January 5, 2012

COMPANY: TENNESSEE VALLEY AUTHORITY

SITE: CLINCH RIVER SITE

SUBJECT: SUMMARY OF NOVEMBER 3, 2011, PUBLIC MEETING WITH TENNESSEE VALLEY AUTHORITY REGARDING THE CLINCH RIVER SITE PROJECT REGULATORY FRAMEWORK

On November 3, 2011, staff from the U.S. Nuclear Regulatory Commission (NRC) met with representatives from the Tennessee Valley Authority (TVA) at the Legacy Hotel & Conference Center in Rockville, Maryland. This was the second in a series of public workshops to discuss the TVA Clinch River Site Project Regulatory Framework development. The meeting agenda and meeting attendee list are included in Enclosures 1 and 2. Enclosure 3 includes comments provided by the NRC staff on selected chapters and sections of the TVA Regulatory Framework materials provided for discussion. Please note that these comments are intended to provide the perspective of the staff preparing for a review of a Title 10 of the *Code of Federal* Regulations (10 CFR), Part 50 construction permit (CP) application; it is not intended to imply Regulatory Requirements or Policy beyond those approved or directed by the Commission. A summary of the meeting is included below.

TVA started the meeting by discussing the objective of the workshop which was to clarify the level of detail to be provided by TVA for the Clinch River CP application. TVA engaged the NRC staff in discussion on the section outline content to develop understanding of proposed Regulatory Framework for the CP application. TVA announced at the meeting that their new proposed CP application date is fourth quarter FY2013 for up to four units at the Clinch River Site. TVA also communicated plans to include proposed preliminary Technical Specifications with the CP application. TVA stated that it is not currently planning to request a Limited Work Authorization, but has not ruled out the possibility.

During the public meeting the following Preliminary Safety Analysis Report (PSAR) sections were discussed:

- Chapter 1 - Introduction and General Description of Plant
- Sections 3.1 - 3.2 - GDC Conformance and Structure, System, and Component Classification
- Section 3.3 - Wind and Tornado Loadings
- Section 3.5 - Missile Protection
- Section 3.6 - Protection Against the Dynamic Effects
- Section 3.10 - Seismic and Dynamic Qualification
- Section 3.11 - Environmental Qualification
- Sections 3.12 - 3.13 - ASME Code Class 1, 2, 3

- Section 9.2 - Water Systems
- Section 9.3 - Process Auxiliaries
- Sections 9.5.2, 9.5.3, and 9.5.4 - Other Auxiliary Systems
- Chapter 11- Radioactive Waste Management

For each of the sections and chapters TVA provided the regulatory framework table and associated section outline. During the discussion of Section 3.1 which addresses conformance with the NRC General Design Criteria (GDC) TVA identified one proposed exemption to GDC 17, "Electric power systems." The exemption will focus on the GDC 17 requirement for two physically independent offsite circuits.

The NRC staff provided feedback on the regulatory framework information regarding current Regulatory Guides (RGs) available, GDCs, and cross referencing issues. Many of these comments and issues are identified in Enclose 3 of this summary. In addition, the NRC staff discussed lessons-learned from recent large-light water reactor (LWR) reviews and provided feedback on technical aspects including the following:

- Probabilistic Risk Assessment (PRA) insights would not be provided with the CP application. Therefore, an early identification of systems as Regulatory Treatment of Non-Safety Systems (RTNSS) and presenting a clear understanding of the criteria used and basis for the determination will be particularly important for this 10 CFR Part 50 review.

- The use of the GALE Code for small modular reactors (SMRs) and the determination of its applicability to the new SMR designs are being evaluated by the staff. The NRC staff has provided insights into the concerns in the Section 11.1 portion of Enclosure 3.

TVA's discussion materials and slide presentation are available through the Agencywide Documents Access and Management System (ADAMS). The ADAMS accession numbers are ML11233A267 and ML11306A296, respectively. ADAMS is the system that provides text and image files of NRC's public documents. Documents are available electronically at the NRC's Electronic Reading Room at http://www.nrc.gov/reading-rm/adams.html. If you do not have access to ADAMS or have problems accessing the documents located in ADAMS, contact the NRC Public Document Room (PDR) staff at 1-800-397-4209, 301-415-4737, or pdr@nrc.gov.

Please direct any inquiries to me at 301-415-6091, or email joelle.starefos@NRC.gov.

Sincerely,

/RA/

Joelle Starefos, Senior Project Manager
Projects Branch
Division of Advanced Reactors and Rulemaking
Office of New Reactors

Docket No.: PROJ0785

Enclosure:
1. Agenda
2. Attendance List
3. NRC Staff Comments

cc w/encl: DC B&W mPower Mailing List

Please direct any inquiries to me at 301-415-6091, or email joelle.starefos@NRC.gov.

Sincerely,

/RA/

Joelle Starefos, Senior Project Manager
Projects Branch
Division of Advanced Reactors and Rulemaking
Office of New Reactors

Docket No.: PROJ0785

Enclosure:
1. Agenda
2. Attendance List
3. NRC Staff Comments

cc w/encl: DC B&W mPower Mailing List

DISTRIBUTION:
PUBLIC
RidsNroArp Resource
RidsNroArpArb1_2 Resource
RidsAcrsAcnw_MailCTR Resource
RidsOgcMailCenter Resource
RidsOpaMail Resource
SMagruder, NRO
SCoffin, NRO
MMayfield, NRO

ADAMS Accession No.: ML120050191 **NRC-001**

OFFICE	NRO/ARP/ARB2:PM	NRO/ARP/ARB2:PM
NAME	YMalave (JMazza for)	JStarefos
DATE	1/9/12	1/5/12

OFFICIAL RECORD COPY

cc:

Mr. Lionel Batty
Nuclear Business Team
Graftech
12300 Snow Road
Parma, OH 44130

Russell Bell
Nuclear Energy Institute
1776 I Street, NW
Suite 400
Washington, DC 20006-3708

Mr. Ian M. Grant
Canadian Nuclear Safety Commission
280 Slater Street, Station B
P.O. Box 1046
Ottawa, Ontario
K1P 5S9

Mr. Eugene S. Grecheck
Vice President
Nuclear Support Services
Dominion Energy, Inc.
5000 Dominion Blvd.
Glen Allen, VA 23060

Michael L. Hammond
Technological Hazards Program Office
Radiological Emergency Preparedness
Program, Region X
U.S. Department of Homeland Security
130 228th Street, SW
Bothell, WA 98021

Mr. Brendan Hoffman
Research Associate on Nuclear Energy
Public Citizens Critical Mass Energy and
Environmental Program
215 Pennsylvania Avenue, SE
Washington, DC 20003

Mr. Dobie McArthur
Director, Washington Operations
General Atomics
1899 Pennsylvania Avenue, NW
Suite 300
Washington, DC 20006

Mr. David Repka
Winston & Strawn LLP
1700 K. Street, NW
Washington, DC 20006-3817

Carlos Sisco
Senior Paralegal
Winston & Strawn LLP
1700 K Street NW
Washington, DC 20006

Mr. Robert E. Sweeney
IBEX ESI
4641 Montgomery Avenue
Suite 350
Bethesda, MD 20814

DC B&W mPower

Email

Alan.Levin@areva.com (Alan Levin)
APH@NEI.org (Adrian Heymer)
asi@ornl.gov (Anita Benn)
awc@nei.org (Anne Cottingham)
badwan@lanl.gov (Faris Badwan)
bevans@enercon.com (Bob Evans)
BrinkmCB@westinghouse.com (Charles Brinkman)
cee@nei.org
charles.bagnal@ge.com (Charles Bagnal)
collinlj@westinghouse.com (Leslie Collins)
curtisslaw@gmail.com (Jim Curtiss)
david.hinds@ge.com (David Hinds)
david.lewis@pillsburylaw.com (David Lewis)
deborah@hyperionpowergeneration.com (Deborah Ann Blackwell)
dsafer@comcast.net (Don Safer)
ed.burns@earthlink.net (Ed Burns)
elyman@ucsusa.org (Ed Lyman)
erg-xl@cox.net (Eddie R. Grant)
ewallace@nuscalepower.com (Ed Wallace)
F.Shahrokhi@AREVA.Com (Farshid Shahrokhi)
flowerspa@ornl.gov (Paula Flowers)
gcesare@enercon.com (Guy Cesare)
gmorg50@hotmail.com (Garry Morgan)
jahalfinger@babcock.com (Jeff Halfinger)
james.beard@gene.ge.com (James Beard)
jason.parker@pillsburylaw.com (Jason Parker)
jason.tokey@nuclear.energy.gov (Jason Tokey)
jcsaldar@bechtel.com (James Saldarini)
jerald.head@ge.com (Jerald G. Head)
Jim.Kinsey@inl.gov (James Kinsey)
jim.riccio@wdc.greenpeace.org (James Riccio)
JNR@NuScalePower.com (Jose N. Reyes)
klingcl@westinghouse.com (Charles King)
kouhestani@msn.com (Amir Kouhestani)
KSutton@morganlewis.com (Kathryn M. Sutton)
Kwelter@NuScalePower.com (Kent Welter)
lchandler@morganlewis.com (Lawrence J. Chandler)
lgorenflo@gmail.com (L. Gorenflo)
maria.webb@pillsburylaw.com (Maria Webb)
mark.a.giles@dom.com (Mark Giles)
mark.beaumont@wsms.com (Mark Beaumont)
mark.holbrook@inl.gov (Mark Holbrook)
mark@npva.net
matias.travieso-diaz@pillsburylaw.com (Matias Travieso-Diaz)

DC B&W mPower

murawski@newsobserver.com (John Murawski)
mwetterhahn@winston.com (M. Wetterhahn)
patriciaL.campbell@ge.com (Patricia L. Campbell)
Paul@beyondnuclear.org (Paul Gunter)
PLorenzini@NuScalePower.com (Paul Lorenzini)
poorewpii@ornl.gov (Willis P. Poore III)
rbarrett@astminc.com (Richard Barrett)
rereimels@babcock.com (R.E. Reimels)
rnicholas@ge.com (Robert Nicholas)
RSnuggerud@NuScalePower.com (Ross Snuggerud)
sandra.sloan@areva.com (Sandra Sloan)
sfrantz@morganlewis.com (Stephen P. Frantz)
shobbs@enercon.com (Sam Hobbs)
spellmandj@ornl.gov (Donald J. Spellman)
stephan.moen@ge.com (Stephan Moen)
steven.hucik@ge.com (Steven Hucik)
steven.m.mirsky@saic.com (Steve Mirsky)
Tansel.Selekler@nuclear.energy.gov (Tansel Selekler)
tfeigenb@bechtel.com (Ted Feigenbaum)
tgado@roe.com (Burns & Roe)
timothy.beville@nuclear.energy.gov (Timothy Beville)
TJKim@babcock.com (T.J. Kim)
tom.miller@hq.doe.gov (Tom Miller)
tom.miller@nuclear.energy.gov (Thomas P. Miller)
TomClements329@cs.com (Tom Clements)
tommy_pe2001@yahoo.com (Tommy Le)
trsmith@winston.com (Tyson Smith)
Vanessa.quinn@dhs.gov (Vanessa Quinn)
whorin@winston.com (W. Horin)

AGENDA

TENNESSEE VALLEY AUTHORITY AND NRC
SECOND REGULATORY FRAMEWORK WORKSHOP
NOVEMBER 3, 2011

Time	Topic		Lead
9:00am - 9:15am	Opening Remarks & Introductions		NRC
9:15am - 9:30am	Framework Approach and Process		TVA
9:30am - 9:45am	Chapter 1	Introduction and Interfaces	TVA/NRC
9:45am - 10:00am	SRP Section 3.1	Conformance with GDC – GDC 17 Exemption	TVA/NRC
10:00am -10:15am	SRP Section 3.2	Seismic Classification System Quality Group Classification	TVA/NRC
10:15am - 10:30am	SRP Section 3.3	Wind Loads Tornado Loads	TVA/NRC
10:30am - 10:40am	Public Comment		NRC
10:40am - 10:50am	Break		All
10:50m - 11:20am	SRP Section 3.5	Internally Generated Missiles (Outside Containment) Internally Generated Missiles (Inside Containment) Turbine Missiles Missiles Generated by Tornadoes and Extreme Winds Site Proximity Missiles (Except Aircraft) Aircraft Hazards Structures, Systems, and Components To Be Protected From Externally Generated Missiles Barrier Design Procedures	TVA/NRC
11:20am - 12:00pm	SRP Section 3.6	Plant Design for Protection Against Postulated Piping Failures in Fluid Systems Outside Containment Determination of Rupture Locations and Dynamic Effects Associated with the Postulated Rupture of Piping Leak-Before-Break Evaluation Procedures	TVA/NRC
12:00pm - 12:20pm	SRP Section 3.10	Seismic and Dynamic Qualification of Mechanical and Electrical Equipment	TVA/NRC
12:20pm - 12:30pm	Public Comment		NRC
12:30pm - 1:30pm	Lunch		All
1:30pm - 1:45pm	SRP Section 3.11	Environmental Qualification of Mechanical and Electrical Equipment	TVA/NRC
1:45pm - 2:00pm	SRP Section 3.12	ASME Code Class 1, 2, and 3 Piping Systems and Associated Supports Design [new]	TVA/NRC
2:00pm - 2:15pm	SRP Section 3.13	Threaded Fasteners - ASME Code Class 1, 2, and 3	TVA/NRC

2:15pm - 2:30pm	SRP Section 9.2	Station Service Water System Reactor Auxiliary Cooling Water Systems Potable and Sanitary Water Systems Ultimate Heat Sink Condensate Storage Facilities	TVA/NRC
2:30pm - 2:40pm	Public Comment		NRC
2:40pm - 2:50pm	Break		All
2:50pm - 3:15pm	SRP Section 9.3	Compressed Air System Process and Post Accident Sampling Systems Equipment and Floor Drainage System Chemical and Volume Control System (PWR) Including Boron Recovery System Standby Liquid Control System (BWR)	TVA/NRC
3:15pm - 3:30pm	SRP Section 9.5.2	Communications Systems	TVA/NRC
3:30pm - 3:45pm	SRP Section 9.5.3	Lighting Systems	TVA/NRC
3:45pm - 4:00pm	SRP Section 9.5.4	Emergency Diesel Engine Fuel Oil Storage and Transfer System	TVA/NRC
4:00pm - 4:20pm	Chapter 11	Source Terms Liquid Waste Management Systems Gaseous Waste Management Systems Solid Waste Management Systems Process and Effluent Radiological Monitoring Instrumentation and Sampling Systems	TVA/NRC
4:20pm - 4:30pm	Public Comment		NRC
4:30pm	Adjourn		All

ATTENDANCE LIST

SECOND PUBLIC MEETING BETWEEN TVA AND THE NRC REGARDING REGULATORY FRAMEWORK NOVEMBER 3, 2011

Name	Affiliation
Abdul H Kazi	NRC
Allen Atwood	Bechtel
Altheia Wyche	Bechtel
Andrea Sterdis	TVA
Bob Davis	NRC
Carl Weber	NRC
Chang-Yang Li	NRC
Chet Poslusny	B&W NE
Chris Kerr	Exelon
Dan Barss	NSIR
David Jeng	NRC
Deanna Zhang	NRC
Dustin Giltnane	TVA
Edward Burns	Westinghouse
Edward U McCann	NRC
Eric Reichelt	NRC
Frank Helin	GmP
Garry Morgan	BREDL/BEST/MATRR
Greg Makar	NRC
HC Li	NRC
Hien Le	NRC
Hien Le	NRC
James Saldarini	Bechtel
Jan Mazza	NRC
Jason Tolley	DOE-NE
Jean-Claude Dehmel	NRC
Jeff Perry	TVA
Joel Jenkins	NRC
Joelle Starefos	NRC
John Honcharik	NRC

Enclosure 2

John McKirgan	NRC
Joseph Williams	NRC
Larry Kenworthy	Bechtel
Lynn Van-Derpael	Bechtel
Mark Reimnitz	Bechtel
Marla Szczyelowjka	DOE
Nate Roeder	GmP
Pei-Ying Chen	NRC
Peter Hastings	GmP
Peter J. Kang	NRC
Peter Schaaf	NRC
Rachel Vaucher	NRC
Ramachandran Subbaratnam	NRC
Robert Nicholas	Burns and Roe
Ron Gibson	Bechtel
Ron La Vera	NRC
Sara Barczak	Clean Energy
Sardar Ahmed	NRC
Steve Love	TVA
Steve Routh	Bechtel
Steve Shapiro	Bechtel
Steve Williams	NRO
Steven Mirsky	SAIC-NuScale Power
Steven Pope	B&W NE
Stewart Magruder	NRC
Theresa Clark	NRC
Tim Beville	DOE-NE
Tom Scarbrough	NRO
Tom Spink	TVA
Yanely Malave	NRC
YC (Renee) Li	NRC
Yin Law	NRC
Will Smith	NSIR

Comments Provided by the NRC Staff on Selected Chapters and Sections of the TVA Regulatory Framework Materials Provided for Discussion

NOTE: These comments are intended to provide the perspective of the staff preparing for a review of a 10 CFR Part 50 Construction Permit application. It is not intended to imply Regulatory Requirements or Policy beyond those approved or directed by the Commission.

Chapter 1 - Introduction and General Description

1. The definition of the plant boundary for all routine effluent discharges should be described in PSAR Section 1 and consistent with those presented in PSAR Chapters 11.2, 11.3 and 11.5.

Sections 3.2.1 and 3.2.2 – Seismic and Quality Classifications

1. The discussion on the assignment of seismic and quality classifications should be consistent with RG 1.143 Regulatory Position C.5 and properly cross-referenced in PSAR Sections 11.2 to 11.4, as Radioactive Waste-IIa, -IIb, and –IIc classifications for structures and systems.

Sections 3.5 – Missile Protection

1. Section 3.5.1.1, Internally-Generated Missiles (Outside Containment) for the PSAR (and DCD)- proposed evaluation approach for internally generated missile effects on non-safety-related structures, systems, and components (SSCs) in areas with safety-related SSCs should the failure of the non-safety-related SSCs affect an intended safety function of the safety related SSCs. This should not be limited to non-safety-related SSCs in areas with safety-related SSCs unless it is demonstrated that failure of a non-safety-related SSCs cannot impact safety-related SSCs in other areas.

2. Section 3.5.1.6, Aircraft Hazards, should specifically include a description of the recovery plan.

3. Section 3.5.3, Barrier Design Procedures, or Section 9.5.1 should address barrier design for fire and, if required, smoke.

Section 9.3.3 – Equipment and Floor Drainage System

1. Considering the location of the turbine building, the PSAR should describe the equipment and floor drain connections to the liquid waste management system (LWMS) and related aspects to PSAR Section 11.2, including compliance with 10 CFR Part 20.1406 and RG 4.21.

Section 9.2.2 – Component Cooling Water System

1. Regulatory Guidance should include RG 1.26.

2. 10 CFR 20.1406 requirements, GDC 1, “Quality Standards and Records,” GDC 5, “Sharing of Structures, Systems, and Components,” and SECY 94-084, “Policy and Technical Issues Associated with the Regulatory Treatment of Non-Safety Systems in Passive Plant Designs,” should be considered.

3. The system description should address if the system is important to safety, the number of trains, type of plate, pump net positive suction head and the need for surge tank, water hammer mitigation design features, loads inside containment valves, time duration to remove core decay heat, gas accumulation issues, and what systems are being cooled like reactor coolant pump seals or motor.

4. The system description should address whether the system is backed up by emergency diesel generators.

Section 9.2.3 - Demineralized Water System

1. 10 CFR 20.1406 requirements and GDC 1 should be considered.

2. Basis should be provided for identifying the chilled water system as part of the containment isolation function.

Section 9.2.4 - Potable Water System

1. The PSAR should describe the potable water system and how cross contamination of the plant’s drinking water supply system will be prevented during system recirculation and maintenance, considering the guidance provided in SRP Section 11.5 and IE Bulletin 80-10, “Contamination of Nonradioactive System and Resulting Potential for Unmonitored, Uncontrolled Release of Radioactivity to Environment,” issued on May 6, 1980. Such design features should be considered for other system as well (e.g., raw and make-up water treatment, demineralized water systems, chilled water system, compressed air for instrument air, flushing fluids and gases for sampling systems, plant’s sanitary system, etc).

2. The section should point to PSAR Section 11.5 on the means of collecting samples for rad-analysis should contamination be suspected or known to have occurred.

3. Section 9.2.4, Potable and Sanitary Water Systems: Is it not clear why ITAAC is included for these systems as indicated in the table.

4. The system description should identify if it penetrates the main control room boundary, which will make the system safety related in accordance with GDC 1.

5. 10 CFR 20.1406 requirements should be considered.

Section 9.2.5 - Ultimate Heat Sink

1. The outline for Section 9.2.5, states that the ultimate heat sink (UHS) is the safety-related ultimate heat sink tanks within the containment as described in PSAR

Section 6.2. The PSAR should describe the finite cooling period of time, how this finite period of time was determine to be adequate, and how the cooling function will be carried out after the tank is depleted.

Section 9.2.6 - Condensate Storage Facility:

1. The Regulatory Requirements should include GDC 4.

2. The Regulatory Guidance should include RG 1.26.

Section 9.2.7 - Chilled Water System

1. The Regulatory Guidance should include RG 1.26

2. 10 CFR 20.1406 requirements, GDC 1, GDC 5, and SECY 94-084 should be considered.

3. The PSAR should describe the basis for the applicability of GDC 2, “Design bases for protection against natural phenomena,” GDC 4, “Environmental and dynamic effects design bases,” GDC 44, “Cooling water,” and GDC 45, “Inspection of Cooling Water System.”

4. The system description should address if the system is important to safety, the number of trains, type of plate, pump net positive suction head and the need for surge tank, water hammer mitigation design features, gas accumulation issues, margin for heat removal, time duration to remove core decay heat, and worst dry bulb temperature considerations.

5. The system description should address whether the system is backed up by emergency diesel generators and any refrigerant hazard to plant operators.

Section 9.2.8 – Turbine Building Cooling Water System

1. The Regulatory Guidance should include RG 1.26

2. 10 CFR 20.1406 requirements, GDC 2, and GDC 4 should be considered.

3. Considered the impact on defense in depth systems if failure occurs.

Section 9.2.9 – Raw Water and Pre-Treatment System

1. 10 CFR 20.1406 requirements, GDC 2, GDC 4, and SECY 94-084 should be considered.

2. Considered the impact on defense-in-depth systems if failure occurs.

3. The system description should address if the system is needed for plant cold shutdown and if is important to safety.

Section 9.5.4 – Safety Diesel Generator Auxiliaries

1. Key Issues section should include provision for replenishment of fuel supply following earthquakes or other natural phenomena, possibly beyond the design based accident.

2. Diesel Engine Manufacturers Association (DEMA) Standard has not been kept current. This should be considered for items on the Industry Guidance list.

Section 11.1 - Source Terms Topics

1. The PWR-GALE code (NUREG-0017) is based on an earlier version of ANSI/ANS 18.1-1999 for coolant concentrations, and these concentrations are scaled based on thermal power levels and coolant volumes. The scaling process applied in the code is similar as the scaling process described in ANSI/ANS 18.1-1999. Since ANSI/ANS-based coolant concentrations rely on empirical data, both published and unpublished data from operating reactors, it is hard to determine if the standard is appropriate for the mPower reactor, especially since this design includes a 4-year refueling cycle and higher fuel enrichment profiles across the core.

2. Other major differences include primary coolant chemistry that does not use soluble boron as a moderator; different continuous coolant purification and letdown rates; different containment cleanup and purge rates; different waste gas treatment and holdup systems; a single once-through steam generator; different SG blowdown rates, different feedwater fractional treatment through condensate demineralizers, and a higher capacity factor (95% vs 80%). As a result, there is need to determine how such different plant system design features built into the code should be modified for the mPower reactor design given the required input to the PWR-GALE code.

3. The PWR-GALE code applies a nominal thermal power level of 3400 MWt and then uses a ratio process to adjust the results for the thermal power of the case being evaluated. The currently proposed mPower reactor is expected to be on the order of 500 MWt. A review of the code's subroutine that applies the ratio indicates that it uses specific conditions in comparing the difference between the thermal power level specified by the user and the reference power level built in the code. As a result, there is need to determine if the scaling conditions built into the code would apply to plants with much lower thermal power levels.

4. The PWR-GALE code presents the basis for adjustments made to liquid effluents in accounting for anticipated operational occurrences. Given that this basis may not apply to the mPower reactor, there is a need to review the information presented in the PWR-GALE code and revise it with data to adjust the expected increase of radioactivity for AOOs.

5. The PWR-GALE code applies subroutines, based on empirical relationships, in estimating annual average effluent release rates for tritium, C-14, and Ar-41 in liquid and gaseous effluents. As a result, there is need to determine if the code's subroutine would apply to plants with much lower thermal power levels and different containment configuration.

6. With respect to the development of source terms for shielding analysis and doses to plant workers, consider the guidance of SRP Sections 11.1 and 12 and RG 8.8 with respect to assumed failed fuel fractions in estimating source terms in systems and components.

Section 11.2 - Liquid Waste Management System (LWMS) Topics

1. Given the location of the turbine building, the PSAR should describe the equipment and floor drain connections to the LWMS and related aspects to PSAR Section 9.3.3, including compliance with Part 20.1406, RG 4.21, ISG-06, and NEI 08-08.

2. Consider the guidance in NEI 08-08 and ISG-06 in addition to Part 20.1406, RG 4.21, and IE Bulletin 80-10.

3. Section should address Quality Assurance (QA) for the LWMS given RG 1.143, ANSI/ANS Standards on RWMS, and compliance with Part 20, App. B ECLs, and the unity rule.

4. The PSAR should address in-plant dilution and blowdown in defining the LWMS release path, given the guidance of SRP 11.2 and RG 1.143 in managing effluent releases.

5. PSAR should address the management of spent filtration and adsorption media as part of their transfer to the solid waste management system (SWMS). See related point raised for PSAR Section 11.4 in the context of RG 1.189 for a fire hazard analysis.

6. System description should address provisions to re-circulate tank contents and means for representative sampling before conducting releases.

7. System description should address provisions to back flush sampling lines and return of contaminated flushed fluids to the system of origin or the LWMS.

8. System descriptions should address provisions for venting tanks and vessels and interface with the gas waste management system (GWMS) and building exhaust ventilation and filtration systems.

9. Inspection and testing should be tied to initial test program (ITP) test abstracts described in PSAR Chapter 14.

10. In addition to processing time, PSAR should also address tank capacities to ensure adequate storage volumes under varying operating conditions.

11. In addition to radiation monitoring, PSAR should describe provisions for automatic control features in diverting and terminating liquid effluent releases.

12. System descriptions should include design features on monitoring tank volumes and instrumentation alarms in preventing overflows.

13. System descriptions should include design features on instrumentation alarms and automatic control functions in shutting off transfer and discharge pumps.

14. In addressing potential failures, the evaluation should be expanded to consider shared LWMS subsystems and impact on the operation of the other unit and use of mobile processing equipment.

15. Observation: it appears that liquid effluent concentrations and doses will not be included in PSAR given details to be presented in the Final Safety Analysis Report (FSAR).

16. Describe the approach that will be used in the P/FSAR for LWMS subsystems to comply with Part 20 effluent concentration and dose limits. Such considerations address the initial loading of the proper types and amounts of filtration and absorption media and confirmation of automatic control features in terminating discharges.

Section 11.3 - Gaseous Waste Management System (GWMS) Topics

1. Given the location of the turbine building, the PSAR section should include a description of the MCES/TGSS connections to the GWMS or description of its own release point, including elevations, type of release, exit velocity, discharge rate, etc.

2. PSAR should confirm use of guidance in NEI 08-08 and ISG-06 in addition to Part 20.1406, RG 4.21, and IE 80-10, or describe other methodology as appropriate.

3. Address QA for GWMS given RG 1.143 and ANSI/ANS Standards on radioactive waste management system (RWMS), and compliance with Part 20, App. B ECLs, and the unity rule.

4. The definition of the plant boundary for routine effluent discharges needs to include the MCES/TGSS if not tied to the plant main stack.

5. PSAR should address the management of spent filtration and adsorption media as part of their transfer to the GWMS.

6. System description should address provisions to back flush sampling lines and return of contaminated flushed gases to the system of origin.

7. System descriptions should address provisions for venting process tanks and vessels and interface with waste offgas subsystems, and bldg exhaust ventilation and filtration systems servicing all radiologically controlled plant areas.

8. Inspection and testing should be tied to ITP test abstracts described in PSAR Chapter 14.

9. In addition to processing time, PSAR should also address gas decay tank capacities to ensure adequate decay times, include types and volumes of charcoals in decay tanks.

10. Confirm whether gas decay tank spent charcoals will be regenerated in place or disposed of (if chemically poisoned or water saturated).

11. As part of the failure analysis, confirm that the evaluation will consider potential fires in charcoals contained in decay tanks, water incursion, and failure of the O_2 and H_2 explosive gas monitoring system. See related point raised for PSAR Section 11.4 in the context of RG 1.189 fire hazard analysis (FHA).

12. In addition to radiation monitoring, PSAR should describe provisions for automatic control features in diverting and terminating gaseous effluent releases.

13. For the design of liquid seals, confirm that the basis will consider the requirements of Part 20.1406 and guidance of RG 4.21, ISG-06, IE 80-10 and NEI 08-08.

14. System descriptions should include design features and instrumentation in monitoring and controlling the presence of combustible gas mixtures in the waste gas subsystem.

15. In addressing potential failures, the evaluation should be expanded to consider shared GWMS subsystems and impact on the operation of the other unit.

16. Observation: It appears that gaseous effluent concentrations and doses will not be included in PSAR given details to be presented in FSAR.

17. Regarding the development of atmospheric dispersion and deposition parameters, describe the approach that will be used for the PSAR and FSAR and describe the associated elements of the pre-operational monitoring program for meteorological data.

18. Describe the approach that will be used in the P/FSAR for GWMS subsystems to comply with Part 20 effluent concentration and dose limits. Such considerations address the initial loading of the proper types of high efficiency particulate air (HEPA)/charcoal filtration and amounts of charcoal media in decay/delay tanks and confirmation of automatic control features in terminating discharges.

Section 11.4 – Solid Waste Management System (SWMS) Topics

1. Confirm use of guidance in NEI 08-08 and ISG-06, in addition to Part 20.1406, RG 4.21, and IE 80-10.

2. Address QA for SWMS given RG 1.143 and ANSI/ANS Standards on RWMS.

3. In addressing compliance with Part 20, App. B ECLs, identify whether all process related liquid and gaseous wastes generated during the operation of the SWMS will be processed by the LWMS and GWMS, and whether it will require additional liquid and gaseous effluent release points.

4. Address the management of spent filtration and adsorption media as part of their transfer to onsite and offsite waste storage for Class A, B, and C wastes.

5. PSAR should provide an estimate of the amounts of mixed waste that will be generated yearly and stored or shipped offsite for treatment and disposal.

6. PSAR should address whether the design of the facility will include provisions for the long-term storage of Class B and C wastes, mixed wastes, and large components, should offsite disposal outlets not be available.

7. System description should address provisions to back flush SWMS sampling lines and return of contaminated flushed fluids/gases to its subsystems or to the LWMS and GWMS.

8. System descriptions should address provisions for venting of process tanks and process equipment and interface with building exhaust ventilation and filtration systems servicing all radiologically controlled areas where SWMS equipment is located.

9. Inspection and testing should be tied to ITP test abstracts described in PSAR Chapter 14.

10. In addition to processing time, PSAR should also address tank holding capacities to ensure adequate storage volumes over varying operating conditions.

11. In complying with GL 89-01, using the guidance of NUREG-1301, address the approach being used in the development of a plant-specific process control program (PCP) in the FSAR.

12. As part of the failure analysis, the evaluation should consider potential fires in waste media (spent charcoals, HEPA filters, spent resins, and dry active waste) contained in processing and storage facilities in the context of RG 1.189; and should address the drop of waste containers and spills of in-process waste during subsystem operations.

13. In addition to radiation monitoring, PSAR should describe provisions for automatic control features in diverting and terminating process to prevent tank and process equipment overflows and spills.

14. System descriptions should include design features on monitoring tank volumes and instrumentation alarms in preventing overflows.

15. In addressing potential failures, the evaluation should be expanded to consider shared SWMS subsystems and impact on the operation of the other unit.

Section 11.5 – Process and Effluent Radiological Monitoring Instrumentation and Sampling Systems (PERMSS) Topics

1. The PSAR should identify specific plant process systems that comply with the monitoring and sampling provisions for liquid and gaseous process streams, and liquid and gaseous effluent discharge points.

2. Identify approach in listing radiation monitoring equipment for instrumentation used in monitoring other process systems with no direct effluent discharge points, such as main steam line, CCWS, RCS leakage rate of 1gpm, steam generator blowdown, main control room ventilation, fuel pool cooling and purification, RG 1.97 systems, among others.

3. In addressing compliance with all gaseous and liquid effluent concentrations and doses, also confirm the guidance of NUREG-0543 in meeting the requirements of 40 CFR 190 as implemented under Part 20.1301(e).

4. In complying with GL 89-01, using the guidance of NUREG-1301, address the approach being used in the development of a plant and site-specific offsite dose calculation manual (ODCM) at the FSAR stage, or use of NEI Generic ODCM Template (07-09A).

5. Regarding operational programs, the generic ODCM is based on a typical light water reactor and does not address some of the unique features of the modular design. The applicant should review the generic ODCM template and identify which sections of the generic ODCM template will need to be modified and address how it will define the discharge boundaries of the LWMS and GWMS.

6. PSAR should describe how the sampling of gaseous process and effluent streams will be accomplished given the integrated design of the reactor vessel and deployment of multiple modules. Describe how gaseous samples will be collected from various process and effluent streams and still be radiologically and chemically representative of each sampled systems.

7. Regarding the guidance and acceptance criteria of SRP Section 11.5 and IE Bulletin 80-10 on unmonitored and uncontrolled radioactive releases and Part 20.1406, the PSAR should identify and describe design features of the process and effluent monitoring and sampling systems and their interconnections to non-radioactive systems. Such interconnections to non-radioactive systems include purge air, purge water, instrument air, and makeup water for filling loop seals. The design features should describe how these non-radioactive system interconnections are protected from contamination due to backflow leakage, spillage, valving errors, or other operating conditions. Note that these design considerations should also consider the guidance of RG 4.21 and NEI 08-08.

8. For multi-modular stations sharing common gaseous effluent treatment systems and plant stack, the PSAR should consider how such a design would address the Three Mile Island (TMI)-related requirements of Part 50.34(f)(2) and Type E variables described in RG 1.97. As a result, the PSAR should consider the appropriate TMI-related requirements against the proposed radiation monitoring instrumentation and sampling systems against NRC guidance described in SRP Sections 7.3, 7.5. 7.8, 9.3.2, and 11.5 and BTP 7-10.

9. Regarding the development of data to support the dose assessments for members of the public, consider the approach that will be used for the PSAR and FSAR to describe the associated elements of the pre-operational monitoring program on local and regional land use and population distributions within a radius of 50 miles from the plant.