PROPRIETARY

Nuclear Innovation
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June 20, 2011
U7-C-NINA-NRC-110080
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 Number PROJ0772
Responses to Request for Additional Information

Reference: Request for Additional Information RE: South Texas Nuclear Operating Company Project Topical Report (TR) WCAP-17202-P, "Supplement 4 to Bison Topical Report RPA 90-90-P-A" (TAC No. RG0026) (ML111050109)

Attached are the responses to NRC staff questions included in the reference. The following RAI questions are addressed:

RAI 15.00.02-3	RAI 15.00.02-17
RAI 15.00.02-4	RAI 15.00.02-23
RAI 15.00.02-7	RAI 15.00.02-25
RAI 15.00.02-8	RAI 15.00.02-27
RAI 15.00.02-11	RAI 15.00.02-28
RAI 15.00.02-12	RAI 15.00.02-41

The responses to RAI 15.00.02-7, RAI 15.00.02-12, RAI 15.00.02-17, RAI 15.00.02-23, and RAI 15.00.02-41 contain information proprietary to Westinghouse Electric Corporation. Since these responses contain information proprietary to Westinghouse Electric Company LLC, they are 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.

T007
NRO

STI 32883320

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.

Attachments 1 through 12 contain the responses to the above RAI questions. Attachments 13 through 17 contain the non-proprietary versions of the five (5) proprietary responses. Attachment 18 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 letter CAW-11-3175 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 other than those relating to the proprietary aspects of this response, 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 6/20/11

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

jet

Attachments:

1. RAI 15.00.02-3
2. RAI 15.00.02-4
3. RAI 15.00.02-7 (Proprietary)
4. RAI 15.00.02-8
5. RAI 15.00.02-11
6. RAI 15.00.02-12 (Proprietary)
7. RAI 15.00.02-17 (Proprietary)
8. RAI 15.00.02-23 (Proprietary)
9. RAI 15.00.02-25
10. RAI 15.00.02-27
11. RAI 15.00.02-28
12. RAI 15.00.02-41 (Proprietary)

13. RAI 15.00.02-7 (Non-Proprietary)
14. RAI 15.00.02-12 (Non-Proprietary)
15. RAI 15.00.02-17 (Non-Proprietary)
16. RAI 15.00.02-23 (Non-Proprietary)
17. RAI 15.00.02-41 (Non-Proprietary)
18. Request for Withholding Proprietary Information

cc: w/o enclosure except*
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RAI 15.00.02-3

The "Nomenclature for Equations" is found on pages vi-viii of WCAP-17202.
a. Please add ξ_{wind} and ξ_{stat} (from Equations 2-2 and 2-3) and C, CONDR, k_0, k_1, k_2, ΔT_{surf}, CA and A_{eff} (from Equations 3-49 and 3-50) to this list.

b. Because the units associated with the nomenclature are not always identified in the text, please add the units to each item in this tabulation.

Response to RAI 15.00.02-3 (a and b)

The nomenclature will be updated with units in the approved version of the topical report. Also, some updates and correction of minor errors will be inserted in the nomenclature and unused definitions will be deleted. All changes and insertions, except unit insertions, are highlighted in yellow and the deleted definitions are marked with a strikethrough for traceability. The following is the motivation for deletions and changes:

F: Not used in LTR2.
G: Not used in LTR2.
Leid: T_{leid} is used in LTR2.
R: this is the *specific* gas constant for nitrogen gas and should be so denoted.
ξ_1 to ξ_{32}: These are called loss coefficients, not drag coefficients.

NOMENCLATURE FOR EQUATIONS

A_1	[m^2]	Inner area for the gas tank-scram valve line
A_3	[m^2]	Inner area of the main line after the water tank
A_{32}	[m^2]	Inner area of branch line to rotary actuator
A_4	[m^2]	Plunge area of the rotary actuator
A_{41}	[m^2]	Effective leakage area in the rotary actuator
A_{eff}	[m^2]	Free area outside the separators
A_{rel}	[m^2]	Relative opening area for a scram valve in the water line
A_{w1}	[m^2]	Inner wall area of the gas tank (for heat transfer)
A_{w2}	[m^2]	Heat transfer area in the water tank
C	[kg/s·K]	Steam condensation on the water level
CA	[kg/s·K·m^2]	Steam condensation per unit area on the water level
CONDR	[-]	Fitting parameter in the steam dome water surface condensation model
C_p	[J/kg·K]	Heat capacity
c_p	[J/kg·K]	Isobaric thermal capacity for nitrogen gas
c_v	[J/kg·K]	Isochoric thermal capacity for nitrogen gas
Dh	[m]	Hydraulic diameter
Eta	[Pa·s]	Dynamic viscosity
~~F~~	~~[]~~	~~Notation for water~~
F_R	[N]	Frictional force in an actuator
g	[m/s^2]	Gravity constant
~~G~~		~~Notation for steam~~
G_1	[kg/s]	Gas flow between the gas tank and the water tank
G_2	[kg/s]	Mass flow water in the main line from the water tank
G_{21}	[kg/s]	Mass flow to the extracted actuators

G_{22}	[kg/s]	Mass flow to the non extracted actuators
G_3	[kg/s]	Mass flow water in the branch line to the rotary actuator
G_{41}	[kg/s]	Leakage flow past the plunge in the rotary actuator
h_l	[J]	Enthalpy for the gas in the gas tank
h_2	[J]	Enthalpy for the gas after the water tank
h_{fg}	[J]	Latent heat of vaporization
h_G	[J]	Stagnation enthalpy for the gas flow G1
HP_3	[m]	Plus height for the water tank
HP_4	[m]	Plus height for the rotary actuator
HP_5	[m]	Plus height for the water surface in the reactor tank
k_0	[-]	Constant coefficient in the steam dome water surface condensation model
k_1	[-]	Constant coefficient in the steam dome water surface condensation model
k_2	[-]	Constant coefficient in the steam dome water surface condensation model
L_3	[m]	Length of the main line after the water tank
L_{32}	[m]	Length of a branch line from the main line to rotary actuator (average for the group)
~~Leid~~		~~Leidenfrost~~ (see T_{leid})
M_{don}	[kg]	Weight of moving parts (including control rods) for a rotary actuator
M_l	[kg]	Mass for the gas in the gas tank
M_2	[kg]	Mass for the gas in the water tank
N_{don}	[-]	Number of rotary actuators in the group in question
N_{don1}	[-]	Number of extracted rotary actuators in the group
N_{don2}	[-]	Number of fully inserted rotary actuators in the group
Pr	[-]	Prandtl's number
p_1	[Pa]	Pressure in the gas tank
p_{12}	[Pa]	Pressure in smallest section or the venturi nozzle
p_2	[Pa]	Pressure in the water tank
p_4	[Pa]	Pressure in rotary actuator (under plunger)
p_5	[Pa]	Reactor steam dome pressure
p_{45}	[Pa]	Pressure difference across the plunger in the rotary actuator
p_{br}	[Pa]	Specific breaking pressure from the hydraulic brake
q_1	[J/s]	Heat flow from the gas tank wall to the gas in the tank
q_2	[J/s]	Heat flow from the pipe walls and water to the gas in the water tank
r	[m]	Radius
R_{spec}	[J/kg·K]	The specific gas constant for nitrogen gas
Re	[-]	Reynold's number
T_{sat}	[K]	Saturation temperature
T_{wall}	[K]	Cladding outside temperature
T_{leid}	[K]	Leidenfrost temperature
T	[K]	Temperature
T_1	[K]	Gas temperature in the gas tank
T_2	[K]	Gas temperature in the water tank
T_{10}	[K]	Initial temperature for the gas in the gas tank. The tank walls are presumed to maintain this temperature
T_{20}	[K]	Initial value for T2. Pipe and tank walls are presumed to stay at this temperature

T_G	[K]	Stagnation temperature for the gas flowing through the reactor scram valve
ΔT_{surf}	[°C]	BISON calculated subcooling in the water surface
t_{open}	[s]	Time to when the scram valve starts to open (cone leaves its seat)
t_v	[s]	Effective valve opening time for the scram valve
u_1	[J]	Internal energy for the gas in the gas tank
u_2	[J]	Internal energy in the water tank
V_1	[m^3]	Volume of the gas tank
V_2	[m^3]	Volume of the gas in the water tank including feed line
V_3	[m^3]	Volume of the water in the water tank
V_{23}	[m^3]	The total volume of the water tank
w	[m/s]	Speed of the actuators moving parts
x	[m]	Coordinate for rotary actuator position
X	[-]	Steam quality
α	[-]	Factor to account for the impact of water when accelerating the rotary actuator's moving parts
α_1	[kg/K·s^3]	Effective thermal exchange constant between the gas in the gas tank and the walls of the tank
α_2	[kg/K·s^3]	Effective heat exchange constant between the gas in the water tank and pipe and tank walls as well as water
α_{void}	[-]	Void reactivity feedback of a recirculation flow change
ε	[-]	Emissivity
λ	[J/m·s·K]	Thermal conductivity
ξ_1	[-]	Loss coefficient for the line between gas tank and water tank
ξ_3	[-]	Loss coefficient for the main line after the water tank
ξ_{32}	[-]	Loss coefficient for the branch line to a rotary actuator (average within a group)
ξ_{wind}	[-]	Loss coefficient for a wind-milling pump
ξ_{stat}	[-]	Loss coefficient for a stationary pump
κ	[-]	Isentropic exponent for nitrogen gas
ρ	[kg/m^3]	Density
ρ_1	[kg/m^3]	Density of the gas in the gas tank
ρ_2	[kg/m^3]	Density for the water in the water tank
ρ_g	[kg/m^3]	Density for gas
ρ_s	[kg/m^3]	Density of the material in the moving parts of the rotary actuator
σ	[N/m]	Water surface tension

RAI 15.00.02-04

Provide the specific programs and procedures that are in place to train the future users of the BISON code both at Westinghouse and potential licensees (e.g., STP).

Response to RAI 15.00.02-04

Westinghouse regularly provides basic training in the BISON code, both for Westinghouse employees and licensees. The basic training gives the user knowledge of how to use the BISON code both for input preparation (modeling of reactor system and input data needed) and interpretation of the output. The training gives hands-on experience to get the code running and knowledge of how to prepare output figures.

There are a number of internal Westinghouse procedures that describe the process to perform transient analysis using BISON. These procedures can be made available for an audit.

RAI 15.00.02-08

Per Section 3.1.2.3 of WCAP-17202, the VALVE factor is zero for a fully opened valve. Depending on the type of valve, a fully open valve can also have a finite form loss. Provide justification for not including the form loss for a fully open scram valve in the general formulation of the model.

Response to RAI 15.00.02-08

The loss coefficient for a fully open valve is included in ξ_3, the loss coefficient for the main line where the valve is situated, as seen in Figure 3-1. The VALVE equation in section 3.1.2.3 describes the additional pressure drop of an opening valve, which is not included in ξ_3.

<u>RAI 15.00.02-11</u>

Equation 3-11 of WCAP-17202 provides an energy balance for the gas space in the water tank. Please explain why the heat transfer from <u>the gas tank</u> wall, q_1, is used in the energy balance for the <u>water tank.</u>

<u>Response to RAI 15.00.02-11:</u>

The term "q_1" in Equation 3-11 is incorrect. The term "q_1" should be "q_2" (q_2 is defined in Equation 3-18). This correction will be made in the approved version of the topical report. The correction only affects the description provided in the topical report. The correct equation described by Equation 3-11 is programmed in the BISON code.

The existing Equation 3-11:

$$q_1 + G_1 \cdot h_G - p_2 \cdot \frac{dV_2}{dt} = \frac{d}{dt} \cdot (M_2 \cdot u_2)$$

Will be replaced in the approved version of WCAP-17202 with the correct Equation 3-11, indicated below:

$$q_2 + G_1 \cdot h_G - p_2 \cdot \frac{dV_2}{dt} = \frac{d}{dt} \cdot (M_2 \cdot u_2)$$

RAI 15.00.02-25

The BISON asynchronous pump model presented in Section 3.3.2.1 of WCAP-17202 includes a slip parameter k_s, defined as the relative difference between the stator and rotor angular speeds. Stator speed in this model is a time-dependent control input from SAFIR, while the rotor speed is described as a time-dependent output.

a. Please clarify the procedure by which the slip parameter is calculated in BISON (e.g., using old timestep values of the angular speeds to calculate slip used in obtaining the new timestep rotor speed).

b. Discuss how impedance Z_2 was derived.

Response to RAI 15.00.02-25

a. The slip parameter definition in Equation 3-41 is not correctly described in the Topical Report.

The current definition is:

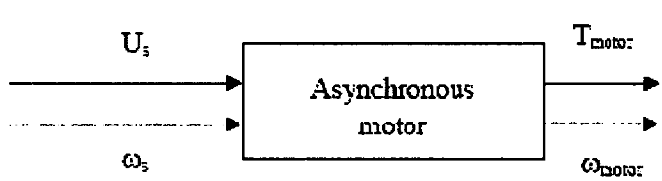
$$k_s = \frac{\omega_s - \omega_r}{\omega_r}$$

It will be updated in the approved version of the topical report to:

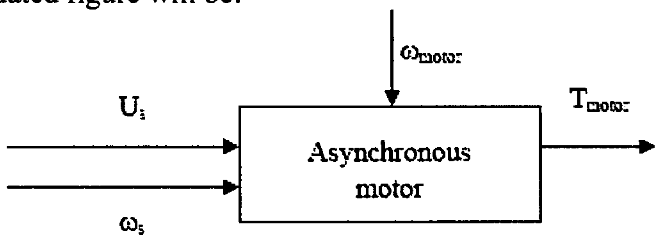
$$k_s = \frac{\omega_s - \omega_r}{\omega_s}$$

In the BISON ASYNC model, the slip parameter is calculated in every time step according to the updated definition provided above. The terms "ω_s" and "ω_r" are both boundary conditions and when combined with the slip, and the generated power over R_2 the angular momentum (T_{motor}) can be found. The ω_{motor} in Figure 3-15 is misplaced and hence the figure will be updated in the approved version of the topical.

The current figure is:



The updated figure will be:

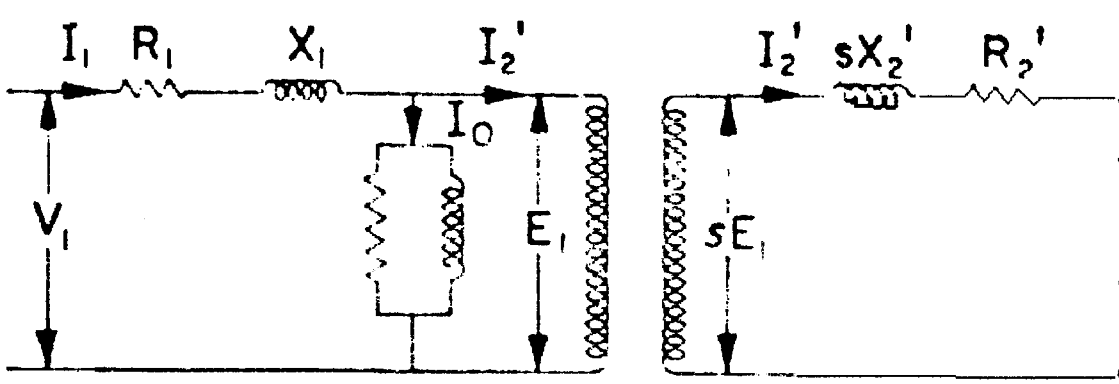


The reason for this update is that equation 3-39 is not actually solved in the asynchronous motor model.

b. The impedance Z_2 should be consistent with Figure 3-16, defined as $\frac{R_2}{s} + jX_2$ in our derivation. It will be updated in the approved version of the topical report. This is because when the machine is rotating, the relative field/rotor motion is no longer at the synchronous speed, and all rates of flux change affecting the rotor are modified in proportion to the slip factor. Consequently the voltage over the rotor becomes sE_1, the rotor circuit frequency becomes sf_1, and hence the rotor leakage reactance changes from the standstill value X_2' to sX_2' (see figure on next page). From Ohm's law we have the following relation:

$$sE_1 = I_2(sX_2 + R_2)$$

To make this correspond to the simplified equivalent scheme in Figure 3-16, the voltage is scaled to E_1.
This yields the expression for Z_2 stated above.



RAI 15.00.02-27

Section 3.4 of WCAP-17202 describes the BISON/SAFIR interface for level measurement and states that it uses the BISON nozzle-component. However, the description of a BISON nozzle-component is neither provided in WCAP-17202 nor in RPA-90-90-P-A. If a new component is being introduced into the BISON code, provide an explanation of the new component and its integration into the BISON code, using the same level of detail as other BISON components described Section 3.8 of RPA-90-90-P-A. If the BISON nozzle-component already exists, provide a reference to its description.

Response to RAI 15.00.02-27

The level measurement model presented in RPA-90-90-P-A, Section 3.9.2, has been replaced by the functionality of the SAFIR code system in conjunction with the new BISON nozzle component. The BISON nozzle component can calculate the pressure at an arbitrary axial elevation in the Reactor Pressure Vessel (RPV). The calculated pressure is determined according to Equation 3-44 in the subject LTR.

RAI 15.00.02-28

With respect to the equations in Section 3.4 of WCAP-17202

a. Does the non-modified BISON level, Z_0, represent the two-phase (mixture) level or the collapsed water level (void fraction = 0)?
b. Is the density used in these equations a single phase density or a mixture density?

Response to RAI 15.00.02-28

a) The non-modified BISON level, Z_0, represents the two-phase mixture level.
b) The density used in this equation is a mixture density, as both the steam density and the water density are taken into account.

RAI 15.00.02-07

In proprietary Equation 3-3 of WCAP-17202, the form loss for the valve appears to be given by the expression in parenthesis. Provide justification for using this expression as the form loss.

Response to RAI 15.00.02-07

The constant pressure drop from a fully open valve is included in ξ_3, the loss coefficient for the main line where the valve is situated. The VALVE term shown below is intended to describe the additional pressure drop due to an opening or closing of the valve.

$$\left[\qquad \qquad \qquad \qquad \right]^{a,c}$$

The VALVE term is based on the general formula for a local pressure loss divided by the flow squared:

$$\frac{\Delta p}{U^2} = \frac{1}{2\rho A^2}$$

The term in parenthesis is to account for the changes in pressure drop due to opening of the scram valve. This term is valid for both the condition of $A_{rel} = 1$ for the completely open valve (pressure drop determined by ξ_3 and A_3 and therefore no additional pressure loss), and $A_{rel} = 0$ for the closed valve (infinite pressure drop – no flow through the valve). The exponent on the term in the parenthesis comes from the fact that it is the square of the relative area that correctly affects the total pressure loss.

RAI 15.00.02-12

Section 3.1.2.7 of WCAP-17202 describes the water flow from the water tank to the rotary actuator using level descriptors (HP_3, HP_4, HP_5) from Figure 3-1. If the levels are calculated dynamically, provide the relevant equations. If not, justify the use of constant values.

Response to RAI 15.00.02-12

HP_3 and HP_5 are used as constant values during the transient to account for the elevation pressure drop between the water tank level and the reactor water level. The reactor water level may increase or decrease during the transient, affecting the pressure drop. However, the contribution to the overall pressure drop is insignificant as compared to the elevation difference between the nominal water tank level and the reactor water level (approximately 21 m in the ABWR). Hence, if the reactor water level increases or decreases by 0.5 m (for example in the ABWR), the contribution from the water tank level and the reactor water level elevation pressure drop would change by only a few percent. Furthermore, the elevation pressure drop to the total pressure drop from the gas tank to the control rod drive mechanism is of much smaller importance than the pressure drop in the pipes caused by frictional pressure drop and local pressure drop. [

]^{a,c} Thus, the elevation pressure drop is of much smaller order of magnitude than the pressure drop caused by friction or local losses. Therefore, using constant values for HP_3 and HP_5 is an adequate assumption.

While HP_3 and HP_5 are constant values, HP_4 is dynamic. HP_4 is used to determine the contribution from the elevation pressure drops according to Equations 3-21 and 3-22 in the LTR. During the hydraulic scram as the control rods move upward, and the distance between the control rod and the reactor water level decreases the position of the control rod actuator is dynamically calculated according to Equation 3-33. However, as noted above, the contribution from the elevation pressure drop is of minor importance in determining the control rod velocity during a hydraulic scram.

<u>RAI 15.00.02-17</u>

In proprietary Figure 3-3, the model shows good agreement for the third and fourth data points. In Figure 3-2, please explain the BISON data with regard to validation of the model corresponding to the same x-values.

<u>Response to RAI 15.00.02-17</u>

At normal rated conditions for [ ]^{a,c}, the pressure difference between the reactor tank and the gas tanks is [ ]^{a,c} (the third and fourth data points in Figure 3-3). At normal rated conditions for [ ]^{a,c} (Figure 3-2), the pressure difference between the reactor tank and the gas tanks is [ ]^{a,c}. Both plant models show a good agreement with measurements for normal rated conditions in their respective pressure ranges.

It can be seen in Figure 3-2 that the experimental insertion time tends to vary approximately [ ]^{a,c} s at each pressure. The variation of both the measured and predicted data over the range [ ]^{a,c} bar is similarly within the range of [ ]^{a,c} s. This means that the model for [ ]^{a,c} is consistent with the measured data. In addition, the Westinghouse methodology takes into account these experimental uncertainties.

<u>RAI 15.00.02-23</u>

Section 3.2 of WCAP-17202 plots the reactivity change associated with a specified perturbation in recirculation flow, but does not report the nominal flow value.

a) Please indicate what change in steady state power is equivalent to this change in flow.
b) Please comment on whether this level of perturbation is intended to establish any limits on the applicability of the method.
c) Please explain how this level of perturbation qualifies the improved Method B for use on limiting transients where the changes to reactivity and power distribution would seem to be larger than what was plotted.

<u>Response to RAI 15.00.02-23</u>

a) The table below lists the relevant nominal data and the changes in steady-state data incurred by a change of [ ][a,c] in core total mass flow rate.

Table 1 – Relevant Nominal Data for Verification Cases

Parameter	Homogeneous Core	Mixed Core	Peach Bottom 2
Thermal Power [MW]	2300.1	3926.0	TT1: 1560.9 TT2: 2030.1 TT3 2275.1
Core Recirculation Flow [kg/s]	5500.0	13050.0	TT1: 12763.8 TT2: 10445.4 TT3: 12839.4
Steam Dome Pressure [bar]	70.00	71.70	TT1: 68.35 TT2: 67.31 TT3: 68.02
Core Inlet Enthalpy [kJ/kg]	1177.13	1222.00	TT1: 1229.05 TT2: 1209.07 TT3: 1217.84

Table 2 – [
][a,c]

a,c

b) This level of perturbation (i.e. [ ][a,c]) is not intended to establish any limits on the applicability of the method. Since the cross-section representation model (polynomial coefficients) is generated in such a manner that the entire expected range of variation in state conditions during a transient is covered, the flow variation is not used for establishing any limits on the method applicability. This particular variation in flow was employed merely to compute a reactivity change for comparison between BISON and the nodal code POLCA7, to demonstrate that the two codes yield similar responses around a given reference steady-state condition. The main purpose of the BISON versus POLCA7 comparison was to verify that the improved Multiple Fuel Type cross-section model (improved Method B) actually produces a good initial steady-state axial power distribution without the need for an axial burnup or control rod density search to match the input POLCA7 power distribution. Since the original Method B requires such a search in order to obtain a reasonable axial power profile, the "improved" model can indeed be considered an improvement over the old one.

The homogeneous and mixed core evaluations can be considered verification cases. Likewise, the reactivity plots comparing BISON, and POLCA7 to measured data for Peach Bottom 2 can be considered validation cases.

c) As pointed out in b) the [ ]^{a,c} perturbation was used only for demonstrative purposes and does not constitute a principle of methodology nor was it done in an effort to validate the application of the improved Method B. The Peach Bottom 2 transient comparisons, on the other hand, serve to validate the application of the improved Method B to limiting transients. Therefore, the improved Method B is appropriate for application to both limiting and non-limiting transient analyses.

RAI 15.00.02-41

Proprietary Figure 3-22 of WCAP-17202 shows the comparisons of predicted and measured temperature increases for one fuel type and proprietary Figures 3-24 to 3-26 show similar comparisons for a second fuel type. The correlation shows relatively large scatter for the prediction of the first fuel type compared to the prediction of the second fuel type. Please describe the reason this difference and discuss any differences between the two experiments.

Response to RAI 15.00.02-41

The experimental results shown in Figure 3-22 corresponds to fuel type [ ]^{a,c} and the experimental results in Figures 3-24 through 3-26 corresponds to fuel type [ ]^{a,c}. All these dryout experiments were carried out in the [ ]^{a,c} .

The test rod bundles were composed of a fuel channel, electrically heated fuel rod simulators, tie plates and spacer grids. [ ]^{a,c}

[ ]^{a,c}

[ ]^{a,c}

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

ss

COUNTY OF BUTLER:

Before me, the undersigned authority, personally appeared J. A. Gresham, 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:

J. A. Gresham, Manager
Regulatory Compliance

Sworn to and subscribed before me
this 13th day of June 2011

Cynthia Olesky
Notary Public

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Cynthia Olesky, Notary Public
Manor Boro, Westmoreland County
My Commission Expires July 16, 2014
Member, Pennsylvania Association of Notaries

(1) I am Manager, Regulatory Compliance, 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 "Response to the NRC's Request for Additional Information for WCAP-17202, 'Supplement 4 to BISON Topical Report RPA 90-90-P-A'" (Proprietary), for submittal to the Commission, being transmitted by South Texas Project Nuclear Operating Company (STPNOC) 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-17202, and may be used only for that purpose.

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).

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