

MRP Materials Reliability Program _____ MRP 2007-002
(via email)

January 22, 2007

Nuclear Regulatory Commission
Tanya Mensah
One White Flint North
Rockville, Maryland

Subject: PWR Fleet Survey – MRP-139 Implementation Plans for Pressurizers – Revision 2

Dear Tanya:

In fall 2005, the PWR fleet committed to mandatory implementation of Primary System Piping Butt Weld Inspection and Evaluation Guideline (MRP-139) under NEI-03-08. This guideline imposed a requirement of completing baseline volumetric exams of all A82/182 dissimilar metal butt welds greater than or equal to 4” NPS and operating at pressurizer temperatures by 12/31/2007.

In November 2006, MRP initiated a survey of the PWR fleet to document the current extent of compliance with MRP-139 baseline pressurizer inspection requirements and the plans that each utility has made to attain full compliance. The survey was originally transmitted to the NRC on November 9, 2006 as MRP 2006-045. A revision to the survey reflecting recent changes in utility plans and including two tables summarizing the survey results was subsequently transmitted to the NRC on December 18, 2006 as MRP-2006-050.

MRP has now carefully reviewed these survey results with the NRC Staff to establish consistency in how the subject nozzles and welds are grouped and counted in order to alleviate any confusion arising from industry and the NRC using slightly different numbers. Consequently, the survey has been revised again to reflect minor notes and additional clarifying comments that have resulted from this review. Additionally, a more detailed summary table has been added to facilitate the consistent counting of nozzles and welds in a more repeatable and traceable manner. This new table includes the final nozzle tallies in various categories considered relevant and useful to both the NRC and industry. Although the utility plans reflected in this survey could change further, the survey results demonstrate a continuing, significant commitment by the fleet to expeditiously implement MRP-139.

The survey results are contained in Attachment 1 with plant information arranged in a single row for each PWR unit and columns for basic information regarding that unit and specific information for the spray, surge, and safety/relief nozzles (regardless of pipe size). In order to capture the range of specific technical and schedule details regarding each category of nozzle for each unit, a coding system was established and is reflected in Attachment 2. Every effort has been taken to ensure the accuracy of the data but it is being provided for information only and does not constitute a commitment by the industry or any individual utility.

In addition, three tables have been prepared to present the results of the “DM Butt weld Inspection & Mitigation Plans” survey in a more easily interpreted manner organized to best highlight utility plans to complete inspection and mitigation. Two of these tables are a single-page summary format organized by nozzle (Attachment 3) and by plant (Attachment 4). The third table (Attachment 5) is an expanded

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summary prepared to facilitate and document the consistent categorization and counting of the subject nozzles. The nozzle and plant tally summary from this table is also presented below for easy reference.

Summary Statistics - Nozzle & Plant Tallies

Count Group	Description	# Nozzles ***	% Total	Cum %	Plants **
All Nozzles w/ A600/82/182	Total Nozzles w/ A600/82/182	279	100%	/	50
	Total As-Found (unmitigated)				
	Baseline Inspections (complete and planned)	47	17%		19
Mitigations Complete and Planned	Total Mitigations through Dec 2006	68	24%	24%	15
	Total to be Mitigated Spring 2007	64	23%	47%	12
	Total to be Mitigated Fall 2007	62	22%	70%	13
	Total to be Mitigated Spring 2008	54	19%	89%	10
	Total to be Mitigated Fall 2008 *	1	0.4%	89%	1
Baseline Inspections Complete and Planned	Total Inspected through Dec 2006	85	30%	30%	21
	Total to be Inspected Spring 2007	68	24%	55%	13
	Total to be Inspected Fall 2007	71	25%	80%	14
	Total to be Inspected Spring 2008	54	19%	99.6%	10
	Total to be Inspected Fall 2008 *	1	0.4%	100%	1
Status January 1, 2007	Total Inspections Remaining	194	70%	/	38
	Total Pending Required Overlays	177	63%		
Optional Mitigations Planned through Spring 2008 - PDI Exam Previously Completed (not counted above)		7	3%	92%	3

* Inspection completed but with PDI / MRP-139 coverage limitation due to safe end material

** Number of individual plants represented in the nozzle count for this item. Since activities may occur during multiple outages, adding cells in this column could result in double counting.

*** Nine nozzles in eight plants contain A600 safe-ends and have two associated DM butt welds (designated above by a "(2)" in the appropriate plant nozzle cells) so the total number of susceptible welds is nine more than the total number of nozzles. As of January 1, 2007, nine of those welds in five nozzles have complied with the baseline inspection requirement and of those, four additional welds not included in the counts above have met MRP-139 baseline inspection requirements. Therefore, a total of 90 welds have met baseline inspection requirements and a total of 51 welds were inspected in the as-found condition.

These final data tallies show that by the end of the Spring 2008 outage season (approximately end of April 2008) all pressurizer nozzle butt welds ($\geq 4''$ NPS per MRP-139 as well as those $\geq 2''$ NPS) will have been inspected and about 92% of the welds will have been mitigated by mechanical stress improvement (MSIP) or full structural weld overlays.

Details regarding these tables are as follows:

Plants are grouped in seven categories with some small amount of overlap as noted below. These main categories are:

- Plants which do not have Alloy 600/82/182 materials in nozzle butt welds
- Plants which have already replaced the pressurizer and the new pressurizer used improved materials with greater resistance to PWSCC

- Plants which have completed PDI qualified inspections in the “as-found” (pre-mitigation) condition. (Note: This list includes some duplicate plants with the next category which have also mitigated welds. This is done so that the “as-found” inspection data points pre-mitigation are clearly identified.)
- Plants which have already mitigated pressurizer butt welds by mechanical stress improvement or full structural weld overlays
- Plants planning to perform inspections, and possibly mitigations, during the Spring 2007 outage season
- Plants planning to perform inspections, and possibly mitigations, during the Fall 2007 outage season
- Plants planning to perform inspections, and possibly mitigations, during the Spring 2008 outage season
- Actions planned beyond Spring 2008 – details are listed in the comments field of the survey data

Within each category, plants are listed in approximate order of decreasing plant operating hours through the end of October 2006. The operating hours were estimated by dividing the total plant production (MW-hr) through the end of October as reported by Plants by the current plant capacity (MW). No adjustments are made for changes in capacity over plant life. Plants above the double line in each category have more operating hours than Wolf Creek at the time the circumferential indications were discovered and plants below the line have fewer operating hours than Wolf Creek.

Blank cells in the table with no text or background color indicate that the activity for that category does not apply to that nozzle or group of nozzles. In each case, that plant will be listed again in another category reflecting the completed or planned action for that nozzle type. Additionally, in a few cases, the safety / relief nozzle group may be addressed in stages or with multiple approaches resulting in duplicate entries. Parenthetical numbers (w/o units) in the safety/relief cells indicate the applicable number of nozzles. Finally, the coding order indicates the sequence of operations (e.g., FW – IN is overlay followed by PDI exam).

This material is not considered proprietary and is not transmitted under affidavit. If you have any questions, please contact Craig Harrington (972-556-6519) or Christine King.(650-855-2605).

Best Regards,



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Program Manager
EPRI Materials Reliability Program

cc: Jeff Gasser, Southern Nuclear
Mike Robinson, Duke Energy
Denny Weakland, First Energy
Craig Harrington, EPRI
David Steininger, EPRI
Attachments 1-5

Attachment 1: Pressurizer Inspection/Mitigation Plans – January 1, 2007

PLANT ID	Plant Name	NSSS Design	Licensee	Initial Operation	Spray	Surge	Safety / Relief	# Safety / Relief Nozzles	Most Recent RFO	Next RFO	Comments (will be provided to NRC)
1	ANO 1	B&W	Entergy	05/21/74	IN-FW-S2007	IN-FW-S2007	IN-FW-S2007	3	F2005	S2007	Spray - A600 safe-end and two A182 DM welds.
2	ANO 2	CE	Entergy	09/01/78	REPZR-F2006	REPZR-F2006	REPZR-F2006	3	F2006	S2008	
3	Beaver Valley 1	W	First Energy	07/02/76	IN-FW-F2007	NA600	IN-FW-F2007	4	S2006	F2007	
4	Beaver Valley 2	W	First Energy	08/14/87	IN-FW-F2006	IN-FW-F2006	IN-FW-F2006	4	F2006	S2008	Mitigation complete; PDI inspection complete
5	Braidwood 1	W	Exelon	07/02/87	IN-FW-F2007	IN-FW-F2007	IN-FW-F2007	4	S2006	F2007	
6	Braidwood 2	W	Exelon	05/05/88	IN-FW-S2008	IN-FW-S2008	IN-FW-S2008	4	F2006	S2008	
7	Byron 1	W	Exelon	02/14/85	IN-FW-F2006	IN-FW-F2006	IN-FW-F2006	4	F2006	S2008	All overlays installed - work complete.
8	Byron 2	W	Exelon	01/30/87	IN-FW-S2007	IN-FW-S2007	IN-FW-S2007	4	F2005	S2007	
9	Callaway	W	Ameren	10/18/84	IN-FW-S2007	IN-FW-S2007	IN-FW-S2007	4	F2005	S2007	
10	Calvert Cliffs 1	CE	Constellation Energy	07/31/74	PI-MS-S2006	PI-MS-S2006	PI-MS-S2006	2	S2006	S2008	Mitigation complete; PDI inspection complete - Indication dispo'd as a crack in a Safety nozzle (2005)
11	Calvert Cliffs 2	CE	Constellation Energy	11/30/76	PI-MS-S2007	PI-MS-S2007	PI-MS-S2007	2	S2005	S2007	Spray & 2 reliefs - PDI inspection in 2005 w/ no ind.; all top nozzles to be insp. & mitigated in 2007
12	Catawba 1	W	Duke	01/17/85	IN-FW-F2006	IN-FW-F2006	IN-FW-F2006	4	F2006	S2008	Mitigation complete; PDI inspection complete
13	Catawba 2	W	Duke	05/15/86	IN-FW-F2007	IN-FW-F2007	IN-FW-F2007	4	S2006	F2007	
14	Comanche Peak 1	W	TXU	04/17/90	IN-FW-S2007	IN-FW-S2007	IN-FW-S2007	4	F2005	S2007	
15	Comanche Peak 2	W	TXU	04/06/93	IN-FW-S2008	IN-FW-S2008	IN-FW-S2008	4	F2006	S2008	
16	Cook 1	W	AEP	10/25/74	IN-FW-F2006	IN-FW-F2006	IN-FW-F2006	4	F2006	S2008	Mitigation complete; PDI inspection complete - Indication dispo'd as a crack in a Safety nozzle (2005)
17	Cook 2	W	AEP	12/23/77	IN-FW-S2006	IN-FW-S2006	IN-FW-S2006	4	S2006	F2007	Mitigation complete; PDI inspection complete. Surge Line LBB Approved but NOT implemented (Unit 2 only).
18	Crystal River 3	B&W	Progress Energy	01/28/77	IN-FW-F2007	IN-FW-F2007	IN-FW-F2007	3	F2005	F2007	Spray - A600 safe-end and two A182 DM welds - PDI exam completed in 2005 of both welds
19	Davis-Besse	B&W	First Energy	04/22/77	PI-UN-S2006	PI-FW-S2008	PI-UN-S2006	3	S2006	S2008	PDI exam in S2006: S/Rs - >90%; Surge - <90%; Spray - nozzle safe-end weld >90% for circ indications <90% for axial indications, safe-end to pipe <90% - Overlay for all planned S2008 (Spray - A600 safe-end and two A182 DM welds.)
20	Diablo Canyon 1	W	PG&E	05/07/85	NA600	NA600	NA600	4	F2005	S2007	
21	Diablo Canyon 2	W	PG&E	03/13/86	IN-FW-S2008	IN-FW-S2008	IN-FW-S2008	4	S2006	S2008	
22	Farley 1	W	Southern Company	06/25/77	IN-FW-F2007	IN-FW-F2007	IN-FW-F2007	4	S2006	F2007	
23	Farley 2	W	Southern Company	03/31/81	PI-UN-F2005	PI-UN-S2007	PI-UN-S2007	4	F2005	S2007	Spray and one safety examined F2005. Others estimated >90% & to be examined S2007. FSWOL planned S2010.
24	Fort Calhoun	CE	OPPD	09/26/73	REPZR-F2006	REPZR-F2006	REPZR-F2006	3	F2006	S2008	No A600 or A82/182 welds in new PZR nozzles
25	GINNA	W	Constellation Energy	12/10/69	NA600	NA600	NA600	4	F2006	S2008	
26	Indian Point 2	W	Entergy	09/28/73	NA600	NA600	NA600	4	S2006	S2008	
27	Indian Point 3	W	Entergy	04/05/76	NA600	NA600	NA600	4	S2005	S2007	
28	Kewaunee	W	Dominion Energy	06/16/74	NA600	NA600	NA600	3	F2006	S2008	
29	McGuire 1	W	Duke	07/08/81	IN-FW-S2007	IN-FW-S2007	IN-FW-S2007	4	F2005	S2007	
30	McGuire 2	W	Duke	05/27/83	IN-FW-F2006	IN-FW-F2006	IN-FW-F2006	4	F2006	S2008	Mitigation complete; PDI inspection complete
31	Millstone 2	CE	Dominion Energy	09/26/75	REPZR-F2006	REPZR-F2006	REPZR-F2006	3	F2006	S2008	
32	Millstone 3	W	Dominion Energy	01/31/86	IN-FW-F2005	IN-FW-S2007	IN-FW-S2007	4	F2005	S2007	
33	North Anna 1	W	Dominion Energy	04/01/78	IN-FW-F2007	IN-FW-F2007	IN-FW-F2007	4	S2006	F2007	
34	North Anna 2	W	Dominion Energy	08/21/80	IN-FW-S2007	IN-FW-S2007	IN-FW-S2007	4	F2005	S2007	
35	Oconee 1	B&W	Duke	02/06/73	IN-FW-F2006	IN-FW-F2006	IN-FW-F2006	3	F2006	S2008	Mitigation complete; PDI inspection complete, (Spray - A600 safe-end and two A182 DM welds.)
36	Oconee 2	B&W	Duke	10/06/73	IN-FW-S2007	IN-FW-S2007	IN-FW-S2007	3	F2005	S2007	Spray - A600 safe-end and two A182 DM welds.
37	Oconee 3	B&W	Duke	07/19/74	IN-FW-F2007	IN-FW-F2007	IN-FW-F2007	3	S2006	F2007	Spray - A600 safe-end and two A182 DM welds.
38	Palisades	CE	NMC	12/31/71	PI-UN-2004	IN-MS-S2006	See Comments for PORV / relief	4	S2006	F2007	Spray: PDI exam in 2004, repeat in 2007 - Continuous flow and operated at cold leg temperature; A600 safe-end and two A182 DM welds. Surge: PDI Exam S2006, Mechanical Stress Improvement in 1995 w/ pre-post UT (pre-PDI); A600 safe-end and two A182 DM welds. PORV: Replaced weld and safe end in 1995 with A690 material (A600 safe-end leak). Relief (3): 3" NPS - ID PT examination in 1993. RI-ISI requires these weld exams - Relief request submitted for ID PT in lieu of UT - plan to inspect remaining three nozzles in 2007. A600 flange w/ A82/182 weld to nozzle, stress-relieved w/ vessel.
39	Palo Verde 1	CE	APS	06/01/85	IN-FW-S2007	IN-FW-S2007	IN-FW-S2007	4	S2007	F2008	
40	Palo Verde 2	CE	APS	04/24/86	IN-FW-S2008	IN-FW-S2008	IN-FW-S2008	4	F2006	S2008	
41	Palo Verde 3	CE	APS	11/25/87	IN-FW-F2007	IN-FW-F2007	IN-FW-F2007	4	S2006	F2007	
42	Point Beach 1	W	NMC	10/05/70	NA600	NA600	NA600	4	F2005	S2007	
43	Point Beach 2	W	NMC	03/08/73	NA600	NA600	NA600	4	F2006	S2008	
44	Prairie Island 1	W	NMC	04/05/74	NA600	NA600	NA600	4	S2006	Jan 2008	
45	Prairie Island 2	W	NMC	10/29/74	NA600	PI-UN-F2006	NA600	4	F2006	Sep 2008	Surge nozzle mitigation in September 2008
46	Robinson 2	W	Progress Energy	09/23/70	NA600	NA600	NA600	4	F2005	S2007	
47	Salem 1	W	PSE&G	08/13/76	NA600	NA600	NA600	4	F2005	S2007	
48	Salem 2	W	PSE&G	05/20/81	NA600	NA600	NA600	4	F2006	S2008	
49	San Onofre 2	CE	SCF	09/07/82	PI-FW-S2006	PI-UN-S2006	PI-FW-S2006	3	S2006	F2007	PDI exam of all 5 pressurizer nozzles in S2006 - cast SS inspection limitation - Surge overlay scheduled for F2007
50	San Onofre 3	CE	SCF	09/16/83	PI-FW-F2006	PI-UN-F2006	PI-FW-F2006	3	F2006	F2008	PDI exam of all 5 pressurizer nozzles in F2006 - cast SS inspection limitation - Surge overlay deferred due to welding issues during F2006 outage
51	Seabrook	W	FPL	03/15/90	IN-FW-S2008	IN-FW-S2008	IN-FW-S2008	4	F2006	S2008	
52	Sequoyah 1	W	TVA	09/17/80	IN-FW-F2007	PI-FW-F2007	IN-FW-F2007	4	S2006	F2007	Initial PDI exam of surge nozzle F2007
53	Sequoyah 2	W	TVA	09/15/81	IN-FW-F2006	PI-FW-F2006	IN-FW-F2006	4	S2005	F2006	Mitigation complete; PDI inspection complete; Pre-mitigation PDI exam also completed for surge nozzle
54	Shearon Harris	W	Progress Energy	01/12/87	IN-FW-F2007	IN-FW-F2007	IN-FW-F2007	4	S2006	F2007	
55	South Texas 1	W	STPNOC	03/22/88	IN-FW-S2008	IN-FW-F2006	IN-FW-S2008	4	F2006	S2008	SWOL & PDI exam of the Unit 1 surge line complete (Fall 2006)
56	South Texas 2	W	STPNOC	03/28/89	IN-FW-S2007	IN-FW-S2007	IN-FW-S2007	4	F2005	S2007	
57	St. Lucie 1	CE	FPL	03/01/76	REPZR-F2005	REPZR-F2005	REPZR-F2005	4	F2005	S2007	New Pressurizer has SS safe end welds and butter
58	St. Lucie 2	CE	FPL	06/10/83	PI-UN-F2007	IN-FW-F2007	PI-UN-F2007*	4	S2006	F2007	*IN-FW-F2007 for Relief (4"), PI-UN-F2007 for the three Safeties (3") - 4 total S/R nozzles
59	Summer	W	SCE&G	11/12/82	IN-FW-S2008	IN-FW-S2008	IN-FW-S2008	4	F2006	S2008	
60	Surry 1	W	Dominion Energy	05/25/72	NA600	NA600	NA600	4	S2006	F2007	
61	Surry 2	W	Dominion Energy	01/29/73	NA600	NA600	NA600	4	F2006	S2008	
62	TMI 1	B&W	Exelon	04/19/74	PI-UN-F2007	PI-UN-F2007	IN-RE-F2007	3	F2005	F2007	2 Safeties & 1 Relief replacement scheduled F2007; Surge nozzle (PZR end) and Spray nozzle (w/ A600 safe-end) to be inspected F2007 & mitigated in 2011. (Spray - A600 safe-end and two A182 DM welds.)
63	Turkey Point 3	W	FPL	07/19/72	NA600	NA600	NA600	4	S2006	F2007	
64	Turkey Point 4	W	FPL	04/10/73	NA600	NA600	NA600	4	F2006	S2008	
65	Vogtle 1	W	Southern Company	03/16/87	IN-FW-S2008	IN-FW-S2008	IN-FW-S2008	4	F2006	S2008	
66	Vogtle 2	W	Southern Company	03/31/89	IN-FW-S2007	IN-FW-S2007	IN-FW-S2007	4	F2005	S2007	
67	Waterford 3	CE	Entergy	03/18/85	IN-FW-S2008	IN-FW-S2008	IN-FW-S2008	3	S2005	F2006	
68	Watts Bar 1	W	TVA	02/07/96	PI-UN-F2006	PI-UN-F2006	PI-UN-F2006	4	F2006	S2008	All weld locations inspected per PDI, future mitigation plans being considered, however in full compliance with MRP-139 baseline.
69	Wolf Creek	W	Wolf Creek	09/03/85	PI-FW-F2006	PI-FW-F2006	PI-FW-F2006	4	F2006	S2008	PDI exams complete for all locations prior to overlay - Indications dispo'd as cracks in Surge, Safety "C", & Relief nozzles (Fall 2006)

Attachment 2: Legend for Attachment 1

Survey Data Entry Coding	
AA-BB-XXXX	Data Entry Format
AA	
PI	Pre-mitigation volumetric exam
IN	Post-mitigation inspection only
BB	
FW	Full structural weld overlay mitigation
MS	MSIP - Mechanical Stress Improvement
UN	Location is unmitigated
RE	Nozzle replacement w/ resistant materials
X	
S	Spring outage season followed by year
F	Fall outage season followed by year
Alternate Entries	
REPZR	Replaced PZR in fall 2007
NA600	Location has no A600, A82, or A182
Example Entry	
IN-FW-F2007	Post full structural weld overlay inspection completed or planned for Fall 2007
Color Coding	
	LBB Approved on this line
	<90% coverage PDI exam

Attachment 3: Summary of Pressurizer Dissimilar Metal Butt Weld Status - Activities By Nozzle – 1/1/2007

Category and Plant	1,000 hrs 2/1/06	Spray	Surge	Safety Relief (# affected)
No Alloy 600 Welds				
- Ginna	244			
- Prairie Island 1	224			
- Point Beach 1	218			
- Point Beach 2	215			
- Kewaunee	212			
- Robinson 2	207			
- Surry 1	203			
- Surry 2	201			
- Indian Point 2	167			
- Indian Point 3	150			
- Diablo Canyon 1	149			
- Turkey Point 3	138			
- Turkey Point 4	134			
- Salem 1	105			
- Salem 2	92			

Pressurizers Replaced - No Alloy 600 Welds				
- Ft. Calhoun	178		Rep Fall 06	
- Millstone 2	159		Rep Fall 06	
- ANO-2	147		Rep Fall 06	
- St. Lucie 1	147		Rep Fall 05	

Alloy 600 Welds Mitigated as of December 2006				
- Oconee 1	211	FW - IN (2w)	FW - IN	FW - IN (3)
- Cook 1	170	FW - IN	FW - IN	FW - IN (4)
- San Onofre 2	161	FW - IN		FW - IN (3)
- San Onofre 3	158	FW - IN		FW - IN (3)
- McGuire 2	153	FW - IN	FW - IN	FW - IN (4)
- Wolf Creek	150	FW - IN	FW - IN	FW - IN (4)
- Palisades	149		MS - IN (2w)	RepNz (PORV)
- Catawba 1	147	FW - IN	FW - IN	FW - IN (4)
- Cook 2	146	FW - IN	FW - IN	FW - IN (4)
- Sequoyah 2	144	FW - IN	FW - IN	FW - IN (4)
- Calvert Cliffs 1	142	PI - MS	PI - MS	PI - MS (2)
- Byron 1	133	FW - IN	FW - IN	FW - IN (4)
- Beaver Valley 2	127	FW - IN	FW - IN	FW - IN (4)
- Millstone 3	121	FW - IN (F05)		
- South Texas 1	118		FW - IN	

Alloy 600 Welds PDI Inspected Pre-Mitigation as of December 2006				
- Prairie Island 2	222	No A600	No Mit 06	No A600
- Farley 2	174	No Mit 05		No Mit 05 (1)
- San Onofre 2	161	FW S06	FW F07	FW F07 (3)
- San Onofre 3	158	FW F06	FW F08	FW F06 (3)
- Crystal River 3	157	No Mit 05 (2w)		
- Davis-Besse	153	PI - FW S08 (2w)	PI - FW S08	PI - FW S08 (3)
- Wolf Creek	150	FW F06	FW F06	FW F06 (4)
- Palisades	149	No Mit (2w)	MS - IN (2w)	ID PT (3) (<4")
- Sequoyah 2	144		FW F06	
- Calvert Cliffs 1	142	MS	MS	MS (2)
- Calvert Cliffs 2	137	MS S07		MS S07 (2)
- Watts Bar	76	No Mit	No Mit	No Mit (4)

Codes:
 PI Pre-mitigation PDI exam
 IN Post-mitigation PDI exam
 MS Mech. Stress Improvement
 FW Full Structural Weld Overlay
 (2w) A600 Safe-end and Two DM Welds

Category and Plant	1,000 hrs 2/1/06	Spray	Surge	Safety Relief (# affected)
Inspections/Mitigation Planned Spring 2007 (Next RFO)				
- Oconee 2	210	FW - IN (2)	FW - IN	FW - IN (3)
- ANO-1	181	FW - IN (2)	FW - IN	FW - IN (3)
- North Anna 2	179	FW - IN	FW - IN	FW - IN (4)
- Farley 2	174		PI - No Mit	PI - No Mit (3)
- McGuire 1	153	FW - IN	FW - IN	FW - IN (4)
- Callaway	149	FW - IN	FW - IN	FW - IN (4)
- Calvert Cliffs 2	137	PI - MS	PI - MS	PI - MS (2)
- Byron 2	131	FW - IN	FW - IN	FW - IN (4)
- Vogtle 2	129	FW - IN	FW - IN	FW - IN (4)
- Palo Verde 1	122	FW - IN	FW - IN	FW - IN (4)
- Millstone 3	121		FW - IN	FW - IN (4)
- Comanche Peak 1	116	FW - IN	FW - IN	FW - IN (4)
- South Texas 2	114	FW - IN	FW - IN	FW - IN (4)

Inspections/Mitigation Planned Fall 2007 (Next RFO)				
- Oconee 3	206	FW - IN (2)	FW - IN	FW - IN (3)
- Farley 1	192	FW - IN	FW - IN	FW - IN (4)
- North Anna 1	184	FW - IN	FW - IN	FW - IN (4)
- TMI	181	PI - No Mit (2)	PI - No Mit	Repl Noz (3)
- Beaver Valley 1	168	FW - IN	No A600	FW - IN (4)
- San Onofre 2	161		PI - FW - IN	
- Crystal River 3	157	FW - IN (2)	FW - IN	FW - IN (3)
- Palisades	149			ID PT (3) (<4")
- Sequoyah 1	144	FW - IN	PI - FW - IN	FW - IN (4)
- Catawba 2	141	FW - IN	FW - IN	FW - IN (4)
- Shearon Harris	136	FW - IN	FW - IN	FW - IN (4)
- Palo Verde 3	126	FW - IN	FW - IN	FW - IN (4)
- Braidwood 1	124	FW - IN	FW - IN	FW - IN (4)
- St. Lucie 2	111	PI - No Mit	FW - IN	PI - No Mit (3) FW - IN (1)

Inspections/Mitigation Planned Spring 2008 (Next RFO)				
- Summer	154	FW - IN	FW - IN	FW - IN (4)
- Davis-Besse	153	PI - FW - IN (2)	PI - FW - IN	PI - FW - IN (3)
- Diablo Canyon 2	147	FW - IN	FW - IN	FW - IN (4)
- Vogtle 1	142	FW - IN	FW - IN	FW - IN (4)
- Waterford 3	140	FW - IN	FW - IN	FW - IN (3)
- Braidwood 2	129	FW - IN	FW - IN	FW - IN (4)
- Palo Verde 2	119	FW - IN	FW - IN	FW - IN (4)
- South Texas 1	118	FW - IN		FW - IN (4)
- Comanche Peak 2	96	FW - IN	FW - IN	FW - IN (4)
- Seabrook	95	FW - IN	FW - IN	FW - IN (4)

Inspections/Mitigation Planned beyond Spring 2008				
- San Onofre 3	158		Complete F2006 FW attempt	

Color Codes:


- = No Alloy 600 Type Weld Material
- = Indication(s) Dispositioned as Fabrication-Related
- = Indication(s) Dispositioned as Weld Cracks
- = PDI Examinations Complete but with Limitations
- = PDI examination Complete for MRP-139 (>90% Circ)
- = Westinghouse
- = Combustion Eng
- = Babcock & Wilcox

Attachment 4: Summary of Pressurizer Dissimilar Metal Butt Weld Status - Activities By Plant – 1/1/2007

Category and Plant	1,000 hrs 2/1/06	Spray	Surge	Safety Relief
No Alloy 600 Welds				
- Ginna	244			
- Prairie Island 1	224			
- Point Beach 1	218			
- Point Beach 2	215			
- Kewaunee	212			
- Robinson 2	207			
- Surry 1	203			
- Surry 2	201			
- Indian Point 2	167			
- Indian Point 3	150			
- Diablo Canyon 1	149			
- Turkey Point 3	138			
- Turkey Point 4	134			
- Salem 1	105			
- Salem 2	92			

Pressurizers Replaced - No Alloy 600 Welds				
- Ft. Calhoun	178		Rep Fall 06	
- Millstone 2	159		Rep Fall 06	
- ANO-2	147		Rep Fall 06	
- St. Lucie 1	147		Rep Fall 05	

All Alloy 600 Welds Mitigated as of December 2006				
- Oconee 1	211	FW - IN (2w)	FW - IN	FW - IN (3)
- Cook 1	170	FW - IN	FW - IN	FW - IN (4)
- McGuire 2	153	FW - IN	FW - IN	FW - IN (4)
- Wolf Creek	150	PI - FW	PI - FW	PI - FW (4)
- Catawba 1	147	FW - IN	FW - IN	FW - IN (4)
- Cook 2	146	FW - IN	FW - IN	FW - IN (4)
- Sequoyah 2	144	FW - IN	PI - FW	FW - IN (4)
- Calvert Cliffs 1	142	PI - MS	PI - MS	PI - MS (2)
- Byron 1	133	FW - IN	FW - IN	FW - IN (4)
- Beaver Valley 2	127	FW - IN	FW - IN	FW - IN (4)

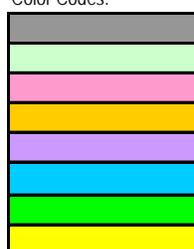
All Alloy 600 Welds PDI Inspected pre-mitigation as of December 2006				
- Prairie Island 2	222	No A600	PI - No Mit	No A600
- San Onofre 2	161	PI - FW S06	PI - FW F07	PI - FW (3)
- San Onofre 3	158	PI - FW F06	PI - FW F08	PI - FW (3)
- Davis-Besse	153	PI - FW S08 (2w)	PI - FW S08	PI - FW (3)
- Pallsades	149	PI - No Mit (2w)	MS - IN (2w)	ID PT (3) (<4")
- Watts Bar	76	PI - No Mit	PI - No Mit	PI - No Mit

Code:
 PI Pre-mitigation PDI exam
 IN Post-mitigation PDI exam
 MS Mech. Stress Improvement
 FW Full Structural Weld Overlay
 (2w) A600 Safe-end and Two DM Welds

Category and Plant	1,000 hrs 2/1/06	Spray	Surge	Safety Relief
Inspections/Mitigation Planned Spring 2007 (Next RFO)				
- Oconee 2	210	FW - IN (2w)	FW - IN	FW - IN (3)
- ANO-1	181	FW - IN (2w)	FW - IN	FW - IN (3)
- North Anna 2	179	FW - IN	FW - IN	FW - IN (4)
- Farley 2	174	PI - No Mit 05	PI - No Mit	PI - No Mit (4)
- McGuire 1	153	FW - IN	FW - IN	FW - IN (4)
- Callaway	149	FW - IN	FW - IN	FW - IN (4)
- Calvert Cliffs 2	137	PI - MS	PI - MS	PI - MS (2)
- Byron 2	131	FW - IN	FW - IN	FW - IN (4)
- Vogtle 2	129	FW - IN	FW - IN	FW - IN (4)
- Palo Verde 1	122	FW - IN	FW - IN	FW - IN (4)
- Millstone 3	121	FW - IN F05	FW - IN	FW - IN (4)
- Comanche Peak 1	116	FW - IN	FW - IN	FW - IN (4)
- South Texas 2	114	FW - IN	FW - IN	FW - IN (4)

Inspections/Mitigation Planned Fall 2007 (Next RFO)				
- Oconee 3	206	FW - IN (2w)	FW - IN	FW - IN (3)
- Farley 1	192	FW - IN	FW - IN	FW - IN (4)
- North Anna 1	184	FW - IN	FW - IN	FW - IN (4)
- TMI	181	PI - No Mit (2w)	PI - No Mit	Repl Noz (3)
- Beaver Valley 1	168	FW - IN	No A600	FW - IN (4)
- Crystal River 3	157	FW - IN (2w)	FW - IN	FW - IN (3)
- Sequoyah 1	144	FW - IN	PI - FW	FW - IN (4)
- Catawba 2	141	FW - IN	FW - IN	FW - IN (4)
- Shearon Harris	136	FW - IN	FW - IN	FW - IN (4)
- Palo Verde 3	126	FW - IN	FW - IN	FW - IN (4)
- Braidwood 1	124	FW - IN	FW - IN	FW - IN (4)
- St. Lucie 2	111	PI - No Mit	FW-IN	PI - No Mit (3) FW - IN (1)

Inspections/Mitigation Planned Spring 2008 (Next RFO)				
- Summer	154	FW - IN	FW - IN	FW - IN (4)
- Diablo Canyon 2	147	FW - IN	FW - IN	FW - IN (4)
- Vogtle 1	142	FW - IN	FW - IN	FW - IN (4)
- Waterford 3	140	FW - IN	FW - IN	FW - IN (3)
- Braidwood 2	129	FW - IN	FW - IN	FW - IN (4)
- Palo Verde 2	119	FW - IN	FW - IN	FW - IN (4)
- South Texas 1	118	FW - IN	FW - IN F06	FW - IN (4)
- Comanche Peak 2	96	FW - IN	FW - IN	FW - IN (4)
- Seabrook	95	FW - IN	FW - IN	FW - IN (4)

Color Codes:

 = No Alloy 600 Type Weld Material
 = Alloy 600 Type welds Mitigated as of 11/30/06
 = PDI Examinations Complete but with Limitations
 = Indications Dispositioned as Weld Cracks
 = PDI examination Complete w/ No Limitations
 = Westinghouse
 = Combustion Eng
 = Babcock & Wilcox

Attachment 6: Summary of Pressurizer Dissimilar Metal Butt Weld Status – Nozzle Tally – 1/1/2007 (cont'd)

Category and Plant	1,000 hrs 21/06	Spray	Surge	Safety Relief X	Safety Relief Y	Safety Relief Z	Safety Relief T	Group Totals
Inspections/Mitigation Planned Spring 2007 (Next RFO)								
- Oconee 2	210	FW - IN (2w)	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	
- ANO-1	181	FW - IN (2w)	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	
- North Anna 2	179	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	
- Farley 2	174		PI - No Mit		PI - No Mit	PI - No Mit	PI - No Mit	
- McGuire 1	153	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	
- Callaway	149	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	
- Calvert Cliffs 2	137	PI - MS	PI - MS	PI - MS	PI - MS	FW - IN	FW - IN	
- Byron 2	131	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	
- Vogtle 2	129	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	
- Palo Verde 1	122	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	
- Millstone 3	121		FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	Overlay Plants 11
- Comanche Peak 1	116	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	Plants Req Action 13
- South Texas 2	114	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	

Inspections/Mitigation Planned Fall 2007 (Next RFO)								
- Oconee 3	206	FW - IN (2w)	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	
- Farley 1	192	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	
- North Anna 1	184	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	
- TMI	181	PI - No Mit (2w)	PI - No Mit	Repl Noz	Repl Noz	Repl Noz	FW - IN	
- Beaver Valley 1	168	FW - IN	No A600	FW - IN	FW - IN	FW - IN	FW - IN	
- San Onofre 2	161		PI - FW - IN					
- Crystal River 3	157	FW - IN (2w)	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	
- Palisades	149			ID PT (<4")	ID PT (<4")	ID PT (<4")	No A600	
- Sequoyah 1	144	FW - IN	PI - FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	
- Calwaba 2	141	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	
- Shearon Harris	136	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	Overlay Plants 12
- Palo Verde 3	126	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	Plants Req Action 14
- Braidwood 1	124	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	
- St. Lucie 2	111	PI - No Mit	FW - IN	PI - No Mit - 3"	PI - No Mit - 3"	PI - No Mit - 3"	FW - IN	

Inspections/Mitigation Planned Spring 2008 (Next RFO)								
- Summer	154	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	
- Davis-Besse	153	PI - FW - IN (2w)	PI - FW - IN	FW - IN				
- Diablo Canyon 2	147	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	
- Vogtle 1	142	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	
- Waterford 3	140	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	
- Braidwood 2	129	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	
- Palo Verde 2	119	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	
- South Texas 1	118	FW - IN		FW - IN	FW - IN	FW - IN	FW - IN	
- Comanche Peak 2	96	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	
- Seabrook	95	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	FW - IN	
								Plants Req Action 10

Inspections/Mitigation Planned beyond Spring 2008								
- San Onofre 3	158		Complete F2006 FW attempt					Overlay Plants 1
								Plants Req Action 1

- Codes:
- = No Alloy 600 Type Weld Material
 - = Indication(s) Dispositioned as Fabrication-Related
 - = Indication(s) Dispositioned as Weld Cracks
 - = PDI Examinations Complete but with Limitations
 - = PDI examination Complete for MRP-139 (>90% Circ)
 - = Westinghouse
 - = Combustion Eng
 - = Babcock & Wilcox
 - = MRP-139 Compliant Inspection Complete - Optional Mitigation Activity
 - = Plant does not have this nozzle
 - PI = Pre-mitigation PDI exam
 - IN = Post-mitigation PDI exam
 - MS = Mech. Stress Improvement
 - FW = Full Structural Weld Overlay
 - (2w) = A600 Safe-end and Two DM Welds

Attachment 7: Summary of Pressurizer Dissimilar Metal Butt Weld Status – Nozzle Tally – 1/1/2007 (cont'd)

Count Group	Description	# Nozzles ***	% Total	Cum %	Plants **
All Nozzles w/ A600/82/182	Total Nozzles w/ A600/82/182	279	100%	/	50
	Total As-Found (unmitigated) Baseline Inspections (complete and planned)	47	17%		19
Mitigations Complete and Planned	Total Mitigations through Dec 2006	68	24%	24%	15
	Total to be Mitigated Spring 2007	64	23%	47%	12
	Total to be Mitigated Fall 2007	62	22%	70%	13
	Total to be Mitigated Spring 2008	54	19%	89%	10
	Total to be Mitigated Fall 2008 *	1	0.4%	89%	1
Baseline Inspections Complete and Planned	Total Inspected through Dec 2006	85	30%	30%	21
	Total to be Inspected Spring 2007	68	24%	55%	13
	Total to be Inspected Fall 2007	71	25%	80%	14
	Total to be Inspected Spring 2008	54	19%	99.6%	10
	Total to be Inspected Fall 2008 *	1	0.4%	100%	1
Status January 1, 2007	Total Inspections Remaining	194	70%	/	38
	Total Pending Required Overlays	177	63%		34
Optional Mitigations Planned through Spring 2008 - PDI Exam Previously Completed (not counted above)		7	3%	92%	3

* Inspection completed but with PDI / MRP-139 coverage limitation due to safe end material

** Number of individual plants represented in the nozzle count for this item. Since activities may occur during multiple outages, adding cells in this column could result in double counting.

*** Nine nozzles in eight plants contain A600 safe-ends and have two associated DM butt welds (designated above by a "(2)" in the appropriate plant nozzle cells) so the total number of susceptible welds is nine more than the total number of nozzles. As of January 1, 2007, nine of those welds in five nozzles have complied with the baseline inspection requirement and of those, four additional welds not included in the counts above have met MRP-139 baseline inspection requirements. Therefore, a total of 90 welds have met baseline inspection requirements and a total of 51 welds were inspected in the as-found condition.