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10 CFR 50.90

March 29, 2004

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Peach Bottom Atomic Power Station, Unit 2
Facility Operating License No. DPR-44
NRC Docket No. 50-277

Subject: Supplement to the Request for License Amendment Related to Main Steam Tunnel Temperature - High, dated February 12, 2004

References: (1) Letter from M. P. Gallagher (Exelon Generation Company, LLC) to USNRC, dated February 12, 2004

(2) Letter from G. F. Wunder (U. S. Nuclear Regulatory Commission) to Mr. Christopher M. Crane (Exelon Generation Company, LLC), dated March 22, 2004

This letter is being sent to supplement the License Amendment Request (LAR) to support the Main Steam Tunnel Temperature – High allowable value revision (Reference 1) at Peach Bottom Atomic Power Station (PBAPS), Unit 2. This LAR proposed to increase the setpoint for the Main Steam Tunnel Temperature – High for those instruments within the Reactor Building.

In the Reference 2 letter, the U. S. Nuclear Regulatory Commission requested additional information. Attachment 1 to this supplemental letter provides a response to the request for additional information. Attachment 2 to this supplement letter provides Gothic Input Decks requested per this Request for Additional Information.

There is no impact to the No Significant Hazards Consideration submitted in the Reference 1 letter. There are no additional commitments contained within this letter.

A001

If you have any questions or require additional information, please contact Doug Walker at (610) 765-5726.

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

Respectfully,

Executed on 03-29-04

Michael P. Gallagher
Director, Licensing and Regulatory Affairs
Exelon Generation Company, LLC

Attachments: 1. Exelon Response to the Request for Additional Information
2. Compact Disk Containing Gothic and CONTAIN Input Decks

cc: H. J. Miller, Administrator, Region I, USNRC
C. W. Smith, USNRC Senior Resident Inspector, PBAPS
G. F. Wunder, Senior Project Manager, USNRC (by FedEx)
R. R. Janati - Commonwealth of Pennsylvania

ATTACHMENT 1

PEACH BOTTOM ATOMIC POWER STATION
UNIT 2

Docket No. 50-277

License No. DPR-44

Supplement to License Amendment Request for
"Main Steam Tunnel Temperature - High"

Response to Request for Additional Information

**Supplement to License Amendment Request for
"Main Steam Tunnel Temperature - High"**

(1) Provide a description of the GOTHIC nodal model (include the GOTHIC version number) used to model the buildings (volumes, flow paths, active heat removal systems and heat structures, and their initial conditions). Identify the model used for the break flow, the model(s) used for heat transfer to structures, and the model(s) used for flow between volumes.

RESPONSE

General Information

The GOTHIC 7.0 computer code was used to determine the spatial and time dependent temperatures within the Main Steam Tunnel (MST). Plant geometric information was used to construct the computer models of this room. Initial conditions were selected that represent lower and upper bounding conditions for the winter and summer climates, respectively. Air flow paths from adjacent plant areas, as well as HVAC flow for the room were represented to the extent they can affect the temperature response of the room of interest.

Transients modeled were (1) Loss of Normal Reactor Building Ventilation System (HVAC) with zero, one and two Standby Gas Treatment System (SGTS) Fans in service after the transient, (2) A 1% main steam leak, and (3) A 10% main steam leak. In addition, the 1% and 10% steam leak cases were run with and without normal HVAC.

Several actual plant loss of HVAC transients were modeled to validate the accuracy of the model.

Model Description

The Main Steam Tunnel was modeled as a single subdivided volume. The volume is subdivided based on the location of the piping systems as well as the general structure of the room (Refer to Figures 2 through 4). The exhaust and supply ductwork are also modeled as subdivided volumes (Refer to Figures 5 and 6). The ductwork volumes are treated as having only a single elevation. Figure 1 illustrates how each of these volumes is connected within the model.

The volume occupied by piping and HVAC supply ductwork is accounted for in the Volume Porosity (or Volume Fraction). The effect of the occupied volume is equally distributed throughout the room.

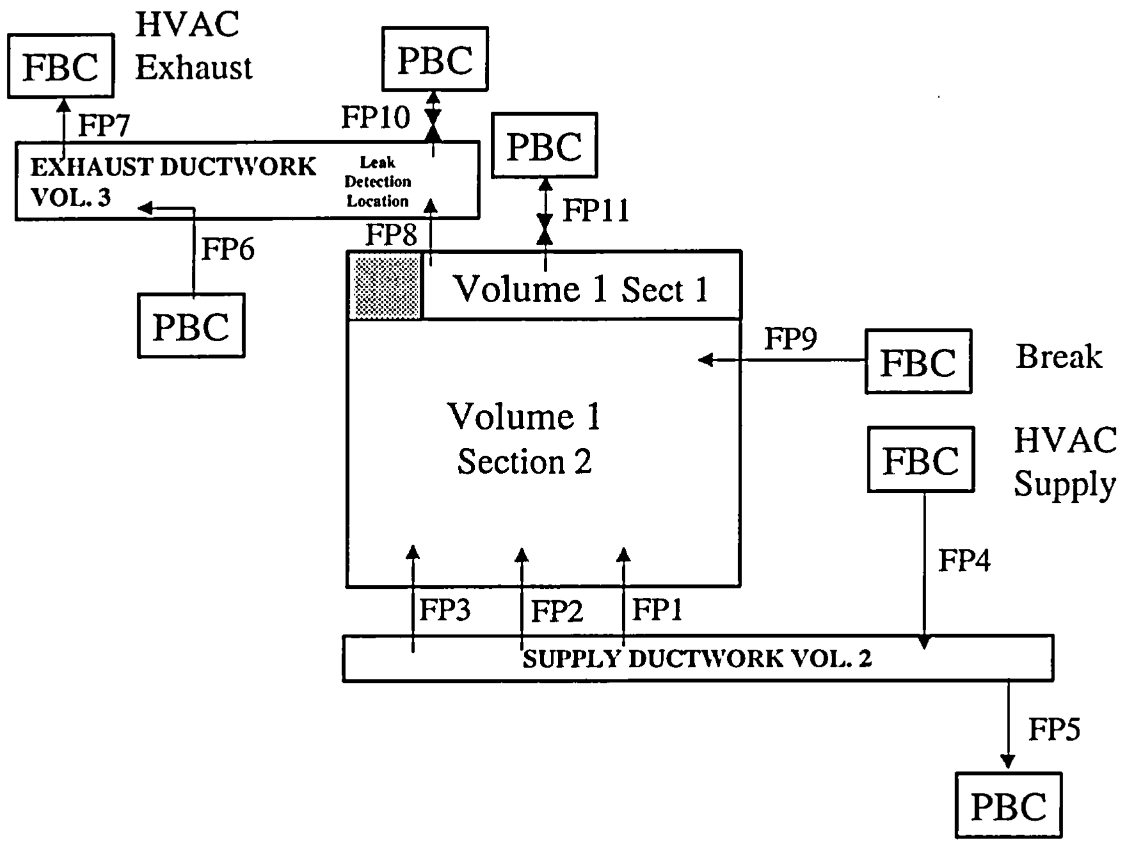

Figure 1 - HVAC Modeling Scheme

FP# - FLOW PATH DESIGNATION
FBC - FLOW BOUNDARY CONDITION
PBC - PRESSURE BOUNDARY CONDITION

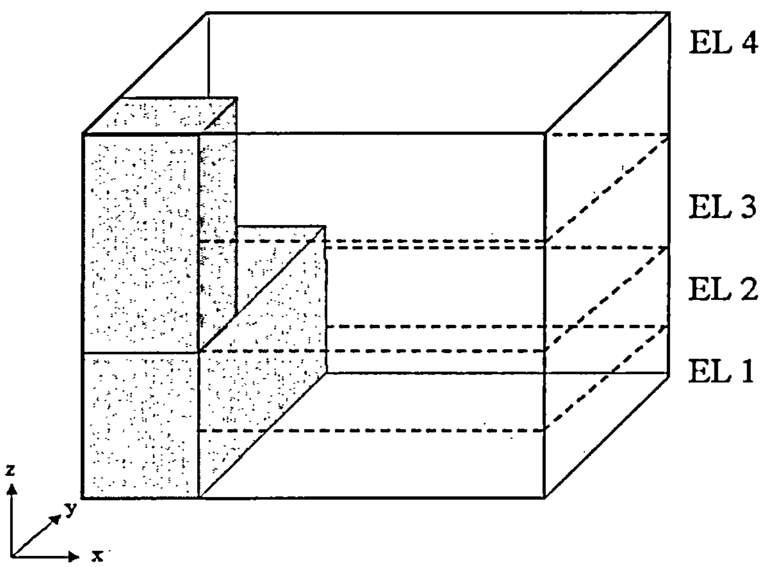

Figure 2 - Main Steam Tunnel Elevations and Blockage

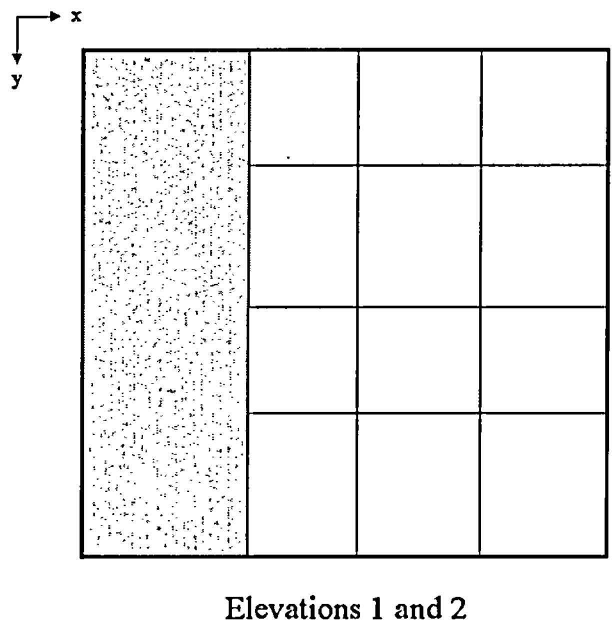

Figure 3 - Main Steam Tunnel Model Plan View, Elevations 1 and 2

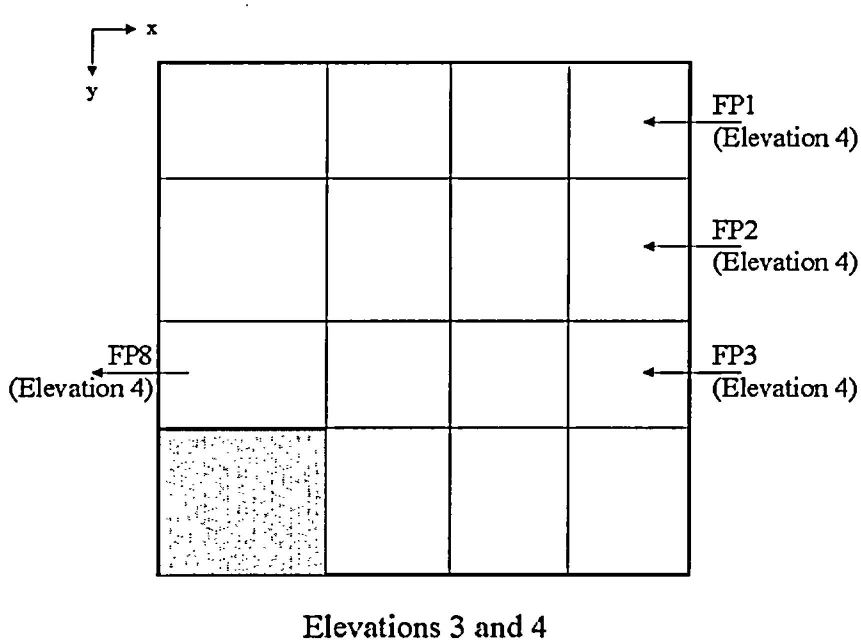

Figure 4 - Main Steam Tunnel Model Plan View, Elevations 3 and 4

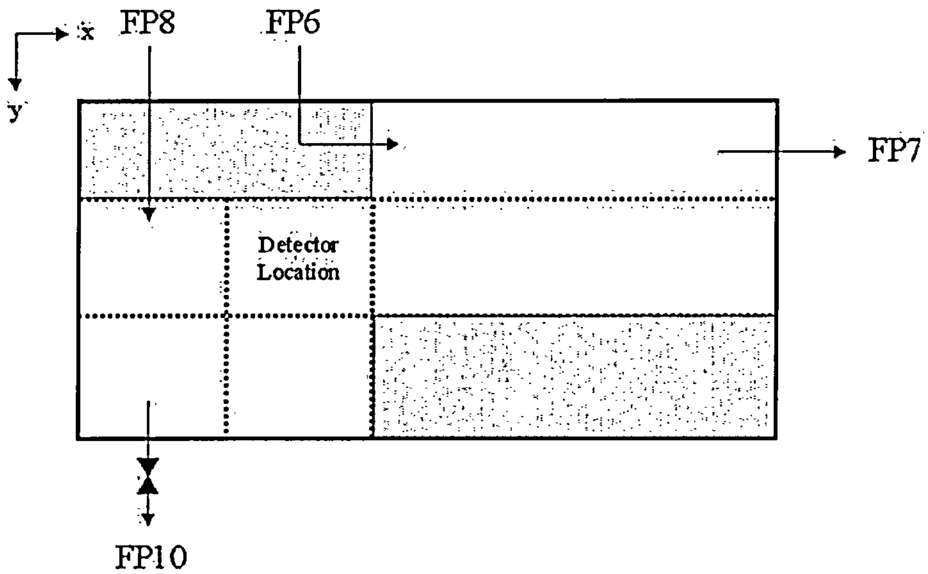

Figure 5 - Exhaust Ventilation Duct Model Plan View – Unit 2

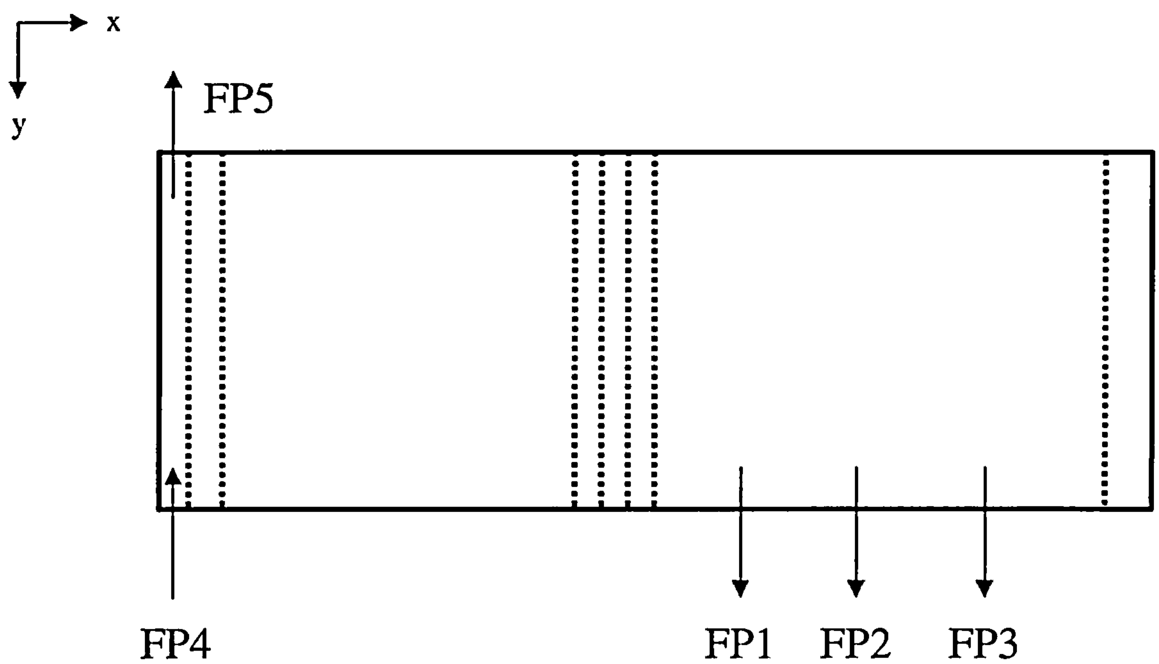

Figure 6 - Supply Ventilation Duct Model Plan View – Unit 2

Main Steam Tunnel Component Volume and Surface Area

The overall dimensions of the Main Steam Tunnel (Refer to Figures 2 through 4) are used to calculate the total volume. The volume occupied by piping and the room ventilation equipment is subtracted from the total volume of the room to determine the amount of free volume available to respond to the elevated temperature effect of a steam leak.

The surface area of the piping, walls, ceiling and floor are calculated to determine the amount of heat transfer surface available in the room. The piping surface area used to represent heat structures is distributed among the different sections of the room in the model in a manner approximating the actual physical location of the piping.

The leak detection instruments are located in the exhaust ductwork outside the room. Therefore, to properly represent the temperature detection, it is necessary to include a volume that represents the ductwork where the instruments reside. This volume is subdivided based on the physical dimensions of the ductwork as illustrated in Figure 5. The physical geometry of these detectors was modeled to account for thermal lag in their response to ambient conditions.

Flow Paths

As illustrated in Figure 1, the MST is supplied with ventilation air from volumes and flow boundary conditions representing the normal and SGTS ventilation flows. The ventilation ductwork volumes are also connected to neighboring areas within the reactor building. The passive contribution of the neighboring areas on the ventilation flow is modeled using junctions and pressure boundary conditions. The flow path junctions to these neighboring plant areas are provided to account for their influence on both the normal and SGTS ventilation, as well as escaping steam in the event of a steam leak. The inclusion of this feature allows steam to leave the room via the supply as well as exhaust ductwork. This is important to ensure the model does not over predict the steam leaving via the exhaust ductwork where the detectors are located, thereby biasing the model into an earlier detection of the leak.

As illustrated in Figure 1, the normal ventilation flow into the Main Steam Tunnel is provided by three flow paths. Three flow paths are provided to symmetrically provide flow to the room relative to the steam line locations, which is consistent with the actual plant configuration.

The approach used in modeling the ventilation flow was to assign a constant volumetric flow rate using a Flow Boundary Condition for the ventilation supply and exhaust. Under steam leak conditions, it is possible that steam enters into the supply ductwork preventing flow into the room. To accommodate this approach it is necessary to include the ductwork volume and the associated boundary conditions as illustrated in Figure 1. These features apply to both the loss of HVAC and steam leak evaluations.

The pressure relief function of the two blowout panels is modeled in the analysis of the main steam leak response. These blowout panels are associated with flow paths FP10 and FP11 shown in Figure 1. These flow paths include critical flow modeling using the tables option provided in GOTHIC. The inclusion of the blowout panels ensures that their influence on the response of the detectors is modeled. Since these panels are located upstream of the detectors they have the potential to divert steam flow from the detectors, and the inclusion of them in the model is appropriate.

Since the blowout panel does not normally allow flow, it is necessary to employ the GOTHIC valve component to mimic this feature. Specifically, the quick-opening valve is used and set to open on a pressure difference of 1 psid.

Heat Loads

Heating loads from piping are located in the MST subvolume(s) that approximate their actual room location. These heat loads are modeled as tube geometry conductors with an internal wall boundary condition temperature that equals the process fluid temperature. The thermal properties of these conductors include an internal steel wall and an outer layer of Calcium Silicate insulation.

Plant response data was used to establish a heat transfer relationship between these heat sources and the air in the Main Steam Tunnel. This resulted in a maximized heat transfer to the air for the loss of HVAC events. It is important to note that the heat transfer from the piping is not maximized for the steam leak analysis. For the steam leak analysis, the heat transfer from the piping systems were based on that predicted by the GOTHIC code direct heat transfer correlations. The piping located in the room was assumed to be fully insulated and no effort to enhance the heat transfer was provided. This resulted in a relatively small heat load in the room prior to and during the steam leak. This was done to ensure that the heat load from any piping located in the room would not bias the detection system toward early detection. The approach adds some conservatism to the analysis as actual plant experience shows a much larger heat load is provided to the room via the piping systems.

The distributed conductor capability in GOTHIC is used to model the concrete walls, with condensation and single-phase vapor heat transfer regimes on the interior surface and constant temperature boundary conditions on the outermost surface of the conductor.

Initial Conditions

The initial conditions inside the MST are influenced by the initial conditions of the adjacent rooms, the source of air drawn into the equipment rooms by the HVAC system, and the heat loads within the MST.

The initial conditions evaluated include the maximum and minimum design conditions listed in the table below.

Parameter	Design / Minimum	Maximum	Units
Total Pressure	14.687	-	Psia
Inside MST Drybulb Temperature	65	165	°F
Relative Humidity	10	90	%
Air Inlet Temperature	65	110	°F
Gas Pressure Ratio (Air)	1	-	-
Liquid Volume Fraction (Water)	0	-	%
Maximum HVAC Flow Rate	-	9,000	cfm
1% & 10% Steam Line Leak	143,865	1,438,650	#/hr.
Torus Compartment*	65	115	°F
Elev 135' Corridor & Access Area*	65	102.7	°F

Parameter	Design / Minimum	Maximum	Units
Elev 165' Access Area (Rm 403)*	65	102.7	°F
Turbine Building – Moist Sep Area*	65	165	°F
Drywell*	65	150	°F

* These temperatures are used to initialize the inner and outer surface thermal conditions for the heat conductors (walls, floor, ceiling).

Heat Transfer Options and Relationships

Walls, Floor, Ceiling and Piping

The walls, floor, ceiling, and piping within the Main Steam Tunnel volume are assigned the Direct Heat Transfer Option provided by the GOTHIC code. With this option, the Condensation/Convection Option is selected to be MAX. The Radiation Heat Transfer Option is set to ON. The Natural Convection Option is selected to VERTICAL WALL for the walls, floor and ceiling and is set to HORIZONTAL CYLINDER for piping. The Forced Convection Option is the default value (Pipe Flow). The selection of these options conservatively predicts the maximized heat transfer from the room to these thermal structures. This is conservative since it delays the response of the detectors to a steam leak condition. For the loss of HVAC events, the heat transfer from the piping to the air was further enhanced to provide a benchmarked comparison with plant data. This increased heat transfer was excluded from the steam leak assessments to ensure a conservative response of the detectors.

Temperature Detection Instrument Model

As with the other conductors, the direct condensation option is selected. Within this option the ADD Condensation/Convection option is used. The Max Condensation option is used along with a HORIZONTAL CYLINDER for the Natural Convection option. The forced convection option is established for flow over a cylinder using the $C(Re)^n$ option that is provided in GOTHIC. The detector itself is modeled as a carbon steel rod. This rod is placed in the exhaust duct.

Break Flow Modeling

The break flow into the MST is modeled for the steam leak assessments using a flow boundary condition and flow path FP9 illustrated in Figure 1. The two break sizes are assumed to be 1% and 10% of total steam flow. The break flow rates are based on the rated full power main steam flow rate documented in the UFSAR. Therefore, the 1% break flow assumes 1% rated steam flow and the 10% break flow assumes 10% rated steam flow. A Critical Flow calculation is not performed for determining break flow using the GOTHIC computer code. The flow boundary condition requires enthalpy and pressure in addition to the flow. These two parameters are set in the model to correspond with nominal process conditions. The flow area for each break size is calculated to correspond with the appropriate critical flux of the system.

2) Provide a discussion of the applicability of the GOTHIC subdivided volume model to the scenario being evaluated. Include references, based on the GOTHIC documentation, to recommend modeling approaches (for example, to connect flow paths between subdivided volume), parameters (for example, junction form loss coefficients and subdivided volume junction parameters such as the inertial length, hydraulic diameters and friction length between these volumes), and GOTHIC validation studies that relate to this scenario.

RESPONSE

The GOTHIC User Manual, Technical Manual, and Qualification Report documents were considered to ensure the model was developed consistent with the intentions of the code developers, and within the scope of the code validation studies. In addition, test facility evaluations and a number of Standard Problems are provided as part of the qualification manual.

Modeling Approach and Parameters

The GOTHIC subdivided volume modeling approach was selected to allow for the evaluation of local temperature values predicted by instrumentation, as opposed to the lumped parameter modeling, which would provide a single temperature value. This was deemed necessary to provide a valid basis for the evaluation of temperature instrumentation at different locations within the Main Steam Tunnel and the exhaust ductwork.

The principal reference used to develop modeling parameters (inputs) is the GOTHIC User Manual. The development of hydraulic diameters and inertial lengths are generally based on the guidelines developed in this document. Plant data, when available in the model development, was used to establish inputs that complemented the approach recommended in the GOTHIC User Manual. In addition, sensitivity studies were performed and evaluated to ensure a bounding set of results were available for determining the appropriate setpoint.

The model used to evaluate the response to the steam leak and loss of ventilation events uses several of the GOTHIC modeling features. Specifically used are volumes, subdivided volumes, flow paths, thermal conductors, pressure and flow boundary conditions, and valves.

The volume feature was used to simulate the Main Steam Tunnel as well as the connecting supply and exhaust ductwork. The GOTHIC User Manual is the primary reference used to develop the model inputs. These include the development of the volume, hydraulic diameter and other volume inputs. Guidance provided in the Qualification Report was used for the development of the nodalization, to ensure that significant mismatches between the node elevations were not created. Such mismatches could potentially lead to unrealistic buoyancy flow conditions. The nodal elevations were established to minimize these types of concerns. In addition, the Qualification Report highlights the importance of appropriate initial temperature conditions. The proper development of temperature conditions is also necessary to avoid the development of unrealistic buoyancy flows in the modeling. These conditions were avoided by the development of null transients, where the model was allowed to progress in time prior to the transient initiation until a steady state temperature distribution was developed. Within the volumes represented by ductwork, form loss coefficients are assigned to represent losses within the volumes. Inputs such as these are applied in a manner consistent with the GOTHIC User Manual, but are developed using other references such as ASHRAE and Crane. Use of these standard industry references is expected by the GOTHIC User Manual.

The flow path inputs were developed in a manner consistent with the guidance outlined in the User Manual. This includes the development of the flow path area, hydraulic diameter, as well as the inertial and frictional lengths. As with the volumes, the form loss coefficients are developed using references that are typically used in establishing such inputs. When appropriate, known flow distribution information was used to modify the inputs. When connecting the flow paths between the different volumes, care was taken to ensure proper orientation between the volumes. The GOTHIC code includes a directional capability when connecting between distributed volumes. Each was connected in a manner that is consistent with actual plant configuration.

Thermal Conductors, which include concrete walls, ceilings and floors, are included in both the steam leak and loss of HVAC evaluations. Within the room are a number of piping systems that transfer fluid at elevated temperatures. These were modeled as thermal conductors that act as a heat source during the loss of HVAC events. These heat sources were excluded from the steam leak scenarios. The exclusion of these heat sources from the steam leak evaluation is conservative since it delays the detector response to the steam leak by eliminating a heat source that produces an elevated initial temperature for both the room and the detector. The User Manual provides the basis for the development of all of the necessary GOTHIC modeling inputs. For the loss of HVAC events, the heat transfer options were established to match the plant data. This is consistent with the GOTHIC User Manual and the qualifications studies, which made similar types of adjustments to match plant data. For the steam leak evaluations, the DIRECT heat transfer option was selected, and sensitivities were performed to demonstrate the impact of the condensation options. The thermal conductors were initialized as part of the analysis to ensure an appropriate temperature profile prior to the initiation of the transients.

Pressure and flow boundary conditions were used to simulate adjoining building areas and ventilation flow rates. The inputs developed are consistent with known plant data and implemented consistent with the GOTHIC User Manual.

The valve component is used to simulate the pressure relief panels associated with the Main Steam Tunnel and exhaust duct. The areas and opening setpoints are developed based upon specific plant data and incorporated in a manner consistent with the GOTHIC User Manual.

Applicable GOTHIC Validation Studies

The Battelle-Frankfurt Model Containment (BFMC) tests were evaluated using the GOTHIC code. The BFMC was constructed specifically to study the thermal-hydraulic response of a containment system during accident conditions, and to use test data to assist development of related thermal-hydraulic codes. BFMC tests C-13 and C-15 are steam-water blowdown experiments that simulate the double-ended break of a main steam line in the central region of the containment. The test description and test data are reported by Battelle-Frankfurt. This integrated evaluation shows that the GOTHIC code provides a valid approach to evaluate steam leaks. Generally, very good agreement between predictions and data is obtained for both tests. Although lumped parameter modeling is used in these evaluations, they demonstrate the ability of the code to model heat transfer and flow path response to the thermal hydraulic transient under review.

Evaluations of the Marviken test data were conducted. The purpose of the GOTHIC simulations is to compare predictions for the code to measured data from the Marviken experimental facility. The results of the predictions demonstrate the ability of GOTHIC to predict a full-scale steam/water blowdown from a pressure vessel into an actual containment geometry. This validates the overall capability and adequacy of GOTHIC models to predict condensation heat transfer on walls, and mass and energy transport within and between multi-compartment geometries.

The NUPEC Model evaluation is similar in that it evaluates a containment sub-compartment response to a thermal hydraulic transient. This evaluation also demonstrates the GOTHIC code response with subdivided compartments.

Standard Problems

Several Standard Problems demonstrate the use of GOTHIC for the evaluation of Main Steam Tunnel Leak Detection at Peach Bottom. Standard Problems 3, 4 and 13 are associated with basic thermodynamics and conservation of mass and energy. These problems demonstrate the code's ability to maintain these laws with both lumped and subdivided volumes. Descriptions are provided in the GOTHIC Qualification Manual, but are summarized here for completeness.

- Standard Problem 3, Air Injected Into Air:
  This problem evaluates a single air-filled lumped volume with an airflow boundary condition. Transient results for volume, pressure, and temperature are compared with analytic results. The following is tested:
  - Temporal term of the continuity and energy equations
  - Work term of the energy equation
  - Mass source boundary condition
  - Junctions connected to a flow boundary condition

  The GOTHIC prediction accurately reflects the analytic solution represented by the data marks.

- Standard Problem 4, 2-D Air Compression, Top:
  Same as Test 3 except that the volume is subdivided into a 3x3-2d mesh. Air is injected at the top. Average results are same as for Test 3. GOTHIC prediction of spatial variation is qualitatively correct.

- Standard Problem 13, 2-D Air Compression, Bottom:
  Same as Test 4 except air is injected at the bottom. Average results are same as for Test 3. Spatial variation is qualitatively correct. This problem tests donor cell logic for a difficult case.

  GOTHIC Standard Problem 13 is defined by a single volume subdivided into a 3x3 mesh with cells in the horizontal direction and 3 cells in the vertical direction. The volume initially contains air. Air is injected vertically into the bottom cell at the center of the mesh. The injection pressure and temperature are the same as the initial pressure and temperature. As the transient progresses, the air temperature in the volume increases due to the work done on the system, while the injection temperature remains at the initial value. At the same time, the warm air stratifies so that the cool injected air is retarded from rising into the volume. This tests the effectiveness of special donor cell logic for transport terms, as well as the following:

- Work term in the energy equation
- Vertical and traverse gas convection terms

Problem 13 demonstrates that GOTHIC provides a stable solution for these conditions. This indicates that the donor cell scheme used in GOTHIC does not generate excessive artificial viscosity for this type of problem.

The GOTHIC Standard Problems 14, 26 and 27 demonstrate the ability to evaluate heat transfer problems. Since the Main Steam Tunnel evaluation includes heat transfer from and to thermal conductors, the evaluation of this modeling is important to demonstrate for validating the use of the GOTHIC code for this purpose.

- Standard Problem 14, CSNI Benchmark:
  This problem evaluates a single lumped volume model with specified steam injection rate. Heat transfer coefficient is specified for a concrete wall. Results for volume pressure, temperature and steam concentration are compared with analytic solution.

- Standard Problem 26, Conduction Solution For Walls, Tubes and Rods:
  This problem evaluates tests calculations for single material conductors with specified temperature and heat flux boundary conditions. Results are compared with analytic solutions.

- Standard Problem 27, Heat Transfer Coefficient Options:
  This test consists of four isolated volumes with internal conductors. Various combinations of specified thermal boundary conditions on the back side of conductors, coolers and mass/energy injections are used to test heat transfer coefficient options. Results are compared with analytic solutions where possible and observed for correct qualitative behavior otherwise.

<u>Conclusion</u>

The studies outlined above demonstrate that the methods and models combined to represent the GOTHIC code are appropriate for use in this evaluation. In addition to evaluating the GOTHIC documentation to ensure the modeling is appropriately applied, plant data was used to further validate the response of the models to actual plant data for loss of HVAC events.

3) Provide the results of the benchmarks against the loss of ventilation events, and the results for the LAR calculation(s).

RESPONSE

The results of the loss of HVAC benchmark evaluations are provided in Figures 7 and 8. These figures compare the detection instrumentation (TE4931A/B/C/D) with the GOTHIC model vapor temperature in the area of the detector (TV3s5) as well as the GOTHIC model detector temperature (TE TB55). The results of this comparison show that the model provides a reasonable comparison with the events.

Figures 7 and 8 demonstrate that the GOTHIC model results bound the maximum temperature response during a loss of HVAC. This ensures the selected setpoint does not result in a spurious isolation during a loss of HVAC.

The steam leak evaluations are depicted in Figure 9. This figure shows the GOTHIC modeled detector response provided for each of the cases.

The graphs on the following pages show the results of the analyses.

Figure 7: July 22, 2003 Benchmark GOTHIC Model versus Actual Plant Data
Figure 8: December 30, 2003 Benchmark GOTHIC Model versus Actual Plant Data
Figure 9: Summary of Results for GOTHIC Steam Leak Model Calculations

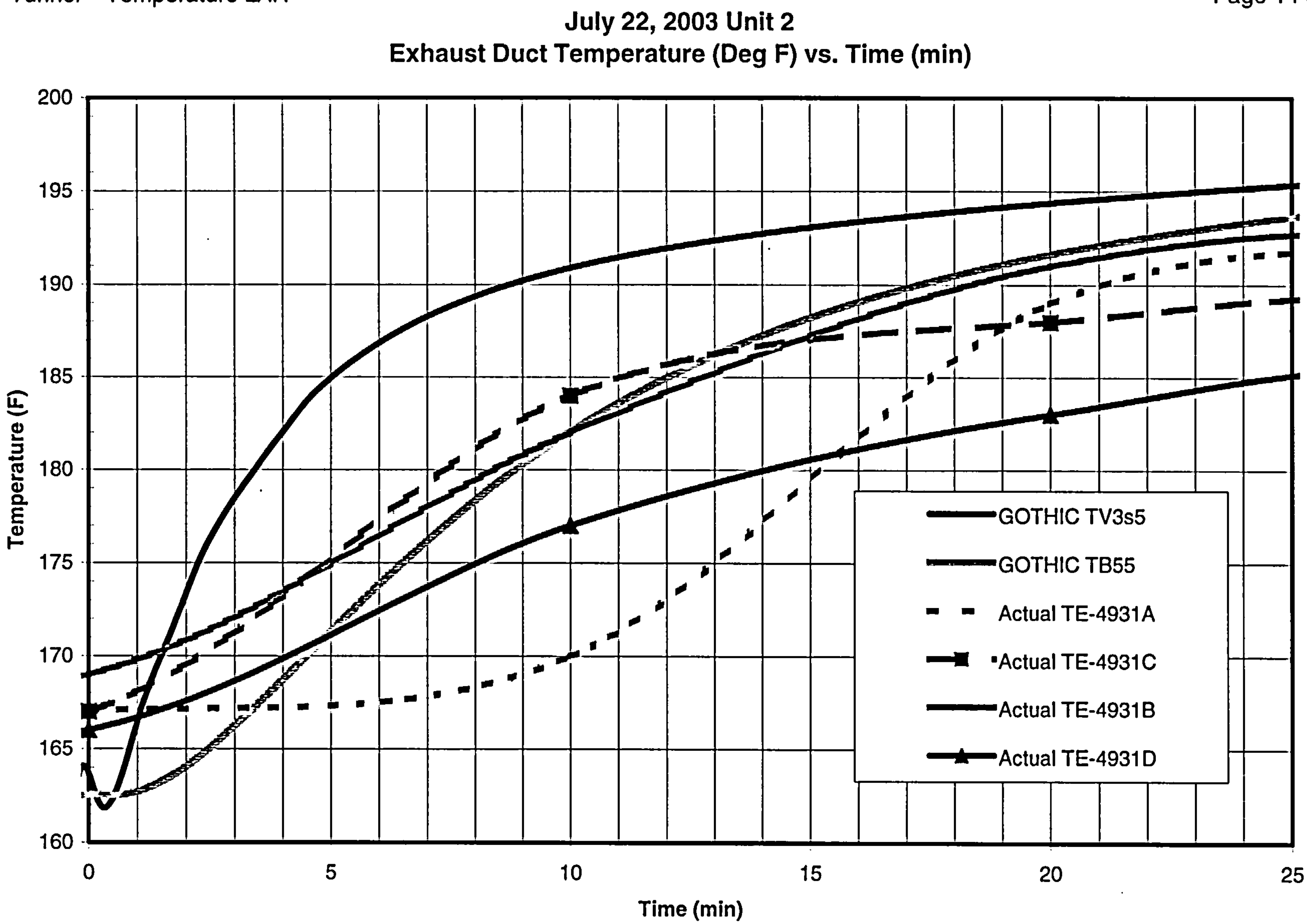
July 22, 2003 Unit 2
Exhaust Duct Temperature (Deg F) vs. Time (min)
Temperature (F)
Time (min)
200
195
190
185
180
175
170
165
160
0
5
10
15
20
25
GOTHIC TV3s5
GOTHIC TB55
Actual TE-4931A
Actual TE-4931C
Actual TE-4931B
Actual TE-4931D

FIGURE 7

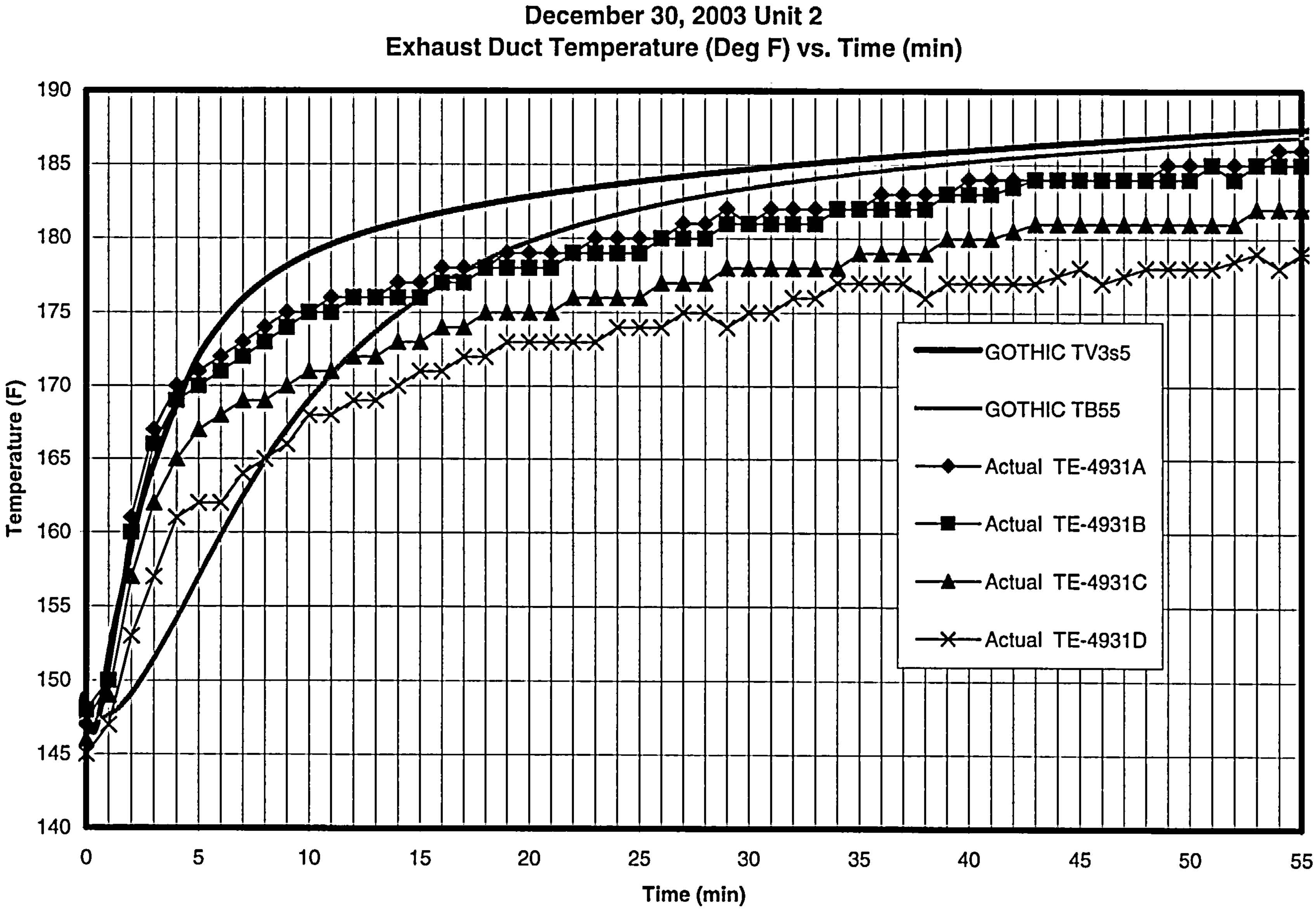
December 30, 2003 Unit 2
Exhaust Duct Temperature (Deg F) vs. Time (min)
190
185
180
175
170
165
160
155
150
145
140
Temperature (F)
0
5
10
15
20
25
30
35
40
45
50
55
Time (min)
GOTHIC TV3s5
GOTHIC TB55
Actual TE-4931A
Actual TE-4931B
Actual TE-4931C
Actual TE-4931D

FIGURE 8

Unit 2 Summary of GOTHIC Steam Leak Cases 1 - 5 Exhaust Duct TE Results

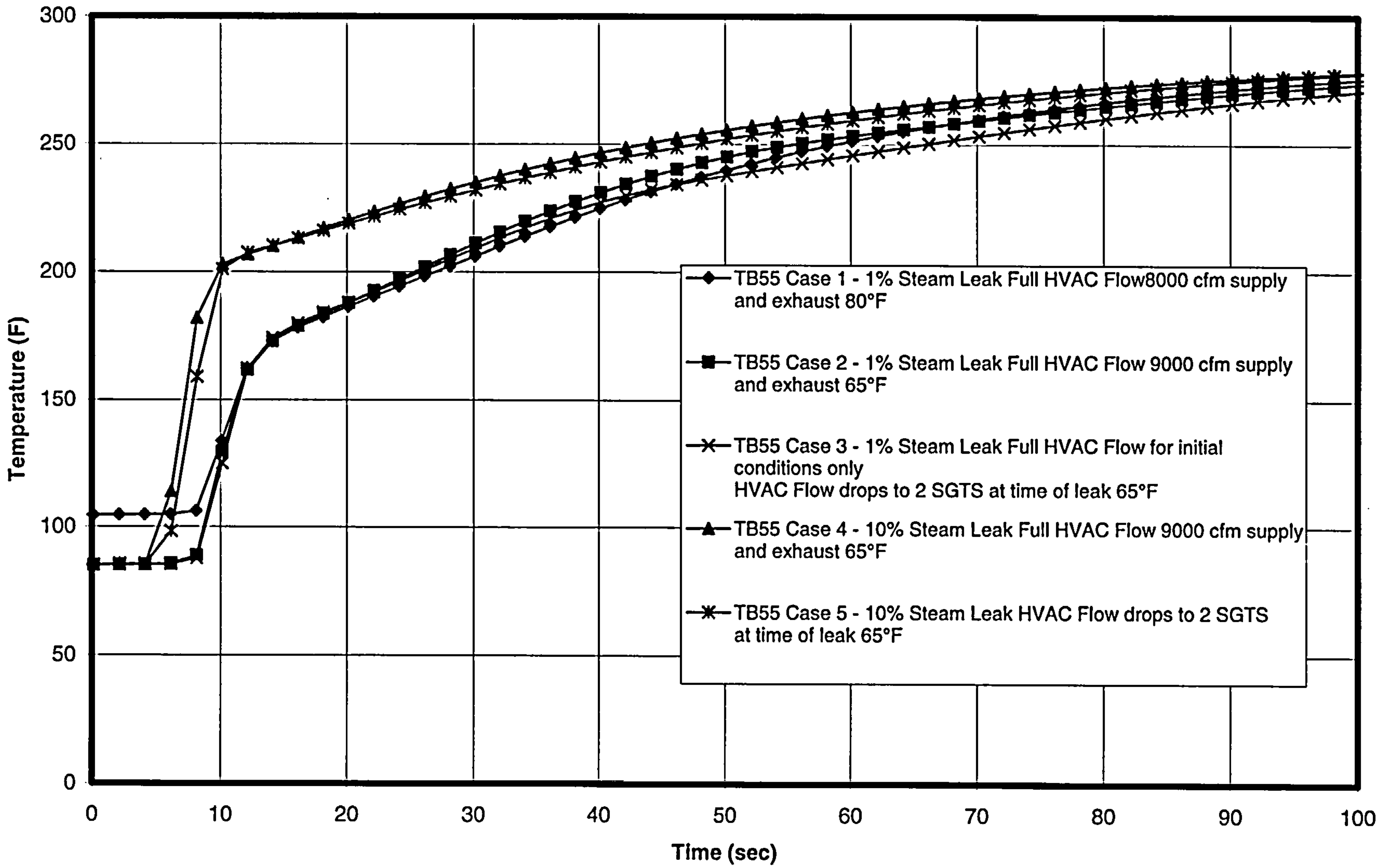

FIGURE 9

4) Identify the current licensing model (computer program or calculation). Provide a benchmark of the GOTHIC model to the current licensing model, using GOTHIC models which closely resemble the licensing model.

RESPONSE

The current licensing analysis is based upon evaluations conducted by the Architect Engineer using their proprietary version of the computer code COPATTA. No code-to-code comparison was conducted as part of this effort to recalculate the response to the steam leak event. The approach taken in this effort was to bench mark the basic model parameters against actual plant loss of HVAC events. This established the basis for loss of HVAC model response as well as the ventilation flow configurations that are used in the steam leak evaluations. As part of an independent design review, the basic GOTHIC MST model was compared with a model developed using CONTAIN 2.0 as an Alternate Calculation method. The CONTAIN 2.0 computer code was used to model and analyze the 1% steam leak and the 10% steam leak cases. This analysis validated the overall response obtained by GOTHIC for these cases.

5) Provide electronic copy(ies) of the GOTHIC input deck(s) (*.GTH) for the model(s) used for the LAR and the benchmarks. The staff may perform independent, confirmatory analyses with the CONTAIN 2.0 code. In addition, the input deck provides the full description of the nodal models and the GOTHIC models used for the LAR.

RESPONSE

The following GOTHIC Decks are provided in Attachment 2:

SLHVAC01.GTH
SLHVAC02.GTH
SLHVAC03.GTH
SLHVAC04.GTH
SLHVAC05.GTH
PBMSTmn6P2.GTH
PBMSTmn7P.GTH
PBMSTmn8P1.GTH
PBMSTmn9P1.GTH
PBMSTmn10P1.GTH

In addition, the CONTAIN 2.0 Input Decks used for the independent design review are provided for information.

The following table gives a description of each case.

GOTHIC Case Descriptions

Case	Description	HVAC Flow	GOTHIC File
1	1% Steam Leak Full HVAC Flow	8000 cfm	SLHVAC01
2	1% Steam Leak Full HVAC Flow	9000 cfm	SLHVAC02
3	1% Steam Leak 2 SGTS Fan Flow	2 SGTS exhaust only	SLHVAC03
4	10% Steam Leak Full HVAC Flow	9000 cfm	SLHVAC04
5	10% Steam Leak 2 SGTS Fan Flow	2 SGTS exhaust only	SLHVAC05
6	Benchmark - Loss of HVAC December 30, 2003	8000 cfm, then 2 SGTS Fan Flow	PBMSTmn6P2
7	Benchmark - Loss of HVAC July 22, 2003	8000 cfm, then 2 SGTS Fan Flow	PBMSTmn7P
8	Loss of HVAC 2 SGTS Fan Flow	9000 cfm, then 2 SGTS Fan Flow	PBMSTmn8P1
9	Loss of HVAC 1 SGTS Fan Flow	9000 cfm, then 1 SGTS Fan Flow	PBMSTmn9P1
10	Loss of HVAC No SGTS Flow	9000 cfm, then No SGTS Flow	PBMSTmn10P1

ATTACHMENT 2

PEACH BOTTOM ATOMIC POWER STATION
UNIT 2

Docket No. 50-277

License No. DPR-44

Supplement to License Amendment Request for
"Main Steam Tunnel Temperature - High"

Compact Disk Containing GOTHIC and CONTAIN Input Decks