



PROPRIETARY

Nuclear Innovation
North America LLC
4000 Avenue F, Suite A
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January 18, 2012
U7-C-NINA-NRC-120002
10 CFR 2.390

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

South Texas Project
Units 3 and 4
Docket No. PROJ0772
Response to Request for Additional Information

Reference: Letter from Tekia Govan to Mark McBurnett, "Request for Additional Information Re: South Texas Project Nuclear Operating Company Topical Report (TR) WCAP-17203-P, Fast Transient and ATWS Methodology (TAC No. ME4505)," May 24, 2011 (ML111440329)

Attached are the responses to the following NRC staff questions included in the reference:

NRR RAI-2
NRR RAI-4
NRR RAI-34

The responses to these RAI questions contain information proprietary to Westinghouse Electric Corporation. Since this letter contains information proprietary to Westinghouse Electric Company LLC, it is supported by an affidavit signed by Westinghouse, the owner of the information. The affidavit sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b) (4) of Section 2.390 of the Commission's regulations.

Accordingly, it is respectfully requested that the information which is proprietary to Westinghouse be withheld from public disclosure in accordance with 10 CFR Section 2.390 of the Commission's regulations.

DO91
NRD

STI 33200967

Attachments 1, 2, and 3 contain the responses to the RAI questions. Attachments 4, 5, and 6 contain the non-proprietary versions of the responses. Attachment 7 contains the request for withholding of proprietary information, the affidavit, the proprietary information notice, and the copyright notice.

Correspondence with respect to the copyright or proprietary aspects of this information or the supporting Westinghouse Affidavit should reference CAW-12-3355 and should be addressed to: J. A. Gresham, Manager, Regulatory Compliance and Plant Licensing, Westinghouse Electric Company LLC, Suite 428, 1000 Westinghouse Drive, Cranberry Township, Pennsylvania, 16066.

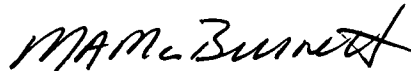
If this letter becomes separated from the proprietary material it is no longer proprietary.

There are no commitments in this letter.

If you have any questions, please contact Scott Head at (361) 972-7136, or Bill Mookhoek at (361) 972-7274.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 1/18/12



Mark McBurnett
Senior Vice President, Oversight & Regulatory Affairs
Nuclear Innovation North America LLC

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Attachments:

1. NRR RAI-2 (Proprietary)
2. NRR RAI-4 (Proprietary)
3. NRR RAI-34 (Proprietary)
4. NRR RAI-2 (Non-Proprietary)
5. NRR RAI-4 (Non-Proprietary)
6. NRR RAI-34 (Non-Proprietary)
7. Request for Withholding Proprietary Information

cc: w/o attachment except*
(paper copy)

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CPS Energy

CAW-12-3355

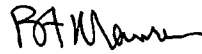
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COMMONWEALTH OF PENNSYLVANIA:

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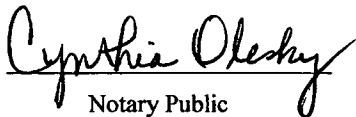
COUNTY OF BUTLER:

Before me, the undersigned authority, personally appeared B. F. Maurer, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC (Westinghouse), and that the averments of fact set forth in this Affidavit are true and correct to the best of his knowledge, information, and belief:

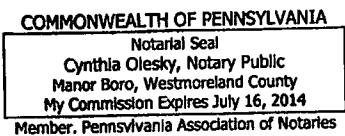


B. F. Maurer, Manager
ABWR Licensing

Sworn to and subscribed before me
this 12th day of January 2012



Notary Public



- (1) I am Manager, ABWR Licensing, in Nuclear Services, Westinghouse Electric Company LLC (Westinghouse), and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rule making proceedings, and am authorized to apply for its withholding on behalf of Westinghouse.
- (2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Commission's regulations and in conjunction with the Westinghouse Application for Withholding Proprietary Information from Public Disclosure accompanying this Affidavit.
- (3) I have personal knowledge of the criteria and procedures utilized by Westinghouse in designating information as a trade secret, privileged or as confidential commercial or financial information.
- (4) Pursuant to the provisions of paragraph (b)(4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.
 - (i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.
 - (ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitutes Westinghouse policy and provides the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

- (a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of

Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

- (b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g., by optimization or improved marketability.
- (c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.
- (d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.
- (e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.
- (f) It contains patentable ideas, for which patent protection may be desirable.

There are sound policy reasons behind the Westinghouse system which include the following:

- (a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.
- (b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.
- (c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.

- (d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.
 - (e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of those countries.
 - (f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.
- (iii) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.390; it is to be received in confidence by the Commission.
- (iv) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.
- (v) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in WEC-NINA-2012-0002 P-Enclosure, "Responses to NRR RAIs 2, 4 and 34 on WCAP-17203" (Proprietary) for submittal to the Commission, being transmitted by Nuclear Innovation North America (NINA) letter and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information as submitted by Westinghouse is that associated with the NRC review of WCAP-17203.

This information is part of that which will enable Westinghouse to:

- (a) Assist customers in obtaining NRC review of the Westinghouse Fast Transient and ATWS Methodology topical as applied to current BWR and ABWR plant designs.

Further this information has substantial commercial value as follows:

- (a) Assist customer to obtain license changes.
- (b) The information requested to be withheld reveals the distinguishing aspects of a methodology which was developed by Westinghouse.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar fuel design and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

Further the deponent sayeth not.

PROPRIETARY INFORMATION NOTICE

Transmitted herewith are proprietary and/or non-proprietary versions of documents furnished to the NRC in connection with requests for generic and/or plant-specific review and approval.

In order to conform to the requirements of 10 CFR 2.390 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the affidavit accompanying this transmittal pursuant to 10 CFR 2.390(b)(1).

COPYRIGHT NOTICE

The reports transmitted herewith each bear a Westinghouse copyright notice. The NRC is permitted to make the number of copies of the information contained in these reports which are necessary for its internal use in connection with generic and plant-specific reviews and approvals as well as the issuance, denial, amendment, transfer, renewal, modification, suspension, revocation, or violation of a license, permit, order, or regulation subject to the requirements of 10 CFR 2.390 regarding restrictions on public disclosure to the extent such information has been identified as proprietary by Westinghouse, copyright protection notwithstanding. With respect to the non-proprietary versions of these reports, the NRC is permitted to make the number of copies beyond those necessary for its internal use which are necessary in order to have one copy available for public viewing in the appropriate docket files in the public document room in Washington, DC and in local public document rooms as may be required by NRC regulations if the number of copies submitted is insufficient for this purpose. Copies made by the NRC must include the copyright notice in all instances and the proprietary notice if the original was identified as proprietary.

NRR RAI-2

Section 3 does not include separate acceptance criteria and figures of merit applicable to the reactor coolant pump rotor seizure and pump shaft break events, which are typically considered in operating plants' licensing bases as accidents rather than AOs. Furthermore, although a distinction is made in Section 1.1 and other places in the topical report, Section 3 also does not distinguish between AOs and infrequent events. Therefore, please clarify whether the AO criteria and figures of merit are to be applied for accidents and infrequent events considered within the scope of the topical report and revise the topical report to clarify this point and the applicable regulatory basis.

Response to NRR RAI-2

The Westinghouse methodology in CENPD-300-P-A "Reference Safety Report for Boiling Water Reactors Reload Fuel" considers the reactor coolant pump rotor seizure and pump shaft break events as accidents. However, as part of the application of this methodology for a specific plant, the plants' licensing basis is used. If the event is considered to be an AO, the AO acceptance criteria are used. If the event is an accident, the accident acceptance criteria are used.

The AO analysis acceptance criteria are only applied to the events that according to plants' licensing bases are expected to occur one or more times during the life of the plant. Accidents and infrequent events are analyzed against the acceptance criteria outlined in a plant's licensing basis. In general for fast transients categorized as postulated accidents the acceptance criteria considered are that the radiological consequences applicable limits are met and the primary system pressure is maintained below acceptable design limits. For the primary system pressure the AOs acceptance criterion and figure-of-merit will be applied.

The evaluation of the radiological consequences is beyond the scope of this topical report. However, using the methodology contained in this report, the number of fuel rod failures can be determined. For this purpose, the MCPR or the cladding temperature are evaluated depending on the plants' licensing bases. [

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The purpose of Section 3 in the LTR is to derive the figures-of-merit as the input for phenomena identification and ranking process. [

]^{a,c} no additional figures-of-merit need to be defined in Section 3 for the postulated accidents or infrequent events.

To clarify this, the following text from the response will be added to Section 3 in the approved version of the report.

"The AOO analysis acceptance criteria are only applied to the events that according to plants' licensing bases are expected to occur one or more times during the life of the plant. Accidents and infrequent events are analyzed against the acceptance criteria outlined in a plant's licensing basis. In general, for fast transients categorized as postulated accidents, the acceptance criteria considered are that the radiological consequences applicable limits are met and the primary system pressure is maintained below acceptable design limits. For the primary system pressure the AOOs acceptance criterion and figure-of-merit will be applied.

The evaluation of the radiological consequences is beyond the scope of this topical report. However, using the methodology contained in this report, the number of fuel rod failures can be determined. For this purpose, the MCPR or the cladding temperature are evaluated depending on the plants' licensing bases. [

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Westinghouse has noticed that the references to the GDC in section 3.1.1 are not correctly specified and will correct them as follows:

Paragraph 2 "Primary System" should refer to GDC 14 (instead of 15) and paragraph 3. "Containment Integrity" should refer to GDC 16 (instead of 31). These will be corrected in the approved version of the topical report.

Original formulation:

2. **Primary System** - The RPV integrity is assured by limiting the maximum primary stress within the Reactor Coolant Pressure Boundary (RCPB) to the emergency limits as defined in the ASME Code, Section III. RPV integrity is required by GDC 15 of 10CFR50 Appendix A.
3. **Containment Integrity** - The long-term containment capability is assured by limiting the maximum containment pressure to the design pressure of the containment structure and the suppression pool temperature to the wetwell design temperature in order to ensure compliance with GDC 31.

Updated formulation:

2. **Primary System** - The RPV integrity is assured by limiting the maximum primary stress within the Reactor Coolant Pressure Boundary (RCPB) to the emergency limits as defined in the ASME Code, Section III. RPV integrity is required by GDC 14 of 10CFR50 Appendix A.

3. **Containment Integrity** - The long-term containment capability is assured by limiting the maximum containment pressure to the design pressure of the containment structure and the suppression pool temperature to the wetwell design temperature in order to ensure compliance with GDC 16.

NRR RAI-4

Please provide a list of all the fast transients as they pertain to the BWR/2through BWR/6 contained in this topical report (WCAP-17203-P), and a comparison to a similar list provided in CENPD-300-P-A. That is, provide a 1-1 mapping between the methodologies and the all the transients modeled or simulated in the two topical reports CENPD-300-P-A and WCAP-17023-P.

Response to NRR RAI-4:

CENPD-300-P-A is a comprehensive umbrella document that describes the application of the NRC approved fuel and core design and analysis codes in the licensing safety analysis process to evaluate any plant modification. The process outlined is plant independent.

In addition, CENPD-300-P-A describes the methodologies applied for core and fuel design and for evaluating potentially limiting events (not only fast transients) for reload applications.

WCAP-17023-P provides a generic, code-independent methodology for evaluating only fast transients including both potentially limiting as well as non-limiting events.

As these licensing topical reports serve different purposes, the initiating events are grouped in somewhat different ways, as presented below. It should be noted that the methodologies for the mechanical, nuclear, thermal and hydraulic design included in the CENPD-300-P-A are not included in the 1 to 1 mapping (Table 1) of this response.

CENPD-300-P-A:

All initiating events pertaining to CENPD-300-P-A in general, and fast transients in particular, are categorized according to their relative probability of occurrence and failures assumption into three categories: Anticipated Operational Occurrences (AOOs), Accidents, and Special Events.

In Section 6.3.1.1 of the topical report, AOOs are further divided into groups according to the effect the initiating event has on eight nuclear system parameters.

1. Reactor Vessel Pressure Increase Events
2. Reactor Core Coolant Temperature Decrease Events
3. Reactor Core Positive Reactivity Insertion
4. Reactor Vessel Coolant Inventory Decrease Events
5. Reactor Core Coolant Flow Decrease Events
6. Reactor Core Coolant Flow Increase Events
7. Reactor Core Coolant Temperature Increase Events
8. Reactor Vessel Coolant Inventory Increase Events

Fast transients are represented in all of these groups with the exception of "Reactor Core Positive Reactivity Insertion".

The only fast transient, as they pertain to the BWR/2 through BWR/6 plant designs, in the category of Accidents is the "Recirculation Pump Failure Accident", which includes both recirculation pump seizure and recirculation pump shaft break.

Fast transients considered as Special Events are the Anticipated Transients without Scram and the Reactor Overpressure Protection.

The systematic process used to determine the potentially limiting events when evaluating a plant modification is described in Section 6.3 of the topical report using the introduction of a reload fuel as an application example and the results are summarized in Table 6-2. Events listed in the table are the minimum set of events requiring analysis for the first time a new fuel type is introduced in a plant¹. The generic list of events requiring evaluation includes fast and slow transients, accidents and special events as defined in the document.

The transient scenario is described in Section 6.3.1. The methodology for analyzing the selected potentially limiting events are further described in Chapters 7, 8 and 9 of the CENPD-300-P-A in general terms and by reference to other approved Licensing Topical Reports.

The methodology for evaluating the fast transients selected in Table 6-2 is described in Sections 7.3 and 7.4 for AOOs, Section 9.3 for Overpressurization Protection and Section 9.5 for ATWS. It should be noted that only the potentially limiting events for a typical reload application are described and none of the listed events is considered as an Accident.

Fast transients:

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¹ Additional events are included on plant specific basis. Based on the type of plant changes proposed, the list of events to be analyzed also varies, as discussed in the CENPD-300-P-A.

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WCAP-17203-P

WCAP-17203-P contains a generic evaluation methodology for all fast transients considered in Table 2-1 and the Special Event ATWS. This topical expands Westinghouse methodology in these areas to first cores or plant changes other than those contained in CENPD-300-P-A.

In WCAP-17203-P, the fast transients are divided into groups to facilitate the identification and ranking of the important phenomena in the following categories:

- Pressure Increase Events
- Pressure Decrease Events
- Reactor Coolant Flow Increase Events
- Reactor Coolant Flow Decrease Events
- Feedwater Flow Increase Events
- Feedwater Flow Decrease Events
- Reactor Coolant Temperature Increase Events
- Reactor Coolant Temperature Decrease Events
- Anticipated Transients without Scram

The transient scenario for each of these events is described in Section 4 and the methodology in Section 6.

Methodologies Mapping

As fast transient group categorization is different in CENPD-300-P-A and WCAP-17203-P, Table 1 below provides the mapping of the transient methodologies and Chapter 15 of the SRP. Please also see the table in the response to RAI-1 from the Office of New Reactors for a mapping of the codes and qualification topical reports.

Nomenclature in Table 1:

Mtd:	Methodology
CENPD:	CENPD-300-P-A
WCAP:	WCAP-17203-P

CENPD-300-P-A

RVPI:	Reactor Vessel Pressure Increase Events
RCCTD:	Reactor Core Coolant Temperature Decrease Events
RCPRI:	Reactor Core Positive Reactivity Insertion
RVCID:	Reactor Vessel Coolant Inventory Decrease Events
RCCFD:	Reactor Core Coolant Flow Decrease Events
RCCFI:	Reactor Core Coolant Flow Increase Events
RCCTI:	Reactor Core Coolant Temperature Increase Events
RVCII:	Reactor Vessel Coolant Inventory Increase Events
ASME:	Reactor Overpressure Protection
ATWS:	Special Event – Anticipated Transients without Scram

WCAP-17203-P

PI:	Pressure Increase Events
PD:	Pressure Decrease Events
RI:	Reactor Coolant Flow Increase Events
RD:	Reactor Coolant Flow Decrease Events
FI:	Feedwater Flow Increase Events
FD:	Feedwater Flow Decrease Events
TI:	Reactor Coolant Temperature Increase Events
TD:	Reactor Coolant Temperature Decrease Events
ATWS:	Anticipated Transients without Scram

WCAP-17203-P initiating events are named as in the SRP, only the category is given in the table below.

Table 1: Methodology mapping between WCAP-17203-P and CENPD-300-P-A

SRP	Initiating Event	WCAP-17203-P	CENPD-300-P-A	Comments
15.1.1	Decrease in Feedwater Temperature	TD	RCCTD • Loss of Feedwater Heating	[] ^{a,c} Mtd CENPD section 7.5.5
15.1.2	Increase in Feedwater Flow	PI	RVCII • Feedwater Controller Failure – Maximum Demand	CENPD Mtd section 7.4.1, 7.4.5 WCAP Mtd section 6.4.1.2
15.1.3	Increase in Steam Flow	PD	RVCID • Pressure Regulator Failure – Open	CENPD Not described WCAP Mtd section 6.4.1.3
15.1.4				See 15.6.1
15.2.1	Loss of External Load	PI	RVPI • Generator Load Rejection with/without Bypass	CENPD Mtd section 7.4.1, 7.4.3 WCAP Mtd section 6.4.1.2
15.2.2	Turbine Trip	PI	RVPI • Turbine Trip with/without Bypass	CENPD Mtd section 7.4.1, 7.4.4 WCAP Mtd section 6.4.1.2
15.2.3	Loss of Condenser Vacuum	PI	RVPI • Loss of Condenser Vacuum	CENPD Not described WCAP Mtd section 6.4.1.2
15.2.4	Closure of Main Steam Isolation Valve	PI	RVPI • Close of One MSIV/ All MSIVs	CENPD Not described WCAP Mtd section 6.4.1.2
15.2.5	Steam Pressure Regulator Failure (Closed)	PI	RVPI • Pressure Regulator Failure - Closed	CENPD Mtd section 7.4.1, 7.4.6 WCAP Mtd section 6.4.1.2

SRP	Initiating Event	WCAP-17203-P	CENPD-300-P-A	Comments
15.2.6	Loss of Nonemergency AC Power to the Station Auxiliaries	PI	RVCID • Loss of AC Power	CENPD Not described
				WCAP Mtd section 6.4.1.2
15.2.7	Loss of Normal Feedwater Flow	FD	RVCID • Loss of Feedwater Flow	CENPD Not described
				WCAP Mtd section 6.4.2.3
15.3.1	Loss of Forced Reactor Coolant Flow Including Trip of Pump Motor	RD	RCCFD • Trip of One/All Recirculation Pumps	CENPD Not described
				WCAP Mtd section 6.4.2.3
15.3.2	(Recirculation) Flow Controller Malfunctions	RD	RCCFD • Recirculation Flow Controller Failure – Decreasing Flow	CENPD Not described
				WCAP Mtd section 6.4.2.3
15.3.3	Reactor Coolant Pump Rotor Seizure	RD	Recirculation Pump Failure Accident	CENPD Not described
				WCAP Mtd section 6.4.2.3
15.3.4	Reactor Coolant Pump Shaft Break	RD	Recirculation Pump Failure Accident	CENPD Not described
				WCAP Mtd section 6.4.2.3
15.4.1	Uncontrolled Control Rod Assembly Withdrawal from a Subcritical or Low Power Startup Condition	Not described	Rod Withdrawal Error	CENPD Mtd section 7.5.4
15.4.2	Uncontrolled Control Rod Assembly Withdrawal at Power	Not described	Rod Withdrawal Error	CENPD Mtd section 7.5.4
15.4.3	Control Rod Misoperation (System Malfunction or operator Error)	Not described	Rod Withdrawal Error	CENPD Mtd section 7.5.4
15.4.4	Startup of an Inactive Loop or Recirculation Loop at an Incorrect Temperature	RI	RCCFI • Startup of an Idle Recirculation Loop	CENPD Not described
				WCAP Mtd section 6.4.2.2

SRP	Initiating Event	WCAP-17203-P	CENPD-300-P-A	Comments
15.4.5	Flow Controller Malfunction Causing an Increase in BWR Core Flow Rate	RI	RCCFI <ul style="list-style-type: none"> Recirculation Flow Controller Failure – Increasing Flow 	[] ^{a,c} CENPD Mtd section 7.5.3 WCAP Mtd section 6.4.2.2
15.4.7	Inadvertent Loading and Operation of a Fuel Assembly in an Improper Position	Not described	Misplaced Assembly Accident (Fuel Loading Error)	CENPD Mislocated Fuel Assembly - Mtd section 8.5.1 Rotated Fuel Assembly – Mtd Section 8.5.2
15.4.9	Spectrum of Rod Drop Accidents (BWR)	Not described	Control Rod Drop Accident	CENPD Mtd section 8.3.
15.5.1	Inadvertent operation of ECCS	TD	RCCTD: <ul style="list-style-type: none"> Inadvertent HPCI Start Inadvertent RHR Shutdown Cooling Operation 	[Slow transient, is evaluated with the same methodology as RCCTD, CENPD 7.5.5] ^{a,c} WCAP Mtd section 6.4.4.2
15.6.1	Inadvertent Opening of a BWR Pressure Relief Valve	PD	RVCID <ul style="list-style-type: none"> Inadvertent Safety/Relief Valve Opening 	CENPD Not described WCAP Mtd section 6.4.1.3
15.7.4	Radiological Consequences of Fuel Handling Accidents	Not described	Fuel Handling Accident	CENPD Mtd section 8.4.3
15.8	Anticipated Transients Without Scram	ATWS	Special Event Anticipated Transients Without Scram	CENPD Mtd section 9.5.2 WCAP Mtd section 6.5.1
15.9	Boiling Water Reactor Stability	Not described	Core Thermal-Hydraulic Stability	CENPD Mtd section 9.2.2
5.2.2	Overpressure Protection	PI	Special Event Reactor Overpressure Protection	CENPD Mtd section 9.3.2 WCAP Mtd section 6.2.3
6.1.3, 6.2.x	(Loss of Coolant Accidents)	Not described	Loss of Coolant Accidents	CENPD Mtd section 8.2.3 The analysis is performed to determine the mass and energy release and the fuel and core performance.

NRR RAI-34

Please discuss the compatibility of the codes currently planned for implementation with WCAP-17203 with best estimate input parameters for statistical analysis (as opposed to a conservative analysis of transient events with limiting inputs). Please also discuss the extent to which they have been previously evaluated and accepted for such analysis, or whether this qualification will come through future topical reports to be submitted to the NRC.

Response to NRR RAI-34

The fast transient and ATWS methodology described in WCAP-17203 is code independent and therefore applicable to any NRC approved transient analysis code. The codes that are currently planned for implementing the methodology are the Westinghouse 1-D transient code BISON and 3-D kinetics transient code POLCA-T.

Both of these codes will be used in the analyses of fast transients and ATWS events according to the restrictions and limitations in their respective SERs.

WCAP-17203 covers only a portion of the evaluation model. The remaining portions are covered in [

] ^{a,c}

For the codes to be used according to the methodology described in WCAP-17203, Section 7 of the LTR requires the Code Capability Assessment (CCA) and Data Uncertainty Assessment (DUA) to be performed. Both of these processes have been documented in the LTR on an example basis. CCA is required as an input to Table 7-1 (Uncertainty Evaluation Matrix) and DUA is required as a link between a certain phenomenon and the parameters describing this phenomenon.

Both of these processes will be documented in Westinghouse internal documents according to their respective requirements defined in Section 7 in the LTR and will be open for NRCs audit prior to their first application.

The statistical distribution functions for the parameters under consideration are determined, according to the process described in Section 7 in the LTR, from the validation basis presented in the code specific topical mentioned above. In several submittals (later ones, such as Appendices C and D to WCAP-16747-P-A) the uncertainty distribution functions are determined directly in the report. The older submittals do not usually include such information, as their primary purpose was to be used in conservative analyses. These submittals however contain the validation of code models against the experimental data. Based on these comparisons, the statistical data will be determined as a part of the Data Uncertainty Assessment process and will be open for NRCs audit prior to their first application.