Proposed Fleet-wide Performance Monitoring Plan for Steam Generator and Pressurizer Nozzle Inner Radii, Nozzle to Shell Weld, & Pressure Vessel Weld Examinations

Optimization of Select NDE Examination Requirements

Nuclear

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Topics

- Brief Project Background / Overview
- Industry's "Proposed" Strategic Shift to a Fleet-wide Performance Monitoring (PM) Approach
- Proposed Fleet-wide Performance Monitoring
  - How Many?
  - Which Ones?
  - When?
- Topical Report and Letter Addendum Overview
- Industry Milestone Interactions and Schedule

Brief Project Background / Overview

Background & Impetus

There are many examinations being performed that are **perceived** to have **low value** based on a history of **few or no relevant indications** being identified during routine inspections **on prescribed intervals.**

When were these intervals established?

- Generally, 40+ years ago during the construction and early operation era

Who established these intervals?

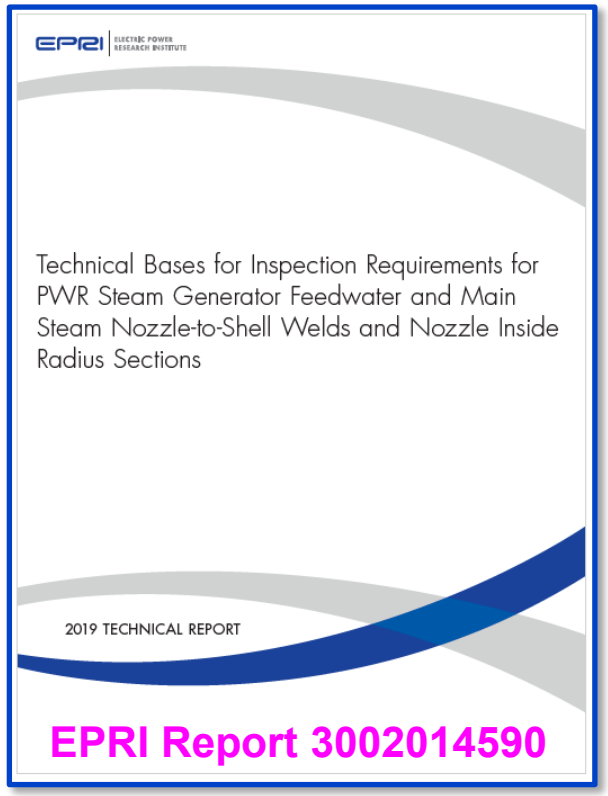
- Codes and Standards organizations

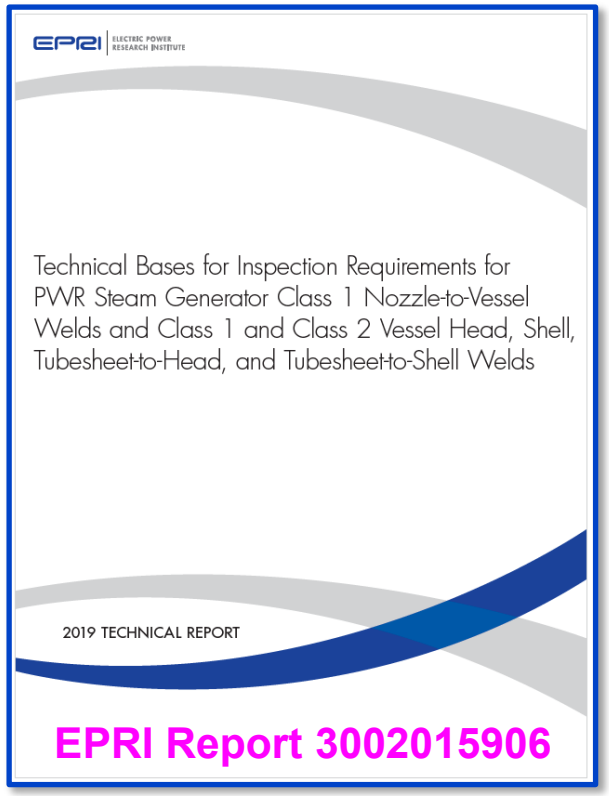
How were these intervals established?

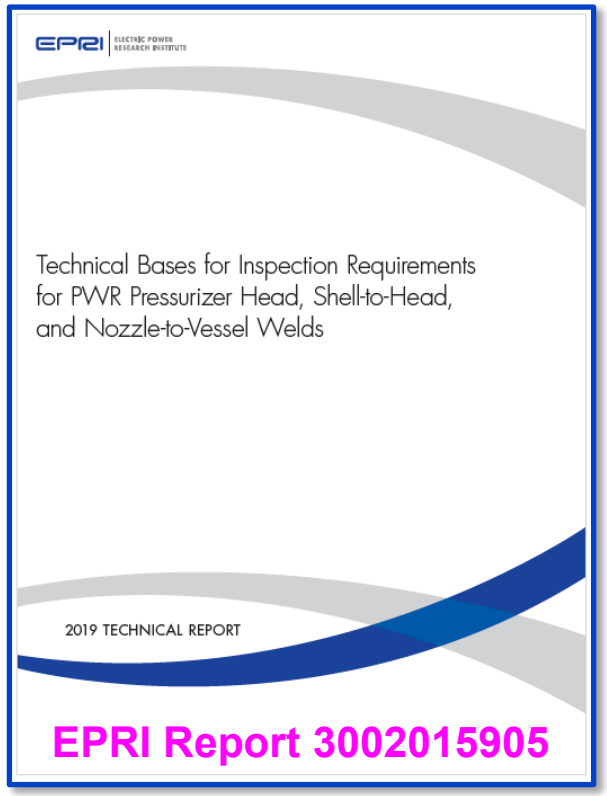
- Engineering judgment
- No supporting technical bases were developed

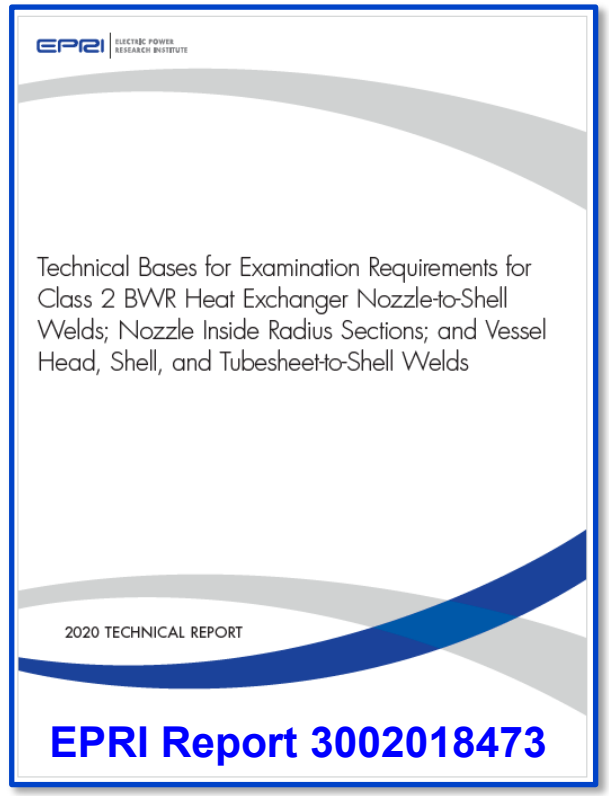
Resultant Technical Bases Reports (1/2)

- EPRI developed a **series of technical reports** establishing the technical bases **for optimizing examination intervals** for the components listed in each report title below.
- Following publication of the EPRI technical bases for optimization of NDE examination intervals, several pilot plants submitted “Requests for Alternative” to the US NRC and were granted permission to use the new intervals via Safety Evaluation Reports (SERs)









Resultant Technical Bases Reports (2/2)

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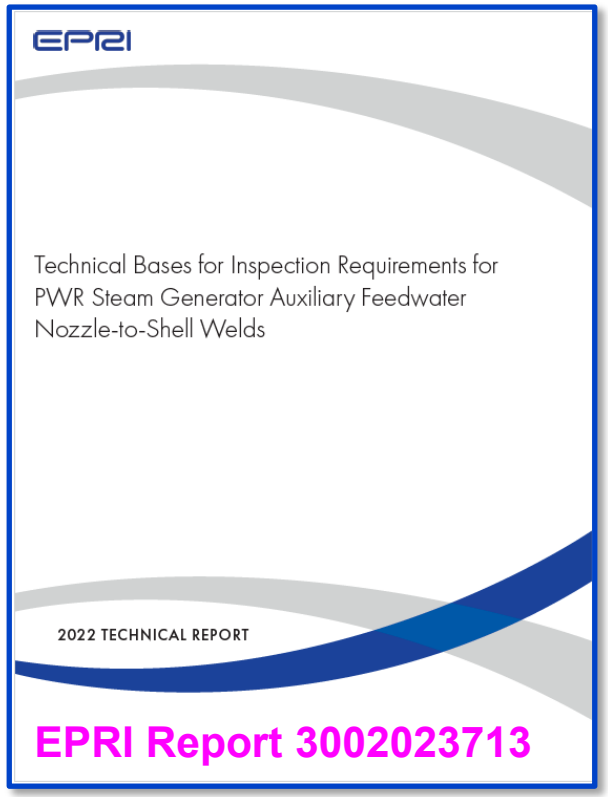
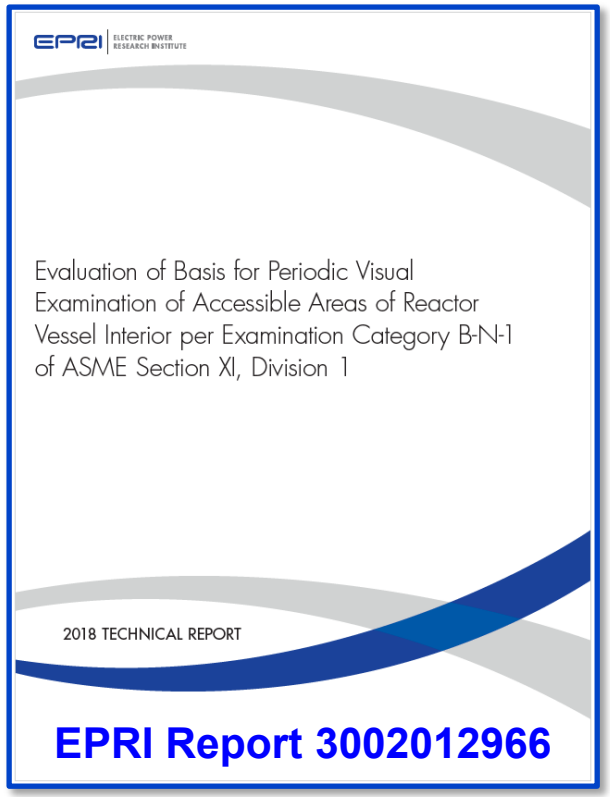
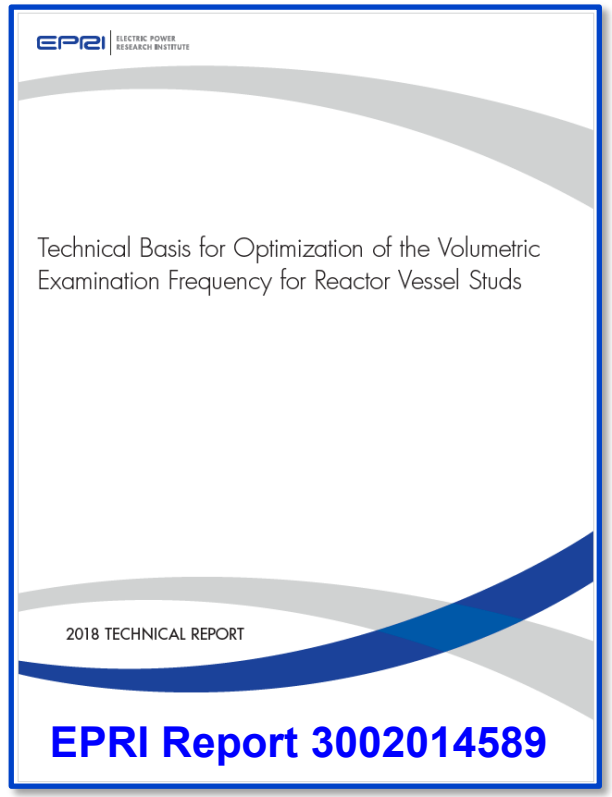
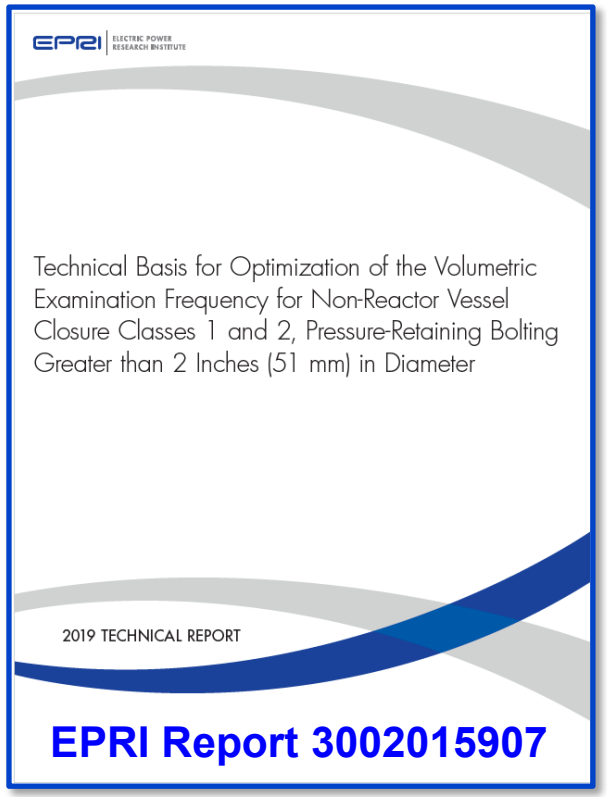


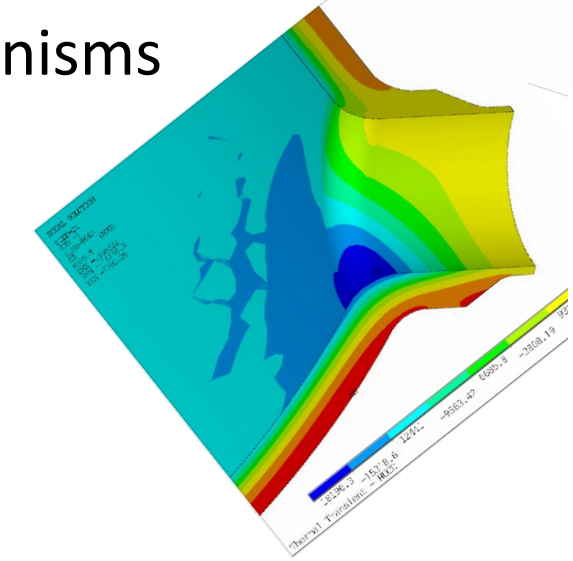






Technical Bases Overview

- Introduction
- Review of Previous Related Work
- Review of Inspection History and Examination Effectiveness
- Survey of Components and Selection of Representative Components for Analysis
- Material Properties, Operating Loads, and Transients
- Evaluation of Potential Degradation Mechanisms
- Component Stress Analysis
- Probabilistic and/or Deterministic Fracture Mechanics Evaluation
- Plant Specific Applicability
- Summary and Conclusions



Sensitivity Study Variable	Importance Factor (%) for Probability of Leakage
Fatigue Crack Growth Rate Coefficient	87.82
Crack Length	9.39
Crack Depth	0.00
Fatigue Crack Growth Rate Threshold	0.01
Fracture Toughness	0.01
Crack Face Pressure	0.04
Pressure	1.82
Residual Stress	0.00
Heat-Up/Cooldown	0.01
Loss of Load	0.04
Load Increase (5%)	0.69
Load Decrease (5%)	0.16

Objective

Optimize component examination requirements using:

- Historical operating experience,
- Historical inspection data and results,
- Fundamental engineering methods,
- Modern day analysis tools to develop robust and comprehensive technical bases, and
- All without any adverse impact to the safe and reliable operation of nuclear facilities

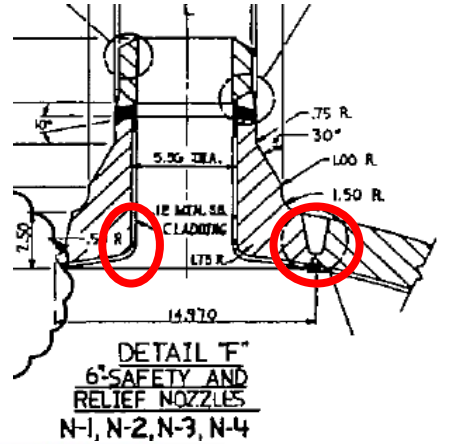
Generalized Technical Bases Conclusions

- ✓ Analyses showed success in **considering 80 years of operation**
- ✓ Results are **acceptable relative to safety margins** (probability of leak or rupture < $1x10^{-6}$ failures per reactor year of operation)
- ✓ Results **support mitigation of personnel health and safety risks** through reduction of examination frequency
- ✓ Results **promote ALARA** through reduction of reduction of examination frequency
- ✓ Results allow **resources and schedule to be focused on higher priority** outage activities

Technical bases support optimizing examination intervals <u>out to 30 years</u>

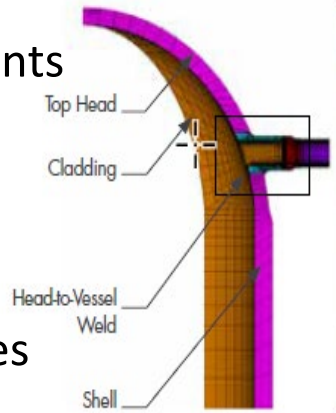
Initial US Implementation Strategy & Benefits

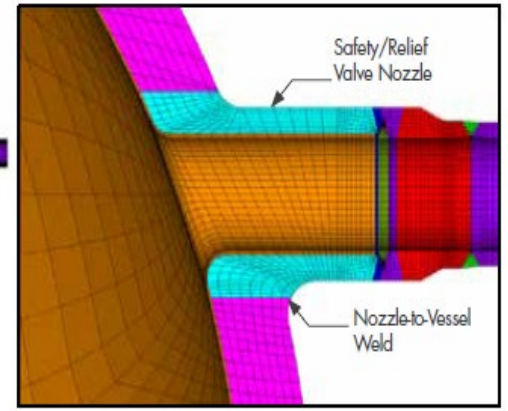
Industry leading utilities piloted the implementation of a series of EPRI NDE technical reports establishing the technical bases for optimizing inspection intervals of mandatory ASME component examination requirements, paving the way for other industry members to follow.



Highlights of Implementation

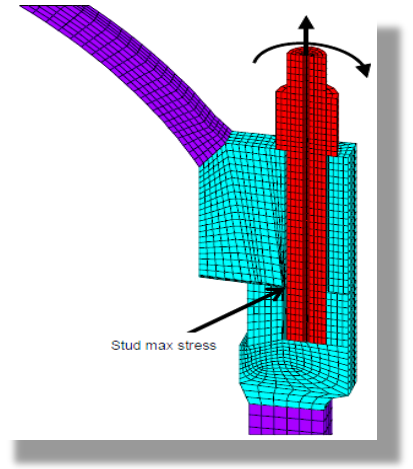
1. Used the NRC Request for Alternative process
2. First-of-a-Kind applications utilizing “PROMISE” code for non-RPV components as the cornerstone for the PFM analysis
3. SERs received for all pilots allowing for optimized examination intervals up to 30 years
4. Current ASME Code actions leverage Technical Bases and SERs
5. EPRI has compiled a Lessons Learned document and relief request templates to support future submittals





Benefits

1. Maximize overall plant safety by focusing resources where they are needed (higher valued examinations)
2. Minimize health & safety risk profile of plant personnel by reducing low-value work activities
3. Potential dose savings (per unit) is on the order of multiple man-rem years
4. Potential cost savings (per unit) is on the order of millions of dollars



Industry's "Proposed" Strategic Shift to a Fleet-wide Performance Monitoring (PM) Approach

Targeted Technical Bases for Proposed Fleet-wide Performance Monitoring Examination Approach

- Focus is on Steam Generator (SG) and Pressurizer (PZR) component item examinations:
  - **EPRI 3002014590** - *Technical Bases for Inspection Requirements for PWR Steam Generator Feedwater and Main Steam Nozzle-to-Shell Welds and Nozzle Inside Radius Sections*
  - **EPRI 3002015906** - *Technical Bases for Inspection Requirements for PWR Steam Generator Class 1 Nozzle-to-Vessel Welds and Class 1 and Class 2 Vessel Head, Shell, Tubesheet-to-Head and Tubesheet-to-Shell Welds*
  - **EPRI 3002023713** - *Technical Bases for Inspection Requirements for PWR Steam Generator Auxiliary Feedwater Nozzle-to-Shell Welds*
  - **EPRI 3002015905** - *Technical Bases for Inspection Requirements for PWR Pressurizer Vessel Head, Shell –to-Head and Nozzle-to-Vessel Welds*
- The probabilistic and deterministic analyses for 80-year operating life and produced results that support exceeding the benchmark safety threshold of **$1X10^{-6}$**.

Shift in Implementation Strategy

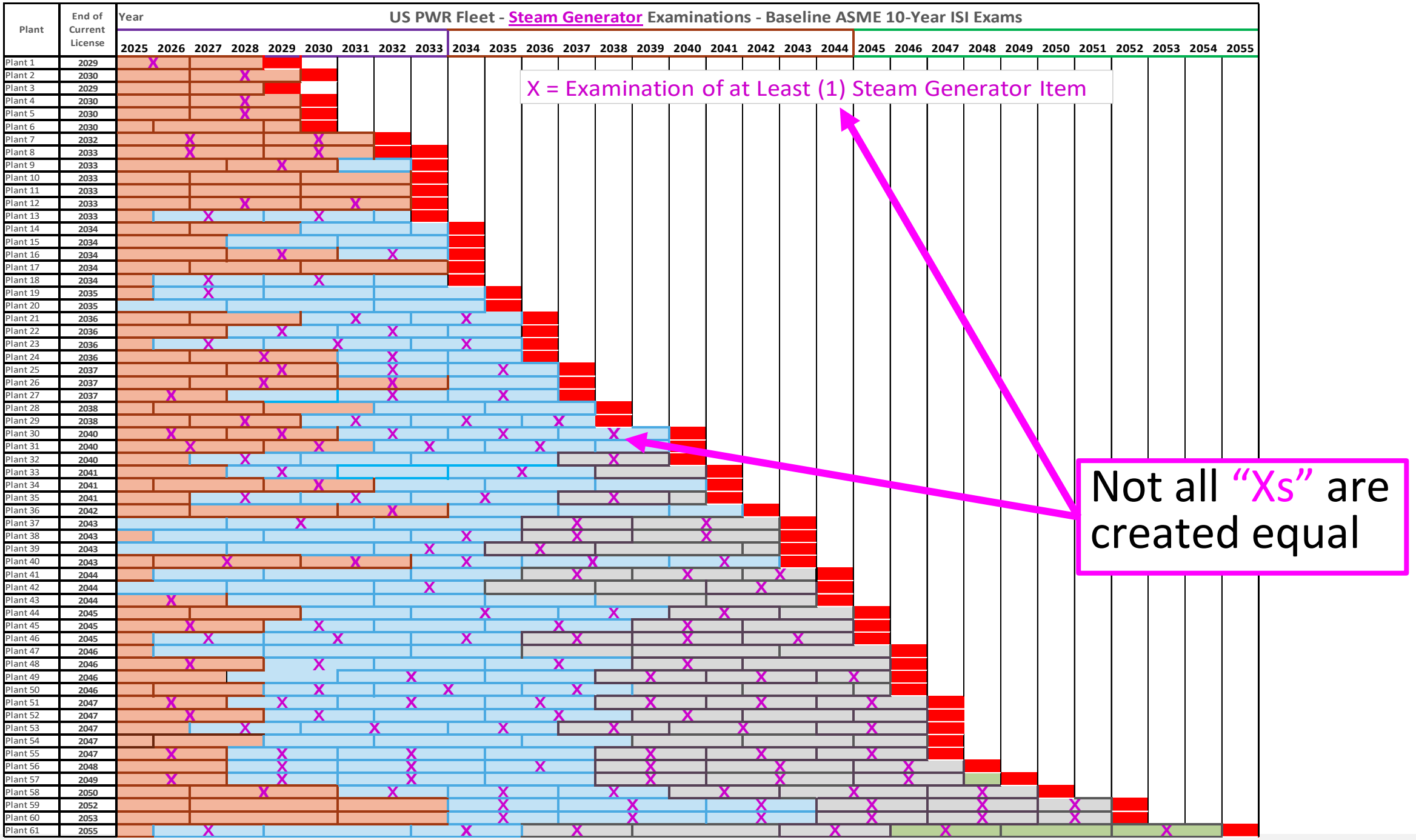
- The US started with pilot plant applications to assess feasibility of the technical bases and process
- Relative to steam generators (SG) and pressurizers (PZR);
  - 28 and 29, respectively, out of 61 plant sites have followed the pilot plants lead and submitted for relief through the US regulatory process
- Collectively, the US utilities have decided to propose a shift in approach, with the desire to implement a fleet-wide PM plan
- This will facilitate a broader, streamlined strategy, which will benefit both the industry and US Regulator.
- This fleet-wide approach carries with it some additional considerations for overall performance monitoring of the SG and PZR components across the US fleet.

The US Industry's Understanding of NRC Concerns

- How does the fleet-wide PM plan conform to:
  1. The NRC's binomial distribution model defining a minimum number of examinations that need to occur across the fleet during the current operating licenses for all plants.
  2. Sufficient, continuous collection of examination data points, over the range of time aligned with current operating licenses for all plants, to identify known and unknown degradation mechanisms in a timely manner.
- The US utilities' proposed fleet-wide PM approach will address these two concerns.

Additional Considerations and Supporting Industry Data

- Surveys of the US fleet were conducted to collect in-service inspection (ISI) program information for “when” and “how many” of these examinations are planned for the entire fleet of US operating plants, through the remainder of their current operating licenses
- Survey data was charted, as a baseline, in a graphical timeline relative to each specific plant’s current operation license and commitment to perform ASME 10-year ISI examinations
- Survey data was further dissected and tabulated for the purposes of:
  - Establishing a baseline number of examination opportunities across the fleet
  - Understanding impact of current Safety Evaluation Report examination commitments and in-process Request for Alternative examination commitments
  - Collectively analyzing data for adherence to the NRC’s binomial distribution model



Tabulation of Steam Generator Survey Data (1/2)

Highlighted Plant # designates a plant with an SER or In-Process for SER

Plant Number	End of Current License	Design	SG Inspection Items per Interval	Remaining Intervals (= > 6 yrs)	Total # of Inspection Opporunities	Remaining Intervals (= > 6 yrs) w/ASME Inspections	SER PM Exam Commitments (# of Inspections)	Binomial Distrbution # of Inspections (Approx 38%)
Plant 1	2024	W4L	7	1	7	1		3
Plant 2	2025	W4L	7	1	7	1		3
Plant 3	2029	W2L	7	1	7	0	0	0
Plant 4	2030	W4L	11	1	11	1		4
Plant 5	2030	W2L	10	1	10	1		4
Plant 6	2030	W3L	10	1	10	0	0	0
Plant 7	2032	W3L	10	1	10	1		4
Plant 8	2033	W3L	10	1	10	1		4
Plant 9	2033	W4L	10	1	10	1		4
Plant 10	2033	B&W	6	1	6	0	0	0
Plant 11	2033	B&W	6	1	6	0	0	0
Plant 12	2033	W4L	7	1	7	1		3
Plant 13	2033	W2L	8	1	8	1		3
Plant 14	2034	CE	14	1	14	0	0	0
Plant 15	2034	B&W	10	1	10	0		0
Plant 16	2034	W4L	9	1	9	1		3
Plant 17	2034	B&W	6	1	6	0	0	0
Plant 18	2034	W2L	7	1	7	1		3
Plant 19	2035	W4L	6	1	6	1		2
Plant 20	2035	CE	18	1	18	0	0	0
Plant 21	2036	CE	14	1	14	1	0	5
Plant 22	2036	W3L	5	1	5	1		2
Plant 23	2036	CE	13	1	13	1		5
Plant 24	2036	W4L	7	1	7	1		3
Plant 25	2037	W4L	9	1	9	1		3
Plant 26	2037	B&W	8	1	8	1		3
Plant 27	2037	W3L	7	1	7	1	0	3
Plant 28	2038	CE	8	2	16	0	1	0
Plant 29	2038	W3L	8	2	16	2		6
Plant 30	2040	W3L	10	2	20	2		8

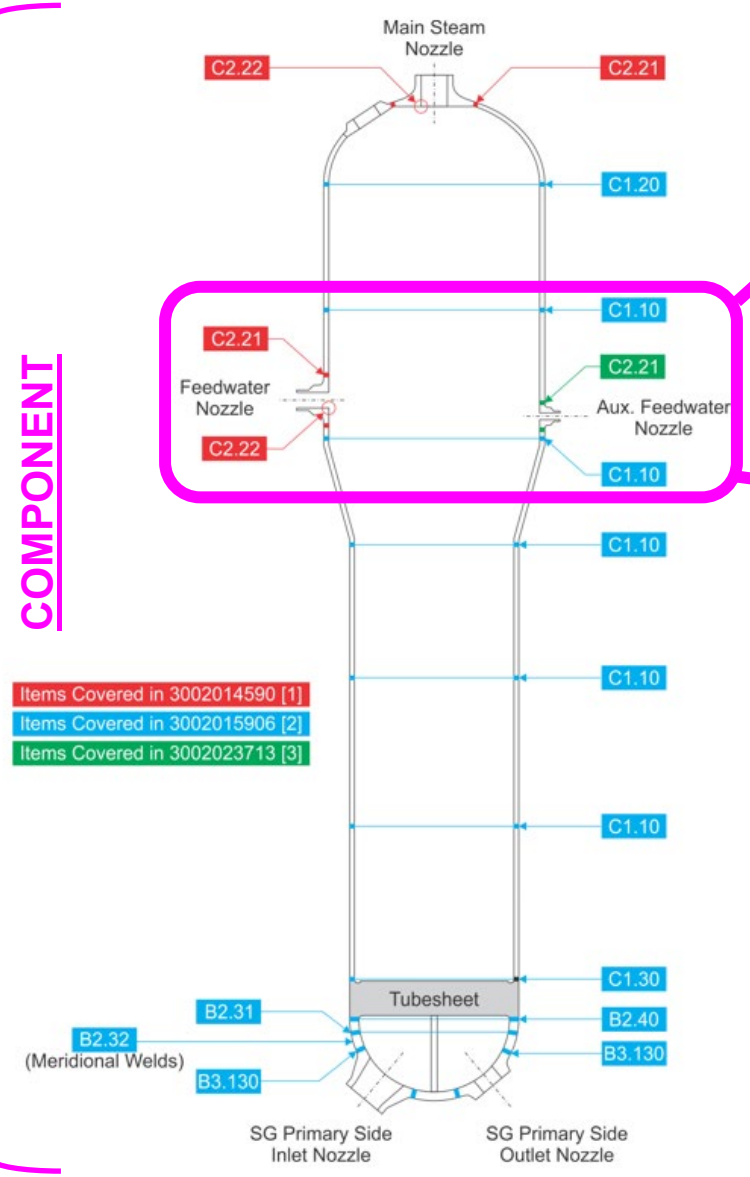
Tabulation of Steam Generator Survey Data (2/2)

Highlighted Plant # designates a plant with an SER or In-Process for SER

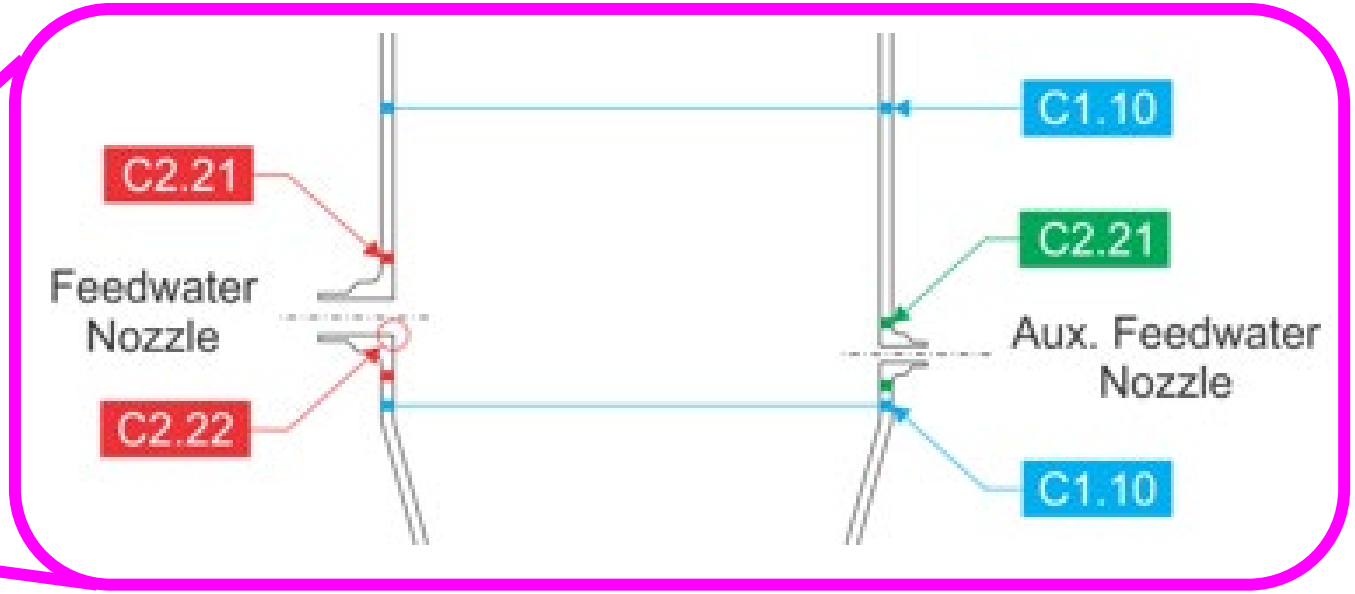
Plant Number	End of Current License	Design	SG Inspection Items per Interval	Remaining Intervals (= > 6 yrs)	Total # of Inspection Opporunities	Remaining Intervals (= > 6 yrs) w/ASME Inspections	SER PM Exam Commitments (# of Inspections)	Binomial Distrbution # of Inspections (Approx 38%)
Plant 31	2040	W4L	7	2	14	2		5
Plant 32	2040	W4L	5	2	10	2		4
Plant 33	2041	W3L	7	2	14	1		3
Plant 34	2041	W4L	5	2	10	0	1	0
Plant 35	2041	W4L	6	2	12	2	0	5
Plant 36	2042	W3L	7	2	14	1	4	3
Plant 37	2043	W4L	5	2	10	1	2	2
Plant 38	2043	W4L	9	2	18	1	2	3
Plant 39	2043	W4L	5	2	10	0	1	0
Plant 40	2043	CE	8	2	16	2		6
Plant 41	2044	W4L	7	2	14	1	0	3
Plant 42	2044	W4L	9	2	18	2		7
Plant 43	2044	CE	5	2	10	0	5	0
Plant 44	2045	W4L	11	1	11	1		4
Plant 45	2045	CE	22	2	44	2		17
Plant 46	2045	W4L	9	2	18	2		7
Plant 47	2046	W4L	9	2	18	0	0	0
Plant 48	2046	CE	22	2	44	2		17
Plant 49	2046	W3L	5	2	10	1	1	2
Plant 50	2046	W4L	7	2	14	1	0	3
Plant 51	2047	W3L	10	2	20	2		8
Plant 52	2047	CE	22	2	44	2		17
Plant 53	2047	W4L	11	2	22	2		8
Plant 54	2047	W4L	9	2	18	0	0	0
Plant 55	2047	W4L	8	2	16	1		3
Plant 56	2048	W4L	10	2	16	2		8
Plant 57	2049	W4L	8	3	24	1		3
Plant 58	2050	W4L	9	3	27	3		10
Plant 59	2052	W4L	10	3	30	2	0	8
Plant 60	2053	W4L	10	3	30	2	0	8
Plant 61	2055	W4L	6	3	18	3		7
Total Number of Examination Opportunities for the Fleet					888		17	249
Total Number of Proposed Examinations for the Fleet					266			

Not All "Xs" Are Created Equal

COMPONENT



Item #s



Plant Number	End of Current License	Design	SG Inspection Items per Interval	Remaining Intervals (= > 6 yrs)	Total # of Inspection Opporunities	Remaining Intervals (= > 6 yrs) w/ASME Inspections	SER PM Exam Commitments (# of Inspections)	Binomial Distrbution # of Inspections (Approx 38%)
Plant 6	2030	W3L	10	1	10	0	0	0
Plant 7	2032	W3L	10	1	10	1		4
Plant 8	2033	W3L	10	1	10	1		4
Plant 22	2036	W3L	5	1	5	1		2
Plant 27	2037	W3L	7	1	7	1	0	3
Plant 29	2038	W3L	8	2	16	2		6
Plant 30	2040	W3L	10	2	20	2		8
Plant 33	2041	W3L	7	2	14	1		3
Plant 36	2042	W3L	7	2	14	1	4	3
Plant 49	2046	W3L	5	2	10	1	1	2
Plant 51	2047	W3L	10	2	20	2		8

Data Dissection and Compiling Baseline Statistics for the US Fleet

Data Points for SG Examination Items per Plant Site (excerpt)

Plant Number	End of Current License	Design	SG Inspection Items per Interval	Remaining Intervals (= > 6 yrs)	Total # of Inspection Opporunities	Remaining Intervals (= > 6 yrs) w/ASME Inspections	SER PM Exam Commitments (# of Inspections)	Binomial Distrbution # of Inspections (Approx 38%)
Plant 30	2040	W3L	10	X 2 =	20	2		8
Plant 31	2040	W4L	7	2	14	2		5
Plant 32	2040	W4L	5	2	10	2		4
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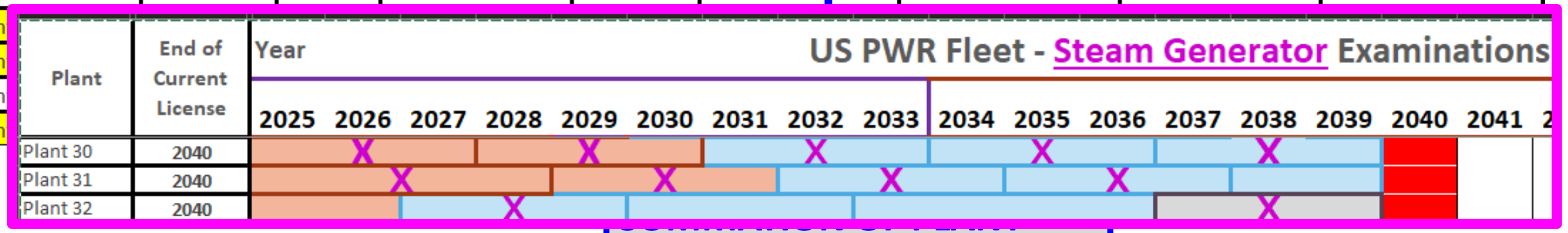


EXAMINATION ITEMS = 888

Refinement of Data for More Granularity

Proposed Fleet-wide Performance Monitoring
How Many? Which Ones? & When?

Data Supporting Proposed Fleet-wide Performance Monitoring

Parameter	SGs	PZRs
Total Examination Opportunities	888	882
Number of Fleet-wide PM Examinations to Meet Binomial Distribution Model @ Minimum 25% Criterion	222	220
Examinations per NRC approved SERs with PM plans (*)	17	18
Remaining 10-year ISI Interval Examinations @ 38% (% based on conservative calculations to meet Binomial Distribution Model @ Minimum 25% Criterion)	249	227
Total number of Fleet-Wide PM Examinations Planned	266	245
Percentage of Total Opportunities for Examinations	30%	28%

* This number does not include the SER commitments when reverting to ASME 10-year ISI interval as part of the SER.

How Many Items Should be Examined? (excerpt)

- Compiling Plant Examination Scenarios – 3 Cases
  1. ASME 10-year ISI examinations
  2. SER w/no further ASME 10-year ISI examinations
  3. SER w/revert to ASME 10-year ISI examinations

Plant Number	End of Current License	Design	SG Inspection Items per Interval		Remaining Intervals (= > 6 yrs)		Total # of Inspection Opporunities	Remaining Intervals (= > 6 yrs) w/ASME Inspections	SER PM Exam Commitments (# of Inspections)	Binomial Distrbution # of Inspections (Approx 38%)
Plant 30	2040	W3L	10	X	2	=	20	2		8
Plant 31	2040	W4L	7		2		14	2		5
Plant 32	2040	W4L	5		2		10	2		4
Plant 33	2041	W3L	7		2		14	1		3
Plant 34	2041	W4L	5	X	2	=	10		1	0
Plant 35	2041	W4L	6		2		12	2	0	5
Plant 36	2042	W3L	7	X	2	=	14	1	4	3

REDUCED # OF INSPECTIONS

SER INSPECTIONS

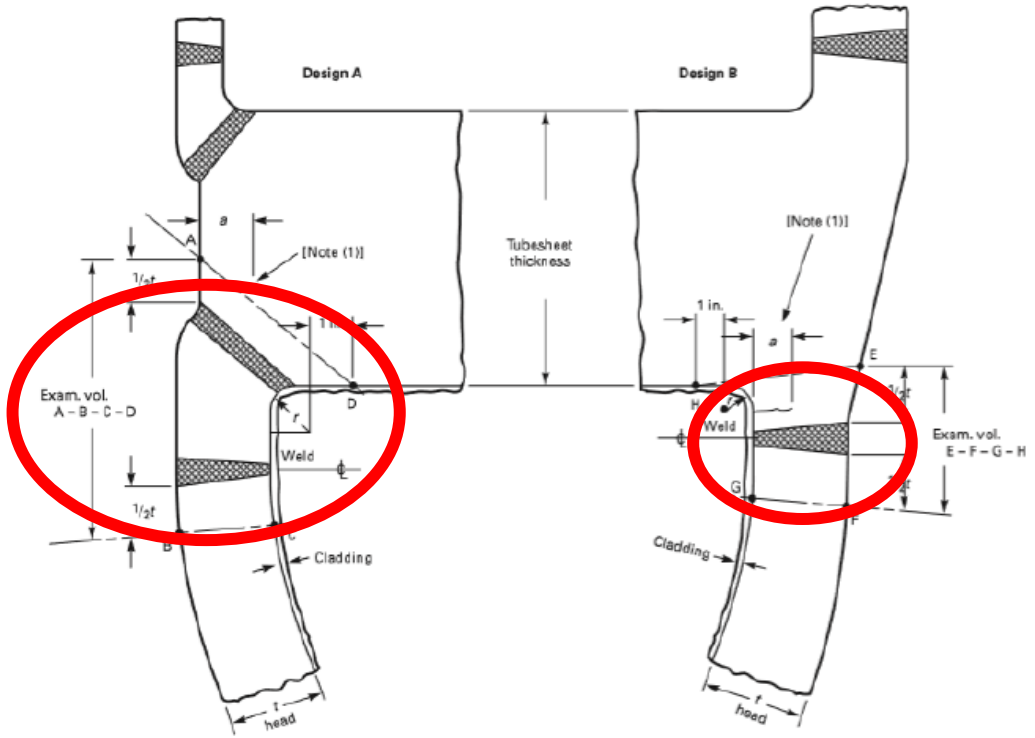
SER + ISI REVERT INSPECTIONS

Establishing the Statistical Relevance

Which Items Should be Examined? – Applied Logic (1/3)

- There are 9 Item Nos. for the SG component examinations
  - 4 on the primary side (Item Nos. B2.31, B2.32, B2.40 and B3.130)
  - 5 on the secondary side (Item Nos. C1.10, C1.20, C1.30, C2.21 and C2.22)
- Item Nos. to be examined were determined by choosing the most critical concentrated stress paths from the FEM, per the EPRI Technical Bases
- In cases where 2 examinations are required, utilities should choose;
  - 1 Item No. B2.40 (Tubesheet to Head Weld)
  - 1 Item No. C2.22 (Feedwater Nozzle Inner Radius)
- In cases where 3 or more examinations are required, utilities should choose;
  - The 2 Item Nos. above should be examined, plus
  - Item No. C2.21 (Feedwater Nozzle-to-Shell)
  - Additional selections, for the remaining number of inspections required, should be prorated equally between primary and secondary side Item Nos.

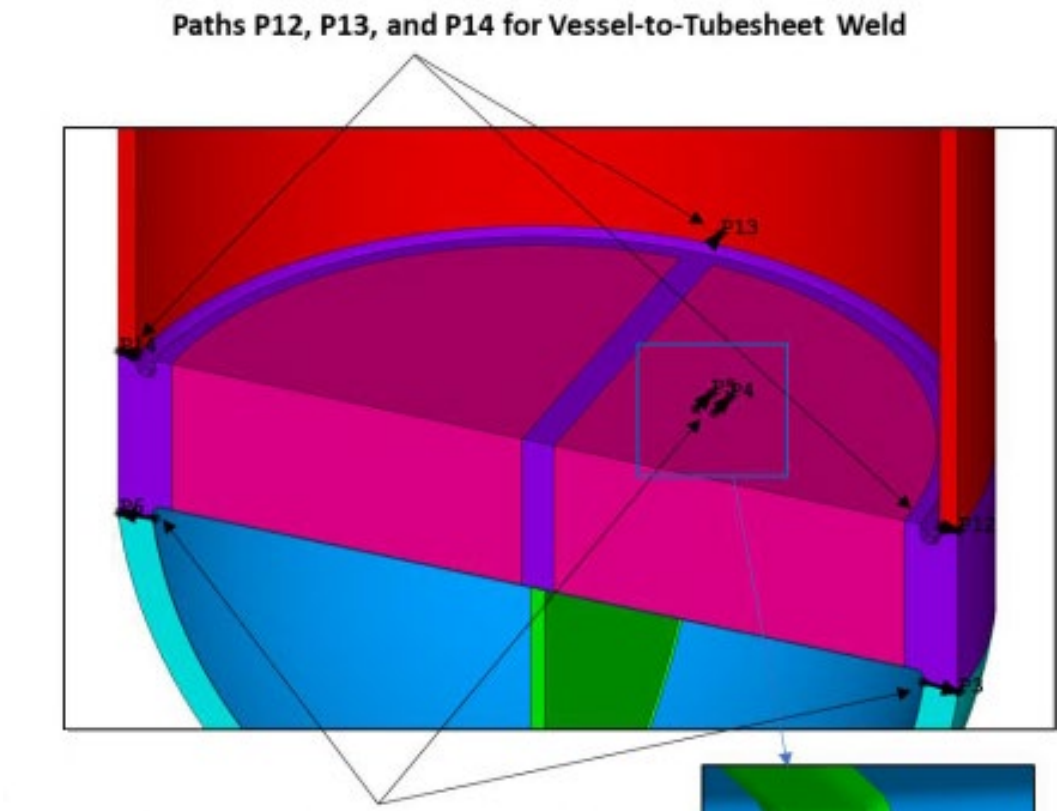
Which Items Should be Examined? – Applied Logic (2/3)

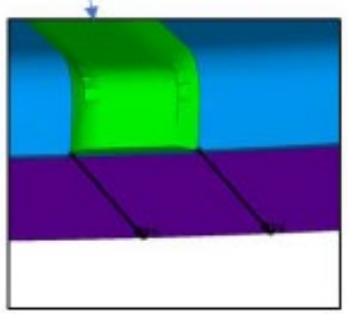


GENERAL NOTE: All flaws are exaggerated in size and scale.

NOTE:
(1) Laminar flaws within examined volume of tubesheet are considered planar flaws.

Figure 1-2
ASME Code, Section XI, Figure IWB-2500-6, Typical Tubesheet-to-Head Weld Joints (Item No. B2.40)

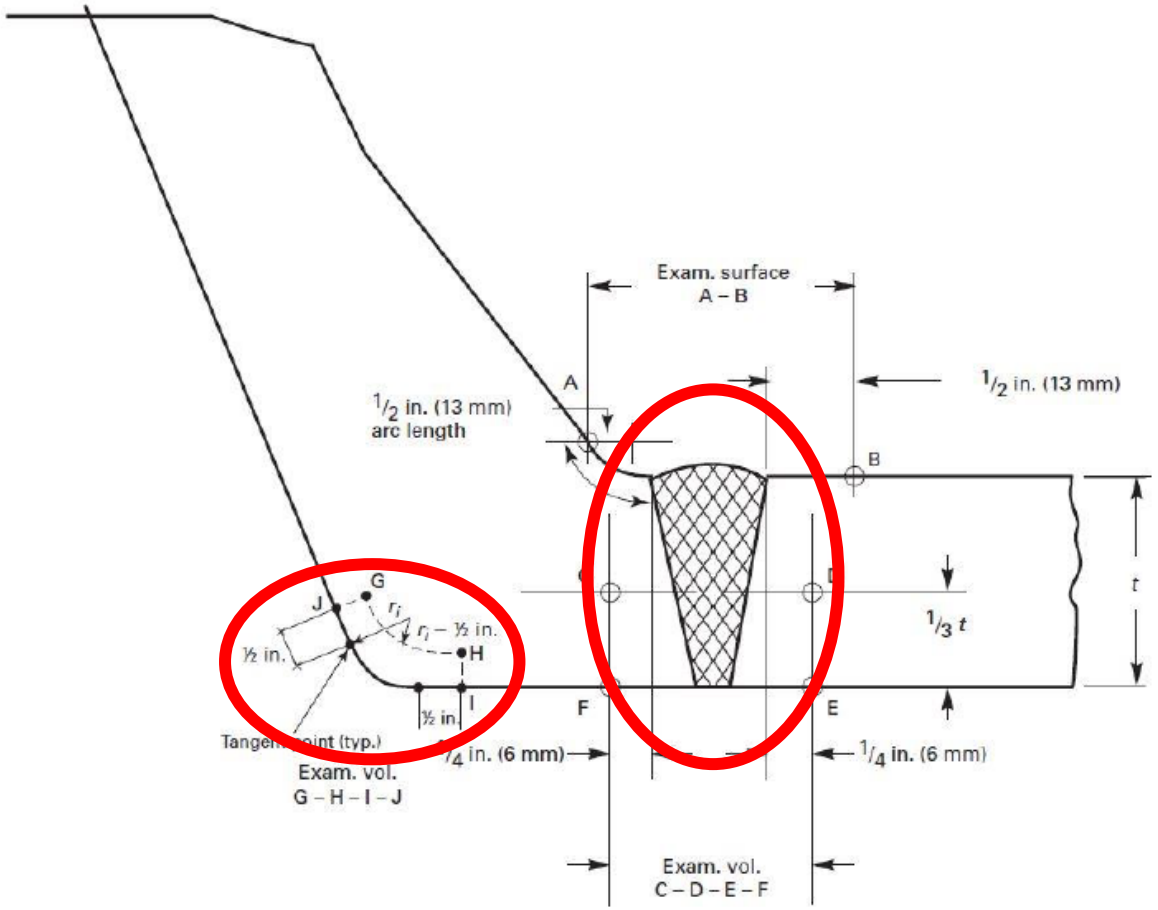




Paths P3 through P6 for Lower Head-to-Tubesheet Weld

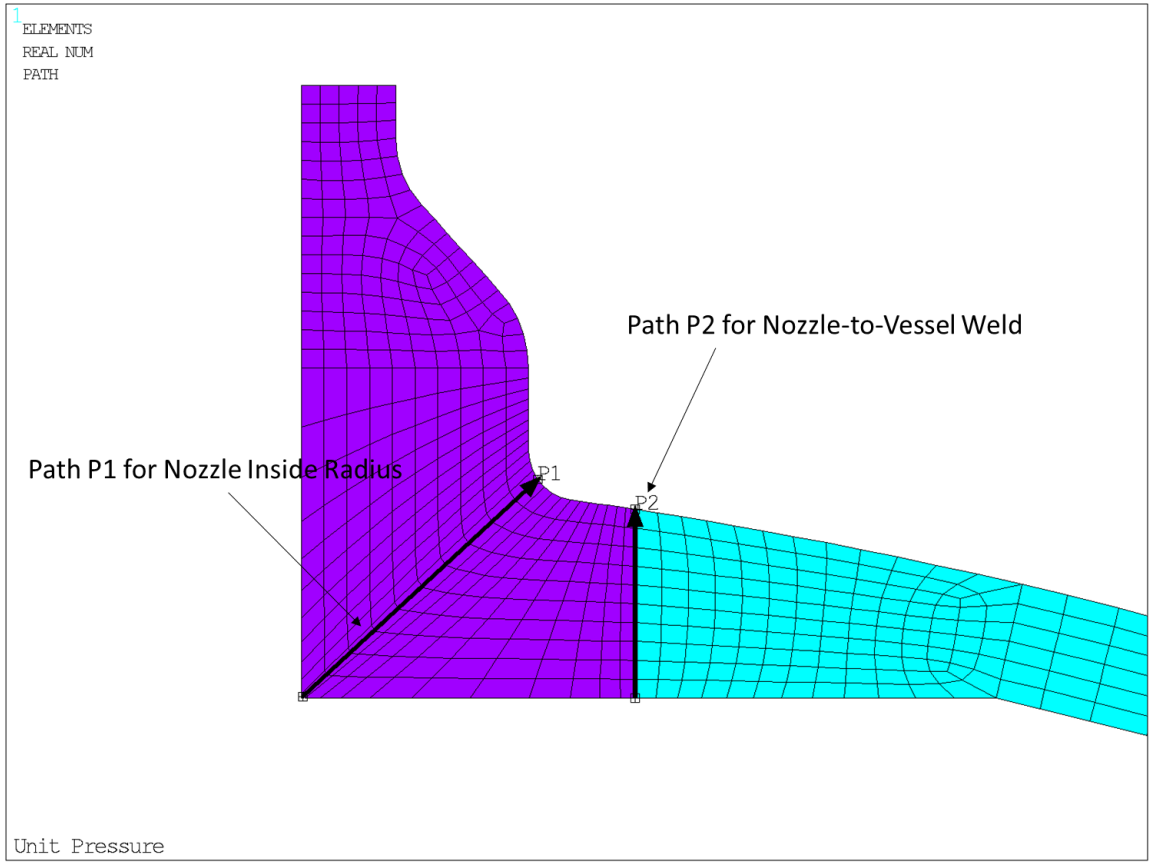
ASME Item B2.40 – Tubesheet to Head Weld (Class 1)

Which Items Should be Examined? – Applied Logic (3/3)



(a) See Notes (1), (2), and (3)

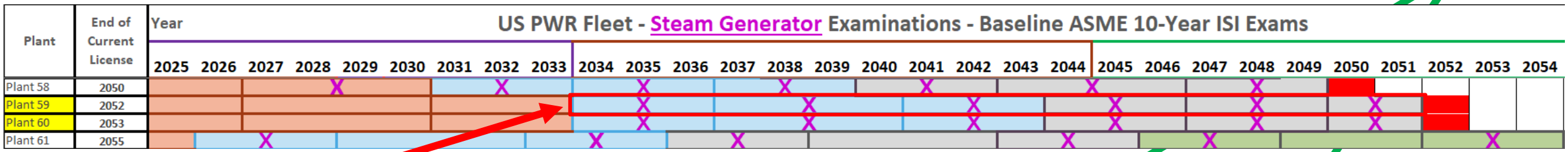
Figure 1-1
ASME Code, Section XI, Figure IWC-2500-4(a)



ASME Items C2.21 & C2.22 – Nozzle to Shell Weld (Class 2)

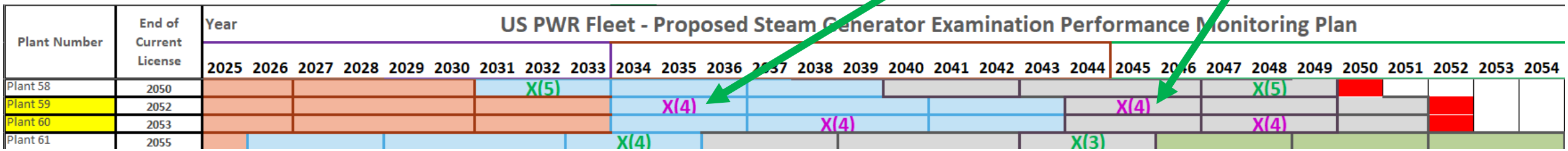
When Should Examination be Performed? - Distribution

Plant Number	End of Current License	Design	SG Inspection Items per Interval	Remaining Intervals (= > 6 yrs)	Total # of Inspection Opporunities	Remaining Intervals (= > 6 yrs) w/ASME Inspections	SER PM Exam Commitments (# of Inspections)	Binomial Distrbution # of Inspections (Approx 38%)
Plant 59	2052	W4L	10	3	30	2	0	8



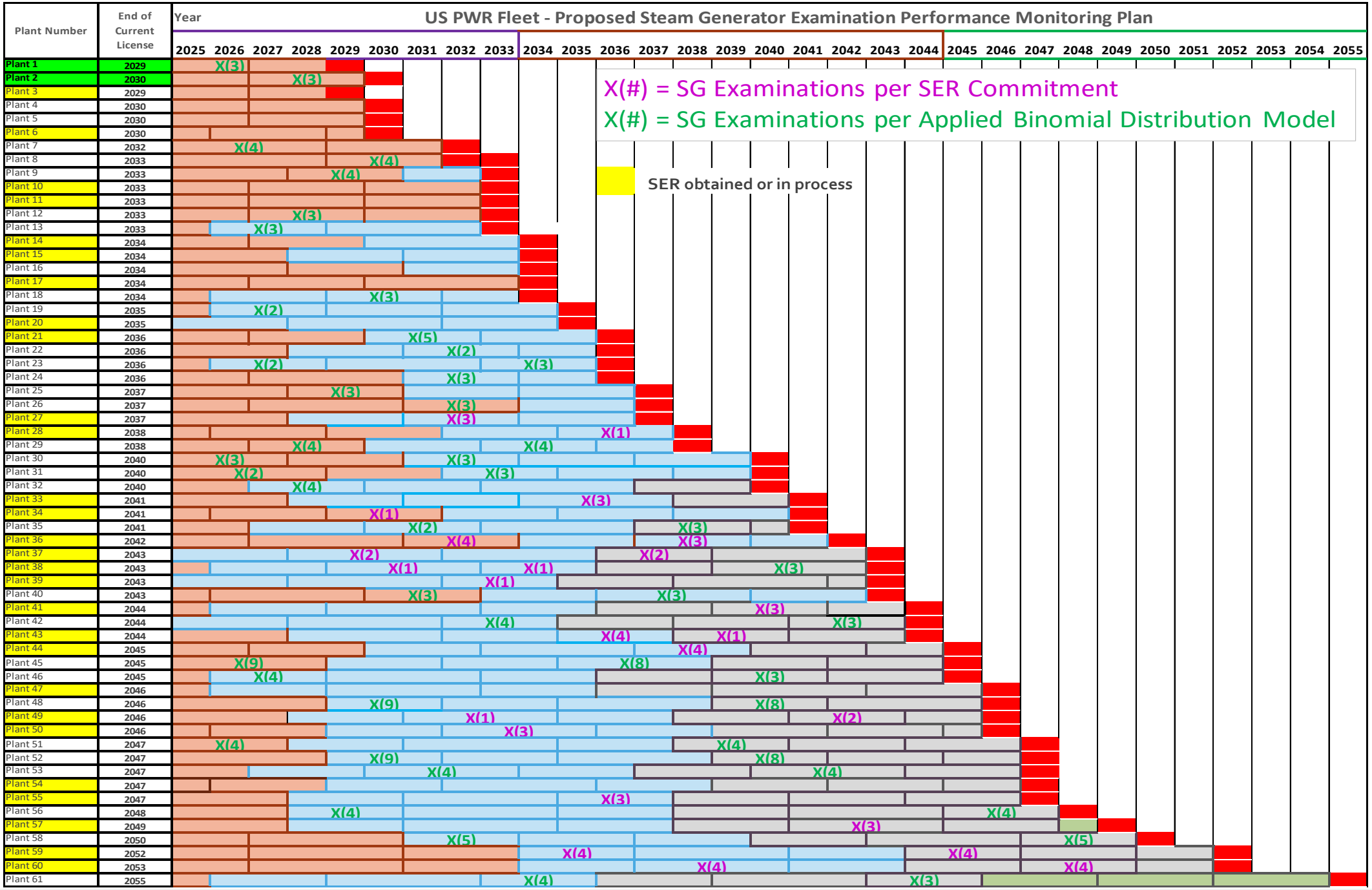
- SER PM = (0) Exams thru End of Current Interval
- Then, ASME 10-year ISI Plan
  - (10) Inspection items per interval = (20) Total inspections

- (8) Inspections per Binomial Distribution Model
  - (3) based on Topical Report guidance B2.40, C2.22, & C2.21
  - (5) remaining at the discretion of the utility

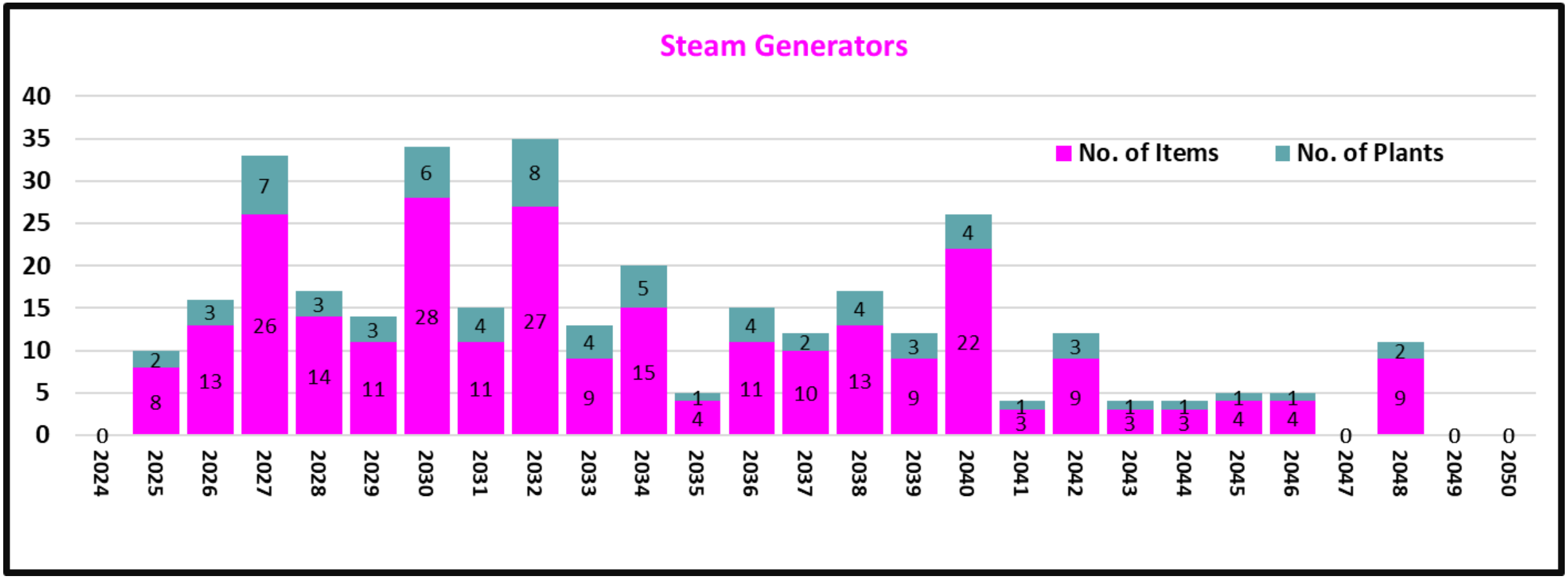


Comparison of ASME 10-year ISI vs. Binomial Distribution Model

US PWR Fleet - Proposed Steam Generator Examination Performance Monitoring Plan

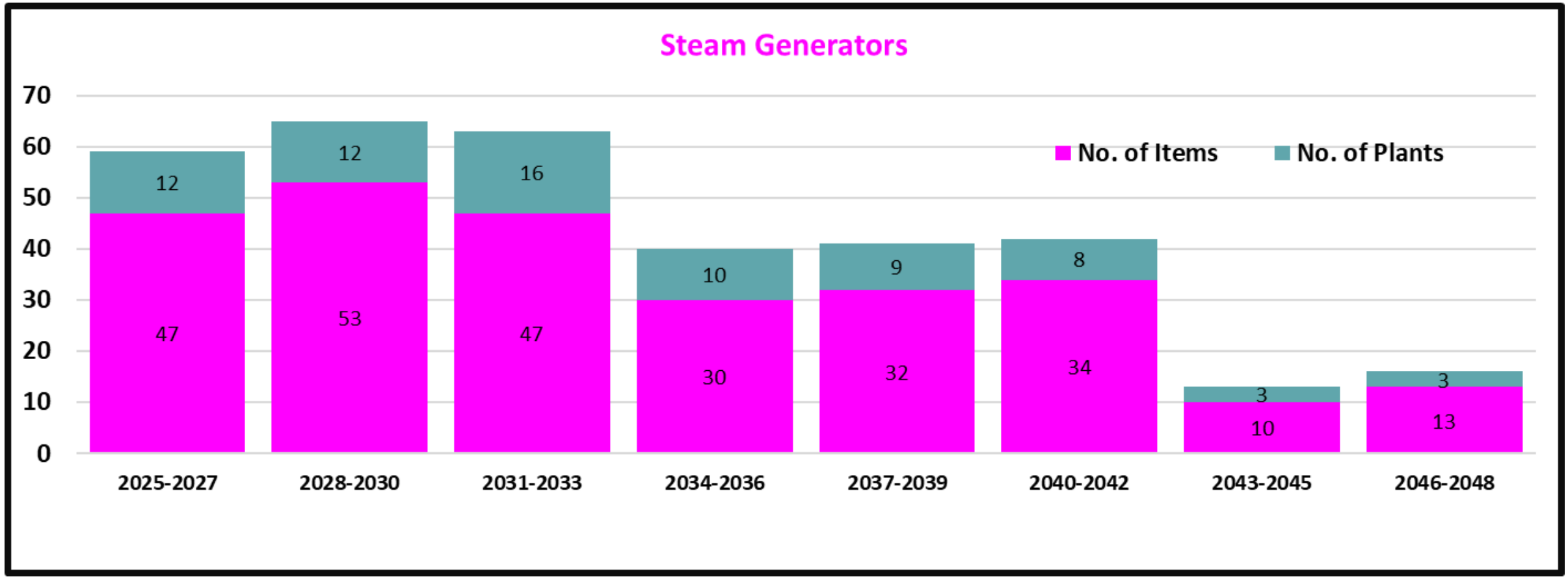


Distribution by # of Examinations and Plants (1/2)



Illustrated in 1-Year Increments

Distribution by # of Examinations and Plants (2/2)



Illustrated in 3-Year Increments

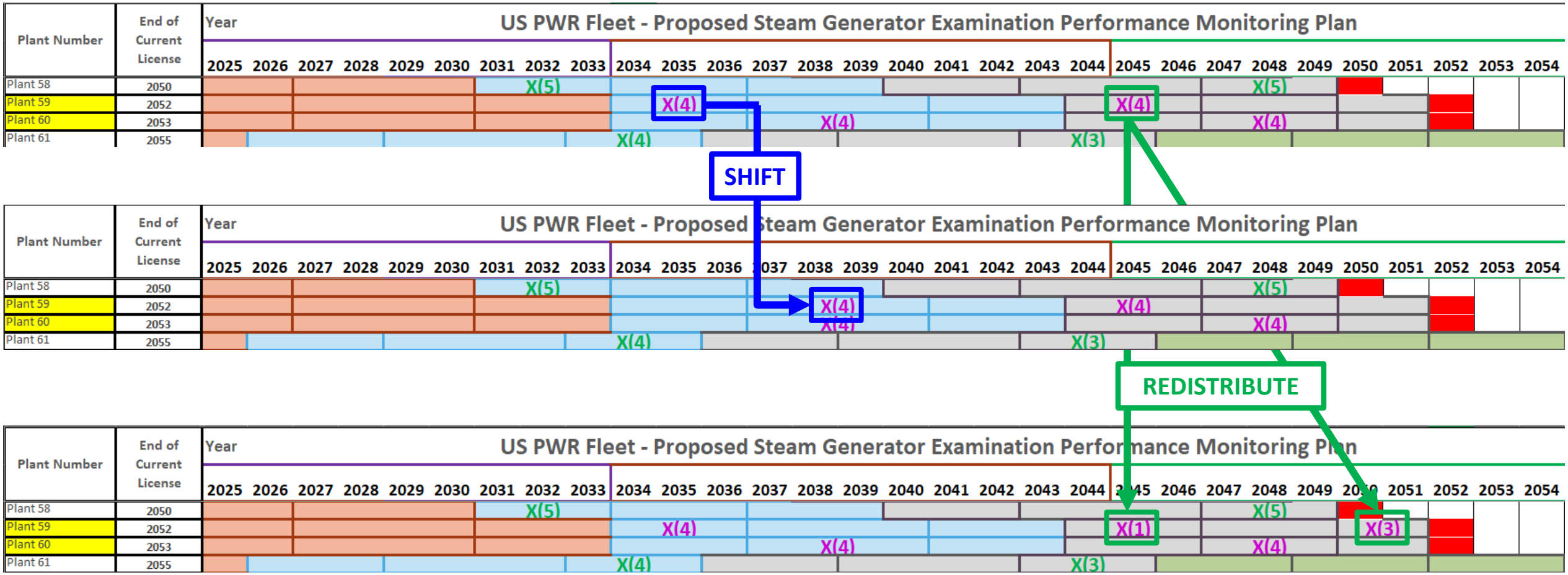
Allowable Adjustments to Distribution (1/2)

- Guidelines for “if and when” specific plants need to adjust the distribution of examinations for outage scope alignment and efficiency
  - Can:
    - Adjust the period in which examinations are to take place by +/- one period as long as it is within the same interval
    - Redistribute or adjust quantity of examination items across additional periods within the same interval
  - Cannot:
    - Change the number of examination items assigned
    - Change the designated examination items assigned
    - Combine examinations from separate inspection intervals

Flexibility without Compromise

Allowable Adjustments to Distribution (2/2)

- Using Plant 59 as an example



Flexibility without Compromise

Inherent and Qualitative Conservatisms

- The international fleet of operating commercial nuclear reactors (~246), over four times the number of PWRs in the U. S., continue to follow the inspection guidelines of ASME Code, Section XI or similar international codes.
- Restarts of U.S. commercial nuclear reactors, up to three units, are not currently part of the overall PM plan. Assumptions are they will conduct a full set of ASME examinations as part of their restart protocol
- Recent “new starts” of U.S. commercial nuclear reactors, two AP1000 units, are not part of the overall PM plan and continue to perform examinations per ASME Code
- License renewals of U.S. commercial nuclear reactors will eventually fold into the overall PM plan, increasing the number of data points and distributions of examinations

Additional Examination Data Points

Topical Report and Letter Addendum Overview

Topical Report for Performance Monitoring Approach

- Title: *"FLEET-WIDE PERFORMANCE MONITORING INSPECTION PLAN FOR SELECT ASME CODE EXAMINATION ITEMS OF US PWR STEAM GENERATORS AND PRESSURIZERS"*
- Report Content:
  - INTRODUCTION
  - CURRENT ASME CODE SECTION XI EXAMINATION REQUIREMENTS
  - CURRENT STATUS OF INSPECTIONS FOR STEAM GENERATORS AND PRESSURIZERS IN THE US FLEET
  - PERFORMANCE MONITORING
  - INSPECTION PLAN FOR STEAM GENERATORS AND PRESSURIZERS
  - SUMMARY
  - REFERENCES
  - APPENDIX A, CURRENT STATUS OF PWR REQUEST FOR ALTERNATIVE SAFETY EVALUATION REPORTS
- Letter Addendum will serve as the mechanism to facilitate adjustments to fleet-wide schedule and examinations (next 2 slides)

Letter Addendum (1/2)

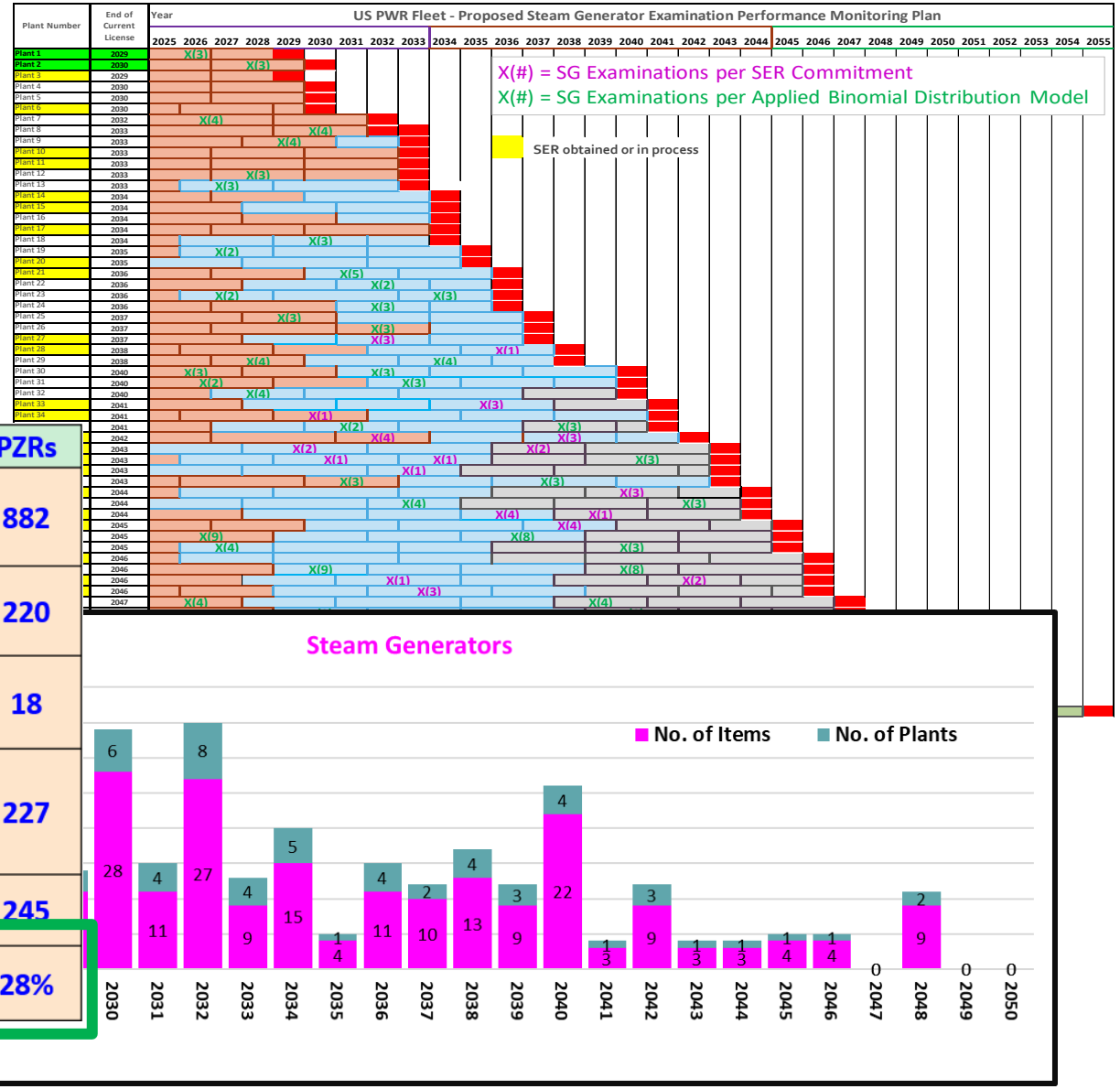
- Restates the Objectives of the Fleet-wide PM Plan:
  1. Perform sufficient fleet-wide inspections during the currently licensed operating life for all plants to meet the minimum 25% sampling expectation implicit in the NRC's binomial distribution model. To achieve this, the minimum number of inspections for each unit must be those shown in Tables 4-1 and 4-2 of the Reference [1] report.
  2. Provide sufficient, ongoing inspections over the currently licensed operating lives of the US PWR fleet to identify possible novel/unknown degradation mechanisms in a timely manner. To achieve this, inspections must be performed according to the schedule shown in Tables 4-1 and 4-2 of the Reference [1] report.
- Summarizes events that predicate a review of the Fleet-wide PM Plan:
  - Plant licensing adjustments or changes that need to be considered
    - Renewals
    - Expired plants
    - New / replacement components
  - Request for Alternative inspection relief
  - Agreed upon periodic review of plan
- Updates to tables and charts (next slide)

Letter Addendum reviews and assessment will ensure regulatory concerns are still being addressed (i.e., the checks & balance on statistical relevance of data points and their distribution)

Letter Addendum (2/2)

Plant Number	End of Current License	Design	SG Inspection Items per Interval	Remaining Intervals (= > 6 yrs)	Total # of Inspection Opportunities	Remaining Intervals (= > 6 yrs) w/ASME Inspections	SER PM Exam Commitments (# of Inspections)	Binomial Distrbution # of Inspections (Approx 38%)
Plant 1	2024	W4L	7	1	7	1		3
Plant 2	2025	W4L	7	1	7	1		3
Plant 3	2029	W2L	7	1	7	0	0	0
Plant 4	2030	W4L	11	1	11	1		4
Plant 5	2030	W2L	10	1	10	1		4
Plant 6	2030	W3L	10	1	10	0	0	0
Plant 7	2032	W3L	10	1	10	1		4
Plant 8	2033	W3L	10	1	10	1		4
Plant 9	2033	W4L	10	1	10	1		4
Plant 10	2033	B&W	6	1	6	0	0	0
Plant 11	2033	B&W	6	1	6	0	0	0
Plant 12	2033	W4L	7	1	7	1		3
Plant 13								
Plant 14								
Plant 15								
Plant 16								
Plant 17								
Plant 18								
Plant 19								
Plant 20								
Plant 21								
Plant 22								
Plant 23								
Plant 24								
Plant 25								
Plant 26								
Plant 27								
Plant 28								
Plant 29								
Plant 30								

Parameter	SGs	PZRs
Total Examination Opportunities	888	882
Number of Fleet-wide PM Examinations to Meet Binomial Distribution Model @ Minimum 25% Criterion	222	220
Examinations per NRC approved SERs with PM plans (*)	17	18
Remaining 10-year ISI Interval Examinations @ 38% (% based on conservative calculations to meet Binomial Distribution Model @ Minimum 25% Criterion)	249	227
Total number of Fleet-Wide PM Examinations Planned	266	245
Percentage of Total Opportunities for Examinations	30%	28%



Industry Milestone Interactions and Schedule

Next Steps and Tentative Schedule for the US Industry

- January 2025; Finalize draft of Topical Report on performance monitoring approach
- February 3 – 6, 2025; EPRI and NEI to socialize with Industry Advisory Committees at Nuclear Power Council (NPC) Meetings
  - Nondestructive Evaluation (NDE) Program Research Integration Committee (RIC) advisors
  - Material Reliability Program (MRP) PWR Materials Management Program (PMMP) Executive Committee (EC) advisors
  - Materials Management Executive Committee (MMEC) advisors
- February – March 2025; NEI to socialize with US Chief Nuclear Officers (CNOs)
  - NEI to assist with communicating and gaining acceptance at the utility CNO level
    - Utilities will be obligated to perform the examinations as prescribed in the EPRI Topical Report and Letter Addendum
    - Utilities, through EPRI, will monitor and update the Letter Addendum as necessary
- March - April 2025; Schedule a Topical Report pre-submittal meeting with the NRC
- May 2025; Finalize Topical Report and Letter Addendum
- June 2025; Submit Topical Report and Letter Addendum to NRC

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