BWROG ECCS Suction Strainers Committee – NRC Public Meeting

William Kopchick II (PSEG)
Steve Scammon (Energy Northwest)
Brad Tyers (Exelon)
Greg Broadbent (Entergy)
Tony Borger (Talen Energy)
Rob Choromokos (SIA)
Ludwig Haber (Alden Lab)
Steve Sawochka (NWT Corporation)

BWR OWNERS' GROUP

BWR Expertise – Proven Solutions

BWROG ECCS Suction Strainers Committee – NRC Public Meeting

BWROG Management Introduction

William Kopchick II (PSEG)
BWROG Executive Committee

Topics

- Meeting Objectives
- Updates Since the December 4, 2014 Public Meeting
  - Downstream Effects (DSE) - Fuels Subcommittee Update
  - DSE - Components Update
  - Debris Source Term Subcommittee Update
- Proposed 2016 Strategic NEDC-33608-P NRC - BWROG Activities
- Chemical Effects Testing Update
- Fuels Testing Program Update
- Summary

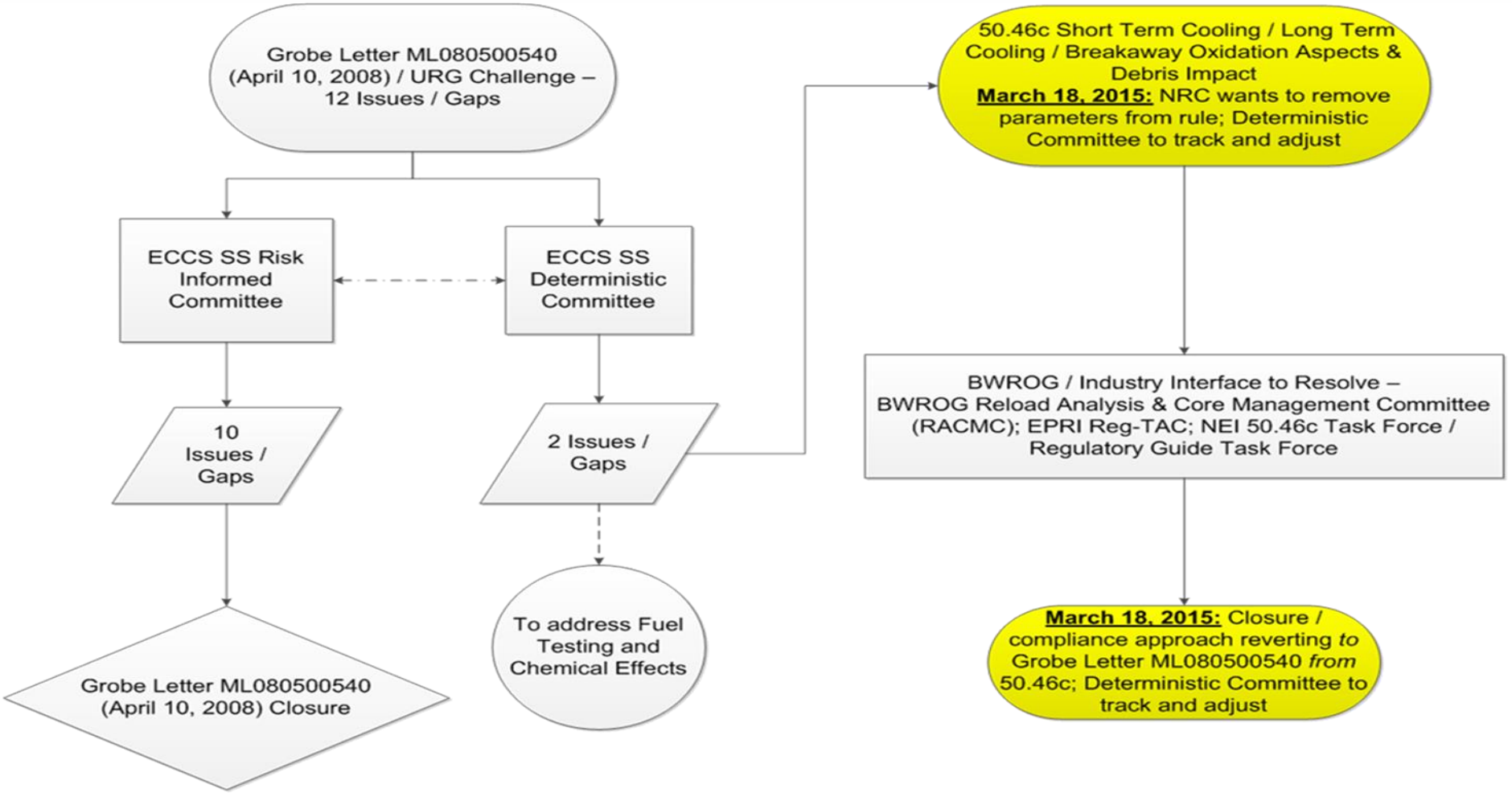
Meeting Objectives

- End of year technical updates and discussion opportunity for deterministic ECCS Suction Strainers project scope areas
- GE Hitachi fuels LTR
  - Newly proposed NEDC-33608-P timetable for 2016 / 2017
  - NEDC-33608-P processing and technical implementation options
  - Logistics discussions
    - 1Q 2016, 2-day NEDC-33608-P workshop (San Jose, CA proposed)
    - 1Q 2016, ½-day public meeting / drop-in to finalize NEDC-33608-P timeline (RIC week)
    - 2Q / 3Q 2016, ½ -day Chemical Effects survey workshop (venue TBD)
    - 3Q 2016, 1-day public meeting / workshop to review debris characteristics / test debris specification / Debris Source Term Master Survey (venue TBD)

BWROG ECCS Suction Strainers Committee Overview

Steve Scammon (Energy Northwest)
Chairman BWROG
ECCS Suction Strainer Committee

Background


Grobe Letter ML080500540 (April 10, 2008) / URG Challenge – 12 Issues / Gaps
ECCS SS Risk Informed Committee
ECCS SS Deterministic Committee
10 Issues / Gaps
2 Issues / Gaps
Grobe Letter ML080500540 (April 10, 2008) Closure
To address Fuel Testing and Chemical Effects
50.46c Short Term Cooling / Long Term Cooling / Breakaway Oxidation Aspects & Debris Impact
March 18, 2015: NRC wants to remove parameters from rule; Deterministic Committee to track and adjust
BWROG / Industry Interface to Resolve – BWROG Reload Analysis & Core Management Committee (RACMC); EPRI Reg-TAC; NEI 50.46c Task Force / Regulatory Guide Task Force
March 18, 2015: Closure / compliance approach reverting to Grobe Letter ML080500540 from 50.46c; Deterministic Committee to track and adjust

Background (cont.)

- 2015 NRC Submittals
  - BWROG-15003 – "Revised BWROG Request for Closure of ECCS Suction Strainer Issues: Latent Debris Issue #6; Zone of Influence (ZOI) Adjustment for Air Jet Testing (AJT) Issue #7; and Spherical Zone of Influence (ZOI) Issue #12" (February 3, 2015)
    - Revisions initiated following the September 24, 2014 technical teleconference
    - Received official response from NRC Staff (ML15062A365) on March 25, 2015; deterministic technical scope for Issues 6, 7 & 12 considered complete
  - BWROG-15018 – "ECCS Suction Strainers Benchtop Test #4 (BT4) Debris Bed Uniformity Test Plan, R0" (April 27, 2015)

Head Loss Subcommittee

- Topics
  - Strainer Test Plan
  - Strainer Testing Program

Head Loss Subcommittee – Strainer Test Plan

BWROG-ECCS-TP-3-2 Background

- Submitted to NRC June 26, 2014
- Comments Received September 8, 2014
- Responses sent to BWROG for review November 11, 2014
- NRC teleconference February 5th, 2015
  - Responses sent to NRC
  - Size distribution is key item
- NRC response received July 15, 2015
  - Debris sequencing largely resolved
  - Agreed on the basis for size distribution; NRC wants to understand if there was further breakdown of fibrous debris in the suppression pool
  - Agreement that a single test may not fully address the issue generically for the fleet

Head Loss Subcommittee – Strainer Testing Program

Implementation of BWROG Test Plan

- Testing commencement on hold / in coordination with ECCS SS Risk-Informed project Phase III / IV work
- Strainer Test Vendor selected (CDI)
- Strainer Hardware
  - Currently selected GEH Strainer

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DSE – Components Update

Bradley Tyers (Exelon)
Vice Chairman BWROG
ECCS Suction Strainer Committee

Topics

Overview

Actions Completed or Underway

Summary

Overview

- Address downstream effects on components using deterministic methods and risk-informed insights
- BWROG obtained use of WCAP-16406-P for evaluating impact of debris on downstream components
- Accident sequences, mission times and operational characteristics obtained from risk informed pilot study

Actions Completed or Underway

- Developing source term for evaluation
- Reviewing wear and abrasion models and methods
- Reviewing NRC SER on limitations and conditions
- Performing initial evaluation for Risk-Informed pilot plant(s); identifying critical systems, mission times, and components for wear and plugging
- Incorporate results into Risk-Informed Phase IV

Summary

- WCAP-16406-P availability to BWR fleet has been obtained
- Coordinating completion with ECCS SS Risk-Informed Solutions committee
- WCAP-16406-P applicability review for BWRs, and pilot plant(s) evaluations to be completed 2016

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Debris Source Term Subcommittee Update

Tony Borger (Talen Energy)
Vice Chairman BWROG
ECCS Suction Strainer Committee

Debris Source Term

Surveys

- Debris Source Term Surveys
  - Survey Information
  - Verification
  - References
- Chemical Effects Surveys
- Coatings Assessment Surveys

Debris Source Term (cont.)

Debris Source Term Survey

- Plant Information & URG Methodology
- Drywell Debris & Transport
- Wetwell Debris
- ECCS System Information

Results being used to develop Source Term Specification (inputs to testing program or generic studies)

Debris Source Term (cont.)

Debris Source Term Survey

- Survey information reviewed with feedback to individual sites for clarification and challenges
- Improved technical rigor and data input quality
- Forecast BWROG-internal completion in 1Q 2016
- NRC opportunity to review during 3Q 2016 workshop associated with debris specification & test debris specification

Debris Source Term (cont.)

Chemical Effects Survey

- Includes SLC chemistry
- Associated data used as input for the Chemical Effects testing program
- Aluminum, iron and lead inventories considered
- Inventory of Chemical Effects Source Term (submerged / non-submerged)
- Survey development and processing in concert with Debris Source Term Master Survey finalization
- NRC opportunity to review during ½ day 2Q / 3Q 2016 workshop

Coatings Assessment Survey

Coatings Assessment Survey

- Program detail
  - Related to Unqualified Coatings
  - Related to Qualified Coatings
- Types of coating systems used
  - Products
  - Thickness
- DST input (flake, particle, chip)
- Inspection details

Coatings Assessment Survey (cont.)

Coatings Assessment Survey

- Industry vetting opportunity for BWROG survey; Nuclear Coatings Committee (NUCC) meeting January 2016
- Forecast BWROG-internal completion in 2Q 2016
- Anticipated submittal of Coatings Assessment Survey to NRC in 2Q / 3Q 2016

Summary

- Support and scheduling of 2016 workshops to improve NRC understanding of debris inputs to testing programs
  - Debris Source Term Master Survey (3Q)
  - Chemical Effects Survey (2Q / 3Q)
- Anticipated submittal of Coatings Assessment Survey in 2Q / 3Q

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Downstream Effects (DSE) – Fuels Subcommittee Update

Greg Broadbent (Entergy)
Vice Chairman BWROG
ECCS Suction Strainer Committee

Topics

Activities Since Last NRC Meeting

Upcoming Activities

Challenges

Summary

Activities Since Last NRC Meeting

Submitted Benchtop Testing Plan 4 (BT4) to NRC

- BT4 evaluates the potential for debris bed non-uniformity
- No NRC comments to date

Upcoming Activities

Finalizing Debris Source Term for Fuel Testing

- Fibrous Debris Concentration Calculation
  - Based on Suction Strainer Bypass Test Results
- Fuel Debris Specification
  - Based on Calculation of Fibrous Debris Concentration and URG for Other Debris

Upcoming Activities

- Finalizing Debris Source Term for Fuel Testing (cont.)
  - Both Documents Utilize Plant Survey Data
  - Both Documents To Be Submitted to NRC

Challenges

- Delay in NRC Reviews of Test Program
- Mitigating 50.46c rulemaking impact to testing program via coordination with other industry organizations (e.g., NEI)
- Balancing resources appropriately between ECCS SS deterministic and risk-informed projects

Summary

- Benchtop Test 2 on hold pending Source Term finalization
- Benchtop Test 4 submitted
- NEDC-33608-P NRC reviewer challenges contributed to layup of fuels testing
  - Full-scale and Benchtop Testing programs included

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Proposed 2016 Strategic NEDC-33608-P NRC – BWROG Activities

Rob Choromokos (SIA)
ECCS Suction Strainer Committee

Discussion Points

- October 19, 2015 Public Teleconference with NRC Staff on NEDC-33608-P review status
  - NRC unable to achieve December 31, 2015 delivery of Safety Evaluation (SE) on LTR-1
  - NRC reviewers requesting additional background on development of LTR-1
  - Planned discussion opportunity to revise existing NRC-BWROG approach associated with NEDC-33608-P
  - BWROG Chairman's outreach offering workshop opportunities review historical / recently developed information
  - BWROG to propose to NRC a revised strategic plan for in-vessel effects possibly including a risk-informed resolution

Discussion Points (cont.)

- BWROG Proposal
  - Areas of requested NRC input for resources / availability / protocol acceptability
    - Consider retracting NEDC-33608-P from formal SE review process and combine with risk-informed disposition of related Grobe Letter potential issue/s
      - 10CFR50.46c rulemaking impact with respect to a need for a Safety Evaluation Report (SE)
    - Consider breaking out Test Program from LTR to accelerate review of LTR Methodology/Analysis
      - Two (2) month NRC Staff reviewer resource availability window for partial NEDC-33608-P review & formal commentary (Methodology & Analysis – 1st priority)
      - Four (4) month NRC Staff reviewer resource availability window for partial NEDC-33608-P review & formal commentary (Testing Program – 2nd priority)

Discussion Points (cont.)

- BWROG Proposal (cont.)
  - Areas of requested NRC input for resources / availability / protocol acceptability (cont.)
    - Staff reviewers' need for a 2-day NEDC-33608-P document review workshop with NRC Staff reviewers (1Q 2016; San Jose, CA)
    - NRC Management's need for ½-day public meeting / drop-in to finalize NEDC-33608-P timeline (1Q 2016; RIC week at White Flint)
    - Staff reviewers' need for a 1-day in-situ meeting in Washington DC in 3Q 2016 to review fuels testing program related information (e.g. debris characteristics, test debris specification and Debris Source Term Master Survey)
      - Debris characteristics / test debris specification / Debris Source Term Master Survey reviews could be coordinated with Alden Lab facilities tour (3Q 2016)

Discussion Points (cont.)

- BWROG Proposal (cont.)
  - Current 2016 BWROG timeline / milestone expectations supporting the overall proposal
    - Internal completion of Debris Source Term Master Survey (1Q 2016)
    - BWROG internal evaluation of 10CFR50.46c rulemaking potential impacts following public release from NRC (3Q 2016)
    - NRC visit / facilities tour of Alden Lab; could be coordinated with debris characteristics / test debris specification workshop / Debris Source Term Master Survey for NRC Staff (3Q 2016)

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Chemical Effects Program Update

Steve Sawochka (NWT Corporation)
ECCS Suction Strainer Committee

CE Testing Program Update

- Four benchtop (BT) and seven high temperature (HT) loop simulation tests completed under original test plan
- Revised test plans developed for additional tests
- Goals of BT tests are:
  - Assess tendency for precipitate formation at Post-LOCA conditions
  - Quantify short term corrosion and release rates of containment materials
  - Quantify short term releases of soluble species from fibrous material
- Goal of HT loop tests is to assess the effect of precipitate formation and fibrous material degradation on debris bed pressure drop
- Assessment of likelihood of chemical effects at individual plants is goal of benchtop and HT loop tests

Benchtop Test Summary

- Material exposures in 2 liter polycarbonate containers:
  - Al, Al + NUKON, Galvanized Carbon Steel (GCS), GCS+ NUKON in Demineralized water and sodium pentaborate solutions (257 ppm B, 109 ppm Na)
  - NUKON in demineralized water
- Material areas (ft^2/ft^3) and NUKON weights (lbs/ft^3) based on "binning" of site survey results
- Exposures at 200°F for 48 hours followed by reductions to 140°F for 24 hours and then 110°F for 24 hours
- Assessments based on visual observations and turbidity, pH and chemical analyses (Al, SiO_2, Si, Na, Zn, etc.)
- Corrosion and release rates based on solution chemistry and coupon weight changes
- Dissolution of NUKON based on solution chemistry

Benchtop Test Summary (cont.)

- Aluminum was considered initially since its precipitates had been shown to form surface films on the debris bed leading to increase pressure drop
- Only 9 BWRs reported exposed aluminum areas greater than 0.01 ft^2 Al/ft^3 liquid in containment; maximum exposed area was 0.39 ft^2/ft^3
- Testing considered effect of NUKON in demineralized water and borated solutions
- Second series of tests preformed with galvanized carbon steel
- 10 BWRs reported exposed GCS/zinc areas greater than 0.01 ft^2 Zn/ft^3 liquid in containment; maximum exposed area was 0.29 ft^2/ft^3
- Additional tests planned with carbon steel and selected fibrous materials

BWR Survey Data: Al/NUKON

Plant #	Total Al, ft^2	Al, ft^2/ft^3	NUKON +Fiber, lb	NUKON, lb/ft^3
13	50000	0.39	113	8.78E-04
29	25000	0.29	686	8.03E-03
20	27720	0.26	1928	1.79E-02
32	7758	0.059	23	1.71E-04
33	7758	0.059	23	1.71E-04
23	4810	0.051	86	9.12E-04
19	4503	0.038	23	1.91E-04
15	1652	0.018	721	8.03E-03
16	1652	0.018	721	8.03E-03
30	295	0.002	23	1.36E-04

Benchtop Test Matrix: Al/NUKON

Test	Solution	Al, ft^2/ft^3	NUKON, lbs/ft^3	Max Al, ppm
NWT-BT2-1	DW	0.333	0	0.3
NWT-BT2-2	DW	0.333	0.0062	0.3
NWT-BT2-3	DW	0.333	0.031	1
NWT-BT2-4	DW	0.998	0	0.3
NWT-BT2-5	DW	0.998	0.0062	0.3
NWT-BT2-6	DW	0.998	0.031	1.6
NWT-HT3	DW	0.4	0.016	1.4
NWT-BT1-1	NaPB	0.333	0	8
NWT-BT1-2	NaPB	0.333	0.0062	8
NWT-BT1-3	NaPB	0.333	0.031	8
NWT-BT1-4	NaPB	0.998	0	11
NWT-BT1-5	NaPB	0.998	0.0062	14
NWT-BT1-6	NaPB	0.998	0.031	14
NWT-HT4	DW/NaPB	0.4	0.016	2.4
NWT-HT5	DW/NaPB	0.4	0.016	3

NWT-BT1 Results: Al/NUKON/NaPB

- No indication of precipitate formation based on visual inspection or turbidity, visual inspection continued for over a month
- Aluminum concentration at 200°F and 140°F significantly below ANL predicted solubility limits of ~660 and 86 ppm
- Concentration at 110°F near solubility limit (~16 ppm)
- Passivation of aluminum coupons apparent from solution concentration variations and subsequent coupon analysis
- No significant effect of NUKON on NaPB solution pH or aluminum release
- Aluminum release rates consistent with values developed by NWT from Alion database (Alion tests performed with continuous stirring with magnetic stirrer bar)
- Approximately 50% of oxidized aluminum released to solution

NWT-BT2 Results: Al/NUKON/DW

- Tests performed with air saturated demineralized water under static conditions
- No indication of precipitate formation based on turbidity or visual inspection
- Solution pH increased to 9 to 9.5 over time due to sodium and calcium release from NUKON
- Aluminum release rates significantly lower than in NaPB solution
- Release rate much lower in absence of NUKON since pH was significantly lower
- Release rate less than in NaPB solution even at higher pH than NaPB solution

BWR Survey Data: GCS/NUKON

Plant	Total Zn, ft^2	Zn, ft^2/ft^3	NUKON +Fiber, lb	NUKON, lb/ft^3	Total Al, ft^2
30	47,989	0.29	22	1.3E-04	295
31	46,739	0.28	22	1.3E-04	31
8	23,385	0.18	239	1.8E-03	N/R
9	23,385	0.18	239	1.8E-03	N/R
10	23,385	0.18	239	1.8E-03	N/R
34	14,600	0.11	27	2.0E-04	N/R
35	10,150	0.08	27	2.0E-04	N/R
27	4,730	0.04	115	8.9E-04	120
28	4,730	0.04	115	8.9E-04	120
21	1,525	0.01	3156	2.6E-02	N/R
6	169	0.00	3622	3.1E-02	108

Benchtop Test Matrix: Zn/NUKON

Test	Solution	Zn, ft^2/ft^3	NUKON, lbs/ft^3
NWT-BT3-1	DW	0.311	0
NWT-BT3-2	DW	0.323	0.002
NWT-BT3-3	DW/NaPB	0.312	0
NWT-BT3-4	DW	0.934	0
NWT-BT3-5	DW	0.949	0.002
NWT-BT3-6	DW/NaPB	0.954	0

NWT-BT3 Results: Zn/NUKON

- No visual indication of precipitate formation, visual inspection continued for over a month. However, formation of limited amount of precipitate and dropout indicated by solution concentration decrease with transition to NaPB chemistry
- Zinc release rates consistent with estimates developed by NWT from Alion database for GCS and zinc coupons
- pH increase observed as NUKON lbs/ft^3 increased, but no significant effect on zinc release
- Most of oxidized zinc released from coupon; minimal film formation (limited passivation)

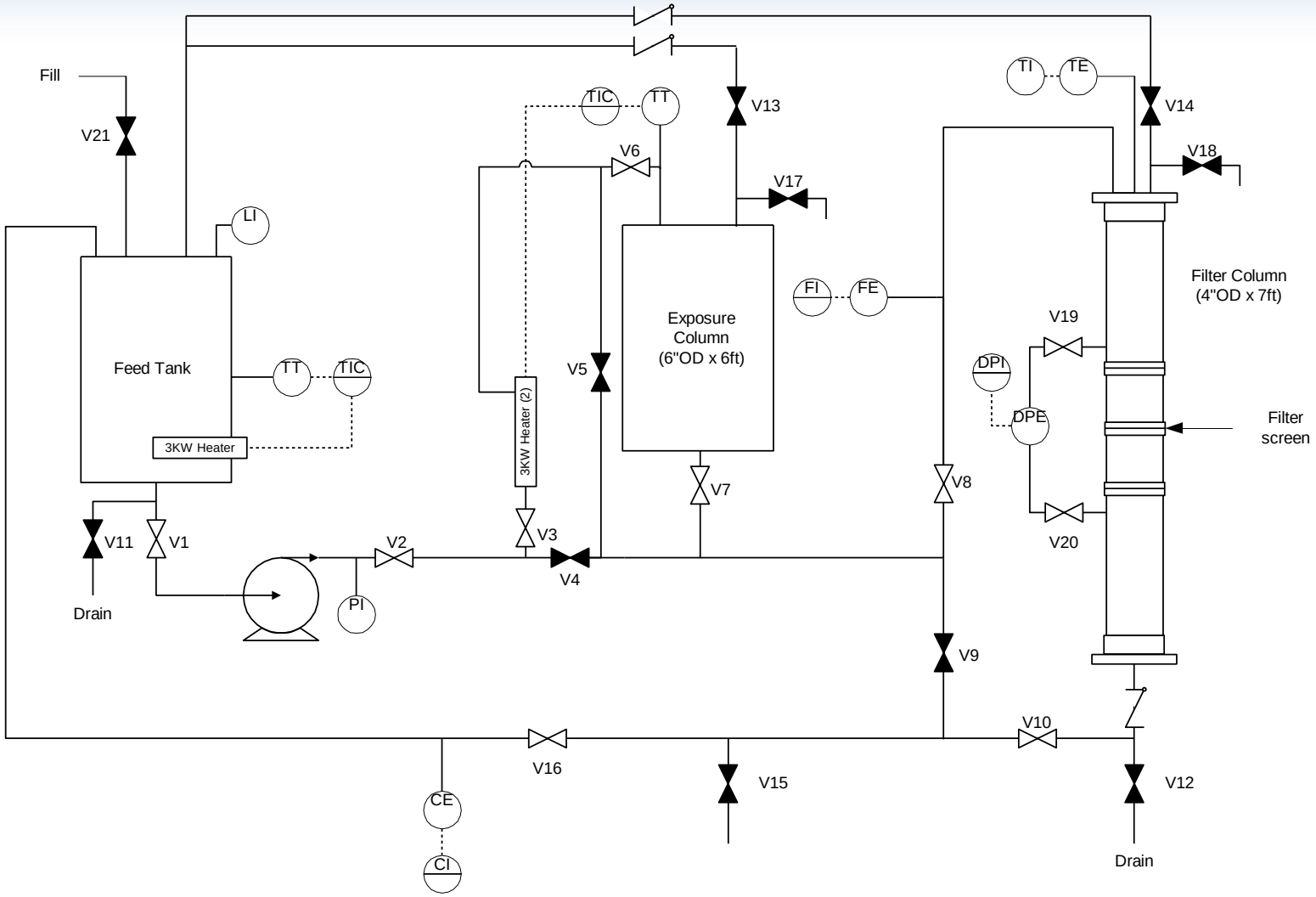
Summary of Benchtop Testing

- Site survey results used to establish solution chemistry, aluminum and galvanized carbon steel areas (ft^2/ft^3) and NUKON concentrations (lbs/ft^3) for initial 18 benchtop tests
- Additional tests to be performed based on materials survey binning
- No precipitate formation indicated by visual observation or turbidity during 4-day tests
- Preliminary basis for estimating releases at individual BWR sites developed

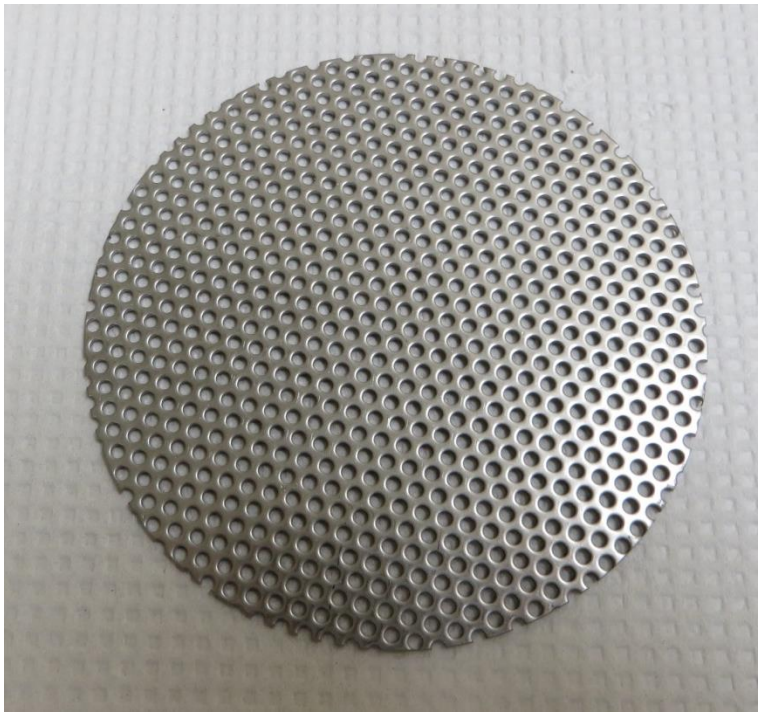
High Temperature Loop Facility

- 3.84-inch diameter filter section - designed to facilitate debris bed removal for analysis (0.0804 ft^2 area)
- 1.5 to 4 GPM flow rate (0.042 to 0.11 fps; 19 to 50 gpm/ft^2); (0.06 fps at 2 gpm)
- 125 gallon SS conical bottom Feed Tank
- 5.83-inch ID exposure vessel (0.02 fps at 2 gpm)
- PID temperature control
- Flow, differential pressure, feedtank level and temperature recorded on data logger

ECCS SS Loop Schematic



4” Column and Perforated Screen



High Temperature Loop Tests

Test #	Al, ft^2/ft^3	Zn, ft^2/ft^3	CS, ft^2/ft^3	NUKON, lb/ft^3	Solution	Comment
NWT-HT1	0	0	0	0.004	DW	2-day hot functional test to demonstrate debris bed formation and evaluate initial steps of test procedure. AlOOH injection following test.
NWT-HT2	0.75	0	0	0.016	DW	NUKON deposition at flow distributer during debris bed formation. Test aborted.
NWT-HT3	0.40	0	0	0.016	DW	18-day test. End of test debris bed pressure drop of 1.6 psi. AlOOH injection following test
NWT-HT4	0.40	0	0	0.016	DW/NaPB	18-day test. End of test debris bed pressure drop of 5.0 psi. AlOOH injection following test.
NWT-HT5	0.40	0	0	0.016	DW/NaPB	14-day test to debris bed pressure drop of 8.2 psi.
NWT-HT6	0	0	0	0.016	DW/NaPB	21-day baseline test. End of test debris bed pressure drop of 2.4 psi.
NWT-HT7	0	0	0	0.004	NaPB	AlOOH debris bed sensitivity test immediately following bed formation.

Debris Bed Sensitivity to Chemical Effects

- AlOOH precipitate injected at debris bed inlet during 4 tests to demonstrate sensitivity to chemical effects
- AlOOH preparation based on WCAP-16530
- Although data are limited, the debris bed sensitivity based on lb Al/lb NUKON appears relatively independent of debris bed exposure history

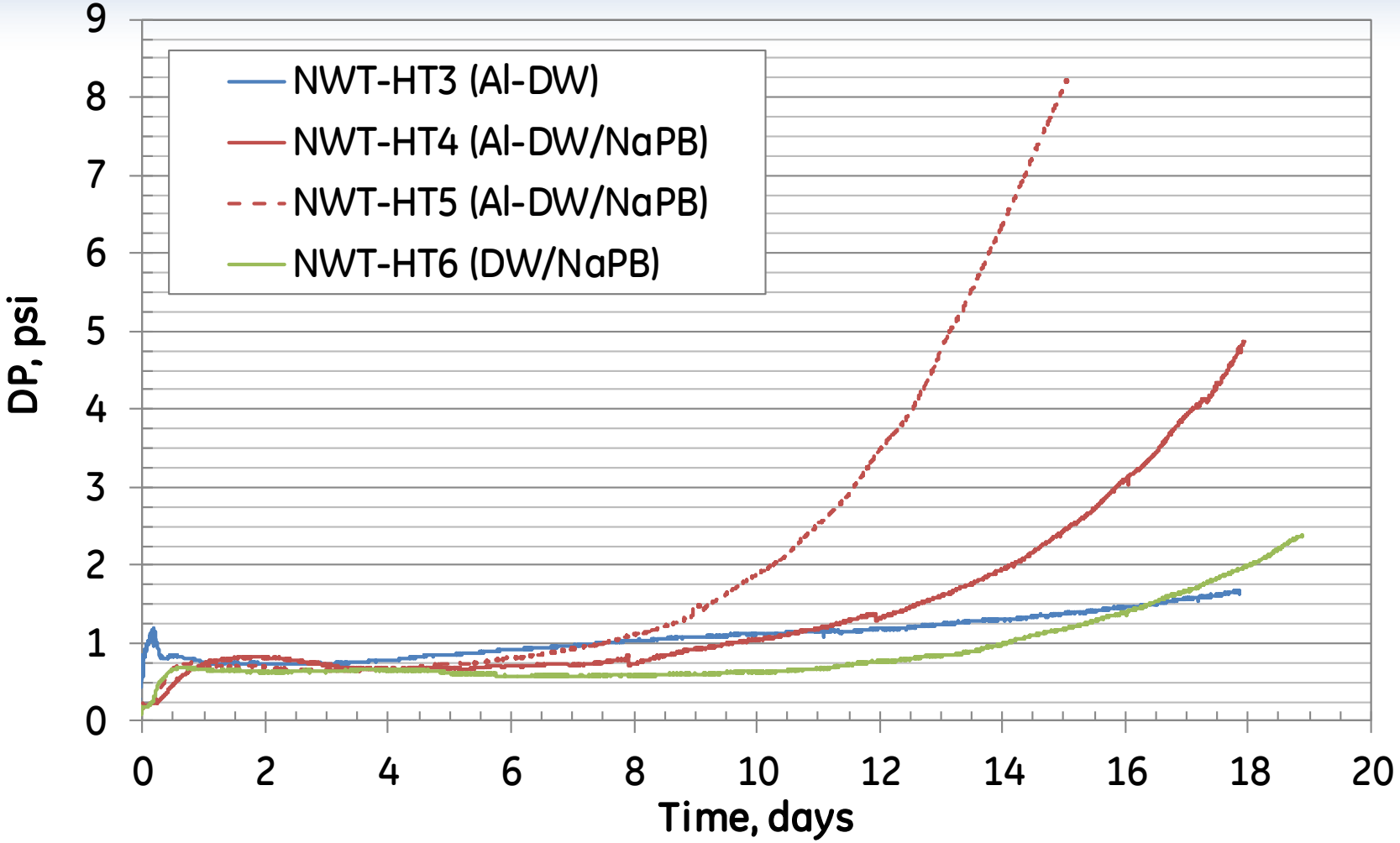
Debris Bed Sensitivity to CE

Test	Chemistry	Debris bed exposure, days	AlOOH inlet conc., ppm Al	DP initial/final, psi	AlOOH, lb Al/lb NUKON
NWT-HT1	DW	2	2.9	0.25/7.9	0.007
NWT-HT3	DW	18	0.7	1.7/~11	0.004
NWT-HT4	DW/NaPB	18	3.2	5/~36	0.007
NWT-HT7	NaPB	0	2.2	0.2/8.5	0.003

Debris Bed Pressure Drop

- Minimal pressure drop increase during 18-day DW / Al / NUKON Test HT3 (Pressure drop of 1.7 psi after 18 days)
- Debris Bed pressure drop increased to 5 psi after 18 days during NaPB/AL/NUKON Test HT4; CE after extended exposure
- Validation Test: Pressure drop increased to 5 psi after 13 days and 8 psi after 15 days during NaPB/AL/NUKON Test HT5
- Effect of Aluminum Release: Pressure drop only increased to 2.4 psi after 19 days during NaPB/NUKON Test HT5 (No Aluminum)
- Significant debris bed compression occurred during all tests. Pressure drop increase appears due to NUKON dissolution leading to bed compression and corrosion product loading

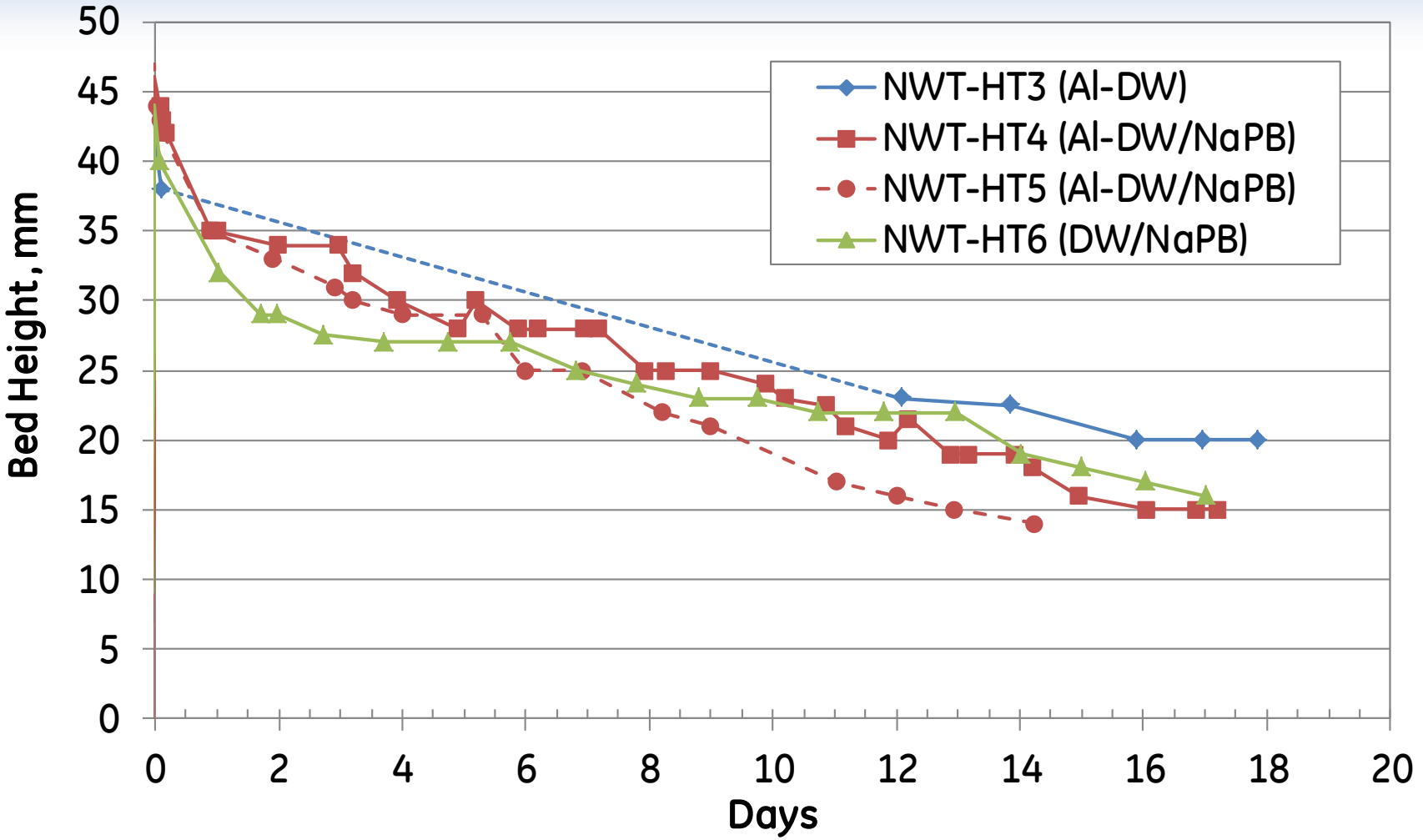
HT Pressure Drop Variations



Debris Bed Height Variations

- Debris bed height decreased/compressed significantly during all tests (height measured at the edge of filter column wall)
- Decreases in bed height appear to reflect NUKON dissolution as well as particulate removal
- Concentrations of Na, Ca, Si correspond to dissolution of 20-30% of the NUKON over 15 to 18 day test

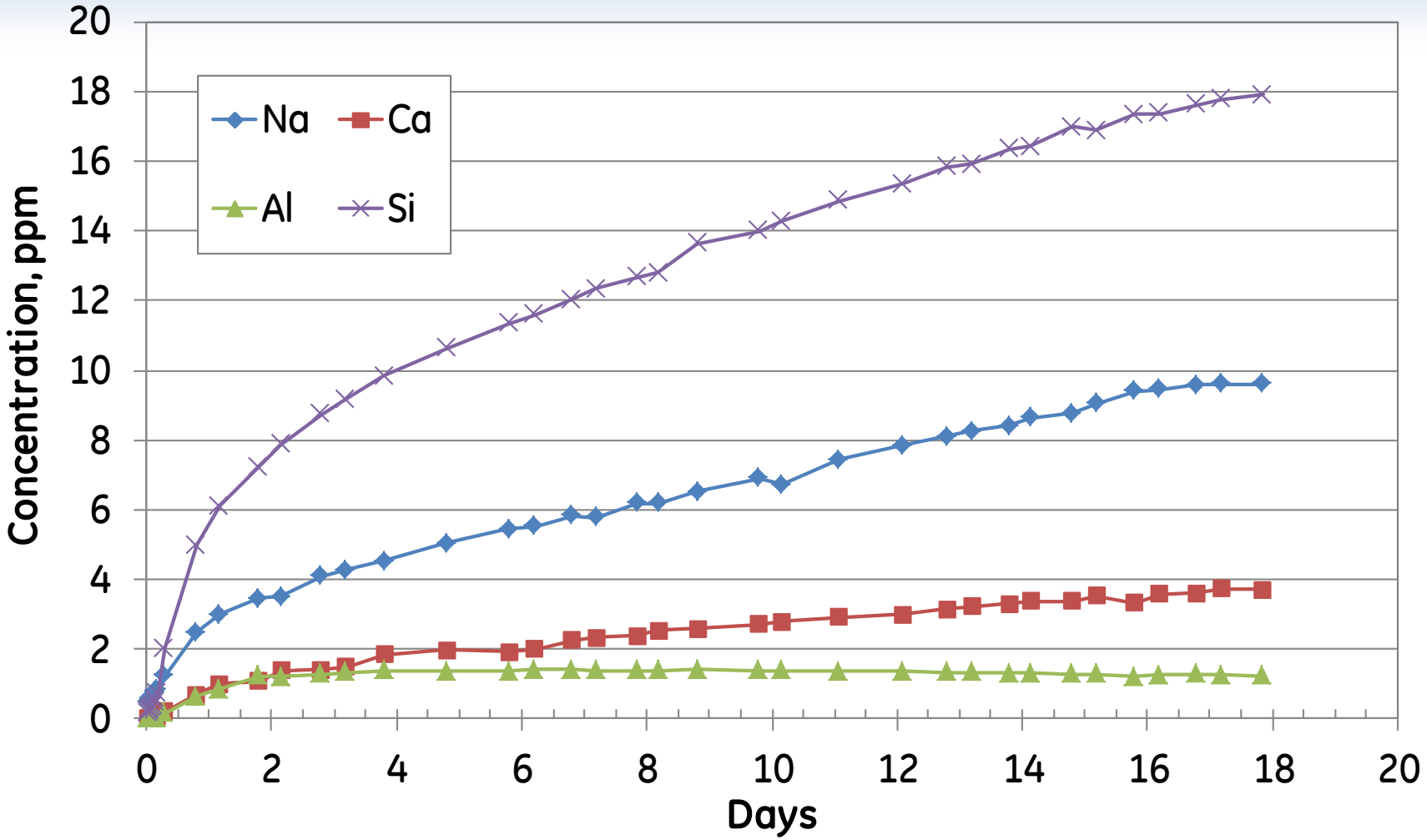
Debris Bed Height Variations



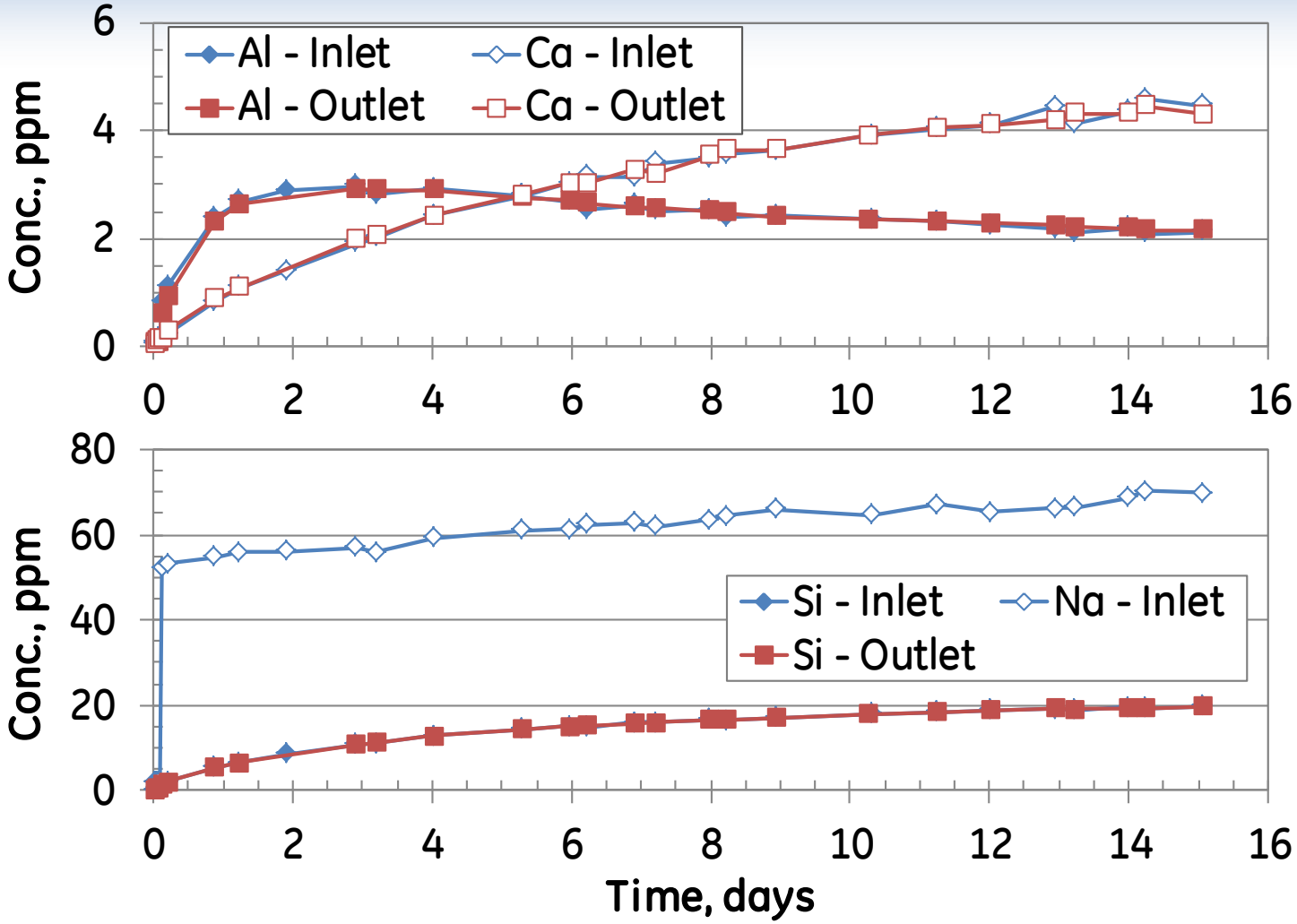
HT Loop Chemistry Observations

- Aluminum, calcium and silica concentrations at filter column inlet and outlet have been effectively identical
  - Particulate/precipitate removal by debris bed cannot be quantified based on inlet and outlet concentration data
  - Removal will have to be estimated from post-test debris bed analysis
- Na, Si and Ca concentrations (resulting from solubilization of NUKON) generally significantly exceed aluminum concentrations due to aluminum corrosion
- Maximum aluminum concentrations during 15 to 18 day HT Loop tests have been very low (<4 ppm) and well below the aluminum solubility limit at 140°F

NWT-HT3 NUKON Dissolution



NWT-HT5 NUKON Dissolution



Test Plan Revisions: 2015

- New Bench Top Test Plan developed: BWROG-ECCS-TP-4-2 Revision 0
- New HT Loop Test Plan near completion (BWROG-ECCS-TP-4-3)
- Key elements of initial combined test plan (BWROG-ECCS-TP-4-1 R5) were retained
- Test Parameters will continue to be based on “binning” of BWROG Containment Materials Survey Results

BT Test Plan

- Five series of tests currently planned in demineralized water and borated solutions (6 parameter sets per test series)
- Test parameters to be based on survey binning results
  - Effect of aluminum surface finish on corrosion and release rates
  - Corrosion and release rates of carbon steel
  - Effect of Al/GCS, Al/CS and GCS/CS ratios on release rates
  - Effects of insulation materials (other than NUKON) on release rates

Proposed HT Loop Test Plan

Overview

- 9 tests planned over 12 months
- Effects of releases from galvanized carbon steel and carbon steel to be evaluated in demineralized water and borated solutions
- Effects of particulate loading on debris bed pressure drop to be evaluated in demineralized water and borated solutions

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Fuel Testing Program Update

Ludwig Haber (Alden Lab)
BWROG ECCS Suction Strainer Committee

DSE – Fuels: Technical Update

Overview:

- BT2 testing put on hold based on source term and surrogate characteristics uncertainty
- Finalizing fiber length size distribution characteristics
- Assisting in NRC reviewer transition

DSE – Fuels: Technical Update

Fiber length characterization:

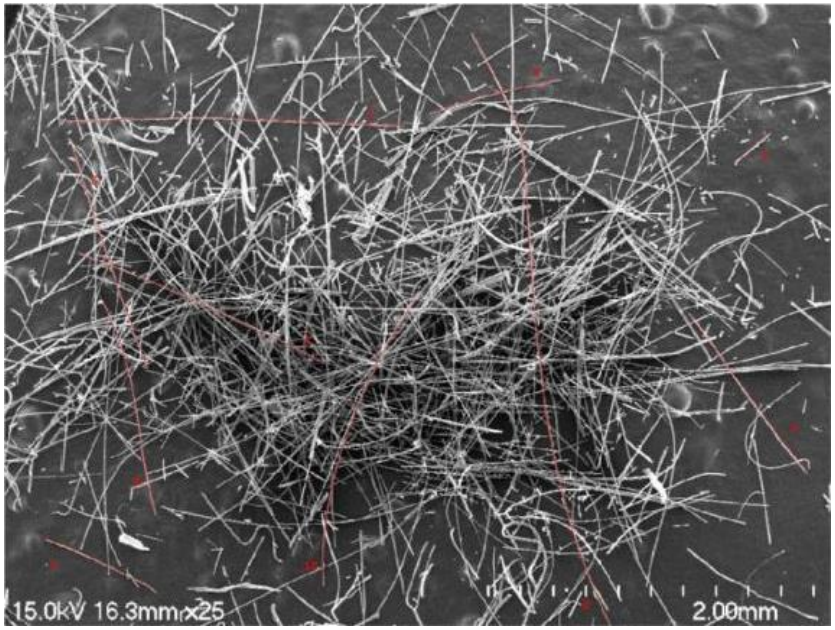
- Original Alion length distribution data is not aligned well (longer) with other industry data obtained by Alden and difficult to duplicate using standard fiber preparation methods
- Filter bags from bypass testing available to Alden for reprocessing
- Results shift towards smaller fiber lengths, more inline with other Alden data

DSE – Fuels: Technical Update

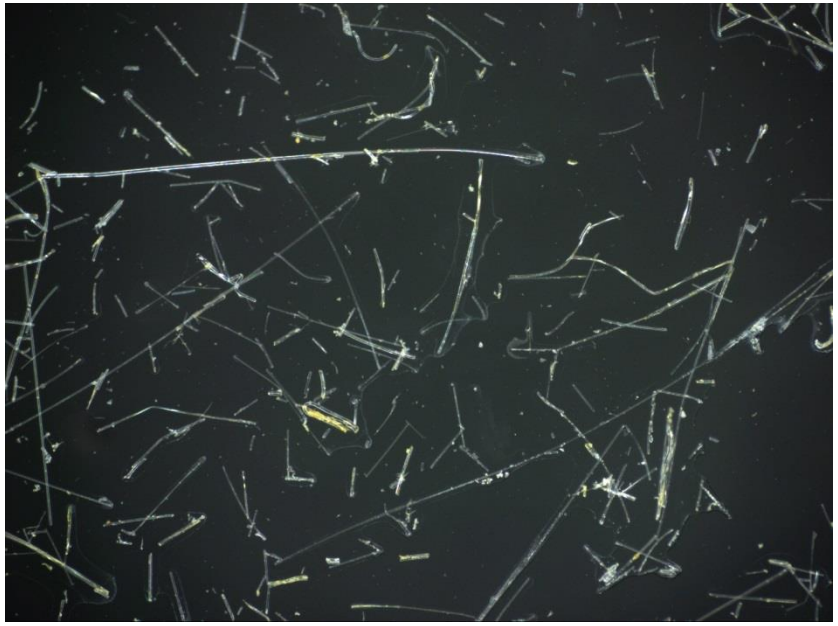
New image analysis

- Relatively few fibers per image, allowing measurement of all fibers, yielding more representative distribution

Old image

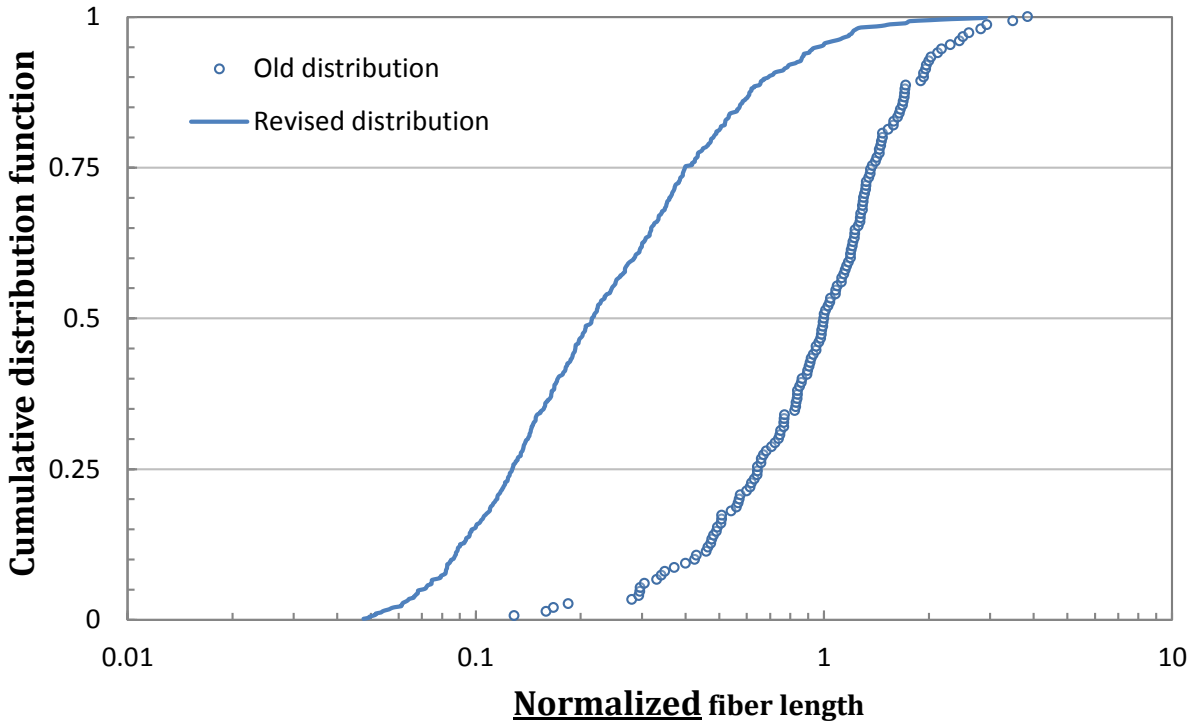


New image



DSE – Fuels: Technical Update

Example updated versus previous size distributions:



DSE – Fuels: Technical Update

- Shift to smaller size is consistent among tests
  - Approximately a 2/3 reduction from original evaluation
- Fiber distribution convergence achieved at 200-300 fibers (sample size)
  - Distribution based on 500-600 fibers (sample size)
- Relationship between fiber types is maintained
  - Longer Temp-Mat
- Final results will be incorporated in debris specification

DSE – Fuels: Technical Update

Assisting NRC reviewer transition:

- Establish agenda and associated materials for proposed 1Q 2016 LTR workshop
  - LTR test program parameter evaluation strategy
  - Provide overview and relationships / context of existing documents

DSE – Fuels: Technical Update

Summary:

- Experimental work on hold pending LTR SE and source term finalization
  - Finalizing target fiber size distribution
  - Updated approach needed for feedback / approval of ongoing efforts

BWROG ECCS Suction Strainers Committee – NRC Public Meeting

BWROG Management Summary

William Kopchick II (PSEG)
BWROG Executive Committee

Summary

- End of year project / subcommittee technical updates
- GE Hitachi fuels LTR topics
  - Newly proposed NEDC-33608-P timetable
  - NEDC-33608-P processing options and achieving ultimate alignment
  - 2016 Logistics discussions
    - NEDC-33608-P workshop
    - NEDC-33608-P timeline acceptance meeting or management drop-in during the RIC week (week March 7, 2016)
    - Fuels testing prerequisite documents review workshop