June 19, 2013

Robert Sisk, Acting Director
SMR Licensing
Nuclear Power Plants
Westinghouse Electric Company
1000 Westinghouse Dr, Suite 115
Cranberry Township, PA 16066

SUBJECT: NEW FINAL DATE FOR THE AUDIT PLAN COMPLETION TO REVIEW THE WESTINGHOUSE SMALL MODULAR REACTOR DESIGN DATA AND SPECIFICATIONS FOR SMALL BREAK LOSS-OF-COOLANT ACCIDENT PHENOMENA IDENTIFICATION AND RANKING TABLE

Dear Mr. Sisk:

The Office of Nuclear Regulatory Research is currently conducting an Audit at the Westinghouse Rockville Office to review internal documentation of the Westinghouse Small Modular Reactor design information associated to topical report WCAP-17573, Revision 1, "Westinghouse Small Modular Reactor Small Break Loss of Coolant Accident Phenomena Identification and Ranking Table." In accordance to the May 2, 2013 letter (Agencywide Documents Access and Management System (ADAMS) accession number ML1312A466) sent to Westinghouse, the Audit was scheduled to end on June 30, 2013. This letter is to re-iterate the conversation we had with you that the completion date of the Audit is now scheduled for August 30, 2013. Attached is the referenced Audit Plan edited with the new date.

Should you have any questions regarding this matter, I may be reached at 301-415-1560.

Sincerely,

/RA/

Anna H. Bradford, Branch Chief
Small Modular Reactor Licensing Branch 2
Division of Advanced Reactors and Rulemaking
Office of New Reactors

Enclosure:
1. Audit Plan
2. Information Needs List

Project No.: PROJ0797

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ADAMS ACCESSION NO.: ML13169A144 **NRO-002**

OFFICE	PM:NRO/DARR/SMRLB2	BC:NRO/DARR/SMRLB2
NAME	ACosta	ABradford
DATE	6/19/13	6/19/13

OFFICIAL RECORD ONLY

AUDIT PLAN TO REVIEW ADDITIONAL WESTINGHOUSE SMALL MODULAR REACTOR DESIGN DATA AND SPECIFICATIONS FOR SMALL BREAK LOSS-OF-COOLANT ACCIDENT PHENOMENA IDENTIFICATION AND RANKING TABLE

A. Background

Westinghouse submitted topical report WCAP-17573, Revision 1, "Westinghouse Small Modular Reactor Small Break Loss-of-Coolant Accident Phenomena Identification and Ranking Table." As part of the topical report review, the Office of New Reactors (NRO) requested that the Reactor Systems Analysis Branch (RSAB) of the Office of Nuclear Regulatory Research (RES) provide technical assistance for developing in-house Westinghouse small modular reactor (W-SMR) phenomena identification and ranking tables (PIRTs) for limiting events, and evaluating acceptability of the W-SMR small-break loss-of-coolant accident (SBLOCA) PIRT described in topical report WCAP-17573. The W-SMR PIRT evaluation will support the evaluation of the W-SMR test programs and safety analysis methodologies in accordance with Standard Review Plan (SRP) 15.0.2, "Review of Transient and Accident Analysis Method."

The purpose of this audit is to review internal Westinghouse documentation of the W-SMR design information to allow RES/RSAB to develop in-house PIRTs of the W-SMR limiting events and review the Westinghouse W-SMR SBLOCA PIRT. During the audit and interactions with the applicant, there may be requests for information developed, which may be part of future formal correspondence. The audit will also include review of additional design information provided by Westinghouse to support the development of confirmatory TRACE/PARCS models.

B. Regulatory Audit Bases

SRP 15.0.2 states that the accident scenario identification process is required in order to determine the needed modeling and assessment requirements for the transients and accident analysis codes. The PIRT process is also needed to identify and rank the reactor components and physical phenomena modeling requirements based on their importance to acceptable modeling of the scenario and their impact on the figure of merit for the calculation. The PIRT process also identifies relatively high importance low knowledge phenomena for the determination of the need for and the scope of licensing basis testing.

Per Office Instruction NRO-REG-108, a regulatory audit is a planned, license or regulation-related activity that includes the examination and evaluation of primarily non-docketed information. A regulatory audit is conducted with the intent to gain understanding, to verify information, and/or to identify information that will require docketing to support the basis of the licensing or regulatory decision.

C. Regulatory Audit Scope or Methodology

The audit is expected to last 5-10 business days (non-consecutive) and will be conducted in several phases at the Westinghouse Rockville Office. The primary purpose of the audit is to obtain W-SMR design information and relevant separate effect and integral effect tests performed under AP600 and AP1000 design certification applications.

This information is needed in the development of the independent PIRTs of the W-SMR limiting events, and the evaluation of the Westinghouse W-SMR SBLOCA PIRT.

The specific scope of this audit will be to:

1. Assure that the design information is complete and responsive to the preliminary set of information needs list (see enclosure),
2. Identify missing information (gaps) in data,
3. Identify specific information and relevant documents the staff needs to directly support the in-depth review of the W-SMR, and
4. Compile a list of additional questions and requests for clarification (if any).

D. Information and Other Material Necessary for the Regulatory Audit

The audit scope and agenda define documentation that is required for the staff to complete the audit. In addition, the staff requests the availability of the documents describe in the attachment.

E. Special Requests

The NRC requests that Westinghouse provide:

- A working space for the duration of the audit at the Westinghouse Rockville Office
- A table indicating those documents that are text searchable and those that are not text searchable
- A telephone for contacting the U.S. Nuclear Regulatory Commission (NRC) staff and headquarters
- A teleconference line for the audit entrance and exit meetings
- A copy of the audit documents at the Westinghouse Rockville Office for a period of 45 days following the exit meeting in the event that the RES/RSAB staff requires additional review prior to issuance of the audit products
- Access (in person or through teleconference) of Westinghouse personnel that generated or are technically cognizant of the contents of the audit documents

F. Audit Team

The audit team will include two senior reactor systems engineers and two reactor systems engineers from RES/RSAB and technical contractors (as required). The RES/RSAB audit team will hold periodic teleconference briefs with counterparts in NRO/SRSB. Prior to audit completion, the calls will include the audit team, NRO counterparts, the NRC Project Manager for the W-SMR review and the NRO technical branch chief.

G. Logistics

Date:	April 12, 2013 through **August 30, 2013** (Multiple, non-consecutive dates)
Time:	9:00 a.m. – 5:00 p.m.
Location:	Westinghouse Offices, Rockville, Maryland
Point-of-Contact:	Robert Sisk, WEC

H. Deliverables

Within 90 days of completion of the final phase of the audit, the audit team will generate an internal audit results summary report (ARSR). The ARSR will document information required for the RES/RSAB staff to complete the W-SMR SBLOCA evaluation. The ARSR is expected to include a large amount of proprietary information. In lieu of a non-proprietary version of the ARSR, the RES/RSAB staff will generate a non-proprietary audit summary. This summary will provide a list of documents audited by the audit team and confirmation that sufficient information has been collected to complete the W-SMR SBLOCA evaluation.

Information Needs List in the Pre-Application Phase of the W-SMR

A. Specific Information for the Independent SBLOCA PIRT
   1) The latest detailed W-SMR design information supporting the W-SMR SBLOCA PIRT
   2) ICP tank normal operating pressure and describe any inventory of non-condensable gases
   3) Rupture disk rupture pressure difference
   4) Detailed inputs (including assumptions, initial conditions, ECCS setpoints, credited ESFs, operator actions, etc.) and analysis results (including event sequences, etc.) for the SBLOCA simulations
   5) Clarifications and detailed information on how the specific separate and integral effects tests planned for the W-SMR, i.e. the test plan or test matrix, correlate with the "gaps" in knowledge identified with the W-SMR SBLOCA PIRT.

B. Specific Information for Independent non-SBLOCA PIRTs
   1) Detailed inputs (including assumptions, initial conditions, ECCS setpoints, credited ESFs, operator actions, etc.) and analysis results (including event sequence, etc.) for the following potential events for consideration:
      a) Loss of forced reactor coolant flow (e.g. limiting trip of multiple RCPs)
      b) Limiting decrease in RCPB temperature event (e.g. inadvertent SGDV opening or recirculation pump overspeed)
      c) Limiting increase in RCPB temperature event (e.g. MSIV closure)
      d) SGTR
      e) Inadvertent ADS Actuation
      f) Inadvertent pressurizer RV opening
      g) Malfunction of the CVCS
      h) Main steam line break inside CV
      i) Rod ejection accident
      j) Inadvertent / Uncontrolled Rod Withdrawal
      k) Station Blackout
      l) ATWS.

C. Information Supporting the Development of Confirmatory TRACE Models
   1) Please discuss the postulated initiating failures that could result in multiple RCP trip.
   2) Please provide the RCP inertia.
   3) Dimensions for the secondary system piping inside the CV
   4) Mechanical design of the reference fuel and control rods.
   5) Neutronics design of the reference core(s), fuel and control rods to support generation of cross-sections for reference core loading(s).
   6) Cross-section Generation
      a) Please provide fuel assembly nuclear design information for the staff to perform confirmatory cross-section calculations including:
      b) A description of all lattices in the reference core design, including pin arrangements and dimensions, tube dimensions, and gap dimensions
      c) A description of the axial arrangement of all lattices in the assembly design(s)
      d) The mass of uranium in each fuel type and in the overall assembly design(s)

e) Complete material composition description of all fuel assembly materials (structural material, spacers, cladding, fuel) including percentages of all isotopes
f) A description of the reference control rod cluster design appropriate for performing lattice calculations, including materials and geometry
g) A complete description of any removable absorber pins
h) Tables (ASCII or other electronic format preferred) of k-infinity and fission rate density distributions as a function of exposure for various density histories

7) Nuclear Model Generation
   a) Please provide the core nuclear design information for the staff to perform confirmatory reactor physics calculations including:
   b) A description of the radial fuel loading by assembly design type
   c) Tables (ASCII or other electronic format preferred) that provide the nodal exposure and exposure history (e.g. boron letdown) information for various points of interest during the cycle (e.g. beginning and end of cycle)
   d) Provide critical boron concentrations for each point of interest in cycle.
   e) Core average direct energy deposition factors to active and bypass flows
   f) Tables (ASCII or other electronic format preferred) of nodal powers for each exposure point