

BWR OWNERS' GROUP

Frederick P. "Ted" Schiffley, II

BWROG Chairman

Tel: (630) 657-3897

Fax: (630) 657-4328

frederick.schiffley@exeloncorp.com

c/o GE Hitachi Nuclear Energy, P.O. Box 780, 3901 Castle Hayne Road, M/C A-70, Wilmington, NC 28402 USA

BWROG-12021
May 18, 2012

Project No. 691

Mr. Joe Golla
Project Manager
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: BWROG ECCS Suction Strainer Program Plan Schedule Update

REFERENCE:

1. BWROG Letter BWROG-10042 dated August 31, 2010, "BWROG ECCS Suction Strainer Issue Resolution Schedule Update"
2. Summary of March 28, 2012, Category II Public Meeting with the Boiling Water Reactor Owners' Group (ADAMS ACCESSION NO.: ML12095A326)

Dear Mr. Golla:

The Boiling Water Reactor Owners' Group (BWROG) has developed an extensive program to address NRC questions regarding the design of the Emergency Core Cooling System Suction Strainers (ECCS SS) in Boiling Water Reactors (BWRs). As discussed in the March 28th meeting (reference 2), enclosed is the current program plan schedule.

This schedule is separated into fourteen (14) major areas of effort by the BWROG ECCS SS Committee for addressing the Staff's questions. For each area, the BWROG has developed a detailed resolution plan. The plan includes major milestones for each of the key deliverables, such as analytical work, test plan development, test plan execution, analysis of test results, and generation of technical reports.

The attached provides a high level overview of the project schedule and major milestones as of May 2012. As with any large-scale project, the schedule may have to be adjusted. For this project, factors that can affect schedule performance are utility funding availability, the outcome of planned efforts, and resource availability within the BWROG.

The BWROG is providing this schedule to assist the Staff with its long-range planning efforts to ensure that the appropriate resources will be available to review these deliverables as they are developed and completed. This is critical to the overall effort, as most of these tasks are serial in nature. Thus, timely review of each key deliverable will be necessary to maintain the overall schedule.

The BWROG would like to discuss this schedule in detail with the Staff in the coming weeks to ensure common understanding of the activities included in the plan and interfaces between the NRC and BWROG. Please contact Ed Asbury (BWROG Project Manager) to schedule a meeting. The BWROG will continue to communicate closely with you to maintain awareness of current activities, major schedule changes, and results of technical activities. We will also work with you to schedule periodic updates on our progress with NRC senior management. The BWROG looks forward to working with the Staff to demonstrate the robustness of the BWR ECCS SS designs.

If you have any questions concerning this letter, please do not hesitate to contact me or Ed Asbury, BWROG Project Manager (910-819-7544).

A handwritten signature in black ink, appearing to read 'F. Schiffley II', with a large, stylized flourish at the end.

Frederick P. "Ted" Schiffley, II
Chairman
BWR Owners' Group

cc: S. L. Scammon, BWROG ECCS SS Committee Chairman
C. J. Nichols, BWROG Program Manager
E. L. Asbury, BWROG ECCS SS Committee Project Manager
BWROG Primary Representatives
BWROG ECCS SS Committee

Attachment:

1. ECCS-SS Program High Level Schedule (May 2012)

Attachment 1

ECCS-SS Program High Level Schedule (May 2012)

BWROG ECCS-Suction Strainer Program High Level Schedule (May 2012)

Activity ID	Activity Name	Finish
ECCS-SS Project		Dec-11-2017
1 NRC ISSUE #1 - Downstream Effects for Components and Systems		Oct-17-2016
1.1	Option 1 Use existing WCAP-16406 as base evaluation tool	Nov-24-2014
1.1.1	Confirm resolution plan with BWROG and NRC - NRC Issue #1	Oct-19-2010-cmp
1.1.1.2	Meet with NRC	Oct-19-2010-cmp
1.1.5	Develop new methods if necessary (ECCS-WP-1-2)	Nov-24-2014
1.1.5.1	ECCS-WP-1-2 Piping, Valve and Heat Exchangers additional scope (Part I) - diff between Ps and Bs	Sep-22-2014
1.1.5.2	ECCS-WP-1-2 ECCS Pump Evaluations (Part II)- differences between Ps and Bs	Oct-20-2014
1.1.5.3	ECCS-WP-1-2 Regulatory Summary (Part III)- differences between Ps and Bs	Nov-24-2014
1.2	Options 1 and 2 - Technical Step 3	Oct-17-2016
1.2.3	Submit ECCS-LTR-1-1 to NRC	Apr-25-2016
1.2.3.7	ECCS-LTR-1-1 Submit report to NRC	Aug-17-2015
1.2.3.8	ECCS-LTR-1-1 NRC review LTR	Apr-25-2016
1.2.4	Resolve NRC RAIs by revving report and resubmitting ECCS-LTR-1-1	Oct-17-2016
1.2.4.7	ECCS-LTR-1-1 Submit report to NRC	Jul-25-2016
1.2.4.8	NRC review / approval	Oct-17-2016
2 NRC ISSUE #2 - Downstream Effects - Fuel		Dec-11-2017
2.1	Confirm overall resolution plan with BWROG and NRC - NRC Issue #2	Oct-22-2010-cmp
2.1.2	Meet with NRC	Oct-22-2010-cmp
2.2	Complete a GEH LOCA analysis of the most limiting LOCA scenarios, BWRs 2 through 6 (ECCS-LTR-2-1)	Apr-03-2013
2.2.05	ECCS-LTR-2-1 r2 NRC review	Jun-07-2011-cmp
2.2.12.1	ECCS-LTR-2-1 r2 NRC Review complete	Aug-28-2012
2.2.12.6	ECCS-LTR-2-1 r3 Draft SE to BWROG	Feb-05-2013
2.2.12.8	ECCS-LTR-2-1 r3 Final SE to BWROG	Apr-03-2013
2.2.11	RAI response from BWROG	Aug-27-2012
2.2.11.1	Batch 1	May-30-2012
2.2.11.1.15	ECCS-LTR-2-1 r2 RAI responses submitted to NRC	Apr-20-2012-cmp
2.2.11.1.16	ECCS-LTR-2-1 r2 NRC Receive for Review	Apr-20-2012-cmp
2.2.11.1.17	ECCS-LTR-2-1 r2 NRC Review	May-30-2012
2.2.11.2	Batch 2	Aug-27-2012
2.2.11.2.20	ECCS-LTR-2-1 r2 RAI responses submitted to NRC	May-31-2012
2.2.11.2.21	ECCS-LTR-2-1 r2 NRC Receive for Review	Jun-01-2012
2.2.11.2.22	ECCS-LTR-2-1 r2 NRC Review	Aug-27-2012
2.4	LTRs 2 and 3	Dec-11-2017

BWROG ECCS-Suction Strainer Program High Level Schedule (May 2012)

<u>Activity ID</u>	<u>Activity Name</u>	<u>Finish</u>
ECCS-SS Project		Dec-11-2017
2.4.9	Complete LTR2 (ECCS-LTR-2-2)	Oct-11-2017
2.4.9.01a	ECCS-LTR-2-2 Complete a AREVA LOCA analysis of the most limiting LOCA scenarios, maximum of six	Dec-18-2014
2.4.9.01b	ECCS-LTR-2-2 Complete a AREVA LOCA analysis of the most limiting LOCA scenarios, maximum of six	Oct-14-2015
2.4.9.14	ECCS-LTR-2-2 submitted to NRC	Feb-03-2016
2.4.9.15	ECCS-LTR-2-2 NRC reviews LTR2	Oct-12-2016
2.4.9.29	ECCS-LTR-2-2 RAI answers submitted to NRC	Jul-19-2017
2.4.9.30	ECCS-LTR-2-2 NRC issue SE	Oct-11-2017
2.4.10	Complete LTR3 (ECCS-LTR-2-3)	Dec-11-2017
2.4.10.01	ECCS-LTR-2-3 Complete a Westinghouse LOCA analysis of the most limiting LOCA scenarios, max of six	Dec-29-2015
2.4.10.14	ECCS-LTR-2-3 LTR3 submitted to NRC	Apr-04-2016
2.4.10.15	ECCS-LTR-2-3 NRC reviews LTR3	Dec-12-2016
2.4.10.29	ECCS-LTR-2-3 RAI answers submitted to NRC	Sep-18-2017
2.4.10.30	ECCS-LTR-2-3 NRC issue SE	Dec-11-2017
2.5	Perform simulated fuel assembly flow blockage testing.	Feb-10-2017
2.5.2	Test Facility	Aug-07-2013
2.5.2.14	Submit test plans to NRC ECCS-TP-2-1	Aug-07-2013
2.5.2.14.09	ECCS-TP-2-1 Submit test plans to NRC	Jun-18-2013
2.5.2.14.10	ECCS-TP-2-1 NRC review test plans	Aug-07-2013
2.5.2.15	Construct test facility	Jul-26-2013
2.5.2.15.1	Build test facility	Jun-27-2013
2.5.2.15.2	NRC invitation to visit test facility	May-16-2013
2.5.2.15.3	QA review of test loop qualification, implementation	Jul-26-2013
2.5.2.15.4	NRC visit of Test facility	Jul-26-2013
2.5.3	Fuel Assembly Procurement	Sep-04-2013
2.5.3.3	Westinghouse	Aug-12-2013
2.5.3.3.5	Westinghouse build simulated fuel assembly and deliver to facility	Aug-12-2013
2.5.3.4	AREVA	Sep-04-2013
2.5.3.4.5	AREVA build simulated fuel assembly and deliver to facility	Sep-04-2013
2.5.3.5	GNF	Apr-30-2013
2.5.3.5.5	GNF build simulated fuel assembly and deliver to facility	Apr-30-2013
2.5.4	Perform simulated fuel bundle testing performed and documented for each fuel vendor.	May-01-2014
2.5.4.1	GEH fuel test	Oct-31-2013
2.5.4.2	Westinghouse fuel test	Feb-06-2014

BWROG ECCS-Suction Strainer Program High Level Schedule (May 2012)

<u>Activity ID</u>	<u>Activity Name</u>	<u>Finish</u>
ECCS-SS Project		Dec-11-2017
2.5.4.3	AREVA fuel test	May-01-2014
2.5.7	Addenda to LTRs 1,2,3 - test results	Feb-10-2017
2.5.7.1	Addendum to LTR1 ECCS-LTR-2-4	Mar-02-2015
2.5.7.1.15	ECCS-LTR-2-4 Submit LTR1 addendum to NRC	Jun-23-2014
2.5.7.1.16	ECCS-LTR-2-4 NRC review LTR1 addendum	Mar-02-2015
2.5.7.2	Addendum to LTR2 ECCS-LTR-2-5	Nov-22-2016
2.5.7.2.14	ECCS-LTR-2-5 Submit LTR2 addendum to NRC	Mar-15-2016
2.5.7.2.15	ECCS-LTR-2-5 NRC review LTR2 addendum	Nov-22-2016
2.5.7.3	Addendum to LTR3 ECCS-LTR-2-6	Feb-10-2017
2.5.7.3.14	ECCS-LTR-2-6 Submit LTR3 addendum to NRC	Jun-03-2016
2.5.7.3.15	ECCS-LTR-2-6 NRC review LTR3 addendum	Feb-10-2017
2.6	Chemical/corrosion product evaluation of fuel cladding.	Oct-21-2013
2.6.6	Prepare report ECCS-WP-2-2	May-13-2013
2.6.6.1	ECCS-WP-2-2 Prepare a report for cladding analysis	May-13-2013
2.6.7	Submit report to NRC ECCS-WP-2-2	Oct-21-2013
2.6.7.7	ECCS-WP-2-2 Submit report to NRC	Jul-26-2013
2.6.7.8	NRC review / approval	Oct-21-2013
3 NRC ISSUE #3 - Debris Head Loss Predictions		Apr-10-2014
3.1	Develop a BWR strainer design guideline document	Mar-05-2013
3.1.08.0	ECCS-S-3-1 NRC staff review headloss surveys	Apr-08-2011-cmp
3.1.1	Confirm resolution plan with BWROG and NRC - NRC Issue #3	Oct-19-2010-cmp
3.1.01.2	Meet with NRC	Oct-19-2010-cmp
3.1.14	Submit assessment report to NRC ECCS-WP-3-1	Oct-05-2012
3.1.14.7	ECCS-WP-3-1 Submit report to NRC	Aug-16-2012
3.1.14.8	ECCS-WP-3-1 NRC review report	Oct-05-2012
3.1.15	Resolve NRC concerns by revving assessment report and resubmitting ECCS-WP-3-1	Dec-20-2012
3.1.15.01	ECCS-WP-3-1 Revise report	Oct-12-2012
3.1.15.12	ECCS-WP-3-1 Submit report to NRC	Dec-20-2012
3.1.17	Submit report to NRC ECCS-WP-3-2	Mar-05-2013
3.1.17.7	ECCS-WP-3-2 Submit report to NRC	Jan-15-2013
3.1.17.8	ECCS-WP-3-2 NRC review report	Mar-05-2013
3.2	Develop a generic BWR thin bed effects test program	Apr-10-2014
3.2.5	Submit test plan to NRC ECCS-TP-3-2	Aug-16-2013

BWROG ECCS-Suction Strainer Program High Level Schedule (May 2012)

Activity ID	Activity Name	Finish
ECCS-SS Project		Dec-11-2017
3.2.5.7	ECCS-TP-3-2 Submit report to NRC	Jun-27-2013
3.2.5.8	ECCS-TP-3-2 NRC review report	Aug-16-2013
3.2.6 Perform testing		Oct-14-2013
3.2.6.2	Obtain test articles	Apr-29-2013
3.2.6.3	ECCS-TP-3-3 Develop procedures	May-20-2013
3.2.6.6	Perform Thin Bed testing	Oct-14-2013
3.2.7 Prepare test report ECCS-TP-3-4		Apr-10-2014
3.2.7.13	ECCS-TP-3-4 Submit report to NRC	Feb-20-2014
3.2.7.14	ECCS-TP-3-4 NRC review report	Apr-10-2014
4 NRC ISSUE #4 - Chemical Effects		Apr-26-2016
4.1 Material Dissolution Correlation Development		May-30-2012
4.1.1 Confirm resolution plan with BWROG and NRC - NRC Issue #4		Aug-11-2010-cmp
4.1.1.2	Meet with NRC	Aug-11-2010-cmp
4.1.3 Submit report to NRC ECCS-WP-4-1		May-30-2012
4.1.3.7	ECCS-WP-4-1 Submit report to NRC	Nov-28-2011-cmp
4.1.3.8	ECCS-WP-4-1 NRC review report	Feb-08-2012-cmp
4.1.3.9	ECCS-WP-4-1 Address NRC comments on chemical effect strategy outline and flowchart	May-30-2012
4.2 Dissolution test plan ECCS-TP-4-1		Feb-19-2013
4.2.5 Write material dissolution test plan ECCS-TP-4-1		Jul-16-2012
4.2.5.1	ECCS-TP-4-1 Write material dissolution test plan	Jul-16-2012
4.2.6 Submit test plan to NRC ECCS-TP-4-1		Feb-19-2013
4.2.6.7	ECCS-TP-4-1 Submit report to NRC	Oct-03-2012
4.2.6.8	ECCS-TP-4-1 NRC review report	Nov-21-2012
4.2.6.9	ECCS-TP-4-1 Address NRC comments on test plan	Feb-19-2013
4.3 Conduct material dissolution testing		Aug-09-2013
4.3.1	Conduct material dissolution testing	Aug-09-2013
4.5 BWR Material dissolution correlation ECCS-WP-4-2		Jul-22-2014
4.5.6 Submit report to NRC ECCS-WP-4-2		Jul-22-2014
4.5.6.7	ECCS-WP-4-2 Submit report to NRC	May-06-2014
4.5.6.8	ECCS-WP-4-2 NRC review report	Jun-24-2014
4.5.6.9	ECCS-WP-4-2 Address NRC comments	Jul-22-2014
4.6 BWR Chemical Effects Evaluation Screening Tool Development ECCS-WP-4-3		Apr-26-2016
4.6.5 Submit report to NRC ECCS-TP-4-3		Apr-14-2015

BWROG ECCS-Suction Strainer Program High Level Schedule (May 2012)

<u>Activity ID</u>	<u>Activity Name</u>	<u>Finish</u>
ECCS-SS Project		Dec-11-2017
4.6.5.7	ECCS-TP-4-3 Submit report to NRC	Dec-30-2014
4.6.5.8	ECCS-TP-4-3 NRC review report	Feb-17-2015
4.6.5.9	ECCS-TP-4-3 Address NRC comments	Apr-14-2015
4.6.6 (New WBS)		Oct-02-2015
4.6.6	Test predicted dissolved material concentrations and simulated suppression pool chemistry	Oct-02-2015
4.6.7 (New WBS)-1		Nov-06-2015
4.6.7	Develop and issue screening tool with criteria and thresholds for the first-pass chemical effects	Nov-06-2015
4.6.11	Submit test report to NRC ECCS-TP-4-4	Apr-26-2016
4.6.11.7	ECCS-TP-4-4 Submit report to NRC	Feb-09-2016
4.6.11.8	ECCS-TP-4-4 NRC review report	Mar-29-2016
4.6.11.9	ECCS-TP-4-4 Address NRC comments	Apr-26-2016
5 NRC ISSUE #5 - Assessment of Coatings		Dec-19-2012
5.1	Assessment of Coatings	Dec-19-2012
5.1.08	ECCS-S-5-1 NRC Review Survey	May-26-2011-cmp
5.1.1	Confirm resolution plan with BWROG and NRC - NRC Issue #5	Sep-14-2010-cmp
5.1.1.2	Meet with NRC	Sep-14-2010-cmp
5.1.15	Submit report to NRC ECCS-WP-5-1	Sep-26-2012
5.1.15.7	ECCS-WP-5-1 Submit report to NRC	Aug-07-2012
5.1.15.8	ECCS-WP-5-1 NRC review report	Sep-26-2012
5.1.16	NRC review report ECCS-WP-5-1	Dec-19-2012
5.1.16.01	ECCS-WP-5-1 Revise report	Oct-10-2012
5.1.16.11	ECCS-WP-5-1 Submit report to NRC	Dec-19-2012
6 NRC ISSUE #6 - Latent Debris		Sep-30-2012
6.1	Adopt 85/15 Dirt/Dust Debris Characteristics - OPTION 1	Sep-30-2012
6.1.7	Submit report to NRC ECCS-WP-6-1	Jul-30-2012
6.1.7	NRC Review report	Aug-30-2012
6.1.8	Resolve NRC comments	Sep-30-2012
7 NRC ISSUE #7 - ZOI Adjustment for Air Jet Testing		May-24-2012
7.1	Review and bolster the current technical basis - OPTION 1	May-24-2012
7.1.02	Get verbal or written confirmation that NRC is open to BWROG argument	Jul-19-2011-cmp
7.1.04	Hold discussion with NRC	Jul-20-2011-cmp
7.1.04.1	Hold discussion with NRC	May-24-2012
7.1.1	Confirm resolution plan with BWROG and NRC - NRC Issue #7	Jul-18-2011-cmp

BWROG ECCS-Suction Strainer Program High Level Schedule (May 2012)

<u>Activity ID</u>	<u>Activity Name</u>	<u>Finish</u>
ECCS-SS Project		Dec-11-2017
7.1.1.4	Get NRC response to Air Jet testing point paper	Jul-18-2011-cmp
8: NRC ISSUE #8 - ZOI for Protective Coatings		Sep-11-2012
8.1 ZOI for Protective Coatings		Sep-11-2012
8.1.1 Confirm resolution plan with BWROG and NRC - NRC Issue #8		Aug-11-2010-cmp
8.1.1.2	Meet with NRC	Aug-11-2010-cmp
8.1.2 Using the jet model, calculate the spherical ZOI ECCS-WP-8-1		Aug-09-2012
8.1.2.09	Submit to NRC	Jun-06-2012
8.1.2.10	NRC Review	Jul-26-2012
8.1.2.11	Resolve comments	Aug-09-2012
8.1.3 Validate Generic Coating Quantity		Sep-11-2012
8.1.3.14	Submit to NRC	Jul-23-2012
8.1.3.15	NRC Review	Sep-11-2012
8.1.9 Resolve NRC comments		Oct-11-2012
9: NRC ISSUE #9 - Debris Transport and Erosion		Apr-25-2014
9.1 Develop a revised BWR debris transport and erosion guidance:		Apr-25-2014
9.1.4 Submit report to NRC ECCS-WP-9-1		Apr-25-2014
9.1.4.7	ECCS-WP-9-1 Submit report to NRC	Mar-07-2014
9.1.4.8	ECCS-WP-9-1 NRC review report	Apr-25-2014
9.1.5 Resolve NRC comments		May-25-2014
10: NRC ISSUE #10 - Debris Characteristics		Jul-19-2013
10.1 Develop a BWR debris characteristics report		Jul-19-2013
10.1.4 Submit report to NRC ECCS-WP-10-1		Jul-19-2013
10.1.4.7	ECCS-WP-10-1 Submit report to NRC	May-30-2013
10.1.4.8	ECCS-WP-10-1 NRC review report	Jul-19-2013
10.1.5 Resolve NRC comments		Aug-19-2013
11: NRC ISSUE #11 - Near Field Effects and Scaling		Sep-23-2013
11.1 Near-Field Effects Evaluation		Sep-23-2013
11.1.4	ECCS-S-3-1 Get feedback on survey from NRC	May-26-2011-cmp
11.1.12 Submit report to NRC ECCS-WP-11-2		Jul-10-2013
11.1.12.7	ECCS-WP-11-2 Submit report to NRC	May-20-2013
11.1.12.8	ECCS-WP-11-2 NRC review report	Jul-10-2013
11.1.13 Resolve NRC concerns by revving report and resubmitting ECCS-WP-11-2		Sep-23-2013
11.1.13.01	ECCS-WP-11-2 Revise report	Jul-24-2013

BWROG ECCS-Suction Strainer Program High Level Schedule (May 2012)

<u>Activity ID</u>	<u>Activity Name</u>	<u>Finish</u>
ECCS-SS Project		Dec-11-2017
11.1.13.11	ECCS-WP-11-2 Submit report to NRC	Sep-23-2013
12 NRC ISSUE #12- Spherical ZOI		Sep-14-2012
12.1	Develop revised guidance for BWR Method 3 brk specific analysis using brk dependent ZOIs - OPTION 1	Sep-14-2012
12.1.13	ECCS-WP-11-2 Submit letter to NRC	Jul-12-2012
12.1.14	ECCS-WP-12-1 NRC review	Aug-30-2012
12.1.15	ECCS-WP-12-1 Resolve NRC concerns	Sep-14-2012
13 Source Term for Generic Evaluations		Jun-29-2012
13.2	Source Term Bounding Estimates for Tests and Analysis	Jun-29-2012
13.2.1	Determine bypass fractions and document	Jun-29-2012
13.2.1.7	Submit test plan to NRC ECCS-TP-13-2	Jan-17-2012-cmp
13.2.1.7.7	ECCS-TP-13-2 Submit report to NRC	Nov-29-2011-cmp
13.2.1.7.8	ECCS-TP-13-2 NRC review report	Jan-17-2012-cmp
13.2.1.8	Perform testing	Jun-29-2012
13.2.1.8.5	Perform testing	Jun-29-2012
13.2.1.8.5.1	PCI test	Jan-12-2012-cmp
13.2.1.8.5.2	Enercon test	Jun-29-2012
13.2.1.9	Prepare test report ECCS-TP-13-4	Jun-01-2012
13.2.1.9.1	ECCS-TP-13-4 Prepare test report	May-31-2012
13.2.1.9.2	Issue Draft report	Jun-01-2012
14 Prepare and issue URG Supplement ECCS-LTR-14-1		May-05-2016
14.5	Submit report to NRC ECCS-LTR-14-1	Sep-21-2015
14.5.8	ECCS-LTR-14-1 Submit report to NRC	Jan-12-2015
14.5.9	ECCS-LTR-14-1 NRC review report	Sep-21-2015
14.6	Resolve NRC concerns by revving report and resubmitting ECCS-LTR-14-1	Nov-19-2015
14.6.10	ECCS-LTR-14-1 Submit report to NRC	Nov-19-2015
14.7	ECCS-LTR-14-1 NRC review URG Supplement	Jan-07-2016
14.10	ECCS-LTR-14-1 Submit RAI resolutions and updated supplement to NRC	Mar-17-2016
14.11	ECCS-LTR-14-1 NRC issue SER	Mar-31-2016
14.12	ECCS-LTR-14-1 Incorporate NRC SER into URG supplement	May-05-2016