring verification used in this document.

5.0 1D28 TUBE REPAIR

5.1 Plugging/Stabilization

During the 1D28 outage, Framatome stabilizers and rolled plugs were installed in tubes that were determined to be exempt from sleeving based on the screening criteria in Reference [10.l]. Plugging and stabilization performed at 1D28R is shown in Table 5-1. Final plugging and sleeving lists are found in Appendix A.

Table 5-1: 1D28 Tube Plugging Stabilization

	SGA	SGB
In-Service Tubes Plugged at 1D28	203(1)	80(1)
De-plugged tubes re-plugged	169(2)	56(2)
Tube Sheet Stabilizers Installed	66	23
Full Length Stabilizers Installed	2	3
Total Tubes Plugged at 1D28	730	437

Notes:
1. Tubes that were in-service during cycle 27
2. Only 11 tubes (7 in SGA and 4 in SGB) were re-plugged on both the hot and cold leg. The remaining tubes were de-plugged and then re-plugged on the hot leg only [10.k].

5.2 De-plugging

De-plugging and Sleeving activities took place from May-August 2025, designated 1D28R (i.e., "R" represents "repair"), with the goal of having previously plugged tubes returned to service (RTS). De-plugging activities were focused on tubes around the stay cylinder region preventatively plugged prior to service (referred to as PSI tubes) and tubes plugged during in-service inspections (referred to as ISI tubes). In total, 500 tubes were de-plugged in both SGs with 275 tubes being RTS with or without sleeves, and 191 total sleeves installed in 42 de-plugged tubes. Tubes that were de-plugged and RTS included 134 axial crack-like indications (SAI) at sleeved locations, and 141 indications of support wear (maximum wear depth of 36%TW in each SG) between the two SGs. Additionally, 466 alloy 600 plugs were removed from both SGs with another 199 alloy 600 plugs replaced with alloy 690 plugs.

A summary of activities and results concerning the de-plugged tubes, including lists of all tubes and flaws RTS are provided in a separate summary report [10.k].

5.3 Sleeving

During the 1D28 outage sleeving was performed to repair and return tubes to service that were determined to be repairable based on the screening criteria in Reference [10.l]. Total number of sleeves installed at 1D28 is shown in Table 5-2 and Table 5-3. Sleeve lists are found in Appendix A. Tubes that had issues with sleeving and required re-plugging/plugging are shown in Table 5-4.

Table 5-2: 1D28 SGA Tube Sleeving

	Tubes w/ Sleeves	Sleeve Type	01H	02H	03H	04H	05H	Total
De-Plugged Tubes	23	Corrective (In-Service)	19	10	10	8	4	51
		Preventative (In-Service)	0	12	13	15	9	49
1D28 Tubes	513	Corrective (Installed)	249	181	65	87	30	612
		Corrective (In-Service)	249	180	65	87	30	611
		Preventative (Installed)	0	217	371	409	398	1395
		Preventative (In-Service)	0	217	370	407	394	1388
		Total (Installed)	**268**	**420**	**459**	**519**	**441**	**2107**
		Total (In-Service)	**268**	**419**	**458**	**517**	**437**	**2099**

Table 5-3: 1D28 SGB Tube Sleeving

	Tubes w/ Sleeves	Sleeve Type	01H	02H	03H	04H	05H	Total
De-Plugged Tubes	23	Corrective (In-Service)	15	8	4	4	4	35
		Preventative (In-Service)	0	11	15	15	15	56
1D28 Tubes	181	Corrective (Installed)	110	57	17	19	6	209
		Corrective (In-Service)	110	57	17	19	6	209
		Preventative (Installed)	0	98	148	161	165	572
		Preventative (In-Service)	0	98	148	161	165	572
		Total (Installed)	**125**	**174**	**184**	**199**	**190**	**872**
		Total (In-Service)	**125**	**174**	**184**	**199**	**190**	**872**

Table 5-4: Sleeved Tubes that Required Plugging at 1D28

SG	Tube	Location	CR No.	Reason
A	68-117	5H	2025-1831	Expansion Issues. Tube plugged.
A	99-92	5H	2025-1686	Expansion issues. Tube plugged.
A	77-124	4H	2025-1833	Expansion issues. Tube plugged.
A	22-105	02H	2025-2027	Expansion issues. Tube plugged.
B	No sleeved tubes in SGB required plugging at 1D28.			

5.4 Total Effective Plugging

Due to sleeve installation performed at 1D28R, calculation of an effective plugging equivalent is required to account for the installed sleeves impact on the steam generator technical specification plugging limit of 15% for an individual SG [5.d]. An analysis of the impact of the number of sleeves installed as a function of number of plugs installed to develop a sleeve-to-plug ratio is detailed in Reference [27] (i.e., as total tubes plugged increases the sleeve-to-plug ratio also increases). Quantities of plugs and sleeves installed are shown in Table 5-5.

The methodology used in Reference [27] was used to calculate the sleeve to plug ratio for SGA as well as the effective plugging to compare total effective plugging to the 15% technical specification limit. Results are shown Table 5-5.

Table 5-5: 1D28 Total Effective Plugging

	A	B	All
Tubes Plugged Prior to 1D28	666	493	1159
Tubes Plugged at 1D28	203	80	283
Total de-plugged Tubes RTS at 1D28 [10.k] (1)	139	136	275
De-plugged PSI Tubes Returned to Service at 1D28 [10.k](1)	*116*	*117*	*233*
De-plugged ISI Tubes Returned to Service at 1D28 [10.k](1)	*23*	*19*	*42*
Total Tubes Plugged at 1D28	730	437	1167
Sleeves In Service at 1D28	2099	872	2971
Sleeve-to-Plug Ratio at 1D28 [27] (2)	11.57	10.33	N/A
Effective plugs	182	85	N/A
Total Effective Plugging	912	522	1434
Total Tubes	8219	8219	16438
Technical Specification Plugging Limit [5.d]	15%	15%	N/A (3)
Effective Tubes Plugged	11.1%	6.4%	N/A (3)

Notes.
1. The total de-plugged tubes RTS at 1D28 included tubes that were plugged pre-service inspections (PSI) and tubes that were plugged during in-service inspections (ISI) prior to 1D28.
2. The sleeve-to-plug ratio is a function of the number of total tubes plugged in the SG per the analysis in Reference [27].
3. The technical specification plugging limit is for any one SG.

5.5 Tube Plugging for future tracking

During the sleeving process the tubes in Table 5-6 had issues that, in the future, will require plugging upon detection of an indication in the parent tube behind specified sleeves.

Table 5-6: Tubes with Preventative Sleeve Locations that are Plug-on-Detection at Future Inspections Due to Sleeve Installation Issues

SG	Tube	Location	CR No.	Issue	Action for Resolution
A	37-116	02H	2025-2018	Sleeve installation issues. Project Engineer recommended to leave in service.	"UTIL" 3LC will be added to ETSS for future tracking Below are examples. More can be added per engineering request. - Multiple mid expansions – MMX - Delta displacement above – DDA - Delta displacement below – DDB For example, future DA/Inspection Scope will have to confirm any Flaw at a location with MMX
A	105-112	05H	2025-1653	Sleeve installation issues. Project Engineer recommended to leave in service.	
A	115-106	05H	202-1661	Sleeve installation issues. Project Engineer recommended to leave in service.	Tube location is to be plugged (removed from service) on detection of an indication in the parent tube behind the 05H sleeve.
B	There were no tubes with preventative sleeve locations in SGB that had sleeve installation issues.				

6.0 OPERATIONAL ASSESSMENT

The Palisades SG Program requires that a "forward looking" Operational Assessment (OA) be performed to determine if the steam generators will continue to meet their structural and leakage integrity requirements at the end of the upcoming operating cycle (EOC 29). The OA herein (analyzed for a conservative cycle length of 1.5 EFPY) will address degradation mechanisms observed during the current inspection and previously (but not detected during 1D28) degradation mechanisms.

As previously discussed in Reference [9.g], the following tube degradation mechanisms were identified during the 1D28 steam generator inspections:

- Support Wear
  - Diagonal bar (DB) support wear
  - Vertical strap (VS) support wear
  - Eggcrate (EC) support wear
- Foreign object (FO) wear
- Axial outer diameter stress corrosion cracking (ODSCC) at hot leg eggcrate intersections
- Axial ODSCC at a dented vertical strap location (dent bobbin voltage <2 Volts)
- Axial ODSCC at hot leg top-of-tubesheet (TTS) locations
- OD Axial in Freespan
- Circumferential ODSCC at hot leg top-of-tubesheet (TTS) locations
- Axial Primary water stress corrosion cracking (PWSCC) within the tubesheet on the hot leg
- Axial primary water stress corrosion cracking (PWSCC) at VS at a dent

The following degradation mechanisms have been identified in the past but were not present at 1D28

- Tube to Tube Wear
- Axial IGA in FS
- OD Circ in Non-Expanded Tubesheet
- OD Axial Near Tube End
- OD Axial in Freespan Ding
- ID Axial in TSH Expansion Transition
- ID Axial in u-bend
- ID Circ in TSH Expanded Region
- Wear at Dented Support

6.1 Noise Monitoring

In accordance with EPRI guideline recommendations [2.b, Appendix N], noise monitoring was performed through measurement comparisons of the 1R21 through the 1D28 inspections from Palisades eddy current data at various Regions of Interest (ROI) for Bobbin (Eggcrate, Freespan, and Vertical Strap locations), and +Point (top-of-tubesheet (TTS), dent/ ding, and u-bend locations) as identified in the degradation assessment [8.g]. These comparisons are to determine if the Palisades SG noise remain relatively unchanged since noise measuring was first

performed in 1R21 [4.c] and whether model assisted probability of detection (MAPOD) needs to be performed using Palisades-specific noise for any of the 1D28 OA evaluations.

As Figure 6-1 through Figure 6-4 demonstrate, the noise levels (as measured by eddy current inspection) are similar between the past eight inspections (2010 through 2024).

1R23 was the first outage at Palisades where ETSS I11524 (Appendix I technique for detection of circumferential PWSCC at TTS) was used, and as illustrated in Figure 6-5 the ETSS I11524 noise levels are bounding for the Palisades TTS noise measurements. Bobbin probe ETSS I-28413 is the principal detection technique for axial ODSCC in the tube freespan and supports (i.e. eggcrate and vertical strap) which can be adjusted using Palisades noise at each ROI to generate various POD distributions as is done in the Degradation Assessment which determined the bounding POD used in the operational assessment [8.a, Section 12.0 and Figure 12-3]. Including vertical strap noise into the comparison results in a POD which is still bounded by the POD used in the OA.

Review of the Palisades noise in 1D28 showed no significant change in noise has occurred since 1R21 providing the basis for the continued use of the POD assumptions used in previous and current Palisades operational assessments.

Figure 6-1: Eggcrate Bobbin Noise Comparison – 2014 through 2024 (Limiting SGs)

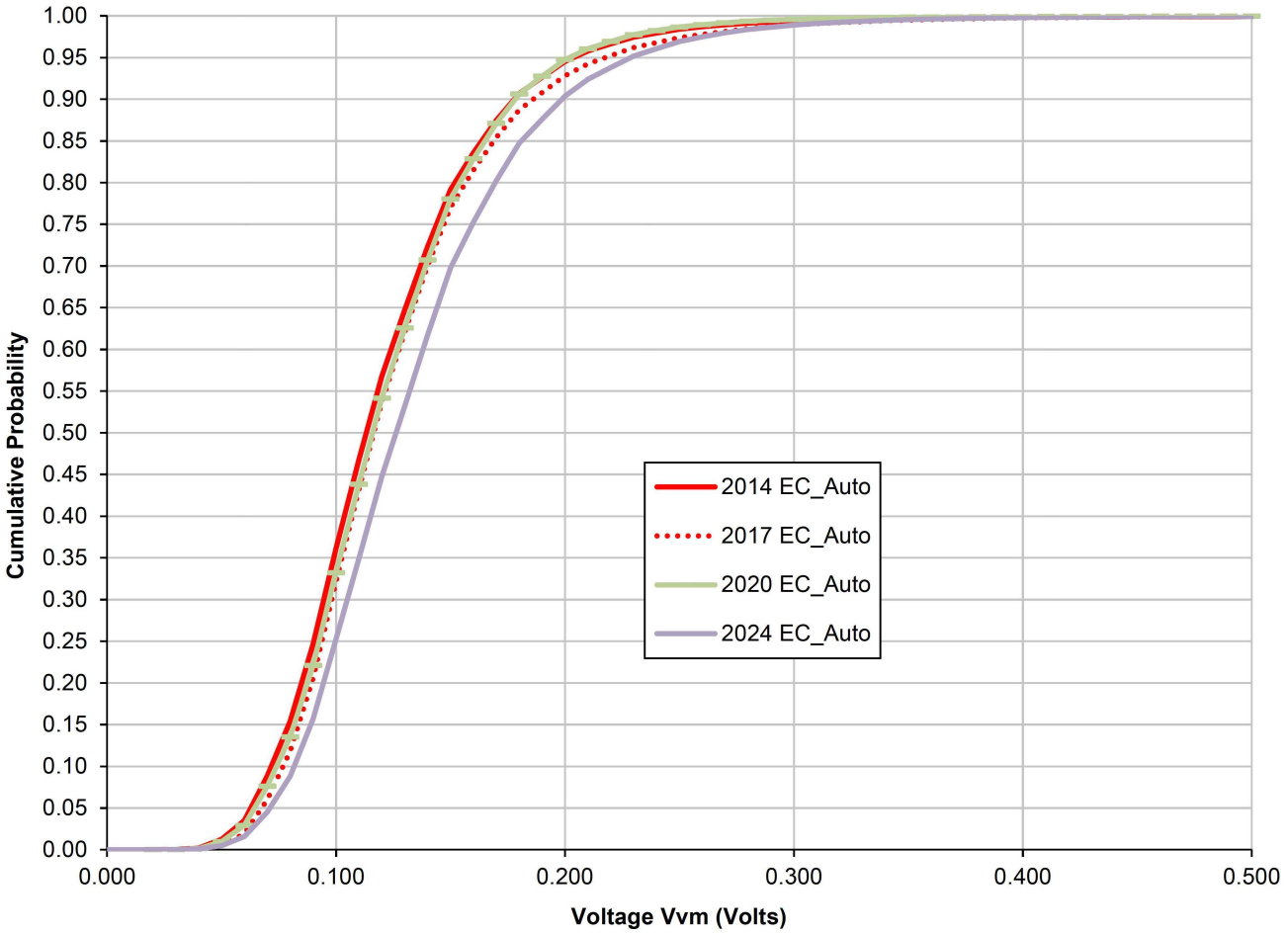


Figure 6-2: TTS +Point™ Noise Comparison – 2014 through 2024 (Limiting SG)

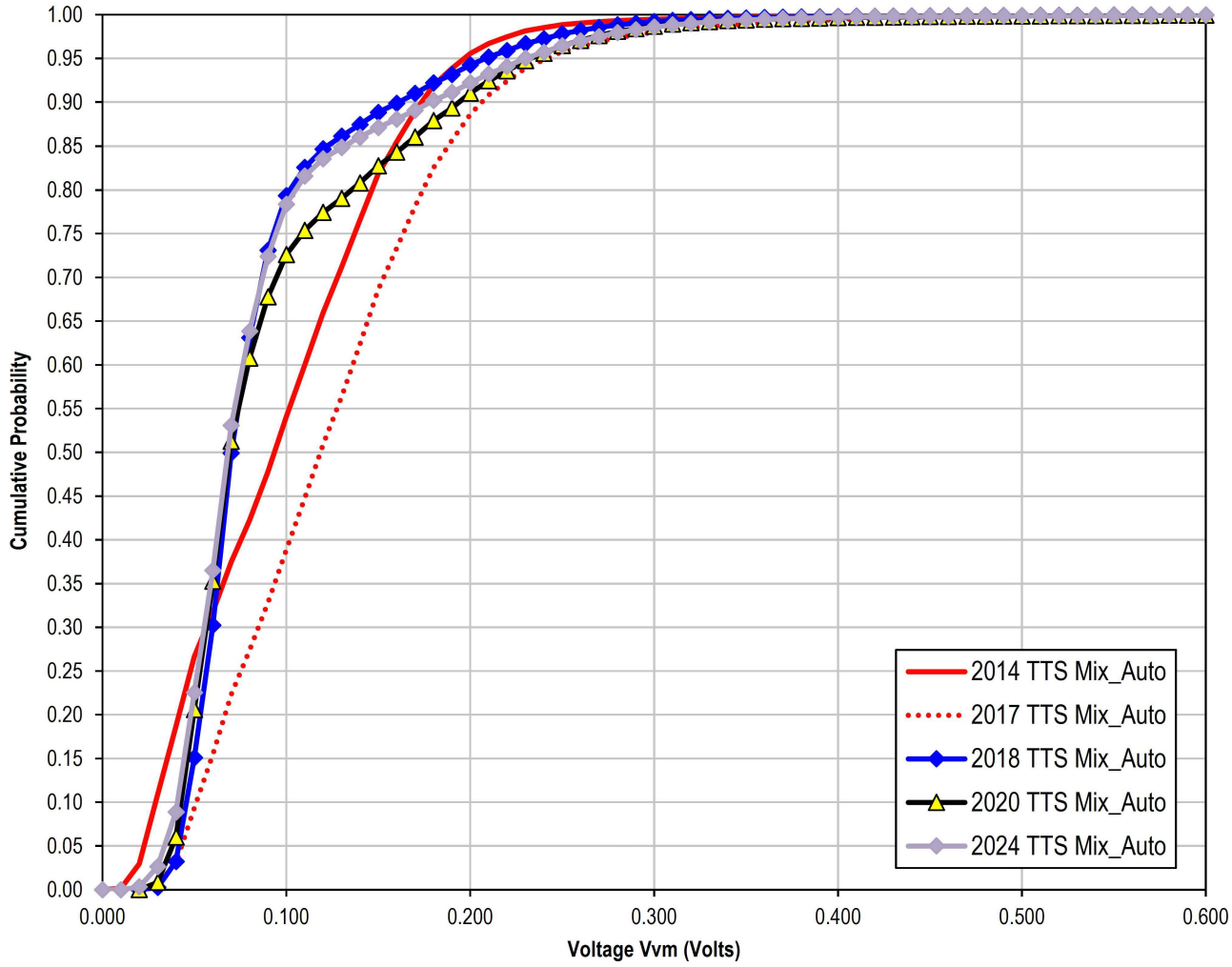


Figure 6-3: Dent +Point™ Noise Comparison – 2010 through 2024 (All SGs)

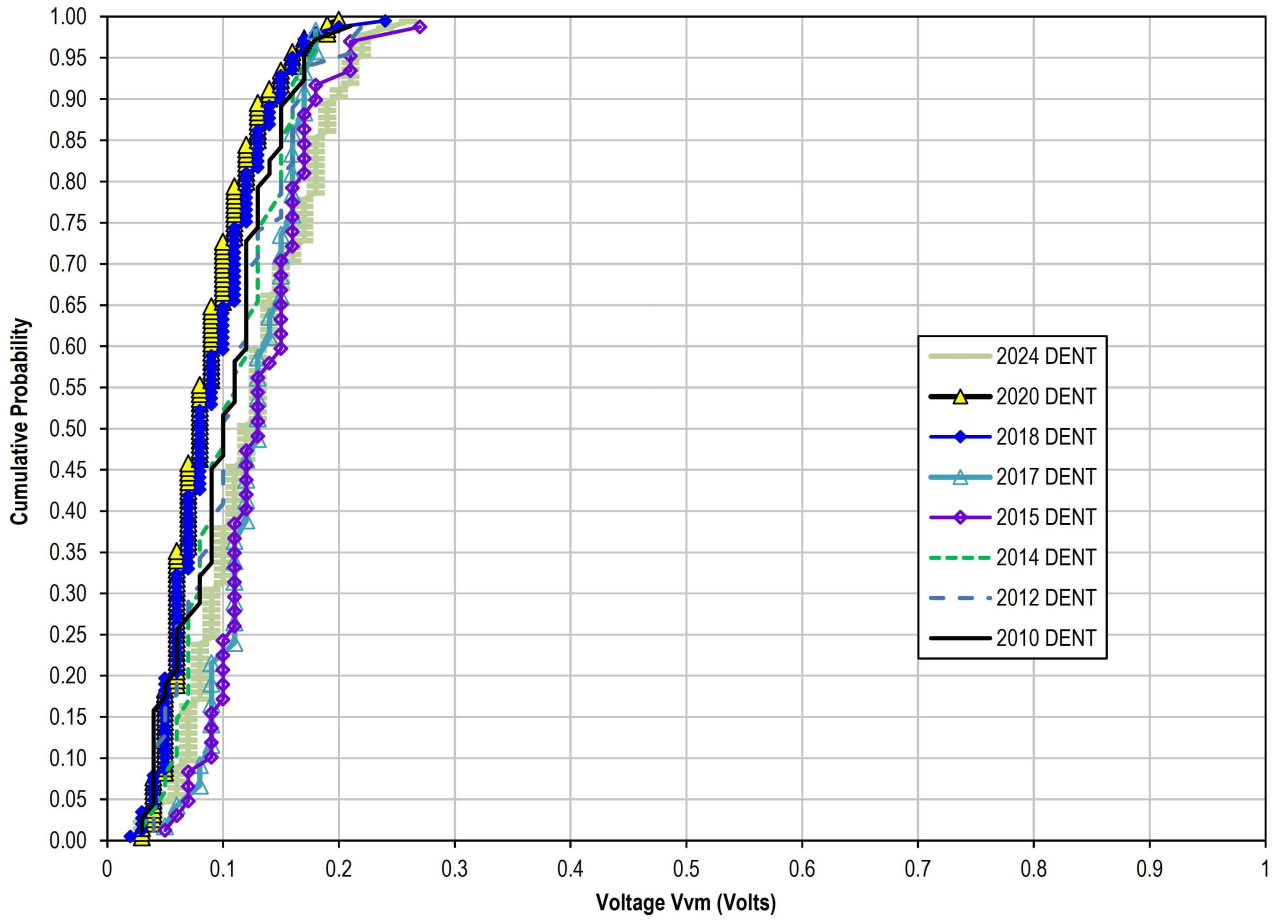


Figure 6-4: U-bend +Point™ Noise Comparison – 2010 through 2024

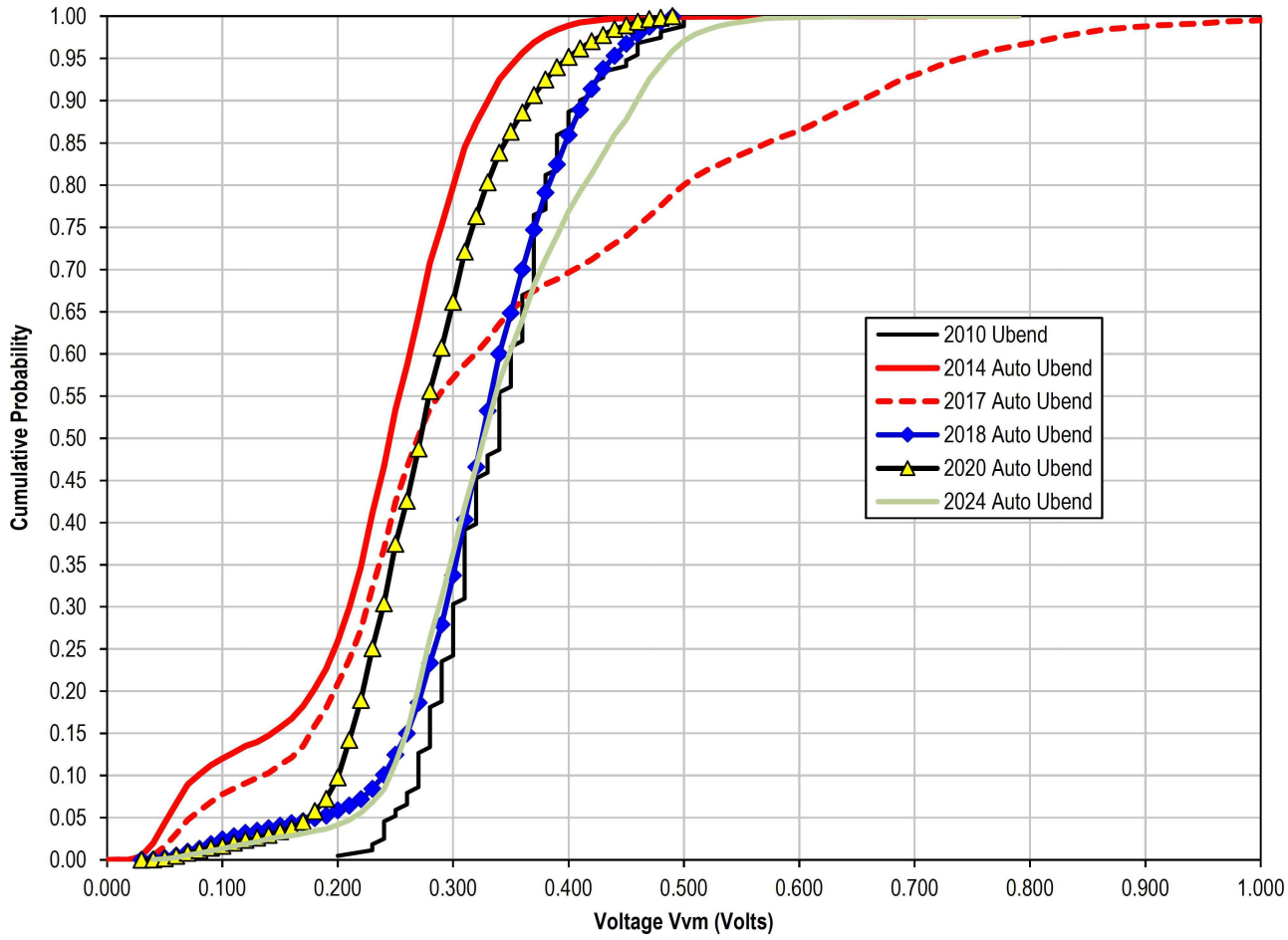
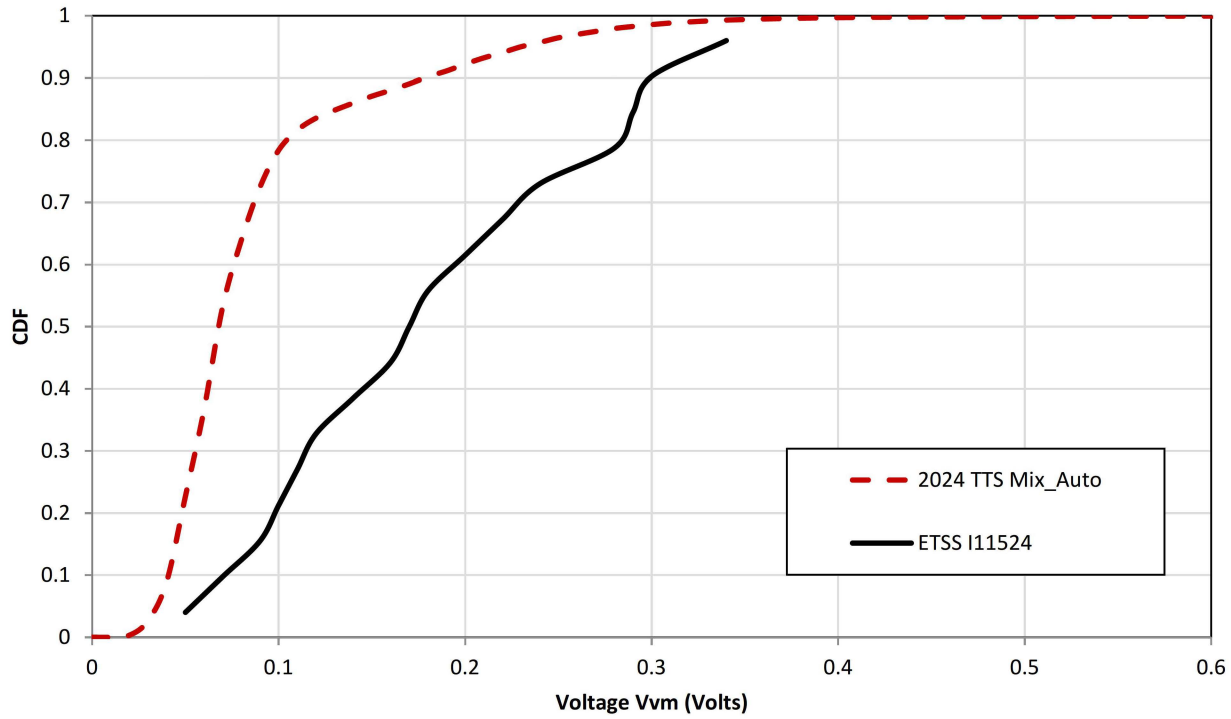


Figure 6-5: ETSS I11524 to 2020 TTS Noise Comparison (Limiting SG)



6.2 Evaluation of Structural Integrity for Detected Population of Existing Degradation Mechanisms

The fundamental OA structural integrity criterion is that the projected worst case degraded tube for each existing degradation mechanism must meet the limiting structural performance parameter with a 95% probability and 50% confidence. Various strategies are used within this OA to demonstrate that this criterion will be met throughout the next operating cycle. Each mechanism is discussed in turn in the subsections below. The basic input parameters provided in Table 6-1 are also used for the operational assessment.

6.2.1 Tube Support Wear

The typical deterministic approach for performing an OA for wear is to identify the worst case flaw left in service during the current outage, apply an allowance for NDE sizing uncertainty and an upper bound growth rate to reflect growth during the next cycle; and compare the resulting depth (i.e., the end-of-cycle (EOC) depth) to the structural limit at a bounding length. This is generally appropriate for degradation mechanisms which involve a small number of flaws. However, when many flaws (hundreds or thousands) of a particular mechanism are expected to develop or are left in-service, it may be non-conservative to perform a deterministic OA evaluation of this type. A probabilistic approach addresses the fact that the presence of a large number of flaws in-service increases the probability that one or more of the flaws will grow to a structurally significant depth by the EOC. Hence, this evaluation approach will yield a lower plugging limit for a SG which has a large population of flaws than would a typical deterministic approach. Due to the large number of tube support wear indications in-service in the Palisades SGs, it is prudent to use a probabilistic approach for this mechanism. Therefore, the OA for support wear was performed using Framatome's full tube bundle probabilistic OA model [29].

This full bundle model uses the following key inputs:

- The population of wear flaws returned to service
- The growth rate distribution anticipated during the next operating cycle
- NDE ETSS regression and uncertainty parameters
- Newly initiated flaws expected during the next cycle.

The model "grows" each flaw that is returned to service (RTS) by randomly sampling from the growth rate distribution, yielding one estimate of the EOC depth for each flaw. In addition, the entire population of expected newly initiated flaws is added to the EOC flaw population. The calculation also considers uncertainties associated with material strength, NDE sizing, the ratio of maximum flaw depth to structurally significant flaw depth, and the burst equation itself. Within the full bundle OA tool, support wear is evaluated using the EPRI Flaw Handbook degradation model for axial part-throughwall degradation less than 135° in circumferential extent, subjected to pressure loading of 3ΔP. From this EOC population (RTS + New) the burst pressure of the worst case degraded tube is calculated and compared with the value of 3ΔP. This process is repeated thousands of times (via a Monte Carlo process) to develop a probability of burst for the worst case degraded tube. This value must be less than 5% to successfully satisfy the fundamental OA criteria. If the result is greater than 5%, a lower plugging limit must be implemented. Each of the inputs are described below and summarized in Table 6-3.

6.2.1.1 Return to Service Indications and Growth Rates

One of the underlying assumptions implemented within the full bundle OA model is that growth rates going forward are random with respect to the current wear depth and they are applied to all flaws returned to service. The full bundle model conservatively assumes that all tubes with support wear <40%TW were returned to service following 1D28, even though some tubes that were plugged during 1D28 did contain (non-repairable) support wear. The growth rate distributions for SGA and SGB support wear are shown in Figure 6-6. These distributions were used in the evaluation to develop a bounding Kunin growth rate distribution. Due to the consistent growth rates in each SG over the past couple inspections, combined SG specific growth rates were used:

- SGA average wear growth rate: 0.43 %TWD/EFPY with a 95th percentile growth rate of 3.18 %TWD/EFPY
- SGB average wear growth rate: 0.33 %TWD/EFPPY with a similar 95th percentile of 3.18 %TWD/EFPY.

6.2.1.2 Structural to Maximum Depth Ratio

The ratio of structural to maximum depth can be applied within the simulation to reflect the influence of tapered morphology on burst pressure. For flat wear, this ratio is equal to one. For tapered wear, this ratio is less than one, and its application has the effect of reducing the maximum, NDE-indicated flaw depth prior to the calculation of burst pressure. Although some of the Palisades tube support wear is tapered, a fixed value of 1.0 was conservatively used for the ratio of structural to maximum depth in this analysis.

6.2.1.3 Initiation and Depth Distribution of New Indications

The number of newly reported indications at 1R29 is estimated within the OA model by projecting forward based on a Weibull fit to the number of new indications reported during the last six inspections (i.e., 1R23 through 1D28). It is assumed that the depth distribution of tube support wear indications projected to be newly reported at 1R29 will have the same statistical characteristics as those newly reported during 1D28. Because the number of newly reported wear flaws in each SG (during 1D28) was relatively low (88), it was necessary to combine the new wear flaw populations from both SGs in order to establish a reliable new indications depth distribution (Figure 6-7). A comparison of the new depth indications reported in 1D28 to the new depth indications reported in the two previous operating cycles is shown in Figure 6-8. Figure 6-8 shows the new flaw depth distribution of 1D28 is comparable to the depth distributions from the previous operating cycles. All wear scars were conservatively modeled using a

four inch axial length that bounds all support widths. Historic Line by Line sizing profiles as well as 1D28 data confirm that actual wear scars are bounded by the four-inch fixed length assumed in the wear model.

6.2.1.4 Results of Probabilistic OA for Support Wear

The results of the probabilistic OA for tube support (i.e., VS, DB, and EC) wear are provided in Table 6-2. The values provided in the table represent the projected EOC probability of non-burst for the entire population of flaws projected at the EOC. These values compare directly with the 95/50 OA criteria and demonstrate that the OA SIPC will be satisfied through the end of cycle 29 with a 1D28 plugging limit of 40%TW.

Table 6-1: Palisades Unit 1 Steam Generator Input Values

Parameter	Value
Desired probability of meeting burst pressure limit	0.95
Tubing wall thickness	0.042 inch
Tubing outer diameter	0.750 inch
Mean of the sum of yield and ultimate strengths adjusted to operating conditions of 650°F	141.02 ksi
Standard deviation of the sum of yield and ultimate strengths adjusted to operating conditions of 650°F	6.604 ksi
Mean of the yield strength adjusted to operating conditions at 650°F	33.102 ksi (Note 1)
3 × Normal Operating Pressure Differential (i.e., 3ΔP)	4110 psid (Conservative Value from 1R27)
Main Steam Line Break Pressure Differential	2600 psid
Assumed Cycle 29 EFPY	1.5 EFPY

Notes:

1. The mean yield strength is taken as the minimum of all Alloy 600MA CE SGs with 0.042” wall thickness (40.27 ksi) and adjusted using the minimum ratio of hot/RT for Alloy 600MA tubing (0.822) from Tables 4-1 and 4-2 of the Flaw Handbook [9.f].

Table 6-2: Projected 1R29 Probability of Survival for Support Wear (Non-Burst):Cycle Length 1.5 EFPY

Steam Generator	Probability of Survival (Non-Burst)
A	0.99
B	0.99
Requirement	≥0.95

Table 6-3: 1R28 Support Wear Full Bundle Model Inputs

Parameter	Value
Mean of the sum of yield and ultimate strengths at temperature	141.02 ksi
Standard Deviation of the sum of yield and ultimate strengths at temperature	6.604 ksi
Normal Operating Pressure Differential (NOPD)	1370 psid
3 X Normal Operating Pressure Differential	4110 psid
Tubing wall thickness	0.042 inch
Tubing outer diameter	0.750 inch
Fixed Structural Length (bounding of support widths)	4.0 inch
Fixed Structural Depth to Maximum Depth Ratio	1:1
ETSS Technique	96004.1, Rev 14
ETSS NDE depth sizing parameters and uncertainty	Slope = 0.99, Intercept = 2.93 %TW Technique Syx = 4.18 %TW
Number of Monte Carlo Cycles	100,000
Cycle length (Bounding of Cycle 29)	1.5 EFPY
Projected New Wear Indications at end of upcoming cycle	188
Return to Service (RTS) Wear Indications	All indications <40%TWD
Growth Rate Distribution	Kunin fit to 1D28 Both SG growth rates

Figure 6-6: SGA and SGB Tube Support Wear Growth

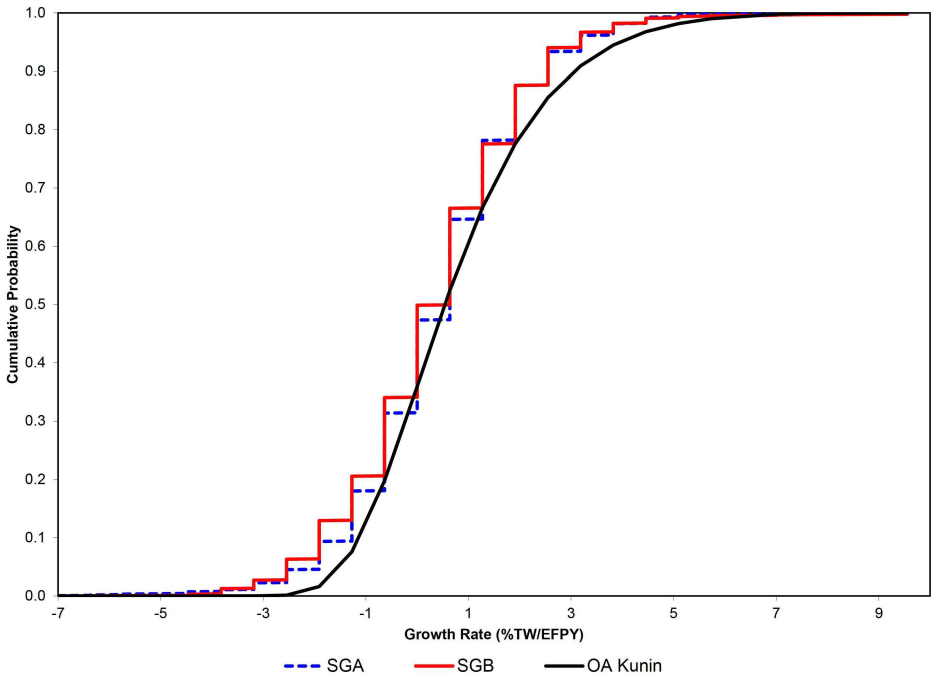


Figure 6-7: Combined (Both SGs) Depth Distribution of Newly Reported Tube Support Wear 1D28

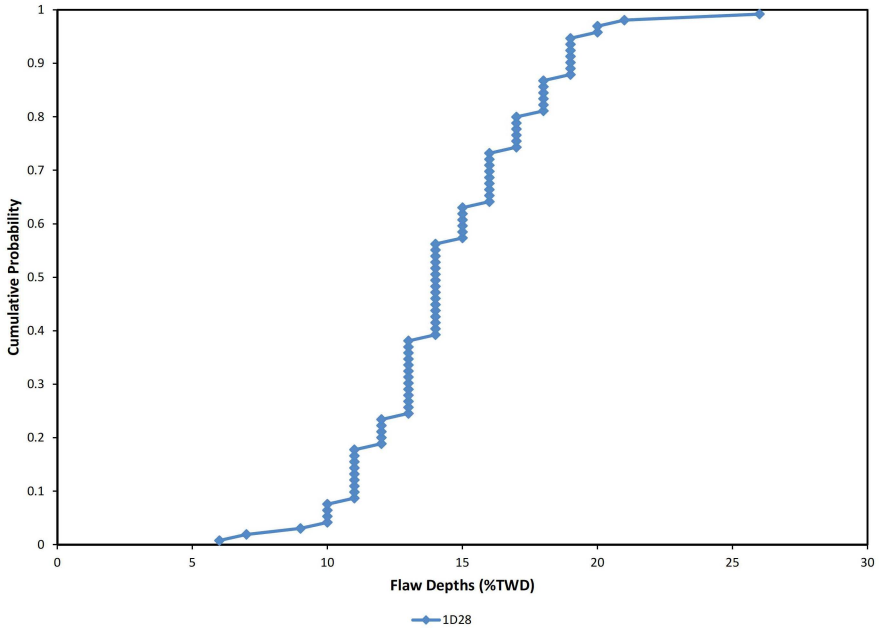
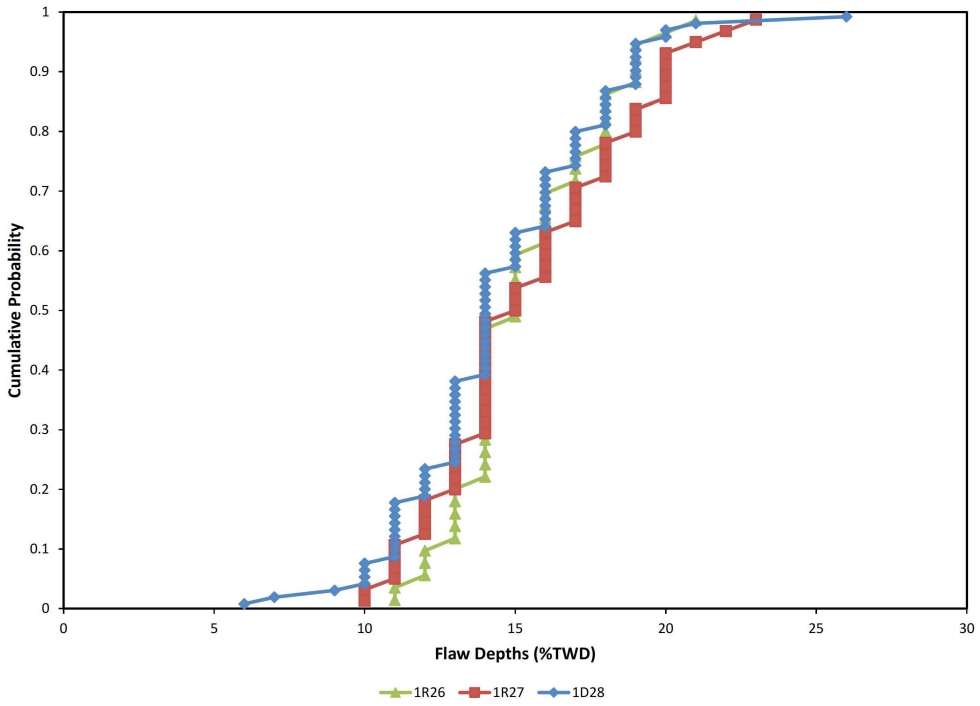


Figure 6-8: Combined (Both SGs) Depth Distribution of Newly Reported Tube Support Wear (1R26:1D28)



6.2.2 Foreign Object Wear

As noted in Reference [9.g], 31 indications of foreign object wear were detected during the 1D28 inspection. 22 of these indications were new, with no prior wear indications found. The remaining 9 indications were determined to be historical based on wear calls in history. Six indications were removed from service by plugging. This section of the OA will address the plugged indications [Reference 9.g, Table 8-11] and the potential for future foreign object wear based on the operating history of the Palisades SGs.

6.2.2.1 Object Not Present

As discussed in [Reference 9.g, Section 9.2.2], the foreign object flaws identified during 1D28 satisfied the SG performance criteria. Since the objects which caused these indications [Reference 9.g, Table 8-9, Table 8-10, and Table 8-11] are either no longer present or the tube was plugged, the growth rate over the next operating period is expected to be zero. This provides reasonable assurance that the structural performance criteria will not be exceeded by these flaws prior to EOC29.

6.2.2.2 Potential Foreign Object Wear

It is reasonable to expect that future inspections may continue to identify wire and other metallic foreign objects within the SGs. Experience demonstrates that the plant can operate for a single cycle with foreign objects in the tube bundle without experiencing tube wear that exceeds the performance criteria (structural and leakage). This argument is further bolstered by the fact that many of the objects currently remaining in the SGs are historical in nature and have not resulted in tube wear or leakage over multiple cycles of operation. Any tube exhibiting a PLP indication or confirmed adjacent object judged to have the potential to cause wear was removed from service, together with any bounding tubes that could be impacted by the presence of the object.

Since it is difficult to predict if and when foreign object wear will occur over the upcoming operating cycle, future results are best predicted by the efforts of the current inspection and the SG operating history. The majority of foreign object wear has been associated with the periphery region of the Palisades SGs. Therefore during 1D28, this region was extensively examined (hot leg and cold leg) using rotating ECT techniques for the best sensitivity of the inspection to both foreign objects and foreign object wear. Additionally, secondary side visual inspections were also performed, with special emphasis on the periphery region, to provide additional assurance that no significant foreign object remains in the SG undetected. Based on the robustness of the SSI and ECT inspections, it is reasonable to conclude that SGs are being returned to service with no pre-existing foreign object degradation in excess of the plugging limit that has not been addressed by stabilization and plugging.

During the last eight refueling outages, Palisades SG Engineering has implemented a consistent approach for the prioritization and resolution of foreign object findings. A review of inspection results from the last seven SG inspections (1R21, 1R22, 1R23, 1R24, 1R25, 1R26, 1R27, and 1D28) show that the dimensions associated with the largest new foreign object wear indication reported during each outage is bounded by 51 %TW and an axial length of 0.38 inches as shown in Table 6-4. None of these foreign object wear flaws exceeded the structural integrity performance criteria. This provides an indication that the process used to manage foreign object issues is appropriate and conservative.

New foreign object wear may result from either a currently existing object in the SG, or a new object being introduced into the bundle after startup. Given the operating history of the SGs where foreign objects (new or historic) have not resulted in tube wear exceeding the CM structural or leakage limits over multiple cycles of operation, there is reasonable assurance that foreign objects will not cause degradation that will exceed the SG performance criteria during operating cycle 29.

Table 6-4: Largest New Foreign Object Wear – Past Eight In-Service Inspections

Outage	Largest NDE %TW	Largest NDE Axial Length (in.)
1R21	<40	0.32
1R22	No new foreign object wear	
1R23	51	0.33
1R24	33	0.38
1R25	No new foreign object wear	
1R26	26	0.32
1R27	No new foreign object wear	
1D28	49	0.21

6.2.3 Eggcrate, Vertical Strap, and Freespan Axial ODSCC

The bobbin probe was used to detect axial ODSCC at eggcrate, vertical strap and freespan locations; however, based on available bobbin probe POD curves [10.c], crack depths at a POD value of 0.95 are relatively large. This removes any deterministic approach as a practical option for operational assessment and necessitates that a fully probabilistic, full-bundle Monte Carlo approach be used. As described in the EPRI Integrity Assessment Guidelines [2.a], the processes of degradation initiation, degradation growth, and inspection are simulated over many trials of steam generator operation over multiple inspection cycles. This is the most rigorous operational assessment method since it explicitly considers all degradation sites in the tube bundle, whether detected or undetected, for multiple inspection cycles both in the past and in the future. Agreement of calculations with past observed inspection results serves to validate the approach and the accuracy of projected states of degradation. Following the methodology described in [24] a fully probabilistic multi-cycle OA evaluation of axial ODSCC at eggcrate and freespan locations was performed using a Framatome Monte Carlo analysis package (MultiFram) [24]. The inputs to the fully probabilistic multi-cycle Monte Carlo analysis consist of a probability of detection curve, a distribution of crack growth rates, a distribution of EOC crack lengths, the relationship between maximum depth and structural depth, and degradation initiation parameters describing the past and projected progression of degradation. See Table 6-5 for a listing of the MultiFram input parameters.

6.2.3.1 Probability of Detection (POD)

Bobbin probe ETSS I-28413 is the principal detection technique for axial ODSCC in the tube freespan and at eggcrate supports. EPRI ETSS I-28413 characterizes the performance of the bobbin probe for the detection of axial ODSCC at eggcrates, vertical straps and freespan locations. The dataset upon which this characterization is based includes cracking data from a variety of SG designs. During the 1D28 outage, bobbin probe noise amplitudes were again measured and are compared with prior outage noise, (Section 6.1), which confirm that no meaningful change in noise has occurred and provide the basis for concluding that the POD relationship applicable to bobbin probe detection of axial ODSCC(ETSS I-28413) in eggcrate, vertical strap and freespan locations need not be adjusted to account for Palisades-specific noise levels.

To reflect the significant change in initiation rates experienced between the start of Cycle 27 and the 1D28 inspection, the model simulates operation with a 9 %TW/EFPY growth rate as discussed below in Section 6.2.3.4. Since the model requires the same growth rate to be applied to all cycles, POD at each early outage (R20-R26) was modeled as near-perfect detection, meaning effectively all flaws were detected and no flaws continued in service. Starting in R27, the POD was reverted to the bobbin ETSS I-28413 POD values of an intercept equal to -5.678 and slope equal to 4.2956, which allowed a realistic population of undetected flaws to remain in service as shown in Table 6-6. The intent is to match (benchmark) the number and sizes of detected flaws in the 1D28 outage. The number of detected flaws in the early outages is greatly overstated to reach the quantity detected in 1D28 and the potential number of flaws detected in 1R29. Once the 1D28 outage is benchmarked, the model is deemed to accurately predict the R29 outage based on the assumption that flaw initiation and growth will continue at the same rate. Figure 6-10 shows model bench marking for eggcrate, vertical strap and freespan axial ODSCC.

6.2.3.2 Crack Initial Length and Growth Rate

The distribution of eggcrate, vertical strap and freespan axial ODSCC lengths measured by NDE during 1D28 and previous Palisades outages along with the Ln normal function used in the model is provided in Figure 6-12. Because the +Point sizing technique tends to overestimate overall crack length, this distribution is a conservative bound of the actual crack length at the next outage (1R29). For this reason, no length growth is applied within the probabilistic evaluation. It is also noted that the eggcrate crack length is bounding for other axial ODSCC within the Palisades SGs (e.g., vertical strap or sludge pile cracks). The eggcrate / freespan crack lengths were modeled using a Ln-Normal distribution with a median of 0.44 and Ln-Normal standard deviation of 0.721.

6.2.3.3 MD/SD Ratio

The characteristic ratio of maximum depth to structural depth for eggcrate, vertical strap and freespan cracks was evaluated based on the results of the last six inspections including 1D28. This parameter is modeled as a Normal distribution with a mean of 1.2042 and a standard deviation of 0.1036.

6.2.3.4 Throughwall Depth Growth Rate

The growth rates input to the model are based on the actual 1D28 growth rates of the flaws assuming that they grew from the threshold of detectability (28%) to the measured depths at 1D28. This resulted in a relatively high average growth rate of 9 %TW/EFPY compared to the EPRI Default average growth rates of 2.15% TW/EFPY expected for SCC in Alloy 600TT tubing at Palisades operating temperature. The input to the probabilistic evaluation is a structural depth growth rate distribution. Consequently, structural depth growth rates are modeled as a Ln-Normal distribution with a mean of 9.0 %TW/EFPY and a representative 1D28 standard deviation of 0.706 that was calculated from the data used to determine the average growth rate. An upper limit of 19.23 %TW/EFPY was used based on the observed 95th percentile maximum growth rate.

6.2.3.5 Crack Initiation

Normally, the cumulative number of eggcrate, vertical strap and freespan axial ODSCC indications identified at each Palisades refueling outage provides the basis for projecting the number of such cracks during future outages. The 1D28 inspection identified a much larger population than any previous inspection. The model conservatively assumes that all the SCC observed at 1D28 occurred during the last operating period. It is also expected that in 1R29, a large number of indications will be detected. This cumulative experience is modeled using the Weibull function that begins with 1R27 and is used to benchmark the results of the 1D28. To date, more cracks have initiated in SGA, therefore this SG was used in the probabilistic evaluation since it is bounding. Figure 6-10 illustrates that the Weibull function used to model eggcrate, vertical strap and freespan axial ODSCC indications conservatively represents the actual detection history for this degradation mechanism.

6.2.3.6 Probabilistic Evaluation Results

Palisades outages 1R20 through 1R29 were simulated 50,000 times while benchmarking the detected eggcrate, vertical strap and freespan axial ODSCC indication history. The resulting distribution of 1R29 worst case degraded tube burst pressures is shown in Figure 6-14. As specified in [2.a], acceptable OA structural integrity is demonstrated if the lower 95th percentile value of this distribution meets or exceeds the SIPC limit of 3960 psi. For the Palisades eggcrate, freespan and axial ODSCC, the lower 95th percentile of worst case burst pressure projected for 1D28 is 3978 psi; therefore, operational assessment structural integrity is projected with margin. The corresponding projected upper 95th percentile leak rate at SLB conditions is zero.

Table 6-5: Probabilistic Evaluation Inputs: Eggcrate, Vertical Strap, and Freespan Axial ODSCC

Description	Value
Wall thickness (inch)	0.042
Tube OD (inch)	0.75
Normal Operating Pressure Differential (psi)	1320
Pressure Differential During SLB (psi)	2600
Mean Value of Sy + Su (psi)	141020
Standard Deviation of Sy + Su (psi)	6604
Number of Susceptible Locations in the SG(s)	137500
Mean or Median Length Growth Rate (inch/EFPY)	1.00E-07
Standard Deviation of Ln Normal Length Growth Distribution	0
Upper limit on length growth rate (inch/EFPY)	0.05
Mean or Median 'Average Depth' Growth Rate (%TW/EFPY)	9.06
Standard Deviation of Ln Normal 'Average Depth' Growth Distribution	0.706
Upper limit on depth growth rate (%TW/EFPY)	19.23
Number of Outages to Simulate	10
Weibull Scale Parameter for Crack Initiation (EFPY)	99.1
Weibull Shape Parameter for Crack Initiation	1.389
Weibull Scale Parameter for Initial Crack Length (inch)	0.553
Weibull Shape Parameter for Initial Crack Length	1.59
Mean or Median Initial Crack Length (inch)	0.44
Standard Deviation of Ln Normal Initial Crack Length Distribution	0.721
Model for Initial Crack Length ('Weibull' or 'LnNorm')	LnNorm
Mean Ratio of Max Depth to Average Depth	1.2042
Standard Deviation of the Ratio of Max Depth to Average Depth	0.1036
POD function ('Log' or 'Log-Log')	Log-Log
Tube Material's Elastic Modulus (psi)	2.85E+07

Table 6-6: Probabilistic Evaluation Inputs: Axial ODSCC at EC, FS, VS POD Parameters

Outage	EFPY	'a' POD Parameter	'b' POD Parameter
1R20	14.09	-25	-25
1R21	15.48	-25	-25
1R22	16.84	-25	-25
1R23	18.25	-25	-25
1R24	19.74	-25	-25
1R25	21.2	-25	-25
1R26	22.6	-25	-25
1R27	24.21	-5.679	4.296
1D28	25.78	-5.679	4.296
1R29	27.28	-5.679	4.296

Figure 6-9: POD Curve: Eggcrate, Vertical Strap, and Freespan Axial ODSCC(ETSS I-28413)

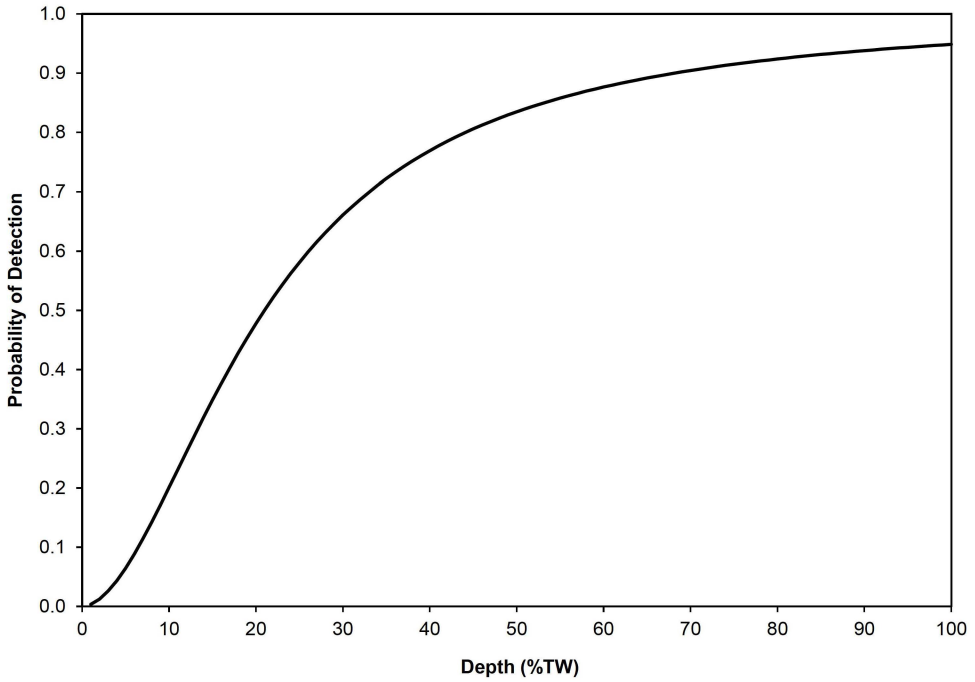


Figure 6-10: Model Indications and Detections vs. Actual Detections: Eggcrate, Vertical Strap, and Freespan Axial ODSCC

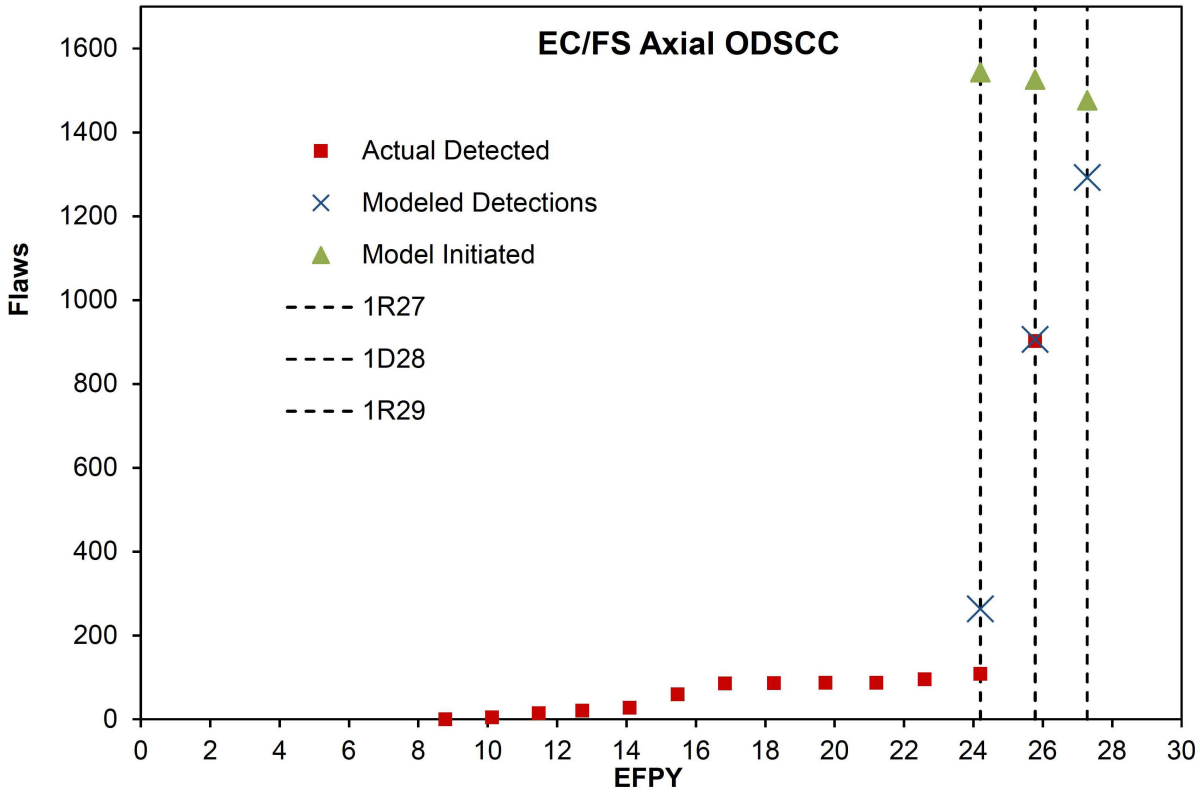


Figure 6-11: Crack Initiation Curve: Eggcrate, Vertical Strap, and Freespan Axial ODSCC

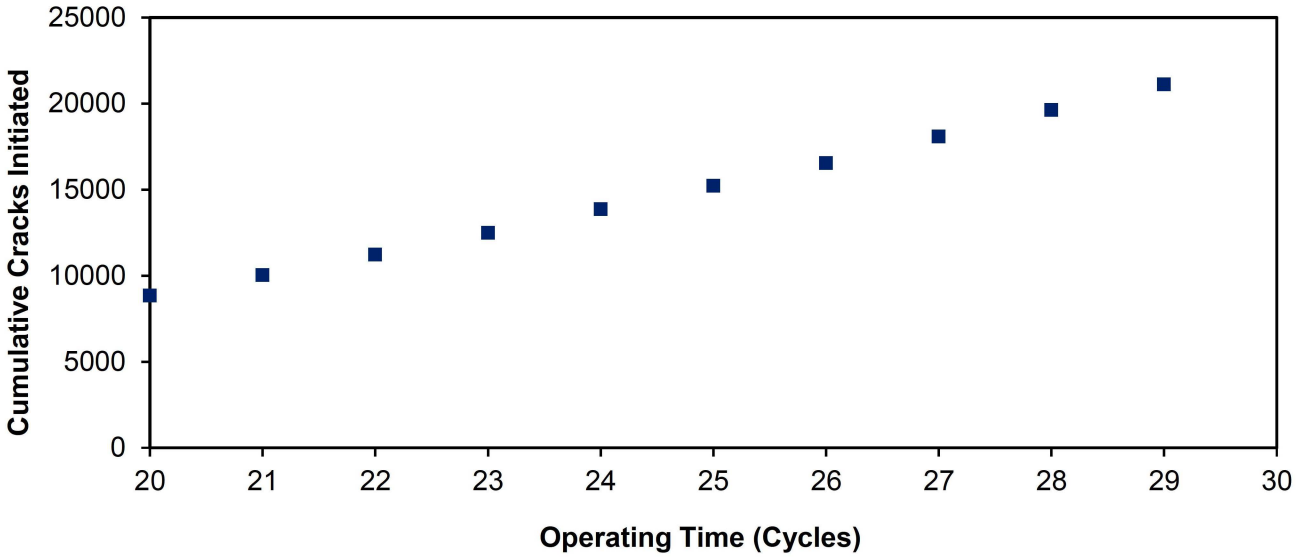


Figure 6-12: Initial Crack Length Distribution: Eggcrate, Vertical Strap, and Freespan Axial ODSCC

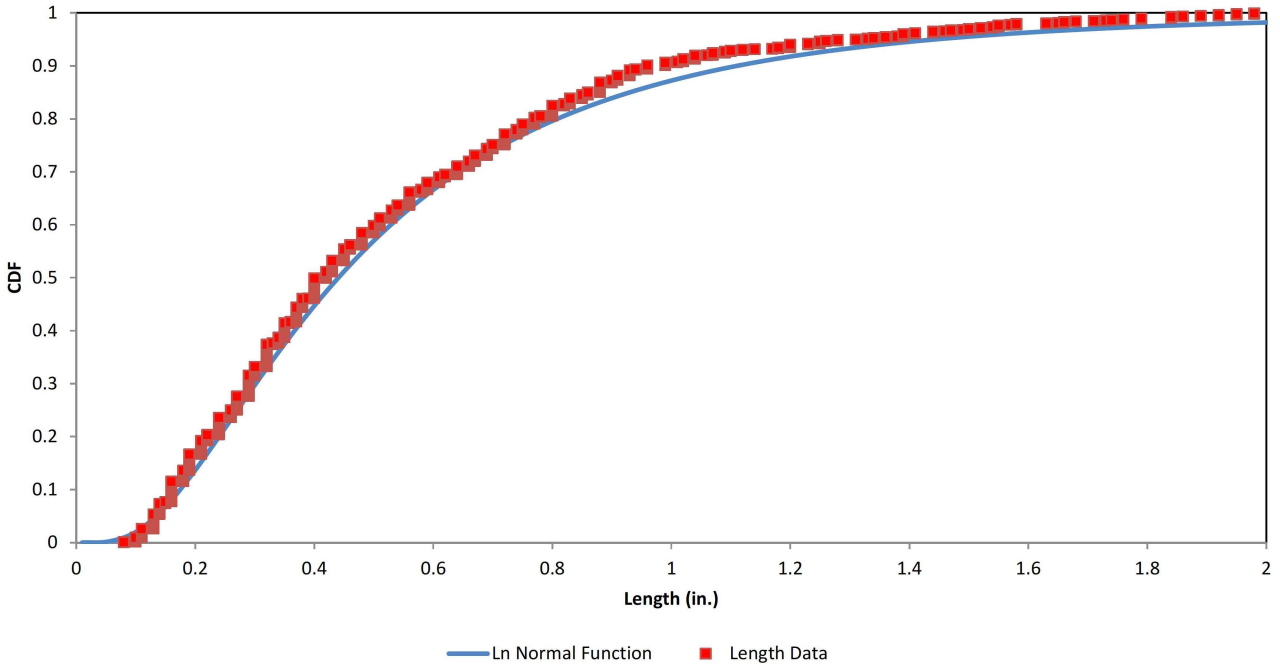


Figure 6-13: Depth Growth Rate Distribution: Eggcrate, Vertical Strap, and Freespan Axial ODSCC

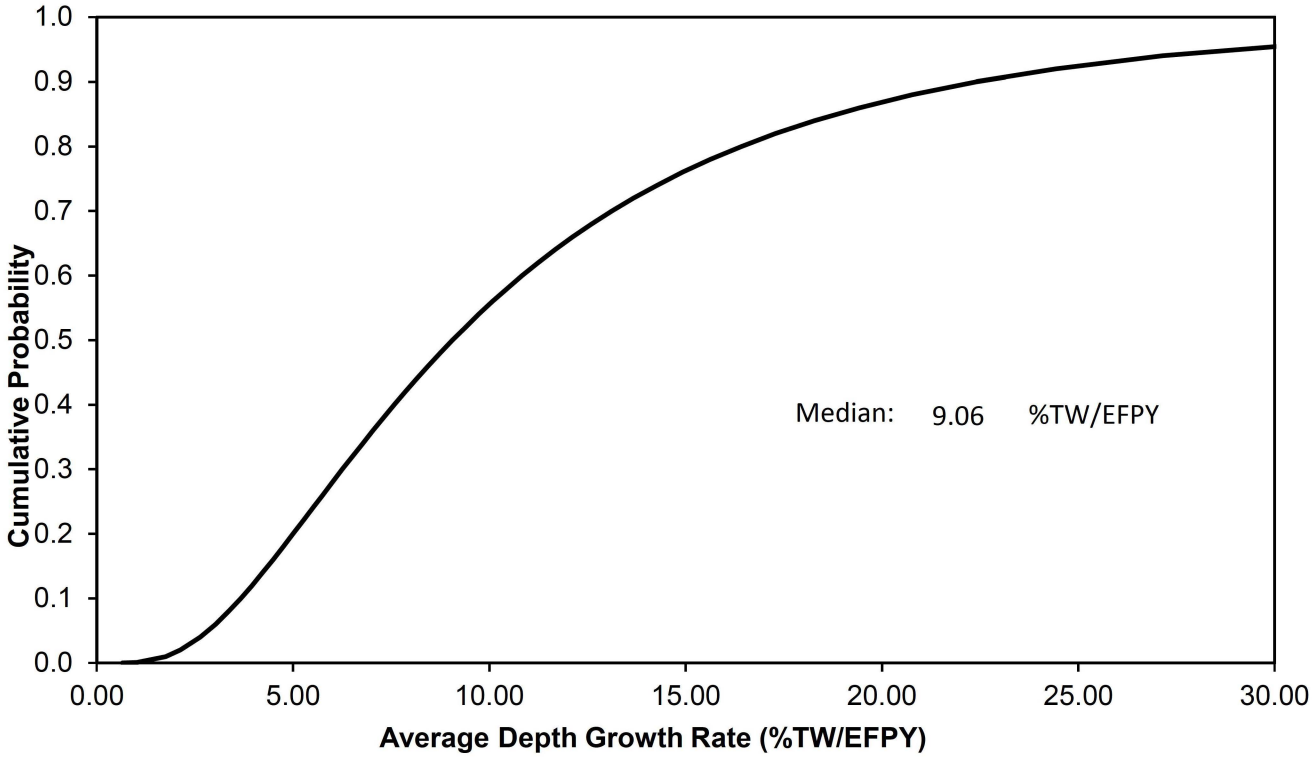


Figure 6-14: Burst Pressure Evaluation: Eggcrate, Vertical Strap, and Freespan Axial ODSCC

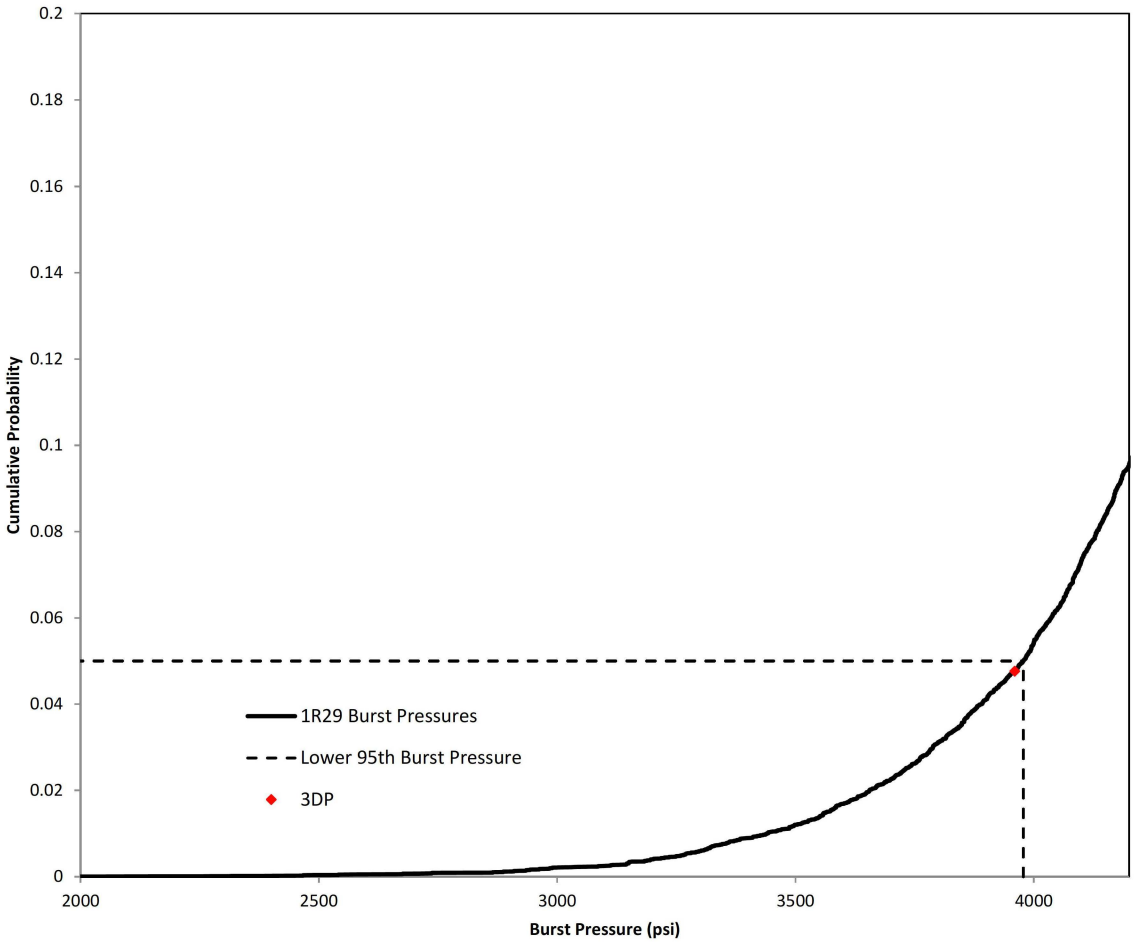


Table 6-7: Probabilistic Evaluation Results: Eggcrate, Vertical Strap, and Freespan Axial ODSCC

Property	Calculated Value	Requirement
Probability of Leakage at MSLB	0.0	<5%
Probability of Burst at 3dP	4.76%	<5%

6.2.4 Top of Tubesheet Axial ODSCC

A similar probabilistic analysis was performed for top of tubesheet (TTS) axial ODSCC with inputs that are applicable to TTS ODSCC. The results are discussed in the sections below.

6.2.4.1 Probability of Detection (POD)

Bobbin noise was evaluated from both generators in 1D28 and used an input along with the a-hat correlation developed for ETSS I-28424. This data was analyzed using the EPRI MADPOD[13] software to develop the POD

curve for the probabilistic model for TTS AXODSCC. The site specific data used bounded the POD curve developed by using parameters from ETSS I-28424, so the site specific values obtained for the POD curve were used. The POD curve used in 1D28 is shown in Figure 6-15.

6.2.4.2 Crack Length

The distribution of TTS axial ODSCC lengths as measured by NDE during 1D28 and previous Palisades outages is provided in Figure 6-16 Because the +Point sizing technique tends to overestimate overall crack length, this distribution is a conservative bound of the actual crack length at the final outage (1D28). For this reason, no length growth is applied within the probabilistic evaluation. The input parameters are provided in Table 6-8 and Table 6-9.

6.2.4.3 MD/SD Ratio

The characteristic ratio of maximum depth to structural depth for TTS cracks was evaluated based on the results of the last six inspections including 1D28. The updated MD/SD ratio for 1D28 was determined to be 1.1605. The input parameters are provided in Table 6-8.

6.2.4.4 Throughwall Depth Growth Rate

As documented in [4.c], the maximum depth growth rate of axial ODSCC in the sludge pile is characterized with mean and upper 95th percentile values of 7.57%TW/EFPY and 15.4%TW/EFPY, respectively. This results in a corresponding average depth growth mean of 6.49%TW/EFPY (7.57/1.1668) and the Ln-Normal standard deviation of 0.43 [(ln(13.16) – ln(6.49))/1.645]. The Average Depth Growth Rate curve used is shown in Figure 6-18. The input parameters are provided in Table 6-8.

6.2.4.5 Crack Initiation and Detection

The cumulative number of TTS axial ODSCC indications identified at each Palisades refueling outage provides the basis for projecting the number of such cracks during future outages shown as actual detections.

Figure 6-17 illustrates that the Weibull function used to model TTS axial ODSCC indications conservatively represents the actual detection history for this degradation mechanism on a cumulative indication basis. This is shown by the cumulative model detected data bounding the cumulative actual detected (flaws found in inspection).

6.2.4.6 Probabilistic Evaluation Results

The resulting distribution of 1R29 worst case degraded tube burst pressures is shown in Figure 6-19. The lower 95th percentile of worst case burst pressure projected for EOC29 is 4340 psi; therefore, operational assessment structural integrity is projected with ample margin above the SIPC limit of 3960 psi. The corresponding projected upper 95th percentile leak rate at SLB conditions is zero.

Table 6-8: Probabilistic Evaluation Inputs: Top of Tubesheet Axial ODSCC

Description	Value
Wall thickness (inch)	0.042
Tube OD (inch)	0.75
Normal Operating Pressure Differential (psi)	1320
Pressure Differential During SLB (psi)	2600
Mean Value of Sy + Su (psi)	141020
Standard Deviation of Sy + Su (psi)	6604
Number of Susceptible Locations in the SG(s)	5000
Mean or Median Length Growth Rate (inch/EFPY)	1.00E-07
Standard Deviation of Ln Normal Length Growth Distribution	0
Upper limit on length growth rate (inch/EFPY)	0.05
Mean or Median 'Average Depth' Growth Rate (%TW/EFPY)	6.49
Standard Deviation of Ln Normal 'Average Depth' Growth Distribution	0.43
Upper limit on depth growth rate (%TW/EFPY)	30
Number of Outages to Simulate	10
Weibull Scale Parameter for Crack Initiation (EFPY)	75
Weibull Shape Parameter for Crack Initiation	2.5
Weibull Scale Parameter for Initial Crack Length (inch)	0.46
Weibull Shape Parameter for Initial Crack Length	2.6
Mean or Median Initial Crack Length (inch)	0.281
Standard Deviation of Ln Normal Initial Crack Length Distribution	0.42
Model for Initial Crack Length ('Weibull' or 'LnNorm')	Weibull
Mean Ratio of Max Depth to Average Depth	1.1605
Standard Deviation of the Ratio of Max Depth to Average Depth	0.0784
POD function ('Log' or 'Log-Log')	Log-Log
Number of Trials in this Simulation	50000
Tube Material's Elastic Modulus (psi)	28450000

Table 6-9: Probabilistic Evaluation Inputs: Top of Tubesheet Axial ODSCC, POD Parameters

Outage	Cumulative EFPY	'a' POD Parameter	'b' POD Parameter
1R20	14.09	-16.17	10.06
1R21	15.48	-16.17	10.06
1R22	16.84	-16.17	10.06
1R23	18.25	-16.17	10.06
1R24	19.74	-16.17	10.06
1R25	21.2	-16.17	10.06
1R26	22.6	-16.17	10.06
1R27	24.21	-16.17	10.06
1D28	25.78	-11.67	7.44
1R29	27.28	-11.67	7.44

Figure 6-15: POD Curve: Top of Tubesheet Axial ODSCC 1D28-1R29

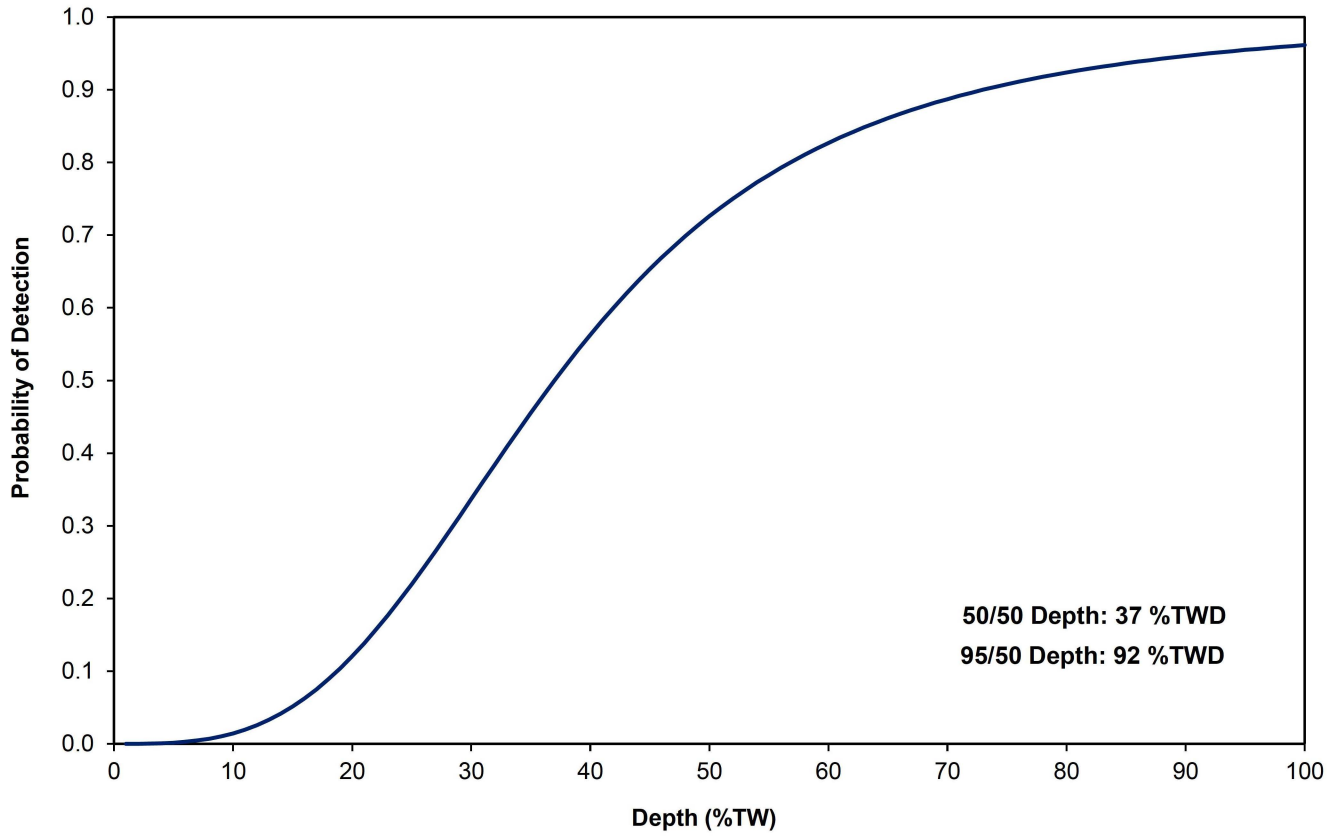


Figure 6-16: Top of Tubesheet Axial ODSCC Lengths (Includes 1D28)

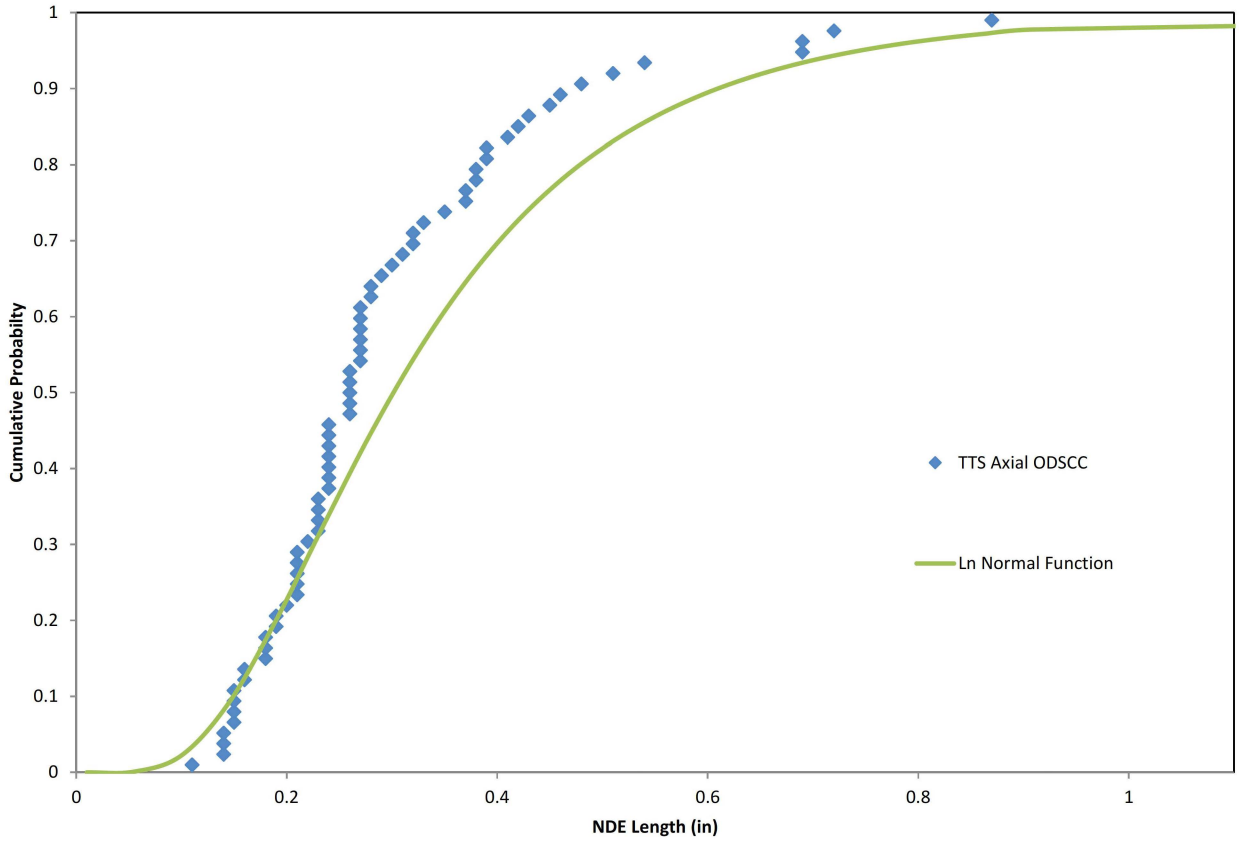


Figure 6-17: Model Indications and Detections vs. Actual Detections: Top of Tubesheet Axial ODSCC

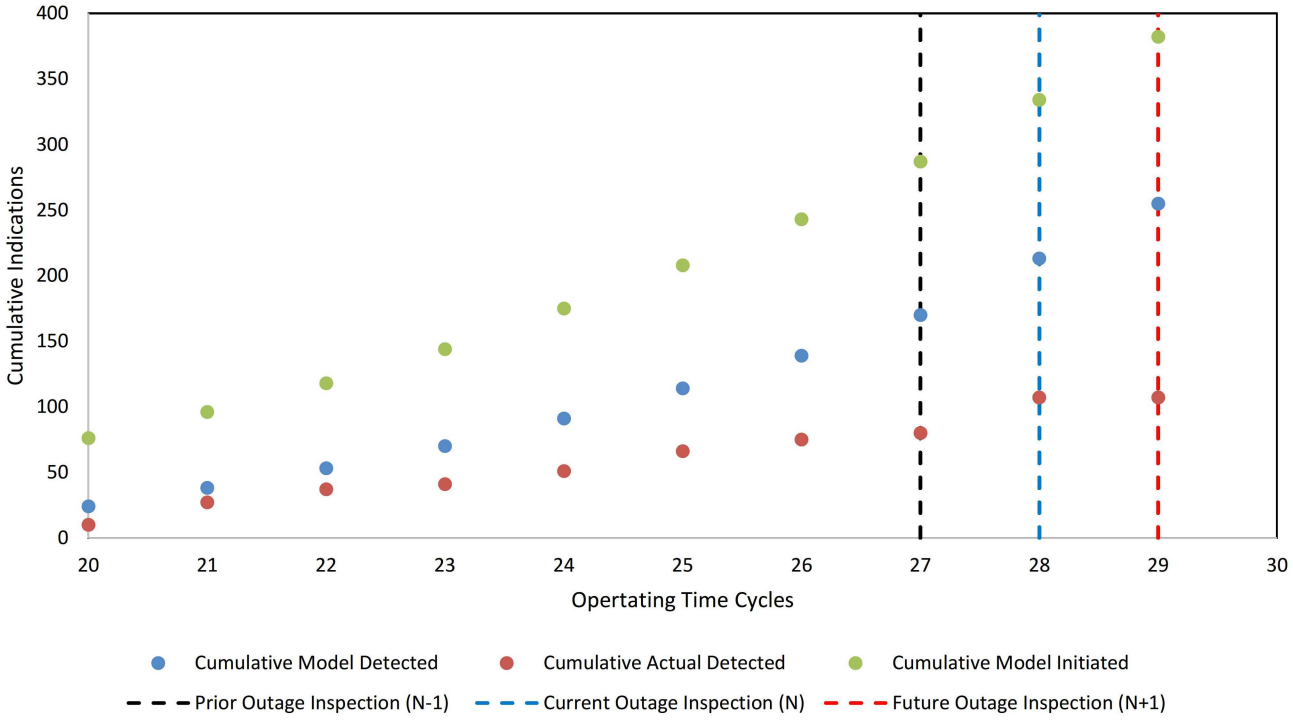


Figure 6-18: Depth Growth Rate Distribution: Top of Tubesheet Axial ODSCC

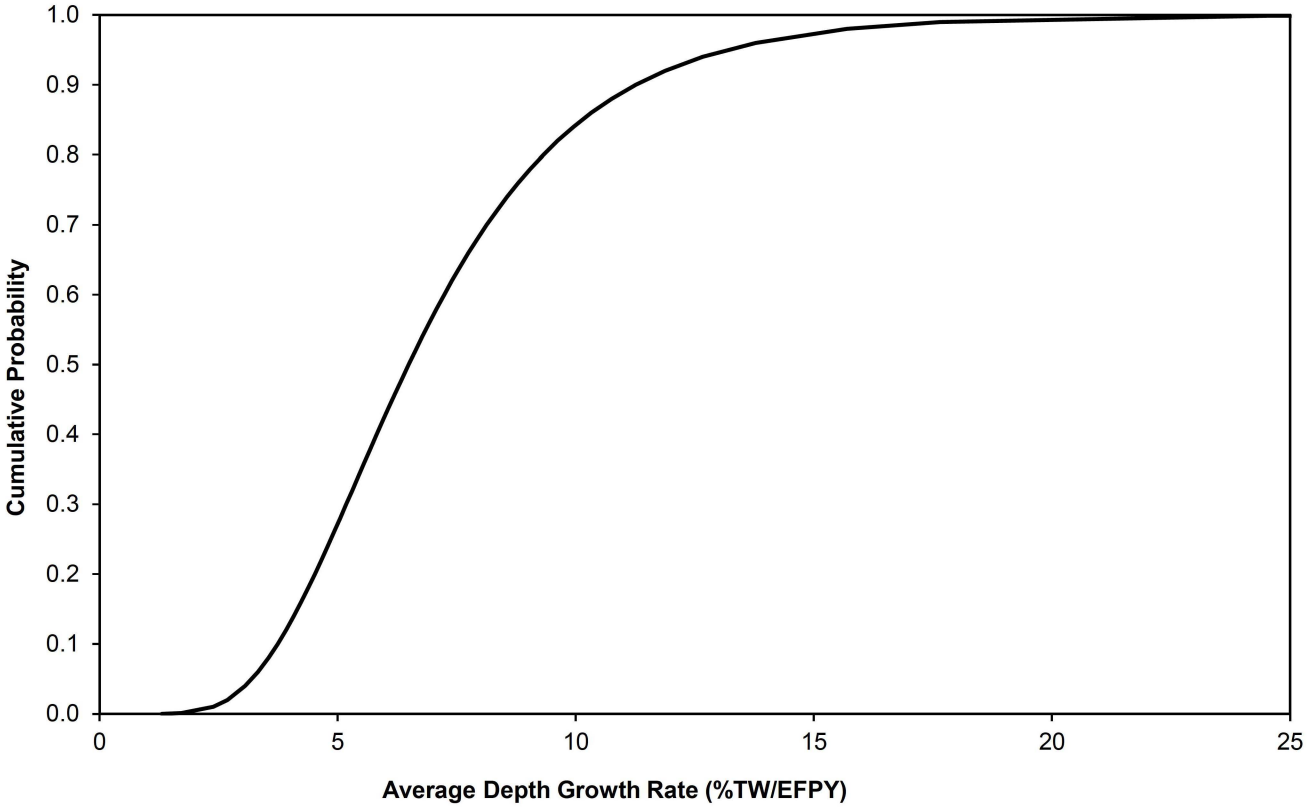
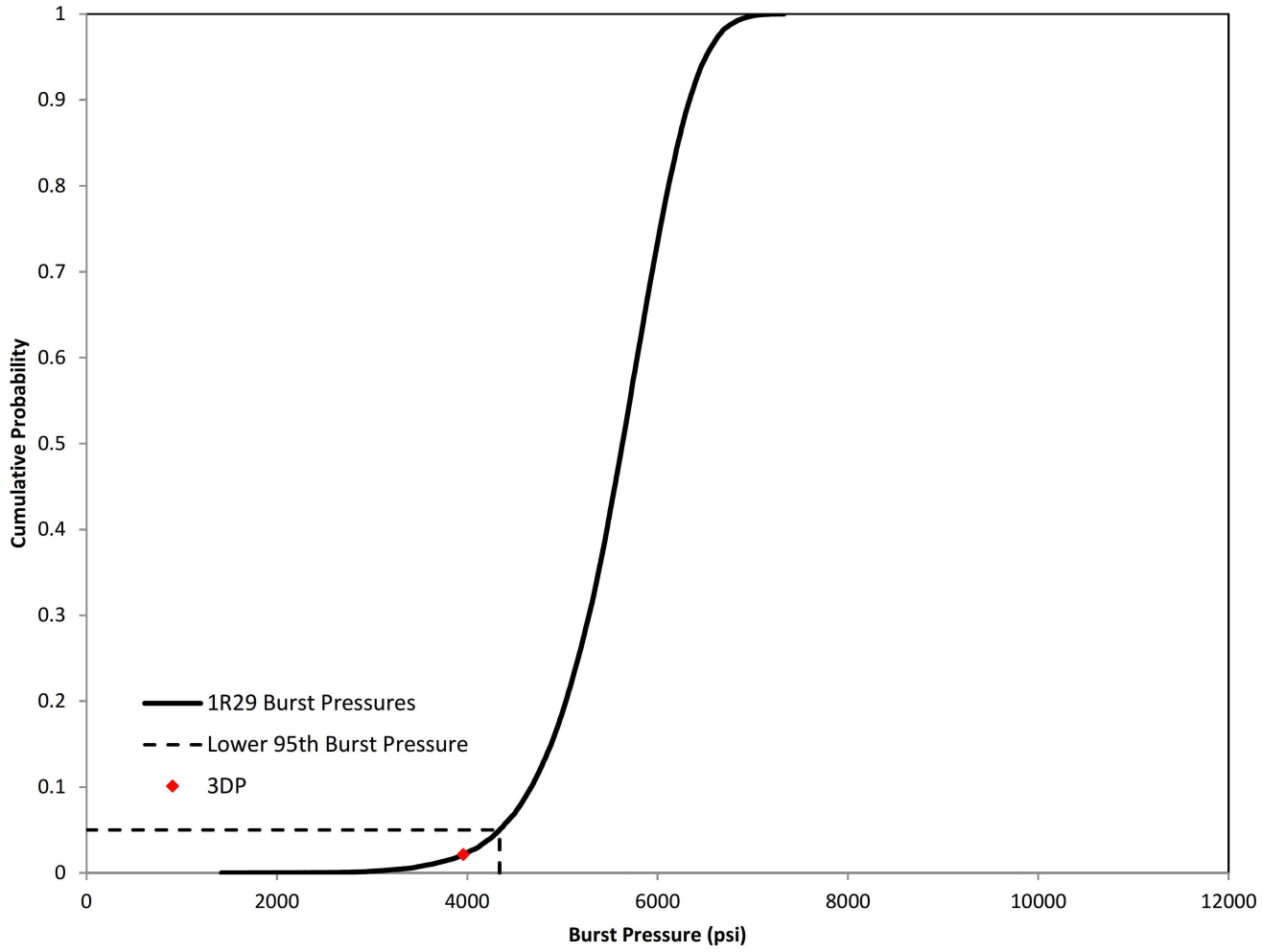


Figure 6-19: Burst Pressure Evaluation: Top of Tubesheet Axial ODSCC



6.2.5 Top of Tubesheet Circumferential ODSCC

A similar probabilistic analysis was performed for top of tubesheet (TTS) circumferential ODSCC using a Framatome Monte Carlo analysis package (MultiCirc) [25]. The inputs to the fully probabilistic multi-cycle Monte Carlo analysis package (MultiCirc) consist of a probability of detection curve, a distribution of crack growth rates, a distribution of EOC crack lengths, the relationship between maximum depth and structural depth, and degradation initiation parameters describing the past and projected progression of degradation.

6.2.5.1 Top of Tubesheet Circumferential ODSCC: Leakage Bounding Model

See Table 6-10 and Table 6-11 for a listing of the MultiCirc input parameters.

6.2.5.1.1 Probability of Detection (POD)

Prior analyses have determined that the use of the ETSS 21410.1 POD curve would be less conservative and less applicable than that of ETSS I28424 [4.c]; therefore, the POD parameters from ETSS I28424 are conservatively used to evaluate TTS circumferential ODSCC. POD curve used in model is shown in Figure 6-20.

6.2.5.1.2 Crack Length

The distribution of TTS circumferential ODSCC lengths as measured by NDE during 1D28 and previous Palisades outages is provided in Figure 6-21. Because the +Point sizing technique tends to overestimate overall crack length, this distribution is a conservative bound of the actual crack length at the final outage (1D28). For this reason, no length growth is applied within the probabilistic evaluation. The input parameters are provided in Table 6-10.

6.2.5.1.3 MD/AD Ratio

The characteristic ratio of maximum depth to average depth for circumferential TTS cracks was evaluated based on the results of the last seven inspections including 1D28. 1D28 MD/AD data calculated an average of 1.67 with a standard deviation of 0.78. To conservatively bound all MD/AD ratios found for Circumferential TTS ODSCC this parameter was modeled as a normal distribution with a mean of 2.2 and a standard deviation of 0.8 as shown in Figure 6-22.

6.2.5.1.4 Throughwall Depth Growth Rate

For the throughwall average depth growth rate of circumferential ODSCC the conservative upper bound estimate was used from Reference [2.a]. A mean average depth growth rate of 2.15%TW/EFPY with the standard deviation of 0.65 from Reference [2.a] was used for the probabilistic evaluation. The average depth growth rate curved used in the probabilistic model is shown in Figure 6-23.

6.2.5.1.5 Crack Initiation

The cumulative number of TTS circumferential ODSCC indications identified at each Palisades refueling outage provides the basis for projecting the number of such cracks during future outages. This cumulative experience is modeled using the Weibull function and is used to benchmark the results of the simulation. Figure 6-24 illustrates that the Weibull function used to model TTS circumferential ODSCC indications conservatively represents the actual detection history for this degradation mechanism.

6.2.5.1.6 Probabilistic Evaluation of Results

Palisades outages 1R19 through 1D28 were simulated 50,000 times while benchmarking the detected TTS circumferential ODSCC indication history. The resulting distribution of 1R29 worst case degraded tube burst pressures is shown in Figure 6-25. Acceptable OA structural integrity is demonstrated if the lower 95th percentile value of this distribution meets or exceeds the SIPC limit of 3960 psi. For the Palisades TTS circumferential ODSCC, the lower 95th percentile of worst case burst pressure projected for 1D28 is 7684 psi; therefore, operational

assessment structural integrity is projected with a substantial margin. The corresponding projected upper 95th percentile leak rate at SLB conditions is zero.

6.2.5.2 Top of Tubesheet Circumferential ODSCC: Pressure Bounding Model

See Table 6-11 and Table 6-12 for a listing of the MultiCirc input parameters for the pressure model.

6.2.5.2.1 Probability of Detection (POD)

Prior analyses have determined that the use of the ETSS 21410.1 POD curve would be less conservative and less applicable than that of ETSS I28424 [4.c]; therefore, the POD parameters from ETSS I28424 are conservatively used to evaluate TTS circumferential ODSCC. The POD curve used in model is shown in Figure 6-20.

6.2.5.2.2 Crack Length

The distribution of TTS circumferential ODSCC lengths as measured by NDE during 1D28 and previous Palisades outages is provided in Figure 6-21. Because the +Point sizing technique tends to overestimate overall crack length, this distribution is a conservative bound of the actual crack length at the final outage (1D28). For this reason, no length growth is applied within the probabilistic evaluation. The input parameters are provided in Table 6-10.

6.2.5.2.3 MD/AD Ratio

The characteristic ratio of maximum depth to average depth for circumferential TTS cracks was evaluated based on the results of the last seven inspections including 1D28. 1D28 MD/AD data calculated an average of 1.67 with a standard deviation of 0.78. In order to conservatively bound this number for burst pressure values from the IAGL[2.a, Section 5.5.2] of 1.25 for the mean and 0.15 for the standard deviation were used.

6.2.5.2.4 Throughwall Depth Growth Rate

For the throughwall average depth growth rate of circumferential ODSCC the conservative upper bound estimate was used from Reference [2.a]. A mean average depth growth rate of 2.15%TW/EFPY with the standard deviation of 0.65 from Reference [2.a] was used for the probabilistic evaluation. The average depth growth rate curved used in the probabilistic model is shown in Figure 6-23.

6.2.5.2.5 Crack Initiation

The cumulative number of TTS circumferential ODSCC indications identified at each Palisades refueling outage provides the basis for projecting the number of such cracks during future outages. This cumulative experience is modeled using the Weibull function and is used to benchmark the results of the simulation. Figure 6-26 illustrates that the Weibull function used to model TTS circumferential ODSCC indications conservatively represents the actual detection history for this degradation mechanism.

6.2.5.2.6 Probabilistic Evaluation of Results

Palisades outages 1R20 through 1R29 were simulated 50,000 times while benchmarking the detected TTS circumferential ODSCC indication history. The resulting distribution of 1R29 worst case degraded tube burst pressures is shown in Figure 6-27. The lowest predicted burst pressure shown in Figure 6-26 was higher than the SIPC limit of 3960 therefore the SIPC limit data point is not shown on the Figure. Acceptable OA structural integrity is demonstrated if the lower 95th percentile value of this distribution meets or exceeds the SIPC limit of 3960 psi. For the Palisades TTS circumferential ODSCC, the lower 95th percentile of worst case burst pressure projected for 1D28 is 7499 psi; therefore, operational assessment structural integrity is projected with a substantial margin. The corresponding projected upper 95th percentile leak rate at SLB conditions is zero.

Table 6-10: Probabilistic Evaluation Inputs: Circumferential TTS ODSCC(Leakage)

Description	Value
Wall thickness (inch)	0.042
Tube OD (inch)	0.75
Normal Operating Pressure Differential (psi)	1320
Pressure Differential During SLB (psi)	2600
Mean Value of Sy + Su (psi)	141020
Standard Deviation of Sy + Su (psi)	6604
Mean Value of Yield Strength (psi)	33102
Number of Susceptible Locations in the SG(s)	3000
Median Mid-Wall Circ Length Growth Rate (inch/EFPY)	1.00E-07
Standard Deviation of Ln Normal Mid-Wall Circ Length Growth Dstribution	0
Upper Limit on Mid-Wall Circ Length Growth Rate (inch/EFPY)	0.12
Median 'Average Depth' Growth Rate (%TW/EFPY)	2.15
Standard Deviation of Ln Normal 'Average Depth' Growth Rate Distribution	0.65
Upper Limit on 'Average Depth' Growth Rate (%TW/EFPY)	10
Number of Outages to Simulate	10
Weibull Scale Parameter for Crack Initiation (EFPY)	35
Weibull Shape Parameter for Crack Initiation	2.93
Weibull Scale Parameter for Initial Mid-Wall Crack Length (inch)	0.1
Weibull Shape Parameter for Initial Mid-Wall Crack Length	1
Median Initial Mid-Wall Crack Length (inch)	0.3679
Standard Deviation of Ln Normal Initial Mid-Wall Crack Length Distribution	0.47
Model for Initial Crack Length ('Weibull' or 'LnNorm')	LnNorm
Mean Ratio of Max Depth to Average Depth	2.2
Standard Deviation of the Ratio of Max Depth to Average Depth	0.8
POD function ('Log' or 'Log-Log')	Log-Log
Number of Trials in this Simulation	50000
Tube Material's Elastic Modulus (psi)	2.85E+07
Circ Crack Initiation Surface	OD

Table 6-11: Probabilistic Evaluation POD Inputs: Circumferential TTS ODSCC

Outage	Cumulative EFPY	'a' POD Parameter	'b' POD Parameter
1R20	14.09	-17.7154	11.4155
1R21	15.48	-17.7154	11.4155
1R22	16.84	-17.7154	11.4155
1R23	18.25	-17.7154	11.4155
1R24	19.74	-17.7154	11.4155
1R25	21.2	-17.7154	11.4155
1R26	22.6	-17.7154	11.4155
1R27	24.21	-17.7154	11.4155
1D28	25.78	-17.7154	11.4155
1R29	27.28	-17.7154	11.4155

Figure 6-20: POD Curve: Circumferential TTS ODSCC

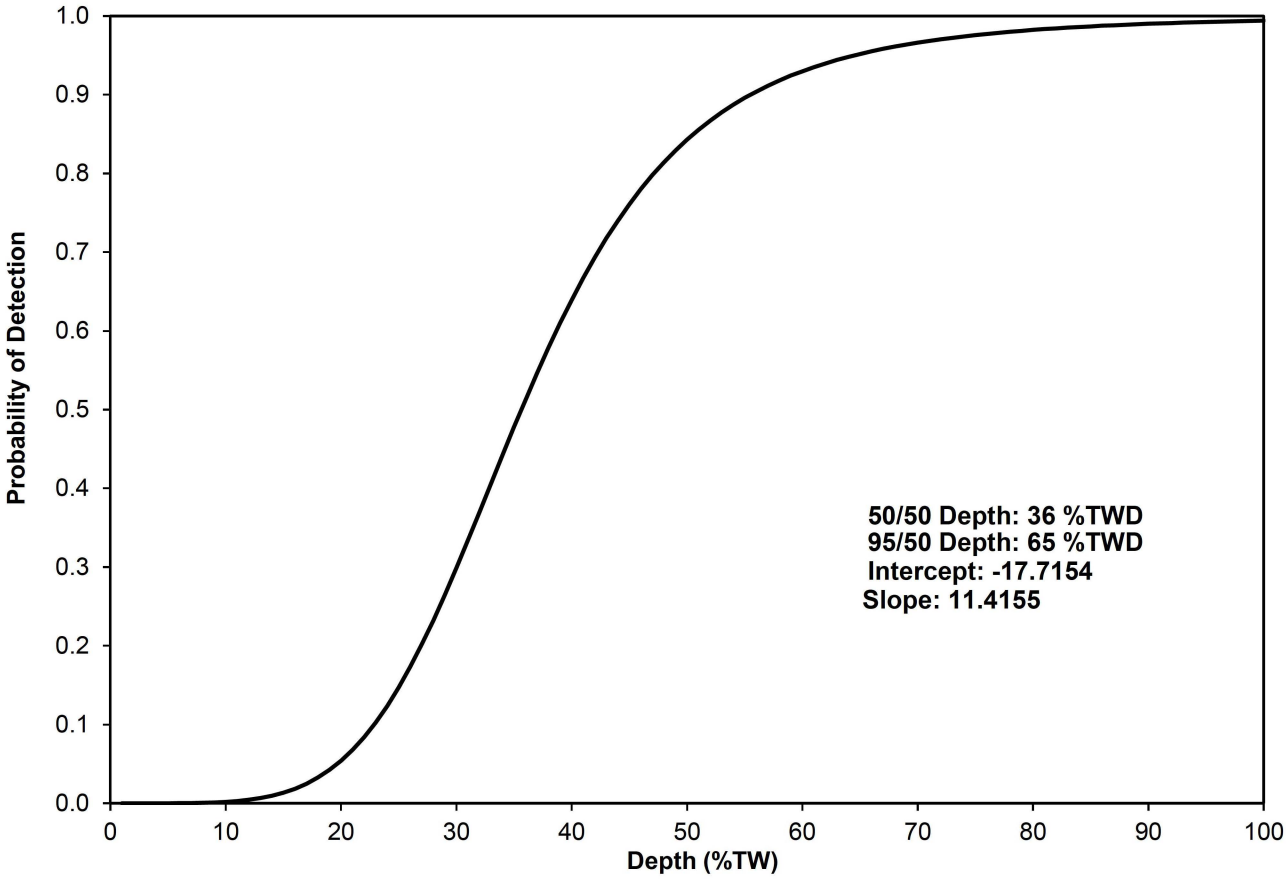


Figure 6-21: Crack Length Distribution: Circumferential TTS ODSCC

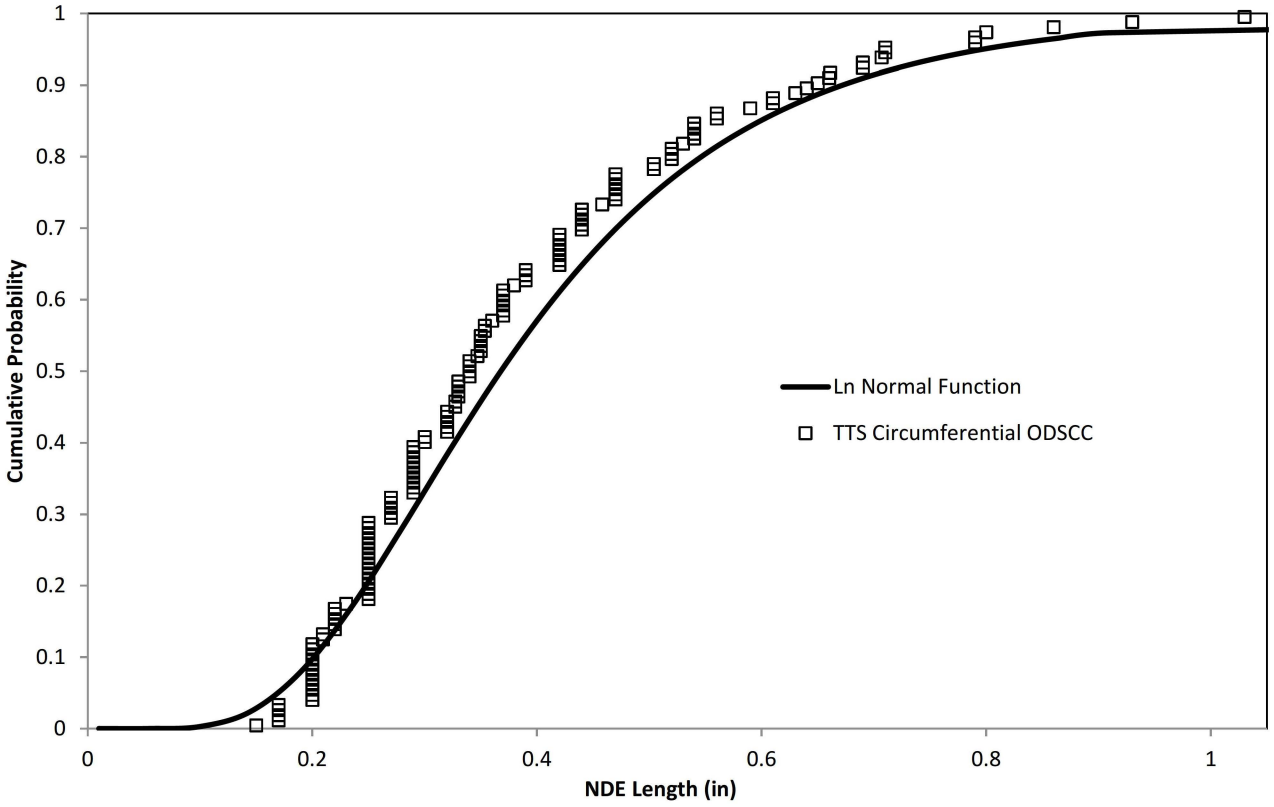


Figure 6-22: TTS Circumferential ODSCC MD/AD Ratio

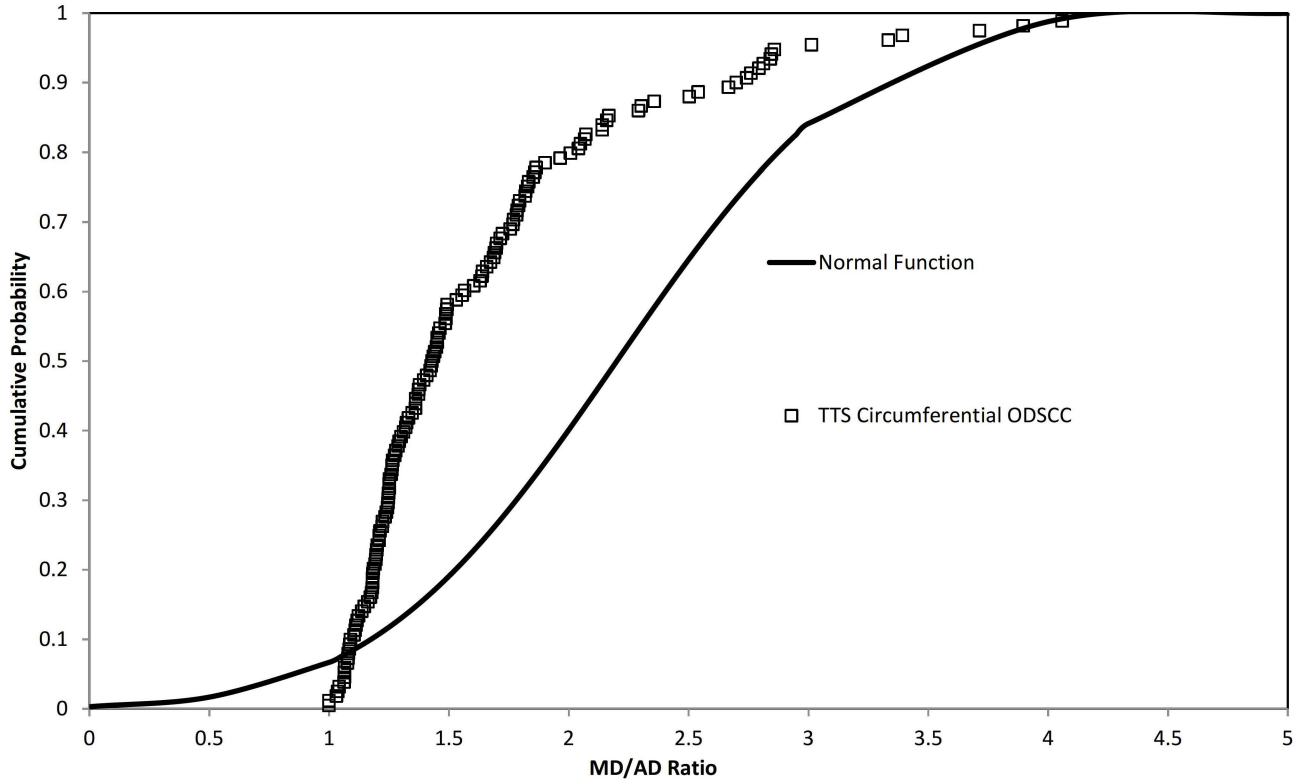


Figure 6-23: Average Depth Growth Rate Distribution: Circumferential TTS ODSCC

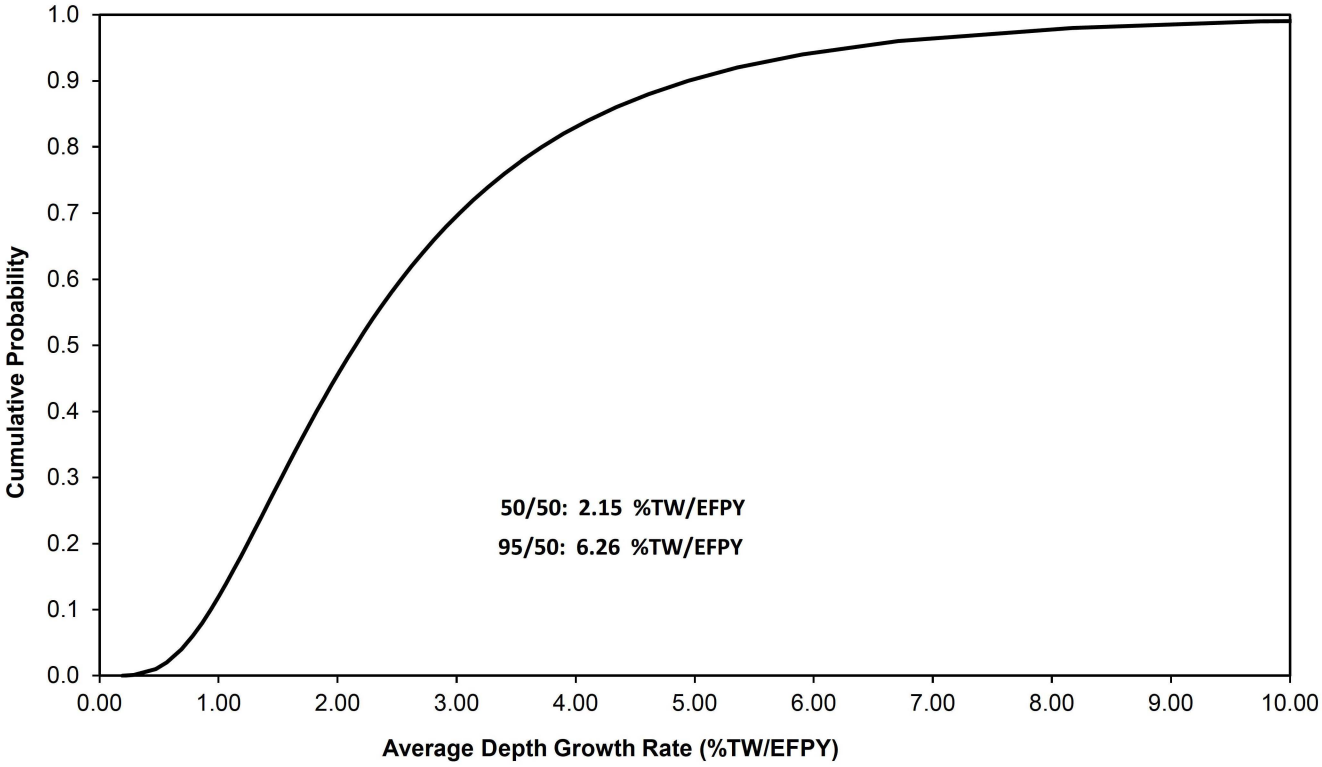


Figure 6-24: Simulated vs. Actual Cumulative TTS Circumferential ODSCC Indications

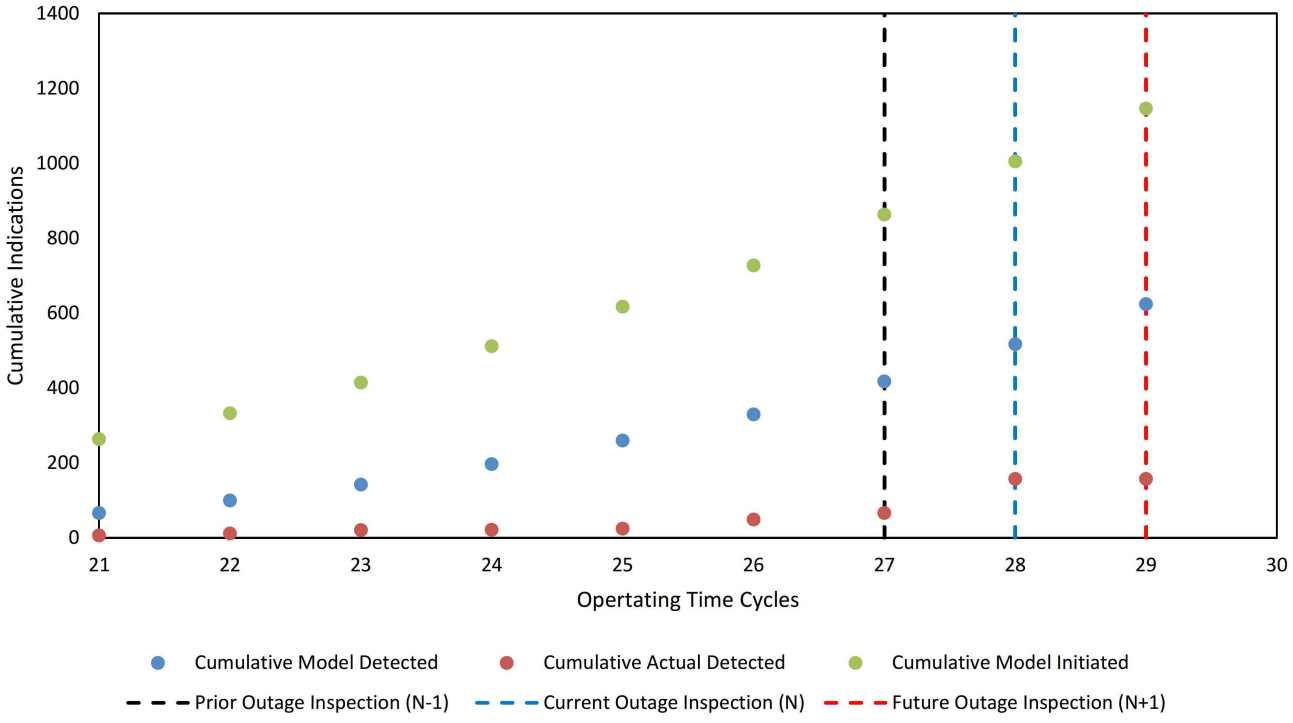
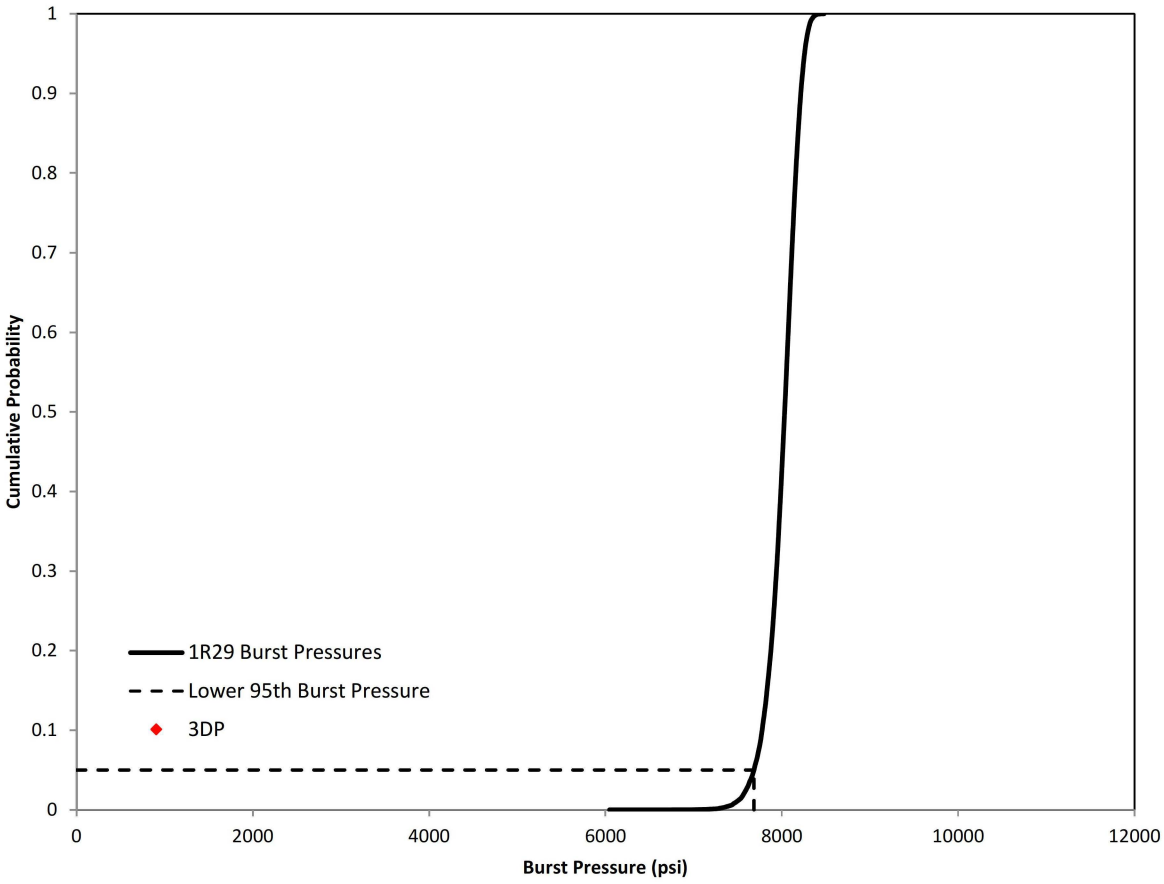


Figure 6-25: Burst Pressure Evaluation: Circumferential TTS ODSCC



Note: The lowest predicted burst pressure plotted was higher than the SIPC limit (3DP) of 3960 therefore the SIPC limit data point (red diamond) is not shown on Figure 6-25

Table 6-12: Probabilistic Evaluation Inputs: Circumferential TTS ODSCC(Pressure)

Description	Value
Wall thickness (inch)	0.042
Tube OD (inch)	0.75
Normal Operating Pressure Differential (psi)	1320
Pressure Differential During SLB (psi)	2600
Mean Value of Sy + Su (psi)	141020
Standard Deviation of Sy + Su (psi)	6604
Mean Value of Yield Strength (psi)	33102
Number of Susceptible Locations in the SG(s)	3000
Median Mid-Wall Circ Length Growth Rate (inch/EFPY)	1.00E-07
Standard Deviation of Ln Normal Mid-Wall Circ Length Growth Distribution	0
Upper Limit on Mid-Wall Circ Length Growth Rate (inch/EFPY)	0.12
Median 'Average Depth' Growth Rate (%TW/EFPY)	2.15
Standard Deviation of Ln Normal 'Average Depth' Growth Rate Distribution	0.65
Upper Limit on 'Average Depth' Growth Rate (%TW/EFPY)	10
Number of Outages to Simulate	10
Weibull Scale Parameter for Crack Initiation (EFPY)	30
Weibull Shape Parameter for Crack Initiation	2.93
Weibull Scale Parameter for Initial Mid-Wall Crack Length (inch)	0.1
Weibull Shape Parameter for Initial Mid-Wall Crack Length	1
Median Initial Mid-Wall Crack Length (inch)	0.3679
Standard Deviation of Ln Normal Initial Mid-Wall Crack Length Distribution	0.47
Model for Initial Crack Length ('Weibull' or 'LnNorm')	LnNorm
Mean Ratio of Max Depth to Average Depth	1.25
Standard Deviation of the Ratio of Max Depth to Average Depth	0.15
POD function ('Log' or 'Log-Log')	Log-Log
Number of Trials in this Simulation	50000
Tube Material's Elastic Modulus (psi)	2.85E+07
Circ Crack Initiation Surface	OD

Figure 6-26: Simulated vs. Actual Cumulative TTS Circumferential ODSCC Indications(Pressure)

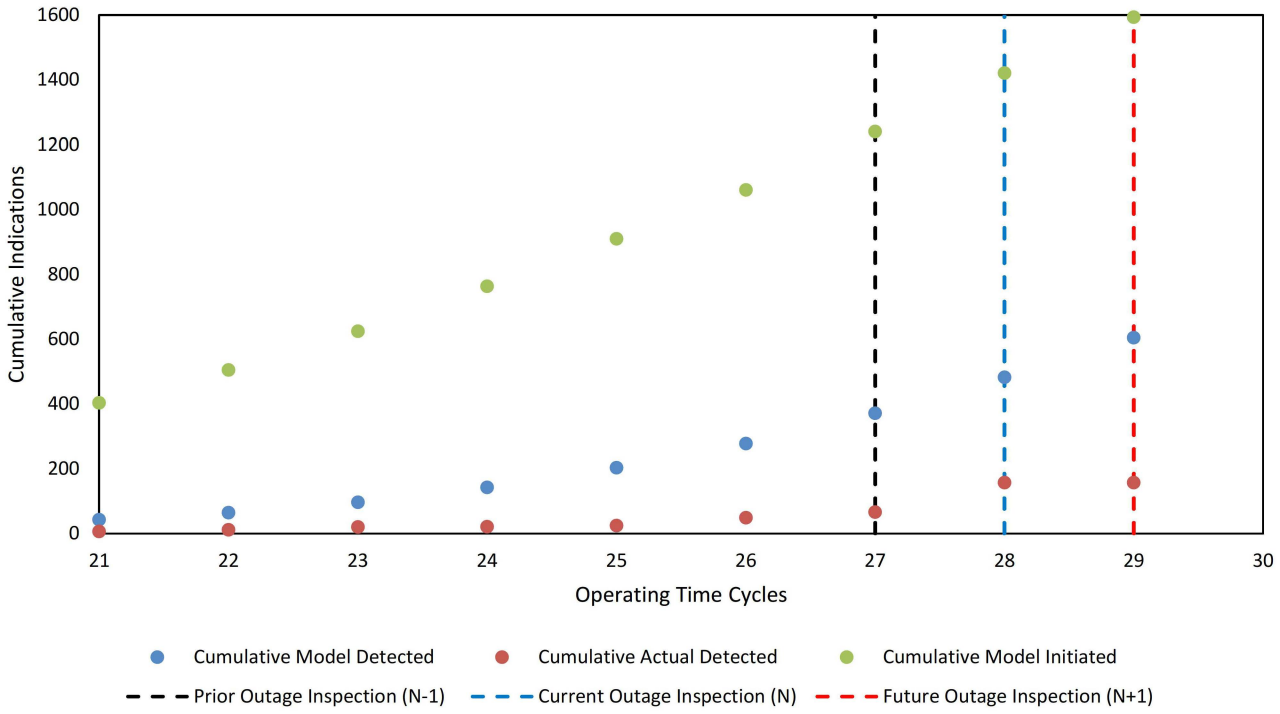
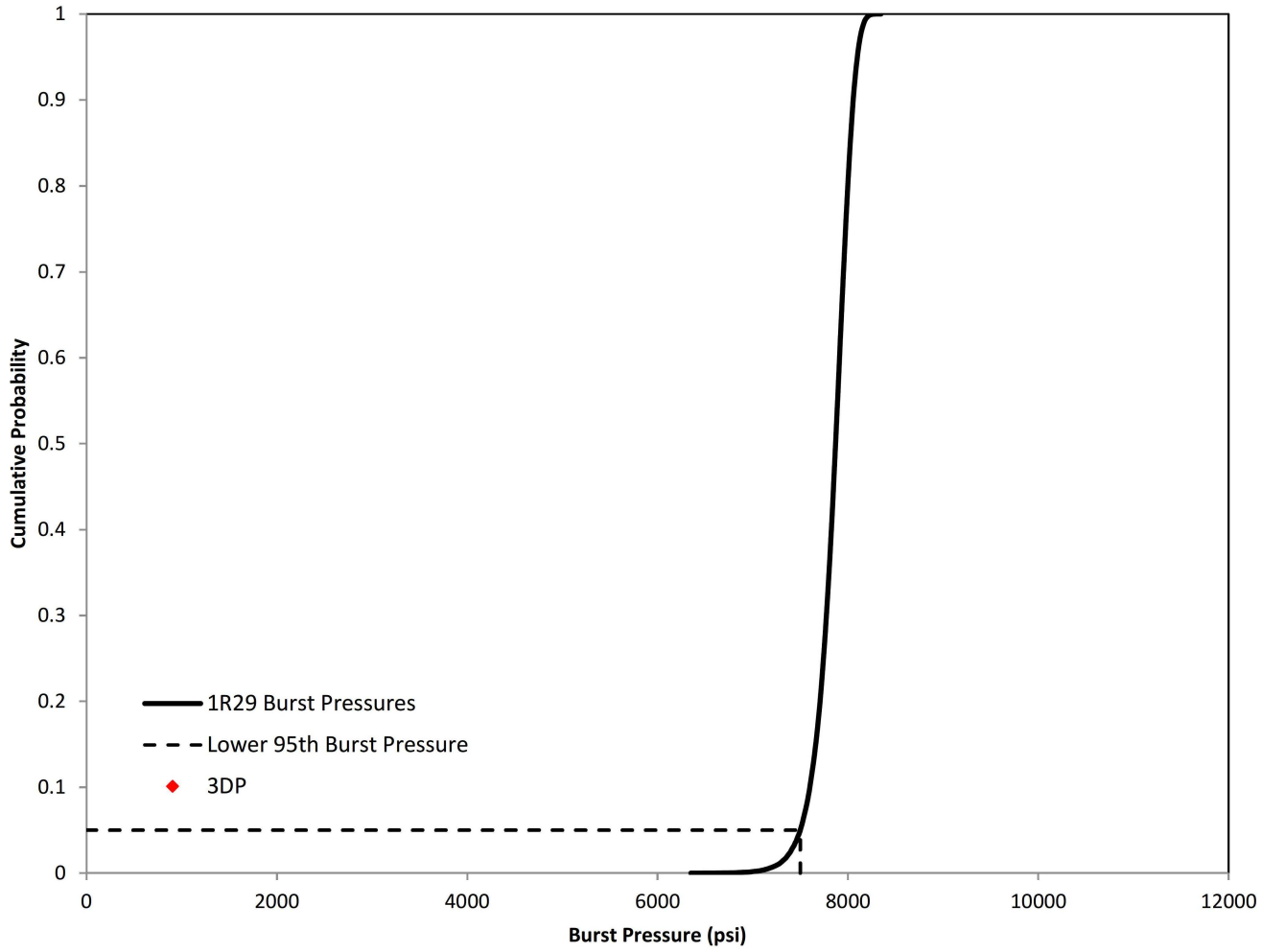


Figure 6-27: Burst Pressure Evaluation: Circumferential TTS ODSCC(Pressure)



Note: The lowest predicted burst pressure plotted was higher than the SIPC limit (3DP) of 3960 therefore the SIPC limit data point (red diamond) is not shown on Figure 6-27.

6.2.6 PWSCC within the Tubesheet

Tube rupture as a result of axial cracks located fully within the tubesheet expansion is not possible due to the structural support provided by the tubesheet [2.c, Appendix D]. Leakage integrity is discussed in Section 6.4.5.

6.2.7 Axial ODSCC at Dents/Dings

Axial ODSCC at dents and dings was evaluated using what is identified as the Mixed Arithmetic / Monte Carlo approach in the EPRI Integrity Assessment Guidelines [2.a]. Using this approach, the worst-case beginning-of-cycle (BOC) degradation severity is set equal to that corresponding to a probability of detection of 0.95. An upper 95th percentile growth allowance is added to this value to project the worst case degradation at the end-of-cycle (EOC). The allowable limiting state of degradation at the EOC is one that meets the required minimum burst pressure (3960 psi) with a probability of 0.95 at 50% confidence.

Three NDE techniques were used for detection of axial ODSCC during the 1D28 outage. Bobbin ETSS I28413 was used to detect axial ODSCC in non-dented and ≤ 2Vpp dented tubing. Bobbin ETSS 24013.1 was used to detect axial ODSCC in freespan dings >2Vpp but ≤5Vpp. +Point ETSS 22401.1 was used to detect axial ODSCC in freespan dings > 5Vpp and support dents > 2Vpp. Here, the bobbin probe provides detection of the >2Vpp dent/ >5Vpp ding, and the +Point probe determines if ODSCC is present in the dent/ding. These techniques are summarized in Table 6-13.

Table 6-13: NDE Techniques for Detection of Axial ODSCC at Dent / Dings

Probe	ETSS	Dents	Dings
Bobbin	I28413	≤ 2Vpp	≤ 2Vpp
Bobbin	24013.1	N/A	>2 Vpp to ≤ 5 Vpp
+Point	22401.1	>2 Vpp	>5 Vpp

From the data set associated with bobbin ETSS 24013.1, all flaws 71%TW and greater were detected. Per the DA, [8.g, Figure 10-5], the limiting high probability structural length for 100%TW degradation (at 3960 3ΔP) is 0.393 inches (meaning that burst is precluded for indication lengths ≤ 0.393 inches). The BOC depth can be set equal to the 71%TW bobbin detection threshold.

Use of the 71%TW bobbin detection threshold equates to a structural depth of 56.8%TW using the default flaw shape factor of 1.25 from the EPRI guidelines (71/1.25) due to a lack of adequate Palisades-specific data for Axial ODSCC at dents or dings. Note, review of the SAI in SG A tube 24-39 VS Line by Line sizing showed a 1.23 shape factor which is comparable to the 1.25 default flaw shape factor. Application of the Palisades 1D28 DA, [8.g, Table 10-3], upper 95th structural depth growth rate (6.55 %TW/ EFPY) over a period of 1.5 EFPY produces a 1R29 structural depth of 67%TW [(71/1.25) + (6.55*1.5)]. The longest reported ODSCC length (at a ding in straight length tubing) is 0.44 inches which is greater than the reported length associated with the vertical strap dinged indication in SGA of 0.38 inches. Input of these values (67%TW structural depth and 0.44 inch length) into the high probability models [15, Section 5.1.4,] results in a burst pressure of 4334 psi. Since this burst pressure exceeds the 3960 psi (3ΔP) criterion, there is reasonable assurance that dent/ding axial ODSCC will not violate the structural integrity criterion during operating cycle 29.

6.2.8 PWSCC at Vertical Straps at Dent

Axial PWSCC at dents and dings was evaluated using what is identified as the Mixed Arithmetic / Monte Carlo approach in the EPRI Integrity Assessment Guidelines [2.a]. Using this approach, the worst-case beginning-of-cycle (BOC) degradation severity is set equal to that corresponding to a probability of detection of 0.95. An upper 95th percentile growth allowance is added to this value to project the worst case degradation at the end-of-cycle (EOC). The allowable limiting state of degradation at the EOC is one that meets the required minimum burst pressure (3960 psi) with a probability of 0.95 at 50% confidence.

+Point ETSS 96703.1 was used to detect Axial PWSCC at dents and dings included dented supports. From the data set associated with bobbin ETSS 96703.1, all flaws 18%TW and greater were detected.

Per the DA, [8.g, Figure 10-5], the limiting high probability structural length for 100%TW degradation (at 3960 3ΔP) is 0.393 inches (meaning that burst is precluded for indication lengths ≤ 0.393 inches). The BOC depth can be set equal to the 18%TW +Point detection threshold.

Use of the 18%TW +Point detection threshold equates to a structural depth of 14.4%TW using the default flaw shape factor of 1.25 from the EPRI guidelines (18/1.25) due to a lack of adequate Palisades-specific data for Axial PWSCC at dents or dings. Application of the Palisades 1D28 DA, [8.g, Table 10-3], upper 95th structural depth

growth rate (8.56 %TW/ EFPY, bounding of PWSCC mechanisms) over a period of 1.5 EFPY produces a 1R29 structural depth of 27.2%TW [18/1.25 + 8.56*(1.5)]. The longest reported PWSCC length (at a dented support) is 0.4 inches. The length uncertainty for ETSS 96703.1 is 0.28 inches. Total length used in model was 0.68 inches (0.4+0.28). Input of these values (27.2%TW structural depth and 0.68 inch length) into the high probability models [Section 5.1.4,[15]] results in a burst pressure of 7302 psi. Since this burst pressure exceeds the 3960 psi (3ΔP) criterion, there is reasonable assurance that dent/ ding axial ODSCC will not violate structural integrity criterion during operating cycle 29.

6.3 Evaluation of Structural Integrity for the Non-Detected Population of Existing Degradation Mechanisms

The structural integrity performance criterion for the non-detected population of existing mechanisms is equivalent to that used for the detected population. That is, the projected worst case degraded tube must meet the limiting structural performance parameter with a 95% probability and 50% confidence. The following damage mechanisms, although not detected during 1D28, must also satisfy the performance criteria set forth in NEI 97-06 [1] and the Integrity Assessment Guidelines [2.a], and be included as part of the operational assessment evaluation. The OA evaluation for the following non-detected damage mechanisms is provided in Sections 6.3.1 through 6.3.4.

- Axial PWSCC at small radius u-bends
- Axial IGA in freespan locations
- Circumferential PWSCC below the expansion transition
- Tube-to-tube wear (TTW)

6.3.1 Axial PWSCC at Small Radius U-bends

Axial PWSCC in small radius u-bends was evaluated using what is identified as the Mixed Arithmetic / Monte Carlo approach in the EPRI Integrity Assessment Guidelines [2.a]. Using this approach, the worst-case beginning-of-cycle (BOC) degradation severity is set equal to that leading to a probability of detection of 0.95. An upper 95th percentile growth allowance is added to this value to project the worst case degradation at the end-of-cycle (EOC). The allowable limiting state of degradation at the EOC is one that meets the required minimum burst pressure (3960 psi) with a probability of 0.95 at 50% confidence.

+Point ETSS 96511.2 was used for detection of PWSCC at u-bend locations during the 1D28 outage. During the 1R21 outage, ETSS 20511.1 was used for detection of axial PWSCC in small radius u-bends. Reference to the 1R21 OA [4.c, Section 5.5], shows that the 95% POD value for ETSS 20511.1 is 68%TW after correcting for u-bend noise through a MAPOD evaluation. By comparing the detection results of the two ETSSs, the POD curve for ETSS 20511.1 bounds that of ETSS 96511.2. Therefore, it is reasonable (and conservative) to use the more bounding ETSS 20511.1 95% POD value as the BOC depth for axial PWSCC in small radius u-bends. Note that the 95% POD value is 68%TW, slightly greater than used for TTS indications. Since the noise distributions presented in Section 6.1 yield similar results between the 2010 and 2024 (1R21 and 1D28) outages, the 1R21 MAPOD results (for ETSS 20511.1) can be carried forward to the 1D28 OA evaluation of PWSCC indications presented herein.

Division by the 1.25 flaw shape factor (the IAG default value) transforms the maximum depth to structural depth for SCC type indications. The BOC depth of 68%TW equates to a structural depth of 55%TW (68/1.25). Application of the Palisades 1D28 DA, [8.g, Table 10-2], upper 95th structural depth growth rate (6.55 %TW/ EFPY) over a period of 1.5 EFPY produces a 1D28 structural depth of 64.2%TW [68/1.25 + 6.55*(1.5)]. The use of the longest reported axial PWSCC length (0.32 inches, FDMS database) results in an upper 95th length of 0.56 inches after adjusting for NDE uncertainty. The uncertainty correction was based on +Point technique 20511.1 (because no length regression relationship exists for ETSS 96511.2), [1.10*(0.32) - 0.01 + 1.645*0.13], where 1.10

and -0.01 are the slope and intercept of the regression equation and 0.13 is the Technique Standard Error, multiplied by *z*, 1.645.

The Palisades 1D28 DA, [8.g, Section 10.1] states that the material properties associated with the row 1 and 2 u-bends are higher than elsewhere in the bundle. These material properties are defined in Section 7.2 of the Palisades 1R21 DA [3.a]. Here, the flow stress is defined to be 75 ksi, which results in a material strength of 150 ksi (i.e., yield + ultimate). If this material strength, along with the more conservative room-temperature standard deviation presented in the 1D28 DA, [8.g, Section 10.1], is input into the high probability models [14, 15], the resulting burst pressure for an EOC 66.4%TW x 0.56 inch PWSCC indication is 4180 psi. This demonstrates that there is adequate margin above the 3960 psi 3ΔP limit and provides reasonable assurance that axial PWSCC in the u-bends will not violate structural integrity requirements during operating cycle 29.

6.3.2 Axial IGA at Freespan Locations

Axial Intergranular Attack (IGA) was not identified during 1D28. However, during 1R25 eight indications at the freespan in SGB (R62-C101 at 03H-04H) that were identified as axial ODSCC also had flaw morphology characteristic of Freespan Axial IGA, commonly referred to as "Groove IGA". Groove IGA is treated similarly to Freespan Axial ODSCC, and for CE SGs, use the same ETSSs for both detection and sizing. Therefore, the evaluation for Freespan Axial ODSCC performed in Section 6.2.3 is also applicable for Axial IGA and provides reasonable assurance that Axial IGA in the freespan will not violate structural integrity requirements during operating cycle 28.

6.3.3 Circumferential PWSCC at Expansion Transitions and Expanded Tubesheet Locations

Circumferential PWSCC at expansion transitions and expanded tubesheet locations was evaluated using what is identified as the Mixed Arithmetic / Monte Carlo approach in the EPRI Integrity Assessment Guidelines [2.a]. Using this approach, the worst-case beginning-of-cycle (BOC) degradation severity is set equal to that corresponding to a probability of detection of 0.95. An upper 95th percentile growth allowance is added to this value to project the worst case degradation at the end-of-cycle (EOC). The allowable limiting state of degradation at the EOC is one that meets the required minimum burst pressure (3960 psi) with a probability of 0.95 at 50% confidence.

+Point ETSS I11524 rev.0 was used for detection of circumferential PWSCC at expansion transition and expanded tubesheet locations during the 1D28 outage. Since the ETSS I11524 noise distribution, presented in Section 6.1, bounds the Palisades TTS noise distribution, the ETSS I11524 POD curve (without a Palisades-specific MAPOD analysis) can be used to determine the BOC flaw size. Reference to the POD curve shows that a maximum depth of 51%TW is bounding at the 95% POD. Division by the 1.25 flaw shape factor (the IAGL default value, [2.a]) transforms the maximum depth to a structural depth for SCC type indications This depth corresponds to an equivalent structural depth of 41%TW (51/1.25). Applying the Palisades 1D28 DA, [3.a, Table 10-3], upper 95th structural depth growth rate of 12 %TW/ EFPY over a period of 1.5 EFPY results in a 1R29 structural depth of 59%TW [51/1.25 + 12*(1.5)]. Assuming a worst case EOC circumferential extent of 360 degrees, results in a percent degraded area (PDA) of 59. Input of this value (59 PDA) into the high probability model [14, 15], results in a burst pressure of 4475 psi. This demonstrates that there is adequate margin above the 3960 psi 3ΔP limit and provides reasonable assurance that circumferential PWSCC at expansion transitions and in expanded tubesheet locations will not violate structural integrity requirements during operating cycle 29.

6.3.4 Tube-to-Tube Wear (TTW)

Tube-to-tube wear (TTW) has only been detected in one tube at Palisades (SGA R136-C77). It was detected during the 1R19 inspection but could not be confirmed as TTW due to the adjacent tube being plugged during a prior inspection. TTW is detected using Bobbin ETSS 13091.1, and from the data set in the ETSS, all flaws, ranging in depth from 7 %TW to 72 %TW, were detected. Conservatively assuming potential undetected flaws of 6 %TW remain in service, and applying a growth rate of 12.7 %TW/EFPY, based on the indication found in 1R19 (16%TW

/ 1.26 EFPY), would result in a 1D28 depth of 25 %TW [6 + 12.7*(1.5)] which is well below the CM limit of 60% for an assumed length of 2.5" [8.g, Figure 10-3]. This demonstrates that there is adequate margin above the 3960 psi 3ΔP limit and provides reasonable assurance that TTW will not violate structural integrity requirements during operating cycle 28.

6.4 Evaluation of Leakage Integrity for the Detected Population of Existing Degradation Mechanisms

6.4.1 AILPC Sleeve Adjustment

Prior to 1D28, OA models used for Palisades utilized a 0.1 gpm[8.g] AILPC limit as a target leakage to determine if the 5% POL(Probability of Leakage) criteria is met. With the sleeving discussed in Section 5.0 this number was adjusted to a new limit to incorporate any potential leakage from the installed sleeves. This adjustment is shown in Table 6-14. SGA is the generator with the highest number of plugs and sleeves so its allowable leakage of 0.0768 gpm was used as the target leakage for all OA probabilistic models ran for the projected 1.5 EFPY cycle.

Table 6-14: Palisades Leakage Limit with Installed Sleeves 1D28

SG	Description	Value	Units
A	Palisades AILPC	0.1	gpm
	Sleeves In-service	2099	sleeves
	Estimate of Leakage per Sleeve	0.0159	gpd
	Estimate of Leakage per Sleeve	1.10417E-05	gpm
	Estimate of Leakage of all installed sleeves	0.0232	gpm
	Cycle 28 Known Operational Leakage	0.0007	gpm
	OA Allowable leakage for SG	0.0761	gpm
B	Palisades AILPC	0.1	gpm
	Sleeves In-service	872	sleeves
	Estimate of Leakage per Sleeve	0.0159	gpd
	Estimate of Leakage per Sleeve	1.10417E-05	gpm
	Estimate of Leakage of all installed sleeves	0.0096	gpm
	Cycle 28 Known Operational Leakage	0.0007	gpm
	OA Allowable leakage for SG	0.0897	gpm

6.4.2 Wear

Per reference [2.a], the onset of pop-through leakage for axially oriented (≥ 0.25" axial length) volumetric flaws with limited circumferential extent, the nature of the support wear degradation identified in Palisades SGs is coincident with burst. Since none of the identified support wear degradation mechanisms are projected to exceed the structural performance criteria prior to the next scheduled inspection in each SG, there is reasonable assurance that neither the operational, nor the accident-induced leakage performance criterion at the lower MSLB pressure, will be exceeded prior to the outage (EOC29).

Since loose part wear can manifest itself as volumetric degradation less than 0.25" in axial length, the potential for pop-through leakage also needs to be considered. As discussed in Section 8.0 of reference [9.g], robust SSI and ECT inspections were performed during 1D28 in an effort to ensure that the SGs are not returned to service with pre-existing foreign object degradation (wear of foreign object) that has not been addressed by stabilization and plugging. Therefore, any potential margin (> 40 %TW) against the occurrence of pop-through for indications ≤ 0.25" in axial length and 51 %TW. Thus, it is reasonable to conclude based on the plant's operating history and the

robustness of the SSI and ECT inspections performed during 1D28, that there is little potential for leakage due to pop-through during operating cycle 29. Leakage due to pop-through would most likely result from a new object being introduced into the bundle after startup or through the movement of a historical foreign object. During the past seven outages, the largest detected NDE depth related to foreign object wear was 51 %TW. The more limiting pop-through curve (axial vs. circumferential) in the Degradation Assessment [8.g] illustrates that there is substantial margin (> 40 %TW) against the occurrence of pop-through for indications ≤ 0.25" in axial length and 51 %TW. Thus, it is reasonable to conclude based on the plant's operating history and the robustness of the SSI and ECT inspections performed during 1D28, that there is little potential for leakage due to pop-through during operating cycle 29.

6.4.3 Axial ODSCC

The probabilistic evaluations discussed earlier in relation to eggcrate, vertical strap and freespan axial ODSCC, and TTS axial ODSCC (Sections 6.2.3 and 6.2.4), projected zero leakage under SLB conditions. Therefore, it is concluded that there is reasonable assurance that neither the operational, nor the accident-induced leakage performance criterion, will be exceeded prior to the EOC29 inspection.

6.4.4 Circumferential ODSCC

The probabilistic evaluations discussed earlier in relation to TTS circumferential ODSCC (Section 6.2.5), projected a best estimate of zero leakage and an upper 95th of 0 gpm under SLB conditions. Therefore, it is concluded that there is reasonable assurance that neither the operational, nor the accident-induced leakage performance criteria, will be exceeded prior to the EOC29.

6.4.5 PWSCC within the Tubesheet

Sixty-one (61) axial PWSCC indications were identified within the tubesheet during the 1D28 outage inspection. This mechanism was infrequently observed prior to 1D28, with only 14 axial PWSCC indications previously identified in this region through 1R27 (including expansion transition). The inspection scope and methodology applied within the tubesheet has been consistent for many outages (100% +Point examinations H/L TS). A probabilistic analysis was performed for tube sheet (TS) axial PWSCC with inputs that are applicable to TS PWSCC. The results are discussed in the sections below. Inputs to the probabilistic evaluation are shown in Table 6-15 and Table 6-16.

6.4.5.1 Probability of Detection (POD)

+Point noise was evaluated from both SGs in 1D28 and used as an input along with the a-hat correlation developed for ETSS 20511.1. These data were analyzed using the EPRI MADPOD[13] software to develop the POD curve for the probabilistic model for TS PWSCC. The POD curve used in 1D28 is shown in Figure 6-28.

6.4.5.2 Crack Length

The distribution of TS PWSCC lengths as measured by NDE during 1D28 and previous Palisades outages is provided in Figure 6-29. Because the +Point sizing technique tends to overestimate overall crack length, this distribution is a conservative bound of the actual crack length at the final outage (1D28). For this reason, no length growth is applied within the probabilistic evaluation.

6.4.5.3 MD/SD Ratio

Per the IAGL[2.a] a mean of 1.25 and standard deviation of 0.15 was used for the MD/SD ratio of the model.

6.4.5.4 Throughwall Depth Growth Rate

The conservative upper bound estimate for growth rate from the IAGL was used for the throughwall depth growth rate after adjustment for Palisades operating temperature. This produces an average growth mean of 3.35%TW/EFPY and an upper 95th percentile value of 9.75%TW/EFPY. The Average Depth Growth Rate curve used is shown in Figure 6-30.

6.4.5.5 Crack Initiation and Detection

The cumulative number of TS PWSCC indications identified at each Palisades refueling outage provides the basis for projecting the number of such cracks during future outages shown as actual detections.

Figure 6-31 illustrates that the Weibull function used to model TS PWSCC conservatively represents the actual detection history for this degradation mechanism on a cumulative indication basis. This is shown by the cumulative model detected data bounding the cumulative actual detected(flaws found in inspection).

6.4.5.6 Probabilistic Evaluation Results

The corresponding projected upper 95th percentile leak rate at SLB conditions is zero for 1R29.

Table 6-15: Probabilistic Evaluation Inputs: TS PWSCC

Description	Value
Wall thickness (inch)	0.042
Tube OD (inch)	0.75
Normal Operating Pressure Differential (psi)	1320
Pressure Differential During SLB (psi)	2600
Mean Value of Sy + Su (psi)	124097
Standard Deviation of Sy + Su (psi)	7505
Number of Susceptible Locations in the SG(s)	3000
Mean or Median Length Growth Rate (inch/EFPY)	1.00E-07
Standard Deviation of Ln Normal Length Growth Distribution	0
Upper limit on length growth rate (inch/EFPY)	0.05
Mean or Median 'Average Depth' Growth Rate (%TW/EFPY)	3.345
Standard Deviation of Ln Normal 'Average Depth' Growth Distribution	0.65
Upper limit on depth growth rate (%TW/EFPY)	30
Number of Outages to Simulate	10
Weibull Scale Parameter for Crack Initiation (EFPY)	50
Weibull Shape Parameter for Crack Initiation	2.24
Weibull Scale Parameter for Initial Crack Length (inch)	0.21
Weibull Shape Parameter for Initial Crack Length	2.5
Mean or Median Initial Crack Length (inch)	0.44
Standard Deviation of Ln Normal Initial Crack Length Distribution	0.721
Model for Initial Crack Length ('Weibull' or 'LnNorm')	LnNorm
Mean Ratio of Max Depth to Average Depth	1.25
Standard Deviation of the Ratio of Max Depth to Average Depth	0.15
POD function ('Log' or 'Log-Log')	Log-Log
Number of Trials in this Simulation	50000
Tube Material's Elastic Modulus (psi)	2.85E+07

Table 6-16: Probabilistic Evaluation Inputs: TS PWSCC, POD Parameters

Outage	Cumulative EFPY	'a' POD Parameter	'b' POD Parameter
1R20	14.09	-3.123	2.738
1R21	15.48	-3.123	2.738
1R22	16.84	-3.123	2.738
1R23	18.25	-3.123	2.738
1R24	19.74	-3.123	2.738
1R25	21.2	-3.123	2.738
1R26	22.6	-3.123	2.738
1R27	24.21	-3.123	2.738
1D28	25.78	-3.123	2.738
1R29	27.28	-3.123	2.738

Figure 6-28: POD Curve: TS PWSCC

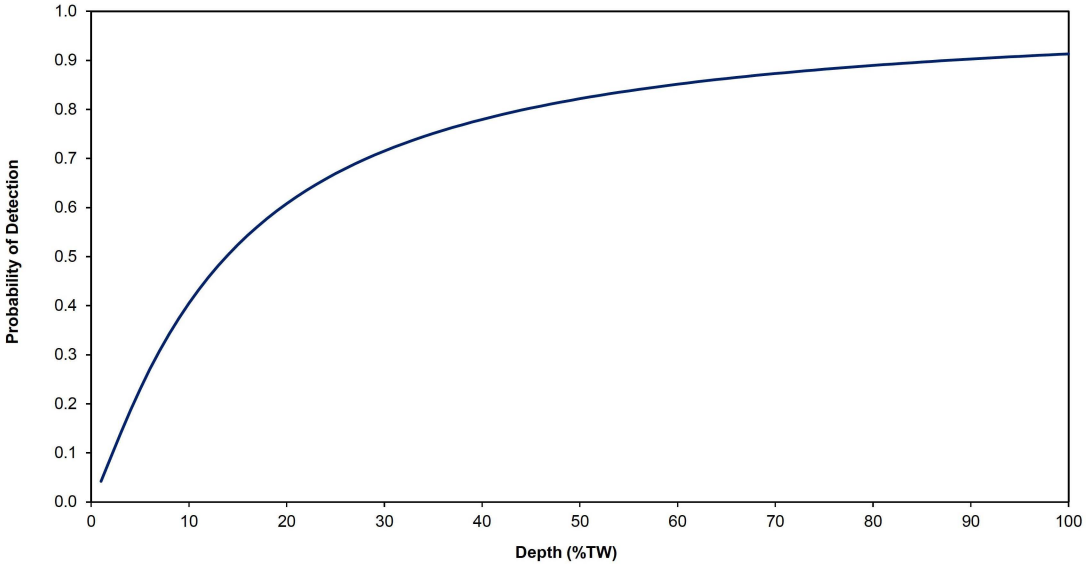


Figure 6-29: PWSCC TS 1D28 Lengths

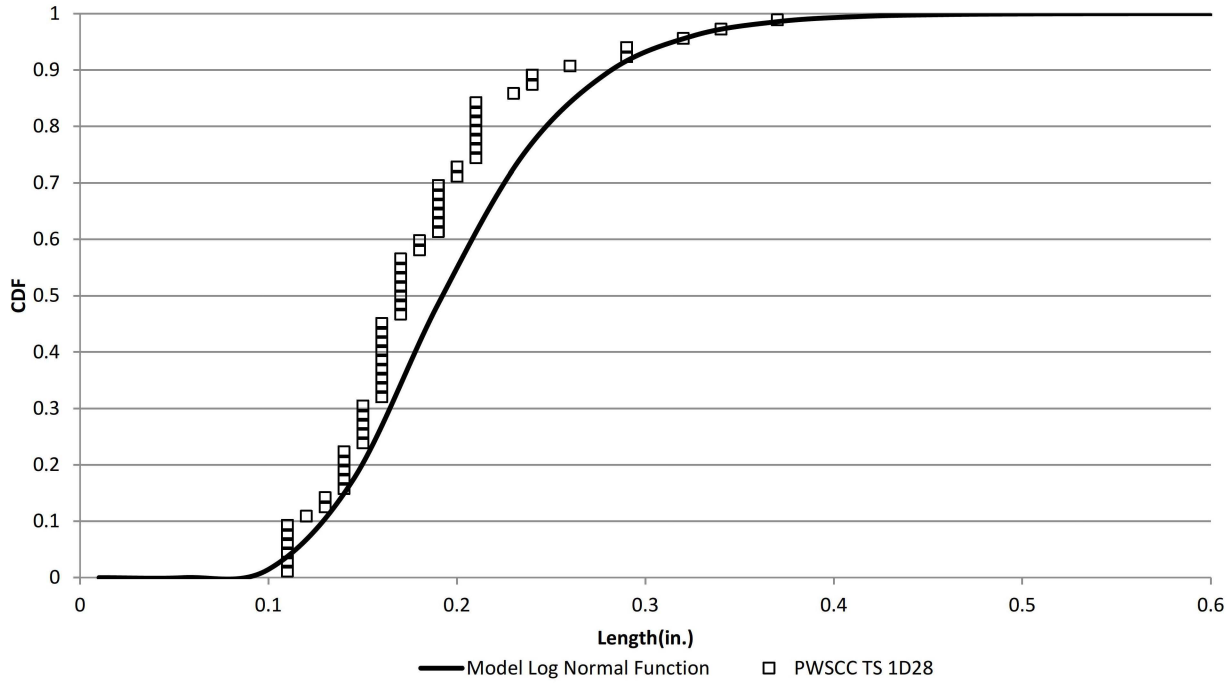


Figure 6-30: Depth Growth Rate Distribution: TS PWSCC

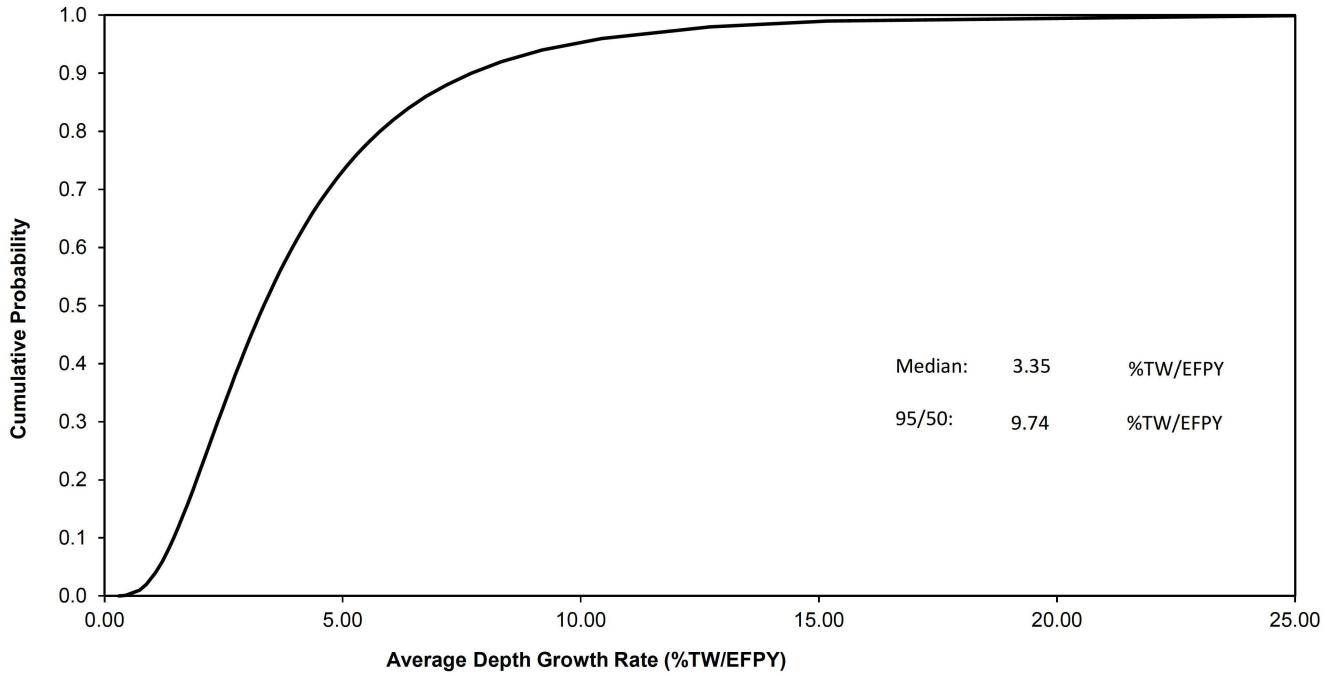
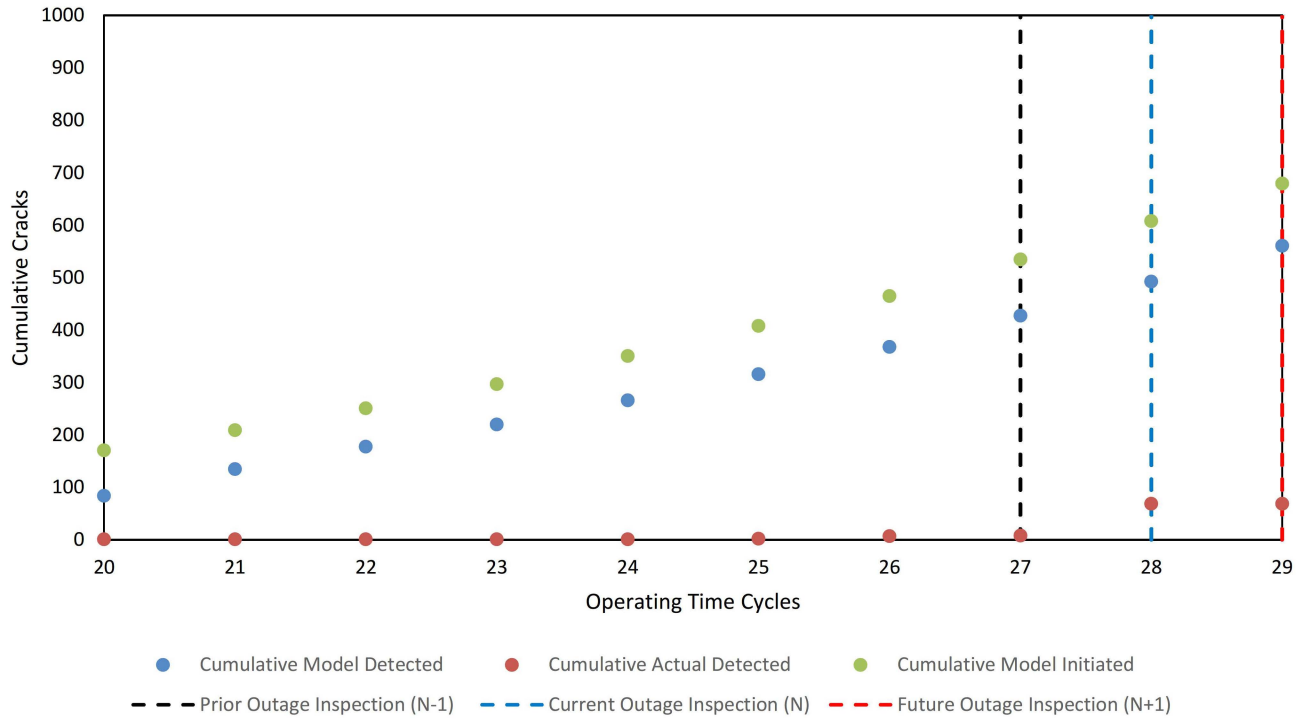


Figure 6-31: Model Indications and Detections vs. Actual Detections: TS PWSCC



6.4.6 Axial ODSCC at Dents/Dings

Three NDE techniques (ETSSs I28413, 24013.1, and 22401.1) were used for detection of axial ODSCC at dents and dings during the Palisades 1D28 outage. Bobbin ETSS I28413 was used to detect axial ODSCC in tubing containing no dent/dings up to 2Vpp dent/dings. Bobbin ETSS 24013.1 was used to detect axial ODSCC in dings >2Vpp to ≤5Vpp. +Point ETSS 22401.1 was used to detect axial ODSCC in dings > 5Vpp and dents > 2Vpp.

Bobbin ETSS I28413: (No Dent/Dings up to 2Vpp Dent/Dings)

The probabilistic evaluations discussed in Section 6.2.3 for axial ODSCC at eggcrate, vertical strap, and freespan locations and in Section 6.2.4 at TTS locations projected zero leakage under SLB conditions. Since the ETSSs supporting these evaluations are also qualified for detection of dent/dings up to 2Vpp, reasonable assurance is provided that neither the operational, nor the accident-induced leakage performance criteria, will be exceeded prior to EOC29 for locations having no dent/dings up to 2Vpp dent/dings.

Bobbin ETSS 24013.1: (Dings >2Vpp to ≤ 5Vpp)

The following OA assessment for axial ODSCC in dings between 2Vpp and 5Vpp will demonstrate, by considering two cases of flaw lengths (lengths <0.1-inch and lengths ≥ 0.1-inch), that leakage integrity will be maintained.

Reference to ETSS 24013.1 shows that all flaws ≥ 71%TW (for all lengths) were successfully detected using the bobbin probe. Setting the BOC depth equal to the 71%TW bobbin detection threshold and using the DA [8.g, Table 10-3] maximum depth growth rate (8.2 %TW/ EFPY) for axial ODSCC at dent/dings applied over 1.5 EFPY, results in an EOC maximum depth of 84%TW [71%TW + 8.2*(1.5)]. Reference to the pop-through curve in the DA [8.g, Section 11.2] illustrates that the 84%TW depth is bound by the pop-through leakage limit for flaw lengths up to 0.5-inch. For flaw lengths ≥ 0.5-inch, leakage integrity is justified once again through use of the ETSS 24013.1 data set by targeting flaw lengths ≥ 0.1-inch. For these flaw lengths, all flaws ≥ 54%TW were detected by the bobbin probe; thereby permitting the bobbin detection threshold (for flaw lengths ≥ 0.1-inch) to be set to 54%TW. If the

0.5-inch length (associated with the 84%TW depth) is conservatively decreased to 0.1-inch and the 54%TW BOC depth is grown using the (8.2 %TW/ EFPY) maximum depth growth rate over 1.5 EFPY, the resulting EOC maximum depth is 67%TW [54%TW + 8.2*(1.5)]. This 67%TW EOC maximum depth is well bound by the pop-through leakage limit for all flaw lengths and specifically for flaw lengths ≥ 0.1-inch.

In summary, leakage integrity for axial ODSCC in dings between 2Vpp and 5Vpp has been demonstrated by segregating the flaw lengths into two cases, lengths <0.1-inch and lengths ≥ 0.1-inch. For lengths <0.1-inch, a BOC detection threshold depth of 71%TW grown over 1.5 EFPY yields an EOC maximum depth of 84%TW. For lengths ≥ 0.1-inch, a BOC detection threshold depth of 54%TW grown over 1.5 EFPY yields an EOC maximum depth of 67%TW. Reference to the pop-through curve shows that both EOC maximum depths (84%TW and 67%TW) are bound by the pop-through leakage limit for the specific lengths of interest, <0.1-inch and ≥ 0.1-inch respectively. Therefore, based on the above discussion, reasonable assurance is provided that leakage integrity will be maintained prior to EOC29 for axial ODSCC indications (of all lengths) in dings between 2Vpp and 5Vpp (>2Vpp to ≤ 5Vpp).

ETSS 22401.1: (Dents > 2Vpp and Dings > 5Vpp)

The 95% POD associated with +Point ETSS 22401.1 for detection of axial ODSCC at support structures (combined with the data from the freespan ding detection program SG-99-03-005) is 68%TW for all dent/ding lengths, [4.c, Section 5.4]. When the DA [8.g, Table 10-3] maximum depth growth rate (8.2 %TW/ EFPY) is applied over 1.5 EFPY and then added to the 95% POD depth value, the resulting EOC maximum depth is 81%TW [68 + 8.2*(1.5)]. Reference to the pop-through curve in the DA [8.g, Figure 11-2] illustrates that for an 81%TW flaw, leakage integrity is maintained (pop-through will not occur) for lengths ≤ 0.8-inch. From the 1R21 OA, [4.c, Section 6.5], the longest reported ODSCC length (NDE length) is 0.22-inch at a ding in straight length tubing and 0.32-inch at a ding in the U-bend section. These values bound the inspection results from 1R21 to 1R27. During 1D28 however, axial ODSCC (NDE length) of 0.4-inch was detected at a dent in the U-bend section of SGA, tube R24-C39 at VS4. When applying the bounding length error of 0.27-inch associated with ETSS 22401.1 Rev.4, the resulting bounding axial length for axial ODSCC at a dent/ding is 0.67-inch [0.4 + 0.27]. Rounding up to 0.7-inch, the pop-through curve shows that pop-through will not occur until the depth reaches 82%TW. Since the projected EOC maximum depth (81%TW) is bound by the pop-through leakage limit, reasonable assurance is provided that leakage integrity will be maintained prior to EOC29 for axial ODSCC indications (≤ 0.7-inch) in dents >2Vpp and dings >5Vpp.

The OA summary of results for axial ODSCC at dent/dings is illustrated below in Table 6-17.

Table 6-17: OA Leakage Summary for Axial ODSCC at Dent / Dings

Probe/ ETSS	Dents	Dings	Lengths	Leakage Results
Bobbin I28413	No Dents to ≤ 2Vpp	No Dings to ≤ 2Vpp	All Dent / Ding Lengths	Dent/ Ding results bounded by the probabilistic results of zero projected leakage at EOC29
Bobbin 24013	N/A	>2Vpp to ≤ 5Vpp	< 0.1-inch	Projected EOC Maximum Depth of 84%TW is Bounded by the Pop-Through Curve
			≥ 0.1-inch	Projected EOC Maximum Depth of 67%TW is Bounded by the Pop-Through Curve
+Point 22401	>2 Vpp	>5 Vpp	≤ 0.7-inch	Projected EOC Maximum Depth of 81%TW is Bounded by the Pop-Through Curve

6.4.7 PWSCC at Vertical Straps at Dent

When the maximum depth growth rate (8.2 %TW/ EFPY) is applied over 1.5 EFPY and then added to the minimum detected depth value of 18%TW for ETSS 96703.1, the resulting EOC maximum depth is 30.3%TW [18%TW + 8.2*(1.5)]. Reference to the pop-through curve in the DA [8.g, Section 11.2] illustrates that this depth is below the pop-through leakage limit thus providing reasonable assurance that leakage integrity will be maintained throughout operating cycle 29 for PWSCC at Supports associated with dents.

6.5 Evaluation of Leakage Integrity for the Non-Detected Population of Existing Degradation Mechanisms

The following pop-through evaluations are based on the equations presented in the EPRI Integrity Assessment Guidelines and the EPRI In-Situ Pressure Test Guidelines, [2.a and 2.c], together with input from Table 6-1 of this document.

6.5.1 Axial PWSCC at Small Radius U-bend Locations

When the maximum depth growth rate (8.2 %TW/ EFPY) is applied over 1.5 EFPY and then added to the 1R21 MAPOD-corrected 95% POD depth value for ETSS 20511.1, [Section 6.3.1], the resulting EOC maximum depth is 80.3%TW [68 + 8.2*(1.5)] for all indication lengths. As discussed earlier, the longest reported PWSCC is 0.32 inches (upper 95th of 0.58 inches after NDE correction). The pop-through threshold corresponding to the 0.58 inch indication length is 84%TW. Thus the EOC maximum depth (81%TW) is projected to be less than the pop-through depth but with little margin when using the nominal material properties identified in the DA, [8.g, Section 10.2].

It is expected that PWSCC should first manifest itself in the low row u-bends (compared to the outer row u-bends). When analyzed for this condition and using the 150 ksi material strength associated with the row 1 and 2 u-bends (discussed previously), the pop-through depth (at 0.58 inch length) increases to 86%TW. This increase in pop-through depth (from 84%TW to 86%TW) provides additional margin and further demonstrates that there is

reasonable assurance that leakage integrity will be maintained throughout operating cycle 29 for axial PWSCC indications located at row 1 and 2 u-bend locations.

6.5.2 Axial IGA at Freespan Locations

As axial IGA is treated similarly as Freespan Axial ODSCC, leakage integrity is satisfied for this degradation mechanisms based on the analysis and discussion from Section 6.4.3 of this document.

6.5.3 Circumferential PWSCC at Expansion Transitions and Expanded Tubesheet Locations

When the maximum depth growth rate (15%TW/ EFPY) is applied over 1.5 EFPY and then added to a bounding upper 95% POD value of 55%TW for ETSS I11524, the resulting EOC maximum depth is 77.5%TW [55 + 15*(1.5)]. Based on the circumferential pop-through curve [8.g, Figure 11-2], a worst case EOC circumferential flaw extending 360 degrees has a pop-through threshold of 89%TW. Since the EOC maximum depth (77.5%TW) is projected to be less than pop-through depth (89%TW), there is reasonable assurance that leakage integrity will be maintained throughout cycle 29 for circumferential PWSCC at expansion transitions and expanded tubesheet locations.

6.5.4 Tube-to-Tube Wear (TTW)

Per reference [2.a], the onset of pop-through leakage for axially oriented (≥ 0.25" axial length) volumetric flaws with limited circumferential extent, the nature of TTW, is coincident with burst. Since TTW is not projected to exceed the structural performance criteria prior to the next scheduled inspection in each SG, there is reasonable assurance that neither the operational, nor the accident-induced leakage performance criteria, will be exceeded prior to the 1R29 inspection of the Palisades SGs.

6.6 Operational Leakage

The magnitude of primary to secondary leakage during normal operation depends principally upon the nature and quantity of tube degradation that exists in in-service tubes. The evaluations discussed in the previous sections conclude that, should a limiting accident occur during cycle 29, there is reasonable assurance that primary to secondary leakage will not occur as a result of currently-undetected or newly-developed tube degradation. This conclusion is also bounding of normal operating conditions which involve a less limiting pressure differential, and therefore lower driving force for pop-through and leakage. The operational leakage from installed plugs and sleeves and from uninspected locations below the hot leg C-star depth is expected to continue to be very low in comparison with the 72 GPD[5.b] administrative operating leakage limit; consequently, leakage is expected to remain well below 5 GPD during cycle 29.

6.7 Secondary Side Internals

No degradation of secondary side internals which could impact tube integrity prior to the next examination was identified during this outage. No tube support deficiencies or misplacement were identified during the 100% bobbin probe examination or during the secondary side visual examinations.

6.8 1R29 Projections

The projected number of 1R29 indications for the damage mechanisms observed during 1D28 are identified in Table 6-18. These projections are based from results of probabilistic models.

Table 6-18: Projections for 1R29- 1.5 EFPY

Damage Mechanism	Projections for 1R29
Axial ODSCC at Supports (Evaluated Probabilistically)	1292 indications (SG A) Physical Depth: 97.5 %TW Physical Length:4.875 in
Axial ODSCC at TTS (Evaluated Probabilistically)	21 indications/SG Physical Depth: 97.5 %TW Physical Length:2.125 in
Axial PWSCC at TS (Evaluated Probabilistically)	68 indications/SG Physical Depth: 97.5 %TW Physical Length 4.875 in
Circumferential ODSCC at TTS (Evaluated Probabilistically)	35 indications/SG Physical Depth: 97.5 %TW Physical Length:2.15 in / 350 deg Max PDA = 52.5
Wear at Supports (Evaluated Probabilistically)	3408 indications (both SGs) 95th Growth Rate: 2.2 %TW/EFPY Max Depth: <50%TW
Normal Operating Pressure Differential	1320 psi

7.0 CONCLUSIONS

During the 1D28R repair outage the following activities were completed:

- In-situ pressure test was completed on 17 tubes (this is discussed in the CM report [9.g])
- 500 previously out-of-service (OOS) tubes were de-plugged and evaluated to be returned-to-service (RTS) [10.k]
    - 275 previously OOS tubes were RTS, of which only 42 tubes required sleeves
    - All de-plugged tubes that could not be RTS were re-plugged with alloy 690 rolled plugs.
- 283 tubes in-service at 1D28 were plugged with alloy 690 rolled plugs
- 94 stabilizers installed
- 2979 sleeves installed in tubes planned to be RTS
    - 8 sleeves in 4 tubes were removed from service after installation
- Steam generator chemical cleaning scheduled to be performed in October 2025

The operational assessment performed for cycle 29 of 1.5 EFPY evaluated steam generator tube degradation mechanisms which were identified in 1D28 as well as those identified during prior inspections but not during 1D28. For the projected cycle length of 1.5 EFPY all damage mechanisms were predicted to not exceed structural integrity or leakage integrity limits based on a probability of burst and probability of leakage of 0.05 where probabilistic models were used.

8.0 COMPUTER FILES

Table 8-1 lists all computer files used in the development of the OA for Cycle 29.

All files were transferred to the following Framatome ColdStor directory:

\cold\General-Access\51\51-9394013-001\official

Table 8-1: Computer Files

File Name	Description	Modified Date / Time
OA Files Rev 001.zip	Files used for OA evaluations	10/1/25 11:42
1D28-LeakageLimit-Equ-Plugging-Rev1.xlsx	Effective Plugging Information	10/2/25 15:53

9.0 REFERENCES

References identified with an (*) are maintained within Palisades Records System and are not retrievable from Framatome Records Management. These are acceptable references per Framatome Administrative Procedure 0402-01, Attachment 7. See page [2] for Project Manager Approval of customer references.

1. Nuclear Energy Institute Document NEI 97-06, “Steam Generator Program Guidelines”, Revision 3, January 2011
2. EPRI Steam Generator Guidelines
    a. EPRI Report 3002020909, “Steam Generator Management Program: Steam Generator Integrity Assessment Guidelines, Revision 5,” December 2021
    b. EPRI Report 3002007572, “Steam Generator Management Program: Pressurized Water Reactor Steam Generator Examination Guidelines: Revision 8”, June 2016 (Includes Interim Guidance SGMP-19-01 incorporated April 2019 (SGMP-19-01) and September 2021 (SGMP-21-02)
    c. EPRI Report 3002007856, “Steam Generator In-situ Pressure Test Guidelines, Revision 5”, November 2016
    d. Report 3002005426, “Steam Generator Management Project: Steam Generator Degradation Specific Management Flaw Handbook, Revision 2”, October 2015
    e. EPRI Report 3002010645, “PWR Secondary Water Chemistry Guidelines, Revision 8”. September 2017
    f. EPRI Report 3002000505, “PWR Primary Water Chemistry Guidelines: Volume 1 and Volume 2, Revision 7”, April 2014
    g. EPRI Report 1013706, “Steam Generator Management Program: Pressurized Water Reactor Steam Generator Examination Guidelines, Revision 7”
    h. EPRI Report TR-107197-P1, “Depth Based Structural Analysis Methods for SG Circumferential Indications, Interim Report, December 1997”

3. * Westinghouse Reports
   a. SG-SGMP-10-22, "Palisades Nuclear Plant 1R21 Steam Generator Degradation Assessment", October 2010
   b. SG-SGMP-10-24, "Palisades Nuclear Plant 1R21 Outage Steam Generator Condition Monitoring Report", October 2010
   c. SG-SGMP-11-1, "Palisades Nuclear Plant Cycle 22 Steam Generator Operational Assessment Report", January 2011
   d. WCAP-16208-P NDE Inspection Length for CE Steam Generator Tubesheet Region Explosive Expansions, October 2004
   e. MRS-TRC-1708, "Bobbin Detection of Wear at Dented Vertical Straps and Diagonal Bars," Revision 0, December 2005
4. * Palisades Tube Inspection Reports
   a. EC28228, "Steam Generator Tube Inspection for the 2010 Refueling Outage, 1R21"
   b. No ID, "Steam Generator Tube Inspection Report for the 2009 Refueling Outage", TS 5.6.8
   c. No ID, "Steam Generator Tube Inspection Report for the 2007 Refueling Outage", TS 5.6.8
   d. No ID, "Steam Generator Tube Surveillance Report for the 2006 Refueling Outage", TS 5.6.8
   e. No ID, "Steam Generator Tube Surveillance Report for the 2004 Refueling Outage", TS 5.6.8
   f. No ID, "Steam Generator Tube Integrity Assessment 2003 Refueling Outage", TS 5.6.8
   g. No ID, "Steam Generator Tube Integrity Assessment 2001 Refueling Outage", TS 5.6.8
   h. No ID, "Steam Generator Tube Integrity Assessment for Oct-Nov 1999", TS 5.6.8
   i. EC39067, "Steam Generator Tube Inspection for the 2012 Refueling Outage, 1R22"
   j. Entergy Letter PNP 2016-038 from Jeffery A. Hardy to USNRC, "Response to Request for Additional Information – Palisades Nuclear Plant 2015 Steam Generator Tube Inspection Report (CAC No. MF7554)" Dated June 17, 2016
5. * Palisades-Specific Documents
   a. Palisades Technical Specification (Administrative Controls), 5.5.8, "Steam Generator (SG) Program" (Includes Amendment No 225 and 261 to Renewed Facility Operating License No. DPR-20)
   b. Palisades Nuclear Plant Abnormal Operating Procedure AOP-24, Revision 2 "Steam Generator Tube Leak"
   c. Palisades Final Safety Analysis Report (FSAR) Revision 35 "Chapter 4 – Primary Coolant System"
   d. Palisades Engineering Assistance Request, EAR-2004-0191 "SG Design Limit for Tube Plugging"
   e. Entergy Letter, "Notification of Deviation from EPRI SGMP: PWR SG Examination Guidelines: Revision 7," PNP 2012-021, April 5, 2012
6. * Palisades Loose Part Evaluations
   a. Palisades Report EC-25487, "Palisades 1R21 Steam Generator Potential Loose Parts Evaluation"

b. Palisades Report EC-36775, “Palisades 1R22 Steam Generator Potential Loose Parts Evaluation”

c. Palisades Report EC-48813, “Palisades 1R23 Steam Generator Potential Loose Parts Evaluation”

7. Framatome Plug and Stabilizer Documents

a. Framatome Document 51-9206178-000, “50.59 Evaluation for Stabilization of SG Tubes at Palisades (CE 2530)”

b. Framatome Document 08-9175539-001 “Equipment Specification for Mechanical Tube Plugging of CE SG 3/4-inch OD Tubes (applicable to Palisades)”

c. Framatome Document 51-1177797-012 “0.750 Mechanical Rolled Plug Design Verification Report – Alloy 690”

d. Framatome Document 33-9177192-003 “Stress Report for Mechanical Roll Plug for CE 2530 Alloy 600 RSG Tubes (3/4" OD X 0.042")”

8. Framatome Degradation Assessments

a. Framatome Document 51-9179646-001 “Steam Generator Degradation Assessment for Palisades 1R22 Inspection, Spring 2012”

b. Framatome Document 51-9198800-001 “Steam Generator Degradation Assessment for Palisades 1R23 Inspection, Spring 2014”

c. Framatome Document 51-9243395-001 “Steam Generator Degradation Assessment for Palisades 1R24 Inspection, Fall 2015”

d. Framatome Document 51-9267304-000, “Steam Generator Degradation Assessment for Palisades 1R25 Inspection, Spring 2017”

e. Framatome Document 51-9285559-001, “Steam Generator Degradation Assessment for Palisades 1R26 Inspection, Fall 2018”

f. Framatome Document 51-9311865-001, “Steam Generator Degradation Assessment for Palisades 1R27 Inspection, Fall 2020”

g. Framatome Document 51-9378492-000, “Steam Generator Degradation Assessment for Palisades 1D28 Defuel Inspection, Fall 2024”

9. Framatome Final CMOA Documents

a. Framatome Document 51-9187110-000, “Palisades Steam Generator Condition Monitoring for 1R22 and Final Operational Assessment for Cycle 23”

b. Framatome Document 51-9223728-000, “Palisades Steam Generator Condition Monitoring for 1R23 and Final Operational Assessment for Cycle 24”

c. Framatome Document 51-9248748-001, Palisades Steam Generator Condition Monitoring for 1R24 and Final Operational Assessment for Cycle 25”

d. Framatome Document 51-9273700-000, Palisades Steam Generator Condition Monitoring for 1R25 and Final Operational Assessment for Cycle 26”

e. Framatome Document 51-9294708-000, Palisades Steam Generator Condition Monitoring for 1R26 and Final Operational Assessment for Cycle 27”

f. Framatome Document 51-9321652-000, Palisades Steam Generator Condition Monitoring for 1R27 and Final Operational Assessment for Cycle 28”

g. Framatome Document 51-9382488-002, Palisades Steam Generator Condition Monitoring for 1D28"

10. 1D28 Inspection Documents
    a. Framatome Document 03-9379706-000, "Secondary Side Visual Inspection Plan for Palisades 1D28"
    b. Framatome Document 51- 9379741-000, "Palisades Unit 1 Steam Generator ECT Inspection Plan – 1D28-08/24"
    c. Framatome Document 51-9216023-006, "Qualified Eddy Current Techniques for Palisades Unit 1"
    d. Framatome Document 03-9175728-006, "Palisades Unit 1 Steam Generator Eddy Current Analysis Guidelines"
    e. Framatome Document 03-1246524-019, "Instructions for Plug Visual Inspection"
    f. Framatome Document 03-9203864-008, "Steam Generator Channel Head Inspection Per Nuclear Safety Advisory Letter (NSAL) 12-1 Level 3 - Information Use"
    g. Framatome Document 03-9020586-008, "Requirements for the Preparation of Automated Eddy Current Data Analysis Programs – Level 3 – Information Use"
    h. Framatome Document 51- 9391858-000, "In Situ Test Results for Palisades (Spring 2025)"
    i. Framatome Document 51-9388329-001, "Palisades 1D28 Steam Generator De-plugging Report and De-plugging List"
    j. Framatome Document 51-9391295-000, "Palisades 1D28 SG Tube De-plug, Sleeve Repair and Eddy Current Implementation and Inspection Plan"
    k. Framatome Document 51-9393800-000, "Palisades Steam Generator De-Plugging Activities Performed at 1D28"
    l. Framatome Document 51-9388851-001, "Palisades 1D28 Steam Generator TSP Sleeving Strategy and List"
11. EPRI Appendix H Performance Based Database and Appendix I Database. On EPRI Website http://sgmp.epriq.com/
12. EPRI SG Degradation Database (SGDD). On EPRI Website http://sgdd.epri.com/
13. EPRI Software 3002010334 "Model Assisted Probability of Detection Using R (MAPOD-R) Version 2.1", September 2017
14. Framatome Document 32-5033045-003, "MathCAD Implementation of SG Flaw Handbook Equations for Integrity Assessment"
15. Framatome Document 51-9125055-002 "EPRI Flaw Handbook Calculator Software Validation"
16. Palisades C* Documentation
    a. NRC ADAMS Accession No. ML060480064 "TAC No. MC5084 – Responses to NRC Requests for Additional Information on WCAP-16208-P, Rev. 0, "NDE Inspection Length for CE Steam Generator Tubesheet Region Explosive Expansions" ", January 23, 2006
    b. NRC ADAMS Accession No. ML060790216 "St. Lucie Plant, Unit No. 2 - Issuance of Amendment Regarding Depth of Required Tube Inspections and Plugging Criteria Within the Tubesheet Region of The Original Steam Generators (TAC No. MC5084)", April 11, 2006

c. NRC ADAMS Accession No. ML061560407 “License Amendment Request Regarding Tubesheet Inspection Depth for Steam Generator Tube Inspections”, May 30, 2006

d. NRC ADAMS Accession No. ML071420216 “Palisades Nuclear Plant - Issuance of Amendment RE: Tubesheet Inspection Depth for Steam Generator Tube Inspections (TAC No. MD2125)”, May 31, 2007

e. NRC ADAMS Accession No. ML16075A103 “License Amendment Request - Revision to the Requirements for Steam Generator Tube Inspections and Repair Criteria in the Cold Leg Tube Sheet Region” March 3, 2016

f. NRC ADAMS Accession No. ML16159A230 “Response to - Palisades Nuclear Plant - Request for Additional Information Regarding the License Amendment Request for Implementation of an Alternate Repair Criterion on the Steam Generator Tubes (CAC No. MF7435)” June 7, 2016

g. NRC ADAMS Accession No. ML16300A030 “Palisades Nuclear Plant - Issuance Of Amendment Re: Revision To The Requirements For Steam Generator Tube Inspections And Repair Criteria In The Cold Leg Tube Sheet Region (CAC No.MF7435)”, Dec 19, 2016

17. EPRI Report 1022830 “Steam Generator Management Program: Investigation of Steam Generator Secondary Side Degradation”, September 2011

18. EPRI Report 1020989 “Steam Generator Management Program: Foreign Object Prioritization Strategy for Triangular Pitch Steam Generators”, July 2010

19. Secondary Side Inspection Documents

    a. Framatome Document 51-9250448-000, “Palisades U1R24 Secondary Side Final Report”

    b. Framatome Document 51-9271822-000, “Secondary Side Visual Inspection Final Report for Entergy, Palisades 1R25”

    c. Framatome Document 51-9292369-000, “Palisades U1R26 Secondary Side Visual Inspection Final Report”

    d. Framatome Document 51-9319743-000, “Palisades U1R27 Secondary Side Visual Inspection Final Report”

20. EPRI Report 3002000473, “Steam Generator Management Program: Steam Generator Channel Head Degradation Failure Modes and Effects Analysis” April 2013

21. EPRI NP-7008, “Strain-Rate Damage Model for Alloy 600 in Primary Water,” Electric Power Research Institute, Palo Alto, CA (October 1990).

22. Framatome Letter AREVA-12-03816, from Dr. James Begley and Chuck Martin to John Hager, “Subject: Responses to NRC letter dated 7-17-2012 regarding the Palisades Appendix I Deviation”, Dated December 20, 2012

23. Framatome Document 03-9273948-001, “Noise Monitoring Checkout Procedure – Level 3 Information Use

24. Framatome Document 32-9173409-000, “Validation of MultiFram on Windows 7

25. Framatome Document 32-9313861-000, “Validation of Multi-Cycle Probabilistic Integrity Assessment Software – MultiCircV1”

26. Framatome Document 51-8164574-001, “Evaluation of Steam Generator Tube Outer Diameter Stress Corrosion Results from 1D28 at the Palisades Nuclear Plant”

27. Framatome Document 32-9384697-000, “Pressure Drop/Heat Loss Effects from Palisades Steam Generator TSP Sleeves”

28. Framatome Document 32-9386352-000, “¾ Mechanical TSP Sleeve Leak Rate Analysis for Palisades”
29. Framatome Document 32-9104082-003, “Mathcad Implementation of SG Fully Probabilistic Operational Assessment”

APPENDIX A: TUBE PLUG/SLEEVE/RETURN TO SERVICE LISTS

A.1 SGA Plug List Rev 0

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Palisades Unit 1 - 1D28 - S/G 1A

PLUG LIST (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A	15	122	ROLLED	ROLLED	SAI @ 01H+0.80	1	NO	0
PAL1A					SAI @ 01H+0.48			0
PAL1A	21	124	ROLLSTAB	ROLLED	SCI @ TSH-0.03	2	YES	0
PAL1A	24	13	ROLLSTAB	ROLLED	SCI @ TSH-5.89	3	YES	0
PAL1A					SCI @ TSH-6.93			0
PAL1A					SCI @ TSH-7.81			0
PAL1A					SCI @ TSH-8.56			0
PAL1A					SCI @ TSH-9.55			0
PAL1A					SCI @ TSH-10.16			0
PAL1A					SCI @ TSH-10.91			0
PAL1A					SCI @ TSH-1.17			0
PAL1A					SAI @ TSH-1.04			0
PAL1A					SCI @ TSH-3.73			0
PAL1A					SCI @ TSH-4.56			0
PAL1A	24	139	ROLLED	ROLLED	SCI @ TSH-7.98	4	NO	0
PAL1A					SCI @ TSH-11.88			0
PAL1A	26	11	ROLLED	ROLLED	SCI @ TSH-6.03	5	NO	0
PAL1A	27	54	ROLLSTAB	ROLLED	SCI @ TSH-0.09	6	YES	0
PAL1A					SCI @ TSH+0.00			0
PAL1A	28	121	ROLLSTAB	ROLLED	SCI @ TSH-0.06	7	YES	0
PAL1A					SCI @ TSH+0.09			0
PAL1A					SAI @ 01H+0.88			0
PAL1A	29	114	ROLLSTAB	ROLLED	SCI @ TSH+0.18	8	YES	0
PAL1A					SCI @ TSH+0.21			0
PAL1A	29	120	ROLLSTAB	ROLLED	SCI @ TSH+0.12	9	YES	0
PAL1A	30	53	ROLLSTAB	ROLLED	SCI @ TSH-0.03	10	YES	0
PAL1A	30	55	ROLLSTAB	ROLLED	SCI @ TSH-0.17	11	YES	0
PAL1A	31	52	ROLLSTAB	ROLLED	SCI @ TSH+0.29	12	YES	0
PAL1A	31	58	ROLLED	ROLLED	SAI @ 05C+0.12	13	NO	0
PAL1A					SAI @ 05C+0.90			0

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Palisades Unit 1 - 1D28 - S/G 1A

PLUG LIST (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A					SAI @ TSH+0.00			0
PAL1A					SAI @ 05H+0.72			0
PAL1A					SAI @ 05H+0.61			0
PAL1A	32	115	ROLLSTAB	ROLLED	SAI @ 01H+0.77	14	YES	0
PAL1A					SAI @ TSH+0.57			0
PAL1A					SAI @ TSH+1.08			0
PAL1A					SCI @ TSH+0.45			0
PAL1A	36	23	ROLLED	ROLLED	SCI @ TSH-8.56	15	NO	0
PAL1A					SCI @ TSH-8.24			0
PAL1A					SCI @ TSH-10.99			0
PAL1A					SCI @ TSH-7.65			0
PAL1A					SCI @ TSH-7.17			0
PAL1A					SCI @ TSH-6.24			0
PAL1A					SCI @ TSH-11.41			0
PAL1A					SCI @ TSH-10.61			0
PAL1A					SCI @ TSH-13.31			0
PAL1A	37	52	ROLLSTAB	ROLLED	SCI @ TSH+0.17	16	YES	0
PAL1A	43	38	ROLLED	ROLLED	SCI @ TSH-9.52	17	NO	0
PAL1A	48	61	ROLLED	ROLLED	SCI @ TSH-7.84	18	NO	0
PAL1A	48	67	ROLLED	ROLLED	SCI @ TSH-11.60	19	NO	0
PAL1A	49	56	ROLLSTAB	ROLLED	SCI @ TSH-0.06	20	YES	0
PAL1A	52	55	ROLLSTAB	ROLLED	SCI @ TSH-0.06	21	YES	0
PAL1A	54	83	ROLLSTAB	ROLLED	TWD @ DBH+0.09	22	YES	0
PAL1A	54	109	ROLLSTAB	ROLLED	SCI @ TSH+0.12	23	YES	0
PAL1A	55	56	ROLLSTAB	ROLLED	SCI @ TSH-0.03	24	YES	0
PAL1A	57	62	ROLLSTAB	ROLLED	SCI @ TSH+0.00	25	YES	0
PAL1A	68	75	ROLLSTAB	ROLLED	SCI @ TSH-0.03	26	YES	0
PAL1A	68	89	ROLLED	ROLLED	SAI @ 01H-0.77	27	NO	0
PAL1A					SAI @ 03H-0.43			0
PAL1A	69	76	ROLLSTAB	ROLLED	SCI @ TSH+0.11	28	YES	0

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Palisades Unit 1 - 1D28 - S/G 1A

PLUG LIST (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A	70	69	ROLLSTAB	ROLLED	SCI @ TSH-0.03	29	YES	0
PAL1A	70	71	ROLLSTAB	ROLLED	SCI @ TSH+0.05	30	YES	0
PAL1A	70	73	ROLLSTAB	ROLLED	SCI @ TSH+0.05	31	YES	0
PAL1A	70	91	ROLLED	ROLLED	SAI @ 01H-0.51	32	NO	0
PAL1A	70	105	ROLLSTAB	ROLLED	SCI @ TSH-0.03	33	YES	0
PAL1A					SCI @ TSH+0.23			0
PAL1A	71	80	ROLLSTAB	ROLLED	SCI @ TSH-0.11	34	YES	0
PAL1A	74	73	ROLLSTAB	ROLLED	SCI @ TSH-0.05	35	YES	0
PAL1A	76	101	ROLLSTAB	ROLLED	SCI @ TSH+0.00	36	YES	0
PAL1A	77	102	ROLLSTAB	ROLLED	SCI @ TSH+0.03	37	YES	0
PAL1A	78	81	ROLLSTAB	ROLLED	SCI @ TSH+0.05	38	YES	0
PAL1A					SAI @ 01H-0.80			0
PAL1A	81	118	ROLLSTAB	ROLLED	SCI @ TSH-0.09	39	YES	0
PAL1A	82	37	ROLLED	ROLLED	SAI @ 02H+0.88	40	NO	0
PAL1A	82	79	ROLLSTAB	ROLLED	SCI @ TSH-0.05	41	YES	0
PAL1A	85	92	ROLLSTAB	ROLLED	SCI @ TSH-0.13	42	YES	0
PAL1A	86	91	ROLLSTAB	ROLLED	SCI @ TSH-0.05	43	YES	0
PAL1A					SAI @ 01H+0.05			0
PAL1A	89	120	ROLLSTAB	ROLLED	SCI @ TSH-0.12	44	YES	0
PAL1A	91	120	ROLLSTAB	ROLLED	SCI @ TSH-0.06	45	YES	0
PAL1A					SAI @ 02H+0.83			0
PAL1A	92	119	ROLLSTAB	ROLLED	SAI @ 01H-0.48	46	YES	0
PAL1A					SAI @ TSH-0.15			0
PAL1A					SCI @ TSH-0.24			0
PAL1A					SCI @ TSH-0.12			0
PAL1A	93	68	ROLLSTAB	ROLLED	SCI @ TSH+0.05	47	YES	0
PAL1A					SCI @ TSH+0.08			0
PAL1A					SAI @ 01H+0.61			0
PAL1A	93	72	ROLLSTAB	ROLLED	SAI @ TSH-0.19	48	YES	0
PAL1A					SCI @ TSH+0.05			0

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Palisades Unit 1 - 1D28 - S/G 1A

PLUG LIST (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A	95	88	ROLLED	ROLLED	SAI @ 01H-0.53	49	NO	0
PAL1A	96	61	ROLLSTAB	ROLLED	SCI @ TSH+0.08	50	YES	0
PAL1A	97	104	ROLLSTAB	ROLLED	SCI @ TSH+0.00	51	YES	0
PAL1A	99	60	ROLLSTAB	ROLLED	SCI @ TSH+0.03	52	YES	0
PAL1A					SAI @ 01H-0.80			0
PAL1A	100	63	ROLLSTAB	ROLLED	SCI @ TSH-0.05	53	YES	0
PAL1A					SCI @ TSH-0.03			0
PAL1A					SCI @ TSH-0.08			0
PAL1A					SAI @ 01H-0.80			0
PAL1A	100	95	ROLLSTAB	ROLLED	SAI @ 01H+0.88	54	YES	0
PAL1A					SCI @ TSH+0.03			0
PAL1A	100	103	ROLLSTAB	ROLLED	SCI @ TSH+0.00	55	YES	0
PAL1A					SCI @ TSH+0.00			0
PAL1A	101	96	ROLLSTAB	ROLLED	SCI @ TSH+0.06	56	YES	0
PAL1A	101	98	ROLLSTAB	ROLLED	SCI @ TSH+0.00	57	YES	0
PAL1A					SCI @ TSH+0.00			0
PAL1A	103	66	ROLLSTAB	ROLLED	SCI @ TSH-0.13	58	YES	0
PAL1A	103	70	ROLLSTAB	ROLLED	SCI @ TSH-0.03	59	YES	0
PAL1A	103	96	ROLLSTAB	ROLLED	SCI @ TSH-0.06	60	YES	0
PAL1A					SAI @ 01H+0.85			0
PAL1A	103	98	ROLLSTAB	ROLLED	SAI @ 01H-0.48	61	YES	0
PAL1A					SCI @ TSH+0.06			0
PAL1A	104	97	ROLLSTAB	ROLLED	SCI @ TSH-0.06	62	YES	0
PAL1A					SCI @ TSH+0.14			0
PAL1A	104	105	ROLLSTAB	ROLLED	SCI @ TSH-0.09	63	YES	0
PAL1A	105	92	ROLLSTAB	ROLLED	SCI @ TSH-0.11	64	YES	0
PAL1A	105	94	ROLLSTAB	ROLLED	SCI @ TSH+0.00	65	YES	0
PAL1A	105	96	ROLLSTAB	ROLLED	SCI @ TSH+0.06	66	YES	0
PAL1A	106	95	ROLLSTAB	ROLLED	SCI @ TSH-0.03	67	YES	0
PAL1A	106	97	ROLLSTAB	ROLLED	SCI @ TSH+0.03	68	YES	0

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Palisades Unit 1 - 1D28 - S/G 1A

PLUG LIST (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A	106	99	ROLLSTAB	ROLLED	SCI @ TSH+0.40	69	YES	0
PAL1A					SCI @ TSH+0.00			0
PAL1A	107	94	ROLLSTAB	ROLLED	SCI @ TSH+0.06	70	YES	0
PAL1A	107	100	ROLLSTAB	ROLLED	SAI @ 01H-0.75	71	YES	0
PAL1A					SAI @ 03H-0.64			0
PAL1A					SCI @ TSH-0.03			0
PAL1A					SCI @ TSH+0.00			0
PAL1A	107	102	ROLLSTAB	ROLLED	SCI @ TSH+0.06	72	YES	0
PAL1A	108	95	ROLLSTAB	ROLLED	SCI @ TSH-0.06	73	YES	0
PAL1A					SCI @ TSH-0.03			0
PAL1A	108	103	ROLLSTAB	ROLLED	SCI @ TSH+0.00	74	YES	0
PAL1A	109	102	ROLLSTAB	ROLLED	SCI @ TSH-0.03	75	YES	0
PAL1A	109	112	ROLLED	ROLLED	SAI @ 01H-0.83	76	NO	0
PAL1A					SAI @ 01H+0.51			0
PAL1A					SAI @ VS6-0.79			0
PAL1A					SAI @ VS2-0.83			0
PAL1A					SAI @ 07C-0.90			0
PAL1A					SAI @ 07C-0.87			0
PAL1A	110	101	ROLLSTAB	ROLLED	SCI @ TSH-0.06	77	YES	0
PAL1A	114	125	ROLLSTAB	ROLLED	PTP, SVI @ TSH+0.09	78	YES	0
PAL1A	117	98	ROLLED	ROLLED	SAI @ VS6-0.65	79	NO	0
PAL1A					SAI @ 02H+0.48			0
PAL1A	126	105	ROLLSTAB	ROLLED	SVI @ TSH+0.35	80	YES	0
PAL1A	127	106	ROLLSTAB	ROLLED	PTP, VOL @ TSH +0.05	81	YES	0

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Palisades Unit 1 - 1D28 - S/G 1A

PLUG LIST (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A	134	93	ROLLED	ROLLED	SVI @ TSH+0.05	82	NO	0
					Totals:	82	67	

Notes (Rev. 0):

1. Tube R54-C83 shall be stabilized using the 1/2" diameter U-bend wire rope stabilizer, P/N 5023369-001 (nominal 480" length).

2. All other tubes tubes requiring stabilization shall be stabilized using either of the the 1/2" diameter tubesheet wire rope stabilizers: P/N 5023370-001 (nominal 115" length, w/ span sleeve) or P/N 5023370-002 (nominal 115" length; w/o span sleeve).

3. All tubes shall be plugged using part number 1208497-003N (750 Stabilizer Rolled Plug Assembly).

4. Tubes on the above list have been screened against the stabilization requirements as identified in Section 4.9.2 of the Degradation Assessment (51-9378492-000). For the tubes on this list, only tubes plugged for diagonal bar or vertical strap wear, tubes plugged for circumferential cracks within 6" of the top of the tubesheet require stabilization, and tubes plugged for foreign object wear with a foreign object or potential loose part (PLP) indication present require stabilization.

5. The tubes on the above list have been screened against the in situ screening criteria. Tubes R15-C122, R21-C124, R30-C55, R31-C58, R32-C115, R68-C89, R70-C91, R82-C37, R92-C119, R95-C88, R100-C103, R103-C98, R104-C97, R107-C100, R107-C102, R109-C102, and R110-C101 required in situ pressure testing. In situ testing has been performed for these tubes as documented in 51-9391858-000.

6. The tubes on the above list have been reviewed for skip rolls, over expansions, dents, bulges and additional indications. No such anomalies or indications were detected that would prohibit installation of the plugs or stabilizers.

7. The indications queried for in FDMS to generate this list are consistent with those specified in the Analysis Guidelines for Tech Spec requierd to be plugged (TBP) and include: >=40%, MAI, MCI, MMI, MVI, SAI, SCI, SVI.

8. All tubes on the above list have been screened to include as preventative tube plugging criteria (PTP) criteria any tube with foreign object wear that has a foreign object or potential loose part (PLP) indication which include R114-C125 and R127-C106.

9. Tubes R109-C112 and R117-C98 had a sleeve installed at 05H and 04H for the purpose of sleeve process verification and positional verification only with post-sleeving ECT Bobbin. The post-sleeving ECT Bobbin was performed and these tubes can now be plugged.

10. The tubes on the above list have been reviewed against the criteria for returning-to-service (RTS) with a sleeve repair and **none of the tubes on the above list can be RTS with a sleeve**. The criteria for RTS with a sleeve repair is as follows:

a. There are no volumetric indications ≥40%TW or crack-like indications located in the "square-bend region" defined as starting at +1.75" above the center of the uppermost eggcrate supports for that tube

b. There are no volumetric indications ≥40%TW or crack-like indications located at the top-of-tubsheet or within the tubesheet

c. There are no volumetric indications ≥40%TW or crack-like indications located in the freespan outside of any hot leg eggcrate support

d. There are no volumetric indications ≥40%TW or crack-like indications located at the 05H eggcrate support in Rows 1-17 tubes, or at the 06H, 07H or 08H eggcrate supports for any tube row

e. There are no volumetric indications ≥40%TW or crack-like indications located at any location along the cold leg

Approvals:

Craig Kelley 5/16/25 6:05 PM

Framatome Integrity Engineering

William P. Wolcott 5/16/2025 18:29

Framatome Data Management

Kendall L. Jilson 6:30 pm 5/16/2025

Framatome Lead Analyst

DJudd Wadzinski Utility Level III

Utility Representative 05/16/25 3:21 pm [6:21 pm EST] (PST)

5/16/2025 Ambar C Rodriguez

Chris Peterson Digitally signed by Chris Peterson Date: 5/17/25 10:24

5/16/2025 6:04 PM

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A.2 SGA Plug List Rev 1

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Palisades Unit 1 - 1D28 - S/G 1A

PLUG LIST (Rev. 1)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A	2	33	ROLLED	ROLLED	SAI @ DBC+0.51	1	NO	1
PAL1A	4	121	ROLLED	ROLLED	SAI @ TSH-0.60	2	NO	1
PAL1A	4	145	ROLLED	ROLLED	SAI @ 04C+0.93	3	NO	1
PAL1A					SAI @ 05C-0.42			1
PAL1A					SAI @ 05C-0.78			1
PAL1A					SAI @ 03H+0.24			1
PAL1A					SAI @ 05H-0.27			1
PAL1A					SAI @ 05H+0.69			1
PAL1A	4	147	ROLLED	ROLLED	SAI @ 05C-0.84	4	NO	1
PAL1A					SAI @ 05H+0.03			1
PAL1A	6	55	ROLLED	ROLLED	SAI @ TSH-0.16	5	NO	1
PAL1A	7	32	ROLLED	ROLLED	SAI @ TSH-0.08	6	NO	1
PAL1A	7	136	ROLLED	ROLLED	SAI @ 04H+0.75	7	NO	1
PAL1A					SAI @ 04H+0.72			1
PAL1A					SAI @ 05H+0.88			1
PAL1A					SAI @ DBH-0.77			1
PAL1A					SAI @ DBH+0.83			1
PAL1A	8	57	ROLLED	ROLLED	SAI @ TSH-0.19	8	NO	1
PAL1A					SAI @ 01H-0.83			1
PAL1A	10	21	ROLLED	ROLLED	SAI @ 05H+1.23	9	NO	1
PAL1A					SAI @ 05C+0.90			1
PAL1A	12	127	ROLLED	ROLLED	SAI @ DBH-1.12	10	NO	1
PAL1A	16	59	ROLLED	ROLLED	SAI @ TSH-0.11	11	NO	1
PAL1A					SAI @ 05H+0.00			1
PAL1A	16	163	ROLLED	ROLLED	SAI @ DBH-1.71	12	NO	1
PAL1A	18	59	ROLLED	ROLLED	SAI @ TSH-0.29	13	NO	1
PAL1A	20	47	ROLLED	ROLLED	SAI @ TSH-0.55	14	NO	1
PAL1A					SAI @ 01H+0.85			1
PAL1A	21	48	ROLLED	ROLLED	SAI @ TSH+0.52	15	NO	1
PAL1A	21	158	ROLLED	ROLLED	SAI @ 04H+0.69	16	NO	1

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Palisades Unit 1 - 1D28 - S/G 1A

PLUG LIST (Rev. 1)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A					SAI @ VS4-0.16			1
PAL1A	21	162	ROLLED	ROLLED	SAI @ DBH-1.89	17	NO	1
PAL1A	22	41	ROLLED	ROLLED	SAI @ VS4+0.93	18	NO	1
PAL1A	23	46	ROLLED	ROLLED	SAI @ 03C+0.75	19	NO	1
PAL1A	24	111	ROLLED	ROLLED	SAI @ TSH-0.15	20	NO	1
PAL1A					SAI @ 05H+0.13			1
PAL1A	24	125	ROLLED	ROLLED	SAI @ 04C+0.90	21	NO	1
PAL1A					SAI @ 02H-0.29			1
PAL1A					SAI @ 02H+0.45			1
PAL1A					SAI @ 03H+0.88			1
PAL1A	25	42	ROLLED	ROLLED	SAI @ TSH-0.13	22	NO	1
PAL1A	25	120	ROLLED	ROLLED	SAI @ VS4+0.79	23	NO	1
PAL1A					SAI @ 02H+0.80			1
PAL1A					SAI @ 04H-0.43			1
PAL1A					SAI @ 04H+0.11			1
PAL1A	25	156	ROLLED	ROLLED	SAI @ DBH+0.96	24	NO	1
PAL1A					SAI @ DBH+0.96			1
PAL1A	26	55	ROLLED	ROLLED	SAI @ 03C-0.57	25	NO	1
PAL1A					SAI @ 05H+0.91			1
PAL1A	27	8	ROLLED	ROLLED	SAI @ TSH-7.17	26	NO	1
PAL1A	27	124	ROLLED	ROLLED	SAI @ VS4+0.65	27	NO	1
PAL1A	27	156	ROLLED	ROLLED	SAI @ 04H+0.77	28	NO	1
PAL1A					SAI @ DBH+0.21			1
PAL1A	29	48	ROLLED	ROLLED	SAI @ TSH+0.83	29	NO	1
PAL1A	29	128	ROLLED	ROLLED	SAI @ TSH-0.06	30	NO	1
PAL1A	29	158	ROLLED	ROLLED	SAI @ VS4-0.07	31	NO	1
PAL1A	30	49	ROLLED	ROLLED	SAI @ TSH+0.92	32	NO	1
PAL1A	32	13	ROLLED	ROLLED	SAI @ 03C+0.90	33	NO	1
PAL1A	32	15	ROLLED	ROLLED	SAI @ TSH-0.03	34	NO	1
PAL1A	32	55	ROLLED	ROLLED	SAI @ TSH-0.14	35	NO	1

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Palisades Unit 1 - 1D28 - S/G 1A

PLUG LIST (Rev. 1)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A					SAI @ 05H+0.67			1
PAL1A	33	36	ROLLED	ROLLED	SAI @ 03C+0.81	36	NO	1
PAL1A					SAI @ 01H-0.29			1
PAL1A	33	58	ROLLED	ROLLED	SAI @ TSH-3.85	37	NO	1
PAL1A					SAI @ TSH-3.54			1
PAL1A					SAI @ 01H+0.48			1
PAL1A					SAI @ 01H+0.88			1
PAL1A					SAI @ 01H+0.88			1
PAL1A	33	126	ROLLED	ROLLED	SAI @ TSH-10.41	38	NO	1
PAL1A	33	136	ROLLED	ROLLED	SAI @ 03C-0.12	39	NO	1
PAL1A	36	123	ROLLED	ROLLED	SAI @ TSH-0.27	40	NO	1
PAL1A	37	126	ROLLED	ROLLED	SAI @ 03C+0.87	41	NO	1
PAL1A	38	51	ROLLED	ROLLED	SAI @ TSH+0.00	42	NO	1
PAL1A	48	115	ROLLED	ROLLED	SAI @ TSH-0.48	43	NO	1
PAL1A	57	56	ROLLED	ROLLED	SAI @ TSH-0.20	44	NO	1
PAL1A	68	97	ROLLED	ROLLED	SAI @ 01H+0.75	45	NO	1
PAL1A					SAI @ TSH+0.45			1
PAL1A	73	98	ROLLED	ROLLED	SAI @ TSH+0.59	46	NO	1
PAL1A	74	99	ROLLED	ROLLED	SAI @ TSH+0.67	47	NO	1
PAL1A	75	80	ROLLED	ROLLED	SAI @ TSH+0.13	48	NO	1
PAL1A					SAI @ 02H+0.48			1
PAL1A	75	90	ROLLED	ROLLED	SAI @ TSH+0.91	49	NO	1
PAL1A					SAI @ 01H+0.59			1
PAL1A	77	96	ROLLED	ROLLED	SAI @ TSH+0.56	50	NO	1
PAL1A	79	94	ROLLED	ROLLED	SAI @ TSH+0.48	51	NO	1
PAL1A	80	85	ROLLED	ROLLED	SAI @ TSH+0.40	52	NO	1
PAL1A					SAI @ 02H+0.83			1
PAL1A	80	101	ROLLED	ROLLED	SAI @ TSH-0.21	53	NO	1
PAL1A	82	49	ROLLED	ROLLED	SAI @ 06C+5.97	54	NO	1
PAL1A	82	97	ROLLED	ROLLED	SAI @ 02H-0.61	55	NO	1

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Palisades Unit 1 - 1D28 - S/G 1A

PLUG LIST (Rev. 1)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A					SAI @ 03H+0.88			1
PAL1A					SAI @ TSH+0.43			1
PAL1A	85	82	ROLLED	ROLLED	SAI @ TSH-0.21	56	NO	1
PAL1A	86	79	ROLLED	ROLLED	SAI @ TSH-0.13	57	NO	1
PAL1A	87	94	ROLLED	ROLLED	SAI @ TSH-0.19	58	NO	1
PAL1A	88	79	ROLLED	ROLLED	SAI @ 01H-0.77	59	NO	1
PAL1A					SAI @ 01H-0.32			1
PAL1A					SAI @ TSH-0.13			1
PAL1A	88	85	ROLLED	ROLLED	SAI @ TSH-0.13	60	NO	1
PAL1A					SAI @ 01H+0.29			1
PAL1A	88	89	ROLLED	ROLLED	SAI @ TSH-0.11	61	NO	1
PAL1A	88	121	ROLLED	ROLLED	SAI @ TSH-0.09	62	NO	1
PAL1A	89	66	ROLLED	ROLLED	SAI @ TSH-0.08	63	NO	1
PAL1A	90	51	ROLLED	ROLLED	SAI @ TSH-0.11	64	NO	1
PAL1A					SAI @ 01H+0.80			1
PAL1A	90	97	ROLLED	ROLLED	SAI @ 01H-0.35	65	NO	1
PAL1A					SAI @ 03H+0.43			1
PAL1A					SAI @ TSH-0.11			1
PAL1A	91	110	ROLLED	ROLLED	SAI @ TSH-0.21	66	NO	1
PAL1A	91	112	ROLLED	ROLLED	SAI @ TSH-0.12	67	NO	1
PAL1A	92	71	ROLLED	ROLLED	SAI @ TSH-0.13	68	NO	1
PAL1A	93	84	ROLLED	ROLLED	SAI @ TSH-0.13	69	NO	1
PAL1A	94	89	ROLLED	ROLLED	SAI @ TSH-0.19	70	NO	1
PAL1A	94	117	ROLLED	ROLLED	SAI @ TSH-0.15	71	NO	1
PAL1A	94	139	ROLLED	ROLLED	SAI @ 07C+1.59	72	NO	1
PAL1A	95	102	ROLLED	ROLLED	SAI @ TSH-0.14	73	NO	1
PAL1A	97	102	ROLLED	ROLLED	SAI @ TSH+0.20	74	NO	1
PAL1A	99	64	ROLLED	ROLLED	SAI @ TSH-0.19	75	NO	1
PAL1A	100	51	ROLLED	ROLLED	SAI @ TSH-0.03	76	NO	1
PAL1A					SAI @ 02H+0.64			1

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Palisades Unit 1 - 1D28 - S/G 1A

PLUG LIST (Rev. 1)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A	100	65	ROLLED	ROLLED	SAI @ TSH-0.19	77	NO	1
PAL1A					SAI @ 01H-0.72			1
PAL1A	102	85	ROLLED	ROLLED	SAI @ TSH-0.16	78	NO	1
PAL1A	102	93	ROLLED	ROLLED	SAI @ TSH-0.23	79	NO	1
PAL1A					SAI @ 02H+0.80			1
PAL1A					SAI @ 03H+0.69			1
PAL1A	105	38	ROLLED	ROLLED	SAI @ VS4-0.77	80	NO	1
PAL1A	105	64	ROLLED	ROLLED	SAI @ TSH-0.13	81	NO	1
PAL1A	105	124	ROLLED	ROLLED	SAI @ 01H+0.29	82	NO	1
PAL1A					SAI @ 02H+0.53			1
PAL1A					SAI @ 05H-0.11			1
PAL1A					SAI @ 06C-0.96			1
PAL1A					SAI @ 06C-0.96			1
PAL1A	106	57	ROLLED	ROLLED	SAI @ 05C-0.84	83	NO	1
PAL1A					SAI @ 01H-0.69			1
PAL1A					SAI @ 02H+0.85			1
PAL1A	106	91	ROLLED	ROLLED	SAI @ TSH-0.11	84	NO	1
PAL1A					SAI @ 01H+0.77			1
PAL1A					SAI @ 01H-0.35			1
PAL1A	107	66	ROLLED	ROLLED	SAI @ TSH-0.08	85	NO	1
PAL1A					SAI @ 01H+0.88			1
PAL1A					SAI @ 01H-0.72			1
PAL1A	107	80	ROLLED	ROLLED	SAI @ 02H+0.11	86	NO	1
PAL1A					SAI @ 04H+0.91			1
PAL1A					SAI @ TSH-0.16			1
PAL1A					SAI @ VS4+0.84			1
PAL1A	109	48	ROLLED	ROLLED	SAI @ VS2+0.96	87	NO	1
PAL1A	109	82	ROLLED	ROLLED	SAI @ TSH-0.19	88	NO	1
PAL1A	110	45	ROLLED	ROLLED	SAI @ VS6-0.65	89	NO	1
PAL1A	110	83	ROLLED	ROLLED	SAI @ 01H-0.75	90	NO	1

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Palisades Unit 1 - 1D28 - S/G 1A

PLUG LIST (Rev. 1)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A					SAI @ 08C-0.90			1
PAL1A	110	123	ROLLED	ROLLED	SAI @ 03C-0.84	91	NO	1
PAL1A	113	66	ROLLED	ROLLED	SAI @ TSH-0.08	92	NO	1
PAL1A					SAI @ 01H-0.29			1
PAL1A	113	94	ROLLED	ROLLED	SAI @ 01H+0.59	93	NO	1
PAL1A					SAI @ 01H-0.56			1
PAL1A					SAI @ 02H+0.69			1
PAL1A					SAI @ 06C+0.78			1
PAL1A	113	114	ROLLED	ROLLED	SAI @ 04C-0.48	94	NO	1
PAL1A					SAI @ 04C+0.30			1
PAL1A	121	74	ROLLED	ROLLED	SAI @ TSH-0.37	95	NO	1
PAL1A	136	85	ROLLED	ROLLED	SAI @ VS1+0.83	96	NO	1
PAL1A					SAI @ 01H-0.27			1
					Totals:	96	0	

Notes (Rev. 1):

1. No tubes require stabilization.
2. All tubes shall be plugged using part number 1208497-003N (750 Stabilizer Rolled Plug Assembly).
3. The tubes on the above list have been screened against the in situ screening criteria. No tubes require In Situ testing.
4. The tubes on the above list have been reviewed for skip rolls, over expansions, dents, bulges and additional indications. No such anomalies or indications were detected that would prohibit installation of the plugs.
5. The indications queried for in FDMS to generate this list are consistent with those specified in the Analysis Guidelines for Tech Spec requierd to be plugged (TBP) and include: >=40%, MAI, MCI, MMI, MVI, SAI, SCI, SVI.
6. The tubes on the above list have been reviewed against the criteria for returning-to-service (RTS) with a sleeve repair and none of the tubes on the above list can be RTS with a sleeve. The criteria for RTS with a sleeve repair is as follows:
   a. There are no volumetric indications ≥40%TW or crack-like indications located in the "square-bend region" defined as starting at +1.75" above the center of the uppermost eggcrate supports for that tube
   b. There are no volumetric indications ≥40%TW or crack-like indications located at the top-of-tubsheet or within the tubesheet
   c. There are no volumetric indications ≥40%TW or crack-like indications located in the freespan outside of any hot leg eggcrate support
   d. There are no volumetric indications ≥40%TW or crack-like indications located at the 05H eggcrate support in Rows 1-17 tubes, or at the 06H, 07H or 08H eggcrate supports for any tube row
   e. There are no volumetric indications ≥40%TW or crack-like indications located at any location along the cold leg

Approvals: Chris Gugnn 15:05

Chris J Dugnn 5/22/25

Framatome Integrity Engineering

William P. Wheeler 05/22/25 17:40

Framatome Data Management

Nicholas Koscielny 5/22/25 15:05

Framatome Lead Analyst

Utility Level III

D Jedlinski

Utility Representative (1325 PST / 1625 EST) 5/22/25

Amilcar Rodriguez 5/27/25

C Peterson 5/27/25

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A.3 SGA Plug List Rev 2

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Palisades Unit 1 - 1D28 - S/G 1A

PLUG LIST (Rev. 2)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A	4	155	ROLLED	ROLLED	SAI @ 05H+0.69	1	NO	2
PAL1A	7	148	ROLLED	ROLLED	SAI @ 02H+0.56	2	NO	2
PAL1A					SAI @ 05H-0.40			2
PAL1A	10	33	ROLLED	ROLLED	SAI @ 05H+0.88	3	NO	2
PAL1A	10	109	ROLLED	ROLLED	SAI @ 05H+0.75	4	NO	2
PAL1A	10	145	ROLLED	ROLLED	SAI @ 04H+0.40	5	NO	2
PAL1A					SAI @ 05H+0.43			2
PAL1A	11	12	ROLLED	ROLLED	SAI @ 05H-0.91	6	NO	2
PAL1A	11	106	ROLLED	ROLLED	SAI @ 03H-0.35	7	NO	2
PAL1A					SAI @ 03H+0.72			2
PAL1A					SAI @ 04H-0.96			2
PAL1A					SAI @ 04H+0.93			2
PAL1A					SAI @ 05H+0.93			2
PAL1A					SAI @ 05H+0.83			2
PAL1A	11	114	ROLLED	ROLLED	SAI @ 05H+0.83	8	NO	2
PAL1A					SAI @ 01H+0.67			2
PAL1A					SAI @ 02H-0.29			2
PAL1A					SAI @ 02H+0.75			2
PAL1A					SAI @ 03H-0.05			2
PAL1A					SAI @ 03H+0.64			2
PAL1A	11	144	ROLLED	ROLLED	SAI @ 01H-0.83	9	NO	2
PAL1A					SAI @ 05H-0.48			2
PAL1A					SAI @ 02H-0.83			2
PAL1A	12	131	ROLLED	ROLLED	SAI @ 01H+0.03	10	NO	2
PAL1A					SAI @ 02H+0.85			2
PAL1A					SAI @ 03H+0.75			2
PAL1A					SAI @ 04H-0.32			2
PAL1A					SAI @ 05H+0.61			2
PAL1A					SAI @ 05H+0.80			2
PAL1A	12	139	ROLLED	ROLLED	SAI @ 03H+0.93	11	NO	2

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Palisades Unit 1 - 1D28 - S/G 1A

PLUG LIST (Rev. 2)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A					SAI @ 01H+0.05			2
PAL1A					SAI @ 05H-0.80			2
PAL1A	12	143	ROLLED	ROLLED	SAI @ 05H-0.22	12	NO	2
PAL1A					SAI @ 05H+0.25			2
PAL1A	13	16	ROLLED	ROLLED	SAI @ 05H+0.77	13	NO	2
PAL1A	13	136	ROLLED	ROLLED	SAI @ 05H+0.32	14	NO	2
PAL1A	14	139	ROLLED	ROLLED	SAI @ 03H+0.05	15	NO	2
PAL1A					SAI @ 05H+0.43			2
PAL1A	15	146	ROLLED	ROLLED	SAI @ 02H+0.93	16	NO	2
PAL1A					SAI @ 05H+0.59			2
PAL1A	17	130	ROLLED	ROLLED	SAI @ 05H+0.96	17	NO	2
PAL1A	22	105	ROLLED	ROLLED	SAI @ 02H+0.40	18	NO	2
PAL1A					SAI @ 02H-0.16			2
PAL1A	24	39	ROLLED	ROLLED	SAI @ VS4+0.16	19	NO	2
PAL1A	68	117	ROLLED	ROLLED	SAI @ 01H+0.61	20	NO	2
PAL1A	77	124	ROLLED	ROLLED	SAI @ 02H+1.04	21	NO	2
PAL1A	99	92	ROLLED	ROLLED	SAI @ 02H-0.21	22	NO	2
PAL1A					SAI @ 02H+0.83			2
PAL1A					SAI @ 02H+0.75			2
PAL1A	103	80	ROLLED	ROLLED	SAI @ 06H+0.75	23	NO	2
PAL1A	110	73	ROLLED	ROLLED	SAI @ 02H-0.96	24	NO	2
PAL1A					SAI @ 07H+0.24			2
PAL1A	113	92	ROLLED	ROLLED	SAI @ 01H+0.53	25	NO	2
PAL1A					SAI @ 02H+0.75			2
PAL1A					SAI @ 03H+0.59			2
PAL1A					SAI @ 07H-0.03			2
					Totals:	25	0	

Notes (Rev. 2):

1. This is the **final plug list for SGA** at 1D28.
2. No tubes on the above list require stabilization as identified in Section 4.9.2 of the Degradation Assessment (51-9378492-000).
3. All tubes shall be plugged using part number 1208497-003N (750 Stabilizer Rolled Plug Assembly).

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Palisades Unit 1 - 1D28 - S/G 1A

PLUG LIST (Rev. 2)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.

4. The tubes on the above list have been screened against the in situ screening criteria. No tubes require in situ testing.

5. The tubes on the above list have been reviewed for skip rolls, over expansions, dents, bulges and additional indications. No such anomalies or indications were detected that would prohibit installation of the plugs or stabilizers.

6. The indications queried for in FDMS to generate this list are consistent with those specified in the Analysis Guidelines for Tech Spec requierd to be plugged (TBP) and include: >=40%, MAI, MCI, MMI, MVI, SAI, SCI, SVI.

7. Tube R24-C39 had sleeves installed at 05H, 04H, 03H, 02H, and 01H for the purpose of sleeve process verification and positional verificaiton only with post-sleeving ECT Bobbin. The post-sleeving ECT Bobbin was performed and these tubes can now be plugged.

8. The following tubes were originally candidates for sleeve repairs to keep in-service; however, are being plugged due to sleeve expansion issues:
a) Tube R68-C117: Sleeve expansion issue at 05H (See Framatome Condition Report CR-2025-1831)
b) Tube R99-C92: Sleeve expansion issue at 04H (See Framatome Condition Report CR-2025-1686)
c) Tube R77-C124: Sleeve expansion issue at 04H (See Framatome Condition Report CR-2025-1833)
d) Tube R22-C105: Sleeve expansion issue at 02H (See Framatome Condition Report CR-2025-2027)

9. All other tubes on the above list have been reviewed against the criteria for returning-to-service (RTS) with a sleeve repair and none of the tubes on the above list can be RTS with a sleeve. The criteria for RTS with a sleeve repair is as follows:
a. There are no volumetric indications ≥40%TW or crack-like indications located in the "square-bend region" defined as starting at +1.75" above the center of the uppermost eggcrate supports for that tube
b. There are no volumetric indications ≥40%TW or crack-like indications located at the top-of-tubsheet or within the tubesheet
c. There are no volumetric indications ≥40%TW or crack-like indications located in the freespan outside of any hot leg eggcrate support
d. There are no volumetric indications ≥40%TW or crack-like indications located at the 05H eggcrate support in Rows 1-17 tubes, or at the 06H, 07H or 08H eggcrate supports for any tube row
e. There are no volumetric indications ≥40%TW or crack-like indications located at any location along the cold leg

Approvals:
Craig Kelley 7/30/25 10:19AM
Framatome Integrity Engineering

William A. Wolters 07/30/2025 1039
Framatome Data Management

Kendall L. Johnson 10:23 AM 7/30/2025
Framatome Lead Analyst

Bobby Griffin 10:23AM 7/30/2025
Utility Representative

7/31/2025 Amber Rodriguez

D. Powell 7/31/25

7/30/2025 10:19 AM

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A.4 SGA Re Plug Hot List Rev 0

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Palisades Unit 1 - 1D28 - S/G 1A

REPLUG LIST - Hot Leg Only (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A	32	97	ROLLED	N/A	Priority 1 (Potential throughwall)	1	NO	0
PAL1A	33	96	ROLLED	N/A	Priority 1 (Potential throughwall)	2	NO	0
PAL1A	34	71	ROLLED	N/A	Priority 1 (Potential throughwall)	3	NO	0
PAL1A	34	95	ROLLED	N/A	Priority 1 (Potential throughwall)	4	NO	0
PAL1A	35	92	ROLLED	N/A	Priority 1 (Potential throughwall)	5	NO	0
PAL1A	35	94	ROLLED	N/A	Priority 1 (Potential throughwall)	6	NO	0
PAL1A	36	71	ROLLED	N/A	Priority 1 (Potential throughwall)	7	NO	0
PAL1A	36	73	ROLLED	N/A	Priority 1 (Potential throughwall)	8	NO	0
PAL1A	36	75	ROLLED	N/A	Priority 1 (Potential throughwall)	9	NO	0
PAL1A	36	91	ROLLED	N/A	Priority 1 (Potential throughwall)	10	NO	0
PAL1A	36	95	ROLLED	N/A	Priority 1 (Potential throughwall)	11	NO	0
PAL1A	37	72	ROLLED	N/A	Priority 1 (Potential throughwall)	12	NO	0
PAL1A	37	74	ROLLED	N/A	Priority 1 (Potential throughwall)	13	NO	0
PAL1A	37	92	ROLLED	N/A	Priority 1 (Potential throughwall)	14	NO	0
PAL1A	37	94	ROLLED	N/A	Priority 1 (Potential throughwall)	15	NO	0
PAL1A	38	71	ROLLED	N/A	Priority 1 (Potential throughwall)	16	NO	0
PAL1A	38	75	ROLLED	N/A	Priority 1 (Potential throughwall)	17	NO	0
PAL1A	38	77	ROLLED	N/A	Priority 1 (Potential throughwall)	18	NO	0
PAL1A	38	81	ROLLED	N/A	Priority 1 (Potential throughwall)	19	NO	0
PAL1A	38	89	ROLLED	N/A	Priority 1 (Potential throughwall)	20	NO	0
PAL1A	38	93	ROLLED	N/A	Priority 1 (Potential throughwall)	21	NO	0
PAL1A	39	74	ROLLED	N/A	Priority 1 (Potential throughwall)	22	NO	0
PAL1A	39	76	ROLLED	N/A	Priority 1 (Potential throughwall)	23	NO	0
PAL1A	39	90	ROLLED	N/A	Priority 1 (Potential throughwall)	24	NO	0
PAL1A	39	94	ROLLED	N/A	Priority 1 (Potential throughwall)	25	NO	0
PAL1A	40	73	ROLLED	N/A	Priority 1 (Potential throughwall)	26	NO	0
PAL1A	40	75	ROLLED	N/A	Priority 1 (Potential throughwall)	27	NO	0
PAL1A	40	79	ROLLED	N/A	Priority 1 (Potential throughwall)	28	NO	0
PAL1A	40	81	ROLLED	N/A	Priority 1 (Potential throughwall)	29	NO	0
PAL1A	40	83	ROLLED	N/A	Priority 1 (Potential throughwall)	30	NO	0
PAL1A	40	85	ROLLED	N/A	Priority 1 (Potential throughwall)	31	NO	0
PAL1A	40	89	ROLLED	N/A	Priority 1 (Potential throughwall)	32	NO	0

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Palisades Unit 1 - 1D28 - S/G 1A

REPLUG LIST - Hot Leg Only (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A	40	91	ROLLED	N/A	Priority 1 (Potential throughwall)	33	NO	0
PAL1A	41	76	ROLLED	N/A	Priority 1 (Potential throughwall)	34	NO	0
PAL1A	41	78	ROLLED	N/A	Priority 1 (Potential throughwall)	35	NO	0
PAL1A	41	80	ROLLED	N/A	Priority 1 (Potential throughwall)	36	NO	0
PAL1A	41	84	ROLLED	N/A	Priority 1 (Potential throughwall)	37	NO	0
PAL1A	41	88	ROLLED	N/A	Priority 1 (Potential throughwall)	38	NO	0
PAL1A	41	92	ROLLED	N/A	Priority 1 (Potential throughwall)	39	NO	0
PAL1A	42	77	ROLLED	N/A	Priority 1 (Potential throughwall)	40	NO	0
PAL1A	42	79	ROLLED	N/A	Priority 1 (Potential throughwall)	41	NO	0
PAL1A	42	81	ROLLED	N/A	Priority 1 (Potential throughwall)	42	NO	0
PAL1A	42	83	ROLLED	N/A	Priority 1 (Potential throughwall)	43	NO	0
PAL1A	42	85	ROLLED	N/A	Priority 1 (Potential throughwall)	44	NO	0
PAL1A	42	87	ROLLED	N/A	Priority 1 (Potential throughwall)	45	NO	0
PAL1A	42	89	ROLLED	N/A	Priority 1 (Potential throughwall)	46	NO	0
PAL1A	42	91	ROLLED	N/A	Priority 1 (Potential throughwall)	47	NO	0
PAL1A	42	93	ROLLED	N/A	Priority 1 (Potential throughwall)	48	NO	0
PAL1A	43	78	ROLLED	N/A	Priority 1 (Potential throughwall)	49	NO	0
PAL1A	43	82	ROLLED	N/A	Priority 1 (Potential throughwall)	50	NO	0
PAL1A	43	84	ROLLED	N/A	Priority 1 (Potential throughwall)	51	NO	0
PAL1A	43	86	ROLLED	N/A	Priority 1 (Potential throughwall)	52	NO	0
PAL1A	43	88	ROLLED	N/A	Priority 1 (Potential throughwall)	53	NO	0
PAL1A	43	90	ROLLED	N/A	Priority 1 (Potential throughwall)	54	NO	0
PAL1A	44	75	ROLLED	N/A	Priority 1 (Potential throughwall)	55	NO	0
PAL1A	44	77	ROLLED	N/A	Priority 1 (Potential throughwall)	56	NO	0
PAL1A	44	81	ROLLED	N/A	Priority 1 (Potential throughwall)	57	NO	0
PAL1A	44	83	ROLLED	N/A	Priority 1 (Potential throughwall)	58	NO	0
PAL1A	44	85	ROLLED	N/A	Priority 1 (Potential throughwall)	59	NO	0
PAL1A	44	89	ROLLED	N/A	Priority 1 (Potential throughwall)	60	NO	0
PAL1A	44	91	ROLLED	N/A	Priority 1 (Potential throughwall)	61	NO	0
PAL1A	45	78	ROLLED	N/A	Priority 1 (Potential throughwall)	62	NO	0
PAL1A	45	80	ROLLED	N/A	Priority 1 (Potential throughwall)	63	NO	0
PAL1A	45	82	ROLLED	N/A	Priority 1 (Potential throughwall)	64	NO	0

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Palisades Unit 1 - 1D28 - S/G 1A

REPLUG LIST - Hot Leg Only (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A	45	88	ROLLED	N/A	Priority 1 (Potential throughwall)	65	NO	0
PAL1A	46	79	ROLLED	N/A	Priority 1 (Potential throughwall)	66	NO	0
PAL1A	47	86	ROLLED	N/A	Priority 1 (Potential throughwall)	67	NO	0
PAL1A	27	100	ROLLED	N/A	Priority 2	68	NO	0
PAL1A	28	67	ROLLED	N/A	Priority 2	69	NO	0
PAL1A	28	99	ROLLED	N/A	Priority 2	70	NO	0
PAL1A	28	101	ROLLED	N/A	Priority 2	71	NO	0
PAL1A	29	68	ROLLED	N/A	Priority 2	72	NO	0
PAL1A	29	98	ROLLED	N/A	Priority 2	73	NO	0
PAL1A	31	98	ROLLED	N/A	Priority 2	74	NO	0
PAL1A	33	70	ROLLED	N/A	Priority 2	75	NO	0
PAL1A	34	65	ROLLED	N/A	Priority 2	76	NO	0
PAL1A	34	97	ROLLED	N/A	Priority 2	77	NO	0
PAL1A	35	72	ROLLED	N/A	Priority 2	78	NO	0
PAL1A	35	96	ROLLED	N/A	Priority 2	79	NO	0
PAL1A	36	97	ROLLED	N/A	Priority 2	80	NO	0
PAL1A	37	96	ROLLED	N/A	Priority 2	81	NO	0
PAL1A	37	98	ROLLED	N/A	Priority 2	82	NO	0
PAL1A	38	73	ROLLED	N/A	Priority 2	83	NO	0
PAL1A	38	95	ROLLED	N/A	Priority 2	84	NO	0
PAL1A	38	97	ROLLED	N/A	Priority 2	85	NO	0
PAL1A	39	72	ROLLED	N/A	Priority 2	86	NO	0
PAL1A	39	92	ROLLED	N/A	Priority 2	87	NO	0
PAL1A	39	96	ROLLED	N/A	Priority 2	88	NO	0
PAL1A	40	71	ROLLED	N/A	Priority 2	89	NO	0
PAL1A	40	77	ROLLED	N/A	Priority 2	90	NO	0
PAL1A	40	93	ROLLED	N/A	Priority 2	91	NO	0
PAL1A	41	74	ROLLED	N/A	Priority 2	92	NO	0
PAL1A	41	86	ROLLED	N/A	Priority 2	93	NO	0
PAL1A	41	94	ROLLED	N/A	Priority 2	94	NO	0
PAL1A	42	71	ROLLED	N/A	Priority 2	95	NO	0
PAL1A	42	73	ROLLED	N/A	Priority 2	96	NO	0

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Palisades Unit 1 - 1D28 - S/G 1A

REPLUG LIST - Hot Leg Only (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A	42	75	ROLLED	N/A	Priority 2	97	NO	0
PAL1A	42	95	ROLLED	N/A	Priority 2	98	NO	0
PAL1A	43	74	ROLLED	N/A	Priority 2	99	NO	0
PAL1A	43	76	ROLLED	N/A	Priority 2	100	NO	0
PAL1A	43	80	ROLLED	N/A	Priority 2	101	NO	0
PAL1A	43	92	ROLLED	N/A	Priority 2	102	NO	0
PAL1A	44	73	ROLLED	N/A	Priority 2	103	NO	0
PAL1A	44	79	ROLLED	N/A	Priority 2	104	NO	0
PAL1A	44	87	ROLLED	N/A	Priority 2	105	NO	0
PAL1A	44	93	ROLLED	N/A	Priority 2	106	NO	0
PAL1A	45	72	ROLLED	N/A	Priority 2	107	NO	0
PAL1A	45	74	ROLLED	N/A	Priority 2	108	NO	0
PAL1A	45	76	ROLLED	N/A	Priority 2	109	NO	0
PAL1A	45	86	ROLLED	N/A	Priority 2	110	NO	0
PAL1A	45	90	ROLLED	N/A	Priority 2	111	NO	0
PAL1A	46	73	ROLLED	N/A	Priority 2	112	NO	0
PAL1A	46	75	ROLLED	N/A	Priority 2	113	NO	0
PAL1A	46	77	ROLLED	N/A	Priority 2	114	NO	0
PAL1A	46	81	ROLLED	N/A	Priority 2	115	NO	0
PAL1A	46	83	ROLLED	N/A	Priority 2	116	NO	0
PAL1A	46	85	ROLLED	N/A	Priority 2	117	NO	0
PAL1A	46	87	ROLLED	N/A	Priority 2	118	NO	0
PAL1A	46	91	ROLLED	N/A	Priority 2	119	NO	0
PAL1A	47	76	ROLLED	N/A	Priority 2	120	NO	0
PAL1A	47	78	ROLLED	N/A	Priority 2	121	NO	0
PAL1A	47	80	ROLLED	N/A	Priority 2	122	NO	0
PAL1A	47	82	ROLLED	N/A	Priority 2	123	NO	0
PAL1A	47	88	ROLLED	N/A	Priority 2	124	NO	0
PAL1A	47	92	ROLLED	N/A	Priority 2	125	NO	0
PAL1A	48	83	ROLLED	N/A	Priority 2	126	NO	0
PAL1A	48	87	ROLLED	N/A	Priority 2	127	NO	0

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Palisades Unit 1 - 1D28 - S/G 1A

REPLUG LIST - Hot Leg Only (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A	49	78	ROLLED	N/A	Priority 2	128	NO	0
PAL1A	49	86	ROLLED	N/A	Priority 2	129	NO	0
					Totals:	129	0	

Notes (Rev. 0):

1. There are no tubes on this list that require stabilization.

2. All tubes shall be re-plugged using part number 1208497-003N (750 Stabilizer Rolled Plug Assembly).

3. The tubes on the above list identified for re-plugging are from tubes originally plugged pre-service and de-plugged on the hot leg only during 1D28.

4. The tubes on the above list have had bobbin and +Point ECT acquired and analyzed on the hot leg from the tube end hot through the "square bend" (defined as starting at +1.75" above the center of the uppermost hot leg eggcrate support for that tube) to the start of the cold leg where applicable. The criteria for re-plugging the hot leg of these tubes, based on review of the ECT data, is as follows:
   a. Volumetric indications ≥40%TW or crack-like indications located in the "square-bend" region
   b. Volumetric indications ≥40%TW or crack-like indications located at the top-of-tubesheet
   c. Volumetric indications ≥40%TW or crack-like indications located in the freespan outside of any hot leg eggcrate support
   d. Volumetric indications ≥40%TW or crack-like indications located at the 05H eggcrate support in Rows 1-17 tubes
   e. Obstructions (i.e., OBS indications) in the "square bend" region which limited the ability to acquire ECT data

5. The tubes on the above list have been identified as Priority 1 and Priority 2 tubes for re-plugging. Priority 1 tubes are more likely to have through-wall defects that would allow primary-to-secondary side leakage.

6. The tubes on the above list do not include any de-plugged tubes with obstructions (i.e., OBS indications) identified at the tube end.

7. Due to the de-plugging process the ECT data for the tubes is of insufficient quality to clearly identify any skip rolls, over expansions, dents, bulges and additional indications. Due to there having been an original plug installed, no such anomalies or indications are expected that would prohibit installation of the plugs or stabilizers.

8. The indications in the tubes on the above list were not in-service during plant operation of Cycle 28 and are not required to be screened against the in situ screening criteria. Therefore, none of the indications in the above require in situ testing.

Approvals:

Craig Kelley 5/7/25 5:50pm
Framatome Integrity Engineering

William C. Wolfpes 5/7/2025 1819
Framatome Data Management

Kendall Bryant 5:50 PM
05/7/2025
Framatome Lead Analyst

D.J. Wudziński 05/07/2025 5:50pm
Utility Representative

Ambar C. Rodriguez
5/8/2025

Stephanie Liska
5/8/2025

A.5 SGA Re Plug Hot List Rev 1

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Palisades Unit 1 - 1D28 - S/G 1A

REPLUG LIST - Hot Leg Only (Rev. 1)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A	32	97	ROLLED	N/A	Priority 1 (Potential throughwall)	1	NO	1
PAL1A	33	96	ROLLED	N/A	Priority 1 (Potential throughwall)	2	NO	1
PAL1A	34	71	ROLLED	N/A	Priority 1 (Potential throughwall)	3	NO	1
PAL1A	34	95	ROLLED	N/A	Priority 1 (Potential throughwall)	4	NO	1
PAL1A	35	92	ROLLED	N/A	Priority 1 (Potential throughwall)	5	NO	1
PAL1A	35	94	ROLLED	N/A	Priority 1 (Potential throughwall)	6	NO	1
PAL1A	36	71	ROLLED	N/A	Priority 1 (Potential throughwall)	7	NO	1
PAL1A	36	73	ROLLED	N/A	Priority 1 (Potential throughwall)	8	NO	1
PAL1A	36	75	ROLLED	N/A	Priority 1 (Potential throughwall)	9	NO	1
PAL1A	36	91	ROLLED	N/A	Priority 1 (Potential throughwall)	10	NO	1
PAL1A	36	95	ROLLED	N/A	Priority 1 (Potential throughwall)	11	NO	1
PAL1A	37	72	ROLLED	N/A	Priority 1 (Potential throughwall)	12	NO	1
PAL1A	37	74	ROLLED	N/A	Priority 1 (Potential throughwall)	13	NO	1
PAL1A	37	92	ROLLED	N/A	Priority 1 (Potential throughwall)	14	NO	1
PAL1A	37	94	ROLLED	N/A	Priority 1 (Potential throughwall)	15	NO	1
PAL1A	38	71	ROLLED	N/A	Priority 1 (Potential throughwall)	16	NO	1
PAL1A	38	75	ROLLED	N/A	Priority 1 (Potential throughwall)	17	NO	1
PAL1A	38	77	ROLLED	N/A	Priority 1 (Potential throughwall)	18	NO	1
PAL1A	38	81	ROLLED	N/A	Priority 1 (Potential throughwall)	19	NO	1
PAL1A	38	89	ROLLED	N/A	Priority 1 (Potential throughwall)	20	NO	1
PAL1A	38	93	ROLLED	N/A	Priority 1 (Potential throughwall)	21	NO	1
PAL1A	39	74	ROLLED	N/A	Priority 1 (Potential throughwall)	22	NO	1
PAL1A	39	76	ROLLED	N/A	Priority 1 (Potential throughwall)	23	NO	1
PAL1A	39	90	ROLLED	N/A	Priority 1 (Potential throughwall)	24	NO	1
PAL1A	39	94	ROLLED	N/A	Priority 1 (Potential throughwall)	25	NO	1
PAL1A	40	73	ROLLED	N/A	Priority 1 (Potential throughwall)	26	NO	1
PAL1A	40	75	ROLLED	N/A	Priority 1 (Potential throughwall)	27	NO	1
PAL1A	40	79	ROLLED	N/A	Priority 1 (Potential throughwall)	28	NO	1
PAL1A	40	81	ROLLED	N/A	Priority 1 (Potential throughwall)	29	NO	1
PAL1A	40	83	ROLLED	N/A	Priority 1 (Potential throughwall)	30	NO	1
PAL1A	40	85	ROLLED	N/A	Priority 1 (Potential throughwall)	31	NO	1
PAL1A	40	89	ROLLED	N/A	Priority 1 (Potential throughwall)	32	NO	1

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Palisades Unit 1 - 1D28 - S/G 1A

REPLUG LIST - Hot Leg Only (Rev. 1)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A	40	91	ROLLED	N/A	Priority 1 (Potential throughwall)	33	NO	1
PAL1A	41	76	ROLLED	N/A	Priority 1 (Potential throughwall)	34	NO	1
PAL1A	41	78	ROLLED	N/A	Priority 1 (Potential throughwall)	35	NO	1
PAL1A	41	80	ROLLED	N/A	Priority 1 (Potential throughwall)	36	NO	1
PAL1A	41	84	ROLLED	N/A	Priority 1 (Potential throughwall)	37	NO	1
PAL1A	41	88	ROLLED	N/A	Priority 1 (Potential throughwall)	38	NO	1
PAL1A	41	92	ROLLED	N/A	Priority 1 (Potential throughwall)	39	NO	1
PAL1A	42	77	ROLLED	N/A	Priority 1 (Potential throughwall)	40	NO	1
PAL1A	42	79	ROLLED	N/A	Priority 1 (Potential throughwall)	41	NO	1
PAL1A	42	81	ROLLED	N/A	Priority 1 (Potential throughwall)	42	NO	1
PAL1A	42	83	ROLLED	N/A	Priority 1 (Potential throughwall)	43	NO	1
PAL1A	42	85	ROLLED	N/A	Priority 1 (Potential throughwall)	44	NO	1
PAL1A	42	87	ROLLED	N/A	Priority 1 (Potential throughwall)	45	NO	1
PAL1A	42	89	ROLLED	N/A	Priority 1 (Potential throughwall)	46	NO	1
PAL1A	42	91	ROLLED	N/A	Priority 1 (Potential throughwall)	47	NO	1
PAL1A	42	93	ROLLED	N/A	Priority 1 (Potential throughwall)	48	NO	1
PAL1A	43	78	ROLLED	N/A	Priority 1 (Potential throughwall)	49	NO	1
PAL1A	43	82	ROLLED	N/A	Priority 1 (Potential throughwall)	50	NO	1
PAL1A	43	84	ROLLED	N/A	Priority 1 (Potential throughwall)	51	NO	1
PAL1A	43	86	ROLLED	N/A	Priority 1 (Potential throughwall)	52	NO	1
PAL1A	43	88	ROLLED	N/A	Priority 1 (Potential throughwall)	53	NO	1
PAL1A	43	90	ROLLED	N/A	Priority 1 (Potential throughwall)	54	NO	1
PAL1A	44	75	ROLLED	N/A	Priority 1 (Potential throughwall)	55	NO	1
PAL1A	44	77	ROLLED	N/A	Priority 1 (Potential throughwall)	56	NO	1
PAL1A	44	81	ROLLED	N/A	Priority 1 (Potential throughwall)	57	NO	1
PAL1A	44	83	ROLLED	N/A	Priority 1 (Potential throughwall)	58	NO	1
PAL1A	44	85	ROLLED	N/A	Priority 1 (Potential throughwall)	59	NO	1
PAL1A	44	89	ROLLED	N/A	Priority 1 (Potential throughwall)	60	NO	1
PAL1A	44	91	ROLLED	N/A	Priority 1 (Potential throughwall)	61	NO	1
PAL1A	45	78	ROLLED	N/A	Priority 1 (Potential throughwall)	62	NO	1
PAL1A	45	80	ROLLED	N/A	Priority 1 (Potential throughwall)	63	NO	1
PAL1A	45	82	ROLLED	N/A	Priority 1 (Potential throughwall)	64	NO	1

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Palisades Unit 1 - 1D28 - S/G 1A

REPLUG LIST - Hot Leg Only (Rev. 1)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A	45	88	ROLLED	N/A	Priority 1 (Potential throughwall)	65	NO	1
PAL1A	46	79	ROLLED	N/A	Priority 1 (Potential throughwall)	66	NO	1
PAL1A	47	86	ROLLED	N/A	Priority 1 (Potential throughwall)	67	NO	1
PAL1A	27	100	ROLLED	N/A	Priority 2	68	NO	1
PAL1A	28	67	ROLLED	N/A	Priority 2	69	NO	1
PAL1A	28	99	ROLLED	N/A	Priority 2	70	NO	1
PAL1A	28	101	ROLLED	N/A	Priority 2	71	NO	1
PAL1A	29	68	ROLLED	N/A	Priority 2	72	NO	1
PAL1A	29	98	ROLLED	N/A	Priority 2	73	NO	1
PAL1A	31	98	ROLLED	N/A	Priority 2	74	NO	1
PAL1A	33	70	ROLLED	N/A	Priority 2	75	NO	1
PAL1A	34	65	ROLLED	N/A	Priority 2	76	NO	1
PAL1A	34	97	ROLLED	N/A	Priority 2	77	NO	1
PAL1A	35	72	ROLLED	N/A	Priority 2	78	NO	1
PAL1A	35	96	ROLLED	N/A	Priority 2	79	NO	1
PAL1A	36	97	ROLLED	N/A	Priority 2	80	NO	1
PAL1A	37	96	ROLLED	N/A	Priority 2	81	NO	1
PAL1A	37	98	ROLLED	N/A	Priority 2	82	NO	1
PAL1A	38	73	ROLLED	N/A	Priority 2	83	NO	1
PAL1A	38	95	ROLLED	N/A	Priority 2	84	NO	1
PAL1A	38	97	ROLLED	N/A	Priority 2	85	NO	1
PAL1A	39	72	ROLLED	N/A	Priority 2	86	NO	1
PAL1A	39	92	ROLLED	N/A	Priority 2	87	NO	1
PAL1A	39	96	ROLLED	N/A	Priority 2	88	NO	1
PAL1A	40	71	ROLLED	N/A	Priority 2	89	NO	1
PAL1A	40	77	ROLLED	N/A	Priority 2	90	NO	1
PAL1A	40	93	ROLLED	N/A	Priority 2	91	NO	1
PAL1A	41	74	ROLLED	N/A	Priority 2	92	NO	1
PAL1A	41	86	ROLLED	N/A	Priority 2	93	NO	1
PAL1A	41	94	ROLLED	N/A	Priority 2	94	NO	1
PAL1A	42	71	ROLLED	N/A	Priority 2	95	NO	1
PAL1A	42	73	ROLLED	N/A	Priority 2	96	NO	1

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Palisades Unit 1 - 1D28 - S/G 1A

REPLUG LIST - Hot Leg Only (Rev. 1)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A	42	75	ROLLED	N/A	Priority 2	97	NO	1
PAL1A	42	95	ROLLED	N/A	Priority 2	98	NO	1
PAL1A	43	74	ROLLED	N/A	Priority 2	99	NO	1
PAL1A	43	76	ROLLED	N/A	Priority 2	100	NO	1
PAL1A	43	80	ROLLED	N/A	Priority 2	101	NO	1
PAL1A	43	92	ROLLED	N/A	Priority 2	102	NO	1
PAL1A	44	73	ROLLED	N/A	Priority 2	103	NO	1
PAL1A	44	79	ROLLED	N/A	Priority 2	104	NO	1
PAL1A	44	87	ROLLED	N/A	Priority 2	105	NO	1
PAL1A	44	93	ROLLED	N/A	Priority 2	106	NO	1
PAL1A	45	72	ROLLED	N/A	Priority 2	107	NO	1
PAL1A	45	74	ROLLED	N/A	Priority 2	108	NO	1
PAL1A	45	76	ROLLED	N/A	Priority 2	109	NO	1
PAL1A	45	86	ROLLED	N/A	Priority 2	110	NO	1
PAL1A	45	90	ROLLED	N/A	Priority 2	111	NO	1
PAL1A	46	73	ROLLED	N/A	Priority 2	112	NO	1
PAL1A	46	75	ROLLED	N/A	Priority 2	113	NO	1
PAL1A	46	77	ROLLED	N/A	Priority 2	114	NO	1
PAL1A	46	81	ROLLED	N/A	Priority 2	115	NO	1
PAL1A	46	83	ROLLED	N/A	Priority 2	116	NO	1
PAL1A	46	85	ROLLED	N/A	Priority 2	117	NO	1
PAL1A	46	87	ROLLED	N/A	Priority 2	118	NO	1
PAL1A	46	91	ROLLED	N/A	Priority 2	119	NO	1
PAL1A	47	76	ROLLED	N/A	Priority 2	120	NO	1
PAL1A	47	78	ROLLED	N/A	Priority 2	121	NO	1
PAL1A	47	80	ROLLED	N/A	Priority 2	122	NO	1
PAL1A	47	82	ROLLED	N/A	Priority 2	123	NO	1
PAL1A	47	88	ROLLED	N/A	Priority 2	124	NO	1
PAL1A	47	92	ROLLED	N/A	Priority 2	125	NO	1
PAL1A	48	83	ROLLED	N/A	Priority 2	126	NO	1
PAL1A	48	87	ROLLED	N/A	Priority 2	127	NO	1

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Palisades Unit 1 - 1D28 - S/G 1A

REPLUG LIST - Hot Leg Only (Rev. 1)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A	49	78	ROLLED	N/A	Priority 2	128	NO	1
PAL1A	49	86	ROLLED	N/A	Priority 2	129	NO	1
					Totals:	129	0	

Notes (Rev. 1):

1. There are no tubes on this list that require stabilization.

2. All tubes shall be re-plugged using part number 1208497-003N (750 Stabilizer Rolled Plug Assembly).

3. The tubes on the above list identified for re-plugging are from tubes originally plugged pre-service and de-plugged on the hot leg only during 1D28.

4. The tubes on the above list have had bobbin and +Point ECT acquired and analyzed on the hot leg from the tube end hot through the "square bend" (defined as starting at +1.75" above the center of the uppermost hot leg eggcrate support for that tube) to the start of the cold leg where applicable. The criteria for re-plugging the hot leg of these tubes, based on review of the ECT data, is as follows:
   a. Volumetric indications ≥40%TW or crack-like indications located in the "square-bend" region
   b. Volumetric indications ≥40%TW or crack-like indications located at the top-of-tubesheet
   c. Volumetric indications ≥40%TW or crack-like indications located in the freespan outside of any hot leg eggcrate support
   d. Volumetric indications ≥40%TW or crack-like indications located at the 05H eggcrate support in Rows 1-17 tubes
   e. Obstructions (i.e., OBS indications) in the "square bend" region which limited the ability to acquire ECT data

5. The tubes on the above list have been identified as Priority 1 and Priority 2 tubes for re-plugging. Priority 1 tubes are more likely to have through-wall defects that would allow primary-to-secondary side leakage.

6. The tubes on the above list do not include any de-plugged tubes with obstructions (i.e., OBS indications) identified at the tube end.

7. Due to the de-plugging process the ECT data at the tube ends does not allow to clearly identify any skip rolls, over expansions, dents, bulges and additional indications. Due to there having been an original plug installed, no such anomalies or indications are expected that would prohibit installation of the plugs or stabilizers.

8. The indications in the tubes on the above list were not in-service during plant operation of Cycle 28 and are not required to be screened against the in situ screening criteria. Therefore, none of the indications in the above require in situ testing.

Approvals:

Craig Kelley 5/8/25 9:21 AM
Framatome Integrity Engineering

5/8/2025 10:35
Framatome Data Management

9:22 am 5/8/25
Framatome Lead Analyst

D Judd Wadzinski 9:45am
Utility Representative Utility Level III 05/08/25

Ambar Rodriguez 5/8/2025

Steven C PETERSON 5/8/25

A.6 SGA Re Plug Hot List Rev 2

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Palisades Unit 1 - 1D28 - S/G 1A

REPLUG LIST - Hot Leg Only (Rev. 2)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A	5	24	ROLLED	N/A	SAI @ 05H, DBC, 05C	1	NO	2
PAL1A	10	57	ROLLED	N/A	SAI @ 05H	2	NO	2
PAL1A	10	59	ROLLED	N/A	SAI @ 05H	3	NO	2
PAL1A	10	111	ROLLED	N/A	SAI @ 05H	4	NO	2
PAL1A	11	52	ROLLED	N/A	SAI @ 05H	5	NO	2
PAL1A	11	110	ROLLED	N/A	SAI @ 05H	6	NO	2
PAL1A	11	150	ROLLED	N/A	SAI @ 05H	7	NO	2
PAL1A	12	57	ROLLED	N/A	SAI @ TSH	8	NO	2
PAL1A	23	118	ROLLED	N/A	SAI @ VS4	9	NO	2
PAL1A	27	106	ROLLED	N/A	SAI @ VS4, DBH	10	NO	2
PAL1A	50	95	ROLLED	N/A	SAI @ VS4	11	NO	2
PAL1A	63	72	ROLLED	N/A	SAI @ VS4	12	NO	2
PAL1A	92	121	ROLLSTAB	N/A	SCI @ TSH	13	YES	2

5/9/2025 6:11 PM

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Palisades Unit 1 - 1D28 - S/G 1A

REPLUG LIST - Hot Leg Only (Rev. 2)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A	111	112	ROLLED	N/A	SAI @ VS2, VS4, VS6	14	NO	2
					Totals:	14	1	

Notes (Rev. 2):

1. All tubes requiring stabilization shall be stabilized using wire rope stabilizers (part number 5023370-002N; nominal 115")

2. All tubes shall be re-plugged using part number 1209497-003N (750 Stabilizer Rolled Plug Assembly).

3. The tubes on the above list identified for re-plugging are from tubes originally plugged during in-service inspections and de-plugged on the hot leg only during 1D28.

4. The tubes on the above list have had bobbin and +Point ECT acquired and analyzed on the hot leg from the tube end hot through the "square bend" (defined as starting at +1.75" above the center of the uppermost hot leg eggcrate support for that tube) to the start of the cold leg where applicable. The criteria for re-plugging the hot leg of these tubes, based on review of the ECT data, is as follows:
   a. Volumetric indications ≥40%TW or crack-like indications located in the "square-bend" region
   b. Volumetric indications ≥40%TW or crack-like indications located at the top-of-tubesheet
   c. Volumetric indications ≥40%TW or crack-like indications located in the freespan outside of any hot leg eggcrate support
   d. Volumetric indications ≥40%TW or crack-like indications located at the 05H eggcrate support in Rows 1-17 tubes
   e. Obstructions (i.e., OBS indications) in the "square bend" region which limited the ability to acquire ECT data

5. Tubes on this list that require stabilization are per the criteria in the Degradation Assessment (51-9378492-000, Section 4.9.2) and include any tube with a circumferential indication located within 6" of the top-of-tubesheet.

6. The tubes on the above list do not include any de-plugged tubes with obstructions (i.e., OBS indications) identified at the tube end.

7. Due to the de-plugging process the ECT data at the tube ends does not allow to clearly identify any skip rolls, over expansions, dents, bulges and additional indications. Due to there having been an original plug installed, no such anomalies or indications are expected that would prohibit installation of the plugs or stabilizers.

8. The indications in the tubes on the above list were not in-service during plant operation of Cycle 28 and are not required to be screened against the in situ screening criteria. Therefore, none of the indications in the above require in situ testing.

Approvals:

Craig Kelley 5/9/25 6:11 PM

Framatome Integrity Engineering

William C. Winters 5/10/2025 0857

Framatome Data Management

Randall Johnson 7:18 AM 5/10/25

Framatome Lead Analyst

05/10/25 8:15am Utility Level III D. Judd Lintzenich

Utility Representative

Ambar Rodriguez May 11, 2025

Chris Peterson Digitally signed by Chris Peterson Date: 5/11/25 09:28

A.7 SGA Re Plug Hot List Rev 3

framatome

Palisades Unit 1 - 1D28 - S/G 1A

REPLUG LIST - Hot Leg Only (Rev. 3)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A	35	74	ROLLED	N/A	OBS @ TEH	1	NO	3
PAL1A	36	83	ROLLED	N/A	OBS @ TEH	2	NO	3
PAL1A	36	93	ROLLED	N/A	OBS @ TEH	3	NO	3
PAL1A	37	76	ROLLED	N/A	OBS @ TEH	4	NO	3
PAL1A	37	90	ROLLED	N/A	OBS @ TEH	5	NO	3
PAL1A	38	78	ROLLED	N/A	OBS @ TEH	6	NO	3
PAL1A	38	85	ROLLED	N/A	OBS @ TEH	7	NO	3
PAL1A	38	87	ROLLED	N/A	OBS @ TEH	8	NO	3
PAL1A	38	91	ROLLED	N/A	OBS @ TEH	9	NO	3
PAL1A	39	78	ROLLED	N/A	OBS @ TEH	10	NO	3
PAL1A	39	80	ROLLED	N/A	OBS @ TEH	11	NO	3
PAL1A	39	82	ROLLED	N/A	OBS @ TEH	12	NO	3
PAL1A	39	84	ROLLED	N/A	OBS @ TEH	13	NO	3
PAL1A	39	88	ROLLED	N/A	OBS @ TEH	14	NO	3
PAL1A	39	88	ROLLED	N/A	OBS @ TEH	15	NO	3
PAL1A	40	87	ROLLED	N/A	OBS @ TEH	16	NO	3
PAL1A	41	82	ROLLED	N/A	OBS @ TEH	17	NO	3
PAL1A	41	90	ROLLED	N/A	OBS @ TEH	18	NO	3
					Totals:	18	0	

Notes (Rev. 3):

1. There are no tubes on this list that require stabilization.
2. All tubes shall be re-plugged using part number 1208497-003N (7/8 Stabilizer Rolled Plug Assembly).
3. The tubes on the above list identified for re-plugging are from tubes originally plugged pre-service and de-plugged on the hot leg only during 1D28.
4. The tubes on the above list have had an obstruction (i.e., an OBS indication) at the tube-end hot (TEH) that prevented acquisition of ECT from the hot leg. Based on a review of ECT data from all other de-plugged tubes, the tubes on the above list are adjacent to tubes with deep wear and potential through-wall defects requiring re-plugging. Therefore, the tubes on the above list are more likely to have through-wall defects and are being re-plugged preventatively without the need of ECT.
5. Due to the de-plugging process the ECT data at the tube ends does not allow to clearly identify any skip rolls, over expansions, dents, bulges and additional indications. Due to there having been an original plug installed, no such anomalies or indications are expected that would prohibit installation of the plugs or stabilizers.
6. The tubes on the above list were not in-service during plant operation of Cycle 28 and are not required to be screened against the in situ screening criteria. Therefore, none of the tubes in the above require in situ testing.

Approvals:

Craig Kelley 5/13/25 5:55 PM

Framatome Integrity Engineering

William C. Wolters 5/14/25 0824

Framatome Data Management

Kimball L. Johnson 7:45am 5/14/2025

Framatome Lead Analyst

7:45amEST

Utility Level III (4:45am PST)

D. Judd Wadzinski 05/14/25

Utility Representative

5/14/2025

Ambar Rodriguez

5/14/25

C. Peterson

5/13/2025 11:31 AM

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A.8 SGA Re Plug Hot List Rev 4

framatome

Palisades Unit 1 - 1D28 - S/G 1A

REPLUG LIST - Hot Leg Only (Rev. 4)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A	32	67	ROLLED	N/A	DPG @ TEH	1	NO	4
					Totals:	1	0	

Notes (Rev. 4):

1. There are no tubes on this list that require stabilization.
2. All tubes shall be re-plugged using part number 1208497-003N (750 Stabilizer Rolled Plug Assembly).
3. The tubes on the above list identified for re-plugging are from tubes originally plugged pre-service and de-plugged on the hot leg only during 1D28.
4. The de-plugging of the hot leg tube plug in tube R32-C67 required a pull force greater than what would allow the tube to return-to-service per Framatome Condition Report CR-2025-1182 and therefore is required to be re-plugged on the hot leg.
5. Due to the de-plugging process and required re-plugging, ECT was not required and was not performed at any location on the tube. Due to there having been an original plug installed, no such anomalies such as skip rolls, over expansions, dents, bulges and additional indication are expected that would prohibit installation of the plugs.
6. The tubes on the above list were not in-service during plant operation of Cycle 28 and are not required to be screened against the in situ screening criteria. Therefore, none of the tubes in the above require in situ testing.

Approvals:

Craig Kelley 6/6/2025 5:43 PM

Craig A Kelley

Framatome Integrity Engineering

William C. Warren 6/9/25 1710

Framatome Data Management

K S LaRose 6-9-2025

Framatome Lead Analyst

Kevin S. LaRose

Utility Level III

D Judd Wadsworth

Utility Representative 06/09/25 11:13am

6/10/2025 Ambar Rodriguez

Donald Powell 6/11/25

6/6/2025 5:42 PM

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A.9 SGA Re Plug Hot-Cold List Rev 0

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Palisades Unit 1 - 1D28 - S/G 1A

REPLUG LIST - Hot Leg and Cold Leg (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A	4	109	ROLLED	ROLLED	SAI @ 05C	1	NO	0
PAL1A	15	132	ROLLED	ROLLED	OBS @ 01C	2	NO	0
PAL1A	32	123	ROLLED	ROLLED	OBS @ TSC	3	NO	0
PAL1A	45	84	ROLLED	ROLLED	PTP @ DBC	4	NO	0
PAL1A	110	85	ROLLED	ROLLED	SAI @ 06C	5	NO	0
					Totals:	5	0	

Notes (Rev. 0):

1. There are no tubes on this list that require stabilization.

2. All tubes shall be re-plugged using part number 1208497-003N (750 Stabilizer Rolled Plug Assembly).

3. The tubes on the above list identified for re-plugging are from tubes originally plugged pre-service or from in-service inspections and de-plugged on the hot leg only during 1D28.

4. The tubes on the above list have had bobbin and +Point ECT acquired on both the hot leg and cold leg including the straight section from the tube end to the uppermost support in each tube, and the "square bend" region (defined as starting at +1.75" above the center of the uppermost eggcrate support in each tube) with inspections performed as specified in the Degradation Assessment (51-9378492-000) where applicable. The criteria for re-plugging these tubes, based on review of the ECT data, is as follows:
   a. Volumetric indications ≥40%TW or crack-like indications located in the "square-bend" region
   b. Volumetric indications ≥40%TW or crack-like indications located at the top-of-tubesheet
   c. Volumetric indications ≥40%TW or crack-like indications located in the freespan outside of any hot leg eggcrate support
   d. Volumetric indications ≥40%TW or crack-like indications located at the 05H eggcrate support in Rows 1-17 tubes
   e. Volumetric indications ≥40%TW or crack-like indications located at any location along the cold leg
   f. Obstructions (i.e., OBS indications) at locations above the tubesheet that limited the ability to acquire ECT data

5. Tube 45-84 is being preventatively re-plugged based on a review of ECT data from this tube and all other de-plugged tubes. The criteria for preventatively tube re-plugging (PTP) Tube 45-84 has deep wear indications in the "square bend" region (36%TW at DBC and 28%TW at DBH) and is adjacent to multiple tubes with deep wear and potential through-wall defects requiring re-plugging.

6. Due to the de-plugging process the ECT data at the tube ends does not allow to clearly identify any skip rolls, over expansions, dents, bulges and additional indications. Due to there having been an original plug installed, no such anomalies or indications are expected that would prohibit installation of the plugs or stabilizers.

7. The tubes on the above list were not in-service during plant operation of Cycle 28 and are not required to be screened against the in situ screening criteria. Therefore, none of the tubes in the above require in situ testing.

Approvals:

Craig Kelley 5/12/25 4:39PM

Framatome Integrity Engineering

William C. Wolcott 5/12/2025 1732

Framatome Data Management

Kendall L. Jones 5:10 pm 5/12/2025

Framatome Lead Analyst

05/12/25 5:25 pm

D. Judd Wadzinski

Utility Representative Utility Level III

5/13/2025

Ambar Rodriguez

Chris Peterson

Digitally signed by Chris Peterson
DN: cn=Chris Peterson, email=c.peterson1@holtec.com
Date: 2025.05.13 09:16:18 -04'00'

5/12/2025 4:39 PM

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A.10 SGA Re Plug Hot-Cold List Rev 1

framatome

Palisades Unit 1 - 1D28 - S/G 1A

REPLUG LIST - Hot Leg and Cold Leg (Rev. 1)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1A	25	106	ROLLED	ROLLED	Did not pass GoGage	1	NO	1
PAL1A	48	103	ROLLED	ROLLED	Did not pass GoGage	2	NO	1
					Totals:	2	0	

Notes (Rev. 1):

1. There are no tubes on this list that require stabilization.
2. All tubes shall be re-plugged using part number 1208497-003N (750 Stabilizer Rolled Plug Assembly).
3. The tubes on the above list identified for re-plugging are from tubes originally plugged from in-service inspections and de-plugged during 1D28.
4. All tubes on the above list had an unsuccessful Sleeve GoGage result at the support locations where corrective sleeved would be required to return to service per 03-8169881-000; therefore, there are clearance issues that would prevent the installation of a sleeve.
   a) R25-C106 has an SAI at 05H. GoGage did not pass at 04H+28"
   b) R48-C103 has an SAI at 02H. GoGage did not pass at TEH+60" (i.e., approximately between 01H-02H)
5. Due to the de-plugging process the ECT data at the tube ends does not allow to clearly identify any skip rolls, over expansions, dents, bulges and additional indications. Due to there having been an original plug installed, no such anomalies or indications are expected that would prohibit installation of the plugs or stabilizers.
6. The tubes on the above list were not in-service during plant operation of Cycle 28 and are not required to be screened against the in situ screening criteria. Therefore, none of the tubes in the above require in situ testing.

Approvals:

Craig Kelley 6/6/2025 5:39 PM

Framatome Integrity Engineering

William P. Wodrich 6/9/25 12:10

Framatome Data Management

6-9-2025

Framatome Lead Analyst

Kevin S. La Reau

Utility Level III

D. Judd Wodzinski

Utility Representative 06/09/25 11:09 am

Ambar Rodriguez 6/10/2025

Daniel Pavel 6/11/25

6/6/2025 5:38 PM

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A.11 SGB Plug List Rev 0

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Palisades Unit 1 - 1D28 - S/G 1B

PLUG LIST (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1B	1	44	ROLLED	ROLLED	SAI @ DBH+0.64	1	NO	0
PAL1B	3	58	ROLLED	ROLLED	OBS @ DBC-9.94	2	NO	0
PAL1B	24	51	ROLLSTAB	ROLLED	SCI @ TSH-0.06	3	YES	0
PAL1B	24	115	ROLLED	ROLLED	SAI @ 01H-0.32	4	NO	0
PAL1B					SAI @ 01H+0.53			0
PAL1B	24	121	ROLLSTAB	ROLLED	SCI @ TSH+0.09	5	YES	0
PAL1B	29	46	ROLLSTAB	ROLLED	SCI @ TSH+0.06	6	YES	0
PAL1B	30	51	ROLLED	ROLLED	SAI @ TSH+0.69	7	NO	0
PAL1B	34	49	ROLLSTAB	ROLLED	SCI @ TSH+0.29	8	YES	0
PAL1B	40	51	ROLLSTAB	ROLLED	SCI @ TSH+0.03	9	YES	0
PAL1B	40	53	ROLLSTAB	ROLLED	SCI @ TSH+0.17	10	YES	0
PAL1B					SCI @ TSH+0.14			0
PAL1B	44	103	ROLLSTAB	ROLLED	TWD @ VS4+1.02	11	YES	0
PAL1B	45	52	ROLLSTAB	ROLLED	SCI @ TSH-0.03	12	YES	0
PAL1B	46	53	ROLLSTAB	ROLLED	SCI @ TSH+0.00	13	YES	0
PAL1B	48	9	ROLLSTAB	ROLLED	TWD @ VS4+0.26	14	YES	0
PAL1B	60	107	ROLLSTAB	ROLLED	SCI @ TSH+0.09	15	YES	0
PAL1B	69	68	ROLLSTAB	ROLLED	SCI @ TSH+0.09	16	YES	0
PAL1B	73	74	ROLLSTAB	ROLLED	SCI @ TSH+0.14	17	YES	0
PAL1B					SCI @ TSH-0.17			0
PAL1B					SCI @ TSH+0.03			0
PAL1B	75	92	ROLLED	ROLLED	SAI @ 01H+0.19	18	NO	0
PAL1B					SAI @ 01H-0.99			0
PAL1B					SAI @ 02H+0.72			0
PAL1B					SAI @ 02H-0.64			0
PAL1B	79	80	ROLLSTAB	ROLLED	SAI @ 01H-0.83	19	YES	0
PAL1B					SCI @ TSH+0.05			0
PAL1B	79	100	ROLLSTAB	ROLLED	SCI @ TSH-0.06	20	YES	0
PAL1B					SAI @ 01H-0.64			0
PAL1B					SAI @ 01H+0.51			0

7/9/2025 5:32 PM

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Palisades Unit 1 - 1D28 - S/G 1B

PLUG LIST (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1B					SAI @ 03C+0.85			0
PAL1B	80	93	ROLLSTAB	ROLLED	SCI @ TSH+0.17	21	YES	0
PAL1B					SAI @ 02H-0.11			0
PAL1B	96	73	ROLLSTAB	ROLLED	SCI @ TSH-0.09	22	YES	0
PAL1B	109	52	ROLLSTAB	ROLLED	TWD @ VS2+0.88	23	YES	0
PAL1B	127	62	ROLLSTAB	ROLLED	SVI @ TSH+0.24	24	YES	0
PAL1B	128	63	ROLLSTAB	ROLLED	PTP @ TSH+0.00	25	YES	0
PAL1B	129	62	ROLLSTAB	ROLLED	PTP, SVI @ TSH+0.00	26	YES	0
PAL1B	130	63	ROLLSTAB	ROLLED	PTP @ TSH+0.00	27	YES	0
PAL1B	131	62	ROLLSTAB	ROLLED	PTP @ TSH+0.00	28	YES	0
PAL1B	132	63	ROLLSTAB	ROLLED	PTP @ TSH+0.00	29	YES	0
PAL1B	133	62	ROLLSTAB	ROLLED	PTP @ TSH+0.00	30	YES	0
PAL1B	134	63	ROLLSTAB	ROLLED	PTP @ TSH+0.00	31	YES	0
					Totals:	31	26	

Notes (Rev. 0):

1. The following tubes shall be stabilized using U-bend wire rope stabilizers:
   a) Tubes R44-C103 and R48-C9 shall be stabilized using the 1/2" diameter U-bend wire rope stabilizer, P/N 5023369-001 (nominal 480" length).
   b) Tube R109-C52 shall be stabilized using the 1/2" diameter U-bend wire rope stabilizer, P/N 1227136-001 (nominal 570" length).

2. All other tubes tubes requiring stabilization shall be stabilized using either of the the 1/2" diameter tubesheet wire rope stabilizers: P/N 5023370-001 (nominal 115" length, w/ span sleeve) or P/N 5023370-002 (nominal 115" length; w/o span sleeve).

3. All tubes shall be plugged using part number 1208497-003N (750 Stabilizer Rolled Plug Assembly).

4. Tubes on the above list have been screened against the stabilization requirements as identified in Section 4.9.2 of the Degradation Assessment (51-9378492-000). For the tubes on this list, only tubes plugged for diagonal bar or vertical strap wear, tubes plugged for circumferential cracks within 6" of the top of the tubesheet require stabilization, and tubes plugged for foreign object wear with a foreign object or potential loose part (PLP) indication present require stabilization.

5. The tubes on the above list have been screened against the in situ screening criteria. Tubes R1-C44, R3-C58, R24-C115, R30-C51, and R75-C92 required in situ pressure testing. In situ testing has been performed for these tubes as documented in 51-9391858-001.

6. The tubes on the above list have been reviewed for skip rolls, over expansions, dents, bulges and additional indications. No such anomalies or indications were detected that would prohibit installation of the plugs or stabilizers.

7. The indications queried for in FDMS to generate this list are consistent with those specified in the Analysis Guidelines for Tech Spec requierd to be plugged (TBP) and include: >=40%, MAI, MCI, MMI, MVI, SAI, SCI, SVI.

8. All tubes on the above list have been screened to include as preventative tube plugging criteria (PTP) criteria any tube with foreign object wear that has a foreign object or potential loose part (PLP) indication, or a foreign object is present with potential to cause wear, which include tubes R128-C63, R129-C62, R130-C63, R131-C62, R132-C63, R133-C62, and R134-C63.

7/9/2025 5:32 PM Page 2 of 3

framatome

Palisades Unit 1 - 1D28 - S/G 1B

PLUG LIST (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.

9. The tubes on the above list have been reviewed against the criteria for returning-to-service (RTS) with a sleeve repair and none of the tubes on the above list can be RTS with a sleeve. The criteria for RTS with a sleeve repair is as follows:

a. There are no volumetric indications ≥40%TW or crack-like indications located in the "square-bend region" defined as starting at +1.75" above the center of the uppermost eggcrate supports for that tube

b. There are no volumetric indications ≥40%TW or crack-like indications located at the top-of-tubsheet or within the tubesheet

c. There are no volumetric indications ≥40%TW or crack-like indications located in the freespan outside of any hot leg eggcrate support

d. There are no volumetric indications ≥40%TW or crack-like indications located at the 05H eggcrate support in Rows 1-17 tubes, or at the 06H, 07H or 08H eggcrate supports for any tube row

e. There are no volumetric indications ≥40%TW or crack-like indications located at any location along the cold leg

Approvals:

Craig Kelley 7/9/25 5:32 PM

Framatome Integrity Engineering

07/10/2025 10:28

Framatome Data Management

7:10 AM 7/14/2025

Framatome Lead Analyst

7/10/2025 9:30 AM

Utility Representative

7/14/25

Ambar C. Rodriguez

7/14/25

7/9/2025 5:32 PM

A.12 SGB Plug List Rev 1

framatome

Palisades Unit 1 - 1D28 - S/G 1B

PLUG LIST (Rev. 1)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1B	1	22	ROLLED	ROLLED	SAI @ 03H-0.80	1	NO	1
PAL1B					SAI @ 05H-0.88			1
PAL1B	1	24	ROLLED	ROLLED	SAI @ 05H-0.40	2	NO	1
PAL1B	1	28	ROLLED	ROLLED	SAI @ 05H+0.16	3	NO	1
PAL1B	1	52	ROLLED	ROLLED	SAI @ 04C+0.85	4	NO	1
PAL1B	1	164	ROLLED	ROLLED	SAI @ DBH-0.88	5	NO	1
PAL1B					SAI @ 04C-0.80			1
PAL1B	2	7	ROLLED	ROLLED	SAI @ 05C+0.24	6	NO	1
PAL1B	2	131	ROLLED	ROLLED	SAI @ 05H+0.37	7	NO	1
PAL1B	2	135	ROLLED	ROLLED	SAI @ 05H+0.51	8	NO	1
PAL1B					SAI @ 01H-0.11			1
PAL1B	2	159	ROLLED	ROLLED	SAI @ DBH-0.24	9	NO	1
PAL1B	3	12	ROLLED	ROLLED	SAI @ 05H-0.88	10	NO	1
PAL1B					SAI @ 05H+0.19			1
PAL1B	3	108	ROLLED	ROLLED	SAI @ TSH-0.32	11	NO	1
PAL1B	3	136	ROLLED	ROLLED	SAI @ TSH-0.34	12	NO	1
PAL1B	18	57	ROLLED	ROLLED	SAI @ DBH+2.56	13	NO	1
PAL1B	19	54	ROLLED	ROLLED	SAI @ TSH-0.37	14	NO	1
PAL1B	21	160	ROLLED	ROLLED	SAI @ 03C-0.19	15	NO	1
PAL1B	25	106	ROLLED	ROLLED	SAI @ TSH-2.13	16	NO	1
PAL1B	26	117	ROLLED	ROLLED	SAI @ TSH+0.33	17	NO	1
PAL1B	31	50	ROLLED	ROLLED	SAI @ TSH+0.98	18	NO	1
PAL1B	33	52	ROLLED	ROLLED	SAI @ TSH+0.46	19	NO	1
PAL1B	34	51	ROLLED	ROLLED	SAI @ TSH+0.78	20	NO	1
PAL1B	36	105	ROLLED	ROLLED	SAI @ TSH-0.34	21	NO	1
PAL1B	42	103	ROLLED	ROLLED	SAI @ TSH-1.67	22	NO	1
PAL1B	54	25	ROLLED	ROLLED	SCI @ TSH-11.84	23	NO	1
PAL1B	56	9	ROLLED	ROLLED	SAI @ TSH-9.37	24	NO	1
PAL1B	62	71	ROLLED	ROLLED	SAI @ VS5+3.55	25	NO	1
PAL1B	63	76	ROLLED	ROLLED	SAI @ 01H+0.61	26	NO	1

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Palisades Unit 1 - 1D28 - S/G 1B

PLUG LIST (Rev. 1)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1B					SAI @ 06H-0.37			1
PAL1B	70	97	ROLLED	ROLLED	SAI @ TSH+0.29	27	NO	1
PAL1B	72	101	ROLLED	ROLLED	SAI @ TSH+1.21	28	NO	1
PAL1B	73	90	ROLLED	ROLLED	SAI @ TSH+0.52	29	NO	1
PAL1B					SAI @ TSH+0.72			1
PAL1B	74	85	ROLLED	ROLLED	SAI @ 02H+0.69	30	NO	1
PAL1B					SAI @ VS5-0.73			1
PAL1B					SAI @ 01H+0.11			1
PAL1B					SAI @ 02H+0.80			1
PAL1B	75	62	ROLLED	ROLLED	SAI @ VS4+0.79	31	NO	1
PAL1B					SAI @ VS4-0.15			1
PAL1B	75	116	ROLLED	ROLLED	SAI @ 01H+0.77	32	NO	1
PAL1B					SAI @ VS4+0.86			1
PAL1B	76	93	ROLLED	ROLLED	SAI @ TSH+1.58	33	NO	1
PAL1B					SAI @ 02H+0.72			1
PAL1B	76	115	ROLLED	ROLLED	SAI @ TSH-0.09	34	NO	1
PAL1B					SAI @ 06H+0.13			1
PAL1B	79	44	ROLLED	ROLLED	SAI @ 07C+0.11	35	NO	1
PAL1B					SAI @ 07C+0.93			1
PAL1B					SAI @ 06H+0.75			1
PAL1B	79	92	ROLLED	ROLLED	SAI @ 01H-0.83	36	NO	1
PAL1B					SAI @ 02H-0.53			1
PAL1B					SAI @ 07H-0.19			1
PAL1B	79	98	ROLLED	ROLLED	SAI @ 06H+0.99	37	NO	1
PAL1B	80	35	ROLLED	ROLLED	SAI @ 06C-0.85	38	NO	1
PAL1B					SAI @ 07C+0.96			1
PAL1B	80	45	ROLLED	ROLLED	SAI @ 07H-0.99	39	NO	1
PAL1B	80	53	ROLLED	ROLLED	SAI @ 05C+0.85	40	NO	1
PAL1B	80	63	ROLLED	ROLLED	SAI @ 02H+0.40	41	NO	1
PAL1B					SAI @ 02H-0.19			1

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Palisades Unit 1 - 1D28 - S/G 1B

PLUG LIST (Rev. 1)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1B					SAI @ 06H+0.85			1
PAL1B	80	79	ROLLED	ROLLED	SAI @ 01H-0.83	42	NO	1
PAL1B					SAI @ 01H-0.16			1
PAL1B					SAI @ 06H+0.13			1
PAL1B	85	74	ROLLED	ROLLED	SAI @ VS6+0.99	43	NO	1
PAL1B	85	96	ROLLED	ROLLED	SAI @ 06C-0.96	44	NO	1
PAL1B					SAI @ 05H+0.59			1
PAL1B	88	45	ROLLED	ROLLED	SAI @ TSH-0.06	45	NO	1
PAL1B					SAI @ 07H-0.77			1
PAL1B	89	82	ROLLED	ROLLED	SAI @ 02H-0.16	46	NO	1
PAL1B					SAI @ 02H+0.64			1
PAL1B					SAI @ VS6+0.86			1
PAL1B	96	111	ROLLED	ROLLED	SAI @ 07H+0.88	47	NO	1
PAL1B	98	39	ROLLED	ROLLED	SAI @ VS6+0.71	48	NO	1
PAL1B	98	89	ROLLED	ROLLED	SAI @ TSH-0.14	49	NO	1
					Totals:	49	0	

Notes (Rev. 1):

1. This is the **final plug list for SGB** at 1D28.

2. No tubes on the above list require stabilization as identified in Section 4.9.2 of the Degradation Assessment (51-9378492-000).

3. All tubes shall be plugged using part number 1208497-003N (750 Stabilizer Rolled Plug Assembly).

4. The tubes on the above list have been screened against the in situ screening criteria. No tubes require in situ testing.

5. The tubes on the above list have been reviewed for skip rolls, over expansions, dents, bulges and additional indications. No such anomalies or indications were detected that would prohibit installation of the plugs or stabilizers.

6. The indications queried for in FDMS to generate this list are consistent with those specified in the Analysis Guidelines for Tech Spec requierd to be plugged (TBP) and include: >=40%, MAI, MCI, MMI, MVI, SAI, SCI, SVI.

7. Tube R75-C116 had sleeves installed at 05H, 04H, 03H, 02H, and 01H for the purpose of sleeve process verification and positional verification only with post-sleeving ECT Bobbin. The post-sleeving ECT Bobbin was performed and these tubes can now be plugged.

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Palisades Unit 1 - 1D28 - S/G 1B

PLUG LIST (Rev. 1)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.

8. All other tubes on the above list have been reviewed against the criteria for returning-to-service (RTS) with a sleeve repair and **none of the tubes on the above list can be RTS with a sleeve**. The criteria for RTS with a sleeve repair is as follows:

a. There are no volumetric indications ≥40%TW or crack-like indications located in the "square-bend region" defined as starting at +1.75" above the center of the uppermost eggcrate supports for that tube

b. There are no volumetric indications ≥40%TW or crack-like indications located at the top-of-tubsheet or within the tubesheet

c. There are no volumetric indications ≥40%TW or crack-like indications located in the freespan outside of any hot leg eggcrate support

d. There are no volumetric indications ≥40%TW or crack-like indications located at the 05H eggcrate support in Rows 1-17 tubes, or at the 06H, 07H or 08H eggcrate supports for any tube row

e. There are no volumetric indications ≥40%TW or crack-like indications located at any location along the cold leg

Approvals:

Craig Kelley 8/8/25 9:46AM

Framatome Integrity Engineering

William C. Walters 8/8/25 12:07

Framatome Data Management

Kendall L. Johnson 11:17 A.M. 8/8/2025

Framatome Lead Analyst

Bobby Griffin 11:28 AM 8/8/2025

Utility Engineering Representative

8/8/2025 Ambar Rodriguez

Don Powell 8/8/25

8/8/2025 9:46 AM

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A.13 SGB Re Plug Hot Rev 0

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Palisades Unit 1 - 1D28 - S/G 1B

REPLUG LIST - Hot Leg Only (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1B	27	66	ROLLED	N/A	Priority 1 (Potential throughwall)	1	NO	0
PAL1B	27	100	ROLLED	N/A	Priority 1 (Potential throughwall)	2	NO	0
PAL1B	28	99	ROLLED	N/A	Priority 1 (Potential throughwall)	3	NO	0
PAL1B	41	94	ROLLED	N/A	Priority 1 (Potential throughwall)	4	NO	0
PAL1B	18	71	ROLLED	N/A	Priority 1 (Potential throughwall)	6	NO	0
PAL1B	43	92	ROLLED	N/A	Priority 1 (Potential throughwall)	6	NO	0
PAL1B	43	94	ROLLED	N/A	Priority 1 (Potential throughwall)	7	NO	0
PAL1B	44	73	ROLLED	N/A	Priority 1 (Potential throughwall)	8	NO	0
PAL1B	44	91	ROLLED	N/A	Priority 1 (Potential throughwall)	9	NO	0
PAL1B	44	75	ROLLED	N/A	Priority 1 (Potential throughwall)	10	NO	0
PAL1B	45	90	ROLLED	N/A	Priority 1 (Potential throughwall)	11	NO	0
PAL1B	45	74	ROLLED	N/A	Priority 1 (Potential throughwall)	12	NO	0
PAL1B	46	73	ROLLED	N/A	Priority 1 (Potential throughwall)	13	NO	0
PAL1B	46	75	ROLLED	N/A	Priority 1 (Potential throughwall)	14	NO	0
PAL1B	46	79	ROLLED	N/A	Priority 1 (Potential throughwall)	15	NO	0
PAL1B	46	81	ROLLED	N/A	Priority 1 (Potential throughwall)	16	NO	0
PAL1B	46	83	ROLLED	N/A	Priority 1 (Potential throughwall)	17	NO	0
PAL1B	46	85	ROLLED	N/A	Priority 1 (Potential throughwall)	18	NO	0
PAL1B	46	91	ROLLED	N/A	Priority 1 (Potential throughwall)	19	NO	0
PAL1B	47	78	ROLLED	N/A	Priority 1 (Potential throughwall)	20	NO	0
PAL1B	47	82	ROLLED	N/A	Priority 1 (Potential throughwall)	21	NO	0
PAL1B	47	84	ROLLED	N/A	Priority 1 (Potential throughwall)	22	NO	0
PAL1B	47	86	ROLLED	N/A	Priority 1 (Potential throughwall)	23	NO	0
PAL1B	48	79	ROLLED	N/A	Priority 1 (Potential throughwall)	24	NO	0
PAL1B	48	83	ROLLED	N/A	Priority 1 (Potential throughwall)	25	NO	0
PAL1B	30	99	ROLLED	N/A	Priority 2	26	NO	0
PAL1B	35	96	ROLLED	N/A	Priority 2	27	NO	0
PAL1B	37	96	ROLLED	N/A	Priority 2	28	NO	0
PAL1B	40	95	ROLLED	N/A	Priority 2	29	NO	0
PAL1B	41	72	ROLLED	N/A	Priority 2	30	NO	0
PAL1B	42	73	ROLLED	N/A	Priority 2	31	NO	0
PAL1B	42	93	ROLLED	N/A	Priority 2	32	NO	0

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Palisades Unit 1 - 1D28 - S/G 1B

REPLUG LIST - Hot Leg Only (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1B	43	72	ROLLED	N/A	Priority 2	33	NO	0
PAL1B	44	93	ROLLED	N/A	Priority 2	34	NO	0
PAL1B	45	76	ROLLED	N/A	Priority 2	35	NO	0
PAL1B	45	92	ROLLED	N/A	Priority 2	36	NO	0
PAL1B	46	77	ROLLED	N/A	Priority 2	37	NO	0
PAL1B	46	87	ROLLED	N/A	Priority 2	38	NO	0
PAL1B	46	89	ROLLED	N/A	Priority 2	39	NO	0
PAL1B	47	80	ROLLED	N/A	Priority 2	40	NO	0
PAL1B	47	88	ROLLED	N/A	Priority 2	41	NO	0
PAL1B	48	75	ROLLED	N/A	Priority 2	42	NO	0
PAL1B	48	77	ROLLED	N/A	Priority 2	43	NO	0
PAL1B	48	81	ROLLED	N/A	Priority 2	44	NO	0
PAL1B	48	85	ROLLED	N/A	Priority 2	45	NO	0
PAL1B	48	89	ROLLED	N/A	Priority 2	46	NO	0
PAL1B	49	84	ROLLED	N/A	Priority 2	47	NO	0
PAL1B	49	86	ROLLED	N/A	Priority 2	48	NO	0
PAL1B	49	88	ROLLED	N/A	Priority 2	49	NO	0
PAL1B	72	93	ROLLED	N/A	Priority 2	50	NO	0
PAL1B	74	87	ROLLED	N/A	Priority 2	51	NO	0
PAL1B	80	25	ROLLED	N/A	Priority 2	52	NO	0
					Totals:	52	0	

Notes (Rev. 0):

1. There are no tubes on this list that require stabilization.

2. All tubes shall be re-plugged using part number 1208497-003N (750 Stabilizer Rolled Plug Assembly).

3. The tubes on the above list identified for re-plugging are from tubes originally plugged pre-service and de-plugged on the hot leg only during 1D28.

4. The tubes on the above list have had bobbin and +Point ECT acquired and analyzed on the hot leg from the tube end hot through the "square bend" (defined as starting at +1.75" above the center of the uppermost hot leg eggcrate support for that tube) to the start of the cold leg where applicable. The criteria for re-plugging the hot leg of these tubes, based on review of the ECT data, is as follows:
   a. Volumetric indications ≥40%TW or crack-like indications located in the "square-bend" region
   b. Volumetric indications ≥40%TW or crack-like indications located at the top-of-tubesheet
   c. Volumetric indications ≥40%TW or crack-like indications located in the freespan outside of any hot leg eggcrate support
   d. Volumetric indications ≥40%TW or crack-like indications located at the 05H eggcrate support in Rows 1-17 tubes
   e. Obstructions (i.e., OBS indications) in the "square bend" region which limited the ability to acquire ECT data

7/15/2025 4:22 PM

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Palisades Unit 1 - 1D28 - S/G 1B

REPLUG LIST - Hot Leg Only (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.

5. The tubes on the above list have been identified as Priority 1 and Priority 2 tubes for re-plugging. Priority 1 tubes are more likely to have through-wall defects that would allow primary-to-secondary side leakage.

6. The tubes on the above list do not include any de-plugged tubes with obstructions (i.e., OBS indications) identified at the tube end.

7. Due to the de-plugging process the ECT data at the tube ends does not allow to clearly identify any skip rolls, over expansions, dents, bulges and additional indications. Due to there having been an original plug installed, no such anomalies or indications are expected that would prohibit installation of the plugs or stabilizers.

8. The indications in the tubes on the above list were not in-service during plant operation of Cycle 28 and are not required to be screened against the in situ screening criteria. Therefore, none of the indications in the above require in situ testing.

Approvals:

Craig Kelley 7/15/2025 4:22PM

Framatome Integrity Engineering

Framatome Data Management

Framatome Lead Analyst

Utility Representative

Dustin Daggett

Digitally signed by Dustin Daggett
DN: cn=Dustin Daggett, o=Holtec, email=DDaggett@holtec.com
Reason: I am the author of this document

A.14 SGB Re Plug Hot Rev 1

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Palisades Unit 1 - 1D28 - S/G 1B

REPLUG LIST - Hot Leg Only (Rev. 1)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1B	27	66	ROLLED	N/A	Priority 1 (Potential throughwall)	1	NO	0
PAL1B	27	100	ROLLED	N/A	Priority 1 (Potential throughwall)	2	NO	0
PAL1B	28	99	ROLLED	N/A	Priority 1 (Potential throughwall)	3	NO	0
PAL1B	41	94	ROLLED	N/A	Priority 1 (Potential throughwall)	4	NO	0
PAL1B	43	74	ROLLED	N/A	Priority 1 (Potential throughwall)	5	NO	0
PAL1B	43	92	ROLLED	N/A	Priority 1 (Potential throughwall)	6	NO	0
PAL1B	43	94	ROLLED	N/A	Priority 1 (Potential throughwall)	7	NO	0
PAL1B	44	73	ROLLED	N/A	Priority 1 (Potential throughwall)	8	NO	0
PAL1B	44	91	ROLLED	N/A	Priority 1 (Potential throughwall)	9	NO	0
PAL1B	44	75	ROLLED	N/A	Priority 1 (Potential throughwall)	10	NO	0
PAL1B	45	90	ROLLED	N/A	Priority 1 (Potential throughwall)	11	NO	0
PAL1B	45	74	ROLLED	N/A	Priority 1 (Potential throughwall)	12	NO	0
PAL1B	46	73	ROLLED	N/A	Priority 1 (Potential throughwall)	13	NO	0
PAL1B	46	75	ROLLED	N/A	Priority 1 (Potential throughwall)	14	NO	0
PAL1B	46	79	ROLLED	N/A	Priority 1 (Potential throughwall)	15	NO	0
PAL1B	46	81	ROLLED	N/A	Priority 1 (Potential throughwall)	16	NO	0
PAL1B	46	83	ROLLED	N/A	Priority 1 (Potential throughwall)	17	NO	0
PAL1B	46	85	ROLLED	N/A	Priority 1 (Potential throughwall)	18	NO	0
PAL1B	46	91	ROLLED	N/A	Priority 1 (Potential throughwall)	19	NO	0
PAL1B	47	78	ROLLED	N/A	Priority 1 (Potential throughwall)	20	NO	0
PAL1B	47	82	ROLLED	N/A	Priority 1 (Potential throughwall)	21	NO	0
PAL1B	47	84	ROLLED	N/A	Priority 1 (Potential throughwall)	22	NO	0
PAL1B	47	86	ROLLED	N/A	Priority 1 (Potential throughwall)	23	NO	0
PAL1B	48	79	ROLLED	N/A	Priority 1 (Potential throughwall)	24	NO	0
PAL1B	48	83	ROLLED	N/A	Priority 1 (Potential throughwall)	25	NO	0
PAL1B	30	99	ROLLED	N/A	Priority 2	26	NO	0
PAL1B	35	96	ROLLED	N/A	Priority 2	27	NO	0
PAL1B	37	96	ROLLED	N/A	Priority 2	28	NO	0
PAL1B	40	95	ROLLED	N/A	Priority 2	29	NO	0
PAL1B	41	72	ROLLED	N/A	Priority 2	30	NO	0
PAL1B	42	73	ROLLED	N/A	Priority 2	31	NO	0
PAL1B	42	93	ROLLED	N/A	Priority 2	32	NO	0

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Palisades Unit 1 - 1D28 - S/G 1B

REPLUG LIST - Hot Leg Only (Rev. 1)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1B	43	72	ROLLED	N/A	Priority 2	33	NO	0
PAL1B	44	93	ROLLED	N/A	Priority 2	34	NO	0
PAL1B	45	76	ROLLED	N/A	Priority 2	35	NO	0
PAL1B	45	92	ROLLED	N/A	Priority 2	36	NO	0
PAL1B	46	77	ROLLED	N/A	Priority 2	37	NO	0
PAL1B	46	87	ROLLED	N/A	Priority 2	38	NO	0
PAL1B	46	89	ROLLED	N/A	Priority 2	39	NO	0
PAL1B	47	80	ROLLED	N/A	Priority 2	40	NO	0
PAL1B	47	88	ROLLED	N/A	Priority 2	41	NO	0
PAL1B	48	75	ROLLED	N/A	Priority 2	42	NO	0
PAL1B	48	77	ROLLED	N/A	Priority 2	43	NO	0
PAL1B	48	81	ROLLED	N/A	Priority 2	44	NO	0
PAL1B	48	85	ROLLED	N/A	Priority 2	45	NO	0
PAL1B	48	89	ROLLED	N/A	Priority 2	46	NO	0
PAL1B	49	84	ROLLED	N/A	Priority 2	47	NO	0
PAL1B	49	86	ROLLED	N/A	Priority 2	48	NO	0
PAL1B	49	88	ROLLED	N/A	Priority 2	49	NO	0
PAL1B	72	93	ROLLED	N/A	Priority 2	50	NO	0
PAL1B	74	87	ROLLED	N/A	Priority 2	51	NO	0
PAL1B	80	25	ROLLED	N/A	Priority 2	52	NO	0
					Totals:	52	0	

Notes (Rev. 1):

1. The purpose of this Rev 1 list is to provide clarification on the tubes from being originally plugged pre-service or from in-service inspections (see Note 4). No tubes on this list are affected by this revision as reflected by the 0 in the "Rev" column.

2. There are no tubes on this list that require stabilization.

3. All tubes shall be re-plugged using part number 1208497-003N (750 Stabilizer Rolled Plug Assembly).

4. Tubes R74-C87, R72-C93, and R80-C25 are are from tubes originally plugged during in-service inspections, with all other tubes on the above list originally plugged pre-service. These tubes were all de-plugged on the hot leg only and are identified for re-plugging during 1D28.

5. The tubes on the above list have had bobbin and +Point ECT acquired and analyzed on the hot leg from the tube end hot through the "square bend" (defined as starting at +1.75" above the center of the uppermost hot leg eggcrate support for that tube) to the start of the cold leg where applicable. The criteria for re-plugging the hot leg of these tubes, based on review of the ECT data, is as follows:
   a. Volumetric indications ≥40%TW or crack-like indications located in the "square-bend" region
   b. Volumetric indications ≥40%TW or crack-like indications located at the top-of-tubesheet
   c. Volumetric indications ≥40%TW or crack-like indications located in the freespan outside of any hot leg eggcrate support
   d. Volumetric indications ≥40%TW or crack-like indications located at the 05H eggcrate support in Rows 1-17 tubes
   e. Obstructions (i.e., OBS indications) in the "square bend" region which limited the ability to acquire ECT data

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Palisades Unit 1 - 1D28 - S/G 1B

REPLUG LIST - Hot Leg Only (Rev. 1)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.

6. The tubes on the above list have been identified as Priority 1 and Priority 2 tubes for re-plugging. Priority 1 tubes are more likely to have through-wall defects that would allow primary-to-secondary side leakage.

7. The tubes on the above list do not include any de-plugged tubes with obstructions (i.e., OBS indications) identified at the tube end.

8. Due to the de-plugging process the ECT data at the tube ends does not allow to clearly identify any skip rolls, over expansions, dents, bulges and additional indications. Due to there having been an original plug installed, no such anomalies or indications are expected that would prohibit installation of the plugs or stabilizers.

9. The indications in the tubes on the above list were not in-service during plant operation of Cycle 28 and are not required to be screened against the in situ screening criteria. Therefore, none of the indications in the above require in situ testing.

Approvals:

Craig Kelley 8/6/25 11:48AM

Framatome Integrity Engineering

William C. Waters 8/6/25 1357

Framatome Data Management

Kendall L. Johnson 1:35 PM 8/6/2025

Framatome Lead Analyst

Bobby Griffin 1:38 pm 8/6/2025

Utility Representative

8/8/2025 Ambar Rodriguez

Richard DenPowell 8/8/25

A.15 SGB Replug Hot-Cold Rev0

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Palisades Unit 1 - 1D28 - S/G 1B

REPLUG LIST - Hot Leg and Cold Leg (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Tube Qty.	Stab	Rev.
PAL1B	22	113	ROLLED	ROLLED	SAI @ 05C	1	NO	0
PAL1B	29	108	ROLLED	ROLLED	SAI @ 02C	2	NO	0
PAL1B	80	41	ROLLED	ROLLED	SAI @ 07C	3	NO	0
PAL1B	80	111	ROLLED	ROLLED	SAI @ 07C	4	NO	0
					Totals:	4	0	

Notes (Rev. 0):

1. There are no tubes on this list that require stabilization.

2. All tubes shall be re-plugged using part number 1208497-003N (750 Stabilizer Rolled Plug Assembly).

3. The tubes on the above list identified for re-plugging are from tubes originally plugged pre-service or from in-service inspections and de-plugged during 1D28.

4. The tubes on the above list have had bobbin and +Point ECT acquired on both the hot leg and cold leg including the straight section from the tube end to the uppermost support in each tube, and the "square bend" region (defined as starting at +1.75" above the center of the uppermost eggcrate support in each tube) with inspections performed as specified in the Degradation Assessment (51-9378492-000) where applicable. The criteria for re-plugging these tubes, based on review of the ECT data, is as follows:
   a. Volumetric indications ≥40%TW or crack-like indications located in the "square-bend" region
   b. Volumetric indications ≥40%TW or crack-like indications located at the top-of-tubesheet
   c. Volumetric indications ≥40%TW or crack-like indications located in the freespan outside of any hot leg eggcrate support
   d. Volumetric indications ≥40%TW or crack-like indications located at the 05H eggcrate support in Rows 1-17 tubes
   e. Volumetric indications ≥40%TW or crack-like indications located at any location along the cold leg
   f. Obstructions (i.e., OBS indications) at locations above the tubesheet that limited the ability to acquire ECT data

5. Due to the de-plugging process the ECT data at the tube ends does not allow to clearly identify any skip rolls, over expansions, dents, bulges and additional indications. Due to there having been an original plug installed, no such anomalies or indications are expected that would prohibit installation of the plugs or stabilizers.

6. The tubes on the above list were not in-service during plant operation of Cycle 28 and are not required to be screened against the in situ screening criteria. Therefore, none of the tubes in the above require in situ testing.

Approvals:

Craig Kelley 8/5/25 5:00PM

Framatome Integrity Engineering

William C. Wolters 8/6/2025 0400

Framatome Data Management

Kendall L. Johnson 5:30pm 8/5/2025

Framatome Lead Analyst

Bobby Griffin 5:30pm

Bobby Nash 8/5/2025

Utility Representative

8/6/2025

Amber Rodriguez

Edward Dan Burkel 8/6/25

8/5/2025 5:00 PM

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A.16 SGA 01H Sleeve Lists

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Palisades Unit 1 - 1D28 - S/G 1A

MECHANICAL SLEEVE LIST - SLEEVE PROCESS VALIDATION (Rev. 6)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Stab	Rev.
PAL1A	24	39	SLV @ 01H	N/A	Sleeve Verification	1	NO	6
					Totals:	1	0	

Notes (Rev. 6):

1. This list is only for tubes with sleeves intalled for process verification and positional verification only at the 1st support (01H). The sleeves on this list will be installed:
   a) **After** all sleeve installations at the 2nd support (02H) have been completed.
   b) **Prior** to any sleeves installed at the 1st support (01H) in tubes that are to be returned-to-service with sleeves.
2. All tubes shall be sleeved using the Alloy 690 Sleeve P/N 8164714-002 (14.5" nominal length).
3. The indications in the tubes on the above list have been screened against the in situ screening criteria. None of the indications in the above list require in situ testing.
4. The tubes on the above list have been reviewed for skip rolls, over expansions, dents, bulges and additional indications. No such anomalies or indications were detected that would prohibit installation of a sleeve.
5. Sleeves on the above list are installed for process verification and positional verification only and are not being used to return the tube to service. All tubes on the list shall be plugged after all post-installation activities are complete
6. Post-sleeving ECT Bobbin will be performed on the tubes on the above list for positional verification.
7. Data Management has confirmed that these tubes are included in repair scopes and planned for plugging prior to the unit returning to service.

Approvals:

Craig Kelley 7/12/2025 6:07PM

Framatome Integrity Engineering

William C. Wolters 07/14/2025 09:01

Framatome Data Management

Kendall L. [illegible] 7/16 AM. 7/14/2025

Framatome Lead Analyst

Bobby Griffin 07:30

Bobby M. [illegible] 7/14/2025

Utility Representative

7/14/25

Ambar Rodriguez

7/14/25

Don Powell

7/12/2025 6:07 PM

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Palisades Unit 1 - 1D28 - S/G 1A

RTS WITH MECHANICAL SLEEVE LIST - 01H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	3	52	SLV @ 01H	N/A	CSV @ 01H	1	-1.01	-0.25	0
PAL1A	6	107	SLV @ 01H	N/A	CSV @ 01H	2	-0.99	0.94	0
PAL1A	8	111	SLV @ 01H	N/A	CSV @ 01H	3	0.64	1.04	0
PAL1A	9	52	SLV @ 01H	N/A	CSV @ 01H	4	-0.96	0.96	0
PAL1A	15	114	SLV @ 01H	N/A	CSV @ 01H	5	0.79	0.96	0
PAL1A	16	43	SLV @ 01H	N/A	CSV @ 01H	6	-0.49	1.04	0
PAL1A	16	127	SLV @ 01H	N/A	CSV @ 01H	7	0.49	0.84	0
PAL1A	17	62	SLV @ 01H	N/A	CSV @ 01H	8	-0.92	0	0
PAL1A	19	118	SLV @ 01H	N/A	CSV @ 01H	9	-1.01	0.96	0
PAL1A	21	108	SLV @ 01H	N/A	CSV @ 01H	10	0.07	1.01	0
PAL1A	29	108	SLV @ 01H	N/A	CSV @ 01H	11	0.02	1.11	0
PAL1A	31	112	SLV @ 01H	N/A	CSV @ 01H	12	-0.94	-0.84	0
PAL1A	60	71	SLV @ 01H	N/A	CSV @ 01H	13	-1.06	0.99	0
PAL1A	80	83	SLV @ 01H	N/A	CSV @ 01H	14	0.37	1.06	0
PAL1A	92	83	SLV @ 01H	N/A	CSV @ 01H	15	-1.01	1.01	0
PAL1A	93	92	SLV @ 01H	N/A	CSV @ 01H	16	-0.99	0.94	0
PAL1A	100	93	SLV @ 01H	N/A	CSV @ 01H	17	0.05	0.94	0
PAL1A	121	88	SLV @ 01H	N/A	CSV @ 01H	18	-0.89	0.79	0
PAL1A	133	94	SLV @ 01H	N/A	CSV @ 01H	19	-0.99	-0.15	0
					Totals:	19			

Notes (Rev. 0):

1. This "returning-to-service (RTS) with sleeves" list is only for sleeves to be installed at the 1st hot leg support (01H) and will be installed **after** all tubes on the above list have had a sleeve installed at 02H

2. All tubes shall be sleeved using the Alloy 690 Sleeve P/N 8164714-002 (14.5" nominal length).

3. All tubes on the above list had a successful Sleeve GoGage result at the support location per 03-8169881-000; therefore, there are no clearance issues that would prevent the installation of a sleeve.

4. All tubes on the above list are identified for "RTS with sleeves" and are from tubes originally plugged from in-service inspections per 51-9388329-001 (Appendix B, Table B-1) and de-plugged on both legs during 1D28. The tubes on the above list have had bobbin and +Point ECT acquired and analyzed on both the hot leg and cold leg including the straight section from the tube end to the uppermost support in each tube, and the "square bend" region (defined as starting at +1.75" above the center of the uppermost eggcrate support in each tube) with inspections performed as specified in the Degradation Assessment (51-9378492-000) where applicable.

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Palisades Unit 1 - 1D28 - S/G 1A

RTS WITH MECHANICAL SLEEVE LIST - 01H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.

5. The sleeving strategy implemented at 1D28 uses "corrective" sleeves (CSV) and "preventative" sleeves (PSV) per 51-9388851-001 based on whether a repairable flaw (i.e., volumetric indications ≥40%TW or crack-like indications) is identified with ECT at the support location. As 01H is the lowest elevation support there is no reason to install a "preventative" sleeve (i.e., a "corrective" sleeve can always be installed at a future inspection as needed); therefore, all installed sleeves at 01H will be "corrective". The criteria for a "corrective" sleeve based on review of the ECT data is as follows:

a) The repairable flaw must be located within the center 3" of the sleeve assuming 0.75" uncertainty on either end of the sleeve for the 14.5" sleeve; therefore, the flaw extents must be within +/- 1.5" of the center of the support.

b) The repairable flaw must be located at hot leg eggcrate support 01H/02H/03H/04H for tubes in Rows 1-17 or 01H/02H/03H/04H/05H for tubes in Rows 18-138.

6. For the tubes on the above list with corrective sleeves (CSV), the minimum and maximum extent of all flaws at the support are listed as measured from the center of the support from the profile sizing data.

7. The tubes on the above list can be "RTS with sleeves". The criteria for "RTS with sleeves" based on review of the ECT data, is as follows:

a. No volumetric indications ≥40%TW or crack-like indications located in the "square-bend" region
b. No volumetric indications ≥40%TW or crack-like indications located at the top-of-tubesheet
c. No volumetric indications ≥40%TW or crack-like indications located in the freespan outside of any hot leg eggcrate support
d. No volumetric indications ≥40%TW or crack-like indications located at the 05H eggcrate support in Rows 1-17 tubes
e. No volumetric indications ≥40%TW or crack-like indications located at any location along the cold leg

8. The indications in the tubes on the above list were not in-service during plant operation of Cycle 28 and are not required to be screened against the in situ screening criteria. Therefore, none of the indications in the above require in situ testing.

9. Post-sleeving ECT Bobbin will be performed on the tubes on the above list for positional verification. Post-sleeving ECT +Point will be performed on the tubes on the above list over the length of the sleeve to obtain a baseline of the ECT data.

Approvals:

Craig Kelley 7/11/25, 4:55PM
Framatome Integrity Engineering

William C. Wolters 07/11/2025 17:53
Framatome Data Management

Kendall Johnson 5:03 PM 7/11/2025
Framatome Lead Analyst

Bobby Griffith 5:20PM 7/11/2025
Utility Representative

7/14/25 Ambar C. Rodriguez

7/14/25 Don Powell

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 01H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	4	55	SLV @ 01H	N/A	CSV @ 01H	1	0.16	1.04	0
PAL1A	4	113	SLV @ 01H	N/A	CSV @ 01H	2	0.67	0.91	0
PAL1A	4	117	SLV @ 01H	N/A	CSV @ 01H	3	0.21	0.91	0
PAL1A	7	56	SLV @ 01H	N/A	CSV @ 01H	4	-0.96	-0.24	0
PAL1A	7	58	SLV @ 01H	N/A	CSV @ 01H	5	-0.96	1.04	0
PAL1A	7	118	SLV @ 01H	N/A	CSV @ 01H	6	-0.59	0.91	0
PAL1A	7	122	SLV @ 01H	N/A	CSV @ 01H	7	0.43	0.88	0
PAL1A	8	109	SLV @ 01H	N/A	CSV @ 01H	8	0.48	0.96	0
PAL1A	8	117	SLV @ 01H	N/A	CSV @ 01H	9	-0.83	0.91	0
PAL1A	10	53	SLV @ 01H	N/A	CSV @ 01H	10	-0.93	0.96	0
PAL1A	10	117	SLV @ 01H	N/A	CSV @ 01H	11	0.45	1.07	0
PAL1A	10	125	SLV @ 01H	N/A	CSV @ 01H	12	0.56	1.01	0
PAL1A	10	153	SLV @ 01H	N/A	CSV @ 01H	13	-0.80	0.61	0
PAL1A	11	40	SLV @ 01H	N/A	CSV @ 01H	14	-0.35	-0.08	0
PAL1A	11	50	SLV @ 01H	N/A	CSV @ 01H	15	0.64	0.96	0
PAL1A	11	116	SLV @ 01H	N/A	CSV @ 01H	16	0.72	1.01	0
PAL1A	11	120	SLV @ 01H	N/A	CSV @ 01H	17	-0.59	0.96	0
PAL1A	11	134	SLV @ 01H	N/A	CSV @ 01H	18	0.72	1.04	0
PAL1A	12	113	SLV @ 01H	N/A	CSV @ 01H	19	0.32	0.88	0
PAL1A	12	155	SLV @ 01H	N/A	CSV @ 01H	20	-0.96	-0.11	0
PAL1A	13	58	SLV @ 01H	N/A	CSV @ 01H	21	-0.99	-0.75	0
PAL1A	14	117	SLV @ 01H	N/A	CSV @ 01H	22	-0.05	0.99	0
PAL1A	15	48	SLV @ 01H	N/A	CSV @ 01H	23	-0.99	-0.03	0
PAL1A	15	110	SLV @ 01H	N/A	CSV @ 01H	24	-0.27	-0.08	0
PAL1A	15	112	SLV @ 01H	N/A	CSV @ 01H	25	0.43	0.96	0
PAL1A	15	116	SLV @ 01H	N/A	CSV @ 01H	26	-0.48	-0.13	0
PAL1A	15	124	SLV @ 01H	N/A	CSV @ 01H	27	0.05	1.01	0
PAL1A	16	109	SLV @ 01H	N/A	CSV @ 01H	28	-0.51	0.83	0

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 01H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	16	113	SLV @ 01H	N/A	CSV @ 01H	29	0.53	0.88	0
PAL1A	16	115	SLV @ 01H	N/A	CSV @ 01H	30	-0.51	-0.08	0
PAL1A	17	44	SLV @ 01H	N/A	CSV @ 01H	31	0.32	0.91	0
PAL1A	17	110	SLV @ 01H	N/A	CSV @ 01H	32	0.64	0.83	0
PAL1A	17	112	SLV @ 01H	N/A	CSV @ 01H	33	-0.85	-0.05	0
PAL1A	17	114	SLV @ 01H	N/A	CSV @ 01H	34	0.45	0.61	0
PAL1A	17	120	SLV @ 01H	N/A	CSV @ 01H	35	0.56	0.72	0
PAL1A	17	126	SLV @ 01H	N/A	CSV @ 01H	36	0.56	0.99	0
PAL1A	18	37	SLV @ 01H	N/A	CSV @ 01H	37	-0.88	0.51	0
PAL1A	18	117	SLV @ 01H	N/A	CSV @ 01H	38	0.56	0.85	0
PAL1A	18	123	SLV @ 01H	N/A	CSV @ 01H	39	0.64	0.77	0
PAL1A	19	44	SLV @ 01H	N/A	CSV @ 01H	40	-0.67	-0.05	0
PAL1A	19	46	SLV @ 01H	N/A	CSV @ 01H	41	-0.56	0.67	0
PAL1A	19	112	SLV @ 01H	N/A	CSV @ 01H	42	0.16	1.01	0
PAL1A	19	114	SLV @ 01H	N/A	CSV @ 01H	43	-1.01	1.01	0
PAL1A	19	126	SLV @ 01H	N/A	CSV @ 01H	44	-0.72	-0.43	0
PAL1A	21	102	SLV @ 01H	N/A	CSV @ 01H	45	0.13	0.69	0
PAL1A	21	118	SLV @ 01H	N/A	CSV @ 01H	46	0.35	1.04	0
PAL1A	22	107	SLV @ 01H	N/A	CSV @ 01H	47	0.37	1.07	0
PAL1A	23	50	SLV @ 01H	N/A	CSV @ 01H	48	-0.08	1.01	0
PAL1A	23	116	SLV @ 01H	N/A	CSV @ 01H	49	0.51	1.01	0
PAL1A	23	122	SLV @ 01H	N/A	CSV @ 01H	50	-0.61	-0.05	0
PAL1A	24	47	SLV @ 01H	N/A	CSV @ 01H	51	0.29	0.83	0
PAL1A	24	133	SLV @ 01H	N/A	CSV @ 01H	52	0.37	0.99	0
PAL1A	25	140	SLV @ 01H	N/A	CSV @ 01H	53	0.32	1.01	0
PAL1A	26	117	SLV @ 01H	N/A	CSV @ 01H	54	0.21	1.04	0
PAL1A	26	139	SLV @ 01H	N/A	CSV @ 01H	55	0.32	0.99	0
PAL1A	27	46	SLV @ 01H	N/A	CSV @ 01H	56	-0.99	-0.67	0

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 01H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	28	55	SLV @ 01H	N/A	CSV @ 01H	57	-0.61	0.88	0
PAL1A	28	63	SLV @ 01H	N/A	CSV @ 01H	58	-0.77	-0.56	0
PAL1A	28	105	SLV @ 01H	N/A	CSV @ 01H	59	0.75	1.01	0
PAL1A	29	28	SLV @ 01H	N/A	CSV @ 01H	60	0.35	0.91	0
PAL1A	29	52	SLV @ 01H	N/A	CSV @ 01H	61	0.56	0.85	0
PAL1A	29	104	SLV @ 01H	N/A	CSV @ 01H	62	0.11	0.99	0
PAL1A	32	103	SLV @ 01H	N/A	CSV @ 01H	63	-0.99	-0.67	0
PAL1A	32	107	SLV @ 01H	N/A	CSV @ 01H	64	-0.91	0.11	0
PAL1A	32	113	SLV @ 01H	N/A	CSV @ 01H	65	0.16	0.88	0
PAL1A	33	26	SLV @ 01H	N/A	CSV @ 01H	66	0.48	1.01	0
PAL1A	33	56	SLV @ 01H	N/A	CSV @ 01H	67	-1.04	1.04	0
PAL1A	33	108	SLV @ 01H	N/A	CSV @ 01H	68	-0.77	-0.11	0
PAL1A	33	110	SLV @ 01H	N/A	CSV @ 01H	69	0.48	0.96	0
PAL1A	33	112	SLV @ 01H	N/A	CSV @ 01H	70	0.03	0.93	0
PAL1A	34	59	SLV @ 01H	N/A	CSV @ 01H	71	-0.93	-0.48	0
PAL1A	36	59	SLV @ 01H	N/A	CSV @ 01H	72	-0.40	0.27	0
PAL1A	38	57	SLV @ 01H	N/A	CSV @ 01H	73	-1.01	-0.69	0
PAL1A	38	109	SLV @ 01H	N/A	CSV @ 01H	74	-0.32	0.08	0
PAL1A	39	60	SLV @ 01H	N/A	CSV @ 01H	75	-0.24	0.45	0
PAL1A	39	110	SLV @ 01H	N/A	CSV @ 01H	76	0.67	0.93	0
PAL1A	39	120	SLV @ 01H	N/A	CSV @ 01H	77	-0.29	-0.11	0
PAL1A	39	122	SLV @ 01H	N/A	CSV @ 01H	78	0.08	0.27	0
PAL1A	40	129	SLV @ 01H	N/A	CSV @ 01H	79	0.56	0.99	0
PAL1A	44	59	SLV @ 01H	N/A	CSV @ 01H	80	-0.93	-0.64	0
PAL1A	45	58	SLV @ 01H	N/A	CSV @ 01H	81	-0.85	-0.75	0
PAL1A	46	35	SLV @ 01H	N/A	CSV @ 01H	82	0.11	0.96	0
PAL1A	46	59	SLV @ 01H	N/A	CSV @ 01H	83	-0.56	1.01	0
PAL1A	46	67	SLV @ 01H	N/A	CSV @ 01H	84	0.64	0.99	0

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 01H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	46	145	SLV @ 01H	N/A	CSV @ 01H	85	-0.83	-0.03	0
PAL1A	47	48	SLV @ 01H	N/A	CSV @ 01H	86	0.16	0.88	0
PAL1A	47	62	SLV @ 01H	N/A	CSV @ 01H	87	-0.99	-0.24	0
PAL1A	48	45	SLV @ 01H	N/A	CSV @ 01H	88	0.13	0.85	0
PAL1A	48	69	SLV @ 01H	N/A	CSV @ 01H	89	0.72	0.99	0
PAL1A	48	113	SLV @ 01H	N/A	CSV @ 01H	90	0.51	0.99	0
PAL1A	49	100	SLV @ 01H	N/A	CSV @ 01H	91	0.13	0.67	0
PAL1A	49	108	SLV @ 01H	N/A	CSV @ 01H	92	0.43	0.77	0
PAL1A	50	99	SLV @ 01H	N/A	CSV @ 01H	93	0.05	0.85	0
PAL1A	50	101	SLV @ 01H	N/A	CSV @ 01H	94	0.85	0.99	0
PAL1A	57	52	SLV @ 01H	N/A	CSV @ 01H	95	0.13	0.96	0
PAL1A	57	68	SLV @ 01H	N/A	CSV @ 01H	96	0.11	1.01	0
PAL1A	58	69	SLV @ 01H	N/A	CSV @ 01H	97	0.37	0.96	0
PAL1A	58	101	SLV @ 01H	N/A	CSV @ 01H	98	-0.96	-0.67	0
PAL1A	60	97	SLV @ 01H	N/A	CSV @ 01H	99	-0.93	-0.03	0
PAL1A	61	118	SLV @ 01H	N/A	CSV @ 01H	100	-0.64	-0.53	0
PAL1A	63	38	SLV @ 01H	N/A	CSV @ 01H	101	-0.75	-0.08	0
PAL1A	63	48	SLV @ 01H	N/A	CSV @ 01H	102	-0.85	1.01	0
PAL1A	64	95	SLV @ 01H	N/A	CSV @ 01H	103	-1.01	-0.35	0
PAL1A	66	77	SLV @ 01H	N/A	CSV @ 01H	104	0.56	0.96	0
PAL1A	66	95	SLV @ 01H	N/A	CSV @ 01H	105	0.75	0.96	0
PAL1A	67	88	SLV @ 01H	N/A	CSV @ 01H	106	-0.93	-0.61	0
PAL1A	67	96	SLV @ 01H	N/A	CSV @ 01H	107	-0.35	0.69	0
PAL1A	68	83	SLV @ 01H	N/A	CSV @ 01H	108	-0.67	0.96	0
PAL1A	68	95	SLV @ 01H	N/A	CSV @ 01H	109	-0.85	-0.51	0
PAL1A	69	78	SLV @ 01H	N/A	CSV @ 01H	110	-0.99	-0.51	0
PAL1A	69	88	SLV @ 01H	N/A	CSV @ 01H	111	0.59	0.69	0
PAL1A	69	90	SLV @ 01H	N/A	CSV @ 01H	112	-0.93	0.13	0

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 01H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	69	94	SLV @ 01H	N/A	CSV @ 01H	113	0.75	0.99	0
PAL1A	70	23	SLV @ 01H	N/A	CSV @ 01H	114	-0.85	0.61	0
PAL1A	70	87	SLV @ 01H	N/A	CSV @ 01H	115	0.19	0.93	0
PAL1A	70	93	SLV @ 01H	N/A	CSV @ 01H	116	-0.88	0.96	0
PAL1A	70	111	SLV @ 01H	N/A	CSV @ 01H	117	-0.21	0.32	0
PAL1A	70	153	SLV @ 01H	N/A	CSV @ 01H	118	0.85	0.99	0
PAL1A	71	102	SLV @ 01H	N/A	CSV @ 01H	119	0.19	0.91	0
PAL1A	71	110	SLV @ 01H	N/A	CSV @ 01H	120	0.13	0.27	0
PAL1A	72	57	SLV @ 01H	N/A	CSV @ 01H	121	-0.96	-0.75	0
PAL1A	72	83	SLV @ 01H	N/A	CSV @ 01H	122	-0.96	-0.40	0
PAL1A	72	89	SLV @ 01H	N/A	CSV @ 01H	123	0.27	0.88	0
PAL1A	72	91	SLV @ 01H	N/A	CSV @ 01H	124	0.64	0.96	0
PAL1A	73	72	SLV @ 01H	N/A	CSV @ 01H	125	0.43	0.99	0
PAL1A	73	78	SLV @ 01H	N/A	CSV @ 01H	126	-0.85	-0.43	0
PAL1A	73	80	SLV @ 01H	N/A	CSV @ 01H	127	-1.07	-0.32	0
PAL1A	73	86	SLV @ 01H	N/A	CSV @ 01H	128	-0.35	1.04	0
PAL1A	74	85	SLV @ 01H	N/A	CSV @ 01H	129	0.83	0.93	0
PAL1A	74	95	SLV @ 01H	N/A	CSV @ 01H	130	0.40	1.01	0
PAL1A	74	101	SLV @ 01H	N/A	CSV @ 01H	131	0.05	0.88	0
PAL1A	74	105	SLV @ 01H	N/A	CSV @ 01H	132	0.83	0.99	0
PAL1A	75	94	SLV @ 01H	N/A	CSV @ 01H	133	0.32	1.04	0
PAL1A	78	41	SLV @ 01H	N/A	CSV @ 01H	134	-1.01	-0.19	0
PAL1A	78	73	SLV @ 01H	N/A	CSV @ 01H	135	-0.93	0.11	0
PAL1A	78	87	SLV @ 01H	N/A	CSV @ 01H	136	0.77	0.88	0
PAL1A	78	103	SLV @ 01H	N/A	CSV @ 01H	137	0.77	0.91	0
PAL1A	78	113	SLV @ 01H	N/A	CSV @ 01H	138	-0.93	-0.51	0
PAL1A	80	79	SLV @ 01H	N/A	CSV @ 01H	139	0.45	0.91	0
PAL1A	80	99	SLV @ 01H	N/A	CSV @ 01H	140	-0.59	0.80	0

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 01H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	80	113	SLV @ 01H	N/A	CSV @ 01H	141	0.45	0.59	0
PAL1A	81	80	SLV @ 01H	N/A	CSV @ 01H	142	0.08	0.83	0
PAL1A	82	101	SLV @ 01H	N/A	CSV @ 01H	143	-0.19	0.93	0
PAL1A	82	109	SLV @ 01H	N/A	CSV @ 01H	144	-0.96	-0.85	0
PAL1A	83	98	SLV @ 01H	N/A	CSV @ 01H	145	0.45	0.96	0
PAL1A	83	102	SLV @ 01H	N/A	CSV @ 01H	146	0.11	0.93	0
PAL1A	84	59	SLV @ 01H	N/A	CSV @ 01H	147	0.35	1.04	0
PAL1A	85	110	SLV @ 01H	N/A	CSV @ 01H	148	-0.61	-0.43	0
PAL1A	86	93	SLV @ 01H	N/A	CSV @ 01H	149	-0.83	-0.24	0
PAL1A	88	47	SLV @ 01H	N/A	CSV @ 01H	150	-0.91	-0.59	0
PAL1A	88	83	SLV @ 01H	N/A	CSV @ 01H	151	0.53	0.96	0
PAL1A	88	93	SLV @ 01H	N/A	CSV @ 01H	152	0.21	0.96	0
PAL1A	88	97	SLV @ 01H	N/A	CSV @ 01H	153	0.08	0.96	0
PAL1A	88	99	SLV @ 01H	N/A	CSV @ 01H	154	-0.99	-0.75	0
PAL1A	88	105	SLV @ 01H	N/A	CSV @ 01H	155	-0.99	0.43	0
PAL1A	88	107	SLV @ 01H	N/A	CSV @ 01H	156	-1.01	-0.21	0
PAL1A	88	115	SLV @ 01H	N/A	CSV @ 01H	157	-0.85	-0.56	0
PAL1A	89	96	SLV @ 01H	N/A	CSV @ 01H	158	-0.77	0.91	0
PAL1A	89	98	SLV @ 01H	N/A	CSV @ 01H	159	-0.80	-0.35	0
PAL1A	90	59	SLV @ 01H	N/A	CSV @ 01H	160	-1.01	0.32	0
PAL1A	90	89	SLV @ 01H	N/A	CSV @ 01H	161	0.51	0.88	0
PAL1A	90	125	SLV @ 01H	N/A	CSV @ 01H	162	-0.99	-0.69	0
PAL1A	91	72	SLV @ 01H	N/A	CSV @ 01H	163	0.64	0.91	0
PAL1A	91	84	SLV @ 01H	N/A	CSV @ 01H	164	-0.56	-0.11	0
PAL1A	91	88	SLV @ 01H	N/A	CSV @ 01H	165	0.88	1.01	0
PAL1A	91	94	SLV @ 01H	N/A	CSV @ 01H	166	0.08	0.96	0
PAL1A	91	96	SLV @ 01H	N/A	CSV @ 01H	167	0.13	1.01	0
PAL1A	91	98	SLV @ 01H	N/A	CSV @ 01H	168	-0.43	0.99	0

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 01H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	91	100	SLV @ 01H	N/A	CSV @ 01H	169	-0.48	0.03	0
PAL1A	92	25	SLV @ 01H	N/A	CSV @ 01H	170	0.85	0.99	0
PAL1A	92	45	SLV @ 01H	N/A	CSV @ 01H	171	0.27	0.61	0
PAL1A	92	97	SLV @ 01H	N/A	CSV @ 01H	172	0.27	0.93	0
PAL1A	92	101	SLV @ 01H	N/A	CSV @ 01H	173	0.08	0.64	0
PAL1A	92	107	SLV @ 01H	N/A	CSV @ 01H	174	-0.91	-0.56	0
PAL1A	92	109	SLV @ 01H	N/A	CSV @ 01H	175	0.21	0.43	0
PAL1A	92	113	SLV @ 01H	N/A	CSV @ 01H	176	-0.29	0.88	0
PAL1A	93	26	SLV @ 01H	N/A	CSV @ 01H	177	0.37	1.01	0
PAL1A	93	74	SLV @ 01H	N/A	CSV @ 01H	178	-0.99	-0.56	0
PAL1A	93	90	SLV @ 01H	N/A	CSV @ 01H	179	-0.67	0.35	0
PAL1A	93	100	SLV @ 01H	N/A	CSV @ 01H	180	0.16	0.56	0
PAL1A	94	77	SLV @ 01H	N/A	CSV @ 01H	181	-1.01	-0.83	0
PAL1A	94	99	SLV @ 01H	N/A	CSV @ 01H	182	0.16	0.37	0
PAL1A	95	90	SLV @ 01H	N/A	CSV @ 01H	183	-0.61	-0.43	0
PAL1A	95	94	SLV @ 01H	N/A	CSV @ 01H	184	-0.83	1.07	0
PAL1A	95	96	SLV @ 01H	N/A	CSV @ 01H	185	-0.93	0.51	0
PAL1A	96	99	SLV @ 01H	N/A	CSV @ 01H	186	-0.96	-0.64	0
PAL1A	96	103	SLV @ 01H	N/A	CSV @ 01H	187	-0.85	-0.35	0
PAL1A	98	53	SLV @ 01H	N/A	CSV @ 01H	188	-0.93	-0.69	0
PAL1A	99	112	SLV @ 01H	N/A	CSV @ 01H	189	-0.75	-0.59	0
PAL1A	100	97	SLV @ 01H	N/A	CSV @ 01H	190	0.53	0.80	0
PAL1A	100	107	SLV @ 01H	N/A	CSV @ 01H	191	-0.88	-0.75	0
PAL1A	100	111	SLV @ 01H	N/A	CSV @ 01H	192	-1.01	-0.29	0
PAL1A	100	119	SLV @ 01H	N/A	CSV @ 01H	193	-0.91	-0.61	0
PAL1A	101	94	SLV @ 01H	N/A	CSV @ 01H	194	0.61	0.91	0
PAL1A	101	104	SLV @ 01H	N/A	CSV @ 01H	195	0.51	1.04	0
PAL1A	101	118	SLV @ 01H	N/A	CSV @ 01H	196	-0.88	-0.59	0

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 01H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	102	99	SLV @ 01H	N/A	CSV @ 01H	197	0.59	0.88	0
PAL1A	102	109	SLV @ 01H	N/A	CSV @ 01H	198	-0.96	-0.45	0
PAL1A	103	76	SLV @ 01H	N/A	CSV @ 01H	199	-0.93	-0.05	0
PAL1A	103	84	SLV @ 01H	N/A	CSV @ 01H	200	-0.91	-0.75	0
PAL1A	103	92	SLV @ 01H	N/A	CSV @ 01H	201	-0.48	1.01	0
PAL1A	103	100	SLV @ 01H	N/A	CSV @ 01H	202	0.67	0.83	0
PAL1A	103	102	SLV @ 01H	N/A	CSV @ 01H	203	-0.24	-0.11	0
PAL1A	103	110	SLV @ 01H	N/A	CSV @ 01H	204	0.59	0.99	0
PAL1A	104	107	SLV @ 01H	N/A	CSV @ 01H	205	-1.01	-0.59	0
PAL1A	105	76	SLV @ 01H	N/A	CSV @ 01H	206	0.69	1.04	0
PAL1A	105	112	SLV @ 01H	N/A	CSV @ 01H	207	-1.01	0.35	0
PAL1A	106	69	SLV @ 01H	N/A	CSV @ 01H	208	0.13	0.69	0
PAL1A	106	107	SLV @ 01H	N/A	CSV @ 01H	209	0.08	0.77	0
PAL1A	107	54	SLV @ 01H	N/A	CSV @ 01H	210	0.16	1.04	0
PAL1A	107	60	SLV @ 01H	N/A	CSV @ 01H	211	-0.83	-0.59	0
PAL1A	107	72	SLV @ 01H	N/A	CSV @ 01H	212	-0.91	-0.69	0
PAL1A	107	108	SLV @ 01H	N/A	CSV @ 01H	213	-0.93	0.19	0
PAL1A	108	71	SLV @ 01H	N/A	CSV @ 01H	214	0.93	1.07	0
PAL1A	109	80	SLV @ 01H	N/A	CSV @ 01H	215	0.08	0.99	0
PAL1A	109	90	SLV @ 01H	N/A	CSV @ 01H	216	-0.21	0.88	0
PAL1A	109	94	SLV @ 01H	N/A	CSV @ 01H	217	0.27	0.99	0
PAL1A	110	61	SLV @ 01H	N/A	CSV @ 01H	218	-1.01	-0.72	0
PAL1A	110	91	SLV @ 01H	N/A	CSV @ 01H	219	-0.96	0.99	0
PAL1A	110	103	SLV @ 01H	N/A	CSV @ 01H	220	-0.19	0.99	0
PAL1A	110	109	SLV @ 01H	N/A	CSV @ 01H	221	-0.93	-0.03	0
PAL1A	110	131	SLV @ 01H	N/A	CSV @ 01H	222	-0.08	0.27	0
PAL1A	111	90	SLV @ 01H	N/A	CSV @ 01H	223	-1.07	-0.11	0
PAL1A	113	82	SLV @ 01H	N/A	CSV @ 01H	224	-0.99	-0.59	0

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 01H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	113	88	SLV @ 01H	N/A	CSV @ 01H	225	-1.04	-0.21	0
PAL1A	113	90	SLV @ 01H	N/A	CSV @ 01H	226	-0.51	0.96	0
PAL1A	113	104	SLV @ 01H	N/A	CSV @ 01H	227	-0.99	-0.19	0
PAL1A	114	69	SLV @ 01H	N/A	CSV @ 01H	228	0.00	0.93	0
PAL1A	114	73	SLV @ 01H	N/A	CSV @ 01H	229	0.56	0.99	0
PAL1A	114	91	SLV @ 01H	N/A	CSV @ 01H	230	0.08	1.15	0
PAL1A	115	88	SLV @ 01H	N/A	CSV @ 01H	231	-0.91	0.16	0
PAL1A	115	104	SLV @ 01H	N/A	CSV @ 01H	232	-0.85	-0.24	0
PAL1A	115	108	SLV @ 01H	N/A	CSV @ 01H	233	-0.56	0.16	0
PAL1A	117	104	SLV @ 01H	N/A	CSV @ 01H	234	0.29	0.88	0
PAL1A	121	90	SLV @ 01H	N/A	CSV @ 01H	235	-1.07	-0.03	0
PAL1A	122	63	SLV @ 01H	N/A	CSV @ 01H	236	0.11	0.51	0
PAL1A	122	89	SLV @ 01H	N/A	CSV @ 01H	237	-0.56	-0.08	0
PAL1A	123	94	SLV @ 01H	N/A	CSV @ 01H	238	0.37	1.09	0
PAL1A	125	98	SLV @ 01H	N/A	CSV @ 01H	239	-0.85	-0.61	0
PAL1A	128	91	SLV @ 01H	N/A	CSV @ 01H	240	-1.01	-0.69	0
PAL1A	128	97	SLV @ 01H	N/A	CSV @ 01H	241	0.59	0.96	0
PAL1A	129	90	SLV @ 01H	N/A	CSV @ 01H	242	0.29	0.77	0
PAL1A	130	65	SLV @ 01H	N/A	CSV @ 01H	243	-0.99	-0.67	0
PAL1A	130	95	SLV @ 01H	N/A	CSV @ 01H	244	-0.37	0.99	0
PAL1A	130	97	SLV @ 01H	N/A	CSV @ 01H	245	-0.61	-0.35	0
PAL1A	134	99	SLV @ 01H	N/A	CSV @ 01H	246	-0.64	0.24	0
PAL1A	136	87	SLV @ 01H	N/A	CSV @ 01H	247	-1.01	-0.53	0
PAL1A	136	89	SLV @ 01H	N/A	CSV @ 01H	248	0.03	0.40	0
PAL1A	137	84	SLV @ 01H	N/A	CSV @ 01H	249	0.03	0.32	0
					Totals:	249			

Notes (Rev. 0):

1. This "In-Service" sleeving list is only for sleeves to be installed at the 1st hot leg support (01H) and will be installed **after** all tubes on the above list have had a sleeve installed at 02H.

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 01H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.

2. All tubes shall be sleeved using the Alloy 690 Sleeve P/N 8164714-002 (14.5" nominal length).

3. All tubes on the above list had a successful Sleeve GoGage result at the support location per 03-8169881-000; therefore, there are no clearance issues that would prevent the installation of a sleeve.

4. All tubes on the above list were in service during plant operation for Cycle 28. Sleeving of de-plugged tubes that are being returned to service is covered under the "RTS" (Return-to-Service) sleeving list. All eddy current testing required by the Degradation Assessment (51-9378492-000) has been completed on these tubes.

5. The sleeving strategy implemented at 1D28 uses "corrective" sleeves (CSV) and "preventative" sleeves (PSV) per 51-9388851-001 based on whether a repairable flaw (i.e., volumetric indications ≥40%TW or crack-like indications) is identified with ECT at the support location. As 01H is the lowest elevation support there is no reason to install a "preventative" sleeve (i.e., a "corrective" sleeve can always be installed at a future inspection as needed); therefore, all installed sleeves at 01H will be "corrective".
The criteria for a "corrective" sleeve based on review of the ECT data is as follows:
a) The repairable flaw must be located within the center 3" of the sleeve assuming 0.75" uncertainty on either end of the sleeve for the 14.5" sleeve; therefore, the flaw extents must be within +/- 1.5" of the center of the support.
b) The repairable flaw must be located at hot leg eggcrate support 01H/02H/03H/04H for tubes in Rows 1-17 or 01H/02H/03H/04H/05H for tubes in Rows 18-138.

6. For the tubes on the above list with corrective sleeves (CSV), the minimum and maximum extent of the flaw(s) at the support are listed as measured from the center of the support from the profile sizing data.

7. The tubes on the above list can remain in service following successful sleeve installation. The criteria for the selection of sleeving candidates based on review of the ECT data, is as follows:
a. No volumetric indications ≥40%TW or crack-like indications located in the "square-bend" region
b. No volumetric indications ≥40%TW or crack-like indications located at the top-of-tubesheet
c. No volumetric indications ≥40%TW or crack-like indications located in the freespan outside of any hot leg eggcrate support
d. No volumetric indications ≥40%TW or crack-like indications located at the 05H eggcrate support in Rows 1-17 tubes
e. No volumetric indications ≥40%TW or crack-like indications located at any location along the cold leg
f. No volumetric indications ≥40%TW or crack-like indications located at any hot leg support above 05H

8. The indications in the tubes on the above list were in-service during plant operation of Cycle 28. The indications in these tubes have screened against the in situ screening criteria. None of the indications in the above tubes require in situ testing.

9. Post-sleeving ECT Bobbin will be performed on the tubes on the above list for positional verification. Post-sleeving ECT +Point will be performed on the tubes on the above list over the length of the sleeve to obtain a baseline of the ECT data.

Approvals:

Craig Kelley 7/11/2025 4:56 PM
Craig J Kelley
Framatome Integrity Engineering

William C. Weeks 07/11/2025 17:52
Framatome Data Management

Kendall Jones 5:13 PM 7/11/2025
Framatome Lead Analyst

Bobby Griffin
7/11/2025 5:20pm
Utility Representative

7/14/25
Ambar C. Rodriguez

7/14/25
Don Powell

A.17 SGA 02H Sleeve Lists

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 02H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.

8. The indications in the tubes on the above list were in-service during plant operation of Cycle 28. The indications in these tubes have screened against the in situ screening criteria. None of the indications in the above tubes require in situ testing.

9. Post-sleeving ECT Bobbin will be performed on the tubes on the above list for positional verification. Post-sleeving ECT +Point will be performed on the tubes on the above list over the length of the sleeve to obtain a baseline of the ECT data.

Approvals:

Craig Kelley 7/8/25 2:27 PM

Framatome Integrity Engineering

07/08/2025 15:40

Framatome Data Management

7/8/2025 2:35 P.M.

Framatome Lead Analyst

Bobby Griffin

7/8/2025 2:35 pm

Utility Representative

7/10/25

Ambar Rodriguez

7/10/25

7/8/2025 2:27 PM

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 02H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	92	97	SLV @ 02H	N/A	PSV @ 02H	281	N/A	N/A	0
PAL1A	92	101	SLV @ 02H	N/A	PSV @ 02H	282	N/A	N/A	0
PAL1A	92	107	SLV @ 02H	N/A	PSV @ 02H	283	N/A	N/A	0
PAL1A	92	109	SLV @ 02H	N/A	PSV @ 02H	284	N/A	N/A	0
PAL1A	92	113	SLV @ 02H	N/A	PSV @ 02H	285	N/A	N/A	0
PAL1A	93	26	SLV @ 02H	N/A	PSV @ 02H	286	N/A	N/A	0
PAL1A	93	50	SLV @ 02H	N/A	CSV @ 02H	287	0.35	0.72	0
PAL1A	93	74	SLV @ 02H	N/A	CSV @ 02H	288	0.40	0.99	0
PAL1A	93	90	SLV @ 02H	N/A	PSV @ 02H	289	N/A	N/A	0
PAL1A	93	100	SLV @ 02H	N/A	PSV @ 02H	290	N/A	N/A	0
PAL1A	93	122	SLV @ 02H	N/A	CSV @ 02H	291	0.67	1.01	0
PAL1A	94	77	SLV @ 02H	N/A	PSV @ 02H	292	N/A	N/A	0
PAL1A	94	99	SLV @ 02H	N/A	PSV @ 02H	293	N/A	N/A	0
PAL1A	95	72	SLV @ 02H	N/A	CSV @ 02H	294	0.56	0.96	0
PAL1A	95	80	SLV @ 02H	N/A	CSV @ 02H	295	0.19	0.99	0
PAL1A	95	90	SLV @ 02H	N/A	PSV @ 02H	296	N/A	N/A	0
PAL1A	95	94	SLV @ 02H	N/A	CSV @ 02H	297	0.72	1.09	0
PAL1A	95	96	SLV @ 02H	N/A	PSV @ 02H	298	N/A	N/A	0
PAL1A	96	99	SLV @ 02H	N/A	CSV @ 02H	299	0.40	0.91	0
PAL1A	96	103	SLV @ 02H	N/A	PSV @ 02H	300	N/A	N/A	0
PAL1A	98	53	SLV @ 02H	N/A	PSV @ 02H	301	N/A	N/A	0
PAL1A	99	112	SLV @ 02H	N/A	PSV @ 02H	302	N/A	N/A	0
PAL1A	99	114	SLV @ 02H	N/A	CSV @ 02H	303	0.11	1.04	0
PAL1A	99	128	SLV @ 02H	N/A	CSV @ 02H	304	0.19	0.64	0
PAL1A	100	97	SLV @ 02H	N/A	PSV @ 02H	305	N/A	N/A	0
PAL1A	100	107	SLV @ 02H	N/A	PSV @ 02H	306	N/A	N/A	0
PAL1A	100	111	SLV @ 02H	N/A	PSV @ 02H	307	N/A	N/A	0
PAL1A	100	119	SLV @ 02H	N/A	PSV @ 02H	308	N/A	N/A	0

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 02H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	101	56	SLV @ 02H	N/A	CSV @ 02H	309	0.77	1.07	0
PAL1A	101	94	SLV @ 02H	N/A	PSV @ 02H	310	N/A	N/A	0
PAL1A	101	104	SLV @ 02H	N/A	PSV @ 02H	311	N/A	N/A	0
PAL1A	101	118	SLV @ 02H	N/A	PSV @ 02H	312	N/A	N/A	0
PAL1A	102	99	SLV @ 02H	N/A	PSV @ 02H	313	N/A	N/A	0
PAL1A	102	109	SLV @ 02H	N/A	PSV @ 02H	314	N/A	N/A	0
PAL1A	103	76	SLV @ 02H	N/A	CSV @ 02H	315	0.56	0.80	0
PAL1A	103	84	SLV @ 02H	N/A	PSV @ 02H	316	N/A	N/A	0
PAL1A	103	92	SLV @ 02H	N/A	PSV @ 02H	317	N/A	N/A	0
PAL1A	103	100	SLV @ 02H	N/A	PSV @ 02H	318	N/A	N/A	0
PAL1A	103	102	SLV @ 02H	N/A	PSV @ 02H	319	N/A	N/A	0
PAL1A	103	110	SLV @ 02H	N/A	PSV @ 02H	320	N/A	N/A	0
PAL1A	104	107	SLV @ 02H	N/A	PSV @ 02H	321	N/A	N/A	0
PAL1A	105	74	SLV @ 02H	N/A	CSV @ 02H	322	0.35	0.85	0
PAL1A	105	76	SLV @ 02H	N/A	PSV @ 02H	323	N/A	N/A	0
PAL1A	105	112	SLV @ 02H	N/A	CSV @ 02H	324	0.19	1.04	0
PAL1A	106	69	SLV @ 02H	N/A	PSV @ 02H	325	N/A	N/A	0
PAL1A	106	87	SLV @ 02H	N/A	CSV @ 02H	326	-0.72	-0.11	0
PAL1A	106	107	SLV @ 02H	N/A	CSV @ 02H	327	0.53	0.99	0
PAL1A	107	54	SLV @ 02H	N/A	PSV @ 02H	328	N/A	N/A	0
PAL1A	107	60	SLV @ 02H	N/A	PSV @ 02H	329	N/A	N/A	0
PAL1A	107	72	SLV @ 02H	N/A	PSV @ 02H	330	N/A	N/A	0
PAL1A	107	108	SLV @ 02H	N/A	CSV @ 02H	331	-1.07	0.88	0
PAL1A	107	122	SLV @ 02H	N/A	CSV @ 02H	332	-0.91	-0.61	0
PAL1A	108	71	SLV @ 02H	N/A	PSV @ 02H	333	N/A	N/A	0
PAL1A	109	62	SLV @ 02H	N/A	CSV @ 02H	334	-1.01	-0.13	0
PAL1A	109	68	SLV @ 02H	N/A	CSV @ 02H	335	-0.75	-0.21	0
PAL1A	109	80	SLV @ 02H	N/A	PSV @ 02H	336	N/A	N/A	0

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 02H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	109	86	SLV @ 02H	N/A	CSV @ 02H	337	0.67	0.96	0
PAL1A	109	90	SLV @ 02H	N/A	PSV @ 02H	338	N/A	N/A	0
PAL1A	109	94	SLV @ 02H	N/A	CSV @ 02H	339	0.69	0.88	0
PAL1A	109	118	SLV @ 02H	N/A	CSV @ 02H	340	-0.80	-0.48	0
PAL1A	110	61	SLV @ 02H	N/A	PSV @ 02H	341	N/A	N/A	0
PAL1A	110	69	SLV @ 02H	N/A	CSV @ 02H	342	-0.88	-0.72	0
PAL1A	110	91	SLV @ 02H	N/A	CSV @ 02H	343	0.80	1.01	0
PAL1A	110	103	SLV @ 02H	N/A	PSV @ 02H	344	N/A	N/A	0
PAL1A	110	109	SLV @ 02H	N/A	CSV @ 02H	345	-0.69	1.07	0
PAL1A	110	131	SLV @ 02H	N/A	PSV @ 02H	346	N/A	N/A	0
PAL1A	111	62	SLV @ 02H	N/A	CSV @ 02H	347	-0.93	-0.56	0
PAL1A	111	90	SLV @ 02H	N/A	CSV @ 02H	348	0.51	1.12	0
PAL1A	113	82	SLV @ 02H	N/A	PSV @ 02H	349	N/A	N/A	0
PAL1A	113	88	SLV @ 02H	N/A	PSV @ 02H	350	N/A	N/A	0
PAL1A	113	90	SLV @ 02H	N/A	PSV @ 02H	351	N/A	N/A	0
PAL1A	113	96	SLV @ 02H	N/A	CSV @ 02H	352	0.64	1.01	0
PAL1A	113	102	SLV @ 02H	N/A	CSV @ 02H	353	-0.32	0.85	0
PAL1A	113	104	SLV @ 02H	N/A	PSV @ 02H	354	N/A	N/A	0
PAL1A	113	118	SLV @ 02H	N/A	CSV @ 02H	355	-0.88	-0.35	0
PAL1A	114	69	SLV @ 02H	N/A	PSV @ 02H	356	N/A	N/A	0
PAL1A	114	73	SLV @ 02H	N/A	PSV @ 02H	357	N/A	N/A	0
PAL1A	114	75	SLV @ 02H	N/A	CSV @ 02H	358	-0.69	-0.11	0
PAL1A	114	91	SLV @ 02H	N/A	CSV @ 02H	359	0.61	1.01	0
PAL1A	114	93	SLV @ 02H	N/A	CSV @ 02H	360	-0.96	1.09	0
PAL1A	114	111	SLV @ 02H	N/A	CSV @ 02H	361	0.75	0.93	0
PAL1A	115	76	SLV @ 02H	N/A	CSV @ 02H	362	0.13	0.93	0
PAL1A	115	88	SLV @ 02H	N/A	PSV @ 02H	363	N/A	N/A	0
PAL1A	115	98	SLV @ 02H	N/A	CSV @ 02H	364	0.51	0.99	0

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 02H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	115	104	SLV @ 02H	N/A	PSV @ 02H	365	N/A	N/A	0
PAL1A	115	106	SLV @ 02H	N/A	CSV @ 02H	366	0.35	1.01	0
PAL1A	115	108	SLV @ 02H	N/A	PSV @ 02H	367	N/A	N/A	0
PAL1A	116	87	SLV @ 02H	N/A	CSV @ 02H	368	-0.37	0.99	0
PAL1A	117	104	SLV @ 02H	N/A	PSV @ 02H	369	N/A	N/A	0
PAL1A	119	96	SLV @ 02H	N/A	CSV @ 02H	370	0.75	0.91	0
PAL1A	120	51	SLV @ 02H	N/A	CSV @ 02H	371	-0.93	-0.80	0
PAL1A	120	91	SLV @ 02H	N/A	CSV @ 02H	372	-0.99	1.01	0
PAL1A	121	90	SLV @ 02H	N/A	PSV @ 02H	373	N/A	N/A	0
PAL1A	121	98	SLV @ 02H	N/A	CSV @ 02H	374	0.61	0.93	0
PAL1A	121	102	SLV @ 02H	N/A	CSV @ 02H	375	0.59	0.93	0
PAL1A	121	104	SLV @ 02H	N/A	CSV @ 02H	376	0.24	0.88	0
PAL1A	121	106	SLV @ 02H	N/A	CSV @ 02H	377	0.11	0.83	0
PAL1A	122	63	SLV @ 02H	N/A	PSV @ 02H	378	N/A	N/A	0
PAL1A	122	89	SLV @ 02H	N/A	PSV @ 02H	379	N/A	N/A	0
PAL1A	123	94	SLV @ 02H	N/A	CSV @ 02H	380	0.05	1.01	0
PAL1A	125	66	SLV @ 02H	N/A	CSV @ 02H	381	0.56	0.93	0
PAL1A	125	98	SLV @ 02H	N/A	PSV @ 02H	382	N/A	N/A	0
PAL1A	125	102	SLV @ 02H	N/A	CSV @ 02H	383	0.69	0.88	0
PAL1A	127	64	SLV @ 02H	N/A	CSV @ 02H	384	0.56	0.75	0
PAL1A	128	71	SLV @ 02H	N/A	CSV @ 02H	385	0.61	1.01	0
PAL1A	128	81	SLV @ 02H	N/A	CSV @ 02H	386	0.77	0.99	0
PAL1A	128	91	SLV @ 02H	N/A	PSV @ 02H	387	N/A	N/A	0
PAL1A	128	97	SLV @ 02H	N/A	PSV @ 02H	388	N/A	N/A	0
PAL1A	129	74	SLV @ 02H	N/A	CSV @ 02H	389	0.67	0.88	0
PAL1A	129	90	SLV @ 02H	N/A	PSV @ 02H	390	N/A	N/A	0
PAL1A	129	98	SLV @ 02H	N/A	CSV @ 02H	391	0.51	0.64	0
PAL1A	130	65	SLV @ 02H	N/A	PSV @ 02H	392	N/A	N/A	0

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 02H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	130	95	SLV @ 02H	N/A	PSV @ 02H	393	N/A	N/A	0
PAL1A	130	97	SLV @ 02H	N/A	PSV @ 02H	394	N/A	N/A	0
PAL1A	134	99	SLV @ 02H	N/A	PSV @ 02H	395	N/A	N/A	0
PAL1A	136	87	SLV @ 02H	N/A	PSV @ 02H	396	N/A	N/A	0
PAL1A	136	89	SLV @ 02H	N/A	PSV @ 02H	397	N/A	N/A	0
PAL1A	137	84	SLV @ 02H	N/A	PSV @ 02H	398	N/A	N/A	0
					Totals:	398			

Notes (Rev. 0):

1. This "In-Service" sleeving list is only for sleeves to be installed at the 2nd hot leg support (02H) and will be installed:
   a) **After** all tubes on the above list have had a sleeve installed at 03H.
   b) **Prior** to any sleeves installed at a lower hot leg support (i.e., 01H).

2. All tubes shall be sleeved using the Alloy 690 Sleeve P/N 8164714-002 (14.5" nominal length).

3. All tubes on the above list had a successful Sleeve GoGage result at the support location per 03-8169881-000; therefore, there are no clearance issues that would prevent the installation of a sleeve.

4. All tubes on the above list were in service during plant operation for Cycle 28. Sleeving of de-plugged tubes that are being returned to service is covered under the "RTS" (Return-to-Service) sleeving list. All eddy current testing required by the Degradation Assessment (51-9378492-000) has been completed on these tubes.

5. The sleeving strategy implemented at 1D28 uses "corrective" sleeves (CSV) and "preventative" sleeves (PSV) per 51-9388851-001 based on whether a repairable flaw (i.e., volumetric indications ≥40%TW or crack-like indications) is identified with ECT at the support location.
The criteria for a "corrective" sleeve based on review of the ECT data is as follows:
   a) The repairable flaw must be located within the center 3" of the sleeve assuming 0.75" uncertainty on either end of the sleeve for the 14.5" sleeve; therefore, the flaw extents must be within +/- 1.5" of the center of the support.
   b) The repairable flaw must be located at hot leg eggcrate support 01H/02H/03H/04H for tubes in Rows 1-17 or 01H/02H/03H/04H/05H for tubes in Rows 18-138.

The criteria for a "preventative" sleeve based on review of the ECT data is as follows:
   a) There **are no** repairable flaws at the hot leg eggcrate support for this support elevation
   b) There **are** repairable flaws at a hot leg eggcrate support below this support elevation

6. For the tubes on the above list with corrective sleeves (CSV), the minimum and maximum extent of the flaw(s) at the support are listed as measured from the center of the support from the profile sizing data.

7. The tubes on the above list can remain in service following successful sleeve installation. The criteria for the selection of sleeving candidates based on review of the ECT data, is as follows:
   a. No volumetric indications ≥40%TW or crack-like indications located in the "square-bend" region
   b. No volumetric indications ≥40%TW or crack-like indications located at the top-of-tubesheet
   c. No volumetric indications ≥40%TW or crack-like indications located in the freespan outside of any hot leg eggcrate support
   d. No volumetric indications ≥40%TW or crack-like indications located at the 05H eggcrate support in Rows 1-17 tubes
   e. No volumetric indications ≥40%TW or crack-like indications located at any location along the cold leg
   f. No volumetric indications ≥40%TW or crack-like indications located at any hot leg support above 05H

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 02H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	33	108	SLV @ 02H	N/A	PSV @ 02H	113	N/A	N/A	0
PAL1A	33	110	SLV @ 02H	N/A	PSV @ 02H	114	N/A	N/A	0
PAL1A	33	112	SLV @ 02H	N/A	PSV @ 02H	115	N/A	N/A	0
PAL1A	33	146	SLV @ 02H	N/A	CSV @ 02H	116	0.56	1.01	0
PAL1A	34	23	SLV @ 02H	N/A	CSV @ 02H	117	-0.99	-0.72	0
PAL1A	34	59	SLV @ 02H	N/A	PSV @ 02H	118	N/A	N/A	0
PAL1A	35	58	SLV @ 02H	N/A	CSV @ 02H	119	0.75	1.07	0
PAL1A	35	106	SLV @ 02H	N/A	CSV @ 02H	120	-0.93	0.99	0
PAL1A	36	59	SLV @ 02H	N/A	PSV @ 02H	121	N/A	N/A	0
PAL1A	36	103	SLV @ 02H	N/A	CSV @ 02H	122	-0.43	-0.24	0
PAL1A	36	105	SLV @ 02H	N/A	CSV @ 02H	123	-0.96	-0.19	0
PAL1A	36	111	SLV @ 02H	N/A	CSV @ 02H	124	0.19	0.96	0
PAL1A	37	106	SLV @ 02H	N/A	CSV @ 02H	125	-0.32	-0.21	0
PAL1A	37	116	SLV @ 02H	N/A	CSV @ 02H	126	-0.91	-0.24	0
PAL1A	38	57	SLV @ 02H	N/A	PSV @ 02H	127	N/A	N/A	0
PAL1A	38	109	SLV @ 02H	N/A	CSV @ 02H	128	-0.75	0.96	0
PAL1A	38	137	SLV @ 02H	N/A	CSV @ 02H	129	-0.37	-0.08	0
PAL1A	39	60	SLV @ 02H	N/A	PSV @ 02H	130	N/A	N/A	0
PAL1A	39	108	SLV @ 02H	N/A	CSV @ 02H	131	-0.37	0.83	0
PAL1A	39	110	SLV @ 02H	N/A	PSV @ 02H	132	N/A	N/A	0
PAL1A	39	120	SLV @ 02H	N/A	PSV @ 02H	133	N/A	N/A	0
PAL1A	39	122	SLV @ 02H	N/A	CSV @ 02H	134	0.45	0.99	0
PAL1A	40	129	SLV @ 02H	N/A	PSV @ 02H	135	N/A	N/A	0
PAL1A	43	112	SLV @ 02H	N/A	CSV @ 02H	136	0.37	0.93	0
PAL1A	44	59	SLV @ 02H	N/A	PSV @ 02H	137	N/A	N/A	0
PAL1A	44	99	SLV @ 02H	N/A	CSV @ 02H	138	-0.96	0.99	0
PAL1A	44	105	SLV @ 02H	N/A	CSV @ 02H	139	-0.91	-0.72	0
PAL1A	45	58	SLV @ 02H	N/A	PSV @ 02H	140	N/A	N/A	0

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 02H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	45	104	SLV @ 02H	N/A	CSV @ 02H	141	0.69	0.91	0
PAL1A	45	158	SLV @ 02H	N/A	CSV @ 02H	142	0.75	0.85	0
PAL1A	46	35	SLV @ 02H	N/A	PSV @ 02H	143	N/A	N/A	0
PAL1A	46	59	SLV @ 02H	N/A	PSV @ 02H	144	N/A	N/A	0
PAL1A	46	67	SLV @ 02H	N/A	PSV @ 02H	145	N/A	N/A	0
PAL1A	46	111	SLV @ 02H	N/A	CSV @ 02H	146	-0.96	-0.05	0
PAL1A	46	121	SLV @ 02H	N/A	CSV @ 02H	147	0.48	1.04	0
PAL1A	46	125	SLV @ 02H	N/A	CSV @ 02H	148	0.16	0.99	0
PAL1A	46	145	SLV @ 02H	N/A	PSV @ 02H	149	N/A	N/A	0
PAL1A	47	48	SLV @ 02H	N/A	PSV @ 02H	150	N/A	N/A	0
PAL1A	47	62	SLV @ 02H	N/A	PSV @ 02H	151	N/A	N/A	0
PAL1A	47	108	SLV @ 02H	N/A	CSV @ 02H	152	-0.37	0.85	0
PAL1A	48	45	SLV @ 02H	N/A	PSV @ 02H	153	N/A	N/A	0
PAL1A	48	69	SLV @ 02H	N/A	PSV @ 02H	154	N/A	N/A	0
PAL1A	48	105	SLV @ 02H	N/A	CSV @ 02H	155	-0.69	0.80	0
PAL1A	48	113	SLV @ 02H	N/A	PSV @ 02H	156	N/A	N/A	0
PAL1A	49	100	SLV @ 02H	N/A	PSV @ 02H	157	N/A	N/A	0
PAL1A	49	102	SLV @ 02H	N/A	CSV @ 02H	158	-0.29	0.29	0
PAL1A	49	108	SLV @ 02H	N/A	PSV @ 02H	159	N/A	N/A	0
PAL1A	50	99	SLV @ 02H	N/A	CSV @ 02H	160	-1.09	-0.45	0
PAL1A	50	101	SLV @ 02H	N/A	PSV @ 02H	161	N/A	N/A	0
PAL1A	50	113	SLV @ 02H	N/A	CSV @ 02H	162	0.72	1.01	0
PAL1A	52	97	SLV @ 02H	N/A	CSV @ 02H	163	-0.37	0.40	0
PAL1A	56	111	SLV @ 02H	N/A	CSV @ 02H	164	0.48	0.99	0
PAL1A	57	52	SLV @ 02H	N/A	PSV @ 02H	165	N/A	N/A	0
PAL1A	57	68	SLV @ 02H	N/A	PSV @ 02H	166	N/A	N/A	0
PAL1A	57	90	SLV @ 02H	N/A	CSV @ 02H	167	0.29	0.83	0
PAL1A	57	112	SLV @ 02H	N/A	CSV @ 02H	168	0.51	0.93	0

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 02H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	57	134	SLV @ 02H	N/A	CSV @ 02H	169	0.56	0.91	0
PAL1A	58	69	SLV @ 02H	N/A	PSV @ 02H	170	N/A	N/A	0
PAL1A	58	101	SLV @ 02H	N/A	PSV @ 02H	171	N/A	N/A	0
PAL1A	60	91	SLV @ 02H	N/A	CSV @ 02H	172	-0.59	-0.08	0
PAL1A	60	93	SLV @ 02H	N/A	CSV @ 02H	173	-0.93	-0.43	0
PAL1A	60	95	SLV @ 02H	N/A	CSV @ 02H	174	0.48	0.96	0
PAL1A	60	97	SLV @ 02H	N/A	PSV @ 02H	175	N/A	N/A	0
PAL1A	61	106	SLV @ 02H	N/A	CSV @ 02H	176	0.45	0.61	0
PAL1A	61	110	SLV @ 02H	N/A	CSV @ 02H	177	-0.72	-0.08	0
PAL1A	61	118	SLV @ 02H	N/A	PSV @ 02H	178	N/A	N/A	0
PAL1A	63	38	SLV @ 02H	N/A	PSV @ 02H	179	N/A	N/A	0
PAL1A	63	48	SLV @ 02H	N/A	PSV @ 02H	180	N/A	N/A	0
PAL1A	63	86	SLV @ 02H	N/A	CSV @ 02H	181	0.35	0.85	0
PAL1A	63	90	SLV @ 02H	N/A	CSV @ 02H	182	0.67	0.80	0
PAL1A	64	93	SLV @ 02H	N/A	CSV @ 02H	183	-0.88	0.53	0
PAL1A	64	95	SLV @ 02H	N/A	PSV @ 02H	184	N/A	N/A	0
PAL1A	65	114	SLV @ 02H	N/A	CSV @ 02H	185	0.05	0.16	0
PAL1A	66	77	SLV @ 02H	N/A	PSV @ 02H	186	N/A	N/A	0
PAL1A	66	95	SLV @ 02H	N/A	PSV @ 02H	187	N/A	N/A	0
PAL1A	67	88	SLV @ 02H	N/A	PSV @ 02H	188	N/A	N/A	0
PAL1A	67	96	SLV @ 02H	N/A	PSV @ 02H	189	N/A	N/A	0
PAL1A	68	83	SLV @ 02H	N/A	PSV @ 02H	190	N/A	N/A	0
PAL1A	68	95	SLV @ 02H	N/A	PSV @ 02H	191	N/A	N/A	0
PAL1A	69	62	SLV @ 02H	N/A	CSV @ 02H	192	0.64	0.93	0
PAL1A	69	78	SLV @ 02H	N/A	CSV @ 02H	193	0.72	0.91	0
PAL1A	69	86	SLV @ 02H	N/A	CSV @ 02H	194	0.45	0.59	0
PAL1A	69	88	SLV @ 02H	N/A	CSV @ 02H	195	0.64	0.96	0
PAL1A	69	90	SLV @ 02H	N/A	CSV @ 02H	196	0.83	0.96	0

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 02H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	69	92	SLV @ 02H	N/A	CSV @ 02H	197	0.72	0.99	0
PAL1A	69	94	SLV @ 02H	N/A	CSV @ 02H	198	0.00	0.77	0
PAL1A	70	23	SLV @ 02H	N/A	PSV @ 02H	199	N/A	N/A	0
PAL1A	70	87	SLV @ 02H	N/A	PSV @ 02H	200	N/A	N/A	0
PAL1A	70	93	SLV @ 02H	N/A	PSV @ 02H	201	N/A	N/A	0
PAL1A	70	111	SLV @ 02H	N/A	CSV @ 02H	202	0.85	1.01	0
PAL1A	70	117	SLV @ 02H	N/A	CSV @ 02H	203	-0.99	-0.85	0
PAL1A	70	153	SLV @ 02H	N/A	PSV @ 02H	204	N/A	N/A	0
PAL1A	71	48	SLV @ 02H	N/A	CSV @ 02H	205	0.77	0.91	0
PAL1A	71	92	SLV @ 02H	N/A	CSV @ 02H	206	0.21	0.91	0
PAL1A	71	102	SLV @ 02H	N/A	PSV @ 02H	207	N/A	N/A	0
PAL1A	71	110	SLV @ 02H	N/A	PSV @ 02H	208	N/A	N/A	0
PAL1A	72	57	SLV @ 02H	N/A	PSV @ 02H	209	N/A	N/A	0
PAL1A	72	83	SLV @ 02H	N/A	PSV @ 02H	210	N/A	N/A	0
PAL1A	72	85	SLV @ 02H	N/A	CSV @ 02H	211	-0.96	0.56	0
PAL1A	72	89	SLV @ 02H	N/A	PSV @ 02H	212	N/A	N/A	0
PAL1A	72	91	SLV @ 02H	N/A	PSV @ 02H	213	N/A	N/A	0
PAL1A	73	58	SLV @ 02H	N/A	CSV @ 02H	214	-0.59	0.03	0
PAL1A	73	72	SLV @ 02H	N/A	PSV @ 02H	215	N/A	N/A	0
PAL1A	73	78	SLV @ 02H	N/A	PSV @ 02H	216	N/A	N/A	0
PAL1A	73	80	SLV @ 02H	N/A	PSV @ 02H	217	N/A	N/A	0
PAL1A	73	86	SLV @ 02H	N/A	PSV @ 02H	218	N/A	N/A	0
PAL1A	74	85	SLV @ 02H	N/A	PSV @ 02H	219	N/A	N/A	0
PAL1A	74	95	SLV @ 02H	N/A	PSV @ 02H	220	N/A	N/A	0
PAL1A	74	101	SLV @ 02H	N/A	PSV @ 02H	221	N/A	N/A	0
PAL1A	74	105	SLV @ 02H	N/A	PSV @ 02H	222	N/A	N/A	0
PAL1A	75	84	SLV @ 02H	N/A	CSV @ 02H	223	0.45	0.93	0
PAL1A	75	92	SLV @ 02H	N/A	CSV @ 02H	224	-0.19	0.08	0

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 02H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	75	94	SLV @ 02H	N/A	PSV @ 02H	225	N/A	N/A	0
PAL1A	77	54	SLV @ 02H	N/A	CSV @ 02H	226	0.61	0.93	0
PAL1A	77	90	SLV @ 02H	N/A	CSV @ 02H	227	-0.21	0.83	0
PAL1A	77	126	SLV @ 02H	N/A	CSV @ 02H	228	0.53	0.88	0
PAL1A	78	41	SLV @ 02H	N/A	PSV @ 02H	229	N/A	N/A	0
PAL1A	78	73	SLV @ 02H	N/A	PSV @ 02H	230	N/A	N/A	0
PAL1A	78	87	SLV @ 02H	N/A	PSV @ 02H	231	N/A	N/A	0
PAL1A	78	103	SLV @ 02H	N/A	PSV @ 02H	232	N/A	N/A	0
PAL1A	78	113	SLV @ 02H	N/A	PSV @ 02H	233	N/A	N/A	0
PAL1A	80	79	SLV @ 02H	N/A	PSV @ 02H	234	N/A	N/A	0
PAL1A	80	99	SLV @ 02H	N/A	PSV @ 02H	235	N/A	N/A	0
PAL1A	80	113	SLV @ 02H	N/A	PSV @ 02H	236	N/A	N/A	0
PAL1A	81	80	SLV @ 02H	N/A	PSV @ 02H	237	N/A	N/A	0
PAL1A	81	110	SLV @ 02H	N/A	CSV @ 02H	238	0.21	0.53	0
PAL1A	82	87	SLV @ 02H	N/A	CSV @ 02H	239	-0.45	0.05	0
PAL1A	82	101	SLV @ 02H	N/A	PSV @ 02H	240	N/A	N/A	0
PAL1A	82	109	SLV @ 02H	N/A	PSV @ 02H	241	N/A	N/A	0
PAL1A	83	96	SLV @ 02H	N/A	CSV @ 02H	242	-0.05	0.45	0
PAL1A	83	98	SLV @ 02H	N/A	PSV @ 02H	243	N/A	N/A	0
PAL1A	83	102	SLV @ 02H	N/A	PSV @ 02H	244	N/A	N/A	0
PAL1A	84	59	SLV @ 02H	N/A	PSV @ 02H	245	N/A	N/A	0
PAL1A	84	93	SLV @ 02H	N/A	CSV @ 02H	246	0.24	0.53	0
PAL1A	85	110	SLV @ 02H	N/A	PSV @ 02H	247	N/A	N/A	0
PAL1A	86	93	SLV @ 02H	N/A	PSV @ 02H	248	N/A	N/A	0
PAL1A	88	47	SLV @ 02H	N/A	PSV @ 02H	249	N/A	N/A	0
PAL1A	88	83	SLV @ 02H	N/A	PSV @ 02H	250	N/A	N/A	0
PAL1A	88	93	SLV @ 02H	N/A	PSV @ 02H	251	N/A	N/A	0
PAL1A	88	97	SLV @ 02H	N/A	PSV @ 02H	252	N/A	N/A	0

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 02H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	88	99	SLV @ 02H	N/A	PSV @ 02H	253	N/A	N/A	0
PAL1A	88	105	SLV @ 02H	N/A	PSV @ 02H	254	N/A	N/A	0
PAL1A	88	107	SLV @ 02H	N/A	PSV @ 02H	255	N/A	N/A	0
PAL1A	88	115	SLV @ 02H	N/A	CSV @ 02H	256	0.61	0.75	0
PAL1A	89	54	SLV @ 02H	N/A	CSV @ 02H	257	0.64	0.96	0
PAL1A	89	90	SLV @ 02H	N/A	CSV @ 02H	258	0.00	0.85	0
PAL1A	89	96	SLV @ 02H	N/A	PSV @ 02H	259	N/A	N/A	0
PAL1A	89	98	SLV @ 02H	N/A	PSV @ 02H	260	N/A	N/A	0
PAL1A	89	114	SLV @ 02H	N/A	CSV @ 02H	261	-0.21	0.45	0
PAL1A	90	59	SLV @ 02H	N/A	PSV @ 02H	262	N/A	N/A	0
PAL1A	90	89	SLV @ 02H	N/A	PSV @ 02H	263	N/A	N/A	0
PAL1A	90	125	SLV @ 02H	N/A	PSV @ 02H	264	N/A	N/A	0
PAL1A	91	64	SLV @ 02H	N/A	CSV @ 02H	265	0.19	0.85	0
PAL1A	91	70	SLV @ 02H	N/A	CSV @ 02H	266	0.83	0.99	0
PAL1A	91	72	SLV @ 02H	N/A	PSV @ 02H	267	N/A	N/A	0
PAL1A	91	78	SLV @ 02H	N/A	CSV @ 02H	268	0.05	0.59	0
PAL1A	91	84	SLV @ 02H	N/A	PSV @ 02H	269	N/A	N/A	0
PAL1A	91	88	SLV @ 02H	N/A	PSV @ 02H	270	N/A	N/A	0
PAL1A	91	90	SLV @ 02H	N/A	CSV @ 02H	271	-1.07	1.04	0
PAL1A	91	94	SLV @ 02H	N/A	CSV @ 02H	272	0.45	0.96	0
PAL1A	91	96	SLV @ 02H	N/A	PSV @ 02H	273	N/A	N/A	0
PAL1A	91	98	SLV @ 02H	N/A	PSV @ 02H	274	N/A	N/A	0
PAL1A	91	100	SLV @ 02H	N/A	PSV @ 02H	275	N/A	N/A	0
PAL1A	91	104	SLV @ 02H	N/A	CSV @ 02H	276	0.67	0.83	0
PAL1A	91	124	SLV @ 02H	N/A	CSV @ 02H	277	0.61	0.85	0
PAL1A	92	25	SLV @ 02H	N/A	PSV @ 02H	278	N/A	N/A	0
PAL1A	92	45	SLV @ 02H	N/A	PSV @ 02H	279	N/A	N/A	0
PAL1A	92	95	SLV @ 02H	N/A	CSV @ 02H	280	-0.93	0.96	0

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 02H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	1	156	SLV @ 02H	N/A	CSV @ 02H	1	0.64	1.01	0
PAL1A	3	114	SLV @ 02H	N/A	CSV @ 02H	2	0.53	0.96	0
PAL1A	4	55	SLV @ 02H	N/A	PSV @ 02H	3	N/A	N/A	0
PAL1A	4	113	SLV @ 02H	N/A	PSV @ 02H	4	N/A	N/A	0
PAL1A	4	117	SLV @ 02H	N/A	PSV @ 02H	5	N/A	N/A	0
PAL1A	7	56	SLV @ 02H	N/A	PSV @ 02H	6	N/A	N/A	0
PAL1A	7	58	SLV @ 02H	N/A	PSV @ 02H	7	N/A	N/A	0
PAL1A	7	118	SLV @ 02H	N/A	PSV @ 02H	8	N/A	N/A	0
PAL1A	7	122	SLV @ 02H	N/A	PSV @ 02H	9	N/A	N/A	0
PAL1A	8	13	SLV @ 02H	N/A	CSV @ 02H	10	0.37	0.75	0
PAL1A	8	109	SLV @ 02H	N/A	PSV @ 02H	11	N/A	N/A	0
PAL1A	8	117	SLV @ 02H	N/A	PSV @ 02H	12	N/A	N/A	0
PAL1A	8	121	SLV @ 02H	N/A	CSV @ 02H	13	-0.91	-0.45	0
PAL1A	10	53	SLV @ 02H	N/A	PSV @ 02H	14	N/A	N/A	0
PAL1A	10	117	SLV @ 02H	N/A	CSV @ 02H	15	-0.48	-0.08	0
PAL1A	10	125	SLV @ 02H	N/A	PSV @ 02H	16	N/A	N/A	0
PAL1A	10	133	SLV @ 02H	N/A	CSV @ 02H	17	-0.24	0.16	0
PAL1A	10	153	SLV @ 02H	N/A	PSV @ 02H	18	N/A	N/A	0
PAL1A	11	40	SLV @ 02H	N/A	PSV @ 02H	19	N/A	N/A	0
PAL1A	11	50	SLV @ 02H	N/A	PSV @ 02H	20	N/A	N/A	0
PAL1A	11	116	SLV @ 02H	N/A	PSV @ 02H	21	N/A	N/A	0
PAL1A	11	120	SLV @ 02H	N/A	PSV @ 02H	22	N/A	N/A	0
PAL1A	11	134	SLV @ 02H	N/A	PSV @ 02H	23	N/A	N/A	0
PAL1A	11	146	SLV @ 02H	N/A	CSV @ 02H	24	0.32	0.51	0
PAL1A	12	113	SLV @ 02H	N/A	CSV @ 02H	25	-0.69	-0.05	0
PAL1A	12	155	SLV @ 02H	N/A	PSV @ 02H	26	N/A	N/A	0
PAL1A	13	58	SLV @ 02H	N/A	PSV @ 02H	27	N/A	N/A	0
PAL1A	13	124	SLV @ 02H	N/A	CSV @ 02H	28	0.77	0.93	0

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 02H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	14	117	SLV @ 02H	N/A	PSV @ 02H	29	N/A	N/A	0
PAL1A	14	121	SLV @ 02H	N/A	CSV @ 02H	30	-0.56	-0.13	0
PAL1A	15	48	SLV @ 02H	N/A	PSV @ 02H	31	N/A	N/A	0
PAL1A	15	50	SLV @ 02H	N/A	CSV @ 02H	32	-0.88	-0.77	0
PAL1A	15	110	SLV @ 02H	N/A	PSV @ 02H	33	N/A	N/A	0
PAL1A	15	112	SLV @ 02H	N/A	PSV @ 02H	34	N/A	N/A	0
PAL1A	15	116	SLV @ 02H	N/A	CSV @ 02H	35	0.37	0.93	0
PAL1A	15	124	SLV @ 02H	N/A	PSV @ 02H	36	N/A	N/A	0
PAL1A	15	152	SLV @ 02H	N/A	CSV @ 02H	37	0.24	0.67	0
PAL1A	15	158	SLV @ 02H	N/A	CSV @ 02H	38	0.16	0.35	0
PAL1A	16	109	SLV @ 02H	N/A	PSV @ 02H	39	N/A	N/A	0
PAL1A	16	113	SLV @ 02H	N/A	CSV @ 02H	40	-1.04	-0.16	0
PAL1A	16	115	SLV @ 02H	N/A	PSV @ 02H	41	N/A	N/A	0
PAL1A	17	44	SLV @ 02H	N/A	PSV @ 02H	42	N/A	N/A	0
PAL1A	17	106	SLV @ 02H	N/A	CSV @ 02H	43	0.61	0.99	0
PAL1A	17	110	SLV @ 02H	N/A	PSV @ 02H	44	N/A	N/A	0
PAL1A	17	112	SLV @ 02H	N/A	PSV @ 02H	45	N/A	N/A	0
PAL1A	17	114	SLV @ 02H	N/A	PSV @ 02H	46	N/A	N/A	0
PAL1A	17	118	SLV @ 02H	N/A	CSV @ 02H	47	-0.37	0.88	0
PAL1A	17	120	SLV @ 02H	N/A	PSV @ 02H	48	N/A	N/A	0
PAL1A	17	126	SLV @ 02H	N/A	PSV @ 02H	49	N/A	N/A	0
PAL1A	17	132	SLV @ 02H	N/A	CSV @ 02H	50	0.56	0.96	0
PAL1A	17	150	SLV @ 02H	N/A	CSV @ 02H	51	0.64	0.85	0
PAL1A	18	37	SLV @ 02H	N/A	PSV @ 02H	52	N/A	N/A	0
PAL1A	18	47	SLV @ 02H	N/A	CSV @ 02H	53	0.75	0.91	0
PAL1A	18	105	SLV @ 02H	N/A	CSV @ 02H	54	-0.80	1.01	0
PAL1A	18	117	SLV @ 02H	N/A	PSV @ 02H	55	N/A	N/A	0
PAL1A	18	123	SLV @ 02H	N/A	PSV @ 02H	56	N/A	N/A	0

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 02H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	18	129	SLV @ 02H	N/A	CSV @ 02H	57	-0.69	0.85	0
PAL1A	18	135	SLV @ 02H	N/A	CSV @ 02H	58	-0.45	-0.08	0
PAL1A	19	44	SLV @ 02H	N/A	PSV @ 02H	59	N/A	N/A	0
PAL1A	19	46	SLV @ 02H	N/A	PSV @ 02H	60	N/A	N/A	0
PAL1A	19	106	SLV @ 02H	N/A	CSV @ 02H	61	0.45	1.04	0
PAL1A	19	112	SLV @ 02H	N/A	PSV @ 02H	62	N/A	N/A	0
PAL1A	19	114	SLV @ 02H	N/A	PSV @ 02H	63	N/A	N/A	0
PAL1A	19	120	SLV @ 02H	N/A	CSV @ 02H	64	-0.27	0.16	0
PAL1A	19	126	SLV @ 02H	N/A	PSV @ 02H	65	N/A	N/A	0
PAL1A	19	148	SLV @ 02H	N/A	CSV @ 02H	66	0.45	0.93	0
PAL1A	20	15	SLV @ 02H	N/A	CSV @ 02H	67	0.72	0.93	0
PAL1A	21	102	SLV @ 02H	N/A	CSV @ 02H	68	0.64	0.93	0
PAL1A	21	104	SLV @ 02H	N/A	CSV @ 02H	69	0.19	0.91	0
PAL1A	21	110	SLV @ 02H	N/A	CSV @ 02H	70	0.08	0.88	0
PAL1A	21	118	SLV @ 02H	N/A	PSV @ 02H	71	N/A	N/A	0
PAL1A	22	105	SLV @ 02H	N/A	CSV @ 02H	72	-0.40	0.53	0
PAL1A	22	107	SLV @ 02H	N/A	PSV @ 02H	73	N/A	N/A	0
PAL1A	23	50	SLV @ 02H	N/A	PSV @ 02H	74	N/A	N/A	0
PAL1A	23	116	SLV @ 02H	N/A	PSV @ 02H	75	N/A	N/A	0
PAL1A	23	122	SLV @ 02H	N/A	PSV @ 02H	76	N/A	N/A	0
PAL1A	23	132	SLV @ 02H	N/A	CSV @ 02H	77	0.48	0.61	0
PAL1A	23	150	SLV @ 02H	N/A	CSV @ 02H	78	0.72	1.01	0
PAL1A	24	47	SLV @ 02H	N/A	PSV @ 02H	79	N/A	N/A	0
PAL1A	24	133	SLV @ 02H	N/A	PSV @ 02H	80	N/A	N/A	0
PAL1A	24	159	SLV @ 02H	N/A	CSV @ 02H	81	0.61	1.01	0
PAL1A	25	128	SLV @ 02H	N/A	CSV @ 02H	82	-0.35	0.93	0
PAL1A	25	140	SLV @ 02H	N/A	PSV @ 02H	83	N/A	N/A	0
PAL1A	25	154	SLV @ 02H	N/A	CSV @ 02H	84	0.75	0.93	0

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 02H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	26	117	SLV @ 02H	N/A	PSV @ 02H	85	N/A	N/A	0
PAL1A	26	139	SLV @ 02H	N/A	PSV @ 02H	86	N/A	N/A	0
PAL1A	27	46	SLV @ 02H	N/A	PSV @ 02H	87	N/A	N/A	0
PAL1A	27	104	SLV @ 02H	N/A	CSV @ 02H	88	0.69	0.93	0
PAL1A	27	110	SLV @ 02H	N/A	CSV @ 02H	89	0.08	1.01	0
PAL1A	27	114	SLV @ 02H	N/A	CSV @ 02H	90	-0.80	1.04	0
PAL1A	27	134	SLV @ 02H	N/A	CSV @ 02H	91	-0.08	0.21	0
PAL1A	27	152	SLV @ 02H	N/A	CSV @ 02H	92	0.16	0.85	0
PAL1A	28	55	SLV @ 02H	N/A	PSV @ 02H	93	N/A	N/A	0
PAL1A	28	63	SLV @ 02H	N/A	PSV @ 02H	94	N/A	N/A	0
PAL1A	28	105	SLV @ 02H	N/A	CSV @ 02H	95	-0.69	0.08	0
PAL1A	29	28	SLV @ 02H	N/A	PSV @ 02H	96	N/A	N/A	0
PAL1A	29	52	SLV @ 02H	N/A	PSV @ 02H	97	N/A	N/A	0
PAL1A	29	102	SLV @ 02H	N/A	CSV @ 02H	98	-0.80	0.75	0
PAL1A	29	104	SLV @ 02H	N/A	CSV @ 02H	99	-0.93	0.96	0
PAL1A	29	106	SLV @ 02H	N/A	CSV @ 02H	100	-0.67	0.93	0
PAL1A	29	130	SLV @ 02H	N/A	CSV @ 02H	101	-0.03	1.04	0
PAL1A	29	152	SLV @ 02H	N/A	CSV @ 02H	102	0.29	1.04	0
PAL1A	31	54	SLV @ 02H	N/A	CSV @ 02H	103	0.91	1.04	0
PAL1A	32	103	SLV @ 02H	N/A	CSV @ 02H	104	0.16	0.99	0
PAL1A	32	105	SLV @ 02H	N/A	CSV @ 02H	105	-0.13	0.59	0
PAL1A	32	107	SLV @ 02H	N/A	CSV @ 02H	106	-0.88	0.99	0
PAL1A	32	113	SLV @ 02H	N/A	PSV @ 02H	107	N/A	N/A	0
PAL1A	32	155	SLV @ 02H	N/A	CSV @ 02H	108	0.64	1.07	0
PAL1A	33	16	SLV @ 02H	N/A	CSV @ 02H	109	-0.96	-0.85	0
PAL1A	33	26	SLV @ 02H	N/A	PSV @ 02H	110	N/A	N/A	0
PAL1A	33	56	SLV @ 02H	N/A	PSV @ 02H	111	N/A	N/A	0
PAL1A	33	106	SLV @ 02H	N/A	CSV @ 02H	112	-0.77	-0.11	0

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Palisades Unit 1 - 1D28 - S/G 1A

RTS WITH MECHANICAL SLEEVE LIST - 02H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.

4. All tubes on the above list are identified for "RTS with sleeves" and are from tubes originally plugged from in-service inspections per 51-9388329-001 (Appendix B, Table B-1) and de-plugged on both legs during 1D28. The tubes on the above list have had bobbin and +Point ECT acquired and analyzed on both the hot leg and cold leg including the straight section from the tube end to the uppermost support in each tube, and the "square bend" region (defined as starting at +1.75" above the center of the uppermost eggcrate support in each tube) with inspections performed as specified in the Degradation Assessment (51-9378492-000) where applicable.

5. The sleeving strategy implemented at 1D28 uses "corrective" sleeve (CSV) and "preventative" sleeves (PSV) per 51-9388851-001 based on whether a repairable flaw (i.e., volumetric indications ≥40%TW or crack-like indications) is identified with ECT at the support location.
The criteria for a "corrective" sleeve based on review of the ECT data is as follows:
a. The repairable flaw must be located within the center 3" of the sleeve assuming 0.75" uncertainty on either end of the sleeve for the 14.5" sleeve; therefore, the flaw extents must be within +/- 1.5" of the center of the support.
b. The repairable flaw must be located at hot leg eggcrate support 01H/02H/03H/04H for tubes in Rows 1-17 or 01H/02H/03H/04H/05H for tubes in Rows 18-138.

The criteria for a "preventative" sleeve based on review of the ECT data is as follows:
a. There <u>are no</u> repairable flaws at the hot leg eggcrate support for this support elevation
b. There <u>are</u> repairable flaws at a hot leg eggcrate support below this support elevation

6. For the tubes on the above list with corrective sleeves (CSV), the minimum and maximum extent of all flaws at the support are listed as measured from the center of the support from the profile sizing data.

7. The tubes on the above list can be "RTS with sleeves". The criteria for "RTS with sleeves" based on review of the ECT data, is as follows:
a. No volumetric indications ≥40%TW or crack-like indications located in the "square-bend" region
b. No volumetric indications ≥40%TW or crack-like indications located at the top-of-tubesheet
c. No volumetric indications ≥40%TW or crack-like indications located in the freespan outside of any hot leg eggcrate support
d. No volumetric indications ≥40%TW or crack-like indications located at the 05H eggcrate support in Rows 1-17 tubes
e. No volumetric indications ≥40%TW or crack-like indications located at any location along the cold leg

8. The indications in the tubes on the above list were not in-service during plant operation of Cycle 28 and are not required to be screened against the in situ screening criteria. Therefore, none of the indications in the above require in situ testing.

9. Post-sleeving ECT Bobbin will be performed on the tubes on the above list for positional verification. Post-sleeving ECT +Point will be performed on the tubes on the above list over the length of the sleeve to obtain a baseline of the ECT data.

Approvals:

Craig Kelley 7/8/25 2:24 PM

Framatome Integrity Engineering

7/8/2025 15:00

Framatome Data Management

7/8/2025 2:33 PM

Framatome Lead Analyst

7/8/2025 2:35 pm

Utility Representative

7/10/25

Ambar Rodriguez

7/10/25

7/8/2025 2:13 PM

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Palisades Unit 1 - 1D28 - S/G 1A

MECHANICAL SLEEVE LIST - SLEEVE PROCESS VALIDATION (Rev. 5)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Stab	Rev.
PAL1A	24	39	SLV @ 02H	N/A	Sleeve Verification	1	NO	5
					Totals:	1	0	

Notes (Rev. 5):

1. This list is only for tubes with sleeves intalled for process verification and positional verification only at the 2nd support (02H). The sleeves on this list will be installed:
   a) **After** all sleeve installations at the 3rd support (03H) have been completed.
   b) **Prior** to any sleeves installed at the 2nd support (02H) in tubes that are to be returned-to-service with sleeves.
2. All tubes shall be sleeved using the Alloy 690 Sleeve P/N 8164714-002 (14.5" nominal length).
3. The indications in the tubes on the above list have been screened against the in situ screening criteria. None of the indications in the above list require in situ testing.
4. The tubes on the above list have been reviewed for skip rolls, over expansions, dents, bulges and additional indications. No such anomalies or indications were detected that would prohibit installation of a sleeve.
5. Sleeves on the above list are installed for process verification and positional verification only and are not being used to return the tube to service. All tubes on the list shall be plugged after all post-installation activities are complete
6. Post-sleeving ECT Bobbin will be performed on the tubes on the above list for positional verification.
7. Data Management has confirmed that these tubes are included in repair scopes and planned for plugging prior to the unit returning to service.

Approvals:

Craig Kelley 7/8/2025 3:38PM

Framatome Integrity Engineering

William C Wolters 07/08/2025 1020

Framatome Data Management

Kendall Johnson 3:42 P.M. 7/8/2025

Framatome Lead Analyst

Robby Griffin

7/8/2025 3:42pm

Utility Representative

7/10/25

Ambar Rodriguez

7/10/25

7/8/2025 3:38 PM

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Palisades Unit 1 - 1D28 - S/G 1A

RTS WITH MECHANICAL SLEEVE LIST - 02H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	3	52	SLV @ 02H	N/A	PSV @ 02H	1	N/A	N/A	0
PAL1A	6	107	SLV @ 02H	N/A	PSV @ 02H	2	N/A	N/A	0
PAL1A	8	111	SLV @ 02H	N/A	CSV @ 02H	3	-0.74	0.72	0
PAL1A	9	52	SLV @ 02H	N/A	PSV @ 02H	4	N/A	N/A	0
PAL1A	11	126	SLV @ 02H	N/A	CSV @ 02H	5	-0.4	0.94	0
PAL1A	15	114	SLV @ 02H	N/A	CSV @ 02H	6	-0.94	0.82	0
PAL1A	16	43	SLV @ 02H	N/A	PSV @ 02H	7	N/A	N/A	0
PAL1A	16	127	SLV @ 02H	N/A	CSV @ 02H	8	-1.01	-0.17	0
PAL1A	17	62	SLV @ 02H	N/A	PSV @ 02H	9	N/A	N/A	0
PAL1A	19	118	SLV @ 02H	N/A	PSV @ 02H	10	N/A	N/A	0
PAL1A	21	108	SLV @ 02H	N/A	PSV @ 02H	11	N/A	N/A	0
PAL1A	23	106	SLV @ 02H	N/A	CSV @ 02H	12	-0.96	-0.67	0
PAL1A	29	108	SLV @ 02H	N/A	CSV @ 02H	13	-1.04	1.04	0
PAL1A	31	112	SLV @ 02H	N/A	CSV @ 02H	14	-1.01	0.94	0
PAL1A	40	103	SLV @ 02H	N/A	CSV @ 02H	15	-0.92	0.99	0
PAL1A	60	71	SLV @ 02H	N/A	PSV @ 02H	16	N/A	N/A	0
PAL1A	80	83	SLV @ 02H	N/A	CSV @ 02H	17	-1.04	-0.05	0
PAL1A	92	83	SLV @ 02H	N/A	PSV @ 02H	18	N/A	N/A	0
PAL1A	93	92	SLV @ 02H	N/A	PSV @ 02H	19	N/A	N/A	0
PAL1A	100	93	SLV @ 02H	N/A	PSV @ 02H	20	N/A	N/A	0
PAL1A	121	88	SLV @ 02H	N/A	CSV @ 02H	21	-0.59	0.2	0
PAL1A	133	94	SLV @ 02H	N/A	PSV @ 02H	22	N/A	N/A	0
					Totals:	22			

Notes (Rev. 0):

1. This "returning-to-service (RTS) with sleeves" list is only for sleeves to be installed at the 2nd hot leg support (02H) and will be installed:
   a) **After** all tubes on the above list have had a sleeve installed at 03H
   b) **Prior** to any sleeves installed at a lower hot leg support (i.e., 01H).

2. All tubes shall be sleeved using the Alloy 690 Sleeve P/N 8164714-002 (14.5" nominal length).

3. All tubes on the above list had a successful Sleeve GoGage result at the support location per 03-8169881-000; therefore, there are no clearance issues that would prevent the installation of a sleeve.

A.18 SGA 03H Sleeve Lists

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Palisades Unit 1 - 1D28 - S/G 1A

MECHANICAL SLEEVE LIST - SLEEVE PROCESS VALIDATION (Rev. 4)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Stab	Rev.
PAL1A	24	39	SLV @ 03H	N/A	Sleeve Verification	1	NO	4
					Totals:	1	0	

Notes (Rev. 3):

1. This list is only for tubes with sleeves intalled for process verification and positional verification only at the 3rd support (03H). The sleeves on this list will be installed:
   a) **After** all sleeve installations at the 4th support (04H) have been completed.
   b) **Prior** to any sleeves installed at the 3rd support (03H) in tubes that are to be returned-to-service with sleeves.
2. All tubes shall be sleeved using the Alloy 690 Sleeve P/N 8164714-002 (14.5" nominal length).
3. The indications in the tubes on the above list have been screened against the in situ screening criteria. None of the indications in the above list require in situ testing.
4. The tubes on the above list have been reviewed for skip rolls, over expansions, dents, bulges and additional indications. No such anomalies or indications were detected that would prohibit installation of a sleeve.
5. Sleeves on the above list are installed for process verification and positional verification only and are not being used to return the tube to service. All tubes on the list shall be plugged after all post-installation activities are complete
6. Post-sleeving ECT Bobbin will be performed on the tubes on the above list for positional verification.
7. Data Management has confirmed that these tubes are included in repair scopes and planned for plugging prior to the unit returning to service.

Approvals:

Craig Kelley 6/26/25 11:55 AM
Framatome Integrity Engineering

William C. Wolters 6/26/2025 13:56
Framatome Data Management

K S LaRem 6-26-25 12:37
Framatome Lead Analyst
Kevin S. LaRean

Utility Level III - D. Judd Wadzinski 6/26/25 1240
Utility Representative

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Donald Powel 6/30/25

6/26/2025 11:55 AM Page 1 of 1

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Palisades Unit 1 - 1D28 - S/G 1A

RTS WITH MECHANICAL SLEEVE LIST - 03H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	3	52	SLV @ 03H	N/A	CSV @ 03H	1	0.72	0.94	0
PAL1A	4	17	SLV @ 03H	N/A	CSV @ 03H	2	-0.54	0.96	0
PAL1A	6	107	SLV @ 03H	N/A	CSV @ 03H	3	-0.87	0.74	0
PAL1A	8	111	SLV @ 03H	N/A	CSV @ 03H	4	-0.35	1.01	0
PAL1A	9	52	SLV @ 03H	N/A	PSV @ 03H	5	N/A	N/A	0
PAL1A	11	126	SLV @ 03H	N/A	PSV @ 03H	6	N/A	N/A	0
PAL1A	15	114	SLV @ 03H	N/A	CSV @ 03H	7	-0.67	0.89	0
PAL1A	16	43	SLV @ 03H	N/A	PSV @ 03H	8	N/A	N/A	0
PAL1A	16	127	SLV @ 03H	N/A	CSV @ 03H	9	0.22	0.99	0
PAL1A	17	62	SLV @ 03H	N/A	PSV @ 03H	10	N/A	N/A	0
PAL1A	19	118	SLV @ 03H	N/A	PSV @ 03H	11	N/A	N/A	0
PAL1A	21	108	SLV @ 03H	N/A	CSV @ 03H	12	0.72	0.96	0
PAL1A	23	106	SLV @ 03H	N/A	CSV @ 03H	13	-0.92	-0.3	0
PAL1A	29	108	SLV @ 03H	N/A	CSV @ 03H	14	-0.54	1.09	0
PAL1A	31	112	SLV @ 03H	N/A	PSV @ 03H	15	N/A	N/A	0
PAL1A	40	103	SLV @ 03H	N/A	CSV @ 03H	16	-0.96	-0.15	0
PAL1A	60	71	SLV @ 03H	N/A	PSV @ 03H	17	N/A	N/A	0
PAL1A	80	83	SLV @ 03H	N/A	PSV @ 03H	18	N/A	N/A	0
PAL1A	92	83	SLV @ 03H	N/A	PSV @ 03H	19	N/A	N/A	0
PAL1A	93	92	SLV @ 03H	N/A	PSV @ 03H	20	N/A	N/A	0
PAL1A	100	93	SLV @ 03H	N/A	PSV @ 03H	21	N/A	N/A	0
PAL1A	121	88	SLV @ 03H	N/A	PSV @ 03H	22	N/A	N/A	0
PAL1A	133	94	SLV @ 03H	N/A	PSV @ 03H	23	N/A	N/A	0
					Totals:	23			

Notes (Rev. 0):

1. This "returning-to-service (RTS) with sleeves" list is only for sleeves to be installed at the 3rd hot leg support (03H) and will be installed:
   a) **After** all tubes on the above list have had a sleeve installed at 04H
   b) **Prior** to any sleeves installed at a lower hot leg support (i.e., 02H, 01H).

2. All tubes shall be sleeved using the Alloy 690 Sleeve P/N 8164714-002 (14.5" nominal length).

3. All tubes on the above list had a successful Sleeve GoGage result at the support location per 03-8169881-000; therefore, there are no clearance issues that would prevent the installation of a sleeve.

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Palisades Unit 1 - 1D28 - S/G 1A

RTS WITH MECHANICAL SLEEVE LIST - 03H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.

4. All tubes on the above list are identified for "RTS with sleeves" and are from tubes originally plugged from in-service inspections per 51-9388329-001 (Appendix B, Table B-1) and de-plugged on both legs during 1D28. The tubes on the above list have had bobbin and +Point ECT acquired and analyzed on both the hot leg and cold leg including the straight section from the tube end to the uppermost support in each tube, and the "square bend" region (defined as starting at +1.75" above the center of the uppermost eggcrate support in each tube) with inspections performed as specified in the Degradation Assessment (51-9378492-000) where applicable.

5. The sleeving strategy implemented at 1D28 uses "corrective" sleeve (CSV) and "preventative" sleeves (PSV) per 51-9388851-001 based on whether a repairable flaw (i.e., volumetric indications ≥40%TW or crack-like indications) is identified with ECT at the support location.
The criteria for a "corrective" sleeve based on review of the ECT data is as follows:
a. The repairable flaw must be located within the center 3" of the sleeve assuming 0.75" uncertainty on either end of the sleeve for the 14.5" sleeve; therefore, the flaw extents must be within +/- 1.5" of the center of the support.
b. The repairable flaw must be located at hot leg eggcrate support 01H/02H/03H/04H for tubes in Rows 1-17 or 01H/02H/03H/04H/05H for tubes in Rows 18-138.

The criteria for a "preventative" sleeve based on review of the ECT data is as follows:
a. There <u>are no</u> repairable flaws at the hot leg eggcrate support for this support elevation
b. There <u>are</u> repairable flaws at a hot leg eggcrate support below this support elevation

6. For the tubes on the above list with corrective sleeves (CSV), the minimum and maximum extent of all flaws at the support are listed as measured from the center of the support from the profile sizing data.

7. The tubes on the above list can be "RTS with sleeves". The criteria for "RTS with sleeves" based on review of the ECT data, is as follows:
a. No volumetric indications ≥40%TW or crack-like indications located in the "square-bend" region
b. No volumetric indications ≥40%TW or crack-like indications located at the top-of-tubesheet
c. No volumetric indications ≥40%TW or crack-like indications located in the freespan outside of any hot leg eggcrate support
d. No volumetric indications ≥40%TW or crack-like indications located at the 05H eggcrate support in Rows 1-17 tubes
e. No volumetric indications ≥40%TW or crack-like indications located at any location along the cold leg

8. The indications in the tubes on the above list were not in-service during plant operation of Cycle 28 and are not required to be screened against the in situ screening criteria. Therefore, none of the indications in the above require in situ testing.

9. Post-sleeving ECT Bobbin will be performed on the tubes on the above list for positional verification. Post-sleeving ECT +Point will be performed on the tubes on the above list over the length of the sleeve to obtain a baseline of the ECT data.

Approvals:

Craig Kelley 6/26/25 8:45 AM
Framatome Integrity Engineering

William P. Winters 0940 06/26/2025
Framatome Data Management

0925 6-26-2025
Framatome Lead Analyst
Kevin S. La Rose

Utility Level III
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6/26/25 0920
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6/30/25
Donald Powel

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 03H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	1	156	SLV @ 03H	N/A	PSV @ 03H	1	N/A	N/A	0
PAL1A	2	53	SLV @ 03H	N/A	CSV @ 03H	2	0.45	1.04	0
PAL1A	3	114	SLV @ 03H	N/A	PSV @ 03H	3	N/A	N/A	0
PAL1A	4	15	SLV @ 03H	N/A	CSV @ 03H	4	-0.19	0.91	0
PAL1A	4	55	SLV @ 03H	N/A	PSV @ 03H	5	N/A	N/A	0
PAL1A	4	113	SLV @ 03H	N/A	PSV @ 03H	6	N/A	N/A	0
PAL1A	4	117	SLV @ 03H	N/A	PSV @ 03H	7	N/A	N/A	0
PAL1A	5	110	SLV @ 03H	N/A	CSV @ 03H	8	-0.35	-0.08	0
PAL1A	7	56	SLV @ 03H	N/A	PSV @ 03H	9	N/A	N/A	0
PAL1A	7	58	SLV @ 03H	N/A	PSV @ 03H	10	N/A	N/A	0
PAL1A	7	106	SLV @ 03H	N/A	CSV @ 03H	11	-0.91	-0.64	0
PAL1A	7	118	SLV @ 03H	N/A	CSV @ 03H	12	-0.51	0.96	0
PAL1A	7	122	SLV @ 03H	N/A	PSV @ 03H	13	N/A	N/A	0
PAL1A	8	13	SLV @ 03H	N/A	PSV @ 03H	14	N/A	N/A	0
PAL1A	8	107	SLV @ 03H	N/A	CSV @ 03H	15	-1.04	0.85	0
PAL1A	8	109	SLV @ 03H	N/A	CSV @ 03H	16	-0.67	0.99	0
PAL1A	8	113	SLV @ 03H	N/A	CSV @ 03H	17	-0.99	-0.27	0
PAL1A	8	117	SLV @ 03H	N/A	PSV @ 03H	18	N/A	N/A	0
PAL1A	8	121	SLV @ 03H	N/A	PSV @ 03H	19	N/A	N/A	0
PAL1A	9	130	SLV @ 03H	N/A	CSV @ 03H	20	0.56	0.88	0
PAL1A	10	19	SLV @ 03H	N/A	CSV @ 03H	21	-0.11	0.99	0
PAL1A	10	53	SLV @ 03H	N/A	PSV @ 03H	22	N/A	N/A	0
PAL1A	10	117	SLV @ 03H	N/A	CSV @ 03H	23	0.69	0.88	0
PAL1A	10	125	SLV @ 03H	N/A	PSV @ 03H	24	N/A	N/A	0
PAL1A	10	129	SLV @ 03H	N/A	CSV @ 03H	25	0.37	0.93	0
PAL1A	10	133	SLV @ 03H	N/A	PSV @ 03H	26	N/A	N/A	0
PAL1A	10	153	SLV @ 03H	N/A	PSV @ 03H	27	N/A	N/A	0
PAL1A	11	40	SLV @ 03H	N/A	PSV @ 03H	28	N/A	N/A	0

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Palisades Unit 1 - 1D28 - S/G 1A

IN-SERVICE MECHANICAL SLEEVE LIST - 03H (Rev. 0)

S/G	Row	Col	Hot Leg	Cold Leg	Reason for Tube Repair	Sleeve Qty.	Flaw Min Ext.	Flaw Max Ext.	Rev.
PAL1A	11	50	SLV @ 03H	N/A	PSV @ 03H	29	N/A	N/A	0
PAL1A	11	116	SLV @ 03H	N/A	PSV @ 03H	30	N/A	N/A	0
PAL1A	11	118	SLV @ 03H	N/A	CSV @ 03H	31	0.21	0.53	0
PAL1A	11	120	SLV @ 03H	N/A	PSV @ 03H	32	N/A	N/A	0
PAL1A	11	134	SLV @ 03H	N/A	PSV @ 03H	33	N/A	N/A	0
PAL1A	11	146	SLV @ 03H	N/A	PSV @ 03H	34	N/A	N/A	0
PAL1A	12	19	SLV @ 03H	N/A	CSV @ 03H	35	-0.69	-0.05	0
PAL1A	12	111	SLV @ 03H	N/A	CSV @ 03H	36	0.19	0.99	0
PAL1A	12	113	SLV @ 03H	N/A	PSV @ 03H	37	N/A	N/A	0
PAL1A	12	155	SLV @ 03H	N/A	PSV @ 03H	38	N/A	N/A	0
PAL1A	13	58	SLV @ 03H	N/A	CSV @ 03H	39	-0.96	-0.48	0
PAL1A	13	124	SLV @ 03H	N/A	PSV @ 03H	40	N/A	N/A	0
PAL1A	14	5	SLV @ 03H	N/A	CSV @ 03H	41	-0.77	-0.59	0
PAL1A	14	107	SLV @ 03H	N/A	CSV @ 03H	42	0.75	1.01	0
PAL1A	14	117	SLV @ 03H	N/A	PSV @ 03H	43	N/A	N/A	0
PAL1A	14	121	SLV @ 03H	N/A	PSV @ 03H	44	N/A	N/A	0
PAL1A	15	48	SLV @ 03H	N/A	PSV @ 03H	45	N/A	N/A	0
PAL1A	15	50	SLV @ 03H	N/A	PSV @ 03H	46	N/A	N/A	0
PAL1A	15	104	SLV @ 03H	N/A	CSV @ 03H	47	-1.07	-0.59	0
PAL1A	15	110	SLV @ 03H	N/A	PSV @ 03H	48	N/A	N/A	0
PAL1A	15	112	SLV @ 03H	N/A	PSV @ 03H	49	N/A	N/A	0
PAL1A	15	116	SLV @ 03H	N/A	CSV @ 03H	50	0.59	0.99	0
PAL1A	15	124	SLV @ 03H	N/A	PSV @ 03H	51	N/A	N/A	0
PAL1A	15	152	SLV @ 03H	N/A	PSV @ 03H	52	N/A	N/A	0
PAL1A	15	158	SLV @ 03H	N/A	PSV @ 03H	53	N/A	N/A	0
PAL1A	16	109	SLV @ 03H	N/A	PSV @ 03H	54	N/A	N/A	0
PAL1A	16	113	SLV @ 03H	N/A	CSV @ 03H	55	-0.27	0.56	0
PAL1A	16	115	SLV @ 03H	N/A	PSV @ 03H	56	N/A	N/A	0