

Duke Energy Corporation Oconee 1, 2, 3
Entergy Operations, Inc. ANO-1
Progress Energy, Florida Crystal River 3



AmerGen Energy Company, LLC
FirstEnergy Nuclear Operating Company
Framatome ANP, Inc. (FANP)

TMI-1
D-B

Working Together to Economically Provide Reliable and Safe Electrical Power

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Comments on Draft Safety Evaluation for BAW-1543(NP), Revision 4, Supplement 5, "Supplement to the Master Integrated Reactor Vessel Surveillance Program"

Ref. 1: Letter, Robert A. Gramm (NRC) to Jerald S. Holm (Framatome ANP), "Draft Safety Evaluation for Babcock and Wilcox Owners Group Topical Report BAW-1543(NP), Revision 4, Supplement 5, 'Supplement to the Master Integrated Reactor Vessel Surveillance Program' (TAC No. MC1762)," February 3, 2005.

The NRC issued a draft safety evaluation on BAW-1543(NP), Revision 4, Supplement 5, and requested that the B&WOG review for any factual errors or clarity concerns. On behalf of the B&WOG, Framatome ANP has reviewed the draft SER provided in Reference 1.

The SER contains minor errors and clarifications which we recommend correcting. A marked up copy of the pages in the draft SER containing the errors is provided in Attachment A. Attachment B provides a summary table of the minor clarifications.

On behalf of the B&WOG, Framatome appreciates this opportunity to offer clarifying comments.

Sincerely,

Jerald S. Holm, Director
Regulatory Affairs

Howard Crawford, Chairman
B&W Owners Group Steering Committee

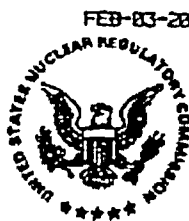
enclosures

cc: D.G. Holland
Project 693
Reactor Vessel Working Group

Framatome ANP, Inc. B&W Owners Group
3315 Old Forest Road
Lynchburg, VA 24501
Phone: 434-832-3635 Fax: 434-832-4121

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Attachment A



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P.03/09

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

DRAFT SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

MASTER INTEGRATED REACTOR VESSEL SURVEILLANCE PROGRAM

TOPICAL REPORT BAW-1543, REVISION 4, SUPPLEMENT 5

1 1.0 INTRODUCTION

2 By letter dated December 19, 2003, the Babcock and Wilcox (B&W) Owners Group (B&WOG)
3 Reactor Vessel Working Group submitted, for NRC approval, topical report (TR)
4 BAW-1543(NP), Revision 4, Supplement 5, "Supplement to the Master Integrated Reactor
5 Vessel Surveillance Program." The revisions contained in this supplement were necessary due
6 to a commitment not being met in Supplement 4, because capsules OC1-D and OC3-F could
7 not be removed from Crystal River Unit 3.

8 2.0 BACKGROUND

PARTICIPATING

9 By letter dated April 10, 2001, the B&WOG submitted, for staff approval, report BAW-1543,
10 Revision 4, Supplement 4, "Supplement to the Master Integrated Reactor Vessel Surveillance
11 Program." BAW-1543, Revision 4, reported the essential features of the master integrated
12 reactor vessel surveillance program (MIRVSP) for all operating B&W 177-fuel assembly (FA)
13 plants and those Westinghouse plants having B&W-fabricated reactor vessels. These reactor
14 vessels include seven B&W-designed 177-FA plants and nine Westinghouse-designed plants
15 with B&W-fabricated reactor vessels. The program was built upon the integrated surveillance
16 program developed by the B&WOG for the B&W 177-FA plants. All 16 reactors are of the
17 same basic design concept: pressurized water reactor, operating at 550 °F and 2250 psi
18 nominal inlet temperature and pressure, and with low enrichment fuel (approximately 2% to 4%
19 enrichment). *A B&W*

20 The irradiation schedules for the B&WOG MIRVSP include the plant-specific capsules for the
21 B&W- and Westinghouse-designed vessels, and the supplementary weld metal surveillance
22 capsules and higher fluence supplementary weld metal surveillance capsules. All the
23 irradiations, with the exception of Capsule W1 and the Westinghouse plant-specific capsules,
24 are performed in the B&W host reactors, Crystal River Unit 3 and Davis-Besse. Capsule W1,
25 an irradiation capsule of the Westinghouse design, is being irradiated in Surry Unit 2. The
26 Westinghouse plant-specific capsules are irradiated in their respective plants. An updated list
27 of the status of the Westinghouse and B&W plant-specific/integrated surveillance capsules is
28 provided in Attachment 1.

29 The staff evaluated the B&WOG's basis for the integrated program concept. The criterion as
30 provided by Appendix H to 10 CFR Part 50, "Reactor Vessel Material Surveillance Program

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1 Requirements,* were met; therefore, the staff determined the MIRVSP to be acceptable. By
2 letter dated June 11, 1991, BAW-1543, Revision 3, was approved by the NRC. The staff noted
3 that the discussions of BAW-1543, Revision 4, were essentially the same as those found in
4 BAW-1543, Revision 3, except for an update of some of the units' withdrawal schedules.
5 BAW-1543, Revision 4, Supplement 1, contained quantitative information which was, in
6 general, fluence dependent and, therefore, subject to change. This revision reflected revised
7 fluence values for some units and revised some withdrawal schedules to comply with American
8 Society for Testing and Materials (ASTM) Standard E 185-73, "Standard Recommended
9 Practice for Surveillance Tests for Nuclear Reactor Vessels." It was anticipated that future
10 revisions to BAW-1543 would only involve the Revision 4 Supplement. BAW-1543, Revision 4,
11 Supplement 2, reflected the revised fluence values and the revised withdrawal schedules, and,
12 therefore, replaced BAW-1543, Revision 4, Supplement 1.

13 The B&WOG later revised and replaced Supplement 2 of Revision 4 of the subject report with
14 Supplement 3. In Supplement 3, the B&WOG deleted Rancho Seco, R.E. Ginna, and Zion
15 Units 1 and 2 from the program. In addition, the B&WOG updated the capsule status and the
16 peak end-of-licensure fluences for several plants. In Supplement 4, the B&WOG incorporated
17 the disposal plan for archive specimens, updated the status for various capsules, and
18 incorporated current fluence levels. The B&WOG submitted Supplement 5 because the last
19 supplement included a commitment regarding Capsules OC1-D and OC3-F; however, that
20 commitment could not be met because these capsules could not be removed from Crystal River
21 Unit 3. STALLED CAPSULES

22 3.0 EVALUATION

23 Appendix H to 10 CFR Part 50 includes criteria to monitor changes in the fracture toughness
24 properties of ferritic materials in the reactor vessel beltline region of light-water nuclear power
25 reactors which result from exposure of these materials to neutron irradiation and the thermal
26 environment. Appendix H to 10 CFR Part 50 endorses ASTM E 185-73. Appendix H states
27 that "[t]he design of the surveillance program and the withdrawal schedule must meet the
28 requirements of the edition of ASTM E 185 that is current on the issue date of the ASME
29 [American Society of Mechanical Engineers] Code [Boiler and Pressure Vessel Code] to which
30 the reactor vessel was purchased. Later editions of ASTM E 185 may be used, but including
31 only those editions through 1982."

32 ASTM E 185-82, "Standard Practice for Conducting Surveillance Tests for Light Water Cooled
33 Nuclear Power Reactor Vessels" and ASTM E 185-88, "Recommended Practice for
34 Surveillance Tests on Structural Materials in Nuclear Reactors" cover procedures for monitoring
35 the radiation-induced changes in the mechanical properties of ferritic materials in the beltline of
36 light-water cooled nuclear power reactor vessels. These practices include guidelines for
37 designing a minimum surveillance program, selecting materials, and evaluating test results.

38 The staff evaluated the withdrawal schedule for each of the B&W and Westinghouse
39 plant-specific reactor vessel surveillance programs, as provided in BAW-1543(NP), Revision 4,
40 Supplement 5, and determined that the withdrawal schedules were prepared in accordance with
41 ASTM E 185-82 for each of the subject units except for Turkey Point Units 3 and 4. Additional
42 details of the staff's assessment are provided below. It should be noted that this evaluation will

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1 focus on the staff's review of the B&WOG's revised withdrawal schedules, as provided in
2 BAW-1543 (NP), Revision 4, Supplement 5.

3 As stated previously, capsules OC1-D and OC3-F could not be removed; therefore, credit for
4 these two capsules could no longer be taken for Oconee Unit 1 and Oconee Unit 3,
5 respectively. The staff independently reviewed the surveillance capsule withdrawal schedules
6 for Oconee Unit 1 and Oconee Unit 3, to ensure that the subject units' surveillance capsule
7 program would still comply with the requirements of ASTM E 185-82.

8 The staff found that the capsule withdrawal schedule for Oconee Unit 1 adequately met the
9 requirements of ASTM E 185-82, in that four capsules have been withdrawn and tested, and
10 the last capsule that was tested, OC1-C, had a fluence of 1 to 2 times the end-of-life fluence.
11 Therefore, the staff determined that the inability to withdraw and test capsule OC1-D had no
12 impact on the ability of the Oconee Unit 1 surveillance capsule program to meet the Appendix H
13 requirements.

14 The staff found that the capsule withdrawal schedule for Oconee Unit 3 adequately met the
15 requirements of ASTM E 185-82, in that three capsules have been tested and an additional
16 capsule, capsule CR3-LG2, which contains the limiting bedline material for Oconee Unit 3 (heat
17 number 72442), was tested and had a fluence of 1 to 2 times the end-of-life fluence for Oconee
18 Unit 3. Therefore, the staff determined that the inability to withdraw and test capsule OC3-F
19 had no impact on the ability of the Oconee Unit 3 surveillance capsule program to meet the
20 Appendix H requirements.

21 The staff noted that the ^{NMC}B&WOG added a supplemental capsule, to be removed and tested, to
22 the Point Beach Unit 2 surveillance program. Also, the B&WOG updated the status of capsules
23 Y and X of Surry Unit 2 and Turkey Point Unit 3, respectively, to indicate that they had been
24 tested. The staff found that these revisions were enhancements or updates to the program and
25 are, therefore, acceptable to the staff.

26
27 On May 26, 2004, the staff requested that the B&WOG remove or address the relevance of the
28 statement, "The owners of plants that have been granted license renewal have made no
29 commitments to test or use information from the capsules that continue to be irradiated under
30 the MIRVSP," because future applicants may wish to take credit for information obtained from
31 the MIRVSP, as opposed to using plant-specific information in order to meet the requirements
32 of 10 CFR Part 50, Appendix H. By letter dated July 7, 2004, the B&WOG indicated that the
33 statement will be removed upon issuance of the approved version of BAW-1543, Revision 4,
34 Supplement 5. The staff found this acceptable.

35 The staff determined that the withdrawal schedules for Oconee Unit 2, Three Mile Island Unit 1
36 (TMI-1), Crystal River Unit 3, Arkansas Nuclear One Unit 1, Davis-Besse, Point Beach Unit 2,
37 Surry Unit 1, Turkey Point Unit 4, as provided in Tables VI and VII of BAW-1543(NP), Revision
38 4, Supplement 5, did not change from Supplement 4 and, therefore, still comply with the
39 requirements of ASTM E 185-82, as stated in the staff's safety evaluation dated July 31, 2001.
40 However, the staff noted that the information in Table VIII, of the subject topical report, did not
41 accurately list the capsules to be withdrawn and tested for Oconee Units 1, 2 and 3, and TMI-1.

1 The B&WOG listed capsules for these subject plants that were no longer going to be withdrawn
2 and tested, i.e., Capsule OC1-D for Oconee Unit 1, Capsule OC2-F for Oconee Unit 2,
3 Capsule OC3-F for Oconee Unit 3, and Capsules F and D for TMI-1.

4 During a conference call that was held on November 23, 2004, the staff discussed this issue
5 with the B&WOG, who indicated that it would revise Table VIII of the report to accurately list the
6 capsules that were going to replace those that were no longer going to be withdrawn and
7 tested. The staff noted that the withdrawal schedule for Oconee Unit 1 already met the
8 requirements of ASTM E185-82; however, the table still needed revision, because the capsules
9 listed were not correct. The B&WOG indicated that Oconee Unit 2's limiting material is
10 contained in Capsule A5 (which was irradiated in Davis Besse), which was tested and satisfied
11 the fourth capsule requirement of ASTM E185-82 for Oconee Unit 2. For Oconee Unit 3, the
12 limiting material is contained in Capsule CR3-LG2, which was tested and satisfied the fourth ~~fourth~~ *FIFTH*
13 capsule requirement of ASTM E185-82, for Oconee Unit 3. And for TMI-1 the limiting material
14 is contained in Capsule TMI2-LG2, which was tested and satisfied the ~~fourth~~ *FIFTH* capsule
15 requirement of ASTM E185-82.

16 By supplemental letter dated January 5, 2005, the B&WOG revised Table VIII to the
17 BAW-1543(NP), Revision 4, Supplement 5 report. The staff found that the revised table
18 accurately listed the withdrawal schedules for Oconee Units 1, 2, and 3, and TMI-1. As stated
19 above, the staff found that each of these plants met the capsule withdrawal schedule
20 requirements of ASTM E185-82, even though the original capsules were not going to be
21 withdrawn and tested for Oconee Units 2 and 3 and TMI-1, because there are other capsules in
22 the MIRVSP that contain the same limiting material for the subject plants that will be withdrawn
23 and tested, and, therefore, will satisfy the requirements of ASTM E185-82.

24
25 Turkey Point Units 3 and 4 were prepared in accordance with ASTM E 185-66. The Turkey
26 Point Units 3 and 4 reactor vessels were purchased to the Summer 1966 Addenda to the 1965
27 ASME Code. ASTM E 185-66 was the surveillance capsule standard in effect at the time the
28 Turkey Point Units 3 and 4 reactor vessels were purchased. Since the Turkey Point Units 3
29 and 4 capsule withdrawal schedules meet the ASTM E 185 edition that was current at the time
30 the reactor vessels were purchased, the withdrawal schedules meet the requirements of
31 Appendix H to 10 CFR Part 50.

32 It should also be noted that, by letter dated February 8, 1985, a safety evaluation report (SER)
33 was submitted to Florida Power & Light Company, which indicated that the NRC approved an
34 integrated surveillance program for Turkey Point Units 3 and 4. The SER indicated that the
35 only capsules to be tested at Turkey Point Units 3 and 4 in accordance with ASTM E 185
36 requirements, are those that contain weld metal specimens.

37 4.0 CONCLUSION

38
39 Based on the staff's review of the B&WOG MIRVSP, the staff found that the revised withdrawal
40 schedules, as indicated in Report BAW-1543(NP), Revision 4, Supplement 5, are acceptable
41 for the B&W-designed 177-FA plants and the Westinghouse-designed plants with B&W-
42 fabricated reactor vessels. The proposed withdrawal schedules satisfy the ASTM E 185-82
43 Standard for all plants participating in the B&WOG MIRVSP except for Turkey Point Units 3 and
44 4. Turkey Point Units 3 and 4 satisfy the ASTM E 185-66 Standard. Since this edition of the

1 standard was current at the time the reactor vessels were purchased, the Turkey Point Units 3
2 and 4 surveillance capsule withdrawal schedules satisfy the requirements of Appendix H to
3 10 CFR Part 50. Also, it should be noted that the NRC previously approved an integrated
4 surveillance program for Turkey Point Units 3 and 4.

5 The staff concluded that the proposed withdrawal schedules of BAW-1543(NP), Revision 4,
6 Supplement 5, comply with Appendix H to 10 CFR Part 50. Therefore, the staff approves the
7 revised withdrawal schedule for each of the plants included in the B&WOG MIRVSP.

8 5.0 REFERENCES

- 9 1. BAW-1543, Revision 4, Supplement 4, "Supplement to the Master Integrated Reactor
10 Vessel Surveillance Program," April 2001.
- 11 2. NRC letter to A. Mendiola, from K. Wichman, NRC, "Safety Evaluation of BAW-1543,
12 Master Integrated Reactor Vessel Surveillance Program, Revision 4, Supplement 4,"
13 July 31, 2001.
- 14 3. Code of Federal Regulations, Title 10, Part 50, Appendix H, "Reactor Vessel Material
15 Surveillance Program Requirements."
- 16 4. American Society for Testing and Materials, "Recommended Practice for Surveillance
17 Tests on Structural Materials in Nuclear Reactors," ASTM E 185-66.
- 18 5. American Society for Testing and Materials, "Recommended Practice for Surveillance
19 Tests for Nuclear Reactor Vessels," ASTM E 185-70.
- 20 6. American Society for Testing and Materials, "Standard Practice for Conducting
21 Surveillance Tests for Light Water Cooled Nuclear Power Reactor Vessels,"
22 ASTM E 185-82.
- 23 7. NUREG-1511, Supplement 2, "Reactor Pressure Vessel Status Report," October 2000.

1 STATUS OF WESTINGHOUSE PLANT-SPECIFIC SURVEILLANCE CAPSULES

2	PLANT	CAPSULE ID	TARGET FLUENCE	STATUS	NOTES
3	POINT BEACH 1	N P R,S,T,V	4.5E19	STANDBY REMOVED TESTED	1 3
4	POINT BEACH 2	N P R,S,T,V W	5.0E19	STANDBY REMOVED TESTED SUPPL CAPSULE	1 3 2
5	SURRY 1	S U W Y Z T,V,X	3.9E19 3.0E19 4.3E19 5.2E19	STANDBY STANDBY TESTED STANDBY STANDBY TESTED	4 4 5 4 1
6	SURRY 2	V,X,Y S T U W Z	3.8E19 3.6E19 3.4E19	TESTED TESTED STANDBY STANDBY TESTED STANDBY	5 1 1 5 4
7	TURKEY POINT 3	S,T,V,X U,W,Y,Z		TESTED STANDBY	.
8	TURKEY POINT 4	S,T X U,V,W,Y,Z	3.85E19	TESTED STANDBY STANDBY	. .

- 9 NOTES:
10 1. TO BE WITHDRAWN AND STORED 4. WILL REMAIN FOR LIFE EXTENSION
11 2. TO BE WITHDRAWN AND TESTED 5. DOSIMETRY
12 3. WITHDRAWN AND STORED
- 13 * During the Turkey Point license renewal review, the applicant stated that the standby
14 capsules can be used to gather data on fluence, spectrum, temperature, and neutron flux
15 during the license renewal period.

STATUS OF BABCOCK AND WILCOX PLANT-SPECIFIC (INTEGRATED)
SURVEILLANCE CAPSULES

PLANT	CAPSULE ID	TARGET FLUENCE	STATUS	NOTES
OCONEE 1	F,E,A,C B		TESTED REMOVED	1
OCONEE 2	C,A,E B,D,F TMI2-LG1 A5		TESTED REMOVED TESTED TESTED	1 3
OCONEE 3	A,B,D C,E,F L1 CR3-LG2		TESTED REMOVED TESTED TESTED	1 3
TMI 1	E, C B,D,F A CR3-LG1 TMI2-LG2		TESTED REMOVED NOT TESTED TESTED TESTED	1 2
CRYSTAL RIVER 3	B,C,D,F A, E		TESTED REMOVED	1
ANO 1	E,B,A,C D, F		TESTED REMOVED	1
DAVIS-BESSE 1	F,B,A,D C, E		TESTED REMOVED	1

NOTES:

1. Capsule contains only base metal specimens, or weld data already exists at the expected/received capsule fluences or data is available at fluences greater than the expected/received capsule fluences, so will be disposed of in accordance with the March 17, 2000, letter from D.L. Howell to the USNRC Document Control Desk.

2. Withdrawn and Stored

3. Irradiated in Davis-Besse

Attachment B

SUMMARY TABLE OF PROPOSED CHANGES

PAGE NO.	LINE(S) NO.	PROPOSED CHANGE AND REASON
1	13	Add "participating" prior to the words "Westinghouse plants." Not all Westinghouse plants having B&W-fabricated reactor vessels participated in the program.
1	14	Change "nine" to "six." As of April 10, 2001, the submittal date of Supplement 4 of BAW-1543, Revision 4, there were six Westinghouse-designed plants with B&W-fabricated reactor vessels participating in the program.
1	16	Change "16" to "13" for accuracy (see above comments).
1	17	Add "about" prior to "550°F" for accuracy.
1	25	Change "is being" to "was" for accuracy.
2	17	Change "archive specimens" to "stored capsules" for clarification.
3	11	Delete "and test." OC1-D was a standby capsule with no commitment for testing.
3	18	Delete "and test." OC3-F was a standby capsule with no commitment for testing.
3	21	Change "the B&WOG" to "NMC" for accuracy.
4	11, 12, 14	Change "fourth" to "fifth" for accuracy.
7	5, 6	Under the fifth column entitled "Notes," omit note 3 for consistency. None of the other capsule irradiation locations are noted.
7	6	Under the second column entitled "Capsule ID," omit Capsule ID "F." This capsule was unable to be removed and is still in the reactor.
7	7	Under the second column entitled "Capsule ID," Omit Capsule ID "A," or substitute with "W1."
7	17	Omit note 3 for consistency.

Duke Energy Corporation
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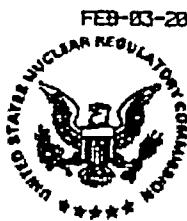
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3 As stated previously, capsules OC1-D and OC3-F could not be removed; therefore, credit for
4 these two capsules could no longer be taken for Oconee Unit 1 and Oconee Unit 3,
5 respectively. The staff independently reviewed the surveillance capsule withdrawal schedules
6 for Oconee Unit 1 and Oconee Unit 3, to ensure that the subject units' surveillance capsule
7 program would still comply with the requirements of ASTM E 185-82.

8 The staff found that the capsule withdrawal schedule for Oconee Unit 1 adequately met the
9 requirements of ASTM E 185-82, in that four capsules have been withdrawn and tested, and
10 the last capsule that was tested, OC1-C, had a fluence of 1 to 2 times the end-of-life fluence.
11 Therefore, the staff determined that the inability to withdraw and test capsule OC1-D had no
12 impact on the ability of the Oconee Unit 1 surveillance capsule program to meet the Appendix H
13 requirements.

14 The staff found that the capsule withdrawal schedule for Oconee Unit 3 adequately met the
15 requirements of ASTM E 185-82, in that three capsules have been tested and an additional
16 capsule, capsule CR3-LG2, which contains the limiting baseline material for Oconee Unit 3 (heat
17 number 72442), was tested and had a fluence of 1 to 2 times the end-of-life fluence for Oconee
18 Unit 3. Therefore, the staff determined that the inability to withdraw and test capsule OC3-F
19 had no impact on the ability of the Oconee Unit 3 surveillance capsule program to meet the
20 Appendix H requirements.

21 The staff noted that the ^{NMC} B&WOG added a supplemental capsule, to be removed and tested, to
22 the Point Beach Unit 2 surveillance program. Also, the B&WOG updated the status of capsules
23 Y and X of Surry Unit 2 and Turkey Point Unit 3, respectively, to indicate that they had been
24 tested. The staff found that these revisions were enhancements or updates to the program and
25 are, therefore, acceptable to the staff.

26
27 On May 26, 2004, the staff requested that the B&WOG remove or address the relevance of the
28 statement, "The owners of plants that have been granted license renewal have made no
29 commitments to test or use information from the capsules that continue to be irradiated under
30 the MIRVSP," because future applicants may wish to take credit for information obtained from
31 the MIRVSP, as opposed to using plant-specific information in order to meet the requirements
32 of 10 CFR Part 50, Appendix H. By letter dated July 7, 2004, the B&WOG indicated that the
33 statement will be removed upon issuance of the approved version of BAW-1543, Revision 4,
34 Supplement 5. The staff found this acceptable.

35 The staff determined that the withdrawal schedules for Oconee Unit 2, Three Mile Island Unit 1
36 (TMI-1), Crystal River Unit 3, Arkansas Nuclear One Unit 1, Davis-Besse, Point Beach Unit 2,
37 Surry Unit 1, Turkey Point Unit 4, as provided in Tables VI and VII of BAW-1543(NP), Revision
38 4, Supplement 5, did not change from Supplement 4 and, therefore, still comply with the
39 requirements of ASTM E 185-82, as stated in the staff's safety evaluation dated July 31, 2001.
40 However, the staff noted that the information in Table VIII, of the subject topical report, did not
41 accurately list the capsules to be withdrawn and tested for Oconee Units 1, 2 and 3, and TMI-1.

1 The B&WOG listed capsules for these subject plants that were no longer going to be withdrawn
2 and tested, i.e., Capsule OC1-D for Oconee Unit 1, Capsule OC2-F for Oconee Unit 2,
3 Capsule OC3-F for Oconee Unit 3, and Capsules F and D for TMI-1.

4 During a conference call that was held on November 23, 2004, the staff discussed this issue
5 with the B&WOG, who indicated that it would revise Table VIII of the report to accurately list the
6 capsules that were going to replace those that were no longer going to be withdrawn and
7 tested. The staff noted that the withdrawal schedule for Oconee Unit 1 already met the
8 requirements of ASTM E185-82; however, the table still needed revision, because the capsules
9 listed were not correct. The B&WOG indicated that Oconee Unit 2's limiting material is
10 contained in Capsule A5 (which was irradiated in Davis Besse), which was tested and satisfied
11 the fourth capsule requirement of ASTM E185-82 for Oconee Unit 2. For Oconee Unit 3, the
12 limiting material is contained in Capsule CR3-LG2, which was tested and satisfied the fourth ~~fourth~~ ^{FIFTH}
13 capsule requirement of ASTM E185-82, for Oconee Unit 3. And for TMI-1 the limiting material
14 is contained in Capsule TMI2-LG2, which was tested and satisfied the fourth capsule
15 requirement of ASTM E185-82. ^{FIFTH}

16 By supplemental letter dated January 5, 2005, the B&WOG revised Table VIII to the
17 BAW-1543(NP), Revision 4, Supplement 5 report. The staff found that the revised table
18 accurately listed the withdrawal schedules for Oconee Units 1, 2, and 3, and TMI-1. As stated
19 above, the staff found that each of these plants met the capsule withdrawal schedule
20 requirements of ASTM E185-82, even though the original capsules were not going to be
21 withdrawn and tested for Oconee Units 2 and 3 and TMI-1, because there are other capsules in
22 the MIRVSP that contain the same limiting material for the subject plants that will be withdrawn
23 and tested, and, therefore, will satisfy the requirements of ASTM E185-82.

24
25 Turkey Point Units 3 and 4 were prepared in accordance with ASTM E 185-66. The Turkey
26 Point Units 3 and 4 reactor vessels were purchased to the Summer 1966 Addenda to the 1965
27 ASME Code. ASTM E 185-66 was the surveillance capsule standard in effect at the time the
28 Turkey Point Units 3 and 4 reactor vessels were purchased. Since the Turkey Point Units 3
29 and 4 capsule withdrawal schedules meet the ASTM E 185 edition that was current at the time
30 the reactor vessels were purchased, the withdrawal schedules meet the requirements of
31 Appendix H to 10 CFR Part 50.

32 It should also be noted that, by letter dated February 8, 1985, a safety evaluation report (SER)
33 was submitted to Florida Power & Light Company, which indicated that the NRC approved an
34 integrated surveillance program for Turkey Point Units 3 and 4. The SER indicated that the
35 only capsules to be tested at Turkey Point Units 3 and 4 in accordance with ASTM E 185
36 requirements, are those that contain weld metal specimens.

37 4.0 CONCLUSION

38
39 Based on the staff's review of the B&WOG MIRVSP, the staff found that the revised withdrawal
40 schedules, as indicated in Report BAW-1543(NP), Revision 4, Supplement 5, are acceptable
41 for the B&W-designed 177-FA plants and the Westinghouse-designed plants with B&W-
42 fabricated reactor vessels. The proposed withdrawal schedules satisfy the ASTM E 185-82
43 Standard for all plants participating in the B&WOG MIRVSP except for Turkey Point Units 3 and
44 4. Turkey Point Units 3 and 4 satisfy the ASTM E 185-66 Standard. Since this edition of the

1 standard was current at the time the reactor vessels were purchased, the Turkey Point Units 3
2 and 4 surveillance capsule withdrawal schedules satisfy the requirements of Appendix H to
3 10 CFR Part 50. Also, it should be noted that the NRC previously approved an integrated
4 surveillance program for Turkey Point Units 3 and 4.

5 The staff concluded that the proposed withdrawal schedules of BAW-1543(NP), Revision 4,
6 Supplement 5, comply with Appendix H to 10 CFR Part 50. Therefore, the staff approves the
7 revised withdrawal schedule for each of the plants included in the B&WOG MIRVSP.

8 5.0 REFERENCES

- 9 1. BAW-1543, Revision 4, Supplement 4, "Supplement to the Master Integrated Reactor
10 Vessel Surveillance Program," April 2001.
- 11 2. NRC letter to A. Mendiola, from K. Wichman, NRC, "Safety Evaluation of BAW-1543,
12 Master Integrated Reactor Vessel Surveillance Program, Revision 4, Supplement 4,"
13 July 31, 2001.
- 14 3. Code of Federal Regulations, Title 10, Part 50, Appendix H, "Reactor Vessel Material
15 Surveillance Program Requirements."
- 16 4. American Society for Testing and Materials, "Recommended Practice for Surveillance
17 Tests on Structural Materials in Nuclear Reactors," ASTM E 185-66.
- 18 5. American Society for Testing and Materials, "Recommended Practice for Surveillance
19 Tests for Nuclear Reactor Vessels," ASTM E 185-70.
- 20 6. American Society for Testing and Materials, "Standard Practice for Conducting
21 Surveillance Tests for Light Water Cooled Nuclear Power Reactor Vessels,"
22 ASTM E 185-82.
- 23 7. NUREG-1511, Supplement 2, "Reactor Pressure Vessel Status Report," October 2000.

1 STATUS OF WESTINGHOUSE PLANT-SPECIFIC SURVEILLANCE CAPSULES

2	PLANT	CAPSULE ID	TARGET FLUENCE	STATUS	NOTES
3	POINT BEACH 1	N P R,S,T,V	4.5E19	STANDBY REMOVED TESTED	1 3
4	POINT BEACH 2	N P R,S,T,V W	5.0E19	STANDBY REMOVED TESTED SUPPL CAPSULE	1 3 2
5	SURRY 1	S U W Y Z T,V,X	3.9E19 3.0E19 4.3E19 5.2E19	STANDBY STANDBY TESTED STANDBY STANDBY TESTED	4 4 5 4 1
6	SURRY 2	V,X,Y S T U W Z	3.8E19 3.6E19 3.4E19	TESTED TESTED STANDBY STANDBY TESTED STANDBY	5 1 1 5 4
7	TURKEY POINT 3	S,T,V,X U,W,Y,Z		TESTED STANDBY	•
8	TURKEY POINT 4	S,T X U,V,W,Y,Z	3.85E19	TESTED STANDBY STANDBY	• •

- 9 NOTES:
 10 1. TO BE WITHDRAWN AND STORED 4. WILL REMAIN FOR LIFE EXTENSION
 11 2. TO BE WITHDRAWN AND TESTED 5. DOSIMETRY
 12 3. WITHDRAWN AND STORED
 13 • During the Turkey Point license renewal review, the applicant stated that the standby
 14 capsules can be used to gather data on fluence, spectrum, temperature, and neutron flux
 15 during the license renewal period.

STATUS OF BABCOCK AND WILCOX PLANT-SPECIFIC (INTEGRATED)
SURVEILLANCE CAPSULES

PLANT	CAPSULE ID	TARGET FLUENCE	STATUS	NOTES
OCONEE 1	F,E,A,C B		TESTED REMOVED	1
OCONEE 2	C,A,E B,D,F TMI2-LG1 A5		TESTED REMOVED TESTED TESTED	1 /
OCONEE 3	A,B,D C,E,F L1 CR3-LG2		TESTED REMOVED TESTED TESTED	1 /
TMI 1	E,C B,D,F A CR3-LG1 TMI2-LG2		TESTED REMOVED NOT TESTED TESTED TESTED	1 2
CRYSTAL RIVER 3	B,C,D,F A,E		TESTED REMOVED	1
ANO 1	E,B,A,C D,F		TESTED REMOVED	1
DAVIS-BESSE 1	F,B,A,D C,E		TESTED REMOVED	1

NOTES:

1. Capsule contains only base metal specimens, or weld data already exists at the expected/received capsule fluences or data is available at fluences greater than the expected/received capsule fluences, so will be disposed of in accordance with the March 17, 2000, letter from D.L. Howell to the USNRC Document Control Desk.

2. Withdrawn and Stored

3. Irradiated in Davis-Besse

Attachment B

SUMMARY TABLE OF PROPOSED CHANGES

PAGE NO.	LINE(S) NO.	PROPOSED CHANGE AND REASON
1	13	Add "participating" prior to the words "Westinghouse plants." Not all Westinghouse plants having B&W-fabricated reactor vessels participated in the program.
1	14	Change "nine" to "six." As of April 10, 2001, the submittal date of Supplement 4 of BAW-1543, Revision 4, there were six Westinghouse-designed plants with B&W-fabricated reactor vessels participating in the program.
1	16	Change "16" to "13" for accuracy (see above comments).
1	17	Add "about" prior to "550°F" for accuracy.
1	25	Change "is being" to "was" for accuracy.
2	17	Change "archive specimens" to "stored capsules" for clarification.
3	11	Delete "and test." OC1-D was a standby capsule with no commitment for testing.
3	18	Delete "and test." OC3-F was a standby capsule with no commitment for testing.
3	21	Change "the B&WOG" to "NMC" for accuracy.
4	11, 12, 14	Change "fourth" to "fifth" for accuracy.
7	5, 6	Under the fifth column entitled "Notes," omit note 3 for consistency. None of the other capsule irradiation locations are noted.
7	6	Under the second column entitled "Capsule ID," omit Capsule ID "F." This capsule was unable to be removed and is still in the reactor.
7	7	Under the second column entitled "Capsule ID," Omit Capsule ID "A," or substitute with "W1."
7	17	Omit note 3 for consistency.