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Docket Nos.: 50-424
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NL-11-1128

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

Vogtle Electric Generating Plant, Units 1 and 2
License Amendment Request to Revise
Technical Specification 3.7.9 Ultimate Heat Sink (UHS)

Ladies and Gentlemen:

In accordance with 10 CFR 50.90, "Application for amendment of license, construction permit or early site permit," Southern Nuclear Operating Company (SNC) proposes to revise the Technical Specifications (TS), Appendix A to Facility Operating License Nos. NPF-68 and NPF-81 for the Vogtle Electric Generating Plant Units 1 and 2, respectively. The proposed changes would revise TS Limiting Conditions for Operation 3.7.9 "Ultimate Heat Sink (UHS)."

The proposed changes involve changing the criteria for Nuclear Service Cooling Water (NSCW) tower three and four fan operation. These proposed changes include an increase in the wet bulb temperature limit for three fan operation and addition of a Condition that allows a seven-day Completion Time for a specific situation.

SNC has determined that the proposed changes meet the requirements of 10 CFR 50.92(c) and do not involve a significant hazards consideration.

Enclosure 1 provides a basis for the proposed changes. Enclosure 2 provides the marked-up TS pages and Bases pages for the proposed changes. Enclosure 3 provides the clean typed pages. The Bases pages will be implemented under the plant Bases Control Program contingent upon NRC approval of this amendment request. Enclosure 5 is a calculation that supports the proposed increase in wet bulb temperature. Enclosure 6 is a calculation that supports the proposed change in Completion Time.

SNC requests approval of the proposed license amendments by August 31, 2012. The proposed changes will be implemented within ninety days of issuance of the amendment.

Mr. M. J. Ajluni states he is Nuclear Licensing Director of Southern Nuclear Operating Company, is authorized to execute this oath on behalf of Southern Nuclear Operating Company and to the best of his knowledge and belief, the facts set forth in this letter are true.

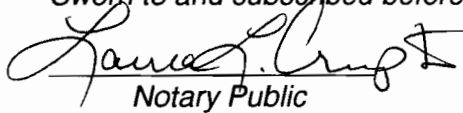
This letter contains a NRC commitment, as indicated in Enclosure 4. If you have any questions, please contact Doug McKinney at (205) 992-5982.

Respectfully submitted,



M. J. Ajluni
Nuclear Licensing Director

Sworn to and subscribed before me this 1st day of September, 2011.


Notary Public

My commission expires: 11-2-2013

MJA/JLS/<>

- Enclosures: 1: Basis for Proposed Changes
2: Marked-up Technical Specification Pages and Bases Pages
3: Clean Typed Technical Specification Pages and Bases Pages
4: Commitment Table
5: Calculation X4C1202S31 "NSCW Ultimate Heat Sink Evaluation of Various Wet-Bulb and Basin Temperatures to Required Number of Fans"
6: Calculation X4C1202S30 "NSCW Cooling Tower Fan Success Criteria Analysis"

cc: Southern Nuclear Operating Company
Mr. S. E. Kuczynski, Chairman, President & CEO
Mr. J. T. Gasser, Executive Vice President
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U. S. Nuclear Regulatory Commission
Mr. V. M. McCree, Regional Administrator
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State of Georgia
Mr. Allen Barnes, Environmental Director Protection Division

**Vogtle Electric Generating Plant, Units 1 and 2
License Amendment Request to Revise
Technical Specification 3.7.9 Ultimate Heat Sink (UHS)**

Enclosure 1

Basis for Proposed Changes

Table of Contents

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1. Summary Description

This licensing amendment request is to amend Operating License Nos. NPF-68 and NPF-81 for the Vogtle Electric Generating Plant (VEGP) Units 1 and 2, respectively.

The proposed changes involve two subjects:

- a) Changing the criteria for Nuclear Service Cooling Water (NSCW) tower three and four fan operation. This proposed change includes an increase in the wet bulb temperature limit for three fan operation. The change in the wet bulb temperature limit is the result of a new engineering calculation.
- b) Adding a Condition that allows a seven-day Completion Time for a specific situation. The Condition is applicable only if one fan/spray cell is inoperable when operating in the four fan/spray cell required region indicated by a proposed Technical Specification (TS) Figure 3.7.9-1. This change is based on a deterministic evaluation and is to allow time for any necessary repairs to the fan to be performed in a safe manner while preventing unnecessary plant shutdowns.

The amendments for Unit 1 and Unit 2 are planned to be implemented within ninety days of issuance of the amendment.

2. Detailed Description

The proposed changes involve two subjects:

- a) The subject of the first change is revision of the TS Limiting Condition for Operation (LCO) 3.7.9 "Ultimate Heat Sink (UHS)" to increase the NSCW wet bulb temperature limit from 63°F for three fan/four spray cell operation to the limits indicated in proposed TS Figure 3.7.9-1 for three fan/three spray cell operation. This proposed change is the result of a new engineering calculation.

Associated with the revised LCO, surveillance SR 3.7.9.5 is to be changed to verify wet bulb temperature is within the three fan/spray cell region of TS Figure 3.7.9-1 if one NSCW tower fan is out of service and the daily high dry bulb temperature is expected to be >48°F.

- b) The subject of the second change is to add a new Condition B that allows a seven-day Completion Time if one fan/spray cell is inoperable, only when operating in the four fan/spray cell required region of proposed TS Figure 3.7.9-1.

This proposed change is based on a deterministic evaluation and is necessary due to accessibility and preparation challenges, industrial safety concerns, and the extent of repairs that may be required to restore an NSCW fan/spray cell to operation. The current seventy-two hour completion time is sometimes not long enough to perform repairs in a safe manner and could result in an unnecessary plant shutdown.

Due to the new Condition B, the newly listed Condition C has been changed to now include the phrase "for reasons other than Condition B."

Other changes consist of alphanumeric listing changes, such as current TS Condition B being changed to Condition C, and other formatting changes required due to the changes discussed above.

The proposed changes to TS 3.7.9 will reduce or eliminate future emergency TS change requests associated with NSCW fan/spray cell repairs. Repairs to the NSCW fans have necessitated the recent generation of the following proposed emergency change and Notice of Enforcement Discretion (NOED) to TS to extend LCO completion times:

- On August 3, 2010, Unit 1 entered into TS 3.7.9 Condition B due to a gearbox problem on NSCW Train B fan #3. SNC submitted an emergency license amendment request by letter dated August 4, 2010. The emergency request was withdrawn by letter dated August 6, 2010 because the necessary repairs were completed within the original allowed completion time.
- On March 19, 2011, Unit 2 entered into TS 3.7.9 Condition B due to excessive vibration of NSCW Train B fan #3. Maintenance issues included a damaged hold-down bolt. Due to fluctuations in wet bulb temperatures, the LCO was exited but then again entered. Although a NOED was prepared for submittal, the fan was repaired, and was declared operable on March 24, 2011 without exceeding the second LCO. Duration from entering the first LCO to exiting the second LCO was approximately five days, one hour.

3. Technical Evaluation

The UHS provides a heat sink for rejecting operating heat from safety related components during a transient or accident, as well as during normal operation. This is done by utilizing the NSCW System and the Component Cooling Water (CCW) System.

The UHS consists of the NSCW System mechanical draft towers. Two 100% capacity redundant NSCW towers are provided for each unit. One tower is associated with each train of the NSCW System. Each NSCW tower consists of a basin that contains the ultimate heat sink water supply and an upper structure that contains four individual fan/spray cells where the heat loads are transferred to the atmosphere. Each spray cell contains one safety-related temperature controlled fan. Instrumentation is provided for monitoring basin level and water temperature. The tower basins each contain a safety-related transfer pump to permit the use of the combined storage capacity of the basins. The combined storage capacity of two tower basins provides greater than a thirty-day cooling water supply assuming the worst combination of meteorological conditions and accident heat loads which maximize the tower heat load, basin temperature, and evaporative losses.

The ultimate heat sink is designed so that a single failure coincident with a loss of offsite power does not result in inadequate core cooling or prevent a safe shutdown under extreme meteorological conditions. System design is based upon maximum

conditions of dry and wet bulb temperatures as they affect peak basin temperature, tower evaporation losses, and basin capacity. The ultimate heat sink is protected from freezing.

The heat rejection capacity of each tower is adequate for rejection of the heat developed during normal power operation with either one or two trains operating. Each cooling tower, with four fans operating, is designed to reject a heat load of 265 million BTUs per hour at a flow rate of 15,600 gpm and a wet bulb temperature of 82°F. The tower design is acceptable in maintaining the basin temperature within the required limits for the heat load of the three conditions that rely on four operating fans. These conditions are plant cool-down with a Loss of Offsite Power (LOSP) or a main steam line break or a Loss-of-Coolant Accident (LOCA) with a LOSP.

The NSCW structures, housing safety-related equipment, systems, and components, are Seismic Category 1 and are designed to withstand the effects due to the design basis tornado. FSAR Table 3.5.1-7 documents that the NSCW fan motors and NSCW pumps are protected against externally generated missiles. FSAR Section 3.5.3 documents that NSCW tower fan cells are not protected against tornado missiles. NRC SER (NUREG-1137) dated June 1985 describes a probabilistic study of tornado missile damage to the mechanical draft cooling tower fans, based on site specific and EPRI methodology. The study demonstrated that the frequency of tornado missiles disabling the UHS (two or more fans in the operable tower struck by missiles) is less than 10E-7 (10E-7 is the NRC criterion for the probability of causing potential radiological exposure in excess of 10 CFR 100 guidelines). FSAR Section 3.5.3 discusses the probabilistic study.

Per SNC letter dated April 18, 2005, in response to a NRC request for information from an earlier proposed TS change, SNC discussed the combination of a LOSP and a fan lost due to a tornado missile. The 2005 TS change used an engineering calculation to support the 63°F wet bulb temperature; that calculation also assumed a NSCW fan failure due to a tornado missile. The NSCW system is designed to meet the single-failure criterion by a loss of one train and the licensing basis for loss of a NSCW fan due to a tornado is for LOSP only – not for LOCA with or without LOSP or main steam line break with or without LOSP. The licensing basis for tornado missiles and LOSP for the NSCW is discussed in FSAR 9.2.5.2.4.

In order to minimize the need for unplanned NSCW maintenance, the following actions have been recently taken:

- Enhanced preventive maintenance of the gearboxes.
 - Instead of sampling NSCW gearbox oil on a thirty-six month frequency, now the oil is replaced on a thirty-six month frequency.
 - Per vendor recommendations, the input and output shafts are now inspected for excess backlash.
- A Replacement Strategy Plan was developed which replaces the NSCW fan gearboxes based on the current runtime for each gearbox. The next planned gearbox replacement is for the 2A NSCW Tower Fan #2, scheduled for fall of 2011, when it is anticipated that cooler weather and lower wet bulb temperature will require only three fan operation.

- Vibration monitoring equipment has been installed on the NSCW fan gearboxes to give an early indication of problems.
- All the NSCW fan motors have been replaced with new motors in the last six years per the fifteen-year replacement preventive maintenance schedule.

Justification for Proposed Changes

The proposed changes to the TS involve increasing the NSCW wet bulb temperature limit from 63°F for three fan/four spray cell operation to the limits indicated in proposed TS Figure 3.7.9-1 for three fan/three spray cell operation, and adding a Condition that allows a seven-day Completion Time for a specific situation.

Justification for wet bulb temperature limit change:

The wet bulb temperature limit change is supported by an engineering calculation (Enclosure 5). That calculation confirms, for wet bulb temperatures in the three fan/spray cell region of the proposed TS Figure 3.7.9-1, three fans/spray cells are adequate to maintain the basin water temperature within required limits for LOSP and LOCA, the worst case heat loads of the UHS. This calculation does not account for any heat loss to the atmosphere via natural draft cooling effect of the out-of-service fan and spray cell. The input to the computer model uses zero air flow to the out-of-service spray cell which results in no cooling of the return flow to this spray cell. This NSCW return flow heat is added directly to the basin and accounted for in the increased basin temperature.

The UHS is considered OPERABLE if it contains a sufficient volume of water at or below the maximum temperature that would allow the NSCW to operate for at least 30 days following the design basis LOCA without the loss of net positive suction head, and without exceeding the maximum design temperature of the equipment served by the NSCW. Currently, in order to meet these requirements, two NSCW tower basins are required OPERABLE with the following:

1. Basin water level must be ≥ 80.25 feet as measured from the bottom of the basin (73% of instrument span),
2. Basin water temperature must be $\leq 90^\circ\text{F}$,
3. Two OPERABLE trains of NSCW tower fans, each train consisting of four fans and four spray cells when ambient wet bulb temperature $> 63^\circ\text{F}$ or three fans and four spray cells (sprays and natural draft through the non-operating fan) when ambient wet bulb temperature $\leq 63^\circ\text{F}$, and
4. Two OPERABLE NSCW basin transfer pumps.

Requirements 1, 2, and 4 above are unaffected by the proposed TS change.

Requirement 3 will be changed such that the necessary number of operating fans/spray cells will be dependent on the wet bulb temperature and basin temperature relationship indicated in the proposed TS Figure 3.7.9-1. As indicated by the proposed TS Figure 3.7.9-1, for a basin temperature $\leq 87^\circ\text{F}$, four fan/spray

cell operation is necessary for wet bulb temperatures $> 73^{\circ}\text{F}$ and three fan/spray cell operation is allowed for wet bulb temperatures $\leq 73^{\circ}\text{F}$.

The change to SR 3.7.9.5 to utilize TS Figure 3.7.9-1 is supported by the following:

In a letter dated July 22, 2005 to the NRC in support of a TS submittal dated April 26, 2004, it was stated that the National Weather Service operates a national verification program that provides feedback to forecasters. This publicly available data provides trends in forecast accuracy. The southeastern United States forecast accuracy is typically within fifteen degrees of the actual daily high temperatures. The letter stated that a review of nineteen months of data demonstrated reasonable assurance that the daily forecast high temperature is accurate to within fifteen degrees of the actual daily high temperature.

Surveillance of the wet bulb temperature is not necessary when the daily forecast high temperature (dry bulb) will be fifteen degrees less (margin) than the TS limit indicated by Figure 3.7.9-1. The 48°F dry bulb temperature criterion for SR 3.7.9.5 ensures margin in excess of fifteen degrees exists between the forecasted daily high temperature and the TS wet bulb limit indicated by TS Figure 3.7.9-1. This limit eliminates the need for surveillance of the wet bulb temperature when daily temperatures (dry bulb) are not expected to reach 48°F . When dry bulb temperature over 48°F is reached, surveillance of the ambient temperature will ensure that the TS wet bulb limit indicated by Figure 3.7.9-1 is not exceeded. There is a margin of 0.5 degrees in the wet bulb limit to account for temperature measurement uncertainties.

As discussed in the VEGP Units 1 & 2 Final Safety Analysis Report (FSAR) Section 9.2.5 description of the Ultimate Heat Sink, the governing case for the maximum basin temperature and NSCW outlet temperature from the fan coolers is one-train continuous operation post-LOCA.

Justification for increase in the Completion Time:

The proposed change in the Completion Time to seven days is necessary for the NSCW fans due to combinations of issues that can exist and have existed, issues such as accessibility challenges, industrial safety concerns (elevated location, limited working space, and possible delays due to inclement weather such as high winds and lightning), preparation challenges (staging crane and other equipment), and the extent of repairs that can be required to restore NSCW fans to operation (for example, during a March 2011 repair a hold down bolt was replaced, requiring time for development of a repair plan, chipping concrete, welding on a threaded rod, and grout curing).

The NSCW cooling towers are located outside the Auxiliary Building and require a crane to perform significant maintenance or repair. As examples of repair, the required major steps for NSCW cooling tower fan motor and gearbox replacement are listed below:

- Fan motor replacement:
- determinate motor

- uncouple motor/remove coupling
- utilize crane to remove old motor from cooling tower
- utilize crane to position new motor on cooling tower
- terminate motor/preparation for bump test
- perform final terminations
- reinstall vibration switch
- perform motor megger test
- align - couple fan and motor
- perform coupled run for vibration and bearing temperature
- perform motor current testing
- run motor without grease plug / install grease plug
- calibrate vibration switch

Fan gearbox replacement:

- preparation for gearbox/replacement/ install pickboards
- visually inspect gearbox
- unbolt and uncouple motor-gearbox shaft, remove coupling
- remove fan cover and fan
- utilize crane to remove old gearbox from cooling tower
- utilize crane to position new gearbox on cooling tower/ install gearbox
- bolt down gearbox
- re-install fan and fan cover
- remove pickboards / preparation for fan run

Although seventy-two hours is usually long enough to perform corrective maintenance on the NSCW fans and assemblies, longer durations may be needed due to combinations of issues, in order to prevent an unnecessary shutdown. These combinations of issues may include, for example, inclement weather or discovery work. The seven-day Completion Time provides an acceptable time for evaluating and repairing problems with a fan without allowing the plant to remain in an unacceptable condition for an extended period of time, and is reasonable due to the availability of the redundant OPERABLE NSCW cooling tower.

Incorporation of the proposed changes to TS 3.7.9 will reduce or eliminate future emergency TS or NOED change requests associated with NSCW fan repair. The combination of wet bulb temperature and basin temperature that would necessitate operation in the four fan/spray cell region of proposed TS Figure 3.7.9-1 is expected to normally occur for approximately four months per year, based on typical weather patterns. Even if a fan/spray cell is not in service in the required four fan/spray cell operation region, the most likely transient, a LOSP, can be mitigated with three fans/spray cells in operation.

Current analysis demonstrates that when four fans/spray cells are required by proposed TS Figure 3.7.9-1, three running fans and associated spray cells would mitigate the most likely transient of a LOSP. Being able to mitigate a LOSP during the proposed seven-day Completion Time provides additional assurance that the NSCW system will provide the needed cooling function. Enclosure 6 is a calculation that supports the proposed change in Completion Time by the

conclusion that a Loss of Offsite Power transient can be mitigated with three fans/spray cells in operation.

When operating in the four-fan/spray cell required region of proposed TS Figure 3.7.9-1, loss of a fan/spray cell causes entry into a time limited LCO. In a time limited LCO, failure of the other train is not postulated. That is, the other train will remain available to mitigate the design basis accident.

During the seven-day Completion Time, compensatory measures will be implemented which include designation of both trains of safety related equipment as "Protected Trains." Nuclear management procedure NMP-OS-010 "Protected Train/Division and Protected Equipment Program" defines the protected train and protected equipment concept. The fundamental objective of the procedure is to enhance nuclear safety by ensuring continued availability of equipment necessary to maintain plant emergency response capability and prevent inadvertent plant trips, transients, or safety system challenges. This procedure provides guidance for management of the protected train and for posting protected equipment when redundant equipment is out of service. Additionally, maintenance of protected plant equipment is limited or prohibited. Compensatory measures include:

- No planned maintenance will be performed on NSCW fans/spray cells when in Condition B of Technical Specification 3.7.9 and imminent inclement weather is forecasted. (Commitment, as indicated in Enclosure 4.)
- Planned maintenance on other safety significant components will be avoided during NSCW fan repair.
- Ensuring plant personnel awareness of the protected train.
- Signage for key components to identify the protected train.
- Additional oversight for the switchyard, emergency diesel generators, and auxiliary feedwater pumps.
- Enhance operator rounds of the opposite train protected equipment.

4. Regulatory Evaluation

4.1 Significant Hazards Consideration

Southern Nuclear Operating Company (SNC) has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Do the proposed changes involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The proposed changes do not significantly increase the probability or consequences of an accident previously evaluated in the Final Safety Analysis Report (FSAR). The Ultimate Heat Sink is not an initiator to any

analyzed accident sequence. Operation in accordance with the proposed technical specification will continue to ensure that the Ultimate Heat Sink remains capable of performing its safety function and that all analyzed accidents will continue to be mitigated as previously analyzed. The proposed technical specification changes will not initiate any accident; therefore, the probability or consequences of an accident have not been increased.

Therefore, these changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Do the proposed changes create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The proposed changes do not create the possibility of a new or different kind of accident than any accident already evaluated in the FSAR. No new accident scenarios, failure mechanisms or limiting single failures are introduced as result of the proposed changes. The changes have no adverse effects on any safety-related system.

Therefore, all accident analyses criteria continue to be met and these changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Do the proposed changes involve a significant reduction in a margin of safety?

Response: No.

Based on the operability of the required NSCW cooling tower fans, the accident analysis assumptions continue to be met with enactment of the proposed changes. The system's design and operation are not affected by the proposed changes. The safety analysis acceptance criteria are not altered by the proposed changes nor is there a change to any Safety Analysis Limit. Finally, the proposed compensatory measures will provide further assurance that no significant reduction in safety margin will occur.

The proposed changes provide reasonable assurance that the NSCW system will continue to perform its intended safety functions.

Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

Based on the preceding evaluation, SNC has determined that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of "no significant hazards consideration" is justified.

4.2 Applicable Regulatory Requirements/Criteria

The Standard Review Plan (SRP) 9.2.5 applies to the UHS. The acceptability of the design of the UHS is based on specific general design criteria (GDC) and regulatory guides. GDC 2, 5, 44, 45, and 46 provide the criteria for an acceptable UHS design, discussed below:

- a) GDC 2 requires that structures, systems, and components important to safety be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunamis, and seiches without the loss of the capability to perform their safety functions.
- b) GDC 5, as related to shared systems and components important to safety being capable of performing required safety functions.
- c) GDC 44, as related to:
 - a. The capability to transfer heat loads from safety-related structures, systems, and components to the heat sink under both normal operating and accident conditions.
 - b. Suitable component redundancy so that safety functions can be performed assuming a single active component failure coincident with loss of offsite power.
 - c. The capability to isolate components, systems, or piping if required so that safety functions are not compromised.
- d) GDC 45, as related to the design provisions to permit in-service inspection of safety-related components and equipment.
- e) GDC 46, as related to the design provisions to permit functional testing of safety-related systems or components.

The criteria related to GDC 2, 5, and 45 are not applicable to the changes proposed by this license amendment request. The changes proposed by this license amendment request have been evaluated based on the criteria for GDC 44 and 46 and found to be acceptable.

Based on the above, it is concluded that the UHS will continue to meet the requirements of GDC 2, 5, 44, 45, and 46 and is, therefore, acceptable with the proposed changes. The UHS, with the proposed changes, will continue to meet the applicable acceptance criteria of SRP Section 9.2.5.

4.3 Conclusion

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5. Environmental Consideration

SNC has determined that the proposed amendment would change a requirement with respect to the installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, SNC has evaluated the proposed amendment and has determined that the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in the individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6. References

1. VEGP FSAR, Revision 17, 06/29/11 Update
2. VEGP Units 1 and 2 Technical Specifications, Amendments 161 and 143 respectively, Section 3.7.9
3. VEGP Units 1 and 2 Environmental Protection Plan, Amendments 97 and 75 respectively
4. Calculation X4C1202S31, Version 2.0 "NSCW Ultimate Heat Sink Evaluation of Various Wet-Bulb and Basin Temperatures to Required Number of Fans"
5. Calculation X4C1202S30, Version 1.0 "NSCW Cooling Tower Fan Success Criteria Analysis"
6. NUREG-1137 "Safety Evaluation Report related to the operation of Vogtle Electric Generating Plant, Units 1 and 2" dated June 1985

**Vogtle Electric Generating Plant, Units 1 and 2
License Amendment Request to Revise
Technical Specification 3.7.9 Ultimate Heat Sink (UHS)**

Enclosure 2

Marked-up Technical Specifications Pages and Bases Pages

Affected Pages

**3.7.9-1
3.7.9-2
3.7.9-3
B 3.7.9-2
B 3.7.9-3
B 3.7.9-4
B 3.7.9-5**

3.7 PLANT SYSTEMS

3.7.9 Ultimate Heat Sink (UHS)

LCO 3.7.9

The UHS shall be OPERABLE. ~~With ambient wet bulb temperature > 63°F, four fans and four spray cells per train shall be OPERABLE. With ambient wet bulb temperature ≤ 63°F, three fans and four spray cells per train shall be OPERABLE.~~

The fans/spray cells shall be as specified in Figure 3.7.9-1.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Nuclear Service Cooling Water (NSCW) basins with water temperature and/or water level not within limits.	A.1 Restore water temperature(s) and water level(s) to within limits.	72 hours
B. One NSCW cooling tower with one or more required fans/spray cells inoperable.	B.1 Restore fan(s) and spray cell(s) to OPERABLE status.	72 hours

C

C

for reasons other than Condition B

(continued)

B. One NSCW cooling tower with one required fan/spray cell inoperable when operating in four fan/spray cell required region of Figure 3.7.9-1.	B.1 Restore fan to OPERABLE status.	7 days
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ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>⊖. One NSCW basin transfer pump inoperable.</p> <p>D → ⊖</p>	<p>⊖.1 Restore the transfer pump to OPERABLE status.</p> <p>OR</p> <p>⊖.2.1 Implement an alternate method of basin transfer.</p> <p>AND</p> <p>⊖.2.2 Restore the transfer pump to OPERABLE status.</p> <p>D → ⊖.2.1</p> <p>D → ⊖.2.2</p>	<p>8 days</p> <p>8 days</p> <p>31 days</p>
<p>⊖. Required Action and associated Completion Time not met.</p> <p>OR</p> <p>UHS inoperable for reasons other than Conditions A, B, or C.</p> <p>E → ⊖</p>	<p>⊖.1 Be in MODE 3.</p> <p>AND</p> <p>⊖.2 Be in MODE 5.</p> <p>E → ⊖.1</p> <p>E → ⊖.2</p>	<p>6 hours</p> <p>36 hours</p>

C, or D → ⊖

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.9.1	Verify water level of NSCW basin is ≥ 80.25 ft.	In accordance with the Surveillance Frequency Control Program
SR 3.7.9.2	Verify water temperature of NSCW basin is $\leq 90^{\circ}\text{F}$.	In accordance with the Surveillance Frequency Control Program
SR 3.7.9.3	Operate each required NSCW cooling tower fan for ≥ 15 minutes.	In accordance with the Surveillance Frequency Control Program
SR 3.7.9.4	Verify NSCW basin transfer pump operation.	In accordance with the Inservice Testing Program
SR 3.7.9.5	Verify ambient wet-bulb temperature $\leq 63^{\circ}\text{F}$ when one NSCW tower fan is out-of-service and daily high temperature (dry-bulb) is forecasted to be $> 48^{\circ}\text{F}$.	In accordance with the Surveillance Frequency Control Program

/spray cell

is within the three fan/spray cell region of Figure 3.7.9-1

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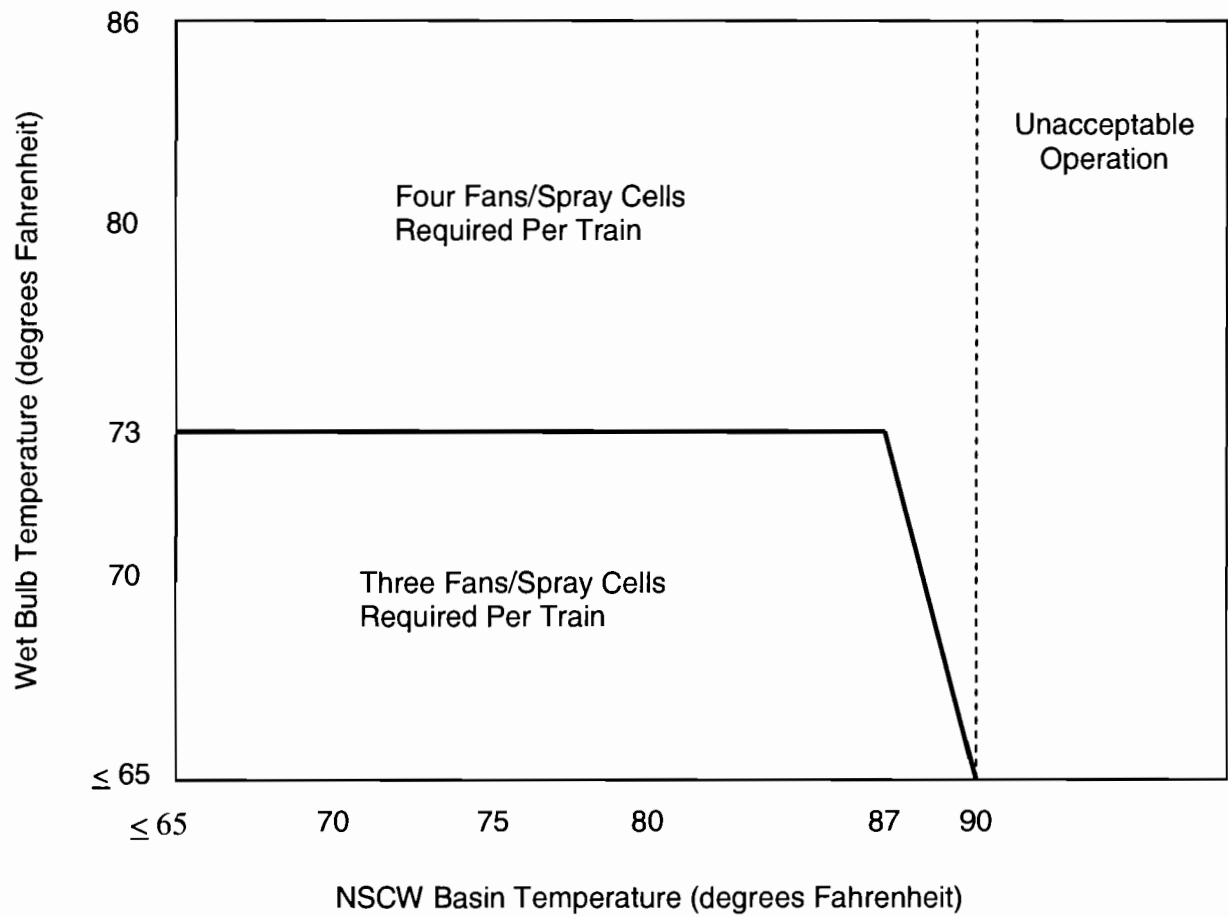


Figure 3.7.9-1
Required Number of Fans/Spray Cells

BASES

APPLICABLE SAFETY ANALYSES (continued)

The operating limits are based on conservative heat transfer analyses for the worst case LOCA. Reference 1 provides the details of the assumptions used in the analysis, which include worst expected meteorological conditions, conservative uncertainties when calculating decay heat, and worst case single active failure (e.g., single failure of a manmade structure). The UHS is designed in accordance with Regulatory Guide 1.27 (Ref. 2), which requires a 30 day supply of cooling water in the UHS.

The UHS satisfies Criterion 3 of 10 CFR 50.36 (c)(2)(ii).

LCO

The UHS is required to be OPERABLE and is considered OPERABLE if it contains a sufficient volume of water at or below the maximum temperature that would allow the NSCW to operate for at least 30 days following the design basis LOCA without the loss of net positive suction head (NPSH), and without exceeding the maximum design temperature of the equipment served by the NSCW.

In order to meet these requirements, two NSCW tower basins are required OPERABLE with the following:

1. Basin water level must be ≥ 80.25 feet as measured from the bottom of the basin (73% of instrument span),
2. Basin water temperature must be $\leq 90^{\circ}\text{F}$,
3. Two OPERABLE trains of NSCW tower fans, each train ~~consisting of four fans and four spray cells when ambient wet bulb temperature $> 63^{\circ}\text{F}$ or three fans and four spray cells (sprays and natural draft through the nonoperating fan) when ambient wet bulb temperature $\leq 63^{\circ}\text{F}$, and~~
4. Two OPERABLE NSCW basin transfer pumps.

/spray cells

with the required
number of fans/spray
cells as specified in
Figure 3.7.9-1

APPLICABILITY

In MODES 1, 2, 3, and 4, the UHS is required to support the OPERABILITY of the equipment serviced by the UHS and required to be OPERABLE in these MODES.

In MODES 5 or 6, there are no TS OPERABILITY requirements for the UHS. However, the functional requirements of the UHS are determined by the systems it supports

(continued)

BASES

APPLICABILITY (continued)

In MODES 5 or 6, there are no TS OPERABILITY requirements for the UHS. However, the functional requirements of the UHS are determined by the systems it supports

ACTIONS

A.1

B.1

If one NSCW cooling tower has one required fan/spray cell inoperable when operating in the four fan/spray cell required region of Figure 3.7.9-1, action must be taken to restore the inoperable fan/spray cell to OPERABLE status within 7 days.

The 7-day Completion Time provides an acceptable time for evaluating and repairing problems with a fan/spray cell without allowing the plant to remain in an unacceptable condition for an extended period of time, and is reasonable due to the availability of the redundant OPERABLE NSCW cooling tower, and due to the low likelihood of an event requiring all four NSCW cooling tower fans /spray cells.

If one or more NSCW basins have a water temperature and/or water level not within the limits, action must be taken to restore the water temperature and level to within the limits within 72 hours.

The 72 hour Completion Time is reasonable based on the low probability of an accident occurring during the 72 hours, the considerable cooling capacity still available in the basin(s), and the time required to reasonably complete the Required Action.

B.1 C for reasons other than Condition B

If one NSCW cooling tower has one or more required fan(s) ~~and/or~~ spray cell(s) inoperable, action must be taken to restore the inoperable fan(s) ~~and~~ spray cell(s) to OPERABLE status within 72 hours.

The 72 hour Completion Time is reasonable based on the low probability of an accident occurring during the 72 hours, the number of available fans ~~and~~ spray cells, and the time required to reasonably complete the Required Action.

/ D
G.1, G.2.1, and G.2.2

If one NSCW basin transfer pump is inoperable, action must be taken to restore the pump to OPERABLE status or implement an alternate method of transferring the water from the affected basin within 8 days. If an alternate method is utilized, action still must be taken to restore the transfer pump to OPERABLE status within 31 days.

The Completion Times are reasonable based on the low probability of an accident occurring during the time allowed to restore the pump or implement an alternate method, the availability of alternate methods, and the amount of time available to transfer the water from one basin to the other under the worst case accident assumptions.

(continued)

BASES

ACTIONS
(continued)

E
D.1 and D.2

, or D

If the Required Actions of Conditions A, B, ~~or~~ C are not completed within their associated Completion Times or if the UHS is inoperable for reasons other than described in Conditions A, B, ~~or~~ C, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 in 6 hours and in MODE 5 within 36 hours.

or D

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE
REQUIREMENTS

SR 3.7.9.1

This SR verifies that adequate long term (30 day) cooling can be maintained. The specified level also ensures that sufficient NPSH is available to operate the NSCW System pumps. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.7.9.2

This SR verifies that the NSCW System is available to cool the CCW System to at least its maximum design temperature with the maximum accident or normal design heat loads for 30 days following a Design Basis Accident. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.7.9.3

Operating each required NSCW cooling tower fan for ≥ 15 minutes ensures that all required fans are OPERABLE and that all associated controls are functioning properly.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.9.3 (continued)

It also ensures that fan or motor failure, or excessive vibration, can be detected for corrective action. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.7.9.4

The verification of NSCW basin transfer pump operation includes testing to verify the pump's developed head at the flow test point is greater than or equal to the required developed head. Flow and differential head are normal tests of centrifugal pump performance required by Section XI of the ASME Code (Ref. 3). This test confirms one point on the pumps design curve and is indicative of overall performance. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. The performance of this surveillance in accordance with the Inservice Testing Program satisfies the requirements of Ref. 3.

within the three
fan/spray cell region
specified in Figure
3.7.9-1.

SR 3.7.9.5

With one tower fan out-of-service this SR verifies that ambient wet-bulb temperature remains ~~≤ 63°F~~ so that the NSCW system remains capable of performing its design basis function. Requiring this SR when forecasted temperature is > 48°F provides assurance that the ambient wet-bulb temperature ~~of 63°F~~ will not be exceeded while the fan is out-of-service. The 24-hour frequency is sufficient since the daily peak temperature is expected to occur once in a 24-hour interval. Measurement of the ambient wet-bulb temperature should be made near the time when the daily peak temperature is expected to occur with a psychrometer in an open area, away from sources of moisture, heat or wind, and within the owner-controlled area at Plant Vogtle.

/spray cell

specified in
Figure 3.7.9-1.

REFERENCES

1. FSAR, Subsection 9.2.5.
2. Regulatory Guide 1.27.
3. ASME, Boiler and Pressure Vessel Code, Section XI.

**Vogtle Electric Generating Plant, Units 1 and 2
License Amendment Request to Revise
Technical Specification 3.7.9 Ultimate Heat Sink (UHS)**

Enclosure 3

Clean-typed Technical Specifications Pages and Bases Pages

Affected Pages

**3.7.9-1
3.7.9-2
3.7.9-3
3.7.9-4
B 3.7.9-2
B 3.7.9-3
B 3.7.9-4
B 3.7.9-5
B 3.7.9-6**

3.7 PLANT SYSTEMS

3.7.9 Ultimate Heat Sink (UHS)

LCO 3.7.9 The UHS shall be OPERABLE. The fans/spray cells shall be as specified in Figure 3.7.9-1.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Nuclear Service Cooling Water (NSCW) basins with water temperature and/or water level not within limits.	A.1 Restore water temperature(s) and water level(s) to within limits.	72 hours
B. One NSCW cooling tower with one required fan/spray cell inoperable when operating in four fan/spray cell required region of Figure 3.7.9-1.	B.1 Restore fan to OPERABLE status.	7 days
C. One NSCW cooling tower with one or more required fans/spray cells inoperable for reasons other than Condition B.	C.1 Restore fan(s)/spray cell(s) to OPERABLE status.	72 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One NSCW basin transfer pump inoperable.	D.1 Restore the transfer pump to OPERABLE status.	8 days
	<u>OR</u>	
	D.2.1 Implement an alternate method of basin transfer.	8 days
	<u>AND</u>	
	D.2.2 Restore the transfer pump to OPERABLE status.	31 days
E. Required Action and associated Completion Time not met.	E.1 Be in MODE 3.	6 hours
<u>OR</u> UHS inoperable for reasons other than Conditions A, B, C, or D.	<u>AND</u>	
	E.2 Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.9.1	Verify water level of NSCW basin is ≥ 80.25 ft.	In accordance with the Surveillance Frequency Control Program
SR 3.7.9.2	Verify water temperature of NSCW basin is $\leq 90^{\circ}\text{F}$.	In accordance with the Surveillance Frequency Control Program
SR 3.7.9.3	Operate each required NSCW cooling tower fan for ≥ 15 minutes.	In accordance with the Surveillance Frequency Control Program
SR 3.7.9.4	Verify NSCW basin transfer pump operation.	In accordance with the Inservice Testing Program
SR 3.7.9.5	Verify ambient wet-bulb temperature is within the three fan/spray cell region of Figure 3.7.9-1 when one NSCW tower fan/spray cell is out-of-service and daily high temperature (dry-bulb) is forecasted to be $> 48^{\circ}\text{F}$.	In accordance with the Surveillance Frequency Control Program

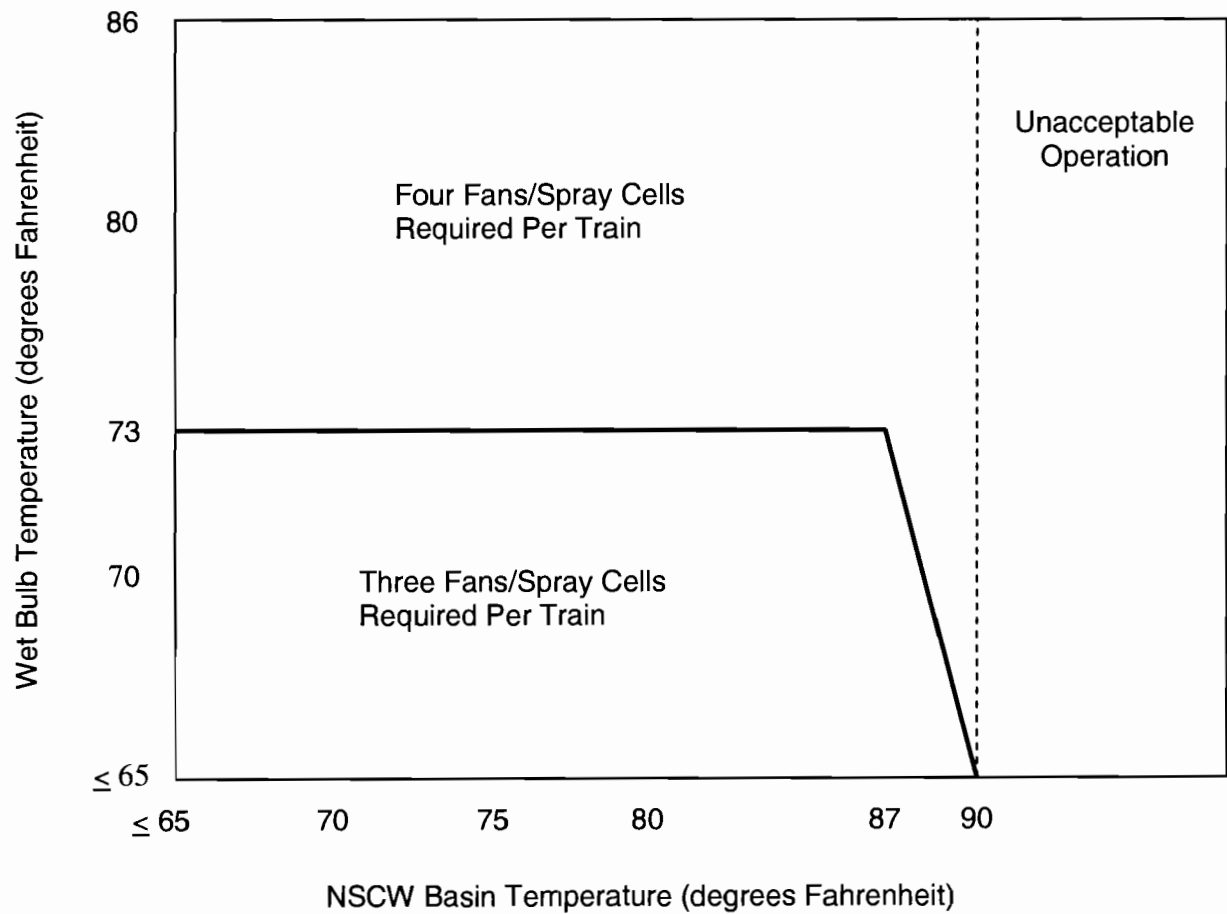


Figure 3.7.9-1
Required Number of Fans/Spray Cells

BASES

APPLICABLE SAFETY ANALYSES (continued)

The operating limits are based on conservative heat transfer analyses for the worst case LOCA. Reference 1 provides the details of the assumptions used in the analysis, which include worst expected meteorological conditions, conservative uncertainties when calculating decay heat, and worst case single active failure (e.g., single failure of a manmade structure). The UHS is designed in accordance with Regulatory Guide 1.27 (Ref. 2), which requires a 30 day supply of cooling water in the UHS.

The UHS satisfies Criterion 3 of 10 CFR 50.36 (c)(2)(ii).

LCO

The UHS is required to be OPERABLE and is considered OPERABLE if it contains a sufficient volume of water at or below the maximum temperature that would allow the NSCW to operate for at least 30 days following the design basis LOCA without the loss of net positive suction head (NPSH), and without exceeding the maximum design temperature of the equipment served by the NSCW.

In order to meet these requirements, two NSCW tower basins are required OPERABLE with the following:

1. Basin water level must be ≥ 80.25 feet as measured from the bottom of the basin (73% of instrument span),
2. Basin water temperature must be $\leq 90^{\circ}\text{F}$,
3. Two OPERABLE trains of NSCW tower fans/spray cells, each train with the required number of fans/spray cells as specified in Figure 3.7.9-1, and
4. Two OPERABLE NSCW basin transfer pumps.

APPLICABILITY

In MODES 1, 2, 3, and 4, the UHS is required to support the OPERABILITY of the equipment serviced by the UHS and required to be OPERABLE in these MODES.

In MODES 5 or 6, there are no TS OPERABILITY requirements for the UHS. However, the functional requirements of the UHS are determined by the systems it supports

(continued)

BASES

APPLICABILITY (continued)

In MODES 5 or 6, there are no TS OPERABILITY requirements for the UHS. However, the functional requirements of the UHS are determined by the systems it supports.

ACTIONS

A.1

If one or more NSCW basins have a water temperature and/or water level not within the limits, action must be taken to restore the water temperature and level to within the limits within 72 hours.

The 72 hour Completion Time is reasonable based on the low probability of an accident occurring during the 72 hours, the considerable cooling capacity still available in the basin(s), and the time required to reasonably complete the Required Action.

B.1

If one NSCW cooling tower has one required fan/spray cell inoperable when operating in the four fan/spray cell region of Figure 3.7.9-1, action must be taken to restore the inoperable fan/spray cell to OPERABLE status within 7 days.

The 7-day Completion Time provides an acceptable time for evaluating and repairing problems with a fan/spray cell without allowing the plant to remain in an unacceptable condition for an extended period of time, and is reasonable due to the availability of the redundant OPERABLE NSCW cooling tower, and due to the low likelihood of an event requiring all four NSCW cooling tower fans/spray cells.

C.1

If one NSCW cooling tower has one or more required fan(s)/spray cell(s) inoperable for reasons other than Condition B, action must be taken to restore the inoperable fan(s)/spray cell(s) to OPERABLE status within 72 hours.

The 72 hour Completion Time is reasonable based on the low probability of an accident occurring during the 72 hours, the number of available fans/spray cells, and the time required to reasonably complete the Required Action.

(continued)

BASES

ACTIONS (continued)

D.1, D.2.1, and D.2.2

If one NSCW basin transfer pump is inoperable, action must be taken to restore the pump to OPERABLE status or implement an alternate method of transferring the water from the affected basin within 8 days. If an alternate method is utilized, action still must be taken to restore the transfer pump to OPERABLE status within 31 days.

The Completion Times are reasonable based on the low probability of an accident occurring during the time allowed to restore the pump or implement an alternate method, the availability of alternate methods, and the amount of time available to transfer the water from one basin to the other under the worst case accident assumptions.

E.1 and E.2

If the Required Actions of Conditions A, B, C, or D are not completed within their associated Completion Times or if the UHS is inoperable for reasons other than described in Conditions A, B, C, or D, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 in 6 hours and in MODE 5 within 36 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.9.1

This SR verifies that adequate long term (30 day) cooling can be maintained. The specified level also ensures that sufficient NPSH is available to operate the NSCW System pumps. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.9.2

This SR verifies that the NSCW System is available to cool the CCW System to at least its maximum design temperature with the maximum accident or normal design heat loads for 30 days following a Design Basis Accident. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.7.9.3

Operating each required NSCW cooling tower fan for ≥ 15 minutes ensures that all required fans are OPERABLE and that all associated controls are functioning properly.

It also ensures that fan or motor failure, or excessive vibration, can be detected for corrective action. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.7.9.4

The verification of NSCW basin transfer pump operation includes testing to verify the pump's developed head at the flow test point is greater than or equal to the required developed head. Flow and differential head are normal tests of centrifugal pump performance required by Section XI of the ASME Code (Ref. 3). This test confirms one point on the pumps design curve and is indicative of overall performance. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. The performance of this surveillance in accordance with the Inservice Testing Program satisfies the requirements of Ref. 3.

SR 3.7.9.5

With one tower fan/spray cell out-of-service this SR verifies that ambient wet-bulb temperature remains within the three fan/spray cell region specified in Figure 3.7.9-1 so that the NSCW system remains capable of performing its design basis function. Requiring this SR when forecasted temperature is $> 48^{\circ}\text{F}$ provides assurance that the ambient wet-bulb temperature specified in Figure 3.7.9-1 will not be exceeded while the fan/spray cell is out-of-service. The 24-hour frequency is sufficient since the daily peak temperature is

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.9.5 (continued)

expected to occur once in a 24-hour interval. Measurement of the ambient wet-bulb temperature should be made, near the time when the daily peak temperature is expected to occur, with a psychrometer in an open area away from sources of moisture, heat or wind, and within the owner-controlled area at Plant Vogtle.

REFERENCES

1. FSAR, Subsection 9.2.5.
 2. Regulatory Guide 1.27.
 3. ASME, Boiler and Pressure Vessel Code, Section XI
-
-

**Vogtle Electric Generating Plant, Units 1 and 2
License Amendment Request to Revise
Technical Specification 3.7.9 Ultimate Heat Sink (UHS)**

Enclosure 4

Commitment Table

List of Regulatory Commitments

The following table identifies the regulatory commitments in this document. Any other statements in this submittal represent intended or planned actions. They are provided for information purposes and are not considered to be regulatory commitments.

REGULATORY COMMITMENT	EVENT
No planned maintenance will be performed on NSCW fans/spray cells when in Condition B of Technical Specification 3.7.9 and imminent inclement weather is forecasted.	In Condition B of Technical Specification 3.7.9 and imminent inclement weather is forecasted.

**Vogtle Electric Generating Plant, Units 1 and 2
License Amendment Request to Revise
Technical Specification 3.7.9 Ultimate Heat Sink (UHS)**

Enclosure 5

**Calculation X4C1202S31 "NSCW Ultimate Heat Sink Evaluation of Various Wet-Bulb and
Basin Temperatures to Required Number of Fans"**

Calculation Number:
X4C1202S31

Plant: Vogtle Electric Generating Plant	Unit: <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 1 & 2	Discipline: Mechanical
Title: NSCW Ultimate Heat Sink Evaluation of Various Wet-Bulb and Basin Temperatures to Required Number of Fans		Subject: System 1202
Purpose / Objective: Determine the number of NSCW cooling tower fans required to be in service based on the worst accident case heat loads of the UHS (LOCA with LOSP) at various ambient wet-bulb temperatures and various NSCW basin temperatures.		
System or Equipment Tag Numbers: N/A		

Contents

Topic	Page	Attachments (Computer Printouts, Technical Papers, Sketches, Correspondence)	# of Pages
Purpose of Calculation	1	ATTACHMENT 1	166
Summary of Conclusions	6		
Methodology	1		
Assumptions	1		
Design Inputs	2		
Body of Calculation	5		
References	6		
Total # of Pages including cover sheet & Attachments :		173	

Nuclear Quality Level

<input checked="" type="checkbox"/> Safety-Related	<input type="checkbox"/> Safety Significant	<input type="checkbox"/> Non- Safety -Significant
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Version Record

Version No.	Description	Originator Printed Name Initial / Date	Reviewer Printed Name Initial / Date	Approval 1 Printed Name Initial / Date	Approval 2 Printed Name Initial / Date
1	Issued per RER VC110595501 Version 1	D. Zheng DE 7/7/11	M. W. Zollensky MMW 7/7/11	A. T. Vieira A/V G. Brauer / A. Kozm A 7/7/11	C. A. Sellers CMS 7/7/11
2	Issue per RER VC110595501 Ver1	W. JENNINGS WJ 7/25/11	A. J. PATKO AJ 7/26/11	C. MARK SELLERS CMS 7/26/11	C. MARK SELLERS CMS 7/26/11

Notes:

Ver. 1 of this calculation corresponds to Nuclear/Mechanical Staff Calc. 550-68-Vogtle UHS, Revision 0.

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: 1 of 6
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PURPOSE OF CALCULATION

The purpose of this calculation is to determine the number of NSCW cooling tower fans required to be in service based on the worst accident case heat loads of the UHS (LOCA with LOSP) at various ambient wet-bulb temperatures and various NSCW basin temperatures, i.e., temperatures below the design basis values.

This calculation is categorized as Safety-Related and is applicable to both Units 1 and 2.

METHODOLOGY

The methodology of this UHS evaluation is similar to Calculation X4C1202V54, Version 2 [1]. Calculation [1] determines the maximum basin temperature following a design basis LOCA for a single NSCW train with all four cooling fans in-operation mode and an initial basin temperature of 90 °F. In this UHS evaluation, both the all four fans in-operation mode (denoted as “4-fan cases”) and the three fans in-operation with one fan out-of-service mode (denoted as “3-fan cases”) are investigated with the variation of initial basin temperatures. The modes with more than one fan out-of-service are determined to be impractical and are not evaluated.

Similar to [1], the Bechtel proprietary computer program UHSSIM is used in this evaluation. There is no revision number associated with UHSSIM. Documentation and validation of UHSSIM are provided in Attachments A and B of [2].

The program was run on Bechtel System FRED40351B (HP Compaq, Pentium 4, Microsoft Windows XP Professional, Service Pack 3). The user verified the successful completion of the power-on-self-test (POST) for the particular computer configuration prior to making all runs. A front-end validation was performed by re-running the UHSSIM input documented in the Att. 7 of [2] and obtained identical results to the UHSSIM output documented in the Att. 8 of [2].

ASSUMPTIONS

1. Vogtle Units 1 and 2 each has two independent NSCW trains each with its own cooling tower [1]. Each train contains a four-cell mechanical draft tower using four induced draft fans (one fan per cell). Similar to [1], single-train is conservatively assumed for this UHS evaluation.
2. For 3-fan cases, water is expected to run through the out-of-service cooling tower cell and dump into the cooling basin without dissipating heat to the outside ambient. Due to the limitation of the UHSSIM computer program, it allows only one set of heat rejection rate data and up to two tower trains. Per sensitivity runs (not documented in this

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: 2 of 6
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calculation), the heat rejection rate will be split proportionally per the water flow rate of each train. Hence, two trains are modeled for this UHS evaluation, with Train-A lumping the three (3) intact cells with normal water flow rates of 2.05E6 lbm/hr per cell and normal air flow rates of 2.07E6 lbm/hr per fan and Train-B contains the out-of-service cell with normal water flow rates of 2.05E6 lbm/hr per cell and zero air flow rates. Normal water flow rate per cell and normal air flow rate per fan are per sht. 9 of [1].

3. It is assumed that the existing design data used in [1], such as the NSCW pump flow and tower fan performance data, is applicable to this UHS evaluation. Similar to Table I-1 of [1], this evaluation applies the worst case accident heat load for UHS, LOCA with loss-of-offsite-power (LOSP).
4. The ambient dry bulb temperature is assumed to be identical to the wet bulb temperature. Wet bulb temperature is the lowest temperature that can be obtained by evaporating water into the air at a constant pressure. It is always lower than the dry bulb temperature, but will be identical with 100% relative humidity. Assuming dry bulb temperature identical to the wet bulb temperature conservatively maximizes the basin return temperature.
5. The ambient pressure is assumed at 14.7 psia. The variation of ambient pressure is expected to be small and the impact of ambient pressure changes is negligible.
6. Similar to UHSSIM case in [1], the water in the basin is assumed to be pure water.

DESIGN INPUTS

The NSCW supply temperature required for operation of the Diesel Generators and ECCS pumps has a design basis of 95 °F. The maximum wet bulb temperature (and dry bulb temperature) necessary to ensure the UHS temperature stays below 95 °F is determined iteratively by UHSSIM, with the as-built cooling tower performance characteristic, number of out-of-service fans and heat loads as design inputs.

The UHSSIM input parameters are:

- 1st Card – Design Data: per tower design parameters on sht. I-5 of [1]

design wet bulb temperature =	82 °F
design dry bulb temperature =	98 °F
design hot water temperature =	129 °F
design pressure =	14.696 psia
design solids content =	0 ppt
units flag =	0

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: 3 of 6
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- 2nd Card – Initial Conditions: per sht. I-5 of [1] and Assumption 6
 initial basin mass = 29,843,200 lbm
 initial basin temperature = Varied between 65 °F and 90 °F *
 * Initial basin temperature is 90/85/80/75/70/65 °F for 4-fan cases, respectively,
 and 90/89/88/87/85/80/75/70/65 °F for 3-fan cases, respectively.
 initial solids content = 0 ppt
 number of towers = 1 or 2 (1 for 4-fan cases, 2 for 3-fan cases)
 start time = 0.0 hr
- 3rd Card – Printout Control: Similar to sht. I-5 of [1], results are printed every 0.1 hour for 10 hours then every hour up to 10 days
 # Time Period Data -- every 0.1 hour for 10 hr then every hour up to 10 days
 # step size, number of steps
 0.1,100
 1,230
- 4th Card – Tower Operation Data: Time dependent lumped tower water flow rate and fan air flow rate in lbm/hr are listed below per different alignments of tower fan operation conditions. The cooling tower characteristics KaV/L of 1.07 is per sht. I-5 of [1] and applied to both trains. For 4-fan cases, the tower operation data is the same as the corresponding data in sht. I-5 of [1]. For 3-fan cases, per Assumption 2, Train-A lumped the three intact cells and Train-B modeled the out-of-service cell.

4-Fan Cases:

```
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,8.2e6,8.28e6,1.07
240.0,8.2e6,8.28e6,1.07
*
```

3-Fan Cases:

```
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,6.15e6,6.21e6,1.07
240.0,6.15e6,6.21e6,1.07
*
# Train B
Trn B
0.0,2.05e6,0.0,1.07
240.0,2.05e6,0.0,1.07
*
```


Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: 4 of 6
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- 5th Card – Heat Load

The total tower heat rejection rates for the design basis LOCA with LOSP are per Table I-1 of [1] and inputted as time in hour and heat rejection rate in Btu/hr.

```

*
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
    0 s    3.2565E+08
    50 s    3.2565E+08
   101 s    3.2565E+08
   116 s    3.1609E+08
   120 s    3.1487E+08
   150 s    3.1640E+08
   300 s    3.1640E+08
   900 s    3.1640E+08
  1800 s    3.0196E+08
  2704 s    2.8660E+08
  2706 s    4.4627E+08
  3600 s    4.3946E+08
    2 h    2.2984E+08
    4 h    1.4731E+08
    6 h    1.4644E+08
    9 h    1.4354E+08
   12 h    1.4254E+08
   18 h    1.5095E+08
   24 h    1.4834E+08
   36 h    1.2219E+08
    2 d    1.1371E+08
    3 d    1.0513E+08
    4 d    9.6311E+07
    5 d    9.1747E+07
    6 d    8.5844E+07
    7 d    8.3698E+07
    8 d    8.4190E+07
    9 d    7.9649E+07
   10 d    8.0549E+07
*

```

- 6th Card – Meteorological Data:

Meteorological conditions (wet bulb temperature in °F, dry bulb temperature in °F, and ambient pressure in psia) are maintained constant. These values, as shown in Table V-1, are determined iteratively to ensure the UHS basin temperature stays below the basin design temperature of 95 °F.

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: 5 of 6
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BODY OF CALCULATION

Technical Specification Section 3.7.9, Ultimate Heat Sink [3], provides the Limiting Condition for Operation (LCO) criteria for the UHS operability:

- With an ambient wet-bulb temperature $> 63^{\circ}\text{F}$, four fans and four spray cells per train shall be operable.
- With ambient wet-bulb temperature of $\leq 63^{\circ}\text{F}$, three fans and four spray cells per train shall be operable.

This LCO criteria are based on the NSCW basin temperature of 90°F and the design basis LOCA with LOSP heat loads whereby the basin temperature must not exceed 95°F . However, the actual NSCW basin temperature is normally well below 90°F . This lower basin temperature increases the NSCW heat sink capacity allowing for higher ambient wet-bulb temperatures to meet the worst case heat load demand on the system based on the number of fans in service. This UHS evaluation determines if the normally low operating temperature of the basin relative to the design basis temperature results in the potential to redefine the criteria at which an LCO of the UHS is declared due to the out-of-service of cooling fans. Table V-1 summarizes the maximum allowable wet-bulb temperatures (that ensure the basin temperature not to exceed 95°F) corresponding to different initial basin temperatures (IBT) for both 4-fan cases and 3-fan cases.

Table V-1

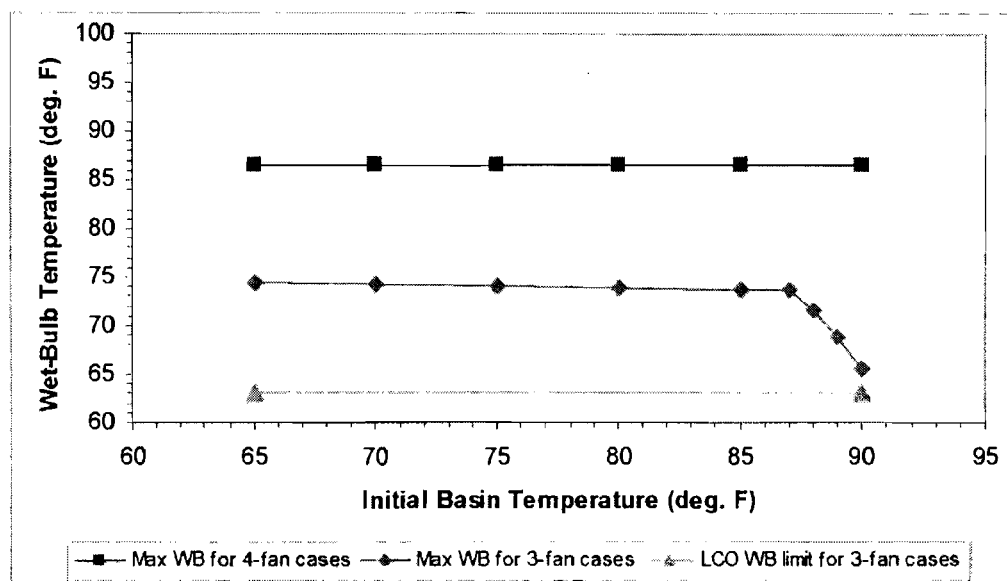
No. of Fan In-Operation	Initial Basin Temperature ($^{\circ}\text{F}$)	Maximum Allowable Wet-Bulb ($^{\circ}\text{F}$)
4-Fan Cases	90	86.5
	85	86.5
	80	86.5
	75	86.6
	70	86.6
	65	86.6
3-Fan Cases	90	65.5
	89	68.7
	88	71.5
	87	73.6
	85	73.6
	80	73.9
	75	74
	70	74.2
	65	74.4

Figure V-1 plots the change of the maximum allowable wet-bulb temperatures corresponding to the variation of initial basin temperatures between 65 to 90°F . The number of fans required for UHS operability can be graphically determined based on the actual ambient wet-bulb and basin temperatures. The current LCO criteria of 63°F is also plotted for comparison purposes.

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Figure V1



UHSSIM input and output files for this calculation are listed in Attachment 1. Since UHSSIM does not report tower train results with zero (0) air flow, the fan out-of-service cell (Train B) results for the 3-fan cases (cases 7 thru 15) do not show up in Attachment 1. However, per justifications provided in Assumption 2, a portion of the hot water will run through the fan out-of-service cell and directly heat up the basin.

REFERENCES

- [1] X4C1202V54, Ver. 2, "Maximum Ultimate Heat Sink Temperature (post LOCA)".
- [2] X4C1202S26, Ver. 5, "Ultimate Heat Sink Analysis".
- [3] Vogtle Units 1 and 2 Technical Specification 3.7.9, "Ultimate Heat Sink (UHS)", Amendment No. 160 (Unit 1) and Amendment No. 142 (Unit 2).

SUMMARY OF CONCLUSIONS

Per results in Figure V-1, with initial basin temperature lower than 87 °F and ambient wet-bulb temperature lower than 73 °F, the UHS is operable with three fans in operation per train and the out-of-service cooling tower cell returning NSCW hot water directly to the basin without dissipating heat to the outside ambient.

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ATTACHMENT 1

UHSSIM Input/Output Listing

Attachment 1 Prepared by: D. Zheng Date: 6/30/2011
Attachment 1 Checked by: M. W. Zelinsky Date: 6/30/2011

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1. UHSSIM input/output for Fan4_90F, 4-Fan Case with IBT of 90 °F

Fan4_90F.inp

```

Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=90F
# design wet-bulb temperature [F], design dry-bulb temperature [F],
# design hot-water temperature [F], design pressure [psia], design solids [ppt]
# 0 => F, psia, btu/hr, lbm/hr units
82, 98, 129.0, 14.696, 0.0, 0
# initial basin mass [lbm], initial basin temperature [F], initial solids [ppt],
# number of towers, starting time of simulation [hr]
29843200, 90, 0, 1, 0.
# Time Period Data -- every 0.1 hour for 10 hr then every hour up to 10 days
# step size, number of steps
0.1,100
1,230
*
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,8.2e6,8.28e6,1.07
240.0,8.2e6,8.28e6,1.07
*
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
0 s 3.2565E+08
50 s 3.2565E+08
101 s 3.2565E+08
116 s 3.1609E+08
120 s 3.1487E+08
150 s 3.1640E+08
300 s 3.1640E+08
900 s 3.1640E+08
1800 s 3.0196E+08
2704 s 2.8660E+08
2706 s 4.4627E+08
3600 s 4.3946E+08
2 h 2.2984E+08
4 h 1.4731E+08
6 h 1.4644E+08
9 h 1.4354E+08
12 h 1.4254E+08
18 h 1.5095E+08
24 h 1.4834E+08
36 h 1.2219E+08
2 d 1.1371E+08
3 d 1.0513E+08
4 d 9.6311E+07
5 d 9.1747E+07
6 d 8.5844E+07
7 d 8.3698E+07
8 d 8.4190E+07
9 d 7.9649E+07
10 d 8.0549E+07
*
# Ambient Data Supplied by Bechtel Power Corp.
# TIME WB DB P
# (hr) (F) (F) (psia)
0, 86.5, 86.5, 14.7
240, 86.5, 86.5, 14.7

```

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Fan4_90F.out

Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 4-fan mode, IBT=90F

Initial Basin Mass 2.984E+07 lbm
Initial Basin Temperature 90.0 F
Initial Basin Solids .0 ppt

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
.0	2.984E+07	90.0	.0	86.5	86.5	3.257E+08	Trn A	8.200E+06	8.280E+06	1.07
.1	2.982E+07	90.2	.0	86.5	86.5	3.164E+08	Trn A	8.200E+06	8.280E+06	1.07
.2	2.980E+07	90.4	.0	86.5	86.5	3.164E+08	Trn A	8.200E+06	8.280E+06	1.07
.3	2.978E+07	90.6	.0	86.5	86.5	3.135E+08	Trn A	8.200E+06	8.280E+06	1.07
.4	2.976E+07	90.8	.0	86.5	86.5	3.077E+08	Trn A	8.200E+06	8.280E+06	1.07
.5	2.973E+07	91.0	.0	86.5	86.5	3.020E+08	Trn A	8.200E+06	8.280E+06	1.07
.6	2.971E+07	91.2	.0	86.5	86.5	2.958E+08	Trn A	8.200E+06	8.280E+06	1.07
.7	2.969E+07	91.4	.0	86.5	86.5	2.897E+08	Trn A	8.200E+06	8.280E+06	1.07
.8	2.967E+07	91.5	.0	86.5	86.5	4.449E+08	Trn A	8.200E+06	8.280E+06	1.07
.9	2.964E+07	91.8	.0	86.5	86.5	4.422E+08	Trn A	8.200E+06	8.280E+06	1.07
1.0	2.960E+07	92.0	.0	86.5	86.5	4.395E+08	Trn A	8.200E+06	8.280E+06	1.07
1.1	2.957E+07	92.2	.0	86.5	86.5	4.185E+08	Trn A	8.200E+06	8.280E+06	1.07
1.2	2.954E+07	92.4	.0	86.5	86.5	3.975E+08	Trn A	8.200E+06	8.280E+06	1.07
1.3	2.951E+07	92.6	.0	86.5	86.5	3.766E+08	Trn A	8.200E+06	8.280E+06	1.07
1.4	2.949E+07	92.7	.0	86.5	86.5	3.556E+08	Trn A	8.200E+06	8.280E+06	1.07
1.5	2.946E+07	92.9	.0	86.5	86.5	3.346E+08	Trn A	8.200E+06	8.280E+06	1.07
1.6	2.944E+07	93.1	.0	86.5	86.5	3.137E+08	Trn A	8.200E+06	8.280E+06	1.07
1.7	2.941E+07	93.2	.0	86.5	86.5	2.927E+08	Trn A	8.200E+06	8.280E+06	1.07
1.8	2.939E+07	93.3	.0	86.5	86.5	2.718E+08	Trn A	8.200E+06	8.280E+06	1.07
1.9	2.937E+07	93.4	.0	86.5	86.5	2.508E+08	Trn A	8.200E+06	8.280E+06	1.07
2.0	2.935E+07	93.5	.0	86.5	86.5	2.298E+08	Trn A	8.200E+06	8.280E+06	1.07
2.1	2.934E+07	93.6	.0	86.5	86.5	2.257E+08	Trn A	8.200E+06	8.280E+06	1.07
2.2	2.932E+07	93.7	.0	86.5	86.5	2.216E+08	Trn A	8.200E+06	8.280E+06	1.07
2.3	2.930E+07	93.8	.0	86.5	86.5	2.175E+08	Trn A	8.200E+06	8.280E+06	1.07
2.4	2.929E+07	93.9	.0	86.5	86.5	2.133E+08	Trn A	8.200E+06	8.280E+06	1.07
2.5	2.927E+07	93.9	.0	86.5	86.5	2.092E+08	Trn A	8.200E+06	8.280E+06	1.07
2.6	2.925E+07	94.0	.0	86.5	86.5	2.051E+08	Trn A	8.200E+06	8.280E+06	1.07
2.7	2.924E+07	94.0	.0	86.5	86.5	2.010E+08	Trn A	8.200E+06	8.280E+06	1.07
2.8	2.922E+07	94.1	.0	86.5	86.5	1.968E+08	Trn A	8.200E+06	8.280E+06	1.07
2.9	2.921E+07	94.2	.0	86.5	86.5	1.927E+08	Trn A	8.200E+06	8.280E+06	1.07
3.0	2.919E+07	94.2	.0	86.5	86.5	1.886E+08	Trn A	8.200E+06	8.280E+06	1.07

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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=90F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
3.1	2.918E+07	94.2	.0	86.5	86.5	1.844E+08	Trn A	8.200E+06	8.280E+06	1.07
3.2	2.916E+07	94.3	.0	86.5	86.5	1.803E+08	Trn A	8.200E+06	8.280E+06	1.07
3.3	2.915E+07	94.3	.0	86.5	86.5	1.762E+08	Trn A	8.200E+06	8.280E+06	1.07
3.4	2.914E+07	94.4	.0	86.5	86.5	1.721E+08	Trn A	8.200E+06	8.280E+06	1.07
3.5	2.912E+07	94.4	.0	86.5	86.5	1.679E+08	Trn A	8.200E+06	8.280E+06	1.07
3.6	2.911E+07	94.4	.0	86.5	86.5	1.638E+08	Trn A	8.200E+06	8.280E+06	1.07
3.7	2.910E+07	94.4	.0	86.5	86.5	1.597E+08	Trn A	8.200E+06	8.280E+06	1.07
3.8	2.908E+07	94.4	.0	86.5	86.5	1.556E+08	Trn A	8.200E+06	8.280E+06	1.07
3.9	2.907E+07	94.5	.0	86.5	86.5	1.514E+08	Trn A	8.200E+06	8.280E+06	1.07
4.0	2.906E+07	94.5	.0	86.5	86.5	1.473E+08	Trn A	8.200E+06	8.280E+06	1.07
4.1	2.905E+07	94.5	.0	86.5	86.5	1.473E+08	Trn A	8.200E+06	8.280E+06	1.07
4.2	2.903E+07	94.5	.0	86.5	86.5	1.472E+08	Trn A	8.200E+06	8.280E+06	1.07
4.3	2.902E+07	94.5	.0	86.5	86.5	1.472E+08	Trn A	8.200E+06	8.280E+06	1.07
4.4	2.901E+07	94.5	.0	86.5	86.5	1.471E+08	Trn A	8.200E+06	8.280E+06	1.07
4.5	2.900E+07	94.5	.0	86.5	86.5	1.471E+08	Trn A	8.200E+06	8.280E+06	1.07
4.6	2.899E+07	94.5	.0	86.5	86.5	1.470E+08	Trn A	8.200E+06	8.280E+06	1.07
4.7	2.898E+07	94.5	.0	86.5	86.5	1.470E+08	Trn A	8.200E+06	8.280E+06	1.07
4.8	2.896E+07	94.5	.0	86.5	86.5	1.470E+08	Trn A	8.200E+06	8.280E+06	1.07
4.9	2.895E+07	94.5	.0	86.5	86.5	1.469E+08	Trn A	8.200E+06	8.280E+06	1.07
5.0	2.894E+07	94.5	.0	86.5	86.5	1.469E+08	Trn A	8.200E+06	8.280E+06	1.07
5.1	2.893E+07	94.6	.0	86.5	86.5	1.468E+08	Trn A	8.200E+06	8.280E+06	1.07
5.2	2.892E+07	94.6	.0	86.5	86.5	1.468E+08	Trn A	8.200E+06	8.280E+06	1.07
5.3	2.890E+07	94.6	.0	86.5	86.5	1.467E+08	Trn A	8.200E+06	8.280E+06	1.07
5.4	2.889E+07	94.6	.0	86.5	86.5	1.467E+08	Trn A	8.200E+06	8.280E+06	1.07
5.5	2.888E+07	94.6	.0	86.5	86.5	1.467E+08	Trn A	8.200E+06	8.280E+06	1.07
5.6	2.887E+07	94.6	.0	86.5	86.5	1.466E+08	Trn A	8.200E+06	8.280E+06	1.07
5.7	2.885E+07	94.6	.0	86.5	86.5	1.466E+08	Trn A	8.200E+06	8.280E+06	1.07
5.8	2.884E+07	94.6	.0	86.5	86.5	1.465E+08	Trn A	8.200E+06	8.280E+06	1.07
5.9	2.883E+07	94.6	.0	86.5	86.5	1.465E+08	Trn A	8.200E+06	8.280E+06	1.07
6.0	2.882E+07	94.6	.0	86.5	86.5	1.464E+08	Trn A	8.200E+06	8.280E+06	1.07
6.1	2.881E+07	94.6	.0	86.5	86.5	1.463E+08	Trn A	8.200E+06	8.280E+06	1.07
6.2	2.879E+07	94.6	.0	86.5	86.5	1.462E+08	Trn A	8.200E+06	8.280E+06	1.07
6.3	2.878E+07	94.6	.0	86.5	86.5	1.462E+08	Trn A	8.200E+06	8.280E+06	1.07
6.4	2.877E+07	94.6	.0	86.5	86.5	1.461E+08	Trn A	8.200E+06	8.280E+06	1.07
6.5	2.876E+07	94.6	.0	86.5	86.5	1.460E+08	Trn A	8.200E+06	8.280E+06	1.07

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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=90F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
6.6	2.875E+07	94.6	.0	86.5	86.5	1.459E+08	Trn A	8.200E+06	8.280E+06	1.07
6.7	2.873E+07	94.6	.0	86.5	86.5	1.458E+08	Trn A	8.200E+06	8.280E+06	1.07
6.8	2.872E+07	94.6	.0	86.5	86.5	1.457E+08	Trn A	8.200E+06	8.280E+06	1.07
6.9	2.871E+07	94.6	.0	86.5	86.5	1.456E+08	Trn A	8.200E+06	8.280E+06	1.07
7.0	2.870E+07	94.6	.0	86.5	86.5	1.455E+08	Trn A	8.200E+06	8.280E+06	1.07
7.1	2.869E+07	94.7	.0	86.5	86.5	1.454E+08	Trn A	8.200E+06	8.280E+06	1.07
7.2	2.867E+07	94.7	.0	86.5	86.5	1.453E+08	Trn A	8.200E+06	8.280E+06	1.07
7.3	2.866E+07	94.7	.0	86.5	86.5	1.452E+08	Trn A	8.200E+06	8.280E+06	1.07
7.4	2.865E+07	94.7	.0	86.5	86.5	1.451E+08	Trn A	8.200E+06	8.280E+06	1.07
7.5	2.864E+07	94.7	.0	86.5	86.5	1.450E+08	Trn A	8.200E+06	8.280E+06	1.07
7.6	2.863E+07	94.7	.0	86.5	86.5	1.449E+08	Trn A	8.200E+06	8.280E+06	1.07
7.7	2.861E+07	94.7	.0	86.5	86.5	1.448E+08	Trn A	8.200E+06	8.280E+06	1.07
7.8	2.860E+07	94.7	.0	86.5	86.5	1.447E+08	Trn A	8.200E+06	8.280E+06	1.07
7.9	2.859E+07	94.7	.0	86.5	86.5	1.446E+08	Trn A	8.200E+06	8.280E+06	1.07
8.0	2.858E+07	94.7	.0	86.5	86.5	1.445E+08	Trn A	8.200E+06	8.280E+06	1.07
8.1	2.857E+07	94.7	.0	86.5	86.5	1.444E+08	Trn A	8.200E+06	8.280E+06	1.07
8.2	2.855E+07	94.7	.0	86.5	86.5	1.443E+08	Trn A	8.200E+06	8.280E+06	1.07
8.3	2.854E+07	94.7	.0	86.5	86.5	1.442E+08	Trn A	8.200E+06	8.280E+06	1.07
8.4	2.853E+07	94.7	.0	86.5	86.5	1.441E+08	Trn A	8.200E+06	8.280E+06	1.07
8.5	2.852E+07	94.7	.0	86.5	86.5	1.440E+08	Trn A	8.200E+06	8.280E+06	1.07
8.6	2.851E+07	94.7	.0	86.5	86.5	1.439E+08	Trn A	8.200E+06	8.280E+06	1.07
8.7	2.849E+07	94.7	.0	86.5	86.5	1.438E+08	Trn A	8.200E+06	8.280E+06	1.07
8.8	2.848E+07	94.7	.0	86.5	86.5	1.437E+08	Trn A	8.200E+06	8.280E+06	1.07
8.9	2.847E+07	94.7	.0	86.5	86.5	1.436E+08	Trn A	8.200E+06	8.280E+06	1.07
9.0	2.846E+07	94.7	.0	86.5	86.5	1.435E+08	Trn A	8.200E+06	8.280E+06	1.07
9.1	2.845E+07	94.7	.0	86.5	86.5	1.435E+08	Trn A	8.200E+06	8.280E+06	1.07
9.2	2.844E+07	94.7	.0	86.5	86.5	1.435E+08	Trn A	8.200E+06	8.280E+06	1.07
9.3	2.842E+07	94.7	.0	86.5	86.5	1.434E+08	Trn A	8.200E+06	8.280E+06	1.07
9.4	2.841E+07	94.7	.0	86.5	86.5	1.434E+08	Trn A	8.200E+06	8.280E+06	1.07
9.5	2.840E+07	94.7	.0	86.5	86.5	1.434E+08	Trn A	8.200E+06	8.280E+06	1.07
9.6	2.839E+07	94.7	.0	86.5	86.5	1.433E+08	Trn A	8.200E+06	8.280E+06	1.07
9.7	2.838E+07	94.7	.0	86.5	86.5	1.433E+08	Trn A	8.200E+06	8.280E+06	1.07
9.8	2.836E+07	94.7	.0	86.5	86.5	1.433E+08	Trn A	8.200E+06	8.280E+06	1.07
9.9	2.835E+07	94.7	.0	86.5	86.5	1.432E+08	Trn A	8.200E+06	8.280E+06	1.07
10.0	2.834E+07	94.7	.0	86.5	86.5	1.432E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 6 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=90F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	Kav/L
11.0	2.822E+07	94.7	.0	86.5	86.5	1.429E+08	Trn A	8.200E+06	8.280E+06	1.07
12.0	2.810E+07	94.7	.0	86.5	86.5	1.425E+08	Trn A	8.200E+06	8.280E+06	1.07
13.0	2.798E+07	94.7	.0	86.5	86.5	1.439E+08	Trn A	8.200E+06	8.280E+06	1.07
14.0	2.786E+07	94.7	.0	86.5	86.5	1.453E+08	Trn A	8.200E+06	8.280E+06	1.07
15.0	2.774E+07	94.7	.0	86.5	86.5	1.467E+08	Trn A	8.200E+06	8.280E+06	1.07
16.0	2.762E+07	94.8	.0	86.5	86.5	1.481E+08	Trn A	8.200E+06	8.280E+06	1.07
17.0	2.750E+07	94.8	.0	86.5	86.5	1.495E+08	Trn A	8.200E+06	8.280E+06	1.07
18.0	2.737E+07	94.8	.0	86.5	86.5	1.509E+08	Trn A	8.200E+06	8.280E+06	1.07
19.0	2.725E+07	94.9	.0	86.5	86.5	1.505E+08	Trn A	8.200E+06	8.280E+06	1.07
20.0	2.713E+07	94.9	.0	86.5	86.5	1.501E+08	Trn A	8.200E+06	8.280E+06	1.07
21.0	2.700E+07	94.9	.0	86.5	86.5	1.496E+08	Trn A	8.200E+06	8.280E+06	1.07
22.0	2.688E+07	94.9	.0	86.5	86.5	1.492E+08	Trn A	8.200E+06	8.280E+06	1.07
23.0	2.675E+07	94.9	.0	86.5	86.5	1.488E+08	Trn A	8.200E+06	8.280E+06	1.07
24.0	2.663E+07	94.9	.0	86.5	86.5	1.483E+08	Trn A	8.200E+06	8.280E+06	1.07
25.0	2.651E+07	94.9	.0	86.5	86.5	1.462E+08	Trn A	8.200E+06	8.280E+06	1.07
26.0	2.639E+07	94.9	.0	86.5	86.5	1.440E+08	Trn A	8.200E+06	8.280E+06	1.07
27.0	2.627E+07	94.9	.0	86.5	86.5	1.418E+08	Trn A	8.200E+06	8.280E+06	1.07
28.0	2.615E+07	94.8	.0	86.5	86.5	1.396E+08	Trn A	8.200E+06	8.280E+06	1.07
29.0	2.603E+07	94.7	.0	86.5	86.5	1.374E+08	Trn A	8.200E+06	8.280E+06	1.07
30.0	2.592E+07	94.7	.0	86.5	86.5	1.353E+08	Trn A	8.200E+06	8.280E+06	1.07
31.0	2.580E+07	94.6	.0	86.5	86.5	1.331E+08	Trn A	8.200E+06	8.280E+06	1.07
32.0	2.569E+07	94.5	.0	86.5	86.5	1.309E+08	Trn A	8.200E+06	8.280E+06	1.07
33.0	2.558E+07	94.5	.0	86.5	86.5	1.287E+08	Trn A	8.200E+06	8.280E+06	1.07
34.0	2.548E+07	94.4	.0	86.5	86.5	1.265E+08	Trn A	8.200E+06	8.280E+06	1.07
35.0	2.537E+07	94.3	.0	86.5	86.5	1.244E+08	Trn A	8.200E+06	8.280E+06	1.07
36.0	2.527E+07	94.2	.0	86.5	86.5	1.222E+08	Trn A	8.200E+06	8.280E+06	1.07
37.0	2.517E+07	94.2	.0	86.5	86.5	1.215E+08	Trn A	8.200E+06	8.280E+06	1.07
38.0	2.507E+07	94.1	.0	86.5	86.5	1.208E+08	Trn A	8.200E+06	8.280E+06	1.07
39.0	2.497E+07	94.0	.0	86.5	86.5	1.201E+08	Trn A	8.200E+06	8.280E+06	1.07
40.0	2.487E+07	94.0	.0	86.5	86.5	1.194E+08	Trn A	8.200E+06	8.280E+06	1.07
41.0	2.477E+07	93.9	.0	86.5	86.5	1.187E+08	Trn A	8.200E+06	8.280E+06	1.07
42.0	2.467E+07	93.9	.0	86.5	86.5	1.180E+08	Trn A	8.200E+06	8.280E+06	1.07
43.0	2.457E+07	93.8	.0	86.5	86.5	1.172E+08	Trn A	8.200E+06	8.280E+06	1.07
44.0	2.447E+07	93.8	.0	86.5	86.5	1.165E+08	Trn A	8.200E+06	8.280E+06	1.07
45.0	2.438E+07	93.7	.0	86.5	86.5	1.158E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 7 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=90F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
46.0	2.428E+07	93.7	.0	86.5	86.5	1.151E+08	Trn A	8.200E+06	8.280E+06	1.07
47.0	2.419E+07	93.7	.0	86.5	86.5	1.144E+08	Trn A	8.200E+06	8.280E+06	1.07
48.0	2.409E+07	93.6	.0	86.5	86.5	1.137E+08	Trn A	8.200E+06	8.280E+06	1.07
49.0	2.400E+07	93.6	.0	86.5	86.5	1.134E+08	Trn A	8.200E+06	8.280E+06	1.07
50.0	2.391E+07	93.6	.0	86.5	86.5	1.130E+08	Trn A	8.200E+06	8.280E+06	1.07
51.0	2.381E+07	93.5	.0	86.5	86.5	1.126E+08	Trn A	8.200E+06	8.280E+06	1.07
52.0	2.372E+07	93.5	.0	86.5	86.5	1.123E+08	Trn A	8.200E+06	8.280E+06	1.07
53.0	2.363E+07	93.5	.0	86.5	86.5	1.119E+08	Trn A	8.200E+06	8.280E+06	1.07
54.0	2.353E+07	93.5	.0	86.5	86.5	1.116E+08	Trn A	8.200E+06	8.280E+06	1.07
55.0	2.344E+07	93.4	.0	86.5	86.5	1.112E+08	Trn A	8.200E+06	8.280E+06	1.07
56.0	2.335E+07	93.4	.0	86.5	86.5	1.109E+08	Trn A	8.200E+06	8.280E+06	1.07
57.0	2.326E+07	93.4	.0	86.5	86.5	1.105E+08	Trn A	8.200E+06	8.280E+06	1.07
58.0	2.317E+07	93.4	.0	86.5	86.5	1.101E+08	Trn A	8.200E+06	8.280E+06	1.07
59.0	2.308E+07	93.4	.0	86.5	86.5	1.098E+08	Trn A	8.200E+06	8.280E+06	1.07
60.0	2.299E+07	93.4	.0	86.5	86.5	1.094E+08	Trn A	8.200E+06	8.280E+06	1.07
61.0	2.290E+07	93.3	.0	86.5	86.5	1.091E+08	Trn A	8.200E+06	8.280E+06	1.07
62.0	2.281E+07	93.3	.0	86.5	86.5	1.087E+08	Trn A	8.200E+06	8.280E+06	1.07
63.0	2.272E+07	93.3	.0	86.5	86.5	1.083E+08	Trn A	8.200E+06	8.280E+06	1.07
64.0	2.263E+07	93.3	.0	86.5	86.5	1.080E+08	Trn A	8.200E+06	8.280E+06	1.07
65.0	2.254E+07	93.3	.0	86.5	86.5	1.076E+08	Trn A	8.200E+06	8.280E+06	1.07
66.0	2.245E+07	93.2	.0	86.5	86.5	1.073E+08	Trn A	8.200E+06	8.280E+06	1.07
67.0	2.237E+07	93.2	.0	86.5	86.5	1.069E+08	Trn A	8.200E+06	8.280E+06	1.07
68.0	2.228E+07	93.2	.0	86.5	86.5	1.066E+08	Trn A	8.200E+06	8.280E+06	1.07
69.0	2.219E+07	93.2	.0	86.5	86.5	1.062E+08	Trn A	8.200E+06	8.280E+06	1.07
70.0	2.210E+07	93.2	.0	86.5	86.5	1.058E+08	Trn A	8.200E+06	8.280E+06	1.07
71.0	2.202E+07	93.1	.0	86.5	86.5	1.055E+08	Trn A	8.200E+06	8.280E+06	1.07
72.0	2.193E+07	93.1	.0	86.5	86.5	1.051E+08	Trn A	8.200E+06	8.280E+06	1.07
73.0	2.184E+07	93.1	.0	86.5	86.5	1.048E+08	Trn A	8.200E+06	8.280E+06	1.07
74.0	2.176E+07	93.1	.0	86.5	86.5	1.044E+08	Trn A	8.200E+06	8.280E+06	1.07
75.0	2.167E+07	93.1	.0	86.5	86.5	1.040E+08	Trn A	8.200E+06	8.280E+06	1.07
76.0	2.159E+07	93.1	.0	86.5	86.5	1.037E+08	Trn A	8.200E+06	8.280E+06	1.07
77.0	2.150E+07	93.1	.0	86.5	86.5	1.033E+08	Trn A	8.200E+06	8.280E+06	1.07
78.0	2.142E+07	93.0	.0	86.5	86.5	1.029E+08	Trn A	8.200E+06	8.280E+06	1.07
79.0	2.133E+07	93.0	.0	86.5	86.5	1.026E+08	Trn A	8.200E+06	8.280E+06	1.07
80.0	2.125E+07	93.0	.0	86.5	86.5	1.022E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 8 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=90F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
81.0	2.117E+07	93.0	.0	86.5	86.5	1.018E+08	Trn A	8.200E+06	8.280E+06	1.07
82.0	2.108E+07	93.0	.0	86.5	86.5	1.015E+08	Trn A	8.200E+06	8.280E+06	1.07
83.0	2.100E+07	93.0	.0	86.5	86.5	1.011E+08	Trn A	8.200E+06	8.280E+06	1.07
84.0	2.092E+07	93.0	.0	86.5	86.5	1.007E+08	Trn A	8.200E+06	8.280E+06	1.07
85.0	2.083E+07	92.9	.0	86.5	86.5	1.004E+08	Trn A	8.200E+06	8.280E+06	1.07
86.0	2.075E+07	92.9	.0	86.5	86.5	9.999E+07	Trn A	8.200E+06	8.280E+06	1.07
87.0	2.067E+07	92.9	.0	86.5	86.5	9.962E+07	Trn A	8.200E+06	8.280E+06	1.07
88.0	2.059E+07	92.9	.0	86.5	86.5	9.925E+07	Trn A	8.200E+06	8.280E+06	1.07
89.0	2.051E+07	92.9	.0	86.5	86.5	9.888E+07	Trn A	8.200E+06	8.280E+06	1.07
90.0	2.043E+07	92.8	.0	86.5	86.5	9.852E+07	Trn A	8.200E+06	8.280E+06	1.07
91.0	2.035E+07	92.8	.0	86.5	86.5	9.815E+07	Trn A	8.200E+06	8.280E+06	1.07
92.0	2.027E+07	92.8	.0	86.5	86.5	9.778E+07	Trn A	8.200E+06	8.280E+06	1.07
93.0	2.019E+07	92.8	.0	86.5	86.5	9.741E+07	Trn A	8.200E+06	8.280E+06	1.07
94.0	2.011E+07	92.8	.0	86.5	86.5	9.705E+07	Trn A	8.200E+06	8.280E+06	1.07
95.0	2.003E+07	92.8	.0	86.5	86.5	9.668E+07	Trn A	8.200E+06	8.280E+06	1.07
96.0	1.995E+07	92.7	.0	86.5	86.5	9.631E+07	Trn A	8.200E+06	8.280E+06	1.07
97.0	1.987E+07	92.7	.0	86.5	86.5	9.612E+07	Trn A	8.200E+06	8.280E+06	1.07
98.0	1.979E+07	92.7	.0	86.5	86.5	9.593E+07	Trn A	8.200E+06	8.280E+06	1.07
99.0	1.971E+07	92.7	.0	86.5	86.5	9.574E+07	Trn A	8.200E+06	8.280E+06	1.07
100.0	1.963E+07	92.7	.0	86.5	86.5	9.555E+07	Trn A	8.200E+06	8.280E+06	1.07
101.0	1.956E+07	92.7	.0	86.5	86.5	9.536E+07	Trn A	8.200E+06	8.280E+06	1.07
102.0	1.948E+07	92.6	.0	86.5	86.5	9.517E+07	Trn A	8.200E+06	8.280E+06	1.07
103.0	1.940E+07	92.6	.0	86.5	86.5	9.498E+07	Trn A	8.200E+06	8.280E+06	1.07
104.0	1.932E+07	92.6	.0	86.5	86.5	9.479E+07	Trn A	8.200E+06	8.280E+06	1.07
105.0	1.925E+07	92.6	.0	86.5	86.5	9.460E+07	Trn A	8.200E+06	8.280E+06	1.07
106.0	1.917E+07	92.6	.0	86.5	86.5	9.441E+07	Trn A	8.200E+06	8.280E+06	1.07
107.0	1.909E+07	92.6	.0	86.5	86.5	9.422E+07	Trn A	8.200E+06	8.280E+06	1.07
108.0	1.901E+07	92.6	.0	86.5	86.5	9.403E+07	Trn A	8.200E+06	8.280E+06	1.07
109.0	1.894E+07	92.6	.0	86.5	86.5	9.384E+07	Trn A	8.200E+06	8.280E+06	1.07
110.0	1.886E+07	92.6	.0	86.5	86.5	9.365E+07	Trn A	8.200E+06	8.280E+06	1.07
111.0	1.879E+07	92.6	.0	86.5	86.5	9.346E+07	Trn A	8.200E+06	8.280E+06	1.07
112.0	1.871E+07	92.6	.0	86.5	86.5	9.327E+07	Trn A	8.200E+06	8.280E+06	1.07
113.0	1.863E+07	92.6	.0	86.5	86.5	9.308E+07	Trn A	8.200E+06	8.280E+06	1.07
114.0	1.856E+07	92.5	.0	86.5	86.5	9.289E+07	Trn A	8.200E+06	8.280E+06	1.07
115.0	1.848E+07	92.5	.0	86.5	86.5	9.270E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 9 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=90F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
116.0	1.841E+07	92.5	.0	86.5	86.5	9.251E+07	Trn A	8.200E+06	8.280E+06	1.07
117.0	1.833E+07	92.5	.0	86.5	86.5	9.232E+07	Trn A	8.200E+06	8.280E+06	1.07
118.0	1.826E+07	92.5	.0	86.5	86.5	9.213E+07	Trn A	8.200E+06	8.280E+06	1.07
119.0	1.818E+07	92.4	.0	86.5	86.5	9.194E+07	Trn A	8.200E+06	8.280E+06	1.07
120.0	1.810E+07	92.4	.0	86.5	86.5	9.175E+07	Trn A	8.200E+06	8.280E+06	1.07
121.0	1.803E+07	92.4	.0	86.5	86.5	9.150E+07	Trn A	8.200E+06	8.280E+06	1.07
122.0	1.796E+07	92.4	.0	86.5	86.5	9.126E+07	Trn A	8.200E+06	8.280E+06	1.07
123.0	1.788E+07	92.4	.0	86.5	86.5	9.101E+07	Trn A	8.200E+06	8.280E+06	1.07
124.0	1.781E+07	92.5	.0	86.5	86.5	9.076E+07	Trn A	8.200E+06	8.280E+06	1.07
125.0	1.773E+07	92.4	.0	86.5	86.5	9.052E+07	Trn A	8.200E+06	8.280E+06	1.07
126.0	1.766E+07	92.4	.0	86.5	86.5	9.027E+07	Trn A	8.200E+06	8.280E+06	1.07
127.0	1.759E+07	92.4	.0	86.5	86.5	9.003E+07	Trn A	8.200E+06	8.280E+06	1.07
128.0	1.751E+07	92.4	.0	86.5	86.5	8.978E+07	Trn A	8.200E+06	8.280E+06	1.07
129.0	1.744E+07	92.4	.0	86.5	86.5	8.953E+07	Trn A	8.200E+06	8.280E+06	1.07
130.0	1.737E+07	92.4	.0	86.5	86.5	8.929E+07	Trn A	8.200E+06	8.280E+06	1.07
131.0	1.730E+07	92.4	.0	86.5	86.5	8.904E+07	Trn A	8.200E+06	8.280E+06	1.07
132.0	1.722E+07	92.3	.0	86.5	86.5	8.880E+07	Trn A	8.200E+06	8.280E+06	1.07
133.0	1.715E+07	92.3	.0	86.5	86.5	8.855E+07	Trn A	8.200E+06	8.280E+06	1.07
134.0	1.708E+07	92.3	.0	86.5	86.5	8.830E+07	Trn A	8.200E+06	8.280E+06	1.07
135.0	1.701E+07	92.3	.0	86.5	86.5	8.806E+07	Trn A	8.200E+06	8.280E+06	1.07
136.0	1.693E+07	92.3	.0	86.5	86.5	8.781E+07	Trn A	8.200E+06	8.280E+06	1.07
137.0	1.686E+07	92.3	.0	86.5	86.5	8.757E+07	Trn A	8.200E+06	8.280E+06	1.07
138.0	1.679E+07	92.3	.0	86.5	86.5	8.732E+07	Trn A	8.200E+06	8.280E+06	1.07
139.0	1.672E+07	92.2	.0	86.5	86.5	8.707E+07	Trn A	8.200E+06	8.280E+06	1.07
140.0	1.665E+07	92.2	.0	86.5	86.5	8.683E+07	Trn A	8.200E+06	8.280E+06	1.07
141.0	1.658E+07	92.2	.0	86.5	86.5	8.658E+07	Trn A	8.200E+06	8.280E+06	1.07
142.0	1.651E+07	92.2	.0	86.5	86.5	8.634E+07	Trn A	8.200E+06	8.280E+06	1.07
143.0	1.644E+07	92.2	.0	86.5	86.5	8.609E+07	Trn A	8.200E+06	8.280E+06	1.07
144.0	1.637E+07	92.2	.0	86.5	86.5	8.584E+07	Trn A	8.200E+06	8.280E+06	1.07
145.0	1.630E+07	92.2	.0	86.5	86.5	8.559E+07	Trn A	8.200E+06	8.280E+06	1.07
146.0	1.623E+07	92.1	.0	86.5	86.5	8.534E+07	Trn A	8.200E+06	8.280E+06	1.07
147.0	1.616E+07	92.1	.0	86.5	86.5	8.509E+07	Trn A	8.200E+06	8.280E+06	1.07
148.0	1.609E+07	92.1	.0	86.5	86.5	8.484E+07	Trn A	8.200E+06	8.280E+06	1.07
149.0	1.602E+07	92.1	.0	86.5	86.5	8.459E+07	Trn A	8.200E+06	8.280E+06	1.07
150.0	1.595E+07	92.1	.0	86.5	86.5	8.434E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 10 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=90F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
151.0	1.588E+07	92.1	.0	86.5	86.5	8.522E+07	Trn A	8.200E+06	8.280E+06	1.07
152.0	1.581E+07	92.1	.0	86.5	86.5	8.513E+07	Trn A	8.200E+06	8.280E+06	1.07
153.0	1.574E+07	92.1	.0	86.5	86.5	8.504E+07	Trn A	8.200E+06	8.280E+06	1.07
154.0	1.567E+07	92.1	.0	86.5	86.5	8.495E+07	Trn A	8.200E+06	8.280E+06	1.07
155.0	1.561E+07	92.1	.0	86.5	86.5	8.486E+07	Trn A	8.200E+06	8.280E+06	1.07
156.0	1.554E+07	92.1	.0	86.5	86.5	8.477E+07	Trn A	8.200E+06	8.280E+06	1.07
157.0	1.547E+07	92.1	.0	86.5	86.5	8.468E+07	Trn A	8.200E+06	8.280E+06	1.07
158.0	1.540E+07	92.1	.0	86.5	86.5	8.459E+07	Trn A	8.200E+06	8.280E+06	1.07
159.0	1.533E+07	92.1	.0	86.5	86.5	8.450E+07	Trn A	8.200E+06	8.280E+06	1.07
160.0	1.526E+07	92.1	.0	86.5	86.5	8.441E+07	Trn A	8.200E+06	8.280E+06	1.07
161.0	1.519E+07	92.1	.0	86.5	86.5	8.432E+07	Trn A	8.200E+06	8.280E+06	1.07
162.0	1.513E+07	92.1	.0	86.5	86.5	8.423E+07	Trn A	8.200E+06	8.280E+06	1.07
163.0	1.506E+07	92.1	.0	86.5	86.5	8.415E+07	Trn A	8.200E+06	8.280E+06	1.07
164.0	1.499E+07	92.1	.0	86.5	86.5	8.406E+07	Trn A	8.200E+06	8.280E+06	1.07
165.0	1.492E+07	92.1	.0	86.5	86.5	8.397E+07	Trn A	8.200E+06	8.280E+06	1.07
166.0	1.485E+07	92.0	.0	86.5	86.5	8.388E+07	Trn A	8.200E+06	8.280E+06	1.07
167.0	1.478E+07	92.0	.0	86.5	86.5	8.379E+07	Trn A	8.200E+06	8.280E+06	1.07
168.0	1.472E+07	92.0	.0	86.5	86.5	8.370E+07	Trn A	8.200E+06	8.280E+06	1.07
169.0	1.465E+07	92.0	.0	86.5	86.5	8.372E+07	Trn A	8.200E+06	8.280E+06	1.07
170.0	1.458E+07	92.0	.0	86.5	86.5	8.374E+07	Trn A	8.200E+06	8.280E+06	1.07
171.0	1.451E+07	92.0	.0	86.5	86.5	8.376E+07	Trn A	8.200E+06	8.280E+06	1.07
172.0	1.444E+07	92.0	.0	86.5	86.5	8.378E+07	Trn A	8.200E+06	8.280E+06	1.07
173.0	1.438E+07	92.0	.0	86.5	86.5	8.380E+07	Trn A	8.200E+06	8.280E+06	1.07
174.0	1.431E+07	92.0	.0	86.5	86.5	8.382E+07	Trn A	8.200E+06	8.280E+06	1.07
175.0	1.424E+07	92.0	.0	86.5	86.5	8.384E+07	Trn A	8.200E+06	8.280E+06	1.07
176.0	1.417E+07	92.0	.0	86.5	86.5	8.386E+07	Trn A	8.200E+06	8.280E+06	1.07
177.0	1.410E+07	92.0	.0	86.5	86.5	8.388E+07	Trn A	8.200E+06	8.280E+06	1.07
178.0	1.404E+07	92.0	.0	86.5	86.5	8.390E+07	Trn A	8.200E+06	8.280E+06	1.07
179.0	1.397E+07	92.0	.0	86.5	86.5	8.392E+07	Trn A	8.200E+06	8.280E+06	1.07
180.0	1.390E+07	92.0	.0	86.5	86.5	8.394E+07	Trn A	8.200E+06	8.280E+06	1.07
181.0	1.383E+07	92.0	.0	86.5	86.5	8.396E+07	Trn A	8.200E+06	8.280E+06	1.07
182.0	1.376E+07	92.0	.0	86.5	86.5	8.399E+07	Trn A	8.200E+06	8.280E+06	1.07
183.0	1.370E+07	92.0	.0	86.5	86.5	8.401E+07	Trn A	8.200E+06	8.280E+06	1.07
184.0	1.363E+07	92.0	.0	86.5	86.5	8.403E+07	Trn A	8.200E+06	8.280E+06	1.07
185.0	1.356E+07	92.1	.0	86.5	86.5	8.405E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 11 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 4-fan mode, IBT=90F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
186.0	1.349E+07	92.1	.0	86.5	86.5	8.407E+07	Trn A	8.200E+06	8.280E+06	1.07
187.0	1.342E+07	92.1	.0	86.5	86.5	8.409E+07	Trn A	8.200E+06	8.280E+06	1.07
188.0	1.336E+07	92.1	.0	86.5	86.5	8.411E+07	Trn A	8.200E+06	8.280E+06	1.07
189.0	1.329E+07	92.1	.0	86.5	86.5	8.413E+07	Trn A	8.200E+06	8.280E+06	1.07
190.0	1.322E+07	92.1	.0	86.5	86.5	8.415E+07	Trn A	8.200E+06	8.280E+06	1.07
191.0	1.315E+07	92.1	.0	86.5	86.5	8.417E+07	Trn A	8.200E+06	8.280E+06	1.07
192.0	1.308E+07	92.0	.0	86.5	86.5	8.419E+07	Trn A	8.200E+06	8.280E+06	1.07
193.0	1.301E+07	92.0	.0	86.5	86.5	8.400E+07	Trn A	8.200E+06	8.280E+06	1.07
194.0	1.295E+07	92.0	.0	86.5	86.5	8.381E+07	Trn A	8.200E+06	8.280E+06	1.07
195.0	1.288E+07	92.0	.0	86.5	86.5	8.362E+07	Trn A	8.200E+06	8.280E+06	1.07
196.0	1.281E+07	92.0	.0	86.5	86.5	8.343E+07	Trn A	8.200E+06	8.280E+06	1.07
197.0	1.274E+07	92.0	.0	86.5	86.5	8.324E+07	Trn A	8.200E+06	8.280E+06	1.07
198.0	1.267E+07	92.0	.0	86.5	86.5	8.305E+07	Trn A	8.200E+06	8.280E+06	1.07
199.0	1.261E+07	92.0	.0	86.5	86.5	8.287E+07	Trn A	8.200E+06	8.280E+06	1.07
200.0	1.254E+07	91.9	.0	86.5	86.5	8.268E+07	Trn A	8.200E+06	8.280E+06	1.07
201.0	1.247E+07	91.9	.0	86.5	86.5	8.249E+07	Trn A	8.200E+06	8.280E+06	1.07
202.0	1.240E+07	91.9	.0	86.5	86.5	8.230E+07	Trn A	8.200E+06	8.280E+06	1.07
203.0	1.234E+07	91.9	.0	86.5	86.5	8.211E+07	Trn A	8.200E+06	8.280E+06	1.07
204.0	1.227E+07	91.9	.0	86.5	86.5	8.192E+07	Trn A	8.200E+06	8.280E+06	1.07
205.0	1.221E+07	91.9	.0	86.5	86.5	8.173E+07	Trn A	8.200E+06	8.280E+06	1.07
206.0	1.214E+07	91.9	.0	86.5	86.5	8.154E+07	Trn A	8.200E+06	8.280E+06	1.07
207.0	1.207E+07	91.9	.0	86.5	86.5	8.135E+07	Trn A	8.200E+06	8.280E+06	1.07
208.0	1.201E+07	91.9	.0	86.5	86.5	8.116E+07	Trn A	8.200E+06	8.280E+06	1.07
209.0	1.194E+07	91.9	.0	86.5	86.5	8.097E+07	Trn A	8.200E+06	8.280E+06	1.07
210.0	1.188E+07	91.9	.0	86.5	86.5	8.078E+07	Trn A	8.200E+06	8.280E+06	1.07
211.0	1.181E+07	91.9	.0	86.5	86.5	8.060E+07	Trn A	8.200E+06	8.280E+06	1.07
212.0	1.175E+07	91.9	.0	86.5	86.5	8.041E+07	Trn A	8.200E+06	8.280E+06	1.07
213.0	1.168E+07	91.9	.0	86.5	86.5	8.022E+07	Trn A	8.200E+06	8.280E+06	1.07
214.0	1.162E+07	91.9	.0	86.5	86.5	8.003E+07	Trn A	8.200E+06	8.280E+06	1.07
215.0	1.155E+07	91.8	.0	86.5	86.5	7.984E+07	Trn A	8.200E+06	8.280E+06	1.07
216.0	1.149E+07	91.8	.0	86.5	86.5	7.965E+07	Trn A	8.200E+06	8.280E+06	1.07
217.0	1.142E+07	91.8	.0	86.5	86.5	7.969E+07	Trn A	8.200E+06	8.280E+06	1.07
218.0	1.136E+07	91.8	.0	86.5	86.5	7.972E+07	Trn A	8.200E+06	8.280E+06	1.07
219.0	1.129E+07	91.8	.0	86.5	86.5	7.976E+07	Trn A	8.200E+06	8.280E+06	1.07
220.0	1.123E+07	91.8	.0	86.5	86.5	7.980E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 12 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 4-fan mode, IBT=90F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
221.0	1.116E+07	91.8	.0	86.5	86.5	7.984E+07	Trn A	8.200E+06	8.280E+06	1.07
222.0	1.110E+07	91.8	.0	86.5	86.5	7.987E+07	Trn A	8.200E+06	8.280E+06	1.07
223.0	1.103E+07	91.8	.0	86.5	86.5	7.991E+07	Trn A	8.200E+06	8.280E+06	1.07
224.0	1.097E+07	91.8	.0	86.5	86.5	7.995E+07	Trn A	8.200E+06	8.280E+06	1.07
225.0	1.090E+07	91.9	.0	86.5	86.5	7.999E+07	Trn A	8.200E+06	8.280E+06	1.07
226.0	1.084E+07	91.9	.0	86.5	86.5	8.002E+07	Trn A	8.200E+06	8.280E+06	1.07
227.0	1.077E+07	91.9	.0	86.5	86.5	8.006E+07	Trn A	8.200E+06	8.280E+06	1.07
228.0	1.071E+07	91.8	.0	86.5	86.5	8.010E+07	Trn A	8.200E+06	8.280E+06	1.07
229.0	1.065E+07	91.8	.0	86.5	86.5	8.014E+07	Trn A	8.200E+06	8.280E+06	1.07
230.0	1.058E+07	91.8	.0	86.5	86.5	8.017E+07	Trn A	8.200E+06	8.280E+06	1.07
231.0	1.051E+07	91.8	.0	86.5	86.5	8.021E+07	Trn A	8.200E+06	8.280E+06	1.07
232.0	1.045E+07	91.8	.0	86.5	86.5	8.025E+07	Trn A	8.200E+06	8.280E+06	1.07
233.0	1.039E+07	91.8	.0	86.5	86.5	8.029E+07	Trn A	8.200E+06	8.280E+06	1.07
234.0	1.032E+07	91.8	.0	86.5	86.5	8.032E+07	Trn A	8.200E+06	8.280E+06	1.07
235.0	1.026E+07	91.8	.0	86.5	86.5	8.036E+07	Trn A	8.200E+06	8.280E+06	1.07
236.0	1.019E+07	91.9	.0	86.5	86.5	8.040E+07	Trn A	8.200E+06	8.280E+06	1.07
237.0	1.013E+07	91.9	.0	86.5	86.5	8.044E+07	Trn A	8.200E+06	8.280E+06	1.07
238.0	1.006E+07	91.9	.0	86.5	86.5	8.047E+07	Trn A	8.200E+06	8.280E+06	1.07
239.0	9.995E+06	91.9	.0	86.5	86.5	8.051E+07	Trn A	8.200E+06	8.280E+06	1.07
240.0	9.930E+06	91.9	.0	86.5	86.5	8.055E+07	Trn A	8.200E+06	8.280E+06	1.07
Stop - Program terminated.										

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 13 of 166
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2. UHSSIM input/output for Fan4_85F, 4-Fan Case with IBT of 85 °F

Fan4_85F.inp

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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 4-fan mode, IBT=85F
# design wet-bulb temperature [F], design dry-bulb temperature [F],
# design hot-water temperature [F], design pressure [psia], design solids [ppt]
# 0 => F, psia, btu/hr, lbm/hr units
82, 98, 129.0, 14.696, 0.0, 0
# initial basin mass [lbm], initial basin temperature [F], initial solids [ppt],
# number of towers, starting time of simulation [hr]
29843200, 85, 0, 1, 0.
# Time Period Data -- every 0.1 hour for 10 hr then every hour up to 10 days
# step size, number of steps
0.1,100
1.230
*
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,8.2e6,8.28e6,1.07
240.0,8.2e6,8.28e6,1.07
*
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
    0 s  3.2565E+08
    50 s  3.2565E+08
   101 s  3.2565E+08
   116 s  3.1609E+08
   120 s  3.1487E+08
   150 s  3.1640E+08
   300 s  3.1640E+08
   900 s  3.1640E+08
  1800 s  3.0196E+08
  2704 s  2.8660E+08
  2706 s  4.4627E+08
  3600 s  4.3946E+08
    2 h  2.2984E+08
    4 h  1.4731E+08
    6 h  1.4644E+08
    9 h  1.4354E+08
   12 h  1.4254E+08
   18 h  1.5095E+08
   24 h  1.4834E+08
   36 h  1.2219E+08
    2 d  1.1371E+08
    3 d  1.0513E+08
    4 d  9.6311E+07
    5 d  9.1747E+07
    6 d  8.5844E+07
    7 d  8.3698E+07
    8 d  8.4190E+07
    9 d  7.9649E+07
   10 d  8.0549E+07
*
# Ambient Data Supplied by Bechtel Power Corp.
# TIME  WB      DB      P
# (hr)  (F)      (F)      (psia)
    0,   86.5,   86.5,   14.7
   240,  86.5,   86.5,   14.7
*

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Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 14 of 166
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Fan4_85F.out

Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 4-fan mode, IBT=85F

Initial Basin Mass 2.984E+07 lbm
Initial Basin Temperature 85.0 F
Initial Basin Solids .0 ppt

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
.0	2.984E+07	85.0	.0	86.5	86.5	3.257E+08	Trn A	8.200E+06	8.280E+06	1.07
.1	2.982E+07	85.3	.0	86.5	86.5	3.164E+08	Trn A	8.200E+06	8.280E+06	1.07
.2	2.981E+07	85.6	.0	86.5	86.5	3.164E+08	Trn A	8.200E+06	8.280E+06	1.07
.3	2.979E+07	85.9	.0	86.5	86.5	3.135E+08	Trn A	8.200E+06	8.280E+06	1.07
.4	2.977E+07	86.2	.0	86.5	86.5	3.077E+08	Trn A	8.200E+06	8.280E+06	1.07
.5	2.975E+07	86.5	.0	86.5	86.5	3.020E+08	Trn A	8.200E+06	8.280E+06	1.07
.6	2.973E+07	86.8	.0	86.5	86.5	2.958E+08	Trn A	8.200E+06	8.280E+06	1.07
.7	2.971E+07	87.1	.0	86.5	86.5	2.897E+08	Trn A	8.200E+06	8.280E+06	1.07
.8	2.969E+07	87.4	.0	86.5	86.5	4.449E+08	Trn A	8.200E+06	8.280E+06	1.07
.9	2.966E+07	87.7	.0	86.5	86.5	4.422E+08	Trn A	8.200E+06	8.280E+06	1.07
1.0	2.963E+07	88.0	.0	86.5	86.5	4.395E+08	Trn A	8.200E+06	8.280E+06	1.07
1.1	2.960E+07	88.3	.0	86.5	86.5	4.185E+08	Trn A	8.200E+06	8.280E+06	1.07
1.2	2.957E+07	88.6	.0	86.5	86.5	3.975E+08	Trn A	8.200E+06	8.280E+06	1.07
1.3	2.954E+07	88.9	.0	86.5	86.5	3.766E+08	Trn A	8.200E+06	8.280E+06	1.07
1.4	2.952E+07	89.1	.0	86.5	86.5	3.556E+08	Trn A	8.200E+06	8.280E+06	1.07
1.5	2.950E+07	89.4	.0	86.5	86.5	3.346E+08	Trn A	8.200E+06	8.280E+06	1.07
1.6	2.947E+07	89.6	.0	86.5	86.5	3.137E+08	Trn A	8.200E+06	8.280E+06	1.07
1.7	2.945E+07	89.8	.0	86.5	86.5	2.927E+08	Trn A	8.200E+06	8.280E+06	1.07
1.8	2.943E+07	90.0	.0	86.5	86.5	2.718E+08	Trn A	8.200E+06	8.280E+06	1.07
1.9	2.942E+07	90.2	.0	86.5	86.5	2.508E+08	Trn A	8.200E+06	8.280E+06	1.07
2.0	2.940E+07	90.4	.0	86.5	86.5	2.298E+08	Trn A	8.200E+06	8.280E+06	1.07
2.1	2.939E+07	90.5	.0	86.5	86.5	2.257E+08	Trn A	8.200E+06	8.280E+06	1.07
2.2	2.937E+07	90.7	.0	86.5	86.5	2.216E+08	Trn A	8.200E+06	8.280E+06	1.07
2.3	2.936E+07	90.8	.0	86.5	86.5	2.175E+08	Trn A	8.200E+06	8.280E+06	1.07
2.4	2.934E+07	91.0	.0	86.5	86.5	2.133E+08	Trn A	8.200E+06	8.280E+06	1.07
2.5	2.933E+07	91.1	.0	86.5	86.5	2.092E+08	Trn A	8.200E+06	8.280E+06	1.07
2.6	2.931E+07	91.2	.0	86.5	86.5	2.051E+08	Trn A	8.200E+06	8.280E+06	1.07
2.7	2.930E+07	91.3	.0	86.5	86.5	2.010E+08	Trn A	8.200E+06	8.280E+06	1.07
2.8	2.928E+07	91.5	.0	86.5	86.5	1.968E+08	Trn A	8.200E+06	8.280E+06	1.07
2.9	2.927E+07	91.6	.0	86.5	86.5	1.927E+08	Trn A	8.200E+06	8.280E+06	1.07
3.0	2.926E+07	91.7	.0	86.5	86.5	1.886E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 15 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=85F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
3.1	2.924E+07	91.8	.0	86.5	86.5	1.844E+08	Trn A	8.200E+06	8.280E+06	1.07
3.2	2.923E+07	91.9	.0	86.5	86.5	1.803E+08	Trn A	8.200E+06	8.280E+06	1.07
3.3	2.922E+07	91.9	.0	86.5	86.5	1.762E+08	Trn A	8.200E+06	8.280E+06	1.07
3.4	2.921E+07	92.0	.0	86.5	86.5	1.721E+08	Trn A	8.200E+06	8.280E+06	1.07
3.5	2.919E+07	92.1	.0	86.5	86.5	1.679E+08	Trn A	8.200E+06	8.280E+06	1.07
3.6	2.918E+07	92.2	.0	86.5	86.5	1.638E+08	Trn A	8.200E+06	8.280E+06	1.07
3.7	2.917E+07	92.2	.0	86.5	86.5	1.597E+08	Trn A	8.200E+06	8.280E+06	1.07
3.8	2.916E+07	92.3	.0	86.5	86.5	1.556E+08	Trn A	8.200E+06	8.280E+06	1.07
3.9	2.915E+07	92.4	.0	86.5	86.5	1.514E+08	Trn A	8.200E+06	8.280E+06	1.07
4.0	2.914E+07	92.4	.0	86.5	86.5	1.473E+08	Trn A	8.200E+06	8.280E+06	1.07
4.1	2.913E+07	92.5	.0	86.5	86.5	1.473E+08	Trn A	8.200E+06	8.280E+06	1.07
4.2	2.911E+07	92.5	.0	86.5	86.5	1.472E+08	Trn A	8.200E+06	8.280E+06	1.07
4.3	2.910E+07	92.6	.0	86.5	86.5	1.472E+08	Trn A	8.200E+06	8.280E+06	1.07
4.4	2.909E+07	92.6	.0	86.5	86.5	1.471E+08	Trn A	8.200E+06	8.280E+06	1.07
4.5	2.908E+07	92.7	.0	86.5	86.5	1.471E+08	Trn A	8.200E+06	8.280E+06	1.07
4.6	2.907E+07	92.7	.0	86.5	86.5	1.470E+08	Trn A	8.200E+06	8.280E+06	1.07
4.7	2.906E+07	92.8	.0	86.5	86.5	1.470E+08	Trn A	8.200E+06	8.280E+06	1.07
4.8	2.905E+07	92.8	.0	86.5	86.5	1.470E+08	Trn A	8.200E+06	8.280E+06	1.07
4.9	2.904E+07	92.8	.0	86.5	86.5	1.469E+08	Trn A	8.200E+06	8.280E+06	1.07
5.0	2.903E+07	92.9	.0	86.5	86.5	1.469E+08	Trn A	8.200E+06	8.280E+06	1.07
5.1	2.902E+07	92.9	.0	86.5	86.5	1.468E+08	Trn A	8.200E+06	8.280E+06	1.07
5.2	2.900E+07	93.0	.0	86.5	86.5	1.468E+08	Trn A	8.200E+06	8.280E+06	1.07
5.3	2.899E+07	93.0	.0	86.5	86.5	1.467E+08	Trn A	8.200E+06	8.280E+06	1.07
5.4	2.898E+07	93.0	.0	86.5	86.5	1.467E+08	Trn A	8.200E+06	8.280E+06	1.07
5.5	2.897E+07	93.1	.0	86.5	86.5	1.467E+08	Trn A	8.200E+06	8.280E+06	1.07
5.6	2.896E+07	93.1	.0	86.5	86.5	1.466E+08	Trn A	8.200E+06	8.280E+06	1.07
5.7	2.895E+07	93.2	.0	86.5	86.5	1.466E+08	Trn A	8.200E+06	8.280E+06	1.07
5.8	2.894E+07	93.2	.0	86.5	86.5	1.465E+08	Trn A	8.200E+06	8.280E+06	1.07
5.9	2.893E+07	93.2	.0	86.5	86.5	1.465E+08	Trn A	8.200E+06	8.280E+06	1.07
6.0	2.891E+07	93.3	.0	86.5	86.5	1.464E+08	Trn A	8.200E+06	8.280E+06	1.07
6.1	2.890E+07	93.3	.0	86.5	86.5	1.463E+08	Trn A	8.200E+06	8.280E+06	1.07
6.2	2.889E+07	93.3	.0	86.5	86.5	1.462E+08	Trn A	8.200E+06	8.280E+06	1.07
6.3	2.888E+07	93.4	.0	86.5	86.5	1.462E+08	Trn A	8.200E+06	8.280E+06	1.07
6.4	2.887E+07	93.4	.0	86.5	86.5	1.461E+08	Trn A	8.200E+06	8.280E+06	1.07
6.5	2.886E+07	93.4	.0	86.5	86.5	1.460E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 16 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=85F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
6.6	2.885E+07	93.4	.0	86.5	86.5	1.459E+08	Trn A	8.200E+06	8.280E+06	1.07
6.7	2.883E+07	93.5	.0	86.5	86.5	1.458E+08	Trn A	8.200E+06	8.280E+06	1.07
6.8	2.882E+07	93.5	.0	86.5	86.5	1.457E+08	Trn A	8.200E+06	8.280E+06	1.07
6.9	2.881E+07	93.5	.0	86.5	86.5	1.456E+08	Trn A	8.200E+06	8.280E+06	1.07
7.0	2.880E+07	93.6	.0	86.5	86.5	1.455E+08	Trn A	8.200E+06	8.280E+06	1.07
7.1	2.879E+07	93.6	.0	86.5	86.5	1.454E+08	Trn A	8.200E+06	8.280E+06	1.07
7.2	2.878E+07	93.6	.0	86.5	86.5	1.453E+08	Trn A	8.200E+06	8.280E+06	1.07
7.3	2.877E+07	93.6	.0	86.5	86.5	1.452E+08	Trn A	8.200E+06	8.280E+06	1.07
7.4	2.875E+07	93.7	.0	86.5	86.5	1.451E+08	Trn A	8.200E+06	8.280E+06	1.07
7.5	2.874E+07	93.7	.0	86.5	86.5	1.450E+08	Trn A	8.200E+06	8.280E+06	1.07
7.6	2.873E+07	93.7	.0	86.5	86.5	1.449E+08	Trn A	8.200E+06	8.280E+06	1.07
7.7	2.872E+07	93.7	.0	86.5	86.5	1.448E+08	Trn A	8.200E+06	8.280E+06	1.07
7.8	2.871E+07	93.8	.0	86.5	86.5	1.447E+08	Trn A	8.200E+06	8.280E+06	1.07
7.9	2.870E+07	93.8	.0	86.5	86.5	1.446E+08	Trn A	8.200E+06	8.280E+06	1.07
8.0	2.869E+07	93.8	.0	86.5	86.5	1.445E+08	Trn A	8.200E+06	8.280E+06	1.07
8.1	2.867E+07	93.8	.0	86.5	86.5	1.444E+08	Trn A	8.200E+06	8.280E+06	1.07
8.2	2.866E+07	93.8	.0	86.5	86.5	1.443E+08	Trn A	8.200E+06	8.280E+06	1.07
8.3	2.865E+07	93.9	.0	86.5	86.5	1.442E+08	Trn A	8.200E+06	8.280E+06	1.07
8.4	2.864E+07	93.9	.0	86.5	86.5	1.441E+08	Trn A	8.200E+06	8.280E+06	1.07
8.5	2.863E+07	93.9	.0	86.5	86.5	1.440E+08	Trn A	8.200E+06	8.280E+06	1.07
8.6	2.862E+07	93.9	.0	86.5	86.5	1.439E+08	Trn A	8.200E+06	8.280E+06	1.07
8.7	2.861E+07	93.9	.0	86.5	86.5	1.438E+08	Trn A	8.200E+06	8.280E+06	1.07
8.8	2.859E+07	93.9	.0	86.5	86.5	1.437E+08	Trn A	8.200E+06	8.280E+06	1.07
8.9	2.858E+07	94.0	.0	86.5	86.5	1.436E+08	Trn A	8.200E+06	8.280E+06	1.07
9.0	2.857E+07	94.0	.0	86.5	86.5	1.435E+08	Trn A	8.200E+06	8.280E+06	1.07
9.1	2.856E+07	94.0	.0	86.5	86.5	1.435E+08	Trn A	8.200E+06	8.280E+06	1.07
9.2	2.855E+07	94.0	.0	86.5	86.5	1.435E+08	Trn A	8.200E+06	8.280E+06	1.07
9.3	2.854E+07	94.0	.0	86.5	86.5	1.434E+08	Trn A	8.200E+06	8.280E+06	1.07
9.4	2.852E+07	94.0	.0	86.5	86.5	1.434E+08	Trn A	8.200E+06	8.280E+06	1.07
9.5	2.851E+07	94.1	.0	86.5	86.5	1.434E+08	Trn A	8.200E+06	8.280E+06	1.07
9.6	2.850E+07	94.1	.0	86.5	86.5	1.433E+08	Trn A	8.200E+06	8.280E+06	1.07
9.7	2.849E+07	94.1	.0	86.5	86.5	1.433E+08	Trn A	8.200E+06	8.280E+06	1.07
9.8	2.848E+07	94.1	.0	86.5	86.5	1.433E+08	Trn A	8.200E+06	8.280E+06	1.07
9.9	2.847E+07	94.1	.0	86.5	86.5	1.432E+08	Trn A	8.200E+06	8.280E+06	1.07
10.0	2.846E+07	94.1	.0	86.5	86.5	1.432E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 17 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=85F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
{hr}	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
11.0	2.834E+07	94.2	.0	86.5	86.5	1.429E+08	Trn A	8.200E+06	8.280E+06	1.07
12.0	2.822E+07	94.3	.0	86.5	86.5	1.425E+08	Trn A	8.200E+06	8.280E+06	1.07
13.0	2.811E+07	94.4	.0	86.5	86.5	1.439E+08	Trn A	8.200E+06	8.280E+06	1.07
14.0	2.799E+07	94.5	.0	86.5	86.5	1.453E+08	Trn A	8.200E+06	8.280E+06	1.07
15.0	2.787E+07	94.5	.0	86.5	86.5	1.467E+08	Trn A	8.200E+06	8.280E+06	1.07
16.0	2.775E+07	94.6	.0	86.5	86.5	1.481E+08	Trn A	8.200E+06	8.280E+06	1.07
17.0	2.762E+07	94.7	.0	86.5	86.5	1.495E+08	Trn A	8.200E+06	8.280E+06	1.07
18.0	2.750E+07	94.7	.0	86.5	86.5	1.509E+08	Trn A	8.200E+06	8.280E+06	1.07
19.0	2.738E+07	94.8	.0	86.5	86.5	1.505E+08	Trn A	8.200E+06	8.280E+06	1.07
20.0	2.725E+07	94.8	.0	86.5	86.5	1.501E+08	Trn A	8.200E+06	8.280E+06	1.07
21.0	2.713E+07	94.9	.0	86.5	86.5	1.496E+08	Trn A	8.200E+06	8.280E+06	1.07
22.0	2.700E+07	94.9	.0	86.5	86.5	1.492E+08	Trn A	8.200E+06	8.280E+06	1.07
23.0	2.688E+07	94.9	.0	86.5	86.5	1.488E+08	Trn A	8.200E+06	8.280E+06	1.07
24.0	2.676E+07	94.9	.0	86.5	86.5	1.483E+08	Trn A	8.200E+06	8.280E+06	1.07
25.0	2.664E+07	94.9	.0	86.5	86.5	1.462E+08	Trn A	8.200E+06	8.280E+06	1.07
26.0	2.651E+07	94.9	.0	86.5	86.5	1.440E+08	Trn A	8.200E+06	8.280E+06	1.07
27.0	2.639E+07	94.8	.0	86.5	86.5	1.418E+08	Trn A	8.200E+06	8.280E+06	1.07
28.0	2.628E+07	94.8	.0	86.5	86.5	1.396E+08	Trn A	8.200E+06	8.280E+06	1.07
29.0	2.616E+07	94.7	.0	86.5	86.5	1.374E+08	Trn A	8.200E+06	8.280E+06	1.07
30.0	2.605E+07	94.7	.0	86.5	86.5	1.353E+08	Trn A	8.200E+06	8.280E+06	1.07
31.0	2.593E+07	94.6	.0	86.5	86.5	1.331E+08	Trn A	8.200E+06	8.280E+06	1.07
32.0	2.582E+07	94.5	.0	86.5	86.5	1.309E+08	Trn A	8.200E+06	8.280E+06	1.07
33.0	2.571E+07	94.5	.0	86.5	86.5	1.287E+08	Trn A	8.200E+06	8.280E+06	1.07
34.0	2.561E+07	94.4	.0	86.5	86.5	1.265E+08	Trn A	8.200E+06	8.280E+06	1.07
35.0	2.550E+07	94.3	.0	86.5	86.5	1.244E+08	Trn A	8.200E+06	8.280E+06	1.07
36.0	2.540E+07	94.2	.0	86.5	86.5	1.222E+08	Trn A	8.200E+06	8.280E+06	1.07
37.0	2.530E+07	94.2	.0	86.5	86.5	1.215E+08	Trn A	8.200E+06	8.280E+06	1.07
38.0	2.519E+07	94.1	.0	86.5	86.5	1.208E+08	Trn A	8.200E+06	8.280E+06	1.07
39.0	2.509E+07	94.0	.0	86.5	86.5	1.201E+08	Trn A	8.200E+06	8.280E+06	1.07
40.0	2.499E+07	94.0	.0	86.5	86.5	1.194E+08	Trn A	8.200E+06	8.280E+06	1.07
41.0	2.489E+07	93.9	.0	86.5	86.5	1.187E+08	Trn A	8.200E+06	8.280E+06	1.07
42.0	2.480E+07	93.8	.0	86.5	86.5	1.180E+08	Trn A	8.200E+06	8.280E+06	1.07
43.0	2.470E+07	93.8	.0	86.5	86.5	1.172E+08	Trn A	8.200E+06	8.280E+06	1.07
44.0	2.460E+07	93.8	.0	86.5	86.5	1.165E+08	Trn A	8.200E+06	8.280E+06	1.07
45.0	2.451E+07	93.7	.0	86.5	86.5	1.158E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 18 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=85F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
46.0	2.441E+07	93.7	.0	86.5	86.5	1.151E+08	Trn A	8.200E+06	8.280E+06	1.07
47.0	2.431E+07	93.7	.0	86.5	86.5	1.144E+08	Trn A	8.200E+06	8.280E+06	1.07
48.0	2.422E+07	93.6	.0	86.5	86.5	1.137E+08	Trn A	8.200E+06	8.280E+06	1.07
49.0	2.413E+07	93.6	.0	86.5	86.5	1.134E+08	Trn A	8.200E+06	8.280E+06	1.07
50.0	2.403E+07	93.6	.0	86.5	86.5	1.130E+08	Trn A	8.200E+06	8.280E+06	1.07
51.0	2.394E+07	93.5	.0	86.5	86.5	1.126E+08	Trn A	8.200E+06	8.280E+06	1.07
52.0	2.385E+07	93.5	.0	86.5	86.5	1.123E+08	Trn A	8.200E+06	8.280E+06	1.07
53.0	2.375E+07	93.5	.0	86.5	86.5	1.119E+08	Trn A	8.200E+06	8.280E+06	1.07
54.0	2.366E+07	93.5	.0	86.5	86.5	1.116E+08	Trn A	8.200E+06	8.280E+06	1.07
55.0	2.357E+07	93.5	.0	86.5	86.5	1.112E+08	Trn A	8.200E+06	8.280E+06	1.07
56.0	2.348E+07	93.4	.0	86.5	86.5	1.109E+08	Trn A	8.200E+06	8.280E+06	1.07
57.0	2.339E+07	93.4	.0	86.5	86.5	1.105E+08	Trn A	8.200E+06	8.280E+06	1.07
58.0	2.330E+07	93.4	.0	86.5	86.5	1.101E+08	Trn A	8.200E+06	8.280E+06	1.07
59.0	2.321E+07	93.4	.0	86.5	86.5	1.098E+08	Trn A	8.200E+06	8.280E+06	1.07
60.0	2.312E+07	93.4	.0	86.5	86.5	1.094E+08	Trn A	8.200E+06	8.280E+06	1.07
61.0	2.303E+07	93.3	.0	86.5	86.5	1.091E+08	Trn A	8.200E+06	8.280E+06	1.07
62.0	2.294E+07	93.3	.0	86.5	86.5	1.087E+08	Trn A	8.200E+06	8.280E+06	1.07
63.0	2.285E+07	93.3	.0	86.5	86.5	1.083E+08	Trn A	8.200E+06	8.280E+06	1.07
64.0	2.276E+07	93.3	.0	86.5	86.5	1.080E+08	Trn A	8.200E+06	8.280E+06	1.07
65.0	2.267E+07	93.3	.0	86.5	86.5	1.076E+08	Trn A	8.200E+06	8.280E+06	1.07
66.0	2.258E+07	93.3	.0	86.5	86.5	1.073E+08	Trn A	8.200E+06	8.280E+06	1.07
67.0	2.249E+07	93.2	.0	86.5	86.5	1.069E+08	Trn A	8.200E+06	8.280E+06	1.07
68.0	2.241E+07	93.2	.0	86.5	86.5	1.066E+08	Trn A	8.200E+06	8.280E+06	1.07
69.0	2.232E+07	93.2	.0	86.5	86.5	1.062E+08	Trn A	8.200E+06	8.280E+06	1.07
70.0	2.223E+07	93.2	.0	86.5	86.5	1.058E+08	Trn A	8.200E+06	8.280E+06	1.07
71.0	2.214E+07	93.2	.0	86.5	86.5	1.055E+08	Trn A	8.200E+06	8.280E+06	1.07
72.0	2.206E+07	93.2	.0	86.5	86.5	1.051E+08	Trn A	8.200E+06	8.280E+06	1.07
73.0	2.197E+07	93.1	.0	86.5	86.5	1.048E+08	Trn A	8.200E+06	8.280E+06	1.07
74.0	2.189E+07	93.1	.0	86.5	86.5	1.044E+08	Trn A	8.200E+06	8.280E+06	1.07
75.0	2.180E+07	93.1	.0	86.5	86.5	1.040E+08	Trn A	8.200E+06	8.280E+06	1.07
76.0	2.171E+07	93.1	.0	86.5	86.5	1.037E+08	Trn A	8.200E+06	8.280E+06	1.07
77.0	2.163E+07	93.1	.0	86.5	86.5	1.033E+08	Trn A	8.200E+06	8.280E+06	1.07
78.0	2.155E+07	93.1	.0	86.5	86.5	1.029E+08	Trn A	8.200E+06	8.280E+06	1.07
79.0	2.146E+07	93.0	.0	86.5	86.5	1.026E+08	Trn A	8.200E+06	8.280E+06	1.07
80.0	2.138E+07	93.0	.0	86.5	86.5	1.022E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 19 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=85F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
81.0	2.129E+07	93.0	.0	86.5	86.5	1.018E+08	Trn A	8.200E+06	8.280E+06	1.07
82.0	2.121E+07	93.0	.0	86.5	86.5	1.015E+08	Trn A	8.200E+06	8.280E+06	1.07
83.0	2.113E+07	93.0	.0	86.5	86.5	1.011E+08	Trn A	8.200E+06	8.280E+06	1.07
84.0	2.104E+07	93.0	.0	86.5	86.5	1.007E+08	Trn A	8.200E+06	8.280E+06	1.07
85.0	2.096E+07	92.9	.0	86.5	86.5	1.004E+08	Trn A	8.200E+06	8.280E+06	1.07
86.0	2.088E+07	92.9	.0	86.5	86.5	9.999E+07	Trn A	8.200E+06	8.280E+06	1.07
87.0	2.080E+07	92.9	.0	86.5	86.5	9.962E+07	Trn A	8.200E+06	8.280E+06	1.07
88.0	2.072E+07	92.9	.0	86.5	86.5	9.925E+07	Trn A	8.200E+06	8.280E+06	1.07
89.0	2.064E+07	92.9	.0	86.5	86.5	9.888E+07	Trn A	8.200E+06	8.280E+06	1.07
90.0	2.055E+07	92.8	.0	86.5	86.5	9.852E+07	Trn A	8.200E+06	8.280E+06	1.07
91.0	2.047E+07	92.8	.0	86.5	86.5	9.815E+07	Trn A	8.200E+06	8.280E+06	1.07
92.0	2.039E+07	92.8	.0	86.5	86.5	9.778E+07	Trn A	8.200E+06	8.280E+06	1.07
93.0	2.031E+07	92.8	.0	86.5	86.5	9.741E+07	Trn A	8.200E+06	8.280E+06	1.07
94.0	2.023E+07	92.8	.0	86.5	86.5	9.705E+07	Trn A	8.200E+06	8.280E+06	1.07
95.0	2.015E+07	92.8	.0	86.5	86.5	9.668E+07	Trn A	8.200E+06	8.280E+06	1.07
96.0	2.008E+07	92.7	.0	86.5	86.5	9.631E+07	Trn A	8.200E+06	8.280E+06	1.07
97.0	2.000E+07	92.7	.0	86.5	86.5	9.612E+07	Trn A	8.200E+06	8.280E+06	1.07
98.0	1.992E+07	92.7	.0	86.5	86.5	9.593E+07	Trn A	8.200E+06	8.280E+06	1.07
99.0	1.984E+07	92.7	.0	86.5	86.5	9.574E+07	Trn A	8.200E+06	8.280E+06	1.07
100.0	1.976E+07	92.7	.0	86.5	86.5	9.555E+07	Trn A	8.200E+06	8.280E+06	1.07
101.0	1.968E+07	92.7	.0	86.5	86.5	9.536E+07	Trn A	8.200E+06	8.280E+06	1.07
102.0	1.961E+07	92.6	.0	86.5	86.5	9.517E+07	Trn A	8.200E+06	8.280E+06	1.07
103.0	1.953E+07	92.6	.0	86.5	86.5	9.498E+07	Trn A	8.200E+06	8.280E+06	1.07
104.0	1.945E+07	92.6	.0	86.5	86.5	9.479E+07	Trn A	8.200E+06	8.280E+06	1.07
105.0	1.937E+07	92.6	.0	86.5	86.5	9.460E+07	Trn A	8.200E+06	8.280E+06	1.07
106.0	1.930E+07	92.6	.0	86.5	86.5	9.441E+07	Trn A	8.200E+06	8.280E+06	1.07
107.0	1.922E+07	92.6	.0	86.5	86.5	9.422E+07	Trn A	8.200E+06	8.280E+06	1.07
108.0	1.914E+07	92.6	.0	86.5	86.5	9.403E+07	Trn A	8.200E+06	8.280E+06	1.07
109.0	1.907E+07	92.6	.0	86.5	86.5	9.384E+07	Trn A	8.200E+06	8.280E+06	1.07
110.0	1.899E+07	92.6	.0	86.5	86.5	9.365E+07	Trn A	8.200E+06	8.280E+06	1.07
111.0	1.891E+07	92.6	.0	86.5	86.5	9.346E+07	Trn A	8.200E+06	8.280E+06	1.07
112.0	1.884E+07	92.6	.0	86.5	86.5	9.327E+07	Trn A	8.200E+06	8.280E+06	1.07
113.0	1.876E+07	92.6	.0	86.5	86.5	9.308E+07	Trn A	8.200E+06	8.280E+06	1.07
114.0	1.869E+07	92.6	.0	86.5	86.5	9.289E+07	Trn A	8.200E+06	8.280E+06	1.07
115.0	1.861E+07	92.5	.0	86.5	86.5	9.270E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 20 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=85F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
116.0	1.853E+07	92.5	.0	86.5	86.5	9.251E+07	Trn A	8.200E+06	8.280E+06	1.07
117.0	1.846E+07	92.5	.0	86.5	86.5	9.232E+07	Trn A	8.200E+06	8.280E+06	1.07
118.0	1.838E+07	92.5	.0	86.5	86.5	9.213E+07	Trn A	8.200E+06	8.280E+06	1.07
119.0	1.831E+07	92.5	.0	86.5	86.5	9.194E+07	Trn A	8.200E+06	8.280E+06	1.07
120.0	1.823E+07	92.5	.0	86.5	86.5	9.175E+07	Trn A	8.200E+06	8.280E+06	1.07
121.0	1.816E+07	92.4	.0	86.5	86.5	9.150E+07	Trn A	8.200E+06	8.280E+06	1.07
122.0	1.808E+07	92.4	.0	86.5	86.5	9.126E+07	Trn A	8.200E+06	8.280E+06	1.07
123.0	1.801E+07	92.4	.0	86.5	86.5	9.101E+07	Trn A	8.200E+06	8.280E+06	1.07
124.0	1.794E+07	92.4	.0	86.5	86.5	9.076E+07	Trn A	8.200E+06	8.280E+06	1.07
125.0	1.786E+07	92.4	.0	86.5	86.5	9.052E+07	Trn A	8.200E+06	8.280E+06	1.07
126.0	1.779E+07	92.4	.0	86.5	86.5	9.027E+07	Trn A	8.200E+06	8.280E+06	1.07
127.0	1.771E+07	92.4	.0	86.5	86.5	9.003E+07	Trn A	8.200E+06	8.280E+06	1.07
128.0	1.764E+07	92.4	.0	86.5	86.5	8.978E+07	Trn A	8.200E+06	8.280E+06	1.07
129.0	1.757E+07	92.4	.0	86.5	86.5	8.953E+07	Trn A	8.200E+06	8.280E+06	1.07
130.0	1.749E+07	92.4	.0	86.5	86.5	8.929E+07	Trn A	8.200E+06	8.280E+06	1.07
131.0	1.742E+07	92.3	.0	86.5	86.5	8.904E+07	Trn A	8.200E+06	8.280E+06	1.07
132.0	1.735E+07	92.3	.0	86.5	86.5	8.880E+07	Trn A	8.200E+06	8.280E+06	1.07
133.0	1.728E+07	92.3	.0	86.5	86.5	8.855E+07	Trn A	8.200E+06	8.280E+06	1.07
134.0	1.721E+07	92.3	.0	86.5	86.5	8.830E+07	Trn A	8.200E+06	8.280E+06	1.07
135.0	1.713E+07	92.3	.0	86.5	86.5	8.806E+07	Trn A	8.200E+06	8.280E+06	1.07
136.0	1.706E+07	92.3	.0	86.5	86.5	8.781E+07	Trn A	8.200E+06	8.280E+06	1.07
137.0	1.699E+07	92.3	.0	86.5	86.5	8.757E+07	Trn A	8.200E+06	8.280E+06	1.07
138.0	1.692E+07	92.2	.0	86.5	86.5	8.732E+07	Trn A	8.200E+06	8.280E+06	1.07
139.0	1.685E+07	92.2	.0	86.5	86.5	8.707E+07	Trn A	8.200E+06	8.280E+06	1.07
140.0	1.678E+07	92.2	.0	86.5	86.5	8.683E+07	Trn A	8.200E+06	8.280E+06	1.07
141.0	1.671E+07	92.2	.0	86.5	86.5	8.658E+07	Trn A	8.200E+06	8.280E+06	1.07
142.0	1.664E+07	92.2	.0	86.5	86.5	8.634E+07	Trn A	8.200E+06	8.280E+06	1.07
143.0	1.657E+07	92.2	.0	86.5	86.5	8.609E+07	Trn A	8.200E+06	8.280E+06	1.07
144.0	1.650E+07	92.2	.0	86.5	86.5	8.584E+07	Trn A	8.200E+06	8.280E+06	1.07
145.0	1.643E+07	92.2	.0	86.5	86.5	8.575E+07	Trn A	8.200E+06	8.280E+06	1.07
146.0	1.636E+07	92.2	.0	86.5	86.5	8.567E+07	Trn A	8.200E+06	8.280E+06	1.07
147.0	1.629E+07	92.2	.0	86.5	86.5	8.558E+07	Trn A	8.200E+06	8.280E+06	1.07
148.0	1.622E+07	92.1	.0	86.5	86.5	8.549E+07	Trn A	8.200E+06	8.280E+06	1.07
149.0	1.615E+07	92.1	.0	86.5	86.5	8.540E+07	Trn A	8.200E+06	8.280E+06	1.07
150.0	1.608E+07	92.1	.0	86.5	86.5	8.531E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 21 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 4-fan mode, IBT=85F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
151.0	1.601E+07	92.1	.0	86.5	86.5	8.522E+07	Trn A	8.200E+06	8.280E+06	1.07
152.0	1.594E+07	92.1	.0	86.5	86.5	8.513E+07	Trn A	8.200E+06	8.280E+06	1.07
153.0	1.587E+07	92.1	.0	86.5	86.5	8.504E+07	Trn A	8.200E+06	8.280E+06	1.07
154.0	1.580E+07	92.1	.0	86.5	86.5	8.495E+07	Trn A	8.200E+06	8.280E+06	1.07
155.0	1.573E+07	92.1	.0	86.5	86.5	8.486E+07	Trn A	8.200E+06	8.280E+06	1.07
156.0	1.566E+07	92.1	.0	86.5	86.5	8.477E+07	Trn A	8.200E+06	8.280E+06	1.07
157.0	1.560E+07	92.1	.0	86.5	86.5	8.468E+07	Trn A	8.200E+06	8.280E+06	1.07
158.0	1.553E+07	92.1	.0	86.5	86.5	8.459E+07	Trn A	8.200E+06	8.280E+06	1.07
159.0	1.546E+07	92.1	.0	86.5	86.5	8.450E+07	Trn A	8.200E+06	8.280E+06	1.07
160.0	1.539E+07	92.1	.0	86.5	86.5	8.441E+07	Trn A	8.200E+06	8.280E+06	1.07
161.0	1.532E+07	92.1	.0	86.5	86.5	8.432E+07	Trn A	8.200E+06	8.280E+06	1.07
162.0	1.525E+07	92.1	.0	86.5	86.5	8.423E+07	Trn A	8.200E+06	8.280E+06	1.07
163.0	1.518E+07	92.1	.0	86.5	86.5	8.415E+07	Trn A	8.200E+06	8.280E+06	1.07
164.0	1.512E+07	92.0	.0	86.5	86.5	8.406E+07	Trn A	8.200E+06	8.280E+06	1.07
165.0	1.505E+07	92.0	.0	86.5	86.5	8.397E+07	Trn A	8.200E+06	8.280E+06	1.07
166.0	1.498E+07	92.0	.0	86.5	86.5	8.388E+07	Trn A	8.200E+06	8.280E+06	1.07
167.0	1.491E+07	92.0	.0	86.5	86.5	8.379E+07	Trn A	8.200E+06	8.280E+06	1.07
168.0	1.484E+07	92.1	.0	86.5	86.5	8.370E+07	Trn A	8.200E+06	8.280E+06	1.07
169.0	1.478E+07	92.1	.0	86.5	86.5	8.372E+07	Trn A	8.200E+06	8.280E+06	1.07
170.0	1.471E+07	92.1	.0	86.5	86.5	8.374E+07	Trn A	8.200E+06	8.280E+06	1.07
171.0	1.464E+07	92.1	.0	86.5	86.5	8.376E+07	Trn A	8.200E+06	8.280E+06	1.07
172.0	1.457E+07	92.1	.0	86.5	86.5	8.378E+07	Trn A	8.200E+06	8.280E+06	1.07
173.0	1.450E+07	92.0	.0	86.5	86.5	8.380E+07	Trn A	8.200E+06	8.280E+06	1.07
174.0	1.444E+07	92.0	.0	86.5	86.5	8.382E+07	Trn A	8.200E+06	8.280E+06	1.07
175.0	1.437E+07	92.0	.0	86.5	86.5	8.384E+07	Trn A	8.200E+06	8.280E+06	1.07
176.0	1.430E+07	92.0	.0	86.5	86.5	8.386E+07	Trn A	8.200E+06	8.280E+06	1.07
177.0	1.423E+07	92.0	.0	86.5	86.5	8.388E+07	Trn A	8.200E+06	8.280E+06	1.07
178.0	1.416E+07	92.0	.0	86.5	86.5	8.390E+07	Trn A	8.200E+06	8.280E+06	1.07
179.0	1.410E+07	92.0	.0	86.5	86.5	8.392E+07	Trn A	8.200E+06	8.280E+06	1.07
180.0	1.403E+07	92.0	.0	86.5	86.5	8.394E+07	Trn A	8.200E+06	8.280E+06	1.07
181.0	1.396E+07	92.0	.0	86.5	86.5	8.396E+07	Trn A	8.200E+06	8.280E+06	1.07
182.0	1.389E+07	92.0	.0	86.5	86.5	8.399E+07	Trn A	8.200E+06	8.280E+06	1.07
183.0	1.382E+07	92.0	.0	86.5	86.5	8.401E+07	Trn A	8.200E+06	8.280E+06	1.07
184.0	1.376E+07	92.0	.0	86.5	86.5	8.403E+07	Trn A	8.200E+06	8.280E+06	1.07
185.0	1.369E+07	92.0	.0	86.5	86.5	8.405E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 22 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=85F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
186.0	1.362E+07	92.0	.0	86.5	86.5	8.407E+07	Trn A	8.200E+06	8.280E+06	1.07
187.0	1.355E+07	92.0	.0	86.5	86.5	8.409E+07	Trn A	8.200E+06	8.280E+06	1.07
188.0	1.348E+07	92.1	.0	86.5	86.5	8.411E+07	Trn A	8.200E+06	8.280E+06	1.07
189.0	1.341E+07	92.1	.0	86.5	86.5	8.413E+07	Trn A	8.200E+06	8.280E+06	1.07
190.0	1.335E+07	92.1	.0	86.5	86.5	8.415E+07	Trn A	8.200E+06	8.280E+06	1.07
191.0	1.328E+07	92.0	.0	86.5	86.5	8.417E+07	Trn A	8.200E+06	8.280E+06	1.07
192.0	1.321E+07	92.0	.0	86.5	86.5	8.419E+07	Trn A	8.200E+06	8.280E+06	1.07
193.0	1.314E+07	92.0	.0	86.5	86.5	8.400E+07	Trn A	8.200E+06	8.280E+06	1.07
194.0	1.307E+07	92.0	.0	86.5	86.5	8.381E+07	Trn A	8.200E+06	8.280E+06	1.07
195.0	1.301E+07	92.0	.0	86.5	86.5	8.362E+07	Trn A	8.200E+06	8.280E+06	1.07
196.0	1.294E+07	92.0	.0	86.5	86.5	8.343E+07	Trn A	8.200E+06	8.280E+06	1.07
197.0	1.287E+07	92.0	.0	86.5	86.5	8.324E+07	Trn A	8.200E+06	8.280E+06	1.07
198.0	1.280E+07	92.0	.0	86.5	86.5	8.305E+07	Trn A	8.200E+06	8.280E+06	1.07
199.0	1.274E+07	92.0	.0	86.5	86.5	8.287E+07	Trn A	8.200E+06	8.280E+06	1.07
200.0	1.267E+07	92.0	.0	86.5	86.5	8.268E+07	Trn A	8.200E+06	8.280E+06	1.07
201.0	1.260E+07	92.0	.0	86.5	86.5	8.249E+07	Trn A	8.200E+06	8.280E+06	1.07
202.0	1.253E+07	92.0	.0	86.5	86.5	8.230E+07	Trn A	8.200E+06	8.280E+06	1.07
203.0	1.247E+07	91.9	.0	86.5	86.5	8.211E+07	Trn A	8.200E+06	8.280E+06	1.07
204.0	1.240E+07	91.9	.0	86.5	86.5	8.192E+07	Trn A	8.200E+06	8.280E+06	1.07
205.0	1.233E+07	91.9	.0	86.5	86.5	8.173E+07	Trn A	8.200E+06	8.280E+06	1.07
206.0	1.227E+07	91.9	.0	86.5	86.5	8.154E+07	Trn A	8.200E+06	8.280E+06	1.07
207.0	1.220E+07	91.9	.0	86.5	86.5	8.135E+07	Trn A	8.200E+06	8.280E+06	1.07
208.0	1.214E+07	91.9	.0	86.5	86.5	8.116E+07	Trn A	8.200E+06	8.280E+06	1.07
209.0	1.207E+07	92.0	.0	86.5	86.5	8.097E+07	Trn A	8.200E+06	8.280E+06	1.07
210.0	1.201E+07	92.0	.0	86.5	86.5	8.078E+07	Trn A	8.200E+06	8.280E+06	1.07
211.0	1.194E+07	91.9	.0	86.5	86.5	8.060E+07	Trn A	8.200E+06	8.280E+06	1.07
212.0	1.187E+07	91.9	.0	86.5	86.5	8.041E+07	Trn A	8.200E+06	8.280E+06	1.07
213.0	1.181E+07	91.9	.0	86.5	86.5	8.022E+07	Trn A	8.200E+06	8.280E+06	1.07
214.0	1.174E+07	91.9	.0	86.5	86.5	8.003E+07	Trn A	8.200E+06	8.280E+06	1.07
215.0	1.168E+07	91.9	.0	86.5	86.5	7.984E+07	Trn A	8.200E+06	8.280E+06	1.07
216.0	1.161E+07	91.8	.0	86.5	86.5	7.965E+07	Trn A	8.200E+06	8.280E+06	1.07
217.0	1.155E+07	91.8	.0	86.5	86.5	7.969E+07	Trn A	8.200E+06	8.280E+06	1.07
218.0	1.149E+07	91.8	.0	86.5	86.5	7.972E+07	Trn A	8.200E+06	8.280E+06	1.07
219.0	1.142E+07	91.8	.0	86.5	86.5	7.976E+07	Trn A	8.200E+06	8.280E+06	1.07
220.0	1.136E+07	91.8	.0	86.5	86.5	7.980E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 23 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=85F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
221.0	1.129E+07	91.8	.0	86.5	86.5	7.984E+07	Trn A	8.200E+06	8.280E+06	1.07
222.0	1.123E+07	91.8	.0	86.5	86.5	7.987E+07	Trn A	8.200E+06	8.280E+06	1.07
223.0	1.116E+07	91.8	.0	86.5	86.5	7.991E+07	Trn A	8.200E+06	8.280E+06	1.07
224.0	1.110E+07	91.8	.0	86.5	86.5	7.995E+07	Trn A	8.200E+06	8.280E+06	1.07
225.0	1.103E+07	91.8	.0	86.5	86.5	7.999E+07	Trn A	8.200E+06	8.280E+06	1.07
226.0	1.097E+07	91.8	.0	86.5	86.5	8.002E+07	Trn A	8.200E+06	8.280E+06	1.07
227.0	1.090E+07	91.8	.0	86.5	86.5	8.006E+07	Trn A	8.200E+06	8.280E+06	1.07
228.0	1.084E+07	91.8	.0	86.5	86.5	8.010E+07	Trn A	8.200E+06	8.280E+06	1.07
229.0	1.077E+07	91.8	.0	86.5	86.5	8.014E+07	Trn A	8.200E+06	8.280E+06	1.07
230.0	1.071E+07	91.8	.0	86.5	86.5	8.017E+07	Trn A	8.200E+06	8.280E+06	1.07
231.0	1.064E+07	91.8	.0	86.5	86.5	8.021E+07	Trn A	8.200E+06	8.280E+06	1.07
232.0	1.058E+07	91.8	.0	86.5	86.5	8.025E+07	Trn A	8.200E+06	8.280E+06	1.07
233.0	1.051E+07	91.8	.0	86.5	86.5	8.029E+07	Trn A	8.200E+06	8.280E+06	1.07
234.0	1.045E+07	91.8	.0	86.5	86.5	8.032E+07	Trn A	8.200E+06	8.280E+06	1.07
235.0	1.038E+07	91.8	.0	86.5	86.5	8.036E+07	Trn A	8.200E+06	8.280E+06	1.07
236.0	1.032E+07	91.8	.0	86.5	86.5	8.040E+07	Trn A	8.200E+06	8.280E+06	1.07
237.0	1.025E+07	91.8	.0	86.5	86.5	8.044E+07	Trn A	8.200E+06	8.280E+06	1.07
238.0	1.019E+07	91.9	.0	86.5	86.5	8.047E+07	Trn A	8.200E+06	8.280E+06	1.07
239.0	1.012E+07	91.9	.0	86.5	86.5	8.051E+07	Trn A	8.200E+06	8.280E+06	1.07
240.0	1.006E+07	91.9	.0	86.5	86.5	8.055E+07	Trn A	8.200E+06	8.280E+06	1.07

Stop - Program terminated.

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 24 of 166
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3. UHSSIM input/output for *Fan4_80F*, 4-Fan Case with IBT of 80 °F

Fan4_80F.inp

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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 4-fan mode, IBT=80F
# design wet-bulb temperature [F], design dry-bulb temperature [F],
# design hot-water temperature [F], design pressure [psia], design solids [ppt]
# 0 => F, psia, btu/hr, lbm/hr units
82, 98, 129.0, 14.696, 0.0, 0
# initial basin mass [lbm], initial basin temperature [F], initial solids [ppt],
# number of towers, starting time of simulation [hr]
29843200, 80, 0, 1, 0.
# Time Period Data -- every 0.1 hour for 10 hr then every hour up to 10 days
# step size, number of steps
0.1,100
1,230
*
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,8.2e6,8.28e6,1.07
240.0,8.2e6,8.28e6,1.07
*
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
0 s 3.2565E+08
50 s 3.2565E+08
101 s 3.2565E+08
116 s 3.1609E+08
120 s 3.1487E+08
150 s 3.1640E+08
300 s 3.1640E+08
900 s 3.1640E+08
1800 s 3.0196E+08
2704 s 2.8660E+08
2706 s 4.4627E+08
3600 s 4.3946E+08
2 h 2.2984E+08
4 h 1.4731E+08
6 h 1.4644E+08
9 h 1.4354E+08
12 h 1.4254E+08
18 h 1.5095E+08
24 h 1.4834E+08
36 h 1.2219E+08
2 d 1.1371E+08
3 d 1.0513E+08
4 d 9.6311E+07
5 d 9.1747E+07
6 d 8.5844E+07
7 d 8.3698E+07
8 d 8.4190E+07
9 d 7.9649E+07
10 d 8.0549E+07
*
# Ambient Data Supplied by Bechtel Power Corp.
# TIME WB DB P
# (hr) (F) (F) (psia)
0, 86.5, 86.5, 14.7
240, 86.5, 86.5, 14.7

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Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 25 of 166
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Fan4_80F.out

Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=80F

Initial Basin Mass 2.984E+07 lbm
Initial Basin Temperature 80.0 F
Initial Basin Solids .0 ppt

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
.0	2.984E+07	80.0	.0	86.5	86.5	3.257E+08	Trn A	8.200E+06	8.280E+06	1.07
.1	2.983E+07	80.4	.0	86.5	86.5	3.164E+08	Trn A	8.200E+06	8.280E+06	1.07
.2	2.981E+07	80.9	.0	86.5	86.5	3.164E+08	Trn A	8.200E+06	8.280E+06	1.07
.3	2.980E+07	81.3	.0	86.5	86.5	3.135E+08	Trn A	8.200E+06	8.280E+06	1.07
.4	2.978E+07	81.7	.0	86.5	86.5	3.077E+08	Trn A	8.200E+06	8.280E+06	1.07
.5	2.976E+07	82.1	.0	86.5	86.5	3.020E+08	Trn A	8.200E+06	8.280E+06	1.07
.6	2.975E+07	82.4	.0	86.5	86.5	2.958E+08	Trn A	8.200E+06	8.280E+06	1.07
.7	2.973E+07	82.8	.0	86.5	86.5	2.897E+08	Trn A	8.200E+06	8.280E+06	1.07
.8	2.971E+07	83.2	.0	86.5	86.5	4.449E+08	Trn A	8.200E+06	8.280E+06	1.07
.9	2.968E+07	83.6	.0	86.5	86.5	4.422E+08	Trn A	8.200E+06	8.280E+06	1.07
1.0	2.966E+07	84.0	.0	86.5	86.5	4.395E+08	Trn A	8.200E+06	8.280E+06	1.07
1.1	2.963E+07	84.4	.0	86.5	86.5	4.185E+08	Trn A	8.200E+06	8.280E+06	1.07
1.2	2.960E+07	84.8	.0	86.5	86.5	3.975E+08	Trn A	8.200E+06	8.280E+06	1.07
1.3	2.958E+07	85.2	.0	86.5	86.5	3.766E+08	Trn A	8.200E+06	8.280E+06	1.07
1.4	2.956E+07	85.5	.0	86.5	86.5	3.556E+08	Trn A	8.200E+06	8.280E+06	1.07
1.5	2.954E+07	85.8	.0	86.5	86.5	3.346E+08	Trn A	8.200E+06	8.280E+06	1.07
1.6	2.952E+07	86.1	.0	86.5	86.5	3.137E+08	Trn A	8.200E+06	8.280E+06	1.07
1.7	2.950E+07	86.4	.0	86.5	86.5	2.927E+08	Trn A	8.200E+06	8.280E+06	1.07
1.8	2.948E+07	86.7	.0	86.5	86.5	2.718E+08	Trn A	8.200E+06	8.280E+06	1.07
1.9	2.947E+07	87.0	.0	86.5	86.5	2.508E+08	Trn A	8.200E+06	8.280E+06	1.07
2.0	2.945E+07	87.2	.0	86.5	86.5	2.298E+08	Trn A	8.200E+06	8.280E+06	1.07
2.1	2.944E+07	87.4	.0	86.5	86.5	2.257E+08	Trn A	8.200E+06	8.280E+06	1.07
2.2	2.943E+07	87.6	.0	86.5	86.5	2.216E+08	Trn A	8.200E+06	8.280E+06	1.07
2.3	2.941E+07	87.8	.0	86.5	86.5	2.175E+08	Trn A	8.200E+06	8.280E+06	1.07
2.4	2.940E+07	88.0	.0	86.5	86.5	2.133E+08	Trn A	8.200E+06	8.280E+06	1.07
2.5	2.939E+07	88.2	.0	86.5	86.5	2.092E+08	Trn A	8.200E+06	8.280E+06	1.07
2.6	2.937E+07	88.4	.0	86.5	86.5	2.051E+08	Trn A	8.200E+06	8.280E+06	1.07
2.7	2.936E+07	88.6	.0	86.5	86.5	2.010E+08	Trn A	8.200E+06	8.280E+06	1.07
2.8	2.935E+07	88.8	.0	86.5	86.5	1.968E+08	Trn A	8.200E+06	8.280E+06	1.07
2.9	2.934E+07	88.9	.0	86.5	86.5	1.927E+08	Trn A	8.200E+06	8.280E+06	1.07
3.0	2.932E+07	89.1	.0	86.5	86.5	1.886E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 26 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=80F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
3.1	2.931E+07	89.2	.0	86.5	86.5	1.844E+08	Trn A	8.200E+06	8.280E+06	1.07
3.2	2.930E+07	89.4	.0	86.5	86.5	1.803E+08	Trn A	8.200E+06	8.280E+06	1.07
3.3	2.929E+07	89.5	.0	86.5	86.5	1.762E+08	Trn A	8.200E+06	8.280E+06	1.07
3.4	2.928E+07	89.7	.0	86.5	86.5	1.721E+08	Trn A	8.200E+06	8.280E+06	1.07
3.5	2.927E+07	89.8	.0	86.5	86.5	1.679E+08	Trn A	8.200E+06	8.280E+06	1.07
3.6	2.926E+07	89.9	.0	86.5	86.5	1.638E+08	Trn A	8.200E+06	8.280E+06	1.07
3.7	2.925E+07	90.0	.0	86.5	86.5	1.597E+08	Trn A	8.200E+06	8.280E+06	1.07
3.8	2.924E+07	90.1	.0	86.5	86.5	1.556E+08	Trn A	8.200E+06	8.280E+06	1.07
3.9	2.923E+07	90.2	.0	86.5	86.5	1.514E+08	Trn A	8.200E+06	8.280E+06	1.07
4.0	2.922E+07	90.3	.0	86.5	86.5	1.473E+08	Trn A	8.200E+06	8.280E+06	1.07
4.1	2.921E+07	90.4	.0	86.5	86.5	1.473E+08	Trn A	8.200E+06	8.280E+06	1.07
4.2	2.920E+07	90.5	.0	86.5	86.5	1.472E+08	Trn A	8.200E+06	8.280E+06	1.07
4.3	2.919E+07	90.6	.0	86.5	86.5	1.472E+08	Trn A	8.200E+06	8.280E+06	1.07
4.4	2.918E+07	90.7	.0	86.5	86.5	1.471E+08	Trn A	8.200E+06	8.280E+06	1.07
4.5	2.917E+07	90.8	.0	86.5	86.5	1.471E+08	Trn A	8.200E+06	8.280E+06	1.07
4.6	2.916E+07	90.9	.0	86.5	86.5	1.470E+08	Trn A	8.200E+06	8.280E+06	1.07
4.7	2.915E+07	90.9	.0	86.5	86.5	1.470E+08	Trn A	8.200E+06	8.280E+06	1.07
4.8	2.914E+07	91.0	.0	86.5	86.5	1.470E+08	Trn A	8.200E+06	8.280E+06	1.07
4.9	2.913E+07	91.1	.0	86.5	86.5	1.469E+08	Trn A	8.200E+06	8.280E+06	1.07
5.0	2.912E+07	91.2	.0	86.5	86.5	1.469E+08	Trn A	8.200E+06	8.280E+06	1.07
5.1	2.911E+07	91.3	.0	86.5	86.5	1.468E+08	Trn A	8.200E+06	8.280E+06	1.07
5.2	2.910E+07	91.3	.0	86.5	86.5	1.468E+08	Trn A	8.200E+06	8.280E+06	1.07
5.3	2.909E+07	91.4	.0	86.5	86.5	1.467E+08	Trn A	8.200E+06	8.280E+06	1.07
5.4	2.907E+07	91.5	.0	86.5	86.5	1.467E+08	Trn A	8.200E+06	8.280E+06	1.07
5.5	2.906E+07	91.5	.0	86.5	86.5	1.467E+08	Trn A	8.200E+06	8.280E+06	1.07
5.6	2.905E+07	91.6	.0	86.5	86.5	1.466E+08	Trn A	8.200E+06	8.280E+06	1.07
5.7	2.904E+07	91.7	.0	86.5	86.5	1.466E+08	Trn A	8.200E+06	8.280E+06	1.07
5.8	2.903E+07	91.8	.0	86.5	86.5	1.465E+08	Trn A	8.200E+06	8.280E+06	1.07
5.9	2.902E+07	91.8	.0	86.5	86.5	1.465E+08	Trn A	8.200E+06	8.280E+06	1.07
6.0	2.901E+07	91.9	.0	86.5	86.5	1.464E+08	Trn A	8.200E+06	8.280E+06	1.07
6.1	2.900E+07	91.9	.0	86.5	86.5	1.463E+08	Trn A	8.200E+06	8.280E+06	1.07
6.2	2.899E+07	92.0	.0	86.5	86.5	1.462E+08	Trn A	8.200E+06	8.280E+06	1.07
6.3	2.898E+07	92.1	.0	86.5	86.5	1.462E+08	Trn A	8.200E+06	8.280E+06	1.07
6.4	2.897E+07	92.1	.0	86.5	86.5	1.461E+08	Trn A	8.200E+06	8.280E+06	1.07
6.5	2.896E+07	92.2	.0	86.5	86.5	1.460E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 27 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=80F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
6.6	2.895E+07	92.2	.0	86.5	86.5	1.459E+08	Trn A	8.200E+06	8.280E+06	1.07
6.7	2.894E+07	92.3	.0	86.5	86.5	1.458E+08	Trn A	8.200E+06	8.280E+06	1.07
6.8	2.893E+07	92.3	.0	86.5	86.5	1.457E+08	Trn A	8.200E+06	8.280E+06	1.07
6.9	2.892E+07	92.4	.0	86.5	86.5	1.456E+08	Trn A	8.200E+06	8.280E+06	1.07
7.0	2.890E+07	92.4	.0	86.5	86.5	1.455E+08	Trn A	8.200E+06	8.280E+06	1.07
7.1	2.889E+07	92.5	.0	86.5	86.5	1.454E+08	Trn A	8.200E+06	8.280E+06	1.07
7.2	2.888E+07	92.5	.0	86.5	86.5	1.453E+08	Trn A	8.200E+06	8.280E+06	1.07
7.3	2.887E+07	92.6	.0	86.5	86.5	1.452E+08	Trn A	8.200E+06	8.280E+06	1.07
7.4	2.886E+07	92.6	.0	86.5	86.5	1.451E+08	Trn A	8.200E+06	8.280E+06	1.07
7.5	2.885E+07	92.7	.0	86.5	86.5	1.450E+08	Trn A	8.200E+06	8.280E+06	1.07
7.6	2.884E+07	92.7	.0	86.5	86.5	1.449E+08	Trn A	8.200E+06	8.280E+06	1.07
7.7	2.883E+07	92.8	.0	86.5	86.5	1.448E+08	Trn A	8.200E+06	8.280E+06	1.07
7.8	2.882E+07	92.8	.0	86.5	86.5	1.447E+08	Trn A	8.200E+06	8.280E+06	1.07
7.9	2.881E+07	92.8	.0	86.5	86.5	1.446E+08	Trn A	8.200E+06	8.280E+06	1.07
8.0	2.880E+07	92.9	.0	86.5	86.5	1.445E+08	Trn A	8.200E+06	8.280E+06	1.07
8.1	2.878E+07	92.9	.0	86.5	86.5	1.444E+08	Trn A	8.200E+06	8.280E+06	1.07
8.2	2.877E+07	93.0	.0	86.5	86.5	1.443E+08	Trn A	8.200E+06	8.280E+06	1.07
8.3	2.876E+07	93.0	.0	86.5	86.5	1.442E+08	Trn A	8.200E+06	8.280E+06	1.07
8.4	2.875E+07	93.0	.0	86.5	86.5	1.441E+08	Trn A	8.200E+06	8.280E+06	1.07
8.5	2.874E+07	93.1	.0	86.5	86.5	1.440E+08	Trn A	8.200E+06	8.280E+06	1.07
8.6	2.873E+07	93.1	.0	86.5	86.5	1.439E+08	Trn A	8.200E+06	8.280E+06	1.07
8.7	2.872E+07	93.1	.0	86.5	86.5	1.438E+08	Trn A	8.200E+06	8.280E+06	1.07
8.8	2.871E+07	93.2	.0	86.5	86.5	1.437E+08	Trn A	8.200E+06	8.280E+06	1.07
8.9	2.870E+07	93.2	.0	86.5	86.5	1.436E+08	Trn A	8.200E+06	8.280E+06	1.07
9.0	2.869E+07	93.2	.0	86.5	86.5	1.435E+08	Trn A	8.200E+06	8.280E+06	1.07
9.1	2.867E+07	93.3	.0	86.5	86.5	1.435E+08	Trn A	8.200E+06	8.280E+06	1.07
9.2	2.866E+07	93.3	.0	86.5	86.5	1.435E+08	Trn A	8.200E+06	8.280E+06	1.07
9.3	2.865E+07	93.3	.0	86.5	86.5	1.434E+08	Trn A	8.200E+06	8.280E+06	1.07
9.4	2.864E+07	93.4	.0	86.5	86.5	1.434E+08	Trn A	8.200E+06	8.280E+06	1.07
9.5	2.863E+07	93.4	.0	86.5	86.5	1.434E+08	Trn A	8.200E+06	8.280E+06	1.07
9.6	2.862E+07	93.4	.0	86.5	86.5	1.433E+08	Trn A	8.200E+06	8.280E+06	1.07
9.7	2.861E+07	93.4	.0	86.5	86.5	1.433E+08	Trn A	8.200E+06	8.280E+06	1.07
9.8	2.860E+07	93.5	.0	86.5	86.5	1.433E+08	Trn A	8.200E+06	8.280E+06	1.07
9.9	2.858E+07	93.5	.0	86.5	86.5	1.432E+08	Trn A	8.200E+06	8.280E+06	1.07
10.0	2.857E+07	93.5	.0	86.5	86.5	1.432E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 28 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=80F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
11.0	2.846E+07	93.8	.0	86.5	86.5	1.429E+08	Trn A	8.200E+06	8.280E+06	1.07
12.0	2.835E+07	93.9	.0	86.5	86.5	1.425E+08	Trn A	8.200E+06	8.280E+06	1.07
13.0	2.823E+07	94.1	.0	86.5	86.5	1.439E+08	Trn A	8.200E+06	8.280E+06	1.07
14.0	2.811E+07	94.2	.0	86.5	86.5	1.453E+08	Trn A	8.200E+06	8.280E+06	1.07
15.0	2.800E+07	94.3	.0	86.5	86.5	1.467E+08	Trn A	8.200E+06	8.280E+06	1.07
16.0	2.788E+07	94.4	.0	86.5	86.5	1.481E+08	Trn A	8.200E+06	8.280E+06	1.07
17.0	2.775E+07	94.5	.0	86.5	86.5	1.495E+08	Trn A	8.200E+06	8.280E+06	1.07
18.0	2.763E+07	94.6	.0	86.5	86.5	1.509E+08	Trn A	8.200E+06	8.280E+06	1.07
19.0	2.751E+07	94.7	.0	86.5	86.5	1.505E+08	Trn A	8.200E+06	8.280E+06	1.07
20.0	2.738E+07	94.8	.0	86.5	86.5	1.501E+08	Trn A	8.200E+06	8.280E+06	1.07
21.0	2.726E+07	94.8	.0	86.5	86.5	1.496E+08	Trn A	8.200E+06	8.280E+06	1.07
22.0	2.714E+07	94.8	.0	86.5	86.5	1.492E+08	Trn A	8.200E+06	8.280E+06	1.07
23.0	2.701E+07	94.9	.0	86.5	86.5	1.488E+08	Trn A	8.200E+06	8.280E+06	1.07
24.0	2.689E+07	94.9	.0	86.5	86.5	1.483E+08	Trn A	8.200E+06	8.280E+06	1.07
25.0	2.677E+07	94.9	.0	86.5	86.5	1.462E+08	Trn A	8.200E+06	8.280E+06	1.07
26.0	2.665E+07	94.9	.0	86.5	86.5	1.440E+08	Trn A	8.200E+06	8.280E+06	1.07
27.0	2.653E+07	94.8	.0	86.5	86.5	1.418E+08	Trn A	8.200E+06	8.280E+06	1.07
28.0	2.641E+07	94.8	.0	86.5	86.5	1.396E+08	Trn A	8.200E+06	8.280E+06	1.07
29.0	2.629E+07	94.7	.0	86.5	86.5	1.374E+08	Trn A	8.200E+06	8.280E+06	1.07
30.0	2.618E+07	94.7	.0	86.5	86.5	1.353E+08	Trn A	8.200E+06	8.280E+06	1.07
31.0	2.607E+07	94.6	.0	86.5	86.5	1.331E+08	Trn A	8.200E+06	8.280E+06	1.07
32.0	2.596E+07	94.5	.0	86.5	86.5	1.309E+08	Trn A	8.200E+06	8.280E+06	1.07
33.0	2.585E+07	94.5	.0	86.5	86.5	1.287E+08	Trn A	8.200E+06	8.280E+06	1.07
34.0	2.574E+07	94.4	.0	86.5	86.5	1.265E+08	Trn A	8.200E+06	8.280E+06	1.07
35.0	2.563E+07	94.3	.0	86.5	86.5	1.244E+08	Trn A	8.200E+06	8.280E+06	1.07
36.0	2.553E+07	94.2	.0	86.5	86.5	1.222E+08	Trn A	8.200E+06	8.280E+06	1.07
37.0	2.543E+07	94.1	.0	86.5	86.5	1.215E+08	Trn A	8.200E+06	8.280E+06	1.07
38.0	2.533E+07	94.1	.0	86.5	86.5	1.208E+08	Trn A	8.200E+06	8.280E+06	1.07
39.0	2.523E+07	94.0	.0	86.5	86.5	1.201E+08	Trn A	8.200E+06	8.280E+06	1.07
40.0	2.513E+07	93.9	.0	86.5	86.5	1.194E+08	Trn A	8.200E+06	8.280E+06	1.07
41.0	2.503E+07	93.9	.0	86.5	86.5	1.187E+08	Trn A	8.200E+06	8.280E+06	1.07
42.0	2.493E+07	93.9	.0	86.5	86.5	1.180E+08	Trn A	8.200E+06	8.280E+06	1.07
43.0	2.483E+07	93.8	.0	86.5	86.5	1.172E+08	Trn A	8.200E+06	8.280E+06	1.07
44.0	2.474E+07	93.8	.0	86.5	86.5	1.165E+08	Trn A	8.200E+06	8.280E+06	1.07
45.0	2.464E+07	93.7	.0	86.5	86.5	1.158E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 29 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 4-fan mode, IBT=80F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
46.0	2.454E+07	93.7	.0	86.5	86.5	1.151E+08	Trn A	8.200E+06	8.280E+06	1.07
47.0	2.445E+07	93.7	.0	86.5	86.5	1.144E+08	Trn A	8.200E+06	8.280E+06	1.07
48.0	2.435E+07	93.6	.0	86.5	86.5	1.137E+08	Trn A	8.200E+06	8.280E+06	1.07
49.0	2.426E+07	93.6	.0	86.5	86.5	1.134E+08	Trn A	8.200E+06	8.280E+06	1.07
50.0	2.417E+07	93.6	.0	86.5	86.5	1.130E+08	Trn A	8.200E+06	8.280E+06	1.07
51.0	2.407E+07	93.5	.0	86.5	86.5	1.126E+08	Trn A	8.200E+06	8.280E+06	1.07
52.0	2.398E+07	93.5	.0	86.5	86.5	1.123E+08	Trn A	8.200E+06	8.280E+06	1.07
53.0	2.389E+07	93.5	.0	86.5	86.5	1.119E+08	Trn A	8.200E+06	8.280E+06	1.07
54.0	2.380E+07	93.5	.0	86.5	86.5	1.116E+08	Trn A	8.200E+06	8.280E+06	1.07
55.0	2.370E+07	93.5	.0	86.5	86.5	1.112E+08	Trn A	8.200E+06	8.280E+06	1.07
56.0	2.361E+07	93.4	.0	86.5	86.5	1.109E+08	Trn A	8.200E+06	8.280E+06	1.07
57.0	2.352E+07	93.4	.0	86.5	86.5	1.105E+08	Trn A	8.200E+06	8.280E+06	1.07
58.0	2.343E+07	93.4	.0	86.5	86.5	1.101E+08	Trn A	8.200E+06	8.280E+06	1.07
59.0	2.334E+07	93.4	.0	86.5	86.5	1.098E+08	Trn A	8.200E+06	8.280E+06	1.07
60.0	2.325E+07	93.4	.0	86.5	86.5	1.094E+08	Trn A	8.200E+06	8.280E+06	1.07
61.0	2.316E+07	93.3	.0	86.5	86.5	1.091E+08	Trn A	8.200E+06	8.280E+06	1.07
62.0	2.307E+07	93.3	.0	86.5	86.5	1.087E+08	Trn A	8.200E+06	8.280E+06	1.07
63.0	2.298E+07	93.3	.0	86.5	86.5	1.083E+08	Trn A	8.200E+06	8.280E+06	1.07
64.0	2.289E+07	93.3	.0	86.5	86.5	1.080E+08	Trn A	8.200E+06	8.280E+06	1.07
65.0	2.280E+07	93.3	.0	86.5	86.5	1.076E+08	Trn A	8.200E+06	8.280E+06	1.07
66.0	2.271E+07	93.2	.0	86.5	86.5	1.073E+08	Trn A	8.200E+06	8.280E+06	1.07
67.0	2.263E+07	93.2	.0	86.5	86.5	1.069E+08	Trn A	8.200E+06	8.280E+06	1.07
68.0	2.254E+07	93.2	.0	86.5	86.5	1.066E+08	Trn A	8.200E+06	8.280E+06	1.07
69.0	2.245E+07	93.2	.0	86.5	86.5	1.062E+08	Trn A	8.200E+06	8.280E+06	1.07
70.0	2.236E+07	93.2	.0	86.5	86.5	1.058E+08	Trn A	8.200E+06	8.280E+06	1.07
71.0	2.228E+07	93.2	.0	86.5	86.5	1.055E+08	Trn A	8.200E+06	8.280E+06	1.07
72.0	2.219E+07	93.1	.0	86.5	86.5	1.051E+08	Trn A	8.200E+06	8.280E+06	1.07
73.0	2.210E+07	93.1	.0	86.5	86.5	1.048E+08	Trn A	8.200E+06	8.280E+06	1.07
74.0	2.202E+07	93.1	.0	86.5	86.5	1.044E+08	Trn A	8.200E+06	8.280E+06	1.07
75.0	2.193E+07	93.1	.0	86.5	86.5	1.040E+08	Trn A	8.200E+06	8.280E+06	1.07
76.0	2.185E+07	93.1	.0	86.5	86.5	1.037E+08	Trn A	8.200E+06	8.280E+06	1.07
77.0	2.176E+07	93.1	.0	86.5	86.5	1.033E+08	Trn A	8.200E+06	8.280E+06	1.07
78.0	2.168E+07	93.0	.0	86.5	86.5	1.029E+08	Trn A	8.200E+06	8.280E+06	1.07
79.0	2.159E+07	93.0	.0	86.5	86.5	1.026E+08	Trn A	8.200E+06	8.280E+06	1.07
80.0	2.151E+07	93.0	.0	86.5	86.5	1.022E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 30 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 4-fan mode, IBT=80F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
81.0	2.143E+07	93.0	.0	86.5	86.5	1.018E+08	Trn A	8.200E+06	8.280E+06	1.07
82.0	2.134E+07	93.0	.0	86.5	86.5	1.015E+08	Trn A	8.200E+06	8.280E+06	1.07
83.0	2.126E+07	93.0	.0	86.5	86.5	1.011E+08	Trn A	8.200E+06	8.280E+06	1.07
84.0	2.118E+07	93.0	.0	86.5	86.5	1.007E+08	Trn A	8.200E+06	8.280E+06	1.07
85.0	2.110E+07	92.9	.0	86.5	86.5	1.004E+08	Trn A	8.200E+06	8.280E+06	1.07
86.0	2.101E+07	92.9	.0	86.5	86.5	9.999E+07	Trn A	8.200E+06	8.280E+06	1.07
87.0	2.093E+07	92.9	.0	86.5	86.5	9.962E+07	Trn A	8.200E+06	8.280E+06	1.07
88.0	2.085E+07	92.9	.0	86.5	86.5	9.925E+07	Trn A	8.200E+06	8.280E+06	1.07
89.0	2.077E+07	92.9	.0	86.5	86.5	9.888E+07	Trn A	8.200E+06	8.280E+06	1.07
90.0	2.069E+07	92.9	.0	86.5	86.5	9.852E+07	Trn A	8.200E+06	8.280E+06	1.07
91.0	2.061E+07	92.8	.0	86.5	86.5	9.815E+07	Trn A	8.200E+06	8.280E+06	1.07
92.0	2.053E+07	92.8	.0	86.5	86.5	9.778E+07	Trn A	8.200E+06	8.280E+06	1.07
93.0	2.045E+07	92.8	.0	86.5	86.5	9.741E+07	Trn A	8.200E+06	8.280E+06	1.07
94.0	2.037E+07	92.8	.0	86.5	86.5	9.705E+07	Trn A	8.200E+06	8.280E+06	1.07
95.0	2.029E+07	92.8	.0	86.5	86.5	9.668E+07	Trn A	8.200E+06	8.280E+06	1.07
96.0	2.021E+07	92.7	.0	86.5	86.5	9.631E+07	Trn A	8.200E+06	8.280E+06	1.07
97.0	2.013E+07	92.7	.0	86.5	86.5	9.612E+07	Trn A	8.200E+06	8.280E+06	1.07
98.0	2.005E+07	92.7	.0	86.5	86.5	9.593E+07	Trn A	8.200E+06	8.280E+06	1.07
99.0	1.997E+07	92.7	.0	86.5	86.5	9.574E+07	Trn A	8.200E+06	8.280E+06	1.07
100.0	1.990E+07	92.7	.0	86.5	86.5	9.555E+07	Trn A	8.200E+06	8.280E+06	1.07
101.0	1.982E+07	92.7	.0	86.5	86.5	9.536E+07	Trn A	8.200E+06	8.280E+06	1.07
102.0	1.974E+07	92.6	.0	86.5	86.5	9.517E+07	Trn A	8.200E+06	8.280E+06	1.07
103.0	1.966E+07	92.6	.0	86.5	86.5	9.498E+07	Trn A	8.200E+06	8.280E+06	1.07
104.0	1.958E+07	92.6	.0	86.5	86.5	9.479E+07	Trn A	8.200E+06	8.280E+06	1.07
105.0	1.951E+07	92.6	.0	86.5	86.5	9.460E+07	Trn A	8.200E+06	8.280E+06	1.07
106.0	1.943E+07	92.6	.0	86.5	86.5	9.441E+07	Trn A	8.200E+06	8.280E+06	1.07
107.0	1.935E+07	92.6	.0	86.5	86.5	9.422E+07	Trn A	8.200E+06	8.280E+06	1.07
108.0	1.928E+07	92.6	.0	86.5	86.5	9.403E+07	Trn A	8.200E+06	8.280E+06	1.07
109.0	1.920E+07	92.6	.0	86.5	86.5	9.384E+07	Trn A	8.200E+06	8.280E+06	1.07
110.0	1.912E+07	92.6	.0	86.5	86.5	9.365E+07	Trn A	8.200E+06	8.280E+06	1.07
111.0	1.905E+07	92.6	.0	86.5	86.5	9.346E+07	Trn A	8.200E+06	8.280E+06	1.07
112.0	1.897E+07	92.6	.0	86.5	86.5	9.327E+07	Trn A	8.200E+06	8.280E+06	1.07
113.0	1.889E+07	92.5	.0	86.5	86.5	9.308E+07	Trn A	8.200E+06	8.280E+06	1.07
114.0	1.882E+07	92.5	.0	86.5	86.5	9.289E+07	Trn A	8.200E+06	8.280E+06	1.07
115.0	1.874E+07	92.5	.0	86.5	86.5	9.270E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 31 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=80F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
{hr}	{lbm}	[F]	{ppt}	[F]	[F]	{btu/hr}		{lbm/hr}	{lbm/hr}	{-}
116.0	1.867E+07	92.5	.0	86.5	86.5	9.251E+07	Trn A	8.200E+06	8.280E+06	1.07
117.0	1.859E+07	92.5	.0	86.5	86.5	9.232E+07	Trn A	8.200E+06	8.280E+06	1.07
118.0	1.852E+07	92.5	.0	86.5	86.5	9.213E+07	Trn A	8.200E+06	8.280E+06	1.07
119.0	1.844E+07	92.5	.0	86.5	86.5	9.194E+07	Trn A	8.200E+06	8.280E+06	1.07
120.0	1.837E+07	92.5	.0	86.5	86.5	9.175E+07	Trn A	8.200E+06	8.280E+06	1.07
121.0	1.829E+07	92.5	.0	86.5	86.5	9.150E+07	Trn A	8.200E+06	8.280E+06	1.07
122.0	1.822E+07	92.5	.0	86.5	86.5	9.126E+07	Trn A	8.200E+06	8.280E+06	1.07
123.0	1.814E+07	92.4	.0	86.5	86.5	9.101E+07	Trn A	8.200E+06	8.280E+06	1.07
124.0	1.807E+07	92.4	.0	86.5	86.5	9.076E+07	Trn A	8.200E+06	8.280E+06	1.07
125.0	1.799E+07	92.4	.0	86.5	86.5	9.052E+07	Trn A	8.200E+06	8.280E+06	1.07
126.0	1.792E+07	92.4	.0	86.5	86.5	9.027E+07	Trn A	8.200E+06	8.280E+06	1.07
127.0	1.785E+07	92.4	.0	86.5	86.5	9.003E+07	Trn A	8.200E+06	8.280E+06	1.07
128.0	1.777E+07	92.4	.0	86.5	86.5	8.978E+07	Trn A	8.200E+06	8.280E+06	1.07
129.0	1.770E+07	92.4	.0	86.5	86.5	8.953E+07	Trn A	8.200E+06	8.280E+06	1.07
130.0	1.763E+07	92.4	.0	86.5	86.5	8.929E+07	Trn A	8.200E+06	8.280E+06	1.07
131.0	1.756E+07	92.3	.0	86.5	86.5	8.904E+07	Trn A	8.200E+06	8.280E+06	1.07
132.0	1.748E+07	92.3	.0	86.5	86.5	8.880E+07	Trn A	8.200E+06	8.280E+06	1.07
133.0	1.741E+07	92.3	.0	86.5	86.5	8.855E+07	Trn A	8.200E+06	8.280E+06	1.07
134.0	1.734E+07	92.3	.0	86.5	86.5	8.830E+07	Trn A	8.200E+06	8.280E+06	1.07
135.0	1.727E+07	92.3	.0	86.5	86.5	8.806E+07	Trn A	8.200E+06	8.280E+06	1.07
136.0	1.719E+07	92.2	.0	86.5	86.5	8.781E+07	Trn A	8.200E+06	8.280E+06	1.07
137.0	1.712E+07	92.2	.0	86.5	86.5	8.757E+07	Trn A	8.200E+06	8.280E+06	1.07
138.0	1.705E+07	92.2	.0	86.5	86.5	8.732E+07	Trn A	8.200E+06	8.280E+06	1.07
139.0	1.698E+07	92.3	.0	86.5	86.5	8.707E+07	Trn A	8.200E+06	8.280E+06	1.07
140.0	1.691E+07	92.3	.0	86.5	86.5	8.683E+07	Trn A	8.200E+06	8.280E+06	1.07
141.0	1.684E+07	92.2	.0	86.5	86.5	8.658E+07	Trn A	8.200E+06	8.280E+06	1.07
142.0	1.677E+07	92.2	.0	86.5	86.5	8.634E+07	Trn A	8.200E+06	8.280E+06	1.07
143.0	1.670E+07	92.2	.0	86.5	86.5	8.609E+07	Trn A	8.200E+06	8.280E+06	1.07
144.0	1.663E+07	92.2	.0	86.5	86.5	8.584E+07	Trn A	8.200E+06	8.280E+06	1.07
145.0	1.656E+07	92.2	.0	86.5	86.5	8.575E+07	Trn A	8.200E+06	8.280E+06	1.07
146.0	1.649E+07	92.2	.0	86.5	86.5	8.567E+07	Trn A	8.200E+06	8.280E+06	1.07
147.0	1.642E+07	92.2	.0	86.5	86.5	8.558E+07	Trn A	8.200E+06	8.280E+06	1.07
148.0	1.635E+07	92.1	.0	86.5	86.5	8.549E+07	Trn A	8.200E+06	8.280E+06	1.07
149.0	1.628E+07	92.1	.0	86.5	86.5	8.540E+07	Trn A	8.200E+06	8.280E+06	1.07
150.0	1.621E+07	92.1	.0	86.5	86.5	8.531E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 32 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=80F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
151.0	1.614E+07	92.1	.0	86.5	86.5	8.522E+07	Trn A	8.200E+06	8.280E+06	1.07
152.0	1.607E+07	92.1	.0	86.5	86.5	8.513E+07	Trn A	8.200E+06	8.280E+06	1.07
153.0	1.600E+07	92.1	.0	86.5	86.5	8.504E+07	Trn A	8.200E+06	8.280E+06	1.07
154.0	1.594E+07	92.1	.0	86.5	86.5	8.495E+07	Trn A	8.200E+06	8.280E+06	1.07
155.0	1.587E+07	92.1	.0	86.5	86.5	8.486E+07	Trn A	8.200E+06	8.280E+06	1.07
156.0	1.580E+07	92.1	.0	86.5	86.5	8.477E+07	Trn A	8.200E+06	8.280E+06	1.07
157.0	1.573E+07	92.1	.0	86.5	86.5	8.468E+07	Trn A	8.200E+06	8.280E+06	1.07
158.0	1.566E+07	92.1	.0	86.5	86.5	8.459E+07	Trn A	8.200E+06	8.280E+06	1.07
159.0	1.559E+07	92.1	.0	86.5	86.5	8.450E+07	Trn A	8.200E+06	8.280E+06	1.07
160.0	1.552E+07	92.1	.0	86.5	86.5	8.441E+07	Trn A	8.200E+06	8.280E+06	1.07
161.0	1.545E+07	92.1	.0	86.5	86.5	8.432E+07	Trn A	8.200E+06	8.280E+06	1.07
162.0	1.539E+07	92.1	.0	86.5	86.5	8.423E+07	Trn A	8.200E+06	8.280E+06	1.07
163.0	1.532E+07	92.1	.0	86.5	86.5	8.415E+07	Trn A	8.200E+06	8.280E+06	1.07
164.0	1.525E+07	92.1	.0	86.5	86.5	8.406E+07	Trn A	8.200E+06	8.280E+06	1.07
165.0	1.518E+07	92.1	.0	86.5	86.5	8.397E+07	Trn A	8.200E+06	8.280E+06	1.07
166.0	1.511E+07	92.1	.0	86.5	86.5	8.388E+07	Trn A	8.200E+06	8.280E+06	1.07
167.0	1.504E+07	92.0	.0	86.5	86.5	8.379E+07	Trn A	8.200E+06	8.280E+06	1.07
168.0	1.498E+07	92.1	.0	86.5	86.5	8.370E+07	Trn A	8.200E+06	8.280E+06	1.07
169.0	1.491E+07	92.1	.0	86.5	86.5	8.372E+07	Trn A	8.200E+06	8.280E+06	1.07
170.0	1.484E+07	92.1	.0	86.5	86.5	8.374E+07	Trn A	8.200E+06	8.280E+06	1.07
171.0	1.477E+07	92.1	.0	86.5	86.5	8.376E+07	Trn A	8.200E+06	8.280E+06	1.07
172.0	1.471E+07	92.1	.0	86.5	86.5	8.378E+07	Trn A	8.200E+06	8.280E+06	1.07
173.0	1.464E+07	92.1	.0	86.5	86.5	8.380E+07	Trn A	8.200E+06	8.280E+06	1.07
174.0	1.457E+07	92.1	.0	86.5	86.5	8.382E+07	Trn A	8.200E+06	8.280E+06	1.07
175.0	1.450E+07	92.0	.0	86.5	86.5	8.384E+07	Trn A	8.200E+06	8.280E+06	1.07
176.0	1.443E+07	92.1	.0	86.5	86.5	8.386E+07	Trn A	8.200E+06	8.280E+06	1.07
177.0	1.437E+07	92.1	.0	86.5	86.5	8.388E+07	Trn A	8.200E+06	8.280E+06	1.07
178.0	1.430E+07	92.1	.0	86.5	86.5	8.390E+07	Trn A	8.200E+06	8.280E+06	1.07
179.0	1.423E+07	92.1	.0	86.5	86.5	8.392E+07	Trn A	8.200E+06	8.280E+06	1.07
180.0	1.416E+07	92.1	.0	86.5	86.5	8.394E+07	Trn A	8.200E+06	8.280E+06	1.07
181.0	1.409E+07	92.0	.0	86.5	86.5	8.396E+07	Trn A	8.200E+06	8.280E+06	1.07
182.0	1.403E+07	92.1	.0	86.5	86.5	8.399E+07	Trn A	8.200E+06	8.280E+06	1.07
183.0	1.396E+07	92.1	.0	86.5	86.5	8.401E+07	Trn A	8.200E+06	8.280E+06	1.07
184.0	1.389E+07	92.1	.0	86.5	86.5	8.403E+07	Trn A	8.200E+06	8.280E+06	1.07
185.0	1.382E+07	92.0	.0	86.5	86.5	8.405E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 33 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 4-fan mode, IBT=80F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
186.0	1.375E+07	92.0	.0	86.5	86.5	8.407E+07	Trn A	8.200E+06	8.280E+06	1.07
187.0	1.368E+07	92.0	.0	86.5	86.5	8.409E+07	Trn A	8.200E+06	8.280E+06	1.07
188.0	1.362E+07	92.0	.0	86.5	86.5	8.411E+07	Trn A	8.200E+06	8.280E+06	1.07
189.0	1.355E+07	92.0	.0	86.5	86.5	8.413E+07	Trn A	8.200E+06	8.280E+06	1.07
190.0	1.348E+07	92.0	.0	86.5	86.5	8.415E+07	Trn A	8.200E+06	8.280E+06	1.07
191.0	1.341E+07	92.0	.0	86.5	86.5	8.417E+07	Trn A	8.200E+06	8.280E+06	1.07
192.0	1.334E+07	92.0	.0	86.5	86.5	8.419E+07	Trn A	8.200E+06	8.280E+06	1.07
193.0	1.328E+07	92.0	.0	86.5	86.5	8.400E+07	Trn A	8.200E+06	8.280E+06	1.07
194.0	1.321E+07	92.0	.0	86.5	86.5	8.381E+07	Trn A	8.200E+06	8.280E+06	1.07
195.0	1.314E+07	92.0	.0	86.5	86.5	8.362E+07	Trn A	8.200E+06	8.280E+06	1.07
196.0	1.307E+07	92.0	.0	86.5	86.5	8.343E+07	Trn A	8.200E+06	8.280E+06	1.07
197.0	1.300E+07	92.0	.0	86.5	86.5	8.324E+07	Trn A	8.200E+06	8.280E+06	1.07
198.0	1.294E+07	92.0	.0	86.5	86.5	8.305E+07	Trn A	8.200E+06	8.280E+06	1.07
199.0	1.287E+07	92.0	.0	86.5	86.5	8.287E+07	Trn A	8.200E+06	8.280E+06	1.07
200.0	1.280E+07	92.0	.0	86.5	86.5	8.268E+07	Trn A	8.200E+06	8.280E+06	1.07
201.0	1.273E+07	92.0	.0	86.5	86.5	8.249E+07	Trn A	8.200E+06	8.280E+06	1.07
202.0	1.267E+07	92.0	.0	86.5	86.5	8.230E+07	Trn A	8.200E+06	8.280E+06	1.07
203.0	1.260E+07	92.0	.0	86.5	86.5	8.211E+07	Trn A	8.200E+06	8.280E+06	1.07
204.0	1.253E+07	92.0	.0	86.5	86.5	8.192E+07	Trn A	8.200E+06	8.280E+06	1.07
205.0	1.247E+07	91.9	.0	86.5	86.5	8.173E+07	Trn A	8.200E+06	8.280E+06	1.07
206.0	1.240E+07	91.9	.0	86.5	86.5	8.154E+07	Trn A	8.200E+06	8.280E+06	1.07
207.0	1.234E+07	91.9	.0	86.5	86.5	8.135E+07	Trn A	8.200E+06	8.280E+06	1.07
208.0	1.227E+07	91.9	.0	86.5	86.5	8.116E+07	Trn A	8.200E+06	8.280E+06	1.07
209.0	1.220E+07	91.9	.0	86.5	86.5	8.097E+07	Trn A	8.200E+06	8.280E+06	1.07
210.0	1.214E+07	91.9	.0	86.5	86.5	8.078E+07	Trn A	8.200E+06	8.280E+06	1.07
211.0	1.207E+07	91.9	.0	86.5	86.5	8.060E+07	Trn A	8.200E+06	8.280E+06	1.07
212.0	1.201E+07	91.9	.0	86.5	86.5	8.041E+07	Trn A	8.200E+06	8.280E+06	1.07
213.0	1.194E+07	91.9	.0	86.5	86.5	8.022E+07	Trn A	8.200E+06	8.280E+06	1.07
214.0	1.188E+07	91.9	.0	86.5	86.5	8.003E+07	Trn A	8.200E+06	8.280E+06	1.07
215.0	1.181E+07	91.9	.0	86.5	86.5	7.984E+07	Trn A	8.200E+06	8.280E+06	1.07
216.0	1.175E+07	91.8	.0	86.5	86.5	7.965E+07	Trn A	8.200E+06	8.280E+06	1.07
217.0	1.168E+07	91.8	.0	86.5	86.5	7.969E+07	Trn A	8.200E+06	8.280E+06	1.07
218.0	1.162E+07	91.8	.0	86.5	86.5	7.972E+07	Trn A	8.200E+06	8.280E+06	1.07
219.0	1.155E+07	91.8	.0	86.5	86.5	7.976E+07	Trn A	8.200E+06	8.280E+06	1.07
220.0	1.149E+07	91.8	.0	86.5	86.5	7.980E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 34 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=80F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
221.0	1.143E+07	91.8	.0	86.5	86.5	7.984E+07	Trn A	8.200E+06	8.280E+06	1.07
222.0	1.136E+07	91.8	.0	86.5	86.5	7.987E+07	Trn A	8.200E+06	8.280E+06	1.07
223.0	1.130E+07	91.8	.0	86.5	86.5	7.991E+07	Trn A	8.200E+06	8.280E+06	1.07
224.0	1.123E+07	91.8	.0	86.5	86.5	7.995E+07	Trn A	8.200E+06	8.280E+06	1.07
225.0	1.117E+07	91.8	.0	86.5	86.5	7.999E+07	Trn A	8.200E+06	8.280E+06	1.07
226.0	1.110E+07	91.8	.0	86.5	86.5	8.002E+07	Trn A	8.200E+06	8.280E+06	1.07
227.0	1.104E+07	91.8	.0	86.5	86.5	8.006E+07	Trn A	8.200E+06	8.280E+06	1.07
228.0	1.097E+07	91.8	.0	86.5	86.5	8.010E+07	Trn A	8.200E+06	8.280E+06	1.07
229.0	1.091E+07	91.8	.0	86.5	86.5	8.014E+07	Trn A	8.200E+06	8.280E+06	1.07
230.0	1.084E+07	91.8	.0	86.5	86.5	8.017E+07	Trn A	8.200E+06	8.280E+06	1.07
231.0	1.078E+07	91.8	.0	86.5	86.5	8.021E+07	Trn A	8.200E+06	8.280E+06	1.07
232.0	1.071E+07	91.8	.0	86.5	86.5	8.025E+07	Trn A	8.200E+06	8.280E+06	1.07
233.0	1.065E+07	91.8	.0	86.5	86.5	8.029E+07	Trn A	8.200E+06	8.280E+06	1.07
234.0	1.058E+07	91.8	.0	86.5	86.5	8.032E+07	Trn A	8.200E+06	8.280E+06	1.07
235.0	1.052E+07	91.8	.0	86.5	86.5	8.036E+07	Trn A	8.200E+06	8.280E+06	1.07
236.0	1.045E+07	91.8	.0	86.5	86.5	8.040E+07	Trn A	8.200E+06	8.280E+06	1.07
237.0	1.039E+07	91.9	.0	86.5	86.5	8.044E+07	Trn A	8.200E+06	8.280E+06	1.07
238.0	1.032E+07	91.9	.0	86.5	86.5	8.047E+07	Trn A	8.200E+06	8.280E+06	1.07
239.0	1.026E+07	91.9	.0	86.5	86.5	8.051E+07	Trn A	8.200E+06	8.280E+06	1.07
240.0	1.019E+07	91.9	.0	86.5	86.5	8.055E+07	Trn A	8.200E+06	8.280E+06	1.07

Stop - Program terminated.

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 35 of 166
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4. UHSSIM input/output for Fan4_75F, 4-Fan Case with IBT of 75 °F

Fan4_75F.inp

```

Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 4-fan mode, IBT=75F
# design wet-bulb temperature [F], design dry-bulb temperature [F],
# design hot-water temperature [F], design pressure [psia], design solids [ppt]
# 0 => F, psia, btu/hr, lbm/hr units
82, 98, 129.0, 14.696, 0.0, 0
# initial basin mass [lbm], initial basin temperature [F], initial solids [ppt],
# number of towers, starting time of simulation [hr]
29843200, 75, 0, 1, 0.
# Time Period Data -- every 0.1 hour for 10 hr then every hour up to 10 days
# step size, number of steps
0.1,100
1,230
*
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,8.2e6,8.28e6,1.07
240.0,8.2e6,8.28e6,1.07
*
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
    0 s  3.2565E+08
    50 s  3.2565E+08
   101 s  3.2565E+08
   116 s  3.1609E+08
   120 s  3.1487E+08
   150 s  3.1640E+08
   300 s  3.1640E+08
   900 s  3.1640E+08
  1800 s  3.0196E+08
  2704 s  2.8660E+08
  2706 s  4.4627E+08
  3600 s  4.3946E+08
    2 h  2.2984E+08
    4 h  1.4731E+08
    6 h  1.4644E+08
    9 h  1.4354E+08
   12 h  1.4254E+08
   18 h  1.5095E+08
   24 h  1.4834E+08
   36 h  1.2219E+08
    2 d  1.1371E+08
    3 d  1.0513E+08
    4 d  9.6311E+07
    5 d  9.1747E+07
    6 d  8.5844E+07
    7 d  8.3698E+07
    8 d  8.4190E+07
    9 d  7.9649E+07
   10 d  8.0549E+07
*
# Ambient Data Supplied by Bechtel Power Corp.
# TIME  WB  DB  P
# (hr)  (F)  (F)  (psia)
    0,  86.6,  86.6,  14.7
  240,  86.6,  86.6,  14.7

```

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S3I	Sheet: Attachment 1 36 of 166
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Fan4_75F.out

Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 4-fan mode, IBT=75F

Initial Basin Mass 2.984E+07 lbm
Initial Basin Temperature 75.0 F
Initial Basin Solids .0 ppt

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
.0	2.984E+07	75.0	.0	86.6	86.6	3.257E+08	Trn A	8.200E+06	8.280E+06	1.07
.1	2.983E+07	75.5	.0	86.6	86.6	3.164E+08	Trn A	8.200E+06	8.280E+06	1.07
.2	2.982E+07	76.1	.0	86.6	86.6	3.164E+08	Trn A	8.200E+06	8.280E+06	1.07
.3	2.980E+07	76.6	.0	86.6	86.6	3.135E+08	Trn A	8.200E+06	8.280E+06	1.07
.4	2.979E+07	77.1	.0	86.6	86.6	3.077E+08	Trn A	8.200E+06	8.280E+06	1.07
.5	2.978E+07	77.6	.0	86.6	86.6	3.020E+08	Trn A	8.200E+06	8.280E+06	1.07
.6	2.976E+07	78.0	.0	86.6	86.6	2.958E+08	Trn A	8.200E+06	8.280E+06	1.07
.7	2.975E+07	78.5	.0	86.6	86.6	2.897E+08	Trn A	8.200E+06	8.280E+06	1.07
.8	2.973E+07	79.0	.0	86.6	86.6	4.449E+08	Trn A	8.200E+06	8.280E+06	1.07
.9	2.971E+07	79.5	.0	86.6	86.6	4.422E+08	Trn A	8.200E+06	8.280E+06	1.07
1.0	2.968E+07	80.0	.0	86.6	86.6	4.395E+08	Trn A	8.200E+06	8.280E+06	1.07
1.1	2.966E+07	80.5	.0	86.6	86.6	4.185E+08	Trn A	8.200E+06	8.280E+06	1.07
1.2	2.964E+07	81.0	.0	86.6	86.6	3.975E+08	Trn A	8.200E+06	8.280E+06	1.07
1.3	2.961E+07	81.4	.0	86.6	86.6	3.766E+08	Trn A	8.200E+06	8.280E+06	1.07
1.4	2.959E+07	81.9	.0	86.6	86.6	3.556E+08	Trn A	8.200E+06	8.280E+06	1.07
1.5	2.958E+07	82.3	.0	86.6	86.6	3.346E+08	Trn A	8.200E+06	8.280E+06	1.07
1.6	2.956E+07	82.7	.0	86.6	86.6	3.137E+08	Trn A	8.200E+06	8.280E+06	1.07
1.7	2.954E+07	83.0	.0	86.6	86.6	2.927E+08	Trn A	8.200E+06	8.280E+06	1.07
1.8	2.953E+07	83.4	.0	86.6	86.6	2.718E+08	Trn A	8.200E+06	8.280E+06	1.07
1.9	2.951E+07	83.7	.0	86.6	86.6	2.508E+08	Trn A	8.200E+06	8.280E+06	1.07
2.0	2.950E+07	84.0	.0	86.6	86.6	2.298E+08	Trn A	8.200E+06	8.280E+06	1.07
2.1	2.949E+07	84.3	.0	86.6	86.6	2.257E+08	Trn A	8.200E+06	8.280E+06	1.07
2.2	2.948E+07	84.6	.0	86.6	86.6	2.216E+08	Trn A	8.200E+06	8.280E+06	1.07
2.3	2.947E+07	84.9	.0	86.6	86.6	2.175E+08	Trn A	8.200E+06	8.280E+06	1.07
2.4	2.946E+07	85.1	.0	86.6	86.6	2.133E+08	Trn A	8.200E+06	8.280E+06	1.07
2.5	2.944E+07	85.4	.0	86.6	86.6	2.092E+08	Trn A	8.200E+06	8.280E+06	1.07
2.6	2.943E+07	85.6	.0	86.6	86.6	2.051E+08	Trn A	8.200E+06	8.280E+06	1.07
2.7	2.942E+07	85.9	.0	86.6	86.6	2.010E+08	Trn A	8.200E+06	8.280E+06	1.07
2.8	2.941E+07	86.1	.0	86.6	86.6	1.968E+08	Trn A	8.200E+06	8.280E+06	1.07
2.9	2.940E+07	86.3	.0	86.6	86.6	1.927E+08	Trn A	8.200E+06	8.280E+06	1.07
3.0	2.939E+07	86.5	.0	86.6	86.6	1.886E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 37 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 4-fan mode, IBT=75P

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
3.1	2.938E+07	86.7	.0	86.6	86.6	1.844E+08	Trn A	8.200E+06	8.280E+06	1.07
3.2	2.937E+07	86.9	.0	86.6	86.6	1.803E+08	Trn A	8.200E+06	8.280E+06	1.07
3.3	2.936E+07	87.1	.0	86.6	86.6	1.762E+08	Trn A	8.200E+06	8.280E+06	1.07
3.4	2.935E+07	87.3	.0	86.6	86.6	1.721E+08	Trn A	8.200E+06	8.280E+06	1.07
3.5	2.934E+07	87.5	.0	86.6	86.6	1.679E+08	Trn A	8.200E+06	8.280E+06	1.07
3.6	2.933E+07	87.6	.0	86.6	86.6	1.638E+08	Trn A	8.200E+06	8.280E+06	1.07
3.7	2.932E+07	87.8	.0	86.6	86.6	1.597E+08	Trn A	8.200E+06	8.280E+06	1.07
3.8	2.931E+07	88.0	.0	86.6	86.6	1.556E+08	Trn A	8.200E+06	8.280E+06	1.07
3.9	2.930E+07	88.1	.0	86.6	86.6	1.514E+08	Trn A	8.200E+06	8.280E+06	1.07
4.0	2.929E+07	88.2	.0	86.6	86.6	1.473E+08	Trn A	8.200E+06	8.280E+06	1.07
4.1	2.928E+07	88.4	.0	86.6	86.6	1.473E+08	Trn A	8.200E+06	8.280E+06	1.07
4.2	2.928E+07	88.5	.0	86.6	86.6	1.472E+08	Trn A	8.200E+06	8.280E+06	1.07
4.3	2.927E+07	88.6	.0	86.6	86.6	1.472E+08	Trn A	8.200E+06	8.280E+06	1.07
4.4	2.926E+07	88.8	.0	86.6	86.6	1.471E+08	Trn A	8.200E+06	8.280E+06	1.07
4.5	2.925E+07	88.9	.0	86.6	86.6	1.471E+08	Trn A	8.200E+06	8.280E+06	1.07
4.6	2.924E+07	89.0	.0	86.6	86.6	1.470E+08	Trn A	8.200E+06	8.280E+06	1.07
4.7	2.923E+07	89.1	.0	86.6	86.6	1.470E+08	Trn A	8.200E+06	8.280E+06	1.07
4.8	2.922E+07	89.3	.0	86.6	86.6	1.470E+08	Trn A	8.200E+06	8.280E+06	1.07
4.9	2.921E+07	89.4	.0	86.6	86.6	1.469E+08	Trn A	8.200E+06	8.280E+06	1.07
5.0	2.920E+07	89.5	.0	86.6	86.6	1.469E+08	Trn A	8.200E+06	8.280E+06	1.07
5.1	2.919E+07	89.6	.0	86.6	86.6	1.468E+08	Trn A	8.200E+06	8.280E+06	1.07
5.2	2.918E+07	89.7	.0	86.6	86.6	1.468E+08	Trn A	8.200E+06	8.280E+06	1.07
5.3	2.918E+07	89.8	.0	86.6	86.6	1.467E+08	Trn A	8.200E+06	8.280E+06	1.07
5.4	2.917E+07	89.9	.0	86.6	86.6	1.467E+08	Trn A	8.200E+06	8.280E+06	1.07
5.5	2.916E+07	90.0	.0	86.6	86.6	1.467E+08	Trn A	8.200E+06	8.280E+06	1.07
5.6	2.915E+07	90.1	.0	86.6	86.6	1.466E+08	Trn A	8.200E+06	8.280E+06	1.07
5.7	2.914E+07	90.2	.0	86.6	86.6	1.466E+08	Trn A	8.200E+06	8.280E+06	1.07
5.8	2.913E+07	90.3	.0	86.6	86.6	1.465E+08	Trn A	8.200E+06	8.280E+06	1.07
5.9	2.912E+07	90.4	.0	86.6	86.6	1.465E+08	Trn A	8.200E+06	8.280E+06	1.07
6.0	2.911E+07	90.5	.0	86.6	86.6	1.464E+08	Trn A	8.200E+06	8.280E+06	1.07
6.1	2.910E+07	90.6	.0	86.6	86.6	1.463E+08	Trn A	8.200E+06	8.280E+06	1.07
6.2	2.909E+07	90.7	.0	86.6	86.6	1.462E+08	Trn A	8.200E+06	8.280E+06	1.07
6.3	2.908E+07	90.8	.0	86.6	86.6	1.462E+08	Trn A	8.200E+06	8.280E+06	1.07
6.4	2.907E+07	90.9	.0	86.6	86.6	1.461E+08	Trn A	8.200E+06	8.280E+06	1.07
6.5	2.906E+07	91.0	.0	86.6	86.6	1.460E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 38 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=75F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
6.6	2.905E+07	91.0	.0	86.6	86.6	1.459E+08	Trn A	8.200E+06	8.280E+06	1.07
6.7	2.904E+07	91.1	.0	86.6	86.6	1.458E+08	Trn A	8.200E+06	8.280E+06	1.07
6.8	2.903E+07	91.2	.0	86.6	86.6	1.457E+08	Trn A	8.200E+06	8.280E+06	1.07
6.9	2.902E+07	91.3	.0	86.6	86.6	1.456E+08	Trn A	8.200E+06	8.280E+06	1.07
7.0	2.901E+07	91.3	.0	86.6	86.6	1.455E+08	Trn A	8.200E+06	8.280E+06	1.07
7.1	2.900E+07	91.4	.0	86.6	86.6	1.454E+08	Trn A	8.200E+06	8.280E+06	1.07
7.2	2.899E+07	91.5	.0	86.6	86.6	1.453E+08	Trn A	8.200E+06	8.280E+06	1.07
7.3	2.898E+07	91.6	.0	86.6	86.6	1.452E+08	Trn A	8.200E+06	8.280E+06	1.07
7.4	2.897E+07	91.6	.0	86.6	86.6	1.451E+08	Trn A	8.200E+06	8.280E+06	1.07
7.5	2.896E+07	91.7	.0	86.6	86.6	1.450E+08	Trn A	8.200E+06	8.280E+06	1.07
7.6	2.895E+07	91.8	.0	86.6	86.6	1.449E+08	Trn A	8.200E+06	8.280E+06	1.07
7.7	2.893E+07	91.8	.0	86.6	86.6	1.448E+08	Trn A	8.200E+06	8.280E+06	1.07
7.8	2.892E+07	91.9	.0	86.6	86.6	1.447E+08	Trn A	8.200E+06	8.280E+06	1.07
7.9	2.891E+07	91.9	.0	86.6	86.6	1.446E+08	Trn A	8.200E+06	8.280E+06	1.07
8.0	2.890E+07	92.0	.0	86.6	86.6	1.445E+08	Trn A	8.200E+06	8.280E+06	1.07
8.1	2.889E+07	92.1	.0	86.6	86.6	1.444E+08	Trn A	8.200E+06	8.280E+06	1.07
8.2	2.888E+07	92.1	.0	86.6	86.6	1.443E+08	Trn A	8.200E+06	8.280E+06	1.07
8.3	2.887E+07	92.2	.0	86.6	86.6	1.442E+08	Trn A	8.200E+06	8.280E+06	1.07
8.4	2.886E+07	92.2	.0	86.6	86.6	1.441E+08	Trn A	8.200E+06	8.280E+06	1.07
8.5	2.885E+07	92.3	.0	86.6	86.6	1.440E+08	Trn A	8.200E+06	8.280E+06	1.07
8.6	2.884E+07	92.3	.0	86.6	86.6	1.439E+08	Trn A	8.200E+06	8.280E+06	1.07
8.7	2.883E+07	92.4	.0	86.6	86.6	1.438E+08	Trn A	8.200E+06	8.280E+06	1.07
8.8	2.882E+07	92.4	.0	86.6	86.6	1.437E+08	Trn A	8.200E+06	8.280E+06	1.07
8.9	2.881E+07	92.5	.0	86.6	86.6	1.436E+08	Trn A	8.200E+06	8.280E+06	1.07
9.0	2.880E+07	92.5	.0	86.6	86.6	1.435E+08	Trn A	8.200E+06	8.280E+06	1.07
9.1	2.879E+07	92.6	.0	86.6	86.6	1.435E+08	Trn A	8.200E+06	8.280E+06	1.07
9.2	2.878E+07	92.6	.0	86.6	86.6	1.435E+08	Trn A	8.200E+06	8.280E+06	1.07
9.3	2.877E+07	92.7	.0	86.6	86.6	1.434E+08	Trn A	8.200E+06	8.280E+06	1.07
9.4	2.875E+07	92.7	.0	86.6	86.6	1.434E+08	Trn A	8.200E+06	8.280E+06	1.07
9.5	2.874E+07	92.8	.0	86.6	86.6	1.434E+08	Trn A	8.200E+06	8.280E+06	1.07
9.6	2.873E+07	92.8	.0	86.6	86.6	1.433E+08	Trn A	8.200E+06	8.280E+06	1.07
9.7	2.872E+07	92.9	.0	86.6	86.6	1.433E+08	Trn A	8.200E+06	8.280E+06	1.07
9.8	2.871E+07	92.9	.0	86.6	86.6	1.433E+08	Trn A	8.200E+06	8.280E+06	1.07
9.9	2.870E+07	92.9	.0	86.6	86.6	1.432E+08	Trn A	8.200E+06	8.280E+06	1.07
10.0	2.869E+07	93.0	.0	86.6	86.6	1.432E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 39 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=75F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
11.0	2.858E+07	93.3	.0	86.6	86.6	1.429E+08	Trn A	8.200E+06	8.280E+06	1.07
12.0	2.847E+07	93.6	.0	86.6	86.6	1.425E+08	Trn A	8.200E+06	8.280E+06	1.07
13.0	2.835E+07	93.8	.0	86.6	86.6	1.439E+08	Trn A	8.200E+06	8.280E+06	1.07
14.0	2.824E+07	94.0	.0	86.6	86.6	1.453E+08	Trn A	8.200E+06	8.280E+06	1.07
15.0	2.812E+07	94.2	.0	86.6	86.6	1.467E+08	Trn A	8.200E+06	8.280E+06	1.07
16.0	2.800E+07	94.3	.0	86.6	86.6	1.481E+08	Trn A	8.200E+06	8.280E+06	1.07
17.0	2.788E+07	94.5	.0	86.6	86.6	1.495E+08	Trn A	8.200E+06	8.280E+06	1.07
18.0	2.776E+07	94.6	.0	86.6	86.6	1.509E+08	Trn A	8.200E+06	8.280E+06	1.07
19.0	2.764E+07	94.7	.0	86.6	86.6	1.505E+08	Trn A	8.200E+06	8.280E+06	1.07
20.0	2.751E+07	94.8	.0	86.6	86.6	1.501E+08	Trn A	8.200E+06	8.280E+06	1.07
21.0	2.739E+07	94.8	.0	86.6	86.6	1.496E+08	Trn A	8.200E+06	8.280E+06	1.07
22.0	2.727E+07	94.9	.0	86.6	86.6	1.492E+08	Trn A	8.200E+06	8.280E+06	1.07
23.0	2.714E+07	94.9	.0	86.6	86.6	1.488E+08	Trn A	8.200E+06	8.280E+06	1.07
24.0	2.702E+07	94.9	.0	86.6	86.6	1.483E+08	Trn A	8.200E+06	8.280E+06	1.07
25.0	2.690E+07	94.9	.0	86.6	86.6	1.462E+08	Trn A	8.200E+06	8.280E+06	1.07
26.0	2.678E+07	94.9	.0	86.6	86.6	1.440E+08	Trn A	8.200E+06	8.280E+06	1.07
27.0	2.666E+07	94.9	.0	86.6	86.6	1.418E+08	Trn A	8.200E+06	8.280E+06	1.07
28.0	2.654E+07	94.8	.0	86.6	86.6	1.396E+08	Trn A	8.200E+06	8.280E+06	1.07
29.0	2.642E+07	94.8	.0	86.6	86.6	1.374E+08	Trn A	8.200E+06	8.280E+06	1.07
30.0	2.631E+07	94.7	.0	86.6	86.6	1.353E+08	Trn A	8.200E+06	8.280E+06	1.07
31.0	2.620E+07	94.7	.0	86.6	86.6	1.331E+08	Trn A	8.200E+06	8.280E+06	1.07
32.0	2.609E+07	94.6	.0	86.6	86.6	1.309E+08	Trn A	8.200E+06	8.280E+06	1.07
33.0	2.598E+07	94.5	.0	86.6	86.6	1.287E+08	Trn A	8.200E+06	8.280E+06	1.07
34.0	2.587E+07	94.5	.0	86.6	86.6	1.265E+08	Trn A	8.200E+06	8.280E+06	1.07
35.0	2.576E+07	94.4	.0	86.6	86.6	1.244E+08	Trn A	8.200E+06	8.280E+06	1.07
36.0	2.566E+07	94.3	.0	86.6	86.6	1.222E+08	Trn A	8.200E+06	8.280E+06	1.07
37.0	2.556E+07	94.2	.0	86.6	86.6	1.215E+08	Trn A	8.200E+06	8.280E+06	1.07
38.0	2.546E+07	94.2	.0	86.6	86.6	1.208E+08	Trn A	8.200E+06	8.280E+06	1.07
39.0	2.536E+07	94.1	.0	86.6	86.6	1.201E+08	Trn A	8.200E+06	8.280E+06	1.07
40.0	2.526E+07	94.0	.0	86.6	86.6	1.194E+08	Trn A	8.200E+06	8.280E+06	1.07
41.0	2.516E+07	94.0	.0	86.6	86.6	1.187E+08	Trn A	8.200E+06	8.280E+06	1.07
42.0	2.506E+07	93.9	.0	86.6	86.6	1.180E+08	Trn A	8.200E+06	8.280E+06	1.07
43.0	2.496E+07	93.9	.0	86.6	86.6	1.172E+08	Trn A	8.200E+06	8.280E+06	1.07
44.0	2.486E+07	93.8	.0	86.6	86.6	1.165E+08	Trn A	8.200E+06	8.280E+06	1.07
45.0	2.477E+07	93.8	.0	86.6	86.6	1.158E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 40 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=75F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
46.0	2.467E+07	93.8	.0	86.6	86.6	1.151E+08	Trn A	8.200E+06	8.280E+06	1.07
47.0	2.458E+07	93.7	.0	86.6	86.6	1.144E+08	Trn A	8.200E+06	8.280E+06	1.07
48.0	2.448E+07	93.7	.0	86.6	86.6	1.137E+08	Trn A	8.200E+06	8.280E+06	1.07
49.0	2.439E+07	93.7	.0	86.6	86.6	1.134E+08	Trn A	8.200E+06	8.280E+06	1.07
50.0	2.430E+07	93.6	.0	86.6	86.6	1.130E+08	Trn A	8.200E+06	8.280E+06	1.07
51.0	2.420E+07	93.6	.0	86.6	86.6	1.126E+08	Trn A	8.200E+06	8.280E+06	1.07
52.0	2.411E+07	93.6	.0	86.6	86.6	1.123E+08	Trn A	8.200E+06	8.280E+06	1.07
53.0	2.402E+07	93.6	.0	86.6	86.6	1.119E+08	Trn A	8.200E+06	8.280E+06	1.07
54.0	2.393E+07	93.5	.0	86.6	86.6	1.116E+08	Trn A	8.200E+06	8.280E+06	1.07
55.0	2.383E+07	93.5	.0	86.6	86.6	1.112E+08	Trn A	8.200E+06	8.280E+06	1.07
56.0	2.374E+07	93.5	.0	86.6	86.6	1.109E+08	Trn A	8.200E+06	8.280E+06	1.07
57.0	2.365E+07	93.5	.0	86.6	86.6	1.105E+08	Trn A	8.200E+06	8.280E+06	1.07
58.0	2.356E+07	93.5	.0	86.6	86.6	1.101E+08	Trn A	8.200E+06	8.280E+06	1.07
59.0	2.347E+07	93.4	.0	86.6	86.6	1.098E+08	Trn A	8.200E+06	8.280E+06	1.07
60.0	2.338E+07	93.4	.0	86.6	86.6	1.094E+08	Trn A	8.200E+06	8.280E+06	1.07
61.0	2.329E+07	93.4	.0	86.6	86.6	1.091E+08	Trn A	8.200E+06	8.280E+06	1.07
62.0	2.320E+07	93.4	.0	86.6	86.6	1.087E+08	Trn A	8.200E+06	8.280E+06	1.07
63.0	2.311E+07	93.4	.0	86.6	86.6	1.083E+08	Trn A	8.200E+06	8.280E+06	1.07
64.0	2.302E+07	93.3	.0	86.6	86.6	1.080E+08	Trn A	8.200E+06	8.280E+06	1.07
65.0	2.293E+07	93.3	.0	86.6	86.6	1.076E+08	Trn A	8.200E+06	8.280E+06	1.07
66.0	2.284E+07	93.3	.0	86.6	86.6	1.073E+08	Trn A	8.200E+06	8.280E+06	1.07
67.0	2.276E+07	93.3	.0	86.6	86.6	1.069E+08	Trn A	8.200E+06	8.280E+06	1.07
68.0	2.267E+07	93.3	.0	86.6	86.6	1.066E+08	Trn A	8.200E+06	8.280E+06	1.07
69.0	2.258E+07	93.3	.0	86.6	86.6	1.062E+08	Trn A	8.200E+06	8.280E+06	1.07
70.0	2.249E+07	93.3	.0	86.6	86.6	1.058E+08	Trn A	8.200E+06	8.280E+06	1.07
71.0	2.241E+07	93.3	.0	86.6	86.6	1.055E+08	Trn A	8.200E+06	8.280E+06	1.07
72.0	2.232E+07	93.2	.0	86.6	86.6	1.051E+08	Trn A	8.200E+06	8.280E+06	1.07
73.0	2.223E+07	93.2	.0	86.6	86.6	1.048E+08	Trn A	8.200E+06	8.280E+06	1.07
74.0	2.215E+07	93.2	.0	86.6	86.6	1.044E+08	Trn A	8.200E+06	8.280E+06	1.07
75.0	2.206E+07	93.2	.0	86.6	86.6	1.040E+08	Trn A	8.200E+06	8.280E+06	1.07
76.0	2.198E+07	93.2	.0	86.6	86.6	1.037E+08	Trn A	8.200E+06	8.280E+06	1.07
77.0	2.189E+07	93.1	.0	86.6	86.6	1.033E+08	Trn A	8.200E+06	8.280E+06	1.07
78.0	2.181E+07	93.1	.0	86.6	86.6	1.029E+08	Trn A	8.200E+06	8.280E+06	1.07
79.0	2.172E+07	93.1	.0	86.6	86.6	1.026E+08	Trn A	8.200E+06	8.280E+06	1.07
80.0	2.164E+07	93.1	.0	86.6	86.6	1.022E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 41 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=75F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
81.0	2.155E+07	93.1	.0	86.6	86.6	1.018E+08	Trn A	8.200E+06	8.280E+06	1.07
82.0	2.147E+07	93.0	.0	86.6	86.6	1.015E+08	Trn A	8.200E+06	8.280E+06	1.07
83.0	2.139E+07	93.0	.0	86.6	86.6	1.011E+08	Trn A	8.200E+06	8.280E+06	1.07
84.0	2.131E+07	93.0	.0	86.6	86.6	1.007E+08	Trn A	8.200E+06	8.280E+06	1.07
85.0	2.122E+07	93.0	.0	86.6	86.6	1.004E+08	Trn A	8.200E+06	8.280E+06	1.07
86.0	2.114E+07	93.0	.0	86.6	86.6	9.999E+07	Trn A	8.200E+06	8.280E+06	1.07
87.0	2.106E+07	93.0	.0	86.6	86.6	9.962E+07	Trn A	8.200E+06	8.280E+06	1.07
88.0	2.098E+07	92.9	.0	86.6	86.6	9.925E+07	Trn A	8.200E+06	8.280E+06	1.07
89.0	2.090E+07	92.9	.0	86.6	86.6	9.888E+07	Trn A	8.200E+06	8.280E+06	1.07
90.0	2.081E+07	92.9	.0	86.6	86.6	9.852E+07	Trn A	8.200E+06	8.280E+06	1.07
91.0	2.073E+07	92.9	.0	86.6	86.6	9.815E+07	Trn A	8.200E+06	8.280E+06	1.07
92.0	2.065E+07	92.9	.0	86.6	86.6	9.778E+07	Trn A	8.200E+06	8.280E+06	1.07
93.0	2.057E+07	92.8	.0	86.6	86.6	9.741E+07	Trn A	8.200E+06	8.280E+06	1.07
94.0	2.049E+07	92.8	.0	86.6	86.6	9.705E+07	Trn A	8.200E+06	8.280E+06	1.07
95.0	2.042E+07	92.8	.0	86.6	86.6	9.668E+07	Trn A	8.200E+06	8.280E+06	1.07
96.0	2.034E+07	92.8	.0	86.6	86.6	9.631E+07	Trn A	8.200E+06	8.280E+06	1.07
97.0	2.026E+07	92.8	.0	86.6	86.6	9.612E+07	Trn A	8.200E+06	8.280E+06	1.07
98.0	2.018E+07	92.8	.0	86.6	86.6	9.593E+07	Trn A	8.200E+06	8.280E+06	1.07
99.0	2.010E+07	92.8	.0	86.6	86.6	9.574E+07	Trn A	8.200E+06	8.280E+06	1.07
100.0	2.002E+07	92.8	.0	86.6	86.6	9.555E+07	Trn A	8.200E+06	8.280E+06	1.07
101.0	1.994E+07	92.8	.0	86.6	86.6	9.536E+07	Trn A	8.200E+06	8.280E+06	1.07
102.0	1.987E+07	92.7	.0	86.6	86.6	9.517E+07	Trn A	8.200E+06	8.280E+06	1.07
103.0	1.979E+07	92.7	.0	86.6	86.6	9.498E+07	Trn A	8.200E+06	8.280E+06	1.07
104.0	1.971E+07	92.7	.0	86.6	86.6	9.479E+07	Trn A	8.200E+06	8.280E+06	1.07
105.0	1.963E+07	92.7	.0	86.6	86.6	9.460E+07	Trn A	8.200E+06	8.280E+06	1.07
106.0	1.956E+07	92.7	.0	86.6	86.6	9.441E+07	Trn A	8.200E+06	8.280E+06	1.07
107.0	1.948E+07	92.7	.0	86.6	86.6	9.422E+07	Trn A	8.200E+06	8.280E+06	1.07
108.0	1.940E+07	92.7	.0	86.6	86.6	9.403E+07	Trn A	8.200E+06	8.280E+06	1.07
109.0	1.933E+07	92.7	.0	86.6	86.6	9.384E+07	Trn A	8.200E+06	8.280E+06	1.07
110.0	1.925E+07	92.6	.0	86.6	86.6	9.365E+07	Trn A	8.200E+06	8.280E+06	1.07
111.0	1.917E+07	92.6	.0	86.6	86.6	9.346E+07	Trn A	8.200E+06	8.280E+06	1.07
112.0	1.910E+07	92.6	.0	86.6	86.6	9.327E+07	Trn A	8.200E+06	8.280E+06	1.07
113.0	1.902E+07	92.6	.0	86.6	86.6	9.308E+07	Trn A	8.200E+06	8.280E+06	1.07
114.0	1.895E+07	92.6	.0	86.6	86.6	9.289E+07	Trn A	8.200E+06	8.280E+06	1.07
115.0	1.887E+07	92.6	.0	86.6	86.6	9.270E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 42 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=75F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
116.0	1.879E+07	92.6	.0	86.6	86.6	9.251E+07	Trn A	8.200E+06	8.280E+06	1.07
117.0	1.872E+07	92.6	.0	86.6	86.6	9.232E+07	Trn A	8.200E+06	8.280E+06	1.07
118.0	1.864E+07	92.6	.0	86.6	86.6	9.213E+07	Trn A	8.200E+06	8.280E+06	1.07
119.0	1.857E+07	92.5	.0	86.6	86.6	9.194E+07	Trn A	8.200E+06	8.280E+06	1.07
120.0	1.849E+07	92.5	.0	86.6	86.6	9.175E+07	Trn A	8.200E+06	8.280E+06	1.07
121.0	1.842E+07	92.5	.0	86.6	86.6	9.150E+07	Trn A	8.200E+06	8.280E+06	1.07
122.0	1.834E+07	92.5	.0	86.6	86.6	9.126E+07	Trn A	8.200E+06	8.280E+06	1.07
123.0	1.827E+07	92.5	.0	86.6	86.6	9.101E+07	Trn A	8.200E+06	8.280E+06	1.07
124.0	1.819E+07	92.5	.0	86.6	86.6	9.076E+07	Trn A	8.200E+06	8.280E+06	1.07
125.0	1.812E+07	92.5	.0	86.6	86.6	9.052E+07	Trn A	8.200E+06	8.280E+06	1.07
126.0	1.805E+07	92.5	.0	86.6	86.6	9.027E+07	Trn A	8.200E+06	8.280E+06	1.07
127.0	1.797E+07	92.5	.0	86.6	86.6	9.003E+07	Trn A	8.200E+06	8.280E+06	1.07
128.0	1.790E+07	92.4	.0	86.6	86.6	8.978E+07	Trn A	8.200E+06	8.280E+06	1.07
129.0	1.783E+07	92.4	.0	86.6	86.6	8.953E+07	Trn A	8.200E+06	8.280E+06	1.07
130.0	1.775E+07	92.4	.0	86.6	86.6	8.929E+07	Trn A	8.200E+06	8.280E+06	1.07
131.0	1.768E+07	92.4	.0	86.6	86.6	8.904E+07	Trn A	8.200E+06	8.280E+06	1.07
132.0	1.761E+07	92.4	.0	86.6	86.6	8.880E+07	Trn A	8.200E+06	8.280E+06	1.07
133.0	1.754E+07	92.4	.0	86.6	86.6	8.855E+07	Trn A	8.200E+06	8.280E+06	1.07
134.0	1.746E+07	92.4	.0	86.6	86.6	8.830E+07	Trn A	8.200E+06	8.280E+06	1.07
135.0	1.739E+07	92.4	.0	86.6	86.6	8.806E+07	Trn A	8.200E+06	8.280E+06	1.07
136.0	1.732E+07	92.4	.0	86.6	86.6	8.781E+07	Trn A	8.200E+06	8.280E+06	1.07
137.0	1.725E+07	92.4	.0	86.6	86.6	8.757E+07	Trn A	8.200E+06	8.280E+06	1.07
138.0	1.718E+07	92.3	.0	86.6	86.6	8.732E+07	Trn A	8.200E+06	8.280E+06	1.07
139.0	1.711E+07	92.3	.0	86.6	86.6	8.707E+07	Trn A	8.200E+06	8.280E+06	1.07
140.0	1.704E+07	92.3	.0	86.6	86.6	8.683E+07	Trn A	8.200E+06	8.280E+06	1.07
141.0	1.697E+07	92.3	.0	86.6	86.6	8.658E+07	Trn A	8.200E+06	8.280E+06	1.07
142.0	1.690E+07	92.3	.0	86.6	86.6	8.634E+07	Trn A	8.200E+06	8.280E+06	1.07
143.0	1.683E+07	92.3	.0	86.6	86.6	8.609E+07	Trn A	8.200E+06	8.280E+06	1.07
144.0	1.676E+07	92.3	.0	86.6	86.6	8.584E+07	Trn A	8.200E+06	8.280E+06	1.07
145.0	1.669E+07	92.3	.0	86.6	86.6	8.575E+07	Trn A	8.200E+06	8.280E+06	1.07
146.0	1.662E+07	92.2	.0	86.6	86.6	8.567E+07	Trn A	8.200E+06	8.280E+06	1.07
147.0	1.655E+07	92.2	.0	86.6	86.6	8.558E+07	Trn A	8.200E+06	8.280E+06	1.07
148.0	1.648E+07	92.2	.0	86.6	86.6	8.549E+07	Trn A	8.200E+06	8.280E+06	1.07
149.0	1.641E+07	92.2	.0	86.6	86.6	8.540E+07	Trn A	8.200E+06	8.280E+06	1.07
150.0	1.634E+07	92.2	.0	86.6	86.6	8.531E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 43 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=75F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
151.0	1.627E+07	92.2	.0	86.6	86.6	8.522E+07	Trn A	8.200E+06	8.280E+06	1.07
152.0	1.620E+07	92.2	.0	86.6	86.6	8.513E+07	Trn A	8.200E+06	8.280E+06	1.07
153.0	1.613E+07	92.2	.0	86.6	86.6	8.504E+07	Trn A	8.200E+06	8.280E+06	1.07
154.0	1.606E+07	92.2	.0	86.6	86.6	8.495E+07	Trn A	8.200E+06	8.280E+06	1.07
155.0	1.599E+07	92.2	.0	86.6	86.6	8.486E+07	Trn A	8.200E+06	8.280E+06	1.07
156.0	1.592E+07	92.2	.0	86.6	86.6	8.477E+07	Trn A	8.200E+06	8.280E+06	1.07
157.0	1.585E+07	92.2	.0	86.6	86.6	8.468E+07	Trn A	8.200E+06	8.280E+06	1.07
158.0	1.579E+07	92.2	.0	86.6	86.6	8.459E+07	Trn A	8.200E+06	8.280E+06	1.07
159.0	1.572E+07	92.2	.0	86.6	86.6	8.450E+07	Trn A	8.200E+06	8.280E+06	1.07
160.0	1.565E+07	92.2	.0	86.6	86.6	8.441E+07	Trn A	8.200E+06	8.280E+06	1.07
161.0	1.558E+07	92.2	.0	86.6	86.6	8.432E+07	Trn A	8.200E+06	8.280E+06	1.07
162.0	1.551E+07	92.1	.0	86.6	86.6	8.423E+07	Trn A	8.200E+06	8.280E+06	1.07
163.0	1.544E+07	92.1	.0	86.6	86.6	8.415E+07	Trn A	8.200E+06	8.280E+06	1.07
164.0	1.537E+07	92.1	.0	86.6	86.6	8.406E+07	Trn A	8.200E+06	8.280E+06	1.07
165.0	1.531E+07	92.1	.0	86.6	86.6	8.397E+07	Trn A	8.200E+06	8.280E+06	1.07
166.0	1.524E+07	92.1	.0	86.6	86.6	8.388E+07	Trn A	8.200E+06	8.280E+06	1.07
167.0	1.517E+07	92.1	.0	86.6	86.6	8.379E+07	Trn A	8.200E+06	8.280E+06	1.07
168.0	1.510E+07	92.1	.0	86.6	86.6	8.370E+07	Trn A	8.200E+06	8.280E+06	1.07
169.0	1.503E+07	92.1	.0	86.6	86.6	8.372E+07	Trn A	8.200E+06	8.280E+06	1.07
170.0	1.497E+07	92.1	.0	86.6	86.6	8.374E+07	Trn A	8.200E+06	8.280E+06	1.07
171.0	1.490E+07	92.1	.0	86.6	86.6	8.376E+07	Trn A	8.200E+06	8.280E+06	1.07
172.0	1.483E+07	92.1	.0	86.6	86.6	8.378E+07	Trn A	8.200E+06	8.290E+06	1.07
173.0	1.476E+07	92.1	.0	86.6	86.6	8.380E+07	Trn A	8.200E+06	8.280E+06	1.07
174.0	1.469E+07	92.1	.0	86.6	86.6	8.382E+07	Trn A	8.200E+06	8.280E+06	1.07
175.0	1.463E+07	92.1	.0	86.6	86.6	8.384E+07	Trn A	8.200E+06	8.280E+06	1.07
176.0	1.456E+07	92.1	.0	86.6	86.6	8.386E+07	Trn A	8.200E+06	8.280E+06	1.07
177.0	1.449E+07	92.1	.0	86.6	86.6	8.388E+07	Trn A	8.200E+06	8.280E+06	1.07
178.0	1.442E+07	92.1	.0	86.6	86.6	8.390E+07	Trn A	8.200E+06	8.280E+06	1.07
179.0	1.435E+07	92.1	.0	86.6	86.6	8.392E+07	Trn A	8.200E+06	8.280E+06	1.07
180.0	1.429E+07	92.1	.0	86.6	86.6	8.394E+07	Trn A	8.200E+06	8.280E+06	1.07
181.0	1.422E+07	92.1	.0	86.6	86.6	8.396E+07	Trn A	8.200E+06	8.280E+06	1.07
182.0	1.415E+07	92.1	.0	86.6	86.6	8.399E+07	Trn A	8.200E+06	8.280E+06	1.07
183.0	1.408E+07	92.1	.0	86.6	86.6	8.401E+07	Trn A	8.200E+06	8.280E+06	1.07
184.0	1.401E+07	92.1	.0	86.6	86.6	8.403E+07	Trn A	8.200E+06	8.280E+06	1.07
185.0	1.394E+07	92.1	.0	86.6	86.6	8.405E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 44 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=75F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
186.0	1.388E+07	92.1	.0	86.6	86.6	8.407E+07	Trn A	8.200E+06	8.280E+06	1.07
187.0	1.381E+07	92.1	.0	86.6	86.6	8.409E+07	Trn A	8.200E+06	8.280E+06	1.07
188.0	1.374E+07	92.1	.0	86.6	86.6	8.411E+07	Trn A	8.200E+06	8.280E+06	1.07
189.0	1.367E+07	92.1	.0	86.6	86.6	8.413E+07	Trn A	8.200E+06	8.280E+06	1.07
190.0	1.360E+07	92.1	.0	86.6	86.6	8.415E+07	Trn A	8.200E+06	8.280E+06	1.07
191.0	1.354E+07	92.1	.0	86.6	86.6	8.417E+07	Trn A	8.200E+06	8.280E+06	1.07
192.0	1.347E+07	92.1	.0	86.6	86.6	8.419E+07	Trn A	8.200E+06	8.280E+06	1.07
193.0	1.340E+07	92.1	.0	86.6	86.6	8.400E+07	Trn A	8.200E+06	8.280E+06	1.07
194.0	1.333E+07	92.1	.0	86.6	86.6	8.381E+07	Trn A	8.200E+06	8.280E+06	1.07
195.0	1.326E+07	92.1	.0	86.6	86.6	8.362E+07	Trn A	8.200E+06	8.280E+06	1.07
196.0	1.319E+07	92.1	.0	86.6	86.6	8.343E+07	Trn A	8.200E+06	8.280E+06	1.07
197.0	1.313E+07	92.1	.0	86.6	86.6	8.324E+07	Trn A	8.200E+06	8.280E+06	1.07
198.0	1.306E+07	92.1	.0	86.6	86.6	8.305E+07	Trn A	8.200E+06	8.280E+06	1.07
199.0	1.299E+07	92.1	.0	86.6	86.6	8.287E+07	Trn A	8.200E+06	8.280E+06	1.07
200.0	1.293E+07	92.1	.0	86.6	86.6	8.268E+07	Trn A	8.200E+06	8.280E+06	1.07
201.0	1.286E+07	92.1	.0	86.6	86.6	8.249E+07	Trn A	8.200E+06	8.280E+06	1.07
202.0	1.279E+07	92.1	.0	86.6	86.6	8.230E+07	Trn A	8.200E+06	8.280E+06	1.07
203.0	1.272E+07	92.0	.0	86.6	86.6	8.211E+07	Trn A	8.200E+06	8.280E+06	1.07
204.0	1.266E+07	92.0	.0	86.6	86.6	8.192E+07	Trn A	8.200E+06	8.280E+06	1.07
205.0	1.259E+07	92.0	.0	86.6	86.6	8.173E+07	Trn A	8.200E+06	8.280E+06	1.07
206.0	1.252E+07	92.0	.0	86.6	86.6	8.154E+07	Trn A	8.200E+06	8.280E+06	1.07
207.0	1.246E+07	92.0	.0	86.6	86.6	8.135E+07	Trn A	8.200E+06	8.280E+06	1.07
208.0	1.239E+07	92.0	.0	86.6	86.6	8.116E+07	Trn A	8.200E+06	8.280E+06	1.07
209.0	1.233E+07	92.0	.0	86.6	86.6	8.097E+07	Trn A	8.200E+06	8.280E+06	1.07
210.0	1.226E+07	92.0	.0	86.6	86.6	8.078E+07	Trn A	8.200E+06	8.280E+06	1.07
211.0	1.220E+07	92.0	.0	86.6	86.6	8.060E+07	Trn A	8.200E+06	8.280E+06	1.07
212.0	1.213E+07	92.0	.0	86.6	86.6	8.041E+07	Trn A	8.200E+06	8.280E+06	1.07
213.0	1.207E+07	91.9	.0	86.6	86.6	8.022E+07	Trn A	8.200E+06	8.280E+06	1.07
214.0	1.200E+07	91.9	.0	86.6	86.6	8.003E+07	Trn A	8.200E+06	8.280E+06	1.07
215.0	1.194E+07	91.9	.0	86.6	86.6	7.984E+07	Trn A	8.200E+06	8.280E+06	1.07
216.0	1.187E+07	91.9	.0	86.6	86.6	7.965E+07	Trn A	8.200E+06	8.280E+06	1.07
217.0	1.181E+07	91.9	.0	86.6	86.6	7.969E+07	Trn A	8.200E+06	8.280E+06	1.07
218.0	1.174E+07	91.9	.0	86.6	86.6	7.972E+07	Trn A	8.200E+06	8.280E+06	1.07
219.0	1.168E+07	91.9	.0	86.6	86.6	7.976E+07	Trn A	8.200E+06	8.280E+06	1.07
220.0	1.161E+07	91.9	.0	86.6	86.6	7.980E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 45 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=75F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
221.0	1.155E+07	91.9	.0	86.6	86.6	7.984E+07	Trn A	8.200E+06	8.280E+06	1.07
222.0	1.148E+07	91.9	.0	86.6	86.6	7.987E+07	Trn A	8.200E+06	8.280E+06	1.07
223.0	1.142E+07	91.9	.0	86.6	86.6	7.991E+07	Trn A	8.200E+06	8.280E+06	1.07
224.0	1.135E+07	91.9	.0	86.6	86.6	7.995E+07	Trn A	8.200E+06	8.280E+06	1.07
225.0	1.129E+07	91.9	.0	86.6	86.6	7.999E+07	Trn A	8.200E+06	8.280E+06	1.07
226.0	1.122E+07	91.9	.0	86.6	86.6	8.002E+07	Trn A	8.200E+06	8.280E+06	1.07
227.0	1.116E+07	91.9	.0	86.6	86.6	8.006E+07	Trn A	8.200E+06	8.280E+06	1.07
228.0	1.109E+07	91.9	.0	86.6	86.6	8.010E+07	Trn A	8.200E+06	8.280E+06	1.07
229.0	1.103E+07	91.9	.0	86.6	86.6	8.014E+07	Trn A	8.200E+06	8.280E+06	1.07
230.0	1.096E+07	91.9	.0	86.6	86.6	8.017E+07	Trn A	8.200E+06	8.280E+06	1.07
231.0	1.090E+07	91.9	.0	86.6	86.6	8.021E+07	Trn A	8.200E+06	8.280E+06	1.07
232.0	1.083E+07	91.9	.0	86.6	86.6	8.025E+07	Trn A	8.200E+06	8.280E+06	1.07
233.0	1.077E+07	91.9	.0	86.6	86.6	8.029E+07	Trn A	8.200E+06	8.280E+06	1.07
234.0	1.070E+07	91.9	.0	86.6	86.6	8.032E+07	Trn A	8.200E+06	8.280E+06	1.07
235.0	1.064E+07	91.9	.0	86.6	86.6	8.036E+07	Trn A	8.200E+06	8.280E+06	1.07
236.0	1.057E+07	91.9	.0	86.6	86.6	8.040E+07	Trn A	8.200E+06	8.280E+06	1.07
237.0	1.051E+07	91.9	.0	86.6	86.6	8.044E+07	Trn A	8.200E+06	8.280E+06	1.07
238.0	1.044E+07	91.9	.0	86.6	86.6	8.047E+07	Trn A	8.200E+06	8.280E+06	1.07
239.0	1.038E+07	91.9	.0	86.6	86.6	8.051E+07	Trn A	8.200E+06	8.280E+06	1.07
240.0	1.031E+07	91.9	.0	86.6	86.6	8.055E+07	Trn A	8.200E+06	8.280E+06	1.07

Stop - Program terminated.

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 46 of 166
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5. UHSSIM input/output for Fan4_70F, 4-Fan Case with IBT of 70 °F

Fan4_70F.inp

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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 4-fan mode, IBT=70F
# design wet-bulb temperature [F], design dry-bulb temperature [F],
# design hot-water temperature [F], design pressure [psia], design solids [ppt]
# 0 => P, psia, btu/hr, lbm/hr units
82, 98, 129.0, 14.696, 0.0, 0
# initial basin mass [lbm], initial basin temperature [F], initial solids [ppt],
# number of towers, starting time of simulation [hr]
29843200, 70, 0, 1, 0.
# Time Period Data -- every 0.1 hour for 10 hr then every hour up to 10 days
# step size, number of steps
0.1,100
1,230
*
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,8.2e6,8.28e6,1.07
240.0,8.2e6,8.28e6,1.07
*
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
    0 s  3.2565E+08
    50 s  3.2565E+08
   101 s  3.2565E+08
   116 s  3.1609E+08
   120 s  3.1487E+08
   150 s  3.1640E+08
   300 s  3.1640E+08
   900 s  3.1640E+08
  1800 s  3.0196E+08
  2704 s  2.8660E+08
  2706 s  4.4627E+08
 3600 s  4.3946E+08
    2 h  2.2984E+08
    4 h  1.4731E+08
    6 h  1.4644E+08
    9 h  1.4354E+08
   12 h  1.4254E+08
   18 h  1.5095E+08
   24 h  1.4834E+08
   36 h  1.2219E+08
    2 d  1.1371E+08
    3 d  1.0513E+08
    4 d  9.6311E+07
    5 d  9.1747E+07
    6 d  8.5844E+07
    7 d  8.3698E+07
    8 d  8.4190E+07
    9 d  7.9649E+07
   10 d  8.0549E+07
*
# Ambient Data Supplied by Bechtel Power Corp.
# TIME  WB    DB    P
# (hr)  (F)    (F)    (psia)
    0,   86.6,   86.6,   14.7
   240,  86.6,   86.6,   14.7
.

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Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 47 of 166
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Fan4_70F.out

Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 4-fan mode, IBT=70F

Initial Basin Mass 2.984E+07 lbm
Initial Basin Temperature 70.0 F
Initial Basin Solids .0 ppt

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
.0	2.984E+07	70.0	.0	86.6	86.6	3.257E+08	Trn A	8.200E+06	8.280E+06	1.07
.1	2.983E+07	70.6	.0	86.6	86.6	3.164E+08	Trn A	8.200E+06	8.280E+06	1.07
.2	2.982E+07	71.3	.0	86.6	86.6	3.164E+08	Trn A	8.200E+06	8.280E+06	1.07
.3	2.981E+07	71.9	.0	86.6	86.6	3.135E+08	Trn A	8.200E+06	8.280E+06	1.07
.4	2.980E+07	72.5	.0	86.6	86.6	3.077E+08	Trn A	8.200E+06	8.280E+06	1.07
.5	2.979E+07	73.1	.0	86.6	86.6	3.020E+08	Trn A	8.200E+06	8.280E+06	1.07
.6	2.978E+07	73.6	.0	86.6	86.6	2.958E+08	Trn A	8.200E+06	8.280E+06	1.07
.7	2.977E+07	74.2	.0	86.6	86.6	2.897E+08	Trn A	8.200E+06	8.280E+06	1.07
.8	2.975E+07	74.8	.0	86.6	86.6	4.449E+08	Trn A	8.200E+06	8.280E+06	1.07
.9	2.973E+07	75.4	.0	86.6	86.6	4.422E+08	Trn A	8.200E+06	8.280E+06	1.07
1.0	2.971E+07	76.0	.0	86.6	86.6	4.395E+08	Trn A	8.200E+06	8.280E+06	1.07
1.1	2.969E+07	76.6	.0	86.6	86.6	4.185E+08	Trn A	8.200E+06	8.280E+06	1.07
1.2	2.966E+07	77.2	.0	86.6	86.6	3.975E+08	Trn A	8.200E+06	8.280E+06	1.07
1.3	2.965E+07	77.7	.0	86.6	86.6	3.766E+08	Trn A	8.200E+06	8.280E+06	1.07
1.4	2.963E+07	78.2	.0	86.6	86.6	3.556E+08	Trn A	8.200E+06	8.280E+06	1.07
1.5	2.961E+07	78.7	.0	86.6	86.6	3.346E+08	Trn A	8.200E+06	8.280E+06	1.07
1.6	2.960E+07	79.2	.0	86.6	86.6	3.137E+08	Trn A	8.200E+06	8.280E+06	1.07
1.7	2.958E+07	79.6	.0	86.6	86.6	2.927E+08	Trn A	8.200E+06	8.280E+06	1.07
1.8	2.957E+07	80.0	.0	86.6	86.6	2.718E+08	Trn A	8.200E+06	8.280E+06	1.07
1.9	2.956E+07	80.4	.0	86.6	86.6	2.508E+08	Trn A	8.200E+06	8.280E+06	1.07
2.0	2.955E+07	80.8	.0	86.6	86.6	2.298E+08	Trn A	8.200E+06	8.280E+06	1.07
2.1	2.954E+07	81.2	.0	86.6	86.6	2.257E+08	Trn A	8.200E+06	8.280E+06	1.07
2.2	2.953E+07	81.5	.0	86.6	86.6	2.216E+08	Trn A	8.200E+06	8.280E+06	1.07
2.3	2.952E+07	81.8	.0	86.6	86.6	2.175E+08	Trn A	8.200E+06	8.280E+06	1.07
2.4	2.951E+07	82.2	.0	86.6	86.6	2.133E+08	Trn A	8.200E+06	8.280E+06	1.07
2.5	2.950E+07	82.5	.0	86.6	86.6	2.092E+08	Trn A	8.200E+06	8.280E+06	1.07
2.6	2.949E+07	82.8	.0	86.6	86.6	2.051E+08	Trn A	8.200E+06	8.280E+06	1.07
2.7	2.948E+07	83.1	.0	86.6	86.6	2.010E+08	Trn A	8.200E+06	8.280E+06	1.07
2.8	2.947E+07	83.4	.0	86.6	86.6	1.968E+08	Trn A	8.200E+06	8.280E+06	1.07
2.9	2.946E+07	83.6	.0	86.6	86.6	1.927E+08	Trn A	8.200E+06	8.280E+06	1.07
3.0	2.945E+07	83.9	.0	86.6	86.6	1.886E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 48 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=70F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
3.1	2.944E+07	84.2	.0	86.6	86.6	1.844E+08	Trn A	8.200E+06	8.280E+06	1.07
3.2	2.943E+07	84.4	.0	86.6	86.6	1.803E+08	Trn A	8.200E+06	8.280E+06	1.07
3.3	2.942E+07	84.6	.0	86.6	86.6	1.762E+08	Trn A	8.200E+06	8.280E+06	1.07
3.4	2.941E+07	84.9	.0	86.6	86.6	1.721E+08	Trn A	8.200E+06	8.280E+06	1.07
3.5	2.941E+07	85.1	.0	86.6	86.6	1.679E+08	Trn A	8.200E+06	8.280E+06	1.07
3.6	2.940E+07	85.3	.0	86.6	86.6	1.638E+08	Trn A	8.200E+06	8.280E+06	1.07
3.7	2.939E+07	85.5	.0	86.6	86.6	1.597E+08	Trn A	8.200E+06	8.280E+06	1.07
3.8	2.938E+07	85.7	.0	86.6	86.6	1.556E+08	Trn A	8.200E+06	8.280E+06	1.07
3.9	2.937E+07	85.9	.0	86.6	86.6	1.514E+08	Trn A	8.200E+06	8.280E+06	1.07
4.0	2.937E+07	86.1	.0	86.6	86.6	1.473E+08	Trn A	8.200E+06	8.280E+06	1.07
4.1	2.936E+07	86.3	.0	86.6	86.6	1.473E+08	Trn A	8.200E+06	8.280E+06	1.07
4.2	2.935E+07	86.5	.0	86.6	86.6	1.472E+08	Trn A	8.200E+06	8.280E+06	1.07
4.3	2.934E+07	86.6	.0	86.6	86.6	1.472E+08	Trn A	8.200E+06	8.280E+06	1.07
4.4	2.933E+07	86.8	.0	86.6	86.6	1.471E+08	Trn A	8.200E+06	8.280E+06	1.07
4.5	2.933E+07	87.0	.0	86.6	86.6	1.471E+08	Trn A	8.200E+06	8.280E+06	1.07
4.6	2.932E+07	87.1	.0	86.6	86.6	1.470E+08	Trn A	8.200E+06	8.280E+06	1.07
4.7	2.931E+07	87.3	.0	86.6	86.6	1.470E+08	Trn A	8.200E+06	8.280E+06	1.07
4.8	2.930E+07	87.4	.0	86.6	86.6	1.470E+08	Trn A	8.200E+06	8.280E+06	1.07
4.9	2.929E+07	87.6	.0	86.6	86.6	1.469E+08	Trn A	8.200E+06	8.280E+06	1.07
5.0	2.929E+07	87.7	.0	86.6	86.6	1.469E+08	Trn A	8.200E+06	8.280E+06	1.07
5.1	2.928E+07	87.9	.0	86.6	86.6	1.468E+08	Trn A	8.200E+06	8.280E+06	1.07
5.2	2.927E+07	88.0	.0	86.6	86.6	1.468E+08	Trn A	8.200E+06	8.280E+06	1.07
5.3	2.926E+07	88.2	.0	86.6	86.6	1.467E+08	Trn A	8.200E+06	8.280E+06	1.07
5.4	2.925E+07	88.3	.0	86.6	86.6	1.467E+08	Trn A	8.200E+06	8.280E+06	1.07
5.5	2.924E+07	88.4	.0	86.6	86.6	1.467E+08	Trn A	8.200E+06	8.280E+06	1.07
5.6	2.923E+07	88.6	.0	86.6	86.6	1.466E+08	Trn A	8.200E+06	8.280E+06	1.07
5.7	2.922E+07	88.7	.0	86.6	86.6	1.466E+08	Trn A	8.200E+06	8.280E+06	1.07
5.8	2.922E+07	88.8	.0	86.6	86.6	1.465E+08	Trn A	8.200E+06	8.280E+06	1.07
5.9	2.921E+07	89.0	.0	86.6	86.6	1.465E+08	Trn A	8.200E+06	8.280E+06	1.07
6.0	2.920E+07	89.1	.0	86.6	86.6	1.464E+08	Trn A	8.200E+06	8.280E+06	1.07
6.1	2.919E+07	89.2	.0	86.6	86.6	1.463E+08	Trn A	8.200E+06	8.280E+06	1.07
6.2	2.918E+07	89.3	.0	86.6	86.6	1.462E+08	Trn A	8.200E+06	8.280E+06	1.07
6.3	2.917E+07	89.4	.0	86.6	86.6	1.462E+08	Trn A	8.200E+06	8.280E+06	1.07
6.4	2.916E+07	89.5	.0	86.6	86.6	1.461E+08	Trn A	8.200E+06	8.280E+06	1.07
6.5	2.915E+07	89.7	.0	86.6	86.6	1.460E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 49 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 4-fan mode, IBT=70F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
6.6	2.914E+07	89.8	.0	86.6	86.6	1.459E+08	Trn A	8.200E+06	8.280E+06	1.07
6.7	2.913E+07	89.9	.0	86.6	86.6	1.458E+08	Trn A	8.200E+06	8.280E+06	1.07
6.8	2.912E+07	90.0	.0	86.6	86.6	1.457E+08	Trn A	8.200E+06	8.280E+06	1.07
6.9	2.911E+07	90.1	.0	86.6	86.6	1.456E+08	Trn A	8.200E+06	8.280E+06	1.07
7.0	2.910E+07	90.2	.0	86.6	86.6	1.455E+08	Trn A	8.200E+06	8.280E+06	1.07
7.1	2.909E+07	90.3	.0	86.6	86.6	1.454E+08	Trn A	8.200E+06	8.280E+06	1.07
7.2	2.908E+07	90.4	.0	86.6	86.6	1.453E+08	Trn A	8.200E+06	8.280E+06	1.07
7.3	2.908E+07	90.5	.0	86.6	86.6	1.452E+08	Trn A	8.200E+06	8.280E+06	1.07
7.4	2.907E+07	90.5	.0	86.6	86.6	1.451E+08	Trn A	8.200E+06	8.280E+06	1.07
7.5	2.906E+07	90.6	.0	86.6	86.6	1.450E+08	Trn A	8.200E+06	8.280E+06	1.07
7.6	2.905E+07	90.7	.0	86.6	86.6	1.449E+08	Trn A	8.200E+06	8.280E+06	1.07
7.7	2.904E+07	90.8	.0	86.6	86.6	1.448E+08	Trn A	8.200E+06	8.280E+06	1.07
7.8	2.903E+07	90.9	.0	86.6	86.6	1.447E+08	Trn A	8.200E+06	8.280E+06	1.07
7.9	2.902E+07	91.0	.0	86.6	86.6	1.446E+08	Trn A	8.200E+06	8.280E+06	1.07
8.0	2.901E+07	91.1	.0	86.6	86.6	1.445E+08	Trn A	8.200E+06	8.280E+06	1.07
8.1	2.900E+07	91.1	.0	86.6	86.6	1.444E+08	Trn A	8.200E+06	8.280E+06	1.07
8.2	2.899E+07	91.2	.0	86.6	86.6	1.443E+08	Trn A	8.200E+06	8.280E+06	1.07
8.3	2.898E+07	91.3	.0	86.6	86.6	1.442E+08	Trn A	8.200E+06	8.280E+06	1.07
8.4	2.897E+07	91.4	.0	86.6	86.6	1.441E+08	Trn A	8.200E+06	8.280E+06	1.07
8.5	2.896E+07	91.4	.0	86.6	86.6	1.440E+08	Trn A	8.200E+06	8.280E+06	1.07
8.6	2.895E+07	91.5	.0	86.6	86.6	1.439E+08	Trn A	8.200E+06	8.280E+06	1.07
8.7	2.894E+07	91.6	.0	86.6	86.6	1.438E+08	Trn A	8.200E+06	8.280E+06	1.07
8.8	2.892E+07	91.6	.0	86.6	86.6	1.437E+08	Trn A	8.200E+06	8.280E+06	1.07
8.9	2.891E+07	91.7	.0	86.6	86.6	1.436E+08	Trn A	8.200E+06	8.280E+06	1.07
9.0	2.890E+07	91.8	.0	86.6	86.6	1.435E+08	Trn A	8.200E+06	8.280E+06	1.07
9.1	2.889E+07	91.8	.0	86.6	86.6	1.435E+08	Trn A	8.200E+06	8.280E+06	1.07
9.2	2.888E+07	91.9	.0	86.6	86.6	1.435E+08	Trn A	8.200E+06	8.280E+06	1.07
9.3	2.887E+07	92.0	.0	86.6	86.6	1.434E+08	Trn A	8.200E+06	8.280E+06	1.07
9.4	2.886E+07	92.0	.0	86.6	86.6	1.434E+08	Trn A	8.200E+06	8.280E+06	1.07
9.5	2.885E+07	92.1	.0	86.6	86.6	1.434E+08	Trn A	8.200E+06	8.280E+06	1.07
9.6	2.884E+07	92.1	.0	86.6	86.6	1.433E+08	Trn A	8.200E+06	8.280E+06	1.07
9.7	2.883E+07	92.2	.0	86.6	86.6	1.433E+08	Trn A	8.200E+06	8.280E+06	1.07
9.8	2.882E+07	92.2	.0	86.6	86.6	1.433E+08	Trn A	8.200E+06	8.280E+06	1.07
9.9	2.881E+07	92.3	.0	86.6	86.6	1.432E+08	Trn A	8.200E+06	8.280E+06	1.07
10.0	2.880E+07	92.3	.0	86.6	86.6	1.432E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 50 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=70F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
11.0	2.869E+07	92.8	.0	86.6	86.6	1.429E+08	Trn A	8.200E+06	8.280E+06	1.07
12.0	2.858E+07	93.2	.0	86.6	86.6	1.425E+08	Trn A	8.200E+06	8.280E+06	1.07
13.0	2.847E+07	93.5	.0	86.6	86.6	1.439E+08	Trn A	8.200E+06	8.280E+06	1.07
14.0	2.836E+07	93.8	.0	86.6	86.6	1.453E+08	Trn A	8.200E+06	8.280E+06	1.07
15.0	2.824E+07	94.0	.0	86.6	86.6	1.467E+08	Trn A	8.200E+06	8.280E+06	1.07
16.0	2.812E+07	94.2	.0	86.6	86.6	1.481E+08	Trn A	8.200E+06	8.280E+06	1.07
17.0	2.801E+07	94.3	.0	86.6	86.6	1.495E+08	Trn A	8.200E+06	8.280E+06	1.07
18.0	2.788E+07	94.5	.0	86.6	86.6	1.509E+08	Trn A	8.200E+06	8.280E+06	1.07
19.0	2.776E+07	94.6	.0	86.6	86.6	1.505E+08	Trn A	8.200E+06	8.280E+06	1.07
20.0	2.764E+07	94.7	.0	86.6	86.6	1.501E+08	Trn A	8.200E+06	8.280E+06	1.07
21.0	2.751E+07	94.8	.0	86.6	86.6	1.496E+08	Trn A	8.200E+06	8.280E+06	1.07
22.0	2.739E+07	94.8	.0	86.6	86.6	1.492E+08	Trn A	8.200E+06	8.280E+06	1.07
23.0	2.727E+07	94.9	.0	86.6	86.6	1.488E+08	Trn A	8.200E+06	8.280E+06	1.07
24.0	2.715E+07	94.9	.0	86.6	86.6	1.483E+08	Trn A	8.200E+06	8.280E+06	1.07
25.0	2.702E+07	94.9	.0	86.6	86.6	1.462E+08	Trn A	8.200E+06	8.280E+06	1.07
26.0	2.690E+07	94.9	.0	86.6	86.6	1.440E+08	Trn A	8.200E+06	8.280E+06	1.07
27.0	2.678E+07	94.9	.0	86.6	86.6	1.418E+08	Trn A	8.200E+06	8.280E+06	1.07
28.0	2.667E+07	94.8	.0	86.6	86.6	1.396E+08	Trn A	8.200E+06	8.280E+06	1.07
29.0	2.655E+07	94.8	.0	86.6	86.6	1.374E+08	Trn A	8.200E+06	8.280E+06	1.07
30.0	2.644E+07	94.7	.0	86.6	86.6	1.353E+08	Trn A	8.200E+06	8.280E+06	1.07
31.0	2.632E+07	94.7	.0	86.6	86.6	1.331E+08	Trn A	8.200E+06	8.280E+06	1.07
32.0	2.621E+07	94.6	.0	86.6	86.6	1.309E+08	Trn A	8.200E+06	8.280E+06	1.07
33.0	2.610E+07	94.5	.0	86.6	86.6	1.287E+08	Trn A	8.200E+06	8.280E+06	1.07
34.0	2.600E+07	94.5	.0	86.6	86.6	1.265E+08	Trn A	8.200E+06	8.280E+06	1.07
35.0	2.589E+07	94.4	.0	86.6	86.6	1.244E+08	Trn A	8.200E+06	8.280E+06	1.07
36.0	2.579E+07	94.3	.0	86.6	86.6	1.222E+08	Trn A	8.200E+06	8.280E+06	1.07
37.0	2.568E+07	94.2	.0	86.6	86.6	1.215E+08	Trn A	8.200E+06	8.280E+06	1.07
38.0	2.558E+07	94.1	.0	86.6	86.6	1.208E+08	Trn A	8.200E+06	8.280E+06	1.07
39.0	2.548E+07	94.1	.0	86.6	86.6	1.201E+08	Trn A	8.200E+06	8.280E+06	1.07
40.0	2.538E+07	94.0	.0	86.6	86.6	1.194E+08	Trn A	8.200E+06	8.280E+06	1.07
41.0	2.528E+07	94.0	.0	86.6	86.6	1.187E+08	Trn A	8.200E+06	8.280E+06	1.07
42.0	2.519E+07	93.9	.0	86.6	86.6	1.180E+08	Trn A	8.200E+06	8.280E+06	1.07
43.0	2.509E+07	93.9	.0	86.6	86.6	1.172E+08	Trn A	8.200E+06	8.280E+06	1.07
44.0	2.499E+07	93.8	.0	86.6	86.6	1.165E+08	Trn A	8.200E+06	8.280E+06	1.07
45.0	2.489E+07	93.8	.0	86.6	86.6	1.158E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 51 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=70F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
46.0	2.480E+07	93.8	.0	86.6	86.6	1.151E+08	Trn A	8.200E+06	8.280E+06	1.07
47.0	2.470E+07	93.7	.0	86.6	86.6	1.144E+08	Trn A	8.200E+06	8.280E+06	1.07
48.0	2.461E+07	93.7	.0	86.6	86.6	1.137E+08	Trn A	8.200E+06	8.280E+06	1.07
49.0	2.452E+07	93.7	.0	86.6	86.6	1.134E+08	Trn A	8.200E+06	8.280E+06	1.07
50.0	2.442E+07	93.6	.0	86.6	86.6	1.130E+08	Trn A	8.200E+06	8.280E+06	1.07
51.0	2.433E+07	93.6	.0	86.6	86.6	1.126E+08	Trn A	8.200E+06	8.280E+06	1.07
52.0	2.424E+07	93.6	.0	86.6	86.6	1.123E+08	Trn A	8.200E+06	8.280E+06	1.07
53.0	2.414E+07	93.6	.0	86.6	86.6	1.119E+08	Trn A	8.200E+06	8.280E+06	1.07
54.0	2.405E+07	93.5	.0	86.6	86.6	1.116E+08	Trn A	8.200E+06	8.280E+06	1.07
55.0	2.396E+07	93.5	.0	86.6	86.6	1.112E+08	Trn A	8.200E+06	8.280E+06	1.07
56.0	2.387E+07	93.5	.0	86.6	86.6	1.109E+08	Trn A	8.200E+06	8.280E+06	1.07
57.0	2.378E+07	93.5	.0	86.6	86.6	1.105E+08	Trn A	8.200E+06	8.280E+06	1.07
58.0	2.369E+07	93.5	.0	86.6	86.6	1.101E+08	Trn A	8.200E+06	8.280E+06	1.07
59.0	2.359E+07	93.5	.0	86.6	86.6	1.098E+08	Trn A	8.200E+06	8.280E+06	1.07
60.0	2.350E+07	93.4	.0	86.6	86.6	1.094E+08	Trn A	8.200E+06	8.280E+06	1.07
61.0	2.341E+07	93.4	.0	86.6	86.6	1.091E+08	Trn A	8.200E+06	8.280E+06	1.07
62.0	2.332E+07	93.4	.0	86.6	86.6	1.087E+08	Trn A	8.200E+06	8.280E+06	1.07
63.0	2.324E+07	93.4	.0	86.6	86.6	1.083E+08	Trn A	8.200E+06	8.280E+06	1.07
64.0	2.315E+07	93.4	.0	86.6	86.6	1.080E+08	Trn A	8.200E+06	8.280E+06	1.07
65.0	2.306E+07	93.3	.0	86.6	86.6	1.076E+08	Trn A	8.200E+06	8.280E+06	1.07
66.0	2.297E+07	93.3	.0	86.6	86.6	1.073E+08	Trn A	8.200E+06	8.280E+06	1.07
67.0	2.288E+07	93.3	.0	86.6	86.6	1.069E+08	Trn A	8.200E+06	8.280E+06	1.07
68.0	2.279E+07	93.3	.0	86.6	86.6	1.066E+08	Trn A	8.200E+06	8.280E+06	1.07
69.0	2.271E+07	93.3	.0	86.6	86.6	1.062E+08	Trn A	8.200E+06	8.280E+06	1.07
70.0	2.262E+07	93.3	.0	86.6	86.6	1.058E+08	Trn A	8.200E+06	8.280E+06	1.07
71.0	2.253E+07	93.2	.0	86.6	86.6	1.055E+08	Trn A	8.200E+06	8.280E+06	1.07
72.0	2.245E+07	93.2	.0	86.6	86.6	1.051E+08	Trn A	8.200E+06	8.280E+06	1.07
73.0	2.236E+07	93.2	.0	86.6	86.6	1.048E+08	Trn A	8.200E+06	8.280E+06	1.07
74.0	2.227E+07	93.2	.0	86.6	86.6	1.044E+08	Trn A	8.200E+06	8.280E+06	1.07
75.0	2.219E+07	93.2	.0	86.6	86.6	1.040E+08	Trn A	8.200E+06	8.280E+06	1.07
76.0	2.210E+07	93.2	.0	86.6	86.6	1.037E+08	Trn A	8.200E+06	8.280E+06	1.07
77.0	2.202E+07	93.2	.0	86.6	86.6	1.033E+08	Trn A	8.200E+06	8.280E+06	1.07
78.0	2.193E+07	93.1	.0	86.6	86.6	1.029E+08	Trn A	8.200E+06	8.280E+06	1.07
79.0	2.185E+07	93.1	.0	86.6	86.6	1.026E+08	Trn A	8.200E+06	8.280E+06	1.07
80.0	2.176E+07	93.1	.0	86.6	86.6	1.022E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 52 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=70F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
81.0	2.168E+07	93.1	.0	86.6	86.6	1.018E+08	Trn A	8.200E+06	8.280E+06	1.07
82.0	2.160E+07	93.1	.0	86.6	86.6	1.015E+08	Trn A	8.200E+06	8.280E+06	1.07
83.0	2.151E+07	93.1	.0	86.6	86.6	1.011E+08	Trn A	8.200E+06	8.280E+06	1.07
84.0	2.143E+07	93.0	.0	86.6	86.6	1.007E+08	Trn A	8.200E+06	8.280E+06	1.07
85.0	2.135E+07	93.0	.0	86.6	86.6	1.004E+08	Trn A	8.200E+06	8.280E+06	1.07
86.0	2.127E+07	93.0	.0	86.6	86.6	9.999E+07	Trn A	8.200E+06	8.280E+06	1.07
87.0	2.118E+07	93.0	.0	86.6	86.6	9.962E+07	Trn A	8.200E+06	8.280E+06	1.07
88.0	2.110E+07	93.0	.0	86.6	86.6	9.925E+07	Trn A	8.200E+06	8.280E+06	1.07
89.0	2.102E+07	92.9	.0	86.6	86.6	9.888E+07	Trn A	8.200E+06	8.280E+06	1.07
90.0	2.094E+07	92.9	.0	86.6	86.6	9.852E+07	Trn A	8.200E+06	8.280E+06	1.07
91.0	2.086E+07	92.9	.0	86.6	86.6	9.815E+07	Trn A	8.200E+06	8.280E+06	1.07
92.0	2.078E+07	92.9	.0	86.6	86.6	9.778E+07	Trn A	8.200E+06	8.280E+06	1.07
93.0	2.070E+07	92.9	.0	86.6	86.6	9.741E+07	Trn A	8.200E+06	8.280E+06	1.07
94.0	2.062E+07	92.8	.0	86.6	86.6	9.705E+07	Trn A	8.200E+06	8.280E+06	1.07
95.0	2.054E+07	92.9	.0	86.6	86.6	9.668E+07	Trn A	8.200E+06	8.280E+06	1.07
96.0	2.046E+07	92.8	.0	86.6	86.6	9.631E+07	Trn A	8.200E+06	8.280E+06	1.07
97.0	2.038E+07	92.8	.0	86.6	86.6	9.612E+07	Trn A	8.200E+06	8.280E+06	1.07
98.0	2.031E+07	92.8	.0	86.6	86.6	9.593E+07	Trn A	8.200E+06	8.280E+06	1.07
99.0	2.023E+07	92.8	.0	86.6	86.6	9.574E+07	Trn A	8.200E+06	8.280E+06	1.07
100.0	2.015E+07	92.8	.0	86.6	86.6	9.555E+07	Trn A	8.200E+06	8.280E+06	1.07
101.0	2.007E+07	92.8	.0	86.6	86.6	9.536E+07	Trn A	8.200E+06	8.280E+06	1.07
102.0	1.999E+07	92.7	.0	86.6	86.6	9.517E+07	Trn A	8.200E+06	8.280E+06	1.07
103.0	1.992E+07	92.7	.0	86.6	86.6	9.498E+07	Trn A	8.200E+06	8.280E+06	1.07
104.0	1.984E+07	92.7	.0	86.6	86.6	9.479E+07	Trn A	8.200E+06	8.280E+06	1.07
105.0	1.976E+07	92.7	.0	86.6	86.6	9.460E+07	Trn A	8.200E+06	8.280E+06	1.07
106.0	1.968E+07	92.7	.0	86.6	86.6	9.441E+07	Trn A	8.200E+06	8.280E+06	1.07
107.0	1.961E+07	92.7	.0	86.6	86.6	9.422E+07	Trn A	8.200E+06	8.280E+06	1.07
108.0	1.953E+07	92.7	.0	86.6	86.6	9.403E+07	Trn A	8.200E+06	8.280E+06	1.07
109.0	1.945E+07	92.6	.0	86.6	86.6	9.384E+07	Trn A	8.200E+06	8.280E+06	1.07
110.0	1.938E+07	92.6	.0	86.6	86.6	9.365E+07	Trn A	8.200E+06	8.280E+06	1.07
111.0	1.930E+07	92.6	.0	86.6	86.6	9.346E+07	Trn A	8.200E+06	8.280E+06	1.07
112.0	1.922E+07	92.6	.0	86.6	86.6	9.327E+07	Trn A	8.200E+06	8.280E+06	1.07
113.0	1.915E+07	92.6	.0	86.6	86.6	9.308E+07	Trn A	8.200E+06	8.280E+06	1.07
114.0	1.907E+07	92.6	.0	86.6	86.6	9.289E+07	Trn A	8.200E+06	8.280E+06	1.07
115.0	1.900E+07	92.6	.0	86.6	86.6	9.270E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 53 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=70F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
116.0	1.892E+07	92.6	.0	86.6	86.6	9.251E+07	Trn A	8.200E+06	8.280E+06	1.07
117.0	1.884E+07	92.6	.0	86.6	86.6	9.232E+07	Trn A	8.200E+06	8.280E+06	1.07
118.0	1.877E+07	92.6	.0	86.6	86.6	9.213E+07	Trn A	8.200E+06	8.280E+06	1.07
119.0	1.869E+07	92.6	.0	86.6	86.6	9.194E+07	Trn A	8.200E+06	8.280E+06	1.07
120.0	1.862E+07	92.6	.0	86.6	86.6	9.175E+07	Trn A	8.200E+06	8.280E+06	1.07
121.0	1.854E+07	92.5	.0	86.6	86.6	9.150E+07	Trn A	8.200E+06	8.280E+06	1.07
122.0	1.847E+07	92.5	.0	86.6	86.6	9.126E+07	Trn A	8.200E+06	8.280E+06	1.07
123.0	1.840E+07	92.5	.0	86.6	86.6	9.101E+07	Trn A	8.200E+06	8.280E+06	1.07
124.0	1.832E+07	92.5	.0	86.6	86.6	9.076E+07	Trn A	8.200E+06	8.280E+06	1.07
125.0	1.825E+07	92.5	.0	86.6	86.6	9.052E+07	Trn A	8.200E+06	8.280E+06	1.07
126.0	1.817E+07	92.5	.0	86.6	86.6	9.027E+07	Trn A	8.200E+06	8.280E+06	1.07
127.0	1.810E+07	92.5	.0	86.6	86.6	9.003E+07	Trn A	8.200E+06	8.280E+06	1.07
128.0	1.803E+07	92.5	.0	86.6	86.6	8.978E+07	Trn A	8.200E+06	8.280E+06	1.07
129.0	1.795E+07	92.4	.0	86.6	86.6	8.953E+07	Trn A	8.200E+06	8.280E+06	1.07
130.0	1.788E+07	92.4	.0	86.6	86.6	8.929E+07	Trn A	8.200E+06	8.280E+06	1.07
131.0	1.781E+07	92.4	.0	86.6	86.6	8.904E+07	Trn A	8.200E+06	8.280E+06	1.07
132.0	1.774E+07	92.4	.0	86.6	86.6	8.880E+07	Trn A	8.200E+06	8.280E+06	1.07
133.0	1.766E+07	92.4	.0	86.6	86.6	8.855E+07	Trn A	8.200E+06	8.280E+06	1.07
134.0	1.759E+07	92.4	.0	86.6	86.6	8.830E+07	Trn A	8.200E+06	8.280E+06	1.07
135.0	1.752E+07	92.4	.0	86.6	86.6	8.806E+07	Trn A	8.200E+06	8.280E+06	1.07
136.0	1.745E+07	92.4	.0	86.6	86.6	8.781E+07	Trn A	8.200E+06	8.280E+06	1.07
137.0	1.738E+07	92.3	.0	86.6	86.6	8.757E+07	Trn A	8.200E+06	8.280E+06	1.07
138.0	1.730E+07	92.3	.0	86.6	86.6	8.732E+07	Trn A	8.200E+06	8.280E+06	1.07
139.0	1.723E+07	92.3	.0	86.6	86.6	8.707E+07	Trn A	8.200E+06	8.280E+06	1.07
140.0	1.716E+07	92.3	.0	86.6	86.6	8.683E+07	Trn A	8.200E+06	8.280E+06	1.07
141.0	1.709E+07	92.3	.0	86.6	86.6	8.658E+07	Trn A	8.200E+06	8.280E+06	1.07
142.0	1.702E+07	92.3	.0	86.6	86.6	8.634E+07	Trn A	8.200E+06	8.280E+06	1.07
143.0	1.695E+07	92.3	.0	86.6	86.6	8.609E+07	Trn A	8.200E+06	8.280E+06	1.07
144.0	1.688E+07	92.3	.0	86.6	86.6	8.584E+07	Trn A	8.200E+06	8.280E+06	1.07
145.0	1.681E+07	92.3	.0	86.6	86.6	8.575E+07	Trn A	8.200E+06	8.280E+06	1.07
146.0	1.674E+07	92.2	.0	86.6	86.6	8.567E+07	Trn A	8.200E+06	8.280E+06	1.07
147.0	1.667E+07	92.2	.0	86.6	86.6	8.558E+07	Trn A	8.200E+06	8.280E+06	1.07
148.0	1.660E+07	92.2	.0	86.6	86.6	8.549E+07	Trn A	8.200E+06	8.280E+06	1.07
149.0	1.653E+07	92.2	.0	86.6	86.6	8.540E+07	Trn A	8.200E+06	8.280E+06	1.07
150.0	1.646E+07	92.2	.0	86.6	86.6	8.531E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 54 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=70F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
151.0	1.639E+07	92.2	.0	86.6	86.6	8.522E+07	Trn A	8.200E+06	8.280E+06	1.07
152.0	1.633E+07	92.2	.0	86.6	86.6	8.513E+07	Trn A	8.200E+06	8.280E+06	1.07
153.0	1.626E+07	92.2	.0	86.6	86.6	8.504E+07	Trn A	8.200E+06	8.280E+06	1.07
154.0	1.619E+07	92.2	.0	86.6	86.6	8.495E+07	Trn A	8.200E+06	8.280E+06	1.07
155.0	1.612E+07	92.2	.0	86.6	86.6	8.486E+07	Trn A	8.200E+06	8.280E+06	1.07
156.0	1.605E+07	92.2	.0	86.6	86.6	8.477E+07	Trn A	8.200E+06	8.280E+06	1.07
157.0	1.598E+07	92.2	.0	86.6	86.6	8.468E+07	Trn A	8.200E+06	8.280E+06	1.07
158.0	1.591E+07	92.2	.0	86.6	86.6	8.459E+07	Trn A	8.200E+06	8.280E+06	1.07
159.0	1.584E+07	92.2	.0	86.6	86.6	8.450E+07	Trn A	8.200E+06	8.280E+06	1.07
160.0	1.577E+07	92.2	.0	86.6	86.6	8.441E+07	Trn A	8.200E+06	8.280E+06	1.07
161.0	1.571E+07	92.2	.0	86.6	86.6	8.432E+07	Trn A	8.200E+06	8.280E+06	1.07
162.0	1.564E+07	92.1	.0	86.6	86.6	8.423E+07	Trn A	8.200E+06	8.280E+06	1.07
163.0	1.557E+07	92.1	.0	86.6	86.6	8.415E+07	Trn A	8.200E+06	8.280E+06	1.07
164.0	1.550E+07	92.1	.0	86.6	86.6	8.406E+07	Trn A	8.200E+06	8.280E+06	1.07
165.0	1.543E+07	92.1	.0	86.6	86.6	8.397E+07	Trn A	8.200E+06	8.280E+06	1.07
166.0	1.536E+07	92.1	.0	86.6	86.6	8.388E+07	Trn A	8.200E+06	8.280E+06	1.07
167.0	1.530E+07	92.2	.0	86.6	86.6	8.379E+07	Trn A	8.200E+06	8.280E+06	1.07
168.0	1.523E+07	92.2	.0	86.6	86.6	8.370E+07	Trn A	8.200E+06	8.280E+06	1.07
169.0	1.516E+07	92.1	.0	86.6	86.6	8.372E+07	Trn A	8.200E+06	8.280E+06	1.07
170.0	1.509E+07	92.1	.0	86.6	86.6	8.374E+07	Trn A	8.200E+06	8.280E+06	1.07
171.0	1.502E+07	92.2	.0	86.6	86.6	8.376E+07	Trn A	8.200E+06	8.280E+06	1.07
172.0	1.496E+07	92.2	.0	86.6	86.6	8.378E+07	Trn A	8.200E+06	8.280E+06	1.07
173.0	1.489E+07	92.1	.0	86.6	86.6	8.380E+07	Trn A	8.200E+06	8.280E+06	1.07
174.0	1.482E+07	92.1	.0	86.6	86.6	8.382E+07	Trn A	8.200E+06	8.280E+06	1.07
175.0	1.475E+07	92.1	.0	86.6	86.6	8.384E+07	Trn A	8.200E+06	8.280E+06	1.07
176.0	1.468E+07	92.1	.0	86.6	86.6	8.386E+07	Trn A	8.200E+06	8.280E+06	1.07
177.0	1.462E+07	92.1	.0	86.6	86.6	8.388E+07	Trn A	8.200E+06	8.280E+06	1.07
178.0	1.455E+07	92.1	.0	86.6	86.6	8.390E+07	Trn A	8.200E+06	8.280E+06	1.07
179.0	1.448E+07	92.1	.0	86.6	86.6	8.392E+07	Trn A	8.200E+06	8.280E+06	1.07
180.0	1.441E+07	92.1	.0	86.6	86.6	8.394E+07	Trn A	8.200E+06	8.280E+06	1.07
181.0	1.434E+07	92.1	.0	86.6	86.6	8.396E+07	Trn A	8.200E+06	8.280E+06	1.07
182.0	1.428E+07	92.1	.0	86.6	86.6	8.399E+07	Trn A	8.200E+06	8.280E+06	1.07
183.0	1.421E+07	92.1	.0	86.6	86.6	8.401E+07	Trn A	8.200E+06	8.280E+06	1.07
184.0	1.414E+07	92.1	.0	86.6	86.6	8.403E+07	Trn A	8.200E+06	8.280E+06	1.07
185.0	1.407E+07	92.1	.0	86.6	86.6	8.405E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 55 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 4-fan mode, IBT=70F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
186.0	1.400E+07	92.1	.0	86.6	86.6	8.407E+07	Trn A	8.200E+06	8.280E+06	1.07
187.0	1.393E+07	92.1	.0	86.6	86.6	8.409E+07	Trn A	8.200E+06	8.280E+06	1.07
188.0	1.387E+07	92.1	.0	86.6	86.6	8.411E+07	Trn A	8.200E+06	8.280E+06	1.07
189.0	1.380E+07	92.1	.0	86.6	86.6	8.413E+07	Trn A	8.200E+06	8.280E+06	1.07
190.0	1.373E+07	92.1	.0	86.6	86.6	8.415E+07	Trn A	8.200E+06	8.280E+06	1.07
191.0	1.366E+07	92.1	.0	86.6	86.6	8.417E+07	Trn A	8.200E+06	8.280E+06	1.07
192.0	1.359E+07	92.1	.0	86.6	86.6	8.419E+07	Trn A	8.200E+06	8.280E+06	1.07
193.0	1.352E+07	92.1	.0	86.6	86.6	8.400E+07	Trn A	8.200E+06	8.280E+06	1.07
194.0	1.346E+07	92.1	.0	86.6	86.6	8.381E+07	Trn A	8.200E+06	8.280E+06	1.07
195.0	1.339E+07	92.1	.0	86.6	86.6	8.362E+07	Trn A	8.200E+06	8.280E+06	1.07
196.0	1.332E+07	92.1	.0	86.6	86.6	8.343E+07	Trn A	8.200E+06	8.280E+06	1.07
197.0	1.325E+07	92.1	.0	86.6	86.6	8.324E+07	Trn A	8.200E+06	8.280E+06	1.07
198.0	1.319E+07	92.1	.0	86.6	86.6	8.305E+07	Trn A	8.200E+06	8.280E+06	1.07
199.0	1.312E+07	92.1	.0	86.6	86.6	8.287E+07	Trn A	8.200E+06	8.280E+06	1.07
200.0	1.305E+07	92.1	.0	86.6	86.6	8.268E+07	Trn A	8.200E+06	8.280E+06	1.07
201.0	1.298E+07	92.1	.0	86.6	86.6	8.249E+07	Trn A	8.200E+06	8.280E+06	1.07
202.0	1.292E+07	92.1	.0	86.6	86.6	8.230E+07	Trn A	8.200E+06	8.280E+06	1.07
203.0	1.285E+07	92.0	.0	86.6	86.6	8.211E+07	Trn A	8.200E+06	8.280E+06	1.07
204.0	1.278E+07	92.0	.0	86.6	86.6	8.192E+07	Trn A	8.200E+06	8.280E+06	1.07
205.0	1.272E+07	92.0	.0	86.6	86.6	8.173E+07	Trn A	8.200E+06	8.280E+06	1.07
206.0	1.265E+07	92.0	.0	86.6	86.6	8.154E+07	Trn A	8.200E+06	8.280E+06	1.07
207.0	1.258E+07	92.0	.0	86.6	86.6	8.135E+07	Trn A	8.200E+06	8.280E+06	1.07
208.0	1.252E+07	92.0	.0	86.6	86.6	8.116E+07	Trn A	8.200E+06	8.280E+06	1.07
209.0	1.245E+07	92.0	.0	86.6	86.6	8.097E+07	Trn A	8.200E+06	8.280E+06	1.07
210.0	1.239E+07	92.0	.0	86.6	86.6	8.078E+07	Trn A	8.200E+06	8.280E+06	1.07
211.0	1.232E+07	92.0	.0	86.6	86.6	8.060E+07	Trn A	8.200E+06	8.280E+06	1.07
212.0	1.226E+07	91.9	.0	86.6	86.6	8.041E+07	Trn A	8.200E+06	8.280E+06	1.07
213.0	1.219E+07	91.9	.0	86.6	86.6	8.022E+07	Trn A	8.200E+06	8.280E+06	1.07
214.0	1.213E+07	91.9	.0	86.6	86.6	8.003E+07	Trn A	8.200E+06	8.280E+06	1.07
215.0	1.206E+07	91.9	.0	86.6	86.6	7.984E+07	Trn A	8.200E+06	8.280E+06	1.07
216.0	1.200E+07	91.9	.0	86.6	86.6	7.965E+07	Trn A	8.200E+06	8.280E+06	1.07
217.0	1.193E+07	91.9	.0	86.6	86.6	7.969E+07	Trn A	8.200E+06	8.280E+06	1.07
218.0	1.187E+07	91.9	.0	86.6	86.6	7.972E+07	Trn A	8.200E+06	8.280E+06	1.07
219.0	1.180E+07	91.9	.0	86.6	86.6	7.976E+07	Trn A	8.200E+06	8.280E+06	1.07
220.0	1.174E+07	91.9	.0	86.6	86.6	7.980E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 56 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=70F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
221.0	1.167E+07	91.9	.0	86.6	86.6	7.984E+07	Trn A	8.200E+06	8.280E+06	1.07
222.0	1.161E+07	91.9	.0	86.6	86.6	7.987E+07	Trn A	8.200E+06	8.280E+06	1.07
223.0	1.154E+07	91.9	.0	86.6	86.6	7.991E+07	Trn A	8.200E+06	8.280E+06	1.07
224.0	1.148E+07	91.9	.0	86.6	86.6	7.995E+07	Trn A	8.200E+06	8.280E+06	1.07
225.0	1.141E+07	91.9	.0	86.6	86.6	7.999E+07	Trn A	8.200E+06	8.280E+06	1.07
226.0	1.135E+07	91.9	.0	86.6	86.6	8.002E+07	Trn A	8.200E+06	8.280E+06	1.07
227.0	1.128E+07	91.9	.0	86.6	86.6	8.006E+07	Trn A	8.200E+06	8.280E+06	1.07
228.0	1.122E+07	91.9	.0	86.6	86.6	8.010E+07	Trn A	8.200E+06	8.280E+06	1.07
229.0	1.115E+07	91.9	.0	86.6	86.6	8.014E+07	Trn A	8.200E+06	8.280E+06	1.07
230.0	1.109E+07	91.9	.0	86.6	86.6	8.017E+07	Trn A	8.200E+06	8.280E+06	1.07
231.0	1.103E+07	91.9	.0	86.6	86.6	8.021E+07	Trn A	8.200E+06	8.280E+06	1.07
232.0	1.096E+07	91.9	.0	86.6	86.6	8.025E+07	Trn A	8.200E+06	8.280E+06	1.07
233.0	1.090E+07	91.9	.0	86.6	86.6	8.029E+07	Trn A	8.200E+06	8.280E+06	1.07
234.0	1.083E+07	91.9	.0	86.6	86.6	8.032E+07	Trn A	8.200E+06	8.280E+06	1.07
235.0	1.077E+07	91.9	.0	86.6	86.6	8.036E+07	Trn A	8.200E+06	8.280E+06	1.07
236.0	1.070E+07	91.9	.0	86.6	86.6	8.040E+07	Trn A	8.200E+06	8.280E+06	1.07
237.0	1.063E+07	91.9	.0	86.6	86.6	8.044E+07	Trn A	8.200E+06	8.280E+06	1.07
238.0	1.057E+07	91.9	.0	86.6	86.6	8.047E+07	Trn A	8.200E+06	8.280E+06	1.07
239.0	1.050E+07	91.9	.0	86.6	86.6	8.051E+07	Trn A	8.200E+06	8.280E+06	1.07
240.0	1.044E+07	91.9	.0	86.6	86.6	8.055E+07	Trn A	8.200E+06	8.280E+06	1.07
Stop - Program terminated.										

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 57 of 166
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6. UHSSIM input/output for Fan4_65F, 4-Fan Case with IBT of 65 °F

Fan4_65F.inp

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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 4-fan mode, IBT=65F
# design wet-bulb temperature [F], design dry-bulb temperature [F],
# design hot-water temperature [F], design pressure [psia], design solids [ppt]
# 0 => F, psia, btu/hr, lbm/hr units
82, 98, 129.0, 14.696, 0.0, 0
# initial basin mass [lbm], initial basin temperature [F], initial solids [ppt],
# number of towers, starting time of simulation [hr]
29843200, 65, 0, 1, 0.
# Time Period Data -- every 0.1 hour for 10 hr then every hour up to 10 days
# step size, number of steps
0.1,100
1,230
*
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,8.2e6,8.28e6,1.07
240.0,8.2e6,8.28e6,1.07
*
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
0 s 3.2565E+08
50 s 3.2565E+08
101 s 3.2565E+08
116 s 3.1609E+08
120 s 3.1487E+08
150 s 3.1640E+08
300 s 3.1640E+08
900 s 3.1640E+08
1800 s 3.0196E+08
2704 s 2.8660E+08
2706 s 4.4627E+08
3600 s 4.3946E+08
2 h 2.2984E+08
4 h 1.4731E+08
6 h 1.4644E+08
9 h 1.4354E+08
12 h 1.4254E+08
18 h 1.5095E+08
24 h 1.4834E+08
36 h 1.2219E+08
2 d 1.1371E+08
3 d 1.0513E+08
4 d 9.6311E+07
5 d 9.1747E+07
6 d 8.5844E+07
7 d 8.3698E+07
8 d 8.4190E+07
9 d 7.9649E+07
10 d 8.0549E+07
*
# Ambient Data Supplied by Bechtel Power Corp.
# TIME WB DB P
# (hr) (F) (F) (psia)
0, 86.6, 86.6, 14.7
240, 86.6, 86.6, 14.7

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Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 58 of 166
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Fan4_65F.out

Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 4-fan mode, IBT=65F

Initial Basin Mass 2.984E+07 lbm
Initial Basin Temperature 65.0 F
Initial Basin Solids .0 ppt

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
.0	2.984E+07	65.0	.0	86.6	86.6	3.257E+08	Trn A	8.200E+06	8.280E+06	1.07
.1	2.984E+07	65.7	.0	86.6	86.6	3.164E+08	Trn A	8.200E+06	8.280E+06	1.07
.2	2.983E+07	66.5	.0	86.6	86.6	3.164E+08	Trn A	8.200E+06	8.280E+06	1.07
.3	2.982E+07	67.2	.0	86.6	86.6	3.135E+08	Trn A	8.200E+06	8.280E+06	1.07
.4	2.981E+07	67.9	.0	86.6	86.6	3.077E+08	Trn A	8.200E+06	8.280E+06	1.07
.5	2.980E+07	68.5	.0	86.6	86.6	3.020E+08	Trn A	8.200E+06	8.280E+06	1.07
.6	2.979E+07	69.2	.0	86.6	86.6	2.958E+08	Trn A	8.200E+06	8.280E+06	1.07
.7	2.979E+07	69.8	.0	86.6	86.6	2.897E+08	Trn A	8.200E+06	8.280E+06	1.07
.8	2.977E+07	70.5	.0	86.6	86.6	4.449E+08	Trn A	8.200E+06	8.280E+06	1.07
.9	2.975E+07	71.3	.0	86.6	86.6	4.422E+08	Trn A	8.200E+06	8.280E+06	1.07
1.0	2.973E+07	72.0	.0	86.6	86.6	4.395E+08	Trn A	8.200E+06	8.280E+06	1.07
1.1	2.971E+07	72.6	.0	86.6	86.6	4.185E+08	Trn A	8.200E+06	8.280E+06	1.07
1.2	2.969E+07	73.3	.0	86.6	86.6	3.975E+08	Trn A	8.200E+06	8.280E+06	1.07
1.3	2.968E+07	73.9	.0	86.6	86.6	3.766E+08	Trn A	8.200E+06	8.280E+06	1.07
1.4	2.966E+07	74.5	.0	86.6	86.6	3.556E+08	Trn A	8.200E+06	8.280E+06	1.07
1.5	2.965E+07	75.1	.0	86.6	86.6	3.346E+08	Trn A	8.200E+06	8.280E+06	1.07
1.6	2.963E+07	75.6	.0	86.6	86.6	3.137E+08	Trn A	8.200E+06	8.280E+06	1.07
1.7	2.962E+07	76.1	.0	86.6	86.6	2.927E+08	Trn A	8.200E+06	8.280E+06	1.07
1.8	2.961E+07	76.6	.0	86.6	86.6	2.718E+08	Trn A	8.200E+06	8.280E+06	1.07
1.9	2.960E+07	77.1	.0	86.6	86.6	2.508E+08	Trn A	8.200E+06	8.280E+06	1.07
2.0	2.959E+07	77.5	.0	86.6	86.6	2.298E+08	Trn A	8.200E+06	8.280E+06	1.07
2.1	2.958E+07	78.0	.0	86.6	86.6	2.257E+08	Trn A	8.200E+06	8.280E+06	1.07
2.2	2.957E+07	78.4	.0	86.6	86.6	2.216E+08	Trn A	8.200E+06	8.280E+06	1.07
2.3	2.957E+07	78.8	.0	86.6	86.6	2.175E+08	Trn A	8.200E+06	8.280E+06	1.07
2.4	2.956E+07	79.1	.0	86.6	86.6	2.133E+08	Trn A	8.200E+06	8.280E+06	1.07
2.5	2.955E+07	79.5	.0	86.6	86.6	2.092E+08	Trn A	8.200E+06	8.280E+06	1.07
2.6	2.954E+07	79.9	.0	86.6	86.6	2.051E+08	Trn A	8.200E+06	8.280E+06	1.07
2.7	2.953E+07	80.2	.0	86.6	86.6	2.010E+08	Trn A	8.200E+06	8.280E+06	1.07
2.8	2.953E+07	80.6	.0	86.6	86.6	1.968E+08	Trn A	8.200E+06	8.280E+06	1.07
2.9	2.952E+07	80.9	.0	86.6	86.6	1.927E+08	Trn A	8.200E+06	8.280E+06	1.07
3.0	2.951E+07	81.2	.0	86.6	86.6	1.886E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 59 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=65F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
3.1	2.950E+07	81.5	.0	86.6	86.6	1.844E+08	Trn A	8.200E+06	8.280E+06	1.07
3.2	2.949E+07	81.8	.0	86.6	86.6	1.803E+08	Trn A	8.200E+06	8.280E+06	1.07
3.3	2.949E+07	82.1	.0	86.6	86.6	1.762E+08	Trn A	8.200E+06	8.280E+06	1.07
3.4	2.948E+07	82.4	.0	86.6	86.6	1.721E+08	Trn A	8.200E+06	8.280E+06	1.07
3.5	2.947E+07	82.7	.0	86.6	86.6	1.679E+08	Trn A	8.200E+06	8.280E+06	1.07
3.6	2.947E+07	82.9	.0	86.6	86.6	1.638E+08	Trn A	8.200E+06	8.280E+06	1.07
3.7	2.946E+07	83.2	.0	86.6	86.6	1.597E+08	Trn A	8.200E+06	8.280E+06	1.07
3.8	2.945E+07	83.4	.0	86.6	86.6	1.556E+08	Trn A	8.200E+06	8.280E+06	1.07
3.9	2.944E+07	83.7	.0	86.6	86.6	1.514E+08	Trn A	8.200E+06	8.280E+06	1.07
4.0	2.944E+07	83.9	.0	86.6	86.6	1.473E+08	Trn A	8.200E+06	8.280E+06	1.07
4.1	2.943E+07	84.1	.0	86.6	86.6	1.473E+08	Trn A	8.200E+06	8.280E+06	1.07
4.2	2.942E+07	84.3	.0	86.6	86.6	1.472E+08	Trn A	8.200E+06	8.280E+06	1.07
4.3	2.942E+07	84.6	.0	86.6	86.6	1.472E+08	Trn A	8.200E+06	8.280E+06	1.07
4.4	2.941E+07	84.8	.0	86.6	86.6	1.471E+08	Trn A	8.200E+06	8.280E+06	1.07
4.5	2.940E+07	85.0	.0	86.6	86.6	1.471E+08	Trn A	8.200E+06	8.280E+06	1.07
4.6	2.940E+07	85.2	.0	86.6	86.6	1.470E+08	Trn A	8.200E+06	8.280E+06	1.07
4.7	2.939E+07	85.4	.0	86.6	86.6	1.470E+08	Trn A	8.200E+06	8.280E+06	1.07
4.8	2.938E+07	85.5	.0	86.6	86.6	1.470E+08	Trn A	8.200E+06	8.280E+06	1.07
4.9	2.938E+07	85.7	.0	86.6	86.6	1.469E+08	Trn A	8.200E+06	8.280E+06	1.07
5.0	2.937E+07	85.9	.0	86.6	86.6	1.469E+08	Trn A	8.200E+06	8.280E+06	1.07
5.1	2.936E+07	86.1	.0	86.6	86.6	1.468E+08	Trn A	8.200E+06	8.280E+06	1.07
5.2	2.935E+07	86.3	.0	86.6	86.6	1.468E+08	Trn A	8.200E+06	8.280E+06	1.07
5.3	2.934E+07	86.5	.0	86.6	86.6	1.467E+08	Trn A	8.200E+06	8.280E+06	1.07
5.4	2.934E+07	86.6	.0	86.6	86.6	1.467E+08	Trn A	8.200E+06	8.280E+06	1.07
5.5	2.933E+07	86.8	.0	86.6	86.6	1.467E+08	Trn A	8.200E+06	8.280E+06	1.07
5.6	2.932E+07	87.0	.0	86.6	86.6	1.466E+08	Trn A	8.200E+06	8.280E+06	1.07
5.7	2.931E+07	87.1	.0	86.6	86.6	1.466E+08	Trn A	8.200E+06	8.280E+06	1.07
5.8	2.930E+07	87.3	.0	86.6	86.6	1.465E+08	Trn A	8.200E+06	8.280E+06	1.07
5.9	2.930E+07	87.4	.0	86.6	86.6	1.465E+08	Trn A	8.200E+06	8.280E+06	1.07
6.0	2.929E+07	87.6	.0	86.6	86.6	1.464E+08	Trn A	8.200E+06	8.280E+06	1.07
6.1	2.928E+07	87.7	.0	86.6	86.6	1.463E+08	Trn A	8.200E+06	8.280E+06	1.07
6.2	2.927E+07	87.9	.0	86.6	86.6	1.462E+08	Trn A	8.200E+06	8.280E+06	1.07
6.3	2.926E+07	88.0	.0	86.6	86.6	1.462E+08	Trn A	8.200E+06	8.280E+06	1.07
6.4	2.925E+07	88.2	.0	86.6	86.6	1.461E+08	Trn A	8.200E+06	8.280E+06	1.07
6.5	2.925E+07	88.3	.0	86.6	86.6	1.460E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 60 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=65F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
6.6	2.924E+07	88.4	.0	86.6	86.6	1.459E+08	Trn A	8.200E+06	8.280E+06	1.07
6.7	2.923E+07	88.6	.0	86.6	86.6	1.458E+08	Trn A	8.200E+06	8.280E+06	1.07
6.8	2.922E+07	88.7	.0	86.6	86.6	1.457E+08	Trn A	8.200E+06	8.280E+06	1.07
6.9	2.921E+07	88.8	.0	86.6	86.6	1.456E+08	Trn A	8.200E+06	8.280E+06	1.07
7.0	2.920E+07	89.0	.0	86.6	86.6	1.455E+08	Trn A	8.200E+06	8.280E+06	1.07
7.1	2.919E+07	89.1	.0	86.6	86.6	1.454E+08	Trn A	8.200E+06	8.280E+06	1.07
7.2	2.918E+07	89.2	.0	86.6	86.6	1.453E+08	Trn A	8.200E+06	8.280E+06	1.07
7.3	2.917E+07	89.3	.0	86.6	86.6	1.452E+08	Trn A	8.200E+06	8.280E+06	1.07
7.4	2.917E+07	89.4	.0	86.6	86.6	1.451E+08	Trn A	8.200E+06	8.280E+06	1.07
7.5	2.916E+07	89.5	.0	86.6	86.6	1.450E+08	Trn A	8.200E+06	8.280E+06	1.07
7.6	2.915E+07	89.6	.0	86.6	86.6	1.449E+08	Trn A	8.200E+06	8.280E+06	1.07
7.7	2.914E+07	89.7	.0	86.6	86.6	1.448E+08	Trn A	8.200E+06	8.280E+06	1.07
7.8	2.913E+07	89.9	.0	86.6	86.6	1.447E+08	Trn A	8.200E+06	8.280E+06	1.07
7.9	2.912E+07	90.0	.0	86.6	86.6	1.446E+08	Trn A	8.200E+06	8.280E+06	1.07
8.0	2.911E+07	90.1	.0	86.6	86.6	1.445E+08	Trn A	8.200E+06	8.280E+06	1.07
8.1	2.910E+07	90.2	.0	86.6	86.6	1.444E+08	Trn A	8.200E+06	8.280E+06	1.07
8.2	2.909E+07	90.3	.0	86.6	86.6	1.443E+08	Trn A	8.200E+06	8.280E+06	1.07
8.3	2.908E+07	90.3	.0	86.6	86.6	1.442E+08	Trn A	8.200E+06	8.280E+06	1.07
8.4	2.907E+07	90.4	.0	86.6	86.6	1.441E+08	Trn A	8.200E+06	8.280E+06	1.07
8.5	2.906E+07	90.5	.0	86.6	86.6	1.440E+08	Trn A	8.200E+06	8.280E+06	1.07
8.6	2.905E+07	90.6	.0	86.6	86.6	1.439E+08	Trn A	8.200E+06	8.280E+06	1.07
8.7	2.904E+07	90.7	.0	86.6	86.6	1.438E+08	Trn A	8.200E+06	8.280E+06	1.07
8.8	2.903E+07	90.8	.0	86.6	86.6	1.437E+08	Trn A	8.200E+06	8.280E+06	1.07
8.9	2.902E+07	90.9	.0	86.6	86.6	1.436E+08	Trn A	8.200E+06	8.280E+06	1.07
9.0	2.901E+07	91.0	.0	86.6	86.6	1.435E+08	Trn A	8.200E+06	8.280E+06	1.07
9.1	2.900E+07	91.0	.0	86.6	86.6	1.435E+08	Trn A	8.200E+06	8.280E+06	1.07
9.2	2.899E+07	91.1	.0	86.6	86.6	1.435E+08	Trn A	8.200E+06	8.280E+06	1.07
9.3	2.898E+07	91.2	.0	86.6	86.6	1.434E+08	Trn A	8.200E+06	8.280E+06	1.07
9.4	2.897E+07	91.3	.0	86.6	86.6	1.434E+08	Trn A	8.200E+06	8.280E+06	1.07
9.5	2.896E+07	91.3	.0	86.6	86.6	1.434E+08	Trn A	8.200E+06	8.280E+06	1.07
9.6	2.895E+07	91.4	.0	86.6	86.6	1.433E+08	Trn A	8.200E+06	8.280E+06	1.07
9.7	2.894E+07	91.5	.0	86.6	86.6	1.433E+08	Trn A	8.200E+06	8.280E+06	1.07
9.8	2.893E+07	91.5	.0	86.6	86.6	1.433E+08	Trn A	8.200E+06	8.280E+06	1.07
9.9	2.892E+07	91.6	.0	86.6	86.6	1.432E+08	Trn A	8.200E+06	8.280E+06	1.07
10.0	2.891E+07	91.7	.0	86.6	86.6	1.432E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 61 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=65F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
11.0	2.881E+07	92.3	.0	86.6	86.6	1.429E+08	Trn A	8.200E+06	8.280E+06	1.07
12.0	2.870E+07	92.7	.0	86.6	86.6	1.425E+08	Trn A	8.200E+06	8.280E+06	1.07
13.0	2.859E+07	93.1	.0	86.6	86.6	1.439E+08	Trn A	8.200E+06	8.280E+06	1.07
14.0	2.848E+07	93.5	.0	86.6	86.6	1.453E+08	Trn A	8.200E+06	8.280E+06	1.07
15.0	2.837E+07	93.7	.0	86.6	86.6	1.467E+08	Trn A	8.200E+06	8.280E+06	1.07
16.0	2.825E+07	94.0	.0	86.6	86.6	1.481E+08	Trn A	8.200E+06	8.280E+06	1.07
17.0	2.813E+07	94.2	.0	86.6	86.6	1.495E+08	Trn A	8.200E+06	8.280E+06	1.07
18.0	2.801E+07	94.4	.0	86.6	86.6	1.509E+08	Trn A	8.200E+06	8.280E+06	1.07
19.0	2.789E+07	94.5	.0	86.6	86.6	1.505E+08	Trn A	8.200E+06	8.280E+06	1.07
20.0	2.776E+07	94.6	.0	86.6	86.6	1.501E+08	Trn A	8.200E+06	8.280E+06	1.07
21.0	2.764E+07	94.7	.0	86.6	86.6	1.496E+08	Trn A	8.200E+06	8.280E+06	1.07
22.0	2.752E+07	94.8	.0	86.6	86.6	1.492E+08	Trn A	8.200E+06	8.280E+06	1.07
23.0	2.740E+07	94.8	.0	86.6	86.6	1.488E+08	Trn A	8.200E+06	8.280E+06	1.07
24.0	2.727E+07	94.8	.0	86.6	86.6	1.483E+08	Trn A	8.200E+06	8.280E+06	1.07
25.0	2.715E+07	94.9	.0	86.6	86.6	1.462E+08	Trn A	8.200E+06	8.280E+06	1.07
26.0	2.703E+07	94.9	.0	86.6	86.6	1.440E+08	Trn A	8.200E+06	8.280E+06	1.07
27.0	2.691E+07	94.9	.0	86.6	86.6	1.418E+08	Trn A	8.200E+06	8.280E+06	1.07
28.0	2.679E+07	94.8	.0	86.6	86.6	1.396E+08	Trn A	8.200E+06	8.280E+06	1.07
29.0	2.668E+07	94.8	.0	86.6	86.6	1.374E+08	Trn A	8.200E+06	8.280E+06	1.07
30.0	2.656E+07	94.7	.0	86.6	86.6	1.353E+08	Trn A	8.200E+06	8.280E+06	1.07
31.0	2.645E+07	94.7	.0	86.6	86.6	1.331E+08	Trn A	8.200E+06	8.280E+06	1.07
32.0	2.634E+07	94.6	.0	86.6	86.6	1.309E+08	Trn A	8.200E+06	8.280E+06	1.07
33.0	2.623E+07	94.5	.0	86.6	86.6	1.287E+08	Trn A	8.200E+06	8.280E+06	1.07
34.0	2.612E+07	94.5	.0	86.6	86.6	1.265E+08	Trn A	8.200E+06	8.280E+06	1.07
35.0	2.602E+07	94.4	.0	86.6	86.6	1.244E+08	Trn A	8.200E+06	8.280E+06	1.07
36.0	2.591E+07	94.3	.0	86.6	86.6	1.222E+08	Trn A	8.200E+06	8.280E+06	1.07
37.0	2.581E+07	94.2	.0	86.6	86.6	1.215E+08	Trn A	8.200E+06	8.280E+06	1.07
38.0	2.571E+07	94.2	.0	86.6	86.6	1.208E+08	Trn A	8.200E+06	8.280E+06	1.07
39.0	2.561E+07	94.1	.0	86.6	86.6	1.201E+08	Trn A	8.200E+06	8.280E+06	1.07
40.0	2.551E+07	94.0	.0	86.6	86.6	1.194E+08	Trn A	8.200E+06	8.280E+06	1.07
41.0	2.541E+07	94.0	.0	86.6	86.6	1.187E+08	Trn A	8.200E+06	8.280E+06	1.07
42.0	2.531E+07	93.9	.0	86.6	86.6	1.180E+08	Trn A	8.200E+06	8.280E+06	1.07
43.0	2.521E+07	93.9	.0	86.6	86.6	1.172E+08	Trn A	8.200E+06	8.280E+06	1.07
44.0	2.512E+07	93.9	.0	86.6	86.6	1.165E+08	Trn A	8.200E+06	8.280E+06	1.07
45.0	2.502E+07	93.8	.0	86.6	86.6	1.158E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 62 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=65F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
46.0	2.493E+07	93.8	.0	86.6	86.6	1.151E+08	Trn A	8.200E+06	8.280E+06	1.07
47.0	2.483E+07	93.7	.0	86.6	86.6	1.144E+08	Trn A	8.200E+06	8.280E+06	1.07
48.0	2.474E+07	93.7	.0	86.6	86.6	1.137E+08	Trn A	8.200E+06	8.280E+06	1.07
49.0	2.464E+07	93.7	.0	86.6	86.6	1.134E+08	Trn A	8.200E+06	8.280E+06	1.07
50.0	2.455E+07	93.6	.0	86.6	86.6	1.130E+08	Trn A	8.200E+06	8.280E+06	1.07
51.0	2.445E+07	93.6	.0	86.6	86.6	1.126E+08	Trn A	8.200E+06	8.280E+06	1.07
52.0	2.436E+07	93.6	.0	86.6	86.6	1.123E+08	Trn A	8.200E+06	8.280E+06	1.07
53.0	2.427E+07	93.6	.0	86.6	86.6	1.119E+08	Trn A	8.200E+06	8.280E+06	1.07
54.0	2.418E+07	93.5	.0	86.6	86.6	1.116E+08	Trn A	8.200E+06	8.280E+06	1.07
55.0	2.409E+07	93.5	.0	86.6	86.6	1.112E+08	Trn A	8.200E+06	8.280E+06	1.07
56.0	2.399E+07	93.5	.0	86.6	86.6	1.109E+08	Trn A	8.200E+06	8.280E+06	1.07
57.0	2.390E+07	93.5	.0	86.6	86.6	1.105E+08	Trn A	8.200E+06	8.280E+06	1.07
58.0	2.381E+07	93.5	.0	86.6	86.6	1.101E+08	Trn A	8.200E+06	8.280E+06	1.07
59.0	2.372E+07	93.5	.0	86.6	86.6	1.098E+08	Trn A	8.200E+06	8.280E+06	1.07
60.0	2.363E+07	93.4	.0	86.6	86.6	1.094E+08	Trn A	8.200E+06	8.280E+06	1.07
61.0	2.354E+07	93.4	.0	86.6	86.6	1.091E+08	Trn A	8.200E+06	8.280E+06	1.07
62.0	2.345E+07	93.4	.0	86.6	86.6	1.087E+08	Trn A	8.200E+06	8.280E+06	1.07
63.0	2.336E+07	93.4	.0	86.6	86.6	1.083E+08	Trn A	8.200E+06	8.280E+06	1.07
64.0	2.327E+07	93.4	.0	86.6	86.6	1.080E+08	Trn A	8.200E+06	8.280E+06	1.07
65.0	2.318E+07	93.4	.0	86.6	86.6	1.076E+08	Trn A	8.200E+06	8.280E+06	1.07
66.0	2.310E+07	93.3	.0	86.6	86.6	1.073E+08	Trn A	8.200E+06	8.280E+06	1.07
67.0	2.301E+07	93.3	.0	86.6	86.6	1.069E+08	Trn A	8.200E+06	8.280E+06	1.07
68.0	2.292E+07	93.3	.0	86.6	86.6	1.066E+08	Trn A	8.200E+06	8.280E+06	1.07
69.0	2.283E+07	93.3	.0	86.6	86.6	1.062E+08	Trn A	8.200E+06	8.280E+06	1.07
70.0	2.275E+07	93.3	.0	86.6	86.6	1.058E+08	Trn A	8.200E+06	8.280E+06	1.07
71.0	2.266E+07	93.3	.0	86.6	86.6	1.055E+08	Trn A	8.200E+06	8.280E+06	1.07
72.0	2.257E+07	93.2	.0	86.6	86.6	1.051E+08	Trn A	8.200E+06	8.280E+06	1.07
73.0	2.249E+07	93.2	.0	86.6	86.6	1.048E+08	Trn A	8.200E+06	8.280E+06	1.07
74.0	2.240E+07	93.2	.0	86.6	86.6	1.044E+08	Trn A	8.200E+06	8.280E+06	1.07
75.0	2.231E+07	93.2	.0	86.6	86.6	1.040E+08	Trn A	8.200E+06	8.280E+06	1.07
76.0	2.223E+07	93.2	.0	86.6	86.6	1.037E+08	Trn A	8.200E+06	8.280E+06	1.07
77.0	2.214E+07	93.2	.0	86.6	86.6	1.033E+08	Trn A	8.200E+06	8.280E+06	1.07
78.0	2.206E+07	93.1	.0	86.6	86.6	1.029E+08	Trn A	8.200E+06	8.280E+06	1.07
79.0	2.197E+07	93.1	.0	86.6	86.6	1.026E+08	Trn A	8.200E+06	8.280E+06	1.07
80.0	2.189E+07	93.1	.0	86.6	86.6	1.022E+08	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 63 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=65F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
81.0	2.181E+07	93.1	.0	86.6	86.6	1.018E+08	Trn A	8.200E+06	8.280E+06	1.07
82.0	2.172E+07	93.1	.0	86.6	86.6	1.015E+08	Trn A	8.200E+06	8.280E+06	1.07
83.0	2.164E+07	93.0	.0	86.6	86.6	1.011E+08	Trn A	8.200E+06	8.280E+06	1.07
84.0	2.156E+07	93.0	.0	86.6	86.6	1.007E+08	Trn A	8.200E+06	8.280E+06	1.07
85.0	2.148E+07	93.0	.0	86.6	86.6	1.004E+08	Trn A	8.200E+06	8.280E+06	1.07
86.0	2.139E+07	93.0	.0	86.6	86.6	9.999E+07	Trn A	8.200E+06	8.280E+06	1.07
87.0	2.131E+07	93.0	.0	86.6	86.6	9.962E+07	Trn A	8.200E+06	8.280E+06	1.07
88.0	2.123E+07	93.0	.0	86.6	86.6	9.925E+07	Trn A	8.200E+06	8.280E+06	1.07
89.0	2.115E+07	92.9	.0	86.6	86.6	9.888E+07	Trn A	8.200E+06	8.280E+06	1.07
90.0	2.107E+07	92.9	.0	86.6	86.6	9.852E+07	Trn A	8.200E+06	8.280E+06	1.07
91.0	2.099E+07	92.9	.0	86.6	86.6	9.815E+07	Trn A	8.200E+06	8.280E+06	1.07
92.0	2.091E+07	92.9	.0	86.6	86.6	9.778E+07	Trn A	8.200E+06	8.280E+06	1.07
93.0	2.083E+07	92.9	.0	86.6	86.6	9.741E+07	Trn A	8.200E+06	8.280E+06	1.07
94.0	2.075E+07	92.8	.0	86.6	86.6	9.705E+07	Trn A	8.200E+06	8.280E+06	1.07
95.0	2.067E+07	92.8	.0	86.6	86.6	9.668E+07	Trn A	8.200E+06	8.280E+06	1.07
96.0	2.059E+07	92.8	.0	86.6	86.6	9.631E+07	Trn A	8.200E+06	8.280E+06	1.07
97.0	2.051E+07	92.9	.0	86.6	86.6	9.612E+07	Trn A	8.200E+06	8.280E+06	1.07
98.0	2.043E+07	92.8	.0	86.6	86.6	9.593E+07	Trn A	8.200E+06	8.280E+06	1.07
99.0	2.035E+07	92.8	.0	86.6	86.6	9.574E+07	Trn A	8.200E+06	8.280E+06	1.07
100.0	2.028E+07	92.8	.0	86.6	86.6	9.555E+07	Trn A	8.200E+06	8.280E+06	1.07
101.0	2.020E+07	92.8	.0	86.6	86.6	9.536E+07	Trn A	8.200E+06	8.280E+06	1.07
102.0	2.012E+07	92.8	.0	86.6	86.6	9.517E+07	Trn A	8.200E+06	8.280E+06	1.07
103.0	2.004E+07	92.8	.0	86.6	86.6	9.498E+07	Trn A	8.200E+06	8.280E+06	1.07
104.0	1.997E+07	92.7	.0	86.6	86.6	9.479E+07	Trn A	8.200E+06	8.280E+06	1.07
105.0	1.989E+07	92.7	.0	86.6	86.6	9.460E+07	Trn A	8.200E+06	8.280E+06	1.07
106.0	1.981E+07	92.7	.0	86.6	86.6	9.441E+07	Trn A	8.200E+06	8.280E+06	1.07
107.0	1.973E+07	92.7	.0	86.6	86.6	9.422E+07	Trn A	8.200E+06	8.280E+06	1.07
108.0	1.966E+07	92.7	.0	86.6	86.6	9.403E+07	Trn A	8.200E+06	8.280E+06	1.07
109.0	1.958E+07	92.7	.0	86.6	86.6	9.384E+07	Trn A	8.200E+06	8.280E+06	1.07
110.0	1.950E+07	92.7	.0	86.6	86.6	9.365E+07	Trn A	8.200E+06	8.280E+06	1.07
111.0	1.943E+07	92.6	.0	86.6	86.6	9.346E+07	Trn A	8.200E+06	8.280E+06	1.07
112.0	1.935E+07	92.6	.0	86.6	86.6	9.327E+07	Trn A	8.200E+06	8.280E+06	1.07
113.0	1.927E+07	92.6	.0	86.6	86.6	9.308E+07	Trn A	8.200E+06	8.280E+06	1.07
114.0	1.920E+07	92.6	.0	86.6	86.6	9.289E+07	Trn A	8.200E+06	8.280E+06	1.07
115.0	1.912E+07	92.6	.0	86.6	86.6	9.270E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 64 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=65F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
116.0	1.905E+07	92.6	.0	86.6	86.6	9.251E+07	Trn A	8.200E+06	8.280E+06	1.07
117.0	1.897E+07	92.5	.0	86.6	86.6	9.232E+07	Trn A	8.200E+06	8.280E+06	1.07
118.0	1.890E+07	92.5	.0	86.6	86.6	9.213E+07	Trn A	8.200E+06	8.280E+06	1.07
119.0	1.882E+07	92.5	.0	86.6	86.6	9.194E+07	Trn A	8.200E+06	8.280E+06	1.07
120.0	1.875E+07	92.5	.0	86.6	86.6	9.175E+07	Trn A	8.200E+06	8.280E+06	1.07
121.0	1.867E+07	92.5	.0	86.6	86.6	9.150E+07	Trn A	8.200E+06	8.280E+06	1.07
122.0	1.860E+07	92.5	.0	86.6	86.6	9.126E+07	Trn A	8.200E+06	8.280E+06	1.07
123.0	1.852E+07	92.5	.0	86.6	86.6	9.101E+07	Trn A	8.200E+06	8.280E+06	1.07
124.0	1.845E+07	92.5	.0	86.6	86.6	9.076E+07	Trn A	8.200E+06	8.280E+06	1.07
125.0	1.837E+07	92.5	.0	86.6	86.6	9.052E+07	Trn A	8.200E+06	8.280E+06	1.07
126.0	1.830E+07	92.5	.0	86.6	86.6	9.027E+07	Trn A	8.200E+06	8.280E+06	1.07
127.0	1.823E+07	92.5	.0	86.6	86.6	9.003E+07	Trn A	8.200E+06	8.280E+06	1.07
128.0	1.815E+07	92.5	.0	86.6	86.6	8.978E+07	Trn A	8.200E+06	8.280E+06	1.07
129.0	1.808E+07	92.5	.0	86.6	86.6	8.953E+07	Trn A	8.200E+06	8.280E+06	1.07
130.0	1.801E+07	92.5	.0	86.6	86.6	8.929E+07	Trn A	8.200E+06	8.280E+06	1.07
131.0	1.794E+07	92.4	.0	86.6	86.6	8.904E+07	Trn A	8.200E+06	8.280E+06	1.07
132.0	1.786E+07	92.4	.0	86.6	86.6	8.880E+07	Trn A	8.200E+06	8.280E+06	1.07
133.0	1.779E+07	92.4	.0	86.6	86.6	8.855E+07	Trn A	8.200E+06	8.280E+06	1.07
134.0	1.772E+07	92.4	.0	86.6	86.6	8.830E+07	Trn A	8.200E+06	8.280E+06	1.07
135.0	1.765E+07	92.4	.0	86.6	86.6	8.806E+07	Trn A	8.200E+06	8.280E+06	1.07
136.0	1.758E+07	92.4	.0	86.6	86.6	8.781E+07	Trn A	8.200E+06	8.280E+06	1.07
137.0	1.750E+07	92.3	.0	86.6	86.6	8.757E+07	Trn A	8.200E+06	8.280E+06	1.07
138.0	1.743E+07	92.3	.0	86.6	86.6	8.732E+07	Trn A	8.200E+06	8.280E+06	1.07
139.0	1.736E+07	92.3	.0	86.6	86.6	8.707E+07	Trn A	8.200E+06	8.280E+06	1.07
140.0	1.729E+07	92.3	.0	86.6	86.6	8.683E+07	Trn A	8.200E+06	8.280E+06	1.07
141.0	1.722E+07	92.3	.0	86.6	86.6	8.658E+07	Trn A	8.200E+06	8.280E+06	1.07
142.0	1.715E+07	92.3	.0	86.6	86.6	8.634E+07	Trn A	8.200E+06	8.280E+06	1.07
143.0	1.708E+07	92.3	.0	86.6	86.6	8.609E+07	Trn A	8.200E+06	8.280E+06	1.07
144.0	1.701E+07	92.3	.0	86.6	86.6	8.584E+07	Trn A	8.200E+06	8.280E+06	1.07
145.0	1.694E+07	92.2	.0	86.6	86.6	8.575E+07	Trn A	8.200E+06	8.280E+06	1.07
146.0	1.687E+07	92.2	.0	86.6	86.6	8.567E+07	Trn A	8.200E+06	8.280E+06	1.07
147.0	1.680E+07	92.2	.0	86.6	86.6	8.558E+07	Trn A	8.200E+06	8.280E+06	1.07
148.0	1.673E+07	92.2	.0	86.6	86.6	8.549E+07	Trn A	8.200E+06	8.280E+06	1.07
149.0	1.666E+07	92.2	.0	86.6	86.6	8.540E+07	Trn A	8.200E+06	8.280E+06	1.07
150.0	1.659E+07	92.2	.0	86.6	86.6	8.531E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 65 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=65F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
151.0	1.652E+07	92.2	.0	86.6	86.6	8.522E+07	Trn A	8.200E+06	8.280E+06	1.07
152.0	1.645E+07	92.2	.0	86.6	86.6	8.513E+07	Trn A	8.200E+06	8.280E+06	1.07
153.0	1.638E+07	92.2	.0	86.6	86.6	8.504E+07	Trn A	8.200E+06	8.280E+06	1.07
154.0	1.631E+07	92.2	.0	86.6	86.6	8.495E+07	Trn A	8.200E+06	8.280E+06	1.07
155.0	1.625E+07	92.2	.0	86.6	86.6	8.486E+07	Trn A	8.200E+06	8.280E+06	1.07
156.0	1.618E+07	92.2	.0	86.6	86.6	8.477E+07	Trn A	8.200E+06	8.280E+06	1.07
157.0	1.611E+07	92.2	.0	86.6	86.6	8.468E+07	Trn A	8.200E+06	8.280E+06	1.07
158.0	1.604E+07	92.2	.0	86.6	86.6	8.459E+07	Trn A	8.200E+06	8.280E+06	1.07
159.0	1.597E+07	92.2	.0	86.6	86.6	8.450E+07	Trn A	8.200E+06	8.280E+06	1.07
160.0	1.590E+07	92.2	.0	86.6	86.6	8.441E+07	Trn A	8.200E+06	8.280E+06	1.07
161.0	1.583E+07	92.2	.0	86.6	86.6	8.432E+07	Trn A	8.200E+06	8.280E+06	1.07
162.0	1.577E+07	92.2	.0	86.6	86.6	8.423E+07	Trn A	8.200E+06	8.280E+06	1.07
163.0	1.570E+07	92.2	.0	86.6	86.6	8.415E+07	Trn A	8.200E+06	8.280E+06	1.07
164.0	1.563E+07	92.2	.0	86.6	86.6	8.406E+07	Trn A	8.200E+06	8.280E+06	1.07
165.0	1.556E+07	92.2	.0	86.6	86.6	8.397E+07	Trn A	8.200E+06	8.280E+06	1.07
166.0	1.549E+07	92.2	.0	86.6	86.6	8.388E+07	Trn A	8.200E+06	8.280E+06	1.07
167.0	1.542E+07	92.2	.0	86.6	86.6	8.379E+07	Trn A	8.200E+06	8.280E+06	1.07
168.0	1.536E+07	92.1	.0	86.6	86.6	8.370E+07	Trn A	8.200E+06	8.280E+06	1.07
169.0	1.529E+07	92.1	.0	86.6	86.6	8.372E+07	Trn A	8.200E+06	8.280E+06	1.07
170.0	1.522E+07	92.1	.0	86.6	86.6	8.374E+07	Trn A	8.200E+06	8.280E+06	1.07
171.0	1.515E+07	92.1	.0	86.6	86.6	8.376E+07	Trn A	8.200E+06	8.280E+06	1.07
172.0	1.508E+07	92.1	.0	86.6	86.6	8.378E+07	Trn A	8.200E+06	8.280E+06	1.07
173.0	1.502E+07	92.1	.0	86.6	86.6	8.380E+07	Trn A	8.200E+06	8.280E+06	1.07
174.0	1.495E+07	92.1	.0	86.6	86.6	8.382E+07	Trn A	8.200E+06	8.280E+06	1.07
175.0	1.488E+07	92.1	.0	86.6	86.6	8.384E+07	Trn A	8.200E+06	8.280E+06	1.07
176.0	1.481E+07	92.1	.0	86.6	86.6	8.386E+07	Trn A	8.200E+06	8.280E+06	1.07
177.0	1.474E+07	92.1	.0	86.6	86.6	8.388E+07	Trn A	8.200E+06	8.280E+06	1.07
178.0	1.468E+07	92.1	.0	86.6	86.6	8.390E+07	Trn A	8.200E+06	8.280E+06	1.07
179.0	1.461E+07	92.1	.0	86.6	86.6	8.392E+07	Trn A	8.200E+06	8.280E+06	1.07
180.0	1.454E+07	92.1	.0	86.6	86.6	8.394E+07	Trn A	8.200E+06	8.280E+06	1.07
181.0	1.447E+07	92.1	.0	86.6	86.6	8.396E+07	Trn A	8.200E+06	8.280E+06	1.07
182.0	1.440E+07	92.1	.0	86.6	86.6	8.399E+07	Trn A	8.200E+06	8.280E+06	1.07
183.0	1.433E+07	92.1	.0	86.6	86.6	8.401E+07	Trn A	8.200E+06	8.280E+06	1.07
184.0	1.427E+07	92.1	.0	86.6	86.6	8.403E+07	Trn A	8.200E+06	8.280E+06	1.07
185.0	1.420E+07	92.1	.0	86.6	86.6	8.405E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 66 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=65F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
186.0	1.413E+07	92.1	.0	86.6	86.6	8.407E+07	Trn A	8.200E+06	8.280E+06	1.07
187.0	1.406E+07	92.1	.0	86.6	86.6	8.409E+07	Trn A	8.200E+06	8.280E+06	1.07
188.0	1.399E+07	92.1	.0	86.6	86.6	8.411E+07	Trn A	8.200E+06	8.280E+06	1.07
189.0	1.393E+07	92.1	.0	86.6	86.6	8.413E+07	Trn A	8.200E+06	8.280E+06	1.07
190.0	1.386E+07	92.1	.0	86.6	86.6	8.415E+07	Trn A	8.200E+06	8.280E+06	1.07
191.0	1.379E+07	92.1	.0	86.6	86.6	8.417E+07	Trn A	8.200E+06	8.280E+06	1.07
192.0	1.372E+07	92.1	.0	86.6	86.6	8.419E+07	Trn A	8.200E+06	8.280E+06	1.07
193.0	1.365E+07	92.1	.0	86.6	86.6	8.400E+07	Trn A	8.200E+06	8.280E+06	1.07
194.0	1.358E+07	92.1	.0	86.6	86.6	8.381E+07	Trn A	8.200E+06	8.280E+06	1.07
195.0	1.352E+07	92.1	.0	86.6	86.6	8.362E+07	Trn A	8.200E+06	8.280E+06	1.07
196.0	1.345E+07	92.1	.0	86.6	86.6	8.343E+07	Trn A	8.200E+06	8.280E+06	1.07
197.0	1.338E+07	92.1	.0	86.6	86.6	8.324E+07	Trn A	8.200E+06	8.280E+06	1.07
198.0	1.331E+07	92.1	.0	86.6	86.6	8.305E+07	Trn A	8.200E+06	8.280E+06	1.07
199.0	1.325E+07	92.1	.0	86.6	86.6	8.287E+07	Trn A	8.200E+06	8.280E+06	1.07
200.0	1.318E+07	92.1	.0	86.6	86.6	8.268E+07	Trn A	8.200E+06	8.280E+06	1.07
201.0	1.311E+07	92.1	.0	86.6	86.6	8.249E+07	Trn A	8.200E+06	8.280E+06	1.07
202.0	1.304E+07	92.1	.0	86.6	86.6	8.230E+07	Trn A	8.200E+06	8.280E+06	1.07
203.0	1.298E+07	92.0	.0	86.6	86.6	8.211E+07	Trn A	8.200E+06	8.280E+06	1.07
204.0	1.291E+07	92.0	.0	86.6	86.6	8.192E+07	Trn A	8.200E+06	8.280E+06	1.07
205.0	1.284E+07	92.0	.0	86.6	86.6	8.173E+07	Trn A	8.200E+06	8.280E+06	1.07
206.0	1.278E+07	92.0	.0	86.6	86.6	8.154E+07	Trn A	8.200E+06	8.280E+06	1.07
207.0	1.271E+07	92.0	.0	86.6	86.6	8.135E+07	Trn A	8.200E+06	8.280E+06	1.07
208.0	1.265E+07	92.0	.0	86.6	86.6	8.116E+07	Trn A	8.200E+06	8.280E+06	1.07
209.0	1.258E+07	92.0	.0	86.6	86.6	8.097E+07	Trn A	8.200E+06	8.280E+06	1.07
210.0	1.251E+07	92.0	.0	86.6	86.6	8.078E+07	Trn A	8.200E+06	8.280E+06	1.07
211.0	1.245E+07	92.0	.0	86.6	86.6	8.060E+07	Trn A	8.200E+06	8.280E+06	1.07
212.0	1.238E+07	92.0	.0	86.6	86.6	8.041E+07	Trn A	8.200E+06	8.280E+06	1.07
213.0	1.232E+07	92.0	.0	86.6	86.6	8.022E+07	Trn A	8.200E+06	8.280E+06	1.07
214.0	1.225E+07	91.9	.0	86.6	86.6	8.003E+07	Trn A	8.200E+06	8.280E+06	1.07
215.0	1.219E+07	91.9	.0	86.6	86.6	7.984E+07	Trn A	8.200E+06	8.280E+06	1.07
216.0	1.212E+07	91.9	.0	86.6	86.6	7.965E+07	Trn A	8.200E+06	8.280E+06	1.07
217.0	1.206E+07	91.9	.0	86.6	86.6	7.969E+07	Trn A	8.200E+06	8.280E+06	1.07
218.0	1.200E+07	91.9	.0	86.6	86.6	7.972E+07	Trn A	8.200E+06	8.280E+06	1.07
219.0	1.193E+07	91.9	.0	86.6	86.6	7.976E+07	Trn A	8.200E+06	8.280E+06	1.07
220.0	1.187E+07	91.9	.0	86.6	86.6	7.980E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 67 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 4-fan mode, IBT=65F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
221.0	1.180E+07	91.9	.0	86.6	86.6	7.984E+07	Trn A	8.200E+06	8.280E+06	1.07
222.0	1.174E+07	91.9	.0	86.6	86.6	7.987E+07	Trn A	8.200E+06	8.280E+06	1.07
223.0	1.167E+07	91.9	.0	86.6	86.6	7.991E+07	Trn A	8.200E+06	8.280E+06	1.07
224.0	1.161E+07	91.9	.0	86.6	86.6	7.995E+07	Trn A	8.200E+06	8.280E+06	1.07
225.0	1.154E+07	91.9	.0	86.6	86.6	7.999E+07	Trn A	8.200E+06	8.280E+06	1.07
226.0	1.148E+07	91.9	.0	86.6	86.6	8.002E+07	Trn A	8.200E+06	8.280E+06	1.07
227.0	1.141E+07	91.9	.0	86.6	86.6	8.006E+07	Trn A	8.200E+06	8.280E+06	1.07
228.0	1.135E+07	91.9	.0	86.6	86.6	8.010E+07	Trn A	8.200E+06	8.280E+06	1.07
229.0	1.128E+07	91.9	.0	86.6	86.6	8.014E+07	Trn A	8.200E+06	8.280E+06	1.07
230.0	1.122E+07	91.9	.0	86.6	86.6	8.017E+07	Trn A	8.200E+06	8.280E+06	1.07
231.0	1.115E+07	91.9	.0	86.6	86.6	8.021E+07	Trn A	8.200E+06	8.280E+06	1.07
232.0	1.109E+07	91.9	.0	86.6	86.6	8.025E+07	Trn A	8.200E+06	8.280E+06	1.07
233.0	1.102E+07	91.9	.0	86.6	86.6	8.029E+07	Trn A	8.200E+06	8.280E+06	1.07
234.0	1.096E+07	91.9	.0	86.6	86.6	8.032E+07	Trn A	8.200E+06	8.280E+06	1.07
235.0	1.089E+07	91.9	.0	86.6	86.6	8.036E+07	Trn A	8.200E+06	8.280E+06	1.07
236.0	1.083E+07	91.9	.0	86.6	86.6	8.040E+07	Trn A	8.200E+06	8.280E+06	1.07
237.0	1.076E+07	91.9	.0	86.6	86.6	8.044E+07	Trn A	8.200E+06	8.280E+06	1.07
238.0	1.070E+07	91.9	.0	86.6	86.6	8.047E+07	Trn A	8.200E+06	8.280E+06	1.07
239.0	1.063E+07	91.9	.0	86.6	86.6	8.051E+07	Trn A	8.200E+06	8.280E+06	1.07
240.0	1.057E+07	91.9	.0	86.6	86.6	8.055E+07	Trn A	8.200E+06	8.280E+06	1.07
Stop - Program terminated.										

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 68 of 166
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7. UHSSIM input/output for Fan3_90F, 3-Fan Case with IBT of 90 °F

Fan3_90F.inp

```

Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=90F
# design wet-bulb temperature [F], design dry-bulb temperature [F],
# design hot-water temperature [F], design pressure [psia], design solids [ppt]
# 0 => F, psia, btu/hr, lbm/hr units
82, 98, 129.0, 14.696, 0.0, 0
# initial basin mass [lbm], initial basin temperature [F], initial solids [ppt],
# number of towers, starting time of simulation [hr]
29843200, 90, 0, 2, 0.
# Time Period Data -- every 0.1 hour for 10 hr then every hour up to 10 days
# step size, number of steps
0.1,100
1,230
*
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,6.15e6,6.21e6,1.07
240.0,6.15e6,6.21e6,1.07
*
# Train B
Trn B
0.0,2.05e6,0.0,1.07
240.0,2.05e6,0.0,1.07
*
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
0 s 3.2565E+08
50 s 3.2565E+08
101 s 3.2565E+08
116 s 3.1609E+08
120 s 3.1487E+08
150 s 3.1640E+08
300 s 3.1640E+08
900 s 3.1640E+08
1800 s 3.0196E+08
2704 s 2.8660E+08
2706 s 4.4627E+08
3600 s 4.3946E+08
2 h 2.2984E+08
4 h 1.4731E+08
6 h 1.4644E+08
9 h 1.4354E+08
12 h 1.4254E+08
18 h 1.5095E+08
24 h 1.4834E+08
36 h 1.2219E+08
2 d 1.1371E+08
3 d 1.0513E+08
4 d 9.6311E+07
5 d 9.1747E+07
6 d 8.5844E+07
7 d 8.3698E+07
8 d 8.4190E+07
9 d 7.9649E+07
10 d 8.0549E+07
*
# Ambient Data Supplied by Bechtel Power Corp.
# TIME WB DB P
# (hr) (F) (F) (psia)
0, 65.5, 65.5, 14.7
240, 65.5, 65.5, 14.7

```

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 69 of 166
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Fan3_90F.out

Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=90F

Initial Basin Mass 2.984E+07 lbm
Initial Basin Temperature 90.0 F
Initial Basin Solids .0 ppt

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
.0	2.984E+07	90.0	.0	65.5	65.5	3.257E+08	Trn A	6.150E+06	6.210E+06	1.07
.1	2.982E+07	90.2	.0	65.5	65.5	3.164E+08	Trn A	6.150E+06	6.210E+06	1.07
.2	2.980E+07	90.5	.0	65.5	65.5	3.164E+08	Trn A	6.150E+06	6.210E+06	1.07
.3	2.978E+07	90.7	.0	65.5	65.5	3.135E+08	Trn A	6.150E+06	6.210E+06	1.07
.4	2.976E+07	91.0	.0	65.5	65.5	3.077E+08	Trn A	6.150E+06	6.210E+06	1.07
.5	2.974E+07	91.2	.0	65.5	65.5	3.020E+08	Trn A	6.150E+06	6.210E+06	1.07
.6	2.972E+07	91.4	.0	65.5	65.5	2.958E+08	Trn A	6.150E+06	6.210E+06	1.07
.7	2.971E+07	91.6	.0	65.5	65.5	2.897E+08	Trn A	6.150E+06	6.210E+06	1.07
.8	2.968E+07	91.9	.0	65.5	65.5	4.449E+08	Trn A	6.150E+06	6.210E+06	1.07
.9	2.965E+07	92.2	.0	65.5	65.5	4.422E+08	Trn A	6.150E+06	6.210E+06	1.07
1.0	2.963E+07	92.6	.0	65.5	65.5	4.395E+08	Trn A	6.150E+06	6.210E+06	1.07
1.1	2.960E+07	92.9	.0	65.5	65.5	4.185E+08	Trn A	6.150E+06	6.210E+06	1.07
1.2	2.957E+07	93.2	.0	65.5	65.5	3.975E+08	Trn A	6.150E+06	6.210E+06	1.07
1.3	2.955E+07	93.5	.0	65.5	65.5	3.766E+08	Trn A	6.150E+06	6.210E+06	1.07
1.4	2.952E+07	93.7	.0	65.5	65.5	3.556E+08	Trn A	6.150E+06	6.210E+06	1.07
1.5	2.950E+07	94.0	.0	65.5	65.5	3.346E+08	Trn A	6.150E+06	6.210E+06	1.07
1.6	2.948E+07	94.2	.0	65.5	65.5	3.137E+08	Trn A	6.150E+06	6.210E+06	1.07
1.7	2.946E+07	94.3	.0	65.5	65.5	2.927E+08	Trn A	6.150E+06	6.210E+06	1.07
1.8	2.944E+07	94.4	.0	65.5	65.5	2.718E+08	Trn A	6.150E+06	6.210E+06	1.07
1.9	2.942E+07	94.6	.0	65.5	65.5	2.508E+08	Trn A	6.150E+06	6.210E+06	1.07
2.0	2.940E+07	94.6	.0	65.5	65.5	2.298E+08	Trn A	6.150E+06	6.210E+06	1.07
2.1	2.938E+07	94.7	.0	65.5	65.5	2.257E+08	Trn A	6.150E+06	6.210E+06	1.07
2.2	2.937E+07	94.7	.0	65.5	65.5	2.216E+08	Trn A	6.150E+06	6.210E+06	1.07
2.3	2.935E+07	94.8	.0	65.5	65.5	2.175E+08	Trn A	6.150E+06	6.210E+06	1.07
2.4	2.934E+07	94.8	.0	65.5	65.5	2.133E+08	Trn A	6.150E+06	6.210E+06	1.07
2.5	2.932E+07	94.9	.0	65.5	65.5	2.092E+08	Trn A	6.150E+06	6.210E+06	1.07
2.6	2.930E+07	94.9	.0	65.5	65.5	2.051E+08	Trn A	6.150E+06	6.210E+06	1.07
2.7	2.929E+07	94.9	.0	65.5	65.5	2.010E+08	Trn A	6.150E+06	6.210E+06	1.07
2.8	2.927E+07	94.9	.0	65.5	65.5	1.968E+08	Trn A	6.150E+06	6.210E+06	1.07
2.9	2.926E+07	94.9	.0	65.5	65.5	1.927E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 70 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=90F

time (hr)	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
3.0	2.924E+07	94.9	.0	65.5	65.5	1.886E+08	Trn A	6.150E+06	6.210E+06	1.07
3.1	2.923E+07	94.9	.0	65.5	65.5	1.844E+08	Trn A	6.150E+06	6.210E+06	1.07
3.2	2.921E+07	94.9	.0	65.5	65.5	1.803E+08	Trn A	6.150E+06	6.210E+06	1.07
3.3	2.920E+07	94.9	.0	65.5	65.5	1.762E+08	Trn A	6.150E+06	6.210E+06	1.07
3.4	2.918E+07	94.8	.0	65.5	65.5	1.721E+08	Trn A	6.150E+06	6.210E+06	1.07
3.5	2.917E+07	94.8	.0	65.5	65.5	1.679E+08	Trn A	6.150E+06	6.210E+06	1.07
3.6	2.915E+07	94.8	.0	65.5	65.5	1.638E+08	Trn A	6.150E+06	6.210E+06	1.07
3.7	2.914E+07	94.7	.0	65.5	65.5	1.597E+08	Trn A	6.150E+06	6.210E+06	1.07
3.8	2.913E+07	94.7	.0	65.5	65.5	1.556E+08	Trn A	6.150E+06	6.210E+06	1.07
3.9	2.911E+07	94.6	.0	65.5	65.5	1.514E+08	Trn A	6.150E+06	6.210E+06	1.07
4.0	2.910E+07	94.6	.0	65.5	65.5	1.473E+08	Trn A	6.150E+06	6.210E+06	1.07
4.1	2.909E+07	94.5	.0	65.5	65.5	1.473E+08	Trn A	6.150E+06	6.210E+06	1.07
4.2	2.907E+07	94.4	.0	65.5	65.5	1.472E+08	Trn A	6.150E+06	6.210E+06	1.07
4.3	2.906E+07	94.4	.0	65.5	65.5	1.472E+08	Trn A	6.150E+06	6.210E+06	1.07
4.4	2.905E+07	94.3	.0	65.5	65.5	1.471E+08	Trn A	6.150E+06	6.210E+06	1.07
4.5	2.904E+07	94.3	.0	65.5	65.5	1.471E+08	Trn A	6.150E+06	6.210E+06	1.07
4.6	2.902E+07	94.2	.0	65.5	65.5	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.7	2.901E+07	94.2	.0	65.5	65.5	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.8	2.900E+07	94.1	.0	65.5	65.5	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.9	2.898E+07	94.0	.0	65.5	65.5	1.469E+08	Trn A	6.150E+06	6.210E+06	1.07
5.0	2.897E+07	94.0	.0	65.5	65.5	1.469E+08	Trn A	6.150E+06	6.210E+06	1.07
5.1	2.896E+07	93.9	.0	65.5	65.5	1.468E+08	Trn A	6.150E+06	6.210E+06	1.07
5.2	2.895E+07	93.9	.0	65.5	65.5	1.468E+08	Trn A	6.150E+06	6.210E+06	1.07
5.3	2.893E+07	93.8	.0	65.5	65.5	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.4	2.892E+07	93.8	.0	65.5	65.5	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.5	2.891E+07	93.7	.0	65.5	65.5	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.6	2.890E+07	93.7	.0	65.5	65.5	1.466E+08	Trn A	6.150E+06	6.210E+06	1.07
5.7	2.888E+07	93.6	.0	65.5	65.5	1.466E+08	Trn A	6.150E+06	6.210E+06	1.07
5.8	2.887E+07	93.6	.0	65.5	65.5	1.465E+08	Trn A	6.150E+06	6.210E+06	1.07
5.9	2.886E+07	93.5	.0	65.5	65.5	1.465E+08	Trn A	6.150E+06	6.210E+06	1.07
6.0	2.885E+07	93.5	.0	65.5	65.5	1.464E+08	Trn A	6.150E+06	6.210E+06	1.07
6.1	2.883E+07	93.4	.0	65.5	65.5	1.463E+08	Trn A	6.150E+06	6.210E+06	1.07
6.2	2.882E+07	93.4	.0	65.5	65.5	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07
6.3	2.881E+07	93.3	.0	65.5	65.5	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 71 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=90F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
6.4	2.880E+07	93.3	.0	65.5	65.5	1.461E+08	Trn A	6.150E+06	6.210E+06	1.07
6.5	2.878E+07	93.3	.0	65.5	65.5	1.460E+08	Trn A	6.150E+06	6.210E+06	1.07
6.6	2.877E+07	93.2	.0	65.5	65.5	1.459E+08	Trn A	6.150E+06	6.210E+06	1.07
6.7	2.876E+07	93.2	.0	65.5	65.5	1.458E+08	Trn A	6.150E+06	6.210E+06	1.07
6.8	2.875E+07	93.1	.0	65.5	65.5	1.457E+08	Trn A	6.150E+06	6.210E+06	1.07
6.9	2.873E+07	93.1	.0	65.5	65.5	1.456E+08	Trn A	6.150E+06	6.210E+06	1.07
7.0	2.872E+07	93.0	.0	65.5	65.5	1.455E+08	Trn A	6.150E+06	6.210E+06	1.07
7.1	2.871E+07	93.0	.0	65.5	65.5	1.454E+08	Trn A	6.150E+06	6.210E+06	1.07
7.2	2.870E+07	92.9	.0	65.5	65.5	1.453E+08	Trn A	6.150E+06	6.210E+06	1.07
7.3	2.869E+07	92.9	.0	65.5	65.5	1.452E+08	Trn A	6.150E+06	6.210E+06	1.07
7.4	2.867E+07	92.9	.0	65.5	65.5	1.451E+08	Trn A	6.150E+06	6.210E+06	1.07
7.5	2.866E+07	92.8	.0	65.5	65.5	1.450E+08	Trn A	6.150E+06	6.210E+06	1.07
7.6	2.865E+07	92.8	.0	65.5	65.5	1.449E+08	Trn A	6.150E+06	6.210E+06	1.07
7.7	2.864E+07	92.7	.0	65.5	65.5	1.448E+08	Trn A	6.150E+06	6.210E+06	1.07
7.8	2.862E+07	92.7	.0	65.5	65.5	1.447E+08	Trn A	6.150E+06	6.210E+06	1.07
7.9	2.861E+07	92.7	.0	65.5	65.5	1.446E+08	Trn A	6.150E+06	6.210E+06	1.07
8.0	2.860E+07	92.6	.0	65.5	65.5	1.445E+08	Trn A	6.150E+06	6.210E+06	1.07
8.1	2.859E+07	92.6	.0	65.5	65.5	1.444E+08	Trn A	6.150E+06	6.210E+06	1.07
8.2	2.858E+07	92.6	.0	65.5	65.5	1.443E+08	Trn A	6.150E+06	6.210E+06	1.07
8.3	2.856E+07	92.5	.0	65.5	65.5	1.442E+08	Trn A	6.150E+06	6.210E+06	1.07
8.4	2.855E+07	92.5	.0	65.5	65.5	1.441E+08	Trn A	6.150E+06	6.210E+06	1.07
8.5	2.854E+07	92.4	.0	65.5	65.5	1.440E+08	Trn A	6.150E+06	6.210E+06	1.07
8.6	2.853E+07	92.4	.0	65.5	65.5	1.439E+08	Trn A	6.150E+06	6.210E+06	1.07
8.7	2.852E+07	92.4	.0	65.5	65.5	1.438E+08	Trn A	6.150E+06	6.210E+06	1.07
8.8	2.850E+07	92.3	.0	65.5	65.5	1.437E+08	Trn A	6.150E+06	6.210E+06	1.07
8.9	2.849E+07	92.3	.0	65.5	65.5	1.436E+08	Trn A	6.150E+06	6.210E+06	1.07
9.0	2.848E+07	92.3	.0	65.5	65.5	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.1	2.847E+07	92.2	.0	65.5	65.5	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.2	2.846E+07	92.2	.0	65.5	65.5	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.3	2.844E+07	92.2	.0	65.5	65.5	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.4	2.843E+07	92.1	.0	65.5	65.5	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.5	2.842E+07	92.1	.0	65.5	65.5	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.6	2.841E+07	92.1	.0	65.5	65.5	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07
9.7	2.840E+07	92.0	.0	65.5	65.5	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 72 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=90F

time	basin	basin	basin	dry-bulb	wet-bulb	heat load	tower	water	air	KaV/L
[hr]	mass	temp	solids	temp	temp	[btu/hr]		flow rate	flow rate	[-]
----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
9.8	2.839E+07	92.0	.0	65.5	65.5	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07
9.9	2.837E+07	92.0	.0	65.5	65.5	1.432E+08	Trn A	6.150E+06	6.210E+06	1.07
10.0	2.836E+07	91.9	.0	65.5	65.5	1.432E+08	Trn A	6.150E+06	6.210E+06	1.07
11.0	2.825E+07	91.7	.0	65.5	65.5	1.429E+08	Trn A	6.150E+06	6.210E+06	1.07
12.0	2.813E+07	91.4	.0	65.5	65.5	1.425E+08	Trn A	6.150E+06	6.210E+06	1.07
13.0	2.801E+07	91.2	.0	65.5	65.5	1.439E+08	Trn A	6.150E+06	6.210E+06	1.07
14.0	2.790E+07	91.0	.0	65.5	65.5	1.453E+08	Trn A	6.150E+06	6.210E+06	1.07
15.0	2.778E+07	90.9	.0	65.5	65.5	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
16.0	2.767E+07	90.8	.0	65.5	65.5	1.481E+08	Trn A	6.150E+06	6.210E+06	1.07
17.0	2.755E+07	90.8	.0	65.5	65.5	1.495E+08	Trn A	6.150E+06	6.210E+06	1.07
18.0	2.744E+07	90.8	.0	65.5	65.5	1.509E+08	Trn A	6.150E+06	6.210E+06	1.07
19.0	2.732E+07	90.8	.0	65.5	65.5	1.505E+08	Trn A	6.150E+06	6.210E+06	1.07
20.0	2.720E+07	90.8	.0	65.5	65.5	1.501E+08	Trn A	6.150E+06	6.210E+06	1.07
21.0	2.709E+07	90.8	.0	65.5	65.5	1.496E+08	Trn A	6.150E+06	6.210E+06	1.07
22.0	2.697E+07	90.7	.0	65.5	65.5	1.492E+08	Trn A	6.150E+06	6.210E+06	1.07
23.0	2.685E+07	90.7	.0	65.5	65.5	1.488E+08	Trn A	6.150E+06	6.210E+06	1.07
24.0	2.674E+07	90.7	.0	65.5	65.5	1.483E+08	Trn A	6.150E+06	6.210E+06	1.07
25.0	2.662E+07	90.6	.0	65.5	65.5	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07
26.0	2.651E+07	90.6	.0	65.5	65.5	1.440E+08	Trn A	6.150E+06	6.210E+06	1.07
27.0	2.640E+07	90.5	.0	65.5	65.5	1.418E+08	Trn A	6.150E+06	6.210E+06	1.07
28.0	2.629E+07	90.3	.0	65.5	65.5	1.396E+08	Trn A	6.150E+06	6.210E+06	1.07
29.0	2.618E+07	90.2	.0	65.5	65.5	1.374E+08	Trn A	6.150E+06	6.210E+06	1.07
30.0	2.607E+07	90.0	.0	65.5	65.5	1.353E+08	Trn A	6.150E+06	6.210E+06	1.07
31.0	2.596E+07	89.9	.0	65.5	65.5	1.331E+08	Trn A	6.150E+06	6.210E+06	1.07
32.0	2.586E+07	89.7	.0	65.5	65.5	1.309E+08	Trn A	6.150E+06	6.210E+06	1.07
33.0	2.576E+07	89.5	.0	65.5	65.5	1.287E+08	Trn A	6.150E+06	6.210E+06	1.07
34.0	2.565E+07	89.3	.0	65.5	65.5	1.265E+08	Trn A	6.150E+06	6.210E+06	1.07
35.0	2.555E+07	89.1	.0	65.5	65.5	1.244E+08	Trn A	6.150E+06	6.210E+06	1.07
36.0	2.546E+07	88.8	.0	65.5	65.5	1.222E+08	Trn A	6.150E+06	6.210E+06	1.07
37.0	2.536E+07	88.6	.0	65.5	65.5	1.215E+08	Trn A	6.150E+06	6.210E+06	1.07
38.0	2.526E+07	88.4	.0	65.5	65.5	1.208E+08	Trn A	6.150E+06	6.210E+06	1.07
39.0	2.517E+07	88.2	.0	65.5	65.5	1.201E+08	Trn A	6.150E+06	6.210E+06	1.07
40.0	2.507E+07	88.1	.0	65.5	65.5	1.194E+08	Trn A	6.150E+06	6.210E+06	1.07
41.0	2.498E+07	87.9	.0	65.5	65.5	1.187E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 73 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=90F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
42.0	2.489E+07	87.8	.0	65.5	65.5	1.180E+08	Trn A	6.150E+06	6.210E+06	1.07
43.0	2.480E+07	87.6	.0	65.5	65.5	1.172E+08	Trn A	6.150E+06	6.210E+06	1.07
44.0	2.471E+07	87.5	.0	65.5	65.5	1.165E+08	Trn A	6.150E+06	6.210E+06	1.07
45.0	2.462E+07	87.4	.0	65.5	65.5	1.158E+08	Trn A	6.150E+06	6.210E+06	1.07
46.0	2.453E+07	87.2	.0	65.5	65.5	1.151E+08	Trn A	6.150E+06	6.210E+06	1.07
47.0	2.444E+07	87.1	.0	65.5	65.5	1.144E+08	Trn A	6.150E+06	6.210E+06	1.07
48.0	2.435E+07	87.0	.0	65.5	65.5	1.137E+08	Trn A	6.150E+06	6.210E+06	1.07
49.0	2.426E+07	86.9	.0	65.5	65.5	1.134E+08	Trn A	6.150E+06	6.210E+06	1.07
50.0	2.418E+07	86.8	.0	65.5	65.5	1.130E+08	Trn A	6.150E+06	6.210E+06	1.07
51.0	2.409E+07	86.7	.0	65.5	65.5	1.126E+08	Trn A	6.150E+06	6.210E+06	1.07
52.0	2.400E+07	86.6	.0	65.5	65.5	1.123E+08	Trn A	6.150E+06	6.210E+06	1.07
53.0	2.392E+07	86.5	.0	65.5	65.5	1.119E+08	Trn A	6.150E+06	6.210E+06	1.07
54.0	2.383E+07	86.5	.0	65.5	65.5	1.116E+08	Trn A	6.150E+06	6.210E+06	1.07
55.0	2.375E+07	86.4	.0	65.5	65.5	1.112E+08	Trn A	6.150E+06	6.210E+06	1.07
56.0	2.366E+07	86.3	.0	65.5	65.5	1.109E+08	Trn A	6.150E+06	6.210E+06	1.07
57.0	2.358E+07	86.3	.0	65.5	65.5	1.105E+08	Trn A	6.150E+06	6.210E+06	1.07
58.0	2.350E+07	86.2	.0	65.5	65.5	1.101E+08	Trn A	6.150E+06	6.210E+06	1.07
59.0	2.341E+07	86.1	.0	65.5	65.5	1.098E+08	Trn A	6.150E+06	6.210E+06	1.07
60.0	2.333E+07	86.1	.0	65.5	65.5	1.094E+08	Trn A	6.150E+06	6.210E+06	1.07
61.0	2.325E+07	86.0	.0	65.5	65.5	1.091E+08	Trn A	6.150E+06	6.210E+06	1.07
62.0	2.317E+07	86.0	.0	65.5	65.5	1.087E+08	Trn A	6.150E+06	6.210E+06	1.07
63.0	2.308E+07	85.9	.0	65.5	65.5	1.083E+08	Trn A	6.150E+06	6.210E+06	1.07
64.0	2.300E+07	85.9	.0	65.5	65.5	1.080E+08	Trn A	6.150E+06	6.210E+06	1.07
65.0	2.292E+07	85.8	.0	65.5	65.5	1.076E+08	Trn A	6.150E+06	6.210E+06	1.07
66.0	2.284E+07	85.8	.0	65.5	65.5	1.073E+08	Trn A	6.150E+06	6.210E+06	1.07
67.0	2.276E+07	85.7	.0	65.5	65.5	1.069E+08	Trn A	6.150E+06	6.210E+06	1.07
68.0	2.268E+07	85.7	.0	65.5	65.5	1.066E+08	Trn A	6.150E+06	6.210E+06	1.07
69.0	2.260E+07	85.6	.0	65.5	65.5	1.062E+08	Trn A	6.150E+06	6.210E+06	1.07
70.0	2.252E+07	85.6	.0	65.5	65.5	1.058E+08	Trn A	6.150E+06	6.210E+06	1.07
71.0	2.244E+07	85.5	.0	65.5	65.5	1.055E+08	Trn A	6.150E+06	6.210E+06	1.07
72.0	2.236E+07	85.5	.0	65.5	65.5	1.051E+08	Trn A	6.150E+06	6.210E+06	1.07
73.0	2.228E+07	85.4	.0	65.5	65.5	1.048E+08	Trn A	6.150E+06	6.210E+06	1.07
74.0	2.220E+07	85.4	.0	65.5	65.5	1.044E+08	Trn A	6.150E+06	6.210E+06	1.07
75.0	2.212E+07	85.3	.0	65.5	65.5	1.040E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 74 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, 1BT=90F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
76.0	2.204E+07	85.3	.0	65.5	65.5	1.037E+08	Trn A	6.150E+06	6.210E+06	1.07
77.0	2.197E+07	85.2	.0	65.5	65.5	1.033E+08	Trn A	6.150E+06	6.210E+06	1.07
78.0	2.189E+07	85.2	.0	65.5	65.5	1.029E+08	Trn A	6.150E+06	6.210E+06	1.07
79.0	2.181E+07	85.1	.0	65.5	65.5	1.026E+08	Trn A	6.150E+06	6.210E+06	1.07
80.0	2.173E+07	85.1	.0	65.5	65.5	1.022E+08	Trn A	6.150E+06	6.210E+06	1.07
81.0	2.166E+07	85.0	.0	65.5	65.5	1.018E+08	Trn A	6.150E+06	6.210E+06	1.07
82.0	2.158E+07	85.0	.0	65.5	65.5	1.015E+08	Trn A	6.150E+06	6.210E+06	1.07
83.0	2.151E+07	84.9	.0	65.5	65.5	1.011E+08	Trn A	6.150E+06	6.210E+06	1.07
84.0	2.143E+07	84.9	.0	65.5	65.5	1.007E+08	Trn A	6.150E+06	6.210E+06	1.07
85.0	2.135E+07	84.8	.0	65.5	65.5	1.004E+08	Trn A	6.150E+06	6.210E+06	1.07
86.0	2.128E+07	84.7	.0	65.5	65.5	9.999E+07	Trn A	6.150E+06	6.210E+06	1.07
87.0	2.120E+07	84.7	.0	65.5	65.5	9.962E+07	Trn A	6.150E+06	6.210E+06	1.07
88.0	2.113E+07	84.6	.0	65.5	65.5	9.925E+07	Trn A	6.150E+06	6.210E+06	1.07
89.0	2.106E+07	84.6	.0	65.5	65.5	9.888E+07	Trn A	6.150E+06	6.210E+06	1.07
90.0	2.098E+07	84.5	.0	65.5	65.5	9.852E+07	Trn A	6.150E+06	6.210E+06	1.07
91.0	2.091E+07	84.5	.0	65.5	65.5	9.815E+07	Trn A	6.150E+06	6.210E+06	1.07
92.0	2.083E+07	84.4	.0	65.5	65.5	9.778E+07	Trn A	6.150E+06	6.210E+06	1.07
93.0	2.076E+07	84.4	.0	65.5	65.5	9.741E+07	Trn A	6.150E+06	6.210E+06	1.07
94.0	2.069E+07	84.3	.0	65.5	65.5	9.705E+07	Trn A	6.150E+06	6.210E+06	1.07
95.0	2.062E+07	84.3	.0	65.5	65.5	9.668E+07	Trn A	6.150E+06	6.210E+06	1.07
96.0	2.054E+07	84.2	.0	65.5	65.5	9.631E+07	Trn A	6.150E+06	6.210E+06	1.07
97.0	2.047E+07	84.2	.0	65.5	65.5	9.612E+07	Trn A	6.150E+06	6.210E+06	1.07
98.0	2.040E+07	84.1	.0	65.5	65.5	9.593E+07	Trn A	6.150E+06	6.210E+06	1.07
99.0	2.033E+07	84.1	.0	65.5	65.5	9.574E+07	Trn A	6.150E+06	6.210E+06	1.07
100.0	2.026E+07	84.0	.0	65.5	65.5	9.555E+07	Trn A	6.150E+06	6.210E+06	1.07
101.0	2.019E+07	84.0	.0	65.5	65.5	9.536E+07	Trn A	6.150E+06	6.210E+06	1.07
102.0	2.012E+07	84.0	.0	65.5	65.5	9.517E+07	Trn A	6.150E+06	6.210E+06	1.07
103.0	2.005E+07	83.9	.0	65.5	65.5	9.498E+07	Trn A	6.150E+06	6.210E+06	1.07
104.0	1.998E+07	83.9	.0	65.5	65.5	9.479E+07	Trn A	6.150E+06	6.210E+06	1.07
105.0	1.990E+07	83.9	.0	65.5	65.5	9.460E+07	Trn A	6.150E+06	6.210E+06	1.07
106.0	1.983E+07	83.8	.0	65.5	65.5	9.441E+07	Trn A	6.150E+06	6.210E+06	1.07
107.0	1.976E+07	83.8	.0	65.5	65.5	9.422E+07	Trn A	6.150E+06	6.210E+06	1.07
108.0	1.970E+07	83.8	.0	65.5	65.5	9.403E+07	Trn A	6.150E+06	6.210E+06	1.07
109.0	1.963E+07	83.7	.0	65.5	65.5	9.384E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 75 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=90F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
110.0	1.956E+07	83.7	.0	65.5	65.5	9.365E+07	Trn A	6.150E+06	6.210E+06	1.07
111.0	1.949E+07	83.7	.0	65.5	65.5	9.346E+07	Trn A	6.150E+06	6.210E+06	1.07
112.0	1.942E+07	83.7	.0	65.5	65.5	9.327E+07	Trn A	6.150E+06	6.210E+06	1.07
113.0	1.935E+07	83.6	.0	65.5	65.5	9.308E+07	Trn A	6.150E+06	6.210E+06	1.07
114.0	1.928E+07	83.6	.0	65.5	65.5	9.289E+07	Trn A	6.150E+06	6.210E+06	1.07
115.0	1.921E+07	83.6	.0	65.5	65.5	9.270E+07	Trn A	6.150E+06	6.210E+06	1.07
116.0	1.914E+07	83.5	.0	65.5	65.5	9.251E+07	Trn A	6.150E+06	6.210E+06	1.07
117.0	1.907E+07	83.5	.0	65.5	65.5	9.232E+07	Trn A	6.150E+06	6.210E+06	1.07
118.0	1.901E+07	83.5	.0	65.5	65.5	9.213E+07	Trn A	6.150E+06	6.210E+06	1.07
119.0	1.894E+07	83.4	.0	65.5	65.5	9.194E+07	Trn A	6.150E+06	6.210E+06	1.07
120.0	1.887E+07	83.4	.0	65.5	65.5	9.175E+07	Trn A	6.150E+06	6.210E+06	1.07
121.0	1.880E+07	83.4	.0	65.5	65.5	9.150E+07	Trn A	6.150E+06	6.210E+06	1.07
122.0	1.873E+07	83.4	.0	65.5	65.5	9.126E+07	Trn A	6.150E+06	6.210E+06	1.07
123.0	1.867E+07	83.3	.0	65.5	65.5	9.101E+07	Trn A	6.150E+06	6.210E+06	1.07
124.0	1.860E+07	83.3	.0	65.5	65.5	9.076E+07	Trn A	6.150E+06	6.210E+06	1.07
125.0	1.853E+07	83.3	.0	65.5	65.5	9.052E+07	Trn A	6.150E+06	6.210E+06	1.07
126.0	1.847E+07	83.2	.0	65.5	65.5	9.027E+07	Trn A	6.150E+06	6.210E+06	1.07
127.0	1.840E+07	83.2	.0	65.5	65.5	9.003E+07	Trn A	6.150E+06	6.210E+06	1.07
128.0	1.833E+07	83.2	.0	65.5	65.5	8.978E+07	Trn A	6.150E+06	6.210E+06	1.07
129.0	1.827E+07	83.1	.0	65.5	65.5	8.953E+07	Trn A	6.150E+06	6.210E+06	1.07
130.0	1.820E+07	83.1	.0	65.5	65.5	8.929E+07	Trn A	6.150E+06	6.210E+06	1.07
131.0	1.813E+07	83.1	.0	65.5	65.5	8.904E+07	Trn A	6.150E+06	6.210E+06	1.07
132.0	1.807E+07	83.0	.0	65.5	65.5	8.880E+07	Trn A	6.150E+06	6.210E+06	1.07
133.0	1.800E+07	83.0	.0	65.5	65.5	8.855E+07	Trn A	6.150E+06	6.210E+06	1.07
134.0	1.794E+07	83.0	.0	65.5	65.5	8.830E+07	Trn A	6.150E+06	6.210E+06	1.07
135.0	1.787E+07	82.9	.0	65.5	65.5	8.806E+07	Trn A	6.150E+06	6.210E+06	1.07
136.0	1.781E+07	82.9	.0	65.5	65.5	8.781E+07	Trn A	6.150E+06	6.210E+06	1.07
137.0	1.774E+07	82.9	.0	65.5	65.5	8.757E+07	Trn A	6.150E+06	6.210E+06	1.07
138.0	1.768E+07	82.8	.0	65.5	65.5	8.732E+07	Trn A	6.150E+06	6.210E+06	1.07
139.0	1.761E+07	82.8	.0	65.5	65.5	8.707E+07	Trn A	6.150E+06	6.210E+06	1.07
140.0	1.755E+07	82.7	.0	65.5	65.5	8.683E+07	Trn A	6.150E+06	6.210E+06	1.07
141.0	1.749E+07	82.7	.0	65.5	65.5	8.658E+07	Trn A	6.150E+06	6.210E+06	1.07
142.0	1.742E+07	82.7	.0	65.5	65.5	8.634E+07	Trn A	6.150E+06	6.210E+06	1.07
143.0	1.736E+07	82.6	.0	65.5	65.5	8.609E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 76 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=90F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
144.0	1.730E+07	82.6	.0	65.5	65.5	8.584E+07	Trn A	6.150E+06	6.210E+06	1.07
145.0	1.723E+07	82.6	.0	65.5	65.5	8.575E+07	Trn A	6.150E+06	6.210E+06	1.07
146.0	1.717E+07	82.5	.0	65.5	65.5	8.567E+07	Trn A	6.150E+06	6.210E+06	1.07
147.0	1.711E+07	82.5	.0	65.5	65.5	8.558E+07	Trn A	6.150E+06	6.210E+06	1.07
148.0	1.704E+07	82.5	.0	65.5	65.5	8.549E+07	Trn A	6.150E+06	6.210E+06	1.07
149.0	1.698E+07	82.4	.0	65.5	65.5	8.540E+07	Trn A	6.150E+06	6.210E+06	1.07
150.0	1.692E+07	82.4	.0	65.5	65.5	8.531E+07	Trn A	6.150E+06	6.210E+06	1.07
151.0	1.686E+07	82.4	.0	65.5	65.5	8.522E+07	Trn A	6.150E+06	6.210E+06	1.07
152.0	1.679E+07	82.4	.0	65.5	65.5	8.513E+07	Trn A	6.150E+06	6.210E+06	1.07
153.0	1.673E+07	82.4	.0	65.5	65.5	8.504E+07	Trn A	6.150E+06	6.210E+06	1.07
154.0	1.667E+07	82.3	.0	65.5	65.5	8.495E+07	Trn A	6.150E+06	6.210E+06	1.07
155.0	1.661E+07	82.3	.0	65.5	65.5	8.486E+07	Trn A	6.150E+06	6.210E+06	1.07
156.0	1.655E+07	82.3	.0	65.5	65.5	8.477E+07	Trn A	6.150E+06	6.210E+06	1.07
157.0	1.648E+07	82.3	.0	65.5	65.5	8.468E+07	Trn A	6.150E+06	6.210E+06	1.07
158.0	1.642E+07	82.3	.0	65.5	65.5	8.459E+07	Trn A	6.150E+06	6.210E+06	1.07
159.0	1.636E+07	82.3	.0	65.5	65.5	8.450E+07	Trn A	6.150E+06	6.210E+06	1.07
160.0	1.630E+07	82.3	.0	65.5	65.5	8.441E+07	Trn A	6.150E+06	6.210E+06	1.07
161.0	1.624E+07	82.3	.0	65.5	65.5	8.432E+07	Trn A	6.150E+06	6.210E+06	1.07
162.0	1.617E+07	82.2	.0	65.5	65.5	8.423E+07	Trn A	6.150E+06	6.210E+06	1.07
163.0	1.611E+07	82.2	.0	65.5	65.5	8.415E+07	Trn A	6.150E+06	6.210E+06	1.07
164.0	1.605E+07	82.2	.0	65.5	65.5	8.406E+07	Trn A	6.150E+06	6.210E+06	1.07
165.0	1.599E+07	82.2	.0	65.5	65.5	8.397E+07	Trn A	6.150E+06	6.210E+06	1.07
166.0	1.593E+07	82.2	.0	65.5	65.5	8.388E+07	Trn A	6.150E+06	6.210E+06	1.07
167.0	1.587E+07	82.2	.0	65.5	65.5	8.379E+07	Trn A	6.150E+06	6.210E+06	1.07
168.0	1.581E+07	82.2	.0	65.5	65.5	8.370E+07	Trn A	6.150E+06	6.210E+06	1.07
169.0	1.575E+07	82.1	.0	65.5	65.5	8.372E+07	Trn A	6.150E+06	6.210E+06	1.07
170.0	1.568E+07	82.1	.0	65.5	65.5	8.374E+07	Trn A	6.150E+06	6.210E+06	1.07
171.0	1.562E+07	82.1	.0	65.5	65.5	8.376E+07	Trn A	6.150E+06	6.210E+06	1.07
172.0	1.556E+07	82.1	.0	65.5	65.5	8.378E+07	Trn A	6.150E+06	6.210E+06	1.07
173.0	1.550E+07	82.1	.0	65.5	65.5	8.380E+07	Trn A	6.150E+06	6.210E+06	1.07
174.0	1.544E+07	82.1	.0	65.5	65.5	8.382E+07	Trn A	6.150E+06	6.210E+06	1.07
175.0	1.538E+07	82.1	.0	65.5	65.5	8.384E+07	Trn A	6.150E+06	6.210E+06	1.07
176.0	1.532E+07	82.1	.0	65.5	65.5	8.386E+07	Trn A	6.150E+06	6.210E+06	1.07
177.0	1.526E+07	82.1	.0	65.5	65.5	8.388E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 77 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=90F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
178.0	1.520E+07	82.1	.0	65.5	65.5	8.390E+07	Trn A	6.150E+06	6.210E+06	1.07
179.0	1.513E+07	82.1	.0	65.5	65.5	8.392E+07	Trn A	6.150E+06	6.210E+06	1.07
180.0	1.507E+07	82.1	.0	65.5	65.5	8.394E+07	Trn A	6.150E+06	6.210E+06	1.07
181.0	1.501E+07	82.1	.0	65.5	65.5	8.396E+07	Trn A	6.150E+06	6.210E+06	1.07
182.0	1.495E+07	82.1	.0	65.5	65.5	8.399E+07	Trn A	6.150E+06	6.210E+06	1.07
183.0	1.489E+07	82.1	.0	65.5	65.5	8.401E+07	Trn A	6.150E+06	6.210E+06	1.07
184.0	1.483E+07	82.1	.0	65.5	65.5	8.403E+07	Trn A	6.150E+06	6.210E+06	1.07
185.0	1.477E+07	82.1	.0	65.5	65.5	8.405E+07	Trn A	6.150E+06	6.210E+06	1.07
186.0	1.471E+07	82.1	.0	65.5	65.5	8.407E+07	Trn A	6.150E+06	6.210E+06	1.07
187.0	1.464E+07	82.1	.0	65.5	65.5	8.409E+07	Trn A	6.150E+06	6.210E+06	1.07
188.0	1.458E+07	82.1	.0	65.5	65.5	8.411E+07	Trn A	6.150E+06	6.210E+06	1.07
189.0	1.452E+07	82.1	.0	65.5	65.5	8.413E+07	Trn A	6.150E+06	6.210E+06	1.07
190.0	1.446E+07	82.1	.0	65.5	65.5	8.415E+07	Trn A	6.150E+06	6.210E+06	1.07
191.0	1.440E+07	82.1	.0	65.5	65.5	8.417E+07	Trn A	6.150E+06	6.210E+06	1.07
192.0	1.434E+07	82.1	.0	65.5	65.5	8.419E+07	Trn A	6.150E+06	6.210E+06	1.07
193.0	1.428E+07	82.1	.0	65.5	65.5	8.400E+07	Trn A	6.150E+06	6.210E+06	1.07
194.0	1.422E+07	82.1	.0	65.5	65.5	8.381E+07	Trn A	6.150E+06	6.210E+06	1.07
195.0	1.415E+07	82.1	.0	65.5	65.5	8.362E+07	Trn A	6.150E+06	6.210E+06	1.07
196.0	1.409E+07	82.1	.0	65.5	65.5	8.343E+07	Trn A	6.150E+06	6.210E+06	1.07
197.0	1.403E+07	82.1	.0	65.5	65.5	8.324E+07	Trn A	6.150E+06	6.210E+06	1.07
198.0	1.397E+07	82.1	.0	65.5	65.5	8.305E+07	Trn A	6.150E+06	6.210E+06	1.07
199.0	1.391E+07	82.1	.0	65.5	65.5	8.287E+07	Trn A	6.150E+06	6.210E+06	1.07
200.0	1.385E+07	82.0	.0	65.5	65.5	8.268E+07	Trn A	6.150E+06	6.210E+06	1.07
201.0	1.379E+07	82.0	.0	65.5	65.5	8.249E+07	Trn A	6.150E+06	6.210E+06	1.07
202.0	1.373E+07	82.0	.0	65.5	65.5	8.230E+07	Trn A	6.150E+06	6.210E+06	1.07
203.0	1.367E+07	81.9	.0	65.5	65.5	8.211E+07	Trn A	6.150E+06	6.210E+06	1.07
204.0	1.361E+07	81.9	.0	65.5	65.5	8.192E+07	Trn A	6.150E+06	6.210E+06	1.07
205.0	1.355E+07	81.9	.0	65.5	65.5	8.173E+07	Trn A	6.150E+06	6.210E+06	1.07
206.0	1.349E+07	81.9	.0	65.5	65.5	8.154E+07	Trn A	6.150E+06	6.210E+06	1.07
207.0	1.343E+07	81.8	.0	65.5	65.5	8.135E+07	Trn A	6.150E+06	6.210E+06	1.07
208.0	1.337E+07	81.8	.0	65.5	65.5	8.116E+07	Trn A	6.150E+06	6.210E+06	1.07
209.0	1.331E+07	81.8	.0	65.5	65.5	8.097E+07	Trn A	6.150E+06	6.210E+06	1.07
210.0	1.325E+07	81.8	.0	65.5	65.5	8.078E+07	Trn A	6.150E+06	6.210E+06	1.07
211.0	1.319E+07	81.7	.0	65.5	65.5	8.060E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 78 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=90F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
212.0	1.314E+07	81.7	.0	65.5	65.5	8.041E+07	Trn A	6.150E+06	6.210E+06	1.07
213.0	1.308E+07	81.7	.0	65.5	65.5	8.022E+07	Trn A	6.150E+06	6.210E+06	1.07
214.0	1.302E+07	81.6	.0	65.5	65.5	8.003E+07	Trn A	6.150E+06	6.210E+06	1.07
215.0	1.296E+07	81.6	.0	65.5	65.5	7.984E+07	Trn A	6.150E+06	6.210E+06	1.07
216.0	1.290E+07	81.6	.0	65.5	65.5	7.965E+07	Trn A	6.150E+06	6.210E+06	1.07
217.0	1.284E+07	81.6	.0	65.5	65.5	7.969E+07	Trn A	6.150E+06	6.210E+06	1.07
218.0	1.279E+07	81.5	.0	65.5	65.5	7.972E+07	Trn A	6.150E+06	6.210E+06	1.07
219.0	1.273E+07	81.5	.0	65.5	65.5	7.976E+07	Trn A	6.150E+06	6.210E+06	1.07
220.0	1.267E+07	81.5	.0	65.5	65.5	7.980E+07	Trn A	6.150E+06	6.210E+06	1.07
221.0	1.261E+07	81.5	.0	65.5	65.5	7.984E+07	Trn A	6.150E+06	6.210E+06	1.07
222.0	1.255E+07	81.5	.0	65.5	65.5	7.987E+07	Trn A	6.150E+06	6.210E+06	1.07
223.0	1.250E+07	81.5	.0	65.5	65.5	7.991E+07	Trn A	6.150E+06	6.210E+06	1.07
224.0	1.244E+07	81.5	.0	65.5	65.5	7.995E+07	Trn A	6.150E+06	6.210E+06	1.07
225.0	1.238E+07	81.5	.0	65.5	65.5	7.999E+07	Trn A	6.150E+06	6.210E+06	1.07
226.0	1.232E+07	81.5	.0	65.5	65.5	8.002E+07	Trn A	6.150E+06	6.210E+06	1.07
227.0	1.226E+07	81.5	.0	65.5	65.5	8.006E+07	Trn A	6.150E+06	6.210E+06	1.07
228.0	1.221E+07	81.5	.0	65.5	65.5	8.010E+07	Trn A	6.150E+06	6.210E+06	1.07
229.0	1.215E+07	81.5	.0	65.5	65.5	8.014E+07	Trn A	6.150E+06	6.210E+06	1.07
230.0	1.209E+07	81.5	.0	65.5	65.5	8.017E+07	Trn A	6.150E+06	6.210E+06	1.07
231.0	1.203E+07	81.5	.0	65.5	65.5	8.021E+07	Trn A	6.150E+06	6.210E+06	1.07
232.0	1.197E+07	81.5	.0	65.5	65.5	8.025E+07	Trn A	6.150E+06	6.210E+06	1.07
233.0	1.192E+07	81.5	.0	65.5	65.5	8.029E+07	Trn A	6.150E+06	6.210E+06	1.07
234.0	1.186E+07	81.6	.0	65.5	65.5	8.032E+07	Trn A	6.150E+06	6.210E+06	1.07
235.0	1.180E+07	81.6	.0	65.5	65.5	8.036E+07	Trn A	6.150E+06	6.210E+06	1.07
236.0	1.174E+07	81.6	.0	65.5	65.5	8.040E+07	Trn A	6.150E+06	6.210E+06	1.07
237.0	1.168E+07	81.6	.0	65.5	65.5	8.044E+07	Trn A	6.150E+06	6.210E+06	1.07
238.0	1.162E+07	81.6	.0	65.5	65.5	8.047E+07	Trn A	6.150E+06	6.210E+06	1.07
239.0	1.157E+07	81.6	.0	65.5	65.5	8.051E+07	Trn A	6.150E+06	6.210E+06	1.07
240.0	1.151E+07	81.6	.0	65.5	65.5	8.055E+07	Trn A	6.150E+06	6.210E+06	1.07

Stop - Program terminated.

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 79 of 166
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8. UHSSIM input/output for Fan3_89F, 3-Fan Case with IBT of 89 °F

Fan3_89F.inp

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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=89F
# design wet-bulb temperature [F], design dry-bulb temperature [F],
# design hot-water temperature [F], design pressure [psia], design solids [ppt]
# 0 => F, psia, btu/hr, lbm/hr units
82, 98, 129.0, 14.696, 0.0, 0
# initial basin mass [lbm], initial basin temperature [F], initial solids [ppt],
# number of towers, starting time of simulation [hr]
29843200, 89, 0, 2, 0.
# Time Period Data -- every 0.1 hour for 10 hr then every hour up to 10 days
# step size, number of steps
0.1,100
1,230
*
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0.6.15e6,6.21e6,1.07
240.0,6.15e6,6.21e6,1.07
*
# Train B
Trn B
0.0.2.05e6,0.0,1.07
240.0,2.05e6,0.0,1.07
*
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
0 s 3.2565E+08
50 s 3.2565E+08
101 s 3.2565E+08
116 s 3.1609E+08
120 s 3.1487E+08
150 s 3.1640E+08
300 s 3.1640E+08
900 s 3.1640E+08
1800 s 3.0196E+08
2704 s 2.8660E+08
2706 s 4.4627E+08
3600 s 4.3946E+08
2 h 2.2984E+08
4 h 1.4731E+08
6 h 1.4644E+08
9 h 1.4354E+08
12 h 1.4254E+08
18 h 1.5095E+08
24 h 1.4834E+08
36 h 1.2219E+08
2 d 1.1371E+08
3 d 1.0513E+08
4 d 9.6311E+07
5 d 9.1747E+07
6 d 8.5844E+07
7 d 8.3698E+07
8 d 8.4190E+07
9 d 7.9649E+07
10 d 8.0549E+07
*
# Ambient Data Supplied by Bechtel Power Corp.
# TIME WB DB P
# (hr) (F) (F) (psia)
0, 68.7, 68.7, 14.7
240, 68.7, 68.7, 14.7

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Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 80 of 166
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Fan3_89F.out

Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=89F

Initial Basin Mass 2.984E+07 lbm
Initial Basin Temperature 89.0 F
Initial Basin Solids .0 ppt

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
.0	2.984E+07	89.0	.0	68.7	68.7	3.257E+08	Trn A	6.150E+06	6.210E+06	1.07
.1	2.982E+07	89.3	.0	68.7	68.7	3.164E+08	Trn A	6.150E+06	6.210E+06	1.07
.2	2.981E+07	89.6	.0	68.7	68.7	3.164E+08	Trn A	6.150E+06	6.210E+06	1.07
.3	2.979E+07	89.8	.0	68.7	68.7	3.135E+08	Trn A	6.150E+06	6.210E+06	1.07
.4	2.977E+07	90.1	.0	68.7	68.7	3.077E+08	Trn A	6.150E+06	6.210E+06	1.07
.5	2.975E+07	90.4	.0	68.7	68.7	3.020E+08	Trn A	6.150E+06	6.210E+06	1.07
.6	2.973E+07	90.6	.0	68.7	68.7	2.958E+08	Trn A	6.150E+06	6.210E+06	1.07
.7	2.971E+07	90.8	.0	68.7	68.7	2.897E+08	Trn A	6.150E+06	6.210E+06	1.07
.8	2.969E+07	91.1	.0	68.7	68.7	4.449E+08	Trn A	6.150E+06	6.210E+06	1.07
.9	2.966E+07	91.5	.0	68.7	68.7	4.422E+08	Trn A	6.150E+06	6.210E+06	1.07
1.0	2.963E+07	91.9	.0	68.7	68.7	4.395E+08	Trn A	6.150E+06	6.210E+06	1.07
1.1	2.961E+07	92.3	.0	68.7	68.7	4.185E+08	Trn A	6.150E+06	6.210E+06	1.07
1.2	2.958E+07	92.6	.0	68.7	68.7	3.975E+08	Trn A	6.150E+06	6.210E+06	1.07
1.3	2.956E+07	93.0	.0	68.7	68.7	3.766E+08	Trn A	6.150E+06	6.210E+06	1.07
1.4	2.953E+07	93.2	.0	68.7	68.7	3.556E+08	Trn A	6.150E+06	6.210E+06	1.07
1.5	2.951E+07	93.5	.0	68.7	68.7	3.346E+08	Trn A	6.150E+06	6.210E+06	1.07
1.6	2.949E+07	93.7	.0	68.7	68.7	3.137E+08	Trn A	6.150E+06	6.210E+06	1.07
1.7	2.947E+07	93.9	.0	68.7	68.7	2.927E+08	Trn A	6.150E+06	6.210E+06	1.07
1.8	2.945E+07	94.1	.0	68.7	68.7	2.718E+08	Trn A	6.150E+06	6.210E+06	1.07
1.9	2.943E+07	94.2	.0	68.7	68.7	2.508E+08	Trn A	6.150E+06	6.210E+06	1.07
2.0	2.941E+07	94.3	.0	68.7	68.7	2.298E+08	Trn A	6.150E+06	6.210E+06	1.07
2.1	2.940E+07	94.4	.0	68.7	68.7	2.257E+08	Trn A	6.150E+06	6.210E+06	1.07
2.2	2.938E+07	94.5	.0	68.7	68.7	2.216E+08	Trn A	6.150E+06	6.210E+06	1.07
2.3	2.937E+07	94.5	.0	68.7	68.7	2.175E+08	Trn A	6.150E+06	6.210E+06	1.07
2.4	2.935E+07	94.6	.0	68.7	68.7	2.133E+08	Trn A	6.150E+06	6.210E+06	1.07
2.5	2.933E+07	94.7	.0	68.7	68.7	2.092E+08	Trn A	6.150E+06	6.210E+06	1.07
2.6	2.932E+07	94.7	.0	68.7	68.7	2.051E+08	Trn A	6.150E+06	6.210E+06	1.07
2.7	2.930E+07	94.8	.0	68.7	68.7	2.010E+08	Trn A	6.150E+06	6.210E+06	1.07
2.8	2.929E+07	94.8	.0	68.7	68.7	1.968E+08	Trn A	6.150E+06	6.210E+06	1.07
2.9	2.927E+07	94.8	.0	68.7	68.7	1.927E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 81 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=89F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
3.0	2.926E+07	94.8	.0	68.7	68.7	1.886E+08	Trn A	6.150E+06	6.210E+06	1.07
3.1	2.924E+07	94.9	.0	68.7	68.7	1.844E+08	Trn A	6.150E+06	6.210E+06	1.07
3.2	2.923E+07	94.9	.0	68.7	68.7	1.803E+08	Trn A	6.150E+06	6.210E+06	1.07
3.3	2.922E+07	94.9	.0	68.7	68.7	1.762E+08	Trn A	6.150E+06	6.210E+06	1.07
3.4	2.920E+07	94.9	.0	68.7	68.7	1.721E+08	Trn A	6.150E+06	6.210E+06	1.07
3.5	2.919E+07	94.9	.0	68.7	68.7	1.679E+08	Trn A	6.150E+06	6.210E+06	1.07
3.6	2.917E+07	94.9	.0	68.7	68.7	1.638E+08	Trn A	6.150E+06	6.210E+06	1.07
3.7	2.916E+07	94.8	.0	68.7	68.7	1.597E+08	Trn A	6.150E+06	6.210E+06	1.07
3.8	2.915E+07	94.8	.0	68.7	68.7	1.556E+08	Trn A	6.150E+06	6.210E+06	1.07
3.9	2.913E+07	94.8	.0	68.7	68.7	1.514E+08	Trn A	6.150E+06	6.210E+06	1.07
4.0	2.912E+07	94.7	.0	68.7	68.7	1.473E+08	Trn A	6.150E+06	6.210E+06	1.07
4.1	2.911E+07	94.7	.0	68.7	68.7	1.473E+08	Trn A	6.150E+06	6.210E+06	1.07
4.2	2.910E+07	94.7	.0	68.7	68.7	1.472E+08	Trn A	6.150E+06	6.210E+06	1.07
4.3	2.908E+07	94.6	.0	68.7	68.7	1.472E+08	Trn A	6.150E+06	6.210E+06	1.07
4.4	2.907E+07	94.6	.0	68.7	68.7	1.471E+08	Trn A	6.150E+06	6.210E+06	1.07
4.5	2.906E+07	94.6	.0	68.7	68.7	1.471E+08	Trn A	6.150E+06	6.210E+06	1.07
4.6	2.905E+07	94.5	.0	68.7	68.7	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.7	2.903E+07	94.5	.0	68.7	68.7	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.8	2.902E+07	94.4	.0	68.7	68.7	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.9	2.901E+07	94.4	.0	68.7	68.7	1.469E+08	Trn A	6.150E+06	6.210E+06	1.07
5.0	2.900E+07	94.4	.0	68.7	68.7	1.469E+08	Trn A	6.150E+06	6.210E+06	1.07
5.1	2.898E+07	94.3	.0	68.7	68.7	1.468E+08	Trn A	6.150E+06	6.210E+06	1.07
5.2	2.897E+07	94.3	.0	68.7	68.7	1.468E+08	Trn A	6.150E+06	6.210E+06	1.07
5.3	2.896E+07	94.3	.0	68.7	68.7	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.4	2.895E+07	94.2	.0	68.7	68.7	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.5	2.894E+07	94.2	.0	68.7	68.7	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.6	2.892E+07	94.2	.0	68.7	68.7	1.466E+08	Trn A	6.150E+06	6.210E+06	1.07
5.7	2.891E+07	94.1	.0	68.7	68.7	1.466E+08	Trn A	6.150E+06	6.210E+06	1.07
5.8	2.890E+07	94.1	.0	68.7	68.7	1.465E+08	Trn A	6.150E+06	6.210E+06	1.07
5.9	2.889E+07	94.1	.0	68.7	68.7	1.465E+08	Trn A	6.150E+06	6.210E+06	1.07
6.0	2.887E+07	94.0	.0	68.7	68.7	1.464E+08	Trn A	6.150E+06	6.210E+06	1.07
6.1	2.886E+07	94.0	.0	68.7	68.7	1.463E+08	Trn A	6.150E+06	6.210E+06	1.07
6.2	2.885E+07	94.0	.0	68.7	68.7	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07
6.3	2.884E+07	94.0	.0	68.7	68.7	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 82 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=89F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
6.4	2.882E+07	93.9	.0	68.7	68.7	1.461E+08	Trn A	6.150E+06	6.210E+06	1.07
6.5	2.881E+07	93.9	.0	68.7	68.7	1.460E+08	Trn A	6.150E+06	6.210E+06	1.07
6.6	2.880E+07	93.9	.0	68.7	68.7	1.459E+08	Trn A	6.150E+06	6.210E+06	1.07
6.7	2.879E+07	93.8	.0	68.7	68.7	1.458E+08	Trn A	6.150E+06	6.210E+06	1.07
6.8	2.878E+07	93.8	.0	68.7	68.7	1.457E+08	Trn A	6.150E+06	6.210E+06	1.07
6.9	2.876E+07	93.8	.0	68.7	68.7	1.456E+08	Trn A	6.150E+06	6.210E+06	1.07
7.0	2.875E+07	93.7	.0	68.7	68.7	1.455E+08	Trn A	6.150E+06	6.210E+06	1.07
7.1	2.874E+07	93.7	.0	68.7	68.7	1.454E+08	Trn A	6.150E+06	6.210E+06	1.07
7.2	2.873E+07	93.7	.0	68.7	68.7	1.453E+08	Trn A	6.150E+06	6.210E+06	1.07
7.3	2.872E+07	93.7	.0	68.7	68.7	1.452E+08	Trn A	6.150E+06	6.210E+06	1.07
7.4	2.870E+07	93.6	.0	68.7	68.7	1.451E+08	Trn A	6.150E+06	6.210E+06	1.07
7.5	2.869E+07	93.6	.0	68.7	68.7	1.450E+08	Trn A	6.150E+06	6.210E+06	1.07
7.6	2.868E+07	93.6	.0	68.7	68.7	1.449E+08	Trn A	6.150E+06	6.210E+06	1.07
7.7	2.867E+07	93.6	.0	68.7	68.7	1.448E+08	Trn A	6.150E+06	6.210E+06	1.07
7.8	2.866E+07	93.5	.0	68.7	68.7	1.447E+08	Trn A	6.150E+06	6.210E+06	1.07
7.9	2.864E+07	93.5	.0	68.7	68.7	1.446E+08	Trn A	6.150E+06	6.210E+06	1.07
8.0	2.863E+07	93.5	.0	68.7	68.7	1.445E+08	Trn A	6.150E+06	6.210E+06	1.07
8.1	2.862E+07	93.5	.0	68.7	68.7	1.444E+08	Trn A	6.150E+06	6.210E+06	1.07
8.2	2.861E+07	93.4	.0	68.7	68.7	1.443E+08	Trn A	6.150E+06	6.210E+06	1.07
8.3	2.860E+07	93.4	.0	68.7	68.7	1.442E+08	Trn A	6.150E+06	6.210E+06	1.07
8.4	2.858E+07	93.4	.0	68.7	68.7	1.441E+08	Trn A	6.150E+06	6.210E+06	1.07
8.5	2.857E+07	93.4	.0	68.7	68.7	1.440E+08	Trn A	6.150E+06	6.210E+06	1.07
8.6	2.856E+07	93.3	.0	68.7	68.7	1.439E+08	Trn A	6.150E+06	6.210E+06	1.07
8.7	2.855E+07	93.3	.0	68.7	68.7	1.438E+08	Trn A	6.150E+06	6.210E+06	1.07
8.8	2.854E+07	93.3	.0	68.7	68.7	1.437E+08	Trn A	6.150E+06	6.210E+06	1.07
8.9	2.852E+07	93.3	.0	68.7	68.7	1.436E+08	Trn A	6.150E+06	6.210E+06	1.07
9.0	2.851E+07	93.2	.0	68.7	68.7	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.1	2.850E+07	93.2	.0	68.7	68.7	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.2	2.849E+07	93.2	.0	68.7	68.7	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.3	2.848E+07	93.2	.0	68.7	68.7	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.4	2.847E+07	93.1	.0	68.7	68.7	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.5	2.845E+07	93.1	.0	68.7	68.7	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.6	2.844E+07	93.1	.0	68.7	68.7	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07
9.7	2.843E+07	93.1	.0	68.7	68.7	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 83 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=89F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
9.8	2.842E+07	93.1	.0	68.7	68.7	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07
9.9	2.841E+07	93.0	.0	68.7	68.7	1.432E+08	Trn A	6.150E+06	6.210E+06	1.07
10.0	2.840E+07	93.0	.0	68.7	68.7	1.432E+08	Trn A	6.150E+06	6.210E+06	1.07
11.0	2.828E+07	92.8	.0	68.7	68.7	1.429E+08	Trn A	6.150E+06	6.210E+06	1.07
12.0	2.816E+07	92.6	.0	68.7	68.7	1.425E+08	Trn A	6.150E+06	6.210E+06	1.07
13.0	2.805E+07	92.5	.0	68.7	68.7	1.439E+08	Trn A	6.150E+06	6.210E+06	1.07
14.0	2.793E+07	92.4	.0	68.7	68.7	1.453E+08	Trn A	6.150E+06	6.210E+06	1.07
15.0	2.782E+07	92.3	.0	68.7	68.7	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
16.0	2.770E+07	92.3	.0	68.7	68.7	1.481E+08	Trn A	6.150E+06	6.210E+06	1.07
17.0	2.758E+07	92.3	.0	68.7	68.7	1.495E+08	Trn A	6.150E+06	6.210E+06	1.07
18.0	2.746E+07	92.3	.0	68.7	68.7	1.509E+08	Trn A	6.150E+06	6.210E+06	1.07
19.0	2.735E+07	92.3	.0	68.7	68.7	1.505E+08	Trn A	6.150E+06	6.210E+06	1.07
20.0	2.723E+07	92.3	.0	68.7	68.7	1.501E+08	Trn A	6.150E+06	6.210E+06	1.07
21.0	2.711E+07	92.3	.0	68.7	68.7	1.496E+08	Trn A	6.150E+06	6.210E+06	1.07
22.0	2.699E+07	92.3	.0	68.7	68.7	1.492E+08	Trn A	6.150E+06	6.210E+06	1.07
23.0	2.688E+07	92.3	.0	68.7	68.7	1.488E+08	Trn A	6.150E+06	6.210E+06	1.07
24.0	2.676E+07	92.3	.0	68.7	68.7	1.483E+08	Trn A	6.150E+06	6.210E+06	1.07
25.0	2.664E+07	92.3	.0	68.7	68.7	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07
26.0	2.653E+07	92.2	.0	68.7	68.7	1.440E+08	Trn A	6.150E+06	6.210E+06	1.07
27.0	2.641E+07	92.1	.0	68.7	68.7	1.418E+08	Trn A	6.150E+06	6.210E+06	1.07
28.0	2.630E+07	92.0	.0	68.7	68.7	1.396E+08	Trn A	6.150E+06	6.210E+06	1.07
29.0	2.619E+07	91.9	.0	68.7	68.7	1.374E+08	Trn A	6.150E+06	6.210E+06	1.07
30.0	2.608E+07	91.7	.0	68.7	68.7	1.353E+08	Trn A	6.150E+06	6.210E+06	1.07
31.0	2.597E+07	91.6	.0	68.7	68.7	1.331E+08	Trn A	6.150E+06	6.210E+06	1.07
32.0	2.587E+07	91.4	.0	68.7	68.7	1.309E+08	Trn A	6.150E+06	6.210E+06	1.07
33.0	2.576E+07	91.2	.0	68.7	68.7	1.287E+08	Trn A	6.150E+06	6.210E+06	1.07
34.0	2.566E+07	91.0	.0	68.7	68.7	1.265E+08	Trn A	6.150E+06	6.210E+06	1.07
35.0	2.556E+07	90.8	.0	68.7	68.7	1.244E+08	Trn A	6.150E+06	6.210E+06	1.07
36.0	2.546E+07	90.6	.0	68.7	68.7	1.222E+08	Trn A	6.150E+06	6.210E+06	1.07
37.0	2.536E+07	90.4	.0	68.7	68.7	1.215E+08	Trn A	6.150E+06	6.210E+06	1.07
38.0	2.526E+07	90.2	.0	68.7	68.7	1.208E+08	Trn A	6.150E+06	6.210E+06	1.07
39.0	2.517E+07	90.0	.0	68.7	68.7	1.201E+08	Trn A	6.150E+06	6.210E+06	1.07
40.0	2.507E+07	89.8	.0	68.7	68.7	1.194E+08	Trn A	6.150E+06	6.210E+06	1.07
41.0	2.498E+07	89.7	.0	68.7	68.7	1.187E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 84 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=89F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
42.0	2.488E+07	89.6	.0	68.7	68.7	1.180E+08	Trn A	6.150E+06	6.210E+06	1.07
43.0	2.479E+07	89.4	.0	68.7	68.7	1.172E+08	Trn A	6.150E+06	6.210E+06	1.07
44.0	2.470E+07	89.3	.0	68.7	68.7	1.165E+08	Trn A	6.150E+06	6.210E+06	1.07
45.0	2.461E+07	89.2	.0	68.7	68.7	1.158E+08	Trn A	6.150E+06	6.210E+06	1.07
46.0	2.452E+07	89.1	.0	68.7	68.7	1.151E+08	Trn A	6.150E+06	6.210E+06	1.07
47.0	2.443E+07	89.0	.0	68.7	68.7	1.144E+08	Trn A	6.150E+06	6.210E+06	1.07
48.0	2.434E+07	88.8	.0	68.7	68.7	1.137E+08	Trn A	6.150E+06	6.210E+06	1.07
49.0	2.425E+07	88.7	.0	68.7	68.7	1.134E+08	Trn A	6.150E+06	6.210E+06	1.07
50.0	2.416E+07	88.7	.0	68.7	68.7	1.130E+08	Trn A	6.150E+06	6.210E+06	1.07
51.0	2.407E+07	88.6	.0	68.7	68.7	1.126E+08	Trn A	6.150E+06	6.210E+06	1.07
52.0	2.398E+07	88.5	.0	68.7	68.7	1.123E+08	Trn A	6.150E+06	6.210E+06	1.07
53.0	2.390E+07	88.4	.0	68.7	68.7	1.119E+08	Trn A	6.150E+06	6.210E+06	1.07
54.0	2.381E+07	88.3	.0	68.7	68.7	1.116E+08	Trn A	6.150E+06	6.210E+06	1.07
55.0	2.372E+07	88.3	.0	68.7	68.7	1.112E+08	Trn A	6.150E+06	6.210E+06	1.07
56.0	2.364E+07	88.2	.0	68.7	68.7	1.109E+08	Trn A	6.150E+06	6.210E+06	1.07
57.0	2.355E+07	88.1	.0	68.7	68.7	1.105E+08	Trn A	6.150E+06	6.210E+06	1.07
58.0	2.347E+07	88.1	.0	68.7	68.7	1.101E+08	Trn A	6.150E+06	6.210E+06	1.07
59.0	2.338E+07	88.0	.0	68.7	68.7	1.098E+08	Trn A	6.150E+06	6.210E+06	1.07
60.0	2.330E+07	88.0	.0	68.7	68.7	1.094E+08	Trn A	6.150E+06	6.210E+06	1.07
61.0	2.321E+07	87.9	.0	68.7	68.7	1.091E+08	Trn A	6.150E+06	6.210E+06	1.07
62.0	2.313E+07	87.9	.0	68.7	68.7	1.087E+08	Trn A	6.150E+06	6.210E+06	1.07
63.0	2.305E+07	87.8	.0	68.7	68.7	1.083E+08	Trn A	6.150E+06	6.210E+06	1.07
64.0	2.296E+07	87.8	.0	68.7	68.7	1.080E+08	Trn A	6.150E+06	6.210E+06	1.07
65.0	2.288E+07	87.7	.0	68.7	68.7	1.076E+08	Trn A	6.150E+06	6.210E+06	1.07
66.0	2.280E+07	87.7	.0	68.7	68.7	1.073E+08	Trn A	6.150E+06	6.210E+06	1.07
67.0	2.271E+07	87.6	.0	68.7	68.7	1.069E+08	Trn A	6.150E+06	6.210E+06	1.07
68.0	2.263E+07	87.6	.0	68.7	68.7	1.066E+08	Trn A	6.150E+06	6.210E+06	1.07
69.0	2.255E+07	87.5	.0	68.7	68.7	1.062E+08	Trn A	6.150E+06	6.210E+06	1.07
70.0	2.247E+07	87.5	.0	68.7	68.7	1.058E+08	Trn A	6.150E+06	6.210E+06	1.07
71.0	2.239E+07	87.4	.0	68.7	68.7	1.055E+08	Trn A	6.150E+06	6.210E+06	1.07
72.0	2.231E+07	87.4	.0	68.7	68.7	1.051E+08	Trn A	6.150E+06	6.210E+06	1.07
73.0	2.223E+07	87.3	.0	68.7	68.7	1.048E+08	Trn A	6.150E+06	6.210E+06	1.07
74.0	2.215E+07	87.3	.0	68.7	68.7	1.044E+08	Trn A	6.150E+06	6.210E+06	1.07
75.0	2.207E+07	87.3	.0	68.7	68.7	1.040E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 85 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=89F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
76.0	2.199E+07	87.2	.0	68.7	68.7	1.037E+08	Trn A	6.150E+06	6.210E+06	1.07
77.0	2.191E+07	87.2	.0	68.7	68.7	1.033E+08	Trn A	6.150E+06	6.210E+06	1.07
78.0	2.183E+07	87.1	.0	68.7	68.7	1.029E+08	Trn A	6.150E+06	6.210E+06	1.07
79.0	2.175E+07	87.1	.0	68.7	68.7	1.026E+08	Trn A	6.150E+06	6.210E+06	1.07
80.0	2.167E+07	87.0	.0	68.7	68.7	1.022E+08	Trn A	6.150E+06	6.210E+06	1.07
81.0	2.159E+07	87.0	.0	68.7	68.7	1.018E+08	Trn A	6.150E+06	6.210E+06	1.07
82.0	2.152E+07	86.9	.0	68.7	68.7	1.015E+08	Trn A	6.150E+06	6.210E+06	1.07
83.0	2.144E+07	86.9	.0	68.7	68.7	1.011E+08	Trn A	6.150E+06	6.210E+06	1.07
84.0	2.136E+07	86.8	.0	68.7	68.7	1.007E+08	Trn A	6.150E+06	6.210E+06	1.07
85.0	2.128E+07	86.8	.0	68.7	68.7	1.004E+08	Trn A	6.150E+06	6.210E+06	1.07
86.0	2.121E+07	86.7	.0	68.7	68.7	9.999E+07	Trn A	6.150E+06	6.210E+06	1.07
87.0	2.113E+07	86.7	.0	68.7	68.7	9.962E+07	Trn A	6.150E+06	6.210E+06	1.07
88.0	2.106E+07	86.6	.0	68.7	68.7	9.925E+07	Trn A	6.150E+06	6.210E+06	1.07
89.0	2.098E+07	86.5	.0	68.7	68.7	9.888E+07	Trn A	6.150E+06	6.210E+06	1.07
90.0	2.090E+07	86.5	.0	68.7	68.7	9.852E+07	Trn A	6.150E+06	6.210E+06	1.07
91.0	2.083E+07	86.5	.0	68.7	68.7	9.815E+07	Trn A	6.150E+06	6.210E+06	1.07
92.0	2.075E+07	86.4	.0	68.7	68.7	9.778E+07	Trn A	6.150E+06	6.210E+06	1.07
93.0	2.068E+07	86.4	.0	68.7	68.7	9.741E+07	Trn A	6.150E+06	6.210E+06	1.07
94.0	2.061E+07	86.3	.0	68.7	68.7	9.705E+07	Trn A	6.150E+06	6.210E+06	1.07
95.0	2.053E+07	86.3	.0	68.7	68.7	9.668E+07	Trn A	6.150E+06	6.210E+06	1.07
96.0	2.046E+07	86.2	.0	68.7	68.7	9.631E+07	Trn A	6.150E+06	6.210E+06	1.07
97.0	2.039E+07	86.2	.0	68.7	68.7	9.612E+07	Trn A	6.150E+06	6.210E+06	1.07
98.0	2.031E+07	86.1	.0	68.7	68.7	9.593E+07	Trn A	6.150E+06	6.210E+06	1.07
99.0	2.024E+07	86.1	.0	68.7	68.7	9.574E+07	Trn A	6.150E+06	6.210E+06	1.07
100.0	2.017E+07	86.0	.0	68.7	68.7	9.555E+07	Trn A	6.150E+06	6.210E+06	1.07
101.0	2.009E+07	86.0	.0	68.7	68.7	9.536E+07	Trn A	6.150E+06	6.210E+06	1.07
102.0	2.002E+07	86.0	.0	68.7	68.7	9.517E+07	Trn A	6.150E+06	6.210E+06	1.07
103.0	1.995E+07	85.9	.0	68.7	68.7	9.498E+07	Trn A	6.150E+06	6.210E+06	1.07
104.0	1.988E+07	85.9	.0	68.7	68.7	9.479E+07	Trn A	6.150E+06	6.210E+06	1.07
105.0	1.981E+07	85.9	.0	68.7	68.7	9.460E+07	Trn A	6.150E+06	6.210E+06	1.07
106.0	1.974E+07	85.9	.0	68.7	68.7	9.441E+07	Trn A	6.150E+06	6.210E+06	1.07
107.0	1.966E+07	85.8	.0	68.7	68.7	9.422E+07	Trn A	6.150E+06	6.210E+06	1.07
108.0	1.959E+07	85.8	.0	68.7	68.7	9.403E+07	Trn A	6.150E+06	6.210E+06	1.07
109.0	1.952E+07	85.8	.0	68.7	68.7	9.384E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 86 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=89F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
110.0	1.945E+07	85.7	.0	68.7	68.7	9.365E+07	Trn A	6.150E+06	6.210E+06	1.07
111.0	1.938E+07	85.7	.0	68.7	68.7	9.346E+07	Trn A	6.150E+06	6.210E+06	1.07
112.0	1.931E+07	85.7	.0	68.7	68.7	9.327E+07	Trn A	6.150E+06	6.210E+06	1.07
113.0	1.924E+07	85.6	.0	68.7	68.7	9.308E+07	Trn A	6.150E+06	6.210E+06	1.07
114.0	1.917E+07	85.6	.0	68.7	68.7	9.289E+07	Trn A	6.150E+06	6.210E+06	1.07
115.0	1.910E+07	85.6	.0	68.7	68.7	9.270E+07	Trn A	6.150E+06	6.210E+06	1.07
116.0	1.903E+07	85.6	.0	68.7	68.7	9.251E+07	Trn A	6.150E+06	6.210E+06	1.07
117.0	1.896E+07	85.5	.0	68.7	68.7	9.232E+07	Trn A	6.150E+06	6.210E+06	1.07
118.0	1.889E+07	85.5	.0	68.7	68.7	9.213E+07	Trn A	6.150E+06	6.210E+06	1.07
119.0	1.882E+07	85.5	.0	68.7	68.7	9.194E+07	Trn A	6.150E+06	6.210E+06	1.07
120.0	1.875E+07	85.5	.0	68.7	68.7	9.175E+07	Trn A	6.150E+06	6.210E+06	1.07
121.0	1.868E+07	85.4	.0	68.7	68.7	9.150E+07	Trn A	6.150E+06	6.210E+06	1.07
122.0	1.861E+07	85.4	.0	68.7	68.7	9.126E+07	Trn A	6.150E+06	6.210E+06	1.07
123.0	1.854E+07	85.4	.0	68.7	68.7	9.101E+07	Trn A	6.150E+06	6.210E+06	1.07
124.0	1.848E+07	85.3	.0	68.7	68.7	9.076E+07	Trn A	6.150E+06	6.210E+06	1.07
125.0	1.841E+07	85.3	.0	68.7	68.7	9.052E+07	Trn A	6.150E+06	6.210E+06	1.07
126.0	1.834E+07	85.3	.0	68.7	68.7	9.027E+07	Trn A	6.150E+06	6.210E+06	1.07
127.0	1.827E+07	85.3	.0	68.7	68.7	9.003E+07	Trn A	6.150E+06	6.210E+06	1.07
128.0	1.820E+07	85.2	.0	68.7	68.7	8.978E+07	Trn A	6.150E+06	6.210E+06	1.07
129.0	1.814E+07	85.2	.0	68.7	68.7	8.953E+07	Trn A	6.150E+06	6.210E+06	1.07
130.0	1.807E+07	85.2	.0	68.7	68.7	8.929E+07	Trn A	6.150E+06	6.210E+06	1.07
131.0	1.800E+07	85.1	.0	68.7	68.7	8.904E+07	Trn A	6.150E+06	6.210E+06	1.07
132.0	1.793E+07	85.1	.0	68.7	68.7	8.880E+07	Trn A	6.150E+06	6.210E+06	1.07
133.0	1.787E+07	85.0	.0	68.7	68.7	8.855E+07	Trn A	6.150E+06	6.210E+06	1.07
134.0	1.780E+07	85.0	.0	68.7	68.7	8.830E+07	Trn A	6.150E+06	6.210E+06	1.07
135.0	1.773E+07	85.0	.0	68.7	68.7	8.806E+07	Trn A	6.150E+06	6.210E+06	1.07
136.0	1.767E+07	84.9	.0	68.7	68.7	8.781E+07	Trn A	6.150E+06	6.210E+06	1.07
137.0	1.760E+07	84.9	.0	68.7	68.7	8.757E+07	Trn A	6.150E+06	6.210E+06	1.07
138.0	1.754E+07	84.9	.0	68.7	68.7	8.732E+07	Trn A	6.150E+06	6.210E+06	1.07
139.0	1.747E+07	84.8	.0	68.7	68.7	8.707E+07	Trn A	6.150E+06	6.210E+06	1.07
140.0	1.741E+07	84.8	.0	68.7	68.7	8.683E+07	Trn A	6.150E+06	6.210E+06	1.07
141.0	1.734E+07	84.8	.0	68.7	68.7	8.658E+07	Trn A	6.150E+06	6.210E+06	1.07
142.0	1.728E+07	84.7	.0	68.7	68.7	8.634E+07	Trn A	6.150E+06	6.210E+06	1.07
143.0	1.721E+07	84.7	.0	68.7	68.7	8.609E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 87 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=89F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
144.0	1.715E+07	84.7	.0	68.7	68.7	8.584E+07	Trn A	6.150E+06	6.210E+06	1.07
145.0	1.708E+07	84.6	.0	68.7	68.7	8.575E+07	Trn A	6.150E+06	6.210E+06	1.07
146.0	1.702E+07	84.6	.0	68.7	68.7	8.567E+07	Trn A	6.150E+06	6.210E+06	1.07
147.0	1.695E+07	84.6	.0	68.7	68.7	8.558E+07	Trn A	6.150E+06	6.210E+06	1.07
148.0	1.689E+07	84.6	.0	68.7	68.7	8.549E+07	Trn A	6.150E+06	6.210E+06	1.07
149.0	1.682E+07	84.5	.0	68.7	68.7	8.540E+07	Trn A	6.150E+06	6.210E+06	1.07
150.0	1.676E+07	84.5	.0	68.7	68.7	8.531E+07	Trn A	6.150E+06	6.210E+06	1.07
151.0	1.670E+07	84.5	.0	68.7	68.7	8.522E+07	Trn A	6.150E+06	6.210E+06	1.07
152.0	1.663E+07	84.5	.0	68.7	68.7	8.513E+07	Trn A	6.150E+06	6.210E+06	1.07
153.0	1.657E+07	84.5	.0	68.7	68.7	8.504E+07	Trn A	6.150E+06	6.210E+06	1.07
154.0	1.651E+07	84.5	.0	68.7	68.7	8.495E+07	Trn A	6.150E+06	6.210E+06	1.07
155.0	1.644E+07	84.4	.0	68.7	68.7	8.486E+07	Trn A	6.150E+06	6.210E+06	1.07
156.0	1.638E+07	84.4	.0	68.7	68.7	8.477E+07	Trn A	6.150E+06	6.210E+06	1.07
157.0	1.632E+07	84.4	.0	68.7	68.7	8.468E+07	Trn A	6.150E+06	6.210E+06	1.07
158.0	1.625E+07	84.4	.0	68.7	68.7	8.459E+07	Trn A	6.150E+06	6.210E+06	1.07
159.0	1.619E+07	84.4	.0	68.7	68.7	8.450E+07	Trn A	6.150E+06	6.210E+06	1.07
160.0	1.613E+07	84.4	.0	68.7	68.7	8.441E+07	Trn A	6.150E+06	6.210E+06	1.07
161.0	1.606E+07	84.4	.0	68.7	68.7	8.432E+07	Trn A	6.150E+06	6.210E+06	1.07
162.0	1.600E+07	84.3	.0	68.7	68.7	8.423E+07	Trn A	6.150E+06	6.210E+06	1.07
163.0	1.594E+07	84.3	.0	68.7	68.7	8.415E+07	Trn A	6.150E+06	6.210E+06	1.07
164.0	1.588E+07	84.3	.0	68.7	68.7	8.406E+07	Trn A	6.150E+06	6.210E+06	1.07
165.0	1.581E+07	84.3	.0	68.7	68.7	8.397E+07	Trn A	6.150E+06	6.210E+06	1.07
166.0	1.575E+07	84.3	.0	68.7	68.7	8.388E+07	Trn A	6.150E+06	6.210E+06	1.07
167.0	1.569E+07	84.3	.0	68.7	68.7	8.379E+07	Trn A	6.150E+06	6.210E+06	1.07
168.0	1.563E+07	84.3	.0	68.7	68.7	8.370E+07	Trn A	6.150E+06	6.210E+06	1.07
169.0	1.556E+07	84.3	.0	68.7	68.7	8.372E+07	Trn A	6.150E+06	6.210E+06	1.07
170.0	1.550E+07	84.2	.0	68.7	68.7	8.374E+07	Trn A	6.150E+06	6.210E+06	1.07
171.0	1.544E+07	84.2	.0	68.7	68.7	8.376E+07	Trn A	6.150E+06	6.210E+06	1.07
172.0	1.538E+07	84.2	.0	68.7	68.7	8.378E+07	Trn A	6.150E+06	6.210E+06	1.07
173.0	1.531E+07	84.2	.0	68.7	68.7	8.380E+07	Trn A	6.150E+06	6.210E+06	1.07
174.0	1.525E+07	84.2	.0	68.7	68.7	8.382E+07	Trn A	6.150E+06	6.210E+06	1.07
175.0	1.519E+07	84.2	.0	68.7	68.7	8.384E+07	Trn A	6.150E+06	6.210E+06	1.07
176.0	1.513E+07	84.2	.0	68.7	68.7	8.386E+07	Trn A	6.150E+06	6.210E+06	1.07
177.0	1.506E+07	84.2	.0	68.7	68.7	8.388E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 88 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=89F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
178.0	1.500E+07	84.2	.0	68.7	68.7	8.390E+07	Trn A	6.150E+06	6.210E+06	1.07
179.0	1.494E+07	84.2	.0	68.7	68.7	8.392E+07	Trn A	6.150E+06	6.210E+06	1.07
180.0	1.488E+07	84.2	.0	68.7	68.7	8.394E+07	Trn A	6.150E+06	6.210E+06	1.07
181.0	1.481E+07	84.2	.0	68.7	68.7	8.396E+07	Trn A	6.150E+06	6.210E+06	1.07
182.0	1.475E+07	84.2	.0	68.7	68.7	8.399E+07	Trn A	6.150E+06	6.210E+06	1.07
183.0	1.469E+07	84.2	.0	68.7	68.7	8.401E+07	Trn A	6.150E+06	6.210E+06	1.07
184.0	1.463E+07	84.2	.0	68.7	68.7	8.403E+07	Trn A	6.150E+06	6.210E+06	1.07
185.0	1.456E+07	84.3	.0	68.7	68.7	8.405E+07	Trn A	6.150E+06	6.210E+06	1.07
186.0	1.450E+07	84.3	.0	68.7	68.7	8.407E+07	Trn A	6.150E+06	6.210E+06	1.07
187.0	1.444E+07	84.3	.0	68.7	68.7	8.409E+07	Trn A	6.150E+06	6.210E+06	1.07
188.0	1.438E+07	84.3	.0	68.7	68.7	8.411E+07	Trn A	6.150E+06	6.210E+06	1.07
189.0	1.431E+07	84.3	.0	68.7	68.7	8.413E+07	Trn A	6.150E+06	6.210E+06	1.07
190.0	1.425E+07	84.2	.0	68.7	68.7	8.415E+07	Trn A	6.150E+06	6.210E+06	1.07
191.0	1.419E+07	84.2	.0	68.7	68.7	8.417E+07	Trn A	6.150E+06	6.210E+06	1.07
192.0	1.413E+07	84.2	.0	68.7	68.7	8.419E+07	Trn A	6.150E+06	6.210E+06	1.07
193.0	1.406E+07	84.2	.0	68.7	68.7	8.400E+07	Trn A	6.150E+06	6.210E+06	1.07
194.0	1.400E+07	84.2	.0	68.7	68.7	8.381E+07	Trn A	6.150E+06	6.210E+06	1.07
195.0	1.394E+07	84.2	.0	68.7	68.7	8.362E+07	Trn A	6.150E+06	6.210E+06	1.07
196.0	1.388E+07	84.2	.0	68.7	68.7	8.343E+07	Trn A	6.150E+06	6.210E+06	1.07
197.0	1.381E+07	84.2	.0	68.7	68.7	8.324E+07	Trn A	6.150E+06	6.210E+06	1.07
198.0	1.375E+07	84.2	.0	68.7	68.7	8.305E+07	Trn A	6.150E+06	6.210E+06	1.07
199.0	1.369E+07	84.2	.0	68.7	68.7	8.287E+07	Trn A	6.150E+06	6.210E+06	1.07
200.0	1.363E+07	84.2	.0	68.7	68.7	8.268E+07	Trn A	6.150E+06	6.210E+06	1.07
201.0	1.357E+07	84.1	.0	68.7	68.7	8.249E+07	Trn A	6.150E+06	6.210E+06	1.07
202.0	1.350E+07	84.1	.0	68.7	68.7	8.230E+07	Trn A	6.150E+06	6.210E+06	1.07
203.0	1.344E+07	84.1	.0	68.7	68.7	8.211E+07	Trn A	6.150E+06	6.210E+06	1.07
204.0	1.338E+07	84.0	.0	68.7	68.7	8.192E+07	Trn A	6.150E+06	6.210E+06	1.07
205.0	1.332E+07	84.0	.0	68.7	68.7	8.173E+07	Trn A	6.150E+06	6.210E+06	1.07
206.0	1.326E+07	84.0	.0	68.7	68.7	8.154E+07	Trn A	6.150E+06	6.210E+06	1.07
207.0	1.320E+07	84.0	.0	68.7	68.7	8.135E+07	Trn A	6.150E+06	6.210E+06	1.07
208.0	1.314E+07	83.9	.0	68.7	68.7	8.116E+07	Trn A	6.150E+06	6.210E+06	1.07
209.0	1.308E+07	83.9	.0	68.7	68.7	8.097E+07	Trn A	6.150E+06	6.210E+06	1.07
210.0	1.302E+07	83.9	.0	68.7	68.7	8.078E+07	Trn A	6.150E+06	6.210E+06	1.07
211.0	1.296E+07	83.9	.0	68.7	68.7	8.060E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 89 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=89F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
212.0	1.290E+07	83.8	.0	68.7	68.7	8.041E+07	Trn A	6.150E+06	6.210E+06	1.07
213.0	1.284E+07	83.8	.0	68.7	68.7	8.022E+07	Trn A	6.150E+06	6.210E+06	1.07
214.0	1.278E+07	83.8	.0	68.7	68.7	8.003E+07	Trn A	6.150E+06	6.210E+06	1.07
215.0	1.272E+07	83.8	.0	68.7	68.7	7.984E+07	Trn A	6.150E+06	6.210E+06	1.07
216.0	1.266E+07	83.7	.0	68.7	68.7	7.965E+07	Trn A	6.150E+06	6.210E+06	1.07
217.0	1.260E+07	83.7	.0	68.7	68.7	7.969E+07	Trn A	6.150E+06	6.210E+06	1.07
218.0	1.254E+07	83.7	.0	68.7	68.7	7.972E+07	Trn A	6.150E+06	6.210E+06	1.07
219.0	1.248E+07	83.7	.0	68.7	68.7	7.976E+07	Trn A	6.150E+06	6.210E+06	1.07
220.0	1.242E+07	83.6	.0	68.7	68.7	7.980E+07	Trn A	6.150E+06	6.210E+06	1.07
221.0	1.236E+07	83.6	.0	68.7	68.7	7.984E+07	Trn A	6.150E+06	6.210E+06	1.07
222.0	1.230E+07	83.6	.0	68.7	68.7	7.987E+07	Trn A	6.150E+06	6.210E+06	1.07
223.0	1.224E+07	83.6	.0	68.7	68.7	7.991E+07	Trn A	6.150E+06	6.210E+06	1.07
224.0	1.219E+07	83.6	.0	68.7	68.7	7.995E+07	Trn A	6.150E+06	6.210E+06	1.07
225.0	1.213E+07	83.6	.0	68.7	68.7	7.999E+07	Trn A	6.150E+06	6.210E+06	1.07
226.0	1.207E+07	83.7	.0	68.7	68.7	8.002E+07	Trn A	6.150E+06	6.210E+06	1.07
227.0	1.201E+07	83.7	.0	68.7	68.7	8.006E+07	Trn A	6.150E+06	6.210E+06	1.07
228.0	1.195E+07	83.7	.0	68.7	68.7	8.010E+07	Trn A	6.150E+06	6.210E+06	1.07
229.0	1.189E+07	83.7	.0	68.7	68.7	8.014E+07	Trn A	6.150E+06	6.210E+06	1.07
230.0	1.183E+07	83.7	.0	68.7	68.7	8.017E+07	Trn A	6.150E+06	6.210E+06	1.07
231.0	1.177E+07	83.7	.0	68.7	68.7	8.021E+07	Trn A	6.150E+06	6.210E+06	1.07
232.0	1.171E+07	83.7	.0	68.7	68.7	8.025E+07	Trn A	6.150E+06	6.210E+06	1.07
233.0	1.165E+07	83.7	.0	68.7	68.7	8.029E+07	Trn A	6.150E+06	6.210E+06	1.07
234.0	1.159E+07	83.7	.0	68.7	68.7	8.032E+07	Trn A	6.150E+06	6.210E+06	1.07
235.0	1.153E+07	83.7	.0	68.7	68.7	8.036E+07	Trn A	6.150E+06	6.210E+06	1.07
236.0	1.147E+07	83.7	.0	68.7	68.7	8.040E+07	Trn A	6.150E+06	6.210E+06	1.07
237.0	1.141E+07	83.7	.0	68.7	68.7	8.044E+07	Trn A	6.150E+06	6.210E+06	1.07
238.0	1.135E+07	83.7	.0	68.7	68.7	8.047E+07	Trn A	6.150E+06	6.210E+06	1.07
239.0	1.129E+07	83.7	.0	68.7	68.7	8.051E+07	Trn A	6.150E+06	6.210E+06	1.07
240.0	1.123E+07	83.7	.0	68.7	68.7	8.055E+07	Trn A	6.150E+06	6.210E+06	1.07

Stop - Program terminated.

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 90 of 166
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9. UHSSIM input/output for Fan3_88F, 3-Fan Case with IBT of 88 °F

Fan3_88F.inp

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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=88F
# design wet-bulb temperature [F], design dry-bulb temperature [F],
# design hot-water temperature [F], design pressure [psia], design solids [ppt]
# 0 => F, psia, btu/hr, lbm/hr units
82, 98, 129.0, 14.696, 0.0, 0
# initial basin mass [lbm], initial basin temperature [F], initial solids [ppt],
# number of towers, starting time of simulation [hr]
29843200, 88, 0, 2, 0.
# Time Period Data -- every 0.1 hour for 10 hr then every hour up to 10 days
# step size, number of steps
0.1,100
1,230
*
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,6.15e6,6.21e6,1.07
240.0,6.15e6,6.21e6,1.07
*
# Train B
Trn B
0.0,2.05e6,0.0,1.07
240.0,2.05e6,0.0,1.07
*
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
0 s 3.2565E+08
50 s 3.2565E+08
101 s 3.2565E+08
116 s 3.1609E+08
120 s 3.1487E+08
150 s 3.1640E+08
300 s 3.1640E+08
900 s 3.1640E+08
1800 s 3.0196E+08
2704 s 2.8660E+08
2706 s 4.4627E+08
3600 s 4.3946E+08
2 h 2.2984E+08
4 h 1.4731E+08
6 h 1.4644E+08
9 h 1.4354E+08
12 h 1.4254E+08
18 h 1.5095E+08
24 h 1.4834E+08
36 h 1.2219E+08
2 d 1.1371E+08
3 d 1.0513E+08
4 d 9.6311E+07
5 d 9.1747E+07
6 d 8.5844E+07
7 d 8.3698E+07
8 d 8.4190E+07
9 d 7.9649E+07
10 d 8.0549E+07
*
# Ambient Data Supplied by Bechtel Power Corp.
# TIME WB DB P
# (hr) (F) (F) (psia)
0, 71.5, 71.5, 14.7
240, 71.5, 71.5, 14.7

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Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 91 of 166
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Fan3_88F.out

Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=88F

Initial Basin Mass 2.984E+07 lbm
Initial Basin Temperature 88.0 F
Initial Basin Solids .0 ppt

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
.0	2.984E+07	88.0	.0	71.5	71.5	3.257E+08	Trn A	6.150E+06	6.210E+06	1.07
.1	2.983E+07	88.3	.0	71.5	71.5	3.164E+08	Trn A	6.150E+06	6.210E+06	1.07
.2	2.981E+07	88.6	.0	71.5	71.5	3.164E+08	Trn A	6.150E+06	6.210E+06	1.07
.3	2.979E+07	88.9	.0	71.5	71.5	3.135E+08	Trn A	6.150E+06	6.210E+06	1.07
.4	2.977E+07	89.2	.0	71.5	71.5	3.077E+08	Trn A	6.150E+06	6.210E+06	1.07
.5	2.975E+07	89.5	.0	71.5	71.5	3.020E+08	Trn A	6.150E+06	6.210E+06	1.07
.6	2.973E+07	89.8	.0	71.5	71.5	2.958E+08	Trn A	6.150E+06	6.210E+06	1.07
.7	2.972E+07	90.1	.0	71.5	71.5	2.897E+08	Trn A	6.150E+06	6.210E+06	1.07
.8	2.970E+07	90.4	.0	71.5	71.5	4.449E+08	Trn A	6.150E+06	6.210E+06	1.07
.9	2.967E+07	90.8	.0	71.5	71.5	4.422E+08	Trn A	6.150E+06	6.210E+06	1.07
1.0	2.964E+07	91.3	.0	71.5	71.5	4.395E+08	Trn A	6.150E+06	6.210E+06	1.07
1.1	2.962E+07	91.7	.0	71.5	71.5	4.185E+08	Trn A	6.150E+06	6.210E+06	1.07
1.2	2.959E+07	92.0	.0	71.5	71.5	3.975E+08	Trn A	6.150E+06	6.210E+06	1.07
1.3	2.957E+07	92.4	.0	71.5	71.5	3.766E+08	Trn A	6.150E+06	6.210E+06	1.07
1.4	2.954E+07	92.7	.0	71.5	71.5	3.556E+08	Trn A	6.150E+06	6.210E+06	1.07
1.5	2.952E+07	93.0	.0	71.5	71.5	3.346E+08	Trn A	6.150E+06	6.210E+06	1.07
1.6	2.950E+07	93.2	.0	71.5	71.5	3.137E+08	Trn A	6.150E+06	6.210E+06	1.07
1.7	2.948E+07	93.4	.0	71.5	71.5	2.927E+08	Trn A	6.150E+06	6.210E+06	1.07
1.8	2.946E+07	93.6	.0	71.5	71.5	2.718E+08	Trn A	6.150E+06	6.210E+06	1.07
1.9	2.945E+07	93.8	.0	71.5	71.5	2.508E+08	Trn A	6.150E+06	6.210E+06	1.07
2.0	2.943E+07	93.9	.0	71.5	71.5	2.298E+08	Trn A	6.150E+06	6.210E+06	1.07
2.1	2.941E+07	94.0	.0	71.5	71.5	2.257E+08	Trn A	6.150E+06	6.210E+06	1.07
2.2	2.940E+07	94.1	.0	71.5	71.5	2.216E+08	Trn A	6.150E+06	6.210E+06	1.07
2.3	2.938E+07	94.2	.0	71.5	71.5	2.175E+08	Trn A	6.150E+06	6.210E+06	1.07
2.4	2.937E+07	94.3	.0	71.5	71.5	2.133E+08	Trn A	6.150E+06	6.210E+06	1.07
2.5	2.935E+07	94.4	.0	71.5	71.5	2.092E+08	Trn A	6.150E+06	6.210E+06	1.07
2.6	2.934E+07	94.5	.0	71.5	71.5	2.051E+08	Trn A	6.150E+06	6.210E+06	1.07
2.7	2.932E+07	94.6	.0	71.5	71.5	2.010E+08	Trn A	6.150E+06	6.210E+06	1.07
2.8	2.931E+07	94.6	.0	71.5	71.5	1.968E+08	Trn A	6.150E+06	6.210E+06	1.07
2.9	2.929E+07	94.7	.0	71.5	71.5	1.927E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 92 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=88F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
3.0	2.928E+07	94.7	.0	71.5	71.5	1.886E+08	Trn A	6.150E+06	6.210E+06	1.07
3.1	2.926E+07	94.8	.0	71.5	71.5	1.844E+08	Trn A	6.150E+06	6.210E+06	1.07
3.2	2.925E+07	94.8	.0	71.5	71.5	1.803E+08	Trn A	6.150E+06	6.210E+06	1.07
3.3	2.924E+07	94.8	.0	71.5	71.5	1.762E+08	Trn A	6.150E+06	6.210E+06	1.07
3.4	2.922E+07	94.8	.0	71.5	71.5	1.721E+08	Trn A	6.150E+06	6.210E+06	1.07
3.5	2.921E+07	94.9	.0	71.5	71.5	1.679E+08	Trn A	6.150E+06	6.210E+06	1.07
3.6	2.920E+07	94.9	.0	71.5	71.5	1.638E+08	Trn A	6.150E+06	6.210E+06	1.07
3.7	2.918E+07	94.9	.0	71.5	71.5	1.597E+08	Trn A	6.150E+06	6.210E+06	1.07
3.8	2.917E+07	94.9	.0	71.5	71.5	1.556E+08	Trn A	6.150E+06	6.210E+06	1.07
3.9	2.916E+07	94.9	.0	71.5	71.5	1.514E+08	Trn A	6.150E+06	6.210E+06	1.07
4.0	2.915E+07	94.8	.0	71.5	71.5	1.473E+08	Trn A	6.150E+06	6.210E+06	1.07
4.1	2.913E+07	94.8	.0	71.5	71.5	1.473E+08	Trn A	6.150E+06	6.210E+06	1.07
4.2	2.912E+07	94.8	.0	71.5	71.5	1.472E+08	Trn A	6.150E+06	6.210E+06	1.07
4.3	2.911E+07	94.8	.0	71.5	71.5	1.472E+08	Trn A	6.150E+06	6.210E+06	1.07
4.4	2.910E+07	94.8	.0	71.5	71.5	1.471E+08	Trn A	6.150E+06	6.210E+06	1.07
4.5	2.909E+07	94.8	.0	71.5	71.5	1.471E+08	Trn A	6.150E+06	6.210E+06	1.07
4.6	2.907E+07	94.7	.0	71.5	71.5	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.7	2.906E+07	94.7	.0	71.5	71.5	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.8	2.905E+07	94.7	.0	71.5	71.5	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.9	2.904E+07	94.7	.0	71.5	71.5	1.469E+08	Trn A	6.150E+06	6.210E+06	1.07
5.0	2.902E+07	94.7	.0	71.5	71.5	1.469E+08	Trn A	6.150E+06	6.210E+06	1.07
5.1	2.901E+07	94.7	.0	71.5	71.5	1.468E+08	Trn A	6.150E+06	6.210E+06	1.07
5.2	2.900E+07	94.6	.0	71.5	71.5	1.468E+08	Trn A	6.150E+06	6.210E+06	1.07
5.3	2.899E+07	94.6	.0	71.5	71.5	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.4	2.898E+07	94.6	.0	71.5	71.5	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.5	2.896E+07	94.6	.0	71.5	71.5	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.6	2.895E+07	94.6	.0	71.5	71.5	1.466E+08	Trn A	6.150E+06	6.210E+06	1.07
5.7	2.894E+07	94.6	.0	71.5	71.5	1.466E+08	Trn A	6.150E+06	6.210E+06	1.07
5.8	2.893E+07	94.5	.0	71.5	71.5	1.465E+08	Trn A	6.150E+06	6.210E+06	1.07
5.9	2.892E+07	94.5	.0	71.5	71.5	1.465E+08	Trn A	6.150E+06	6.210E+06	1.07
6.0	2.890E+07	94.5	.0	71.5	71.5	1.464E+08	Trn A	6.150E+06	6.210E+06	1.07
6.1	2.889E+07	94.5	.0	71.5	71.5	1.463E+08	Trn A	6.150E+06	6.210E+06	1.07
6.2	2.888E+07	94.5	.0	71.5	71.5	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07
6.3	2.887E+07	94.5	.0	71.5	71.5	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 93 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=88F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
6.4	2.886E+07	94.5	.0	71.5	71.5	1.461E+08	Trn A	6.150E+06	6.210E+06	1.07
6.5	2.884E+07	94.4	.0	71.5	71.5	1.460E+08	Trn A	6.150E+06	6.210E+06	1.07
6.6	2.883E+07	94.4	.0	71.5	71.5	1.459E+08	Trn A	6.150E+06	6.210E+06	1.07
6.7	2.882E+07	94.4	.0	71.5	71.5	1.458E+08	Trn A	6.150E+06	6.210E+06	1.07
6.8	2.881E+07	94.4	.0	71.5	71.5	1.457E+08	Trn A	6.150E+06	6.210E+06	1.07
6.9	2.880E+07	94.4	.0	71.5	71.5	1.456E+08	Trn A	6.150E+06	6.210E+06	1.07
7.0	2.878E+07	94.4	.0	71.5	71.5	1.455E+08	Trn A	6.150E+06	6.210E+06	1.07
7.1	2.877E+07	94.4	.0	71.5	71.5	1.454E+08	Trn A	6.150E+06	6.210E+06	1.07
7.2	2.876E+07	94.3	.0	71.5	71.5	1.453E+08	Trn A	6.150E+06	6.210E+06	1.07
7.3	2.875E+07	94.3	.0	71.5	71.5	1.452E+08	Trn A	6.150E+06	6.210E+06	1.07
7.4	2.874E+07	94.3	.0	71.5	71.5	1.451E+08	Trn A	6.150E+06	6.210E+06	1.07
7.5	2.872E+07	94.3	.0	71.5	71.5	1.450E+08	Trn A	6.150E+06	6.210E+06	1.07
7.6	2.871E+07	94.3	.0	71.5	71.5	1.449E+08	Trn A	6.150E+06	6.210E+06	1.07
7.7	2.870E+07	94.3	.0	71.5	71.5	1.448E+08	Trn A	6.150E+06	6.210E+06	1.07
7.8	2.869E+07	94.3	.0	71.5	71.5	1.447E+08	Trn A	6.150E+06	6.210E+06	1.07
7.9	2.868E+07	94.2	.0	71.5	71.5	1.446E+08	Trn A	6.150E+06	6.210E+06	1.07
8.0	2.867E+07	94.2	.0	71.5	71.5	1.445E+08	Trn A	6.150E+06	6.210E+06	1.07
8.1	2.865E+07	94.2	.0	71.5	71.5	1.444E+08	Trn A	6.150E+06	6.210E+06	1.07
8.2	2.864E+07	94.2	.0	71.5	71.5	1.443E+08	Trn A	6.150E+06	6.210E+06	1.07
8.3	2.863E+07	94.2	.0	71.5	71.5	1.442E+08	Trn A	6.150E+06	6.210E+06	1.07
8.4	2.862E+07	94.2	.0	71.5	71.5	1.441E+08	Trn A	6.150E+06	6.210E+06	1.07
8.5	2.861E+07	94.2	.0	71.5	71.5	1.440E+08	Trn A	6.150E+06	6.210E+06	1.07
8.6	2.859E+07	94.1	.0	71.5	71.5	1.439E+08	Trn A	6.150E+06	6.210E+06	1.07
8.7	2.858E+07	94.1	.0	71.5	71.5	1.438E+08	Trn A	6.150E+06	6.210E+06	1.07
8.8	2.857E+07	94.1	.0	71.5	71.5	1.437E+08	Trn A	6.150E+06	6.210E+06	1.07
8.9	2.856E+07	94.1	.0	71.5	71.5	1.436E+08	Trn A	6.150E+06	6.210E+06	1.07
9.0	2.855E+07	94.1	.0	71.5	71.5	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.1	2.854E+07	94.1	.0	71.5	71.5	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.2	2.852E+07	94.1	.0	71.5	71.5	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.3	2.851E+07	94.1	.0	71.5	71.5	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.4	2.850E+07	94.0	.0	71.5	71.5	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.5	2.849E+07	94.0	.0	71.5	71.5	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.6	2.848E+07	94.0	.0	71.5	71.5	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07
9.7	2.847E+07	94.0	.0	71.5	71.5	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 94 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=88F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	(-)
9.8	2.845E+07	94.0	.0	71.5	71.5	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07
9.9	2.844E+07	94.0	.0	71.5	71.5	1.432E+08	Trn A	6.150E+06	6.210E+06	1.07
10.0	2.843E+07	94.0	.0	71.5	71.5	1.432E+08	Trn A	6.150E+06	6.210E+06	1.07
11.0	2.831E+07	93.9	.0	71.5	71.5	1.429E+08	Trn A	6.150E+06	6.210E+06	1.07
12.0	2.820E+07	93.8	.0	71.5	71.5	1.425E+08	Trn A	6.150E+06	6.210E+06	1.07
13.0	2.808E+07	93.7	.0	71.5	71.5	1.439E+08	Trn A	6.150E+06	6.210E+06	1.07
14.0	2.797E+07	93.6	.0	71.5	71.5	1.453E+08	Trn A	6.150E+06	6.210E+06	1.07
15.0	2.785E+07	93.6	.0	71.5	71.5	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
16.0	2.773E+07	93.6	.0	71.5	71.5	1.481E+08	Trn A	6.150E+06	6.210E+06	1.07
17.0	2.762E+07	93.6	.0	71.5	71.5	1.495E+08	Trn A	6.150E+06	6.210E+06	1.07
18.0	2.750E+07	93.7	.0	71.5	71.5	1.509E+08	Trn A	6.150E+06	6.210E+06	1.07
19.0	2.738E+07	93.7	.0	71.5	71.5	1.505E+08	Trn A	6.150E+06	6.210E+06	1.07
20.0	2.726E+07	93.8	.0	71.5	71.5	1.501E+08	Trn A	6.150E+06	6.210E+06	1.07
21.0	2.714E+07	93.8	.0	71.5	71.5	1.496E+08	Trn A	6.150E+06	6.210E+06	1.07
22.0	2.702E+07	93.8	.0	71.5	71.5	1.492E+08	Trn A	6.150E+06	6.210E+06	1.07
23.0	2.690E+07	93.8	.0	71.5	71.5	1.488E+08	Trn A	6.150E+06	6.210E+06	1.07
24.0	2.678E+07	93.8	.0	71.5	71.5	1.483E+08	Trn A	6.150E+06	6.210E+06	1.07
25.0	2.667E+07	93.7	.0	71.5	71.5	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07
26.0	2.655E+07	93.7	.0	71.5	71.5	1.440E+08	Trn A	6.150E+06	6.210E+06	1.07
27.0	2.643E+07	93.6	.0	71.5	71.5	1.418E+08	Trn A	6.150E+06	6.210E+06	1.07
28.0	2.632E+07	93.5	.0	71.5	71.5	1.396E+08	Trn A	6.150E+06	6.210E+06	1.07
29.0	2.621E+07	93.4	.0	71.5	71.5	1.374E+08	Trn A	6.150E+06	6.210E+06	1.07
30.0	2.610E+07	93.2	.0	71.5	71.5	1.353E+08	Trn A	6.150E+06	6.210E+06	1.07
31.0	2.599E+07	93.1	.0	71.5	71.5	1.331E+08	Trn A	6.150E+06	6.210E+06	1.07
32.0	2.588E+07	92.9	.0	71.5	71.5	1.309E+08	Trn A	6.150E+06	6.210E+06	1.07
33.0	2.577E+07	92.7	.0	71.5	71.5	1.287E+08	Trn A	6.150E+06	6.210E+06	1.07
34.0	2.567E+07	92.6	.0	71.5	71.5	1.265E+08	Trn A	6.150E+06	6.210E+06	1.07
35.0	2.557E+07	92.4	.0	71.5	71.5	1.244E+08	Trn A	6.150E+06	6.210E+06	1.07
36.0	2.547E+07	92.2	.0	71.5	71.5	1.222E+08	Trn A	6.150E+06	6.210E+06	1.07
37.0	2.537E+07	92.0	.0	71.5	71.5	1.215E+08	Trn A	6.150E+06	6.210E+06	1.07
38.0	2.527E+07	91.8	.0	71.5	71.5	1.208E+08	Trn A	6.150E+06	6.210E+06	1.07
39.0	2.517E+07	91.6	.0	71.5	71.5	1.201E+08	Trn A	6.150E+06	6.210E+06	1.07
40.0	2.507E+07	91.5	.0	71.5	71.5	1.194E+08	Trn A	6.150E+06	6.210E+06	1.07
41.0	2.498E+07	91.3	.0	71.5	71.5	1.187E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 95 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=88F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
42.0	2.488E+07	91.2	.0	71.5	71.5	1.180E+08	Trn A	6.150E+06	6.210E+06	1.07
43.0	2.479E+07	91.0	.0	71.5	71.5	1.172E+08	Trn A	6.150E+06	6.210E+06	1.07
44.0	2.470E+07	90.9	.0	71.5	71.5	1.165E+08	Trn A	6.150E+06	6.210E+06	1.07
45.0	2.460E+07	90.8	.0	71.5	71.5	1.158E+08	Trn A	6.150E+06	6.210E+06	1.07
46.0	2.451E+07	90.7	.0	71.5	71.5	1.151E+08	Trn A	6.150E+06	6.210E+06	1.07
47.0	2.442E+07	90.6	.0	71.5	71.5	1.144E+08	Trn A	6.150E+06	6.210E+06	1.07
48.0	2.433E+07	90.5	.0	71.5	71.5	1.137E+08	Trn A	6.150E+06	6.210E+06	1.07
49.0	2.424E+07	90.4	.0	71.5	71.5	1.134E+08	Trn A	6.150E+06	6.210E+06	1.07
50.0	2.415E+07	90.3	.0	71.5	71.5	1.130E+08	Trn A	6.150E+06	6.210E+06	1.07
51.0	2.406E+07	90.2	.0	71.5	71.5	1.126E+08	Trn A	6.150E+06	6.210E+06	1.07
52.0	2.397E+07	90.1	.0	71.5	71.5	1.123E+08	Trn A	6.150E+06	6.210E+06	1.07
53.0	2.388E+07	90.1	.0	71.5	71.5	1.119E+08	Trn A	6.150E+06	6.210E+06	1.07
54.0	2.380E+07	90.0	.0	71.5	71.5	1.116E+08	Trn A	6.150E+06	6.210E+06	1.07
55.0	2.371E+07	90.0	.0	71.5	71.5	1.112E+08	Trn A	6.150E+06	6.210E+06	1.07
56.0	2.362E+07	89.9	.0	71.5	71.5	1.109E+08	Trn A	6.150E+06	6.210E+06	1.07
57.0	2.353E+07	89.8	.0	71.5	71.5	1.105E+08	Trn A	6.150E+06	6.210E+06	1.07
58.0	2.345E+07	89.8	.0	71.5	71.5	1.101E+08	Trn A	6.150E+06	6.210E+06	1.07
59.0	2.336E+07	89.7	.0	71.5	71.5	1.098E+08	Trn A	6.150E+06	6.210E+06	1.07
60.0	2.328E+07	89.7	.0	71.5	71.5	1.094E+08	Trn A	6.150E+06	6.210E+06	1.07
61.0	2.319E+07	89.6	.0	71.5	71.5	1.091E+08	Trn A	6.150E+06	6.210E+06	1.07
62.0	2.310E+07	89.6	.0	71.5	71.5	1.087E+08	Trn A	6.150E+06	6.210E+06	1.07
63.0	2.302E+07	89.5	.0	71.5	71.5	1.083E+08	Trn A	6.150E+06	6.210E+06	1.07
64.0	2.294E+07	89.5	.0	71.5	71.5	1.080E+08	Trn A	6.150E+06	6.210E+06	1.07
65.0	2.285E+07	89.4	.0	71.5	71.5	1.076E+08	Trn A	6.150E+06	6.210E+06	1.07
66.0	2.277E+07	89.4	.0	71.5	71.5	1.073E+08	Trn A	6.150E+06	6.210E+06	1.07
67.0	2.268E+07	89.3	.0	71.5	71.5	1.069E+08	Trn A	6.150E+06	6.210E+06	1.07
68.0	2.260E+07	89.3	.0	71.5	71.5	1.066E+08	Trn A	6.150E+06	6.210E+06	1.07
69.0	2.252E+07	89.3	.0	71.5	71.5	1.062E+08	Trn A	6.150E+06	6.210E+06	1.07
70.0	2.243E+07	89.2	.0	71.5	71.5	1.058E+08	Trn A	6.150E+06	6.210E+06	1.07
71.0	2.235E+07	89.2	.0	71.5	71.5	1.055E+08	Trn A	6.150E+06	6.210E+06	1.07
72.0	2.227E+07	89.1	.0	71.5	71.5	1.051E+08	Trn A	6.150E+06	6.210E+06	1.07
73.0	2.219E+07	89.1	.0	71.5	71.5	1.048E+08	Trn A	6.150E+06	6.210E+06	1.07
74.0	2.211E+07	89.0	.0	71.5	71.5	1.044E+08	Trn A	6.150E+06	6.210E+06	1.07
75.0	2.203E+07	89.0	.0	71.5	71.5	1.040E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 96 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=88F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
76.0	2.195E+07	88.9	.0	71.5	71.5	1.037E+08	Trn A	6.150E+06	6.210E+06	1.07
77.0	2.186E+07	88.9	.0	71.5	71.5	1.033E+08	Trn A	6.150E+06	6.210E+06	1.07
78.0	2.178E+07	88.8	.0	71.5	71.5	1.029E+08	Trn A	6.150E+06	6.210E+06	1.07
79.0	2.170E+07	88.8	.0	71.5	71.5	1.026E+08	Trn A	6.150E+06	6.210E+06	1.07
80.0	2.162E+07	88.8	.0	71.5	71.5	1.022E+08	Trn A	6.150E+06	6.210E+06	1.07
81.0	2.155E+07	88.7	.0	71.5	71.5	1.018E+08	Trn A	6.150E+06	6.210E+06	1.07
82.0	2.147E+07	88.7	.0	71.5	71.5	1.015E+08	Trn A	6.150E+06	6.210E+06	1.07
83.0	2.139E+07	88.6	.0	71.5	71.5	1.011E+08	Trn A	6.150E+06	6.210E+06	1.07
84.0	2.131E+07	88.6	.0	71.5	71.5	1.007E+08	Trn A	6.150E+06	6.210E+06	1.07
85.0	2.123E+07	88.5	.0	71.5	71.5	1.004E+08	Trn A	6.150E+06	6.210E+06	1.07
86.0	2.115E+07	88.5	.0	71.5	71.5	9.999E+07	Trn A	6.150E+06	6.210E+06	1.07
87.0	2.108E+07	88.4	.0	71.5	71.5	9.962E+07	Trn A	6.150E+06	6.210E+06	1.07
88.0	2.100E+07	88.4	.0	71.5	71.5	9.925E+07	Trn A	6.150E+06	6.210E+06	1.07
89.0	2.092E+07	88.3	.0	71.5	71.5	9.888E+07	Trn A	6.150E+06	6.210E+06	1.07
90.0	2.085E+07	88.3	.0	71.5	71.5	9.852E+07	Trn A	6.150E+06	6.210E+06	1.07
91.0	2.077E+07	88.2	.0	71.5	71.5	9.815E+07	Trn A	6.150E+06	6.210E+06	1.07
92.0	2.069E+07	88.2	.0	71.5	71.5	9.778E+07	Trn A	6.150E+06	6.210E+06	1.07
93.0	2.062E+07	88.2	.0	71.5	71.5	9.741E+07	Trn A	6.150E+06	6.210E+06	1.07
94.0	2.054E+07	88.1	.0	71.5	71.5	9.705E+07	Trn A	6.150E+06	6.210E+06	1.07
95.0	2.047E+07	88.1	.0	71.5	71.5	9.668E+07	Trn A	6.150E+06	6.210E+06	1.07
96.0	2.039E+07	88.0	.0	71.5	71.5	9.631E+07	Trn A	6.150E+06	6.210E+06	1.07
97.0	2.032E+07	88.0	.0	71.5	71.5	9.612E+07	Trn A	6.150E+06	6.210E+06	1.07
98.0	2.024E+07	88.0	.0	71.5	71.5	9.593E+07	Trn A	6.150E+06	6.210E+06	1.07
99.0	2.017E+07	87.9	.0	71.5	71.5	9.574E+07	Trn A	6.150E+06	6.210E+06	1.07
100.0	2.010E+07	87.9	.0	71.5	71.5	9.555E+07	Trn A	6.150E+06	6.210E+06	1.07
101.0	2.002E+07	87.8	.0	71.5	71.5	9.536E+07	Trn A	6.150E+06	6.210E+06	1.07
102.0	1.995E+07	87.8	.0	71.5	71.5	9.517E+07	Trn A	6.150E+06	6.210E+06	1.07
103.0	1.988E+07	87.8	.0	71.5	71.5	9.498E+07	Trn A	6.150E+06	6.210E+06	1.07
104.0	1.980E+07	87.7	.0	71.5	71.5	9.479E+07	Trn A	6.150E+06	6.210E+06	1.07
105.0	1.973E+07	87.7	.0	71.5	71.5	9.460E+07	Trn A	6.150E+06	6.210E+06	1.07
106.0	1.966E+07	87.7	.0	71.5	71.5	9.441E+07	Trn A	6.150E+06	6.210E+06	1.07
107.0	1.958E+07	87.6	.0	71.5	71.5	9.422E+07	Trn A	6.150E+06	6.210E+06	1.07
108.0	1.951E+07	87.6	.0	71.5	71.5	9.403E+07	Trn A	6.150E+06	6.210E+06	1.07
109.0	1.944E+07	87.6	.0	71.5	71.5	9.384E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 97 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=88F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
110.0	1.937E+07	87.5	.0	71.5	71.5	9.365E+07	Trn A	6.150E+06	6.210E+06	1.07
111.0	1.930E+07	87.5	.0	71.5	71.5	9.346E+07	Trn A	6.150E+06	6.210E+06	1.07
112.0	1.922E+07	87.5	.0	71.5	71.5	9.327E+07	Trn A	6.150E+06	6.210E+06	1.07
113.0	1.915E+07	87.5	.0	71.5	71.5	9.308E+07	Trn A	6.150E+06	6.210E+06	1.07
114.0	1.908E+07	87.4	.0	71.5	71.5	9.289E+07	Trn A	6.150E+06	6.210E+06	1.07
115.0	1.901E+07	87.4	.0	71.5	71.5	9.270E+07	Trn A	6.150E+06	6.210E+06	1.07
116.0	1.894E+07	87.4	.0	71.5	71.5	9.251E+07	Trn A	6.150E+06	6.210E+06	1.07
117.0	1.887E+07	87.4	.0	71.5	71.5	9.232E+07	Trn A	6.150E+06	6.210E+06	1.07
118.0	1.880E+07	87.3	.0	71.5	71.5	9.213E+07	Trn A	6.150E+06	6.210E+06	1.07
119.0	1.873E+07	87.3	.0	71.5	71.5	9.194E+07	Trn A	6.150E+06	6.210E+06	1.07
120.0	1.866E+07	87.3	.0	71.5	71.5	9.175E+07	Trn A	6.150E+06	6.210E+06	1.07
121.0	1.859E+07	87.3	.0	71.5	71.5	9.150E+07	Trn A	6.150E+06	6.210E+06	1.07
122.0	1.852E+07	87.2	.0	71.5	71.5	9.126E+07	Trn A	6.150E+06	6.210E+06	1.07
123.0	1.845E+07	87.2	.0	71.5	71.5	9.101E+07	Trn A	6.150E+06	6.210E+06	1.07
124.0	1.838E+07	87.2	.0	71.5	71.5	9.076E+07	Trn A	6.150E+06	6.210E+06	1.07
125.0	1.831E+07	87.1	.0	71.5	71.5	9.052E+07	Trn A	6.150E+06	6.210E+06	1.07
126.0	1.824E+07	87.1	.0	71.5	71.5	9.027E+07	Trn A	6.150E+06	6.210E+06	1.07
127.0	1.817E+07	87.1	.0	71.5	71.5	9.003E+07	Trn A	6.150E+06	6.210E+06	1.07
128.0	1.810E+07	87.1	.0	71.5	71.5	8.978E+07	Trn A	6.150E+06	6.210E+06	1.07
129.0	1.803E+07	87.0	.0	71.5	71.5	8.953E+07	Trn A	6.150E+06	6.210E+06	1.07
130.0	1.796E+07	87.0	.0	71.5	71.5	8.929E+07	Trn A	6.150E+06	6.210E+06	1.07
131.0	1.789E+07	87.0	.0	71.5	71.5	8.904E+07	Trn A	6.150E+06	6.210E+06	1.07
132.0	1.783E+07	86.9	.0	71.5	71.5	8.880E+07	Trn A	6.150E+06	6.210E+06	1.07
133.0	1.776E+07	86.9	.0	71.5	71.5	8.855E+07	Trn A	6.150E+06	6.210E+06	1.07
134.0	1.769E+07	86.9	.0	71.5	71.5	8.830E+07	Trn A	6.150E+06	6.210E+06	1.07
135.0	1.762E+07	86.8	.0	71.5	71.5	8.806E+07	Trn A	6.150E+06	6.210E+06	1.07
136.0	1.756E+07	86.8	.0	71.5	71.5	8.781E+07	Trn A	6.150E+06	6.210E+06	1.07
137.0	1.749E+07	86.8	.0	71.5	71.5	8.757E+07	Trn A	6.150E+06	6.210E+06	1.07
138.0	1.742E+07	86.7	.0	71.5	71.5	8.732E+07	Trn A	6.150E+06	6.210E+06	1.07
139.0	1.736E+07	86.7	.0	71.5	71.5	8.707E+07	Trn A	6.150E+06	6.210E+06	1.07
140.0	1.729E+07	86.7	.0	71.5	71.5	8.683E+07	Trn A	6.150E+06	6.210E+06	1.07
141.0	1.722E+07	86.6	.0	71.5	71.5	8.658E+07	Trn A	6.150E+06	6.210E+06	1.07
142.0	1.716E+07	86.6	.0	71.5	71.5	8.634E+07	Trn A	6.150E+06	6.210E+06	1.07
143.0	1.709E+07	86.6	.0	71.5	71.5	8.609E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 98 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=88F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
144.0	1.702E+07	86.5	.0	71.5	71.5	8.584E+07	Trn A	6.150E+06	6.210E+06	1.07
145.0	1.696E+07	86.5	.0	71.5	71.5	8.575E+07	Trn A	6.150E+06	6.210E+06	1.07
146.0	1.689E+07	86.5	.0	71.5	71.5	8.567E+07	Trn A	6.150E+06	6.210E+06	1.07
147.0	1.683E+07	86.4	.0	71.5	71.5	8.558E+07	Trn A	6.150E+06	6.210E+06	1.07
148.0	1.676E+07	86.4	.0	71.5	71.5	8.549E+07	Trn A	6.150E+06	6.210E+06	1.07
149.0	1.670E+07	86.4	.0	71.5	71.5	8.540E+07	Trn A	6.150E+06	6.210E+06	1.07
150.0	1.663E+07	86.4	.0	71.5	71.5	8.531E+07	Trn A	6.150E+06	6.210E+06	1.07
151.0	1.657E+07	86.4	.0	71.5	71.5	8.522E+07	Trn A	6.150E+06	6.210E+06	1.07
152.0	1.650E+07	86.3	.0	71.5	71.5	8.513E+07	Trn A	6.150E+06	6.210E+06	1.07
153.0	1.644E+07	86.3	.0	71.5	71.5	8.504E+07	Trn A	6.150E+06	6.210E+06	1.07
154.0	1.637E+07	86.3	.0	71.5	71.5	8.495E+07	Trn A	6.150E+06	6.210E+06	1.07
155.0	1.631E+07	86.3	.0	71.5	71.5	8.486E+07	Trn A	6.150E+06	6.210E+06	1.07
156.0	1.625E+07	86.3	.0	71.5	71.5	8.477E+07	Trn A	6.150E+06	6.210E+06	1.07
157.0	1.618E+07	86.3	.0	71.5	71.5	8.468E+07	Trn A	6.150E+06	6.210E+06	1.07
158.0	1.612E+07	86.3	.0	71.5	71.5	8.459E+07	Trn A	6.150E+06	6.210E+06	1.07
159.0	1.605E+07	86.3	.0	71.5	71.5	8.450E+07	Trn A	6.150E+06	6.210E+06	1.07
160.0	1.599E+07	86.2	.0	71.5	71.5	8.441E+07	Trn A	6.150E+06	6.210E+06	1.07
161.0	1.592E+07	86.2	.0	71.5	71.5	8.432E+07	Trn A	6.150E+06	6.210E+06	1.07
162.0	1.586E+07	86.2	.0	71.5	71.5	8.423E+07	Trn A	6.150E+06	6.210E+06	1.07
163.0	1.580E+07	86.2	.0	71.5	71.5	8.415E+07	Trn A	6.150E+06	6.210E+06	1.07
164.0	1.573E+07	86.2	.0	71.5	71.5	8.406E+07	Trn A	6.150E+06	6.210E+06	1.07
165.0	1.567E+07	86.2	.0	71.5	71.5	8.397E+07	Trn A	6.150E+06	6.210E+06	1.07
166.0	1.560E+07	86.2	.0	71.5	71.5	8.388E+07	Trn A	6.150E+06	6.210E+06	1.07
167.0	1.554E+07	86.2	.0	71.5	71.5	8.379E+07	Trn A	6.150E+06	6.210E+06	1.07
168.0	1.548E+07	86.1	.0	71.5	71.5	8.370E+07	Trn A	6.150E+06	6.210E+06	1.07
169.0	1.541E+07	86.1	.0	71.5	71.5	8.372E+07	Trn A	6.150E+06	6.210E+06	1.07
170.0	1.535E+07	86.1	.0	71.5	71.5	8.374E+07	Trn A	6.150E+06	6.210E+06	1.07
171.0	1.529E+07	86.1	.0	71.5	71.5	8.376E+07	Trn A	6.150E+06	6.210E+06	1.07
172.0	1.522E+07	86.1	.0	71.5	71.5	8.378E+07	Trn A	6.150E+06	6.210E+06	1.07
173.0	1.516E+07	86.1	.0	71.5	71.5	8.380E+07	Trn A	6.150E+06	6.210E+06	1.07
174.0	1.510E+07	86.1	.0	71.5	71.5	8.382E+07	Trn A	6.150E+06	6.210E+06	1.07
175.0	1.503E+07	86.1	.0	71.5	71.5	8.384E+07	Trn A	6.150E+06	6.210E+06	1.07
176.0	1.497E+07	86.1	.0	71.5	71.5	8.386E+07	Trn A	6.150E+06	6.210E+06	1.07
177.0	1.491E+07	86.1	.0	71.5	71.5	8.388E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 99 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=88F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
178.0	1.484E+07	86.1	.0	71.5	71.5	8.390E+07	Trn A	6.150E+06	6.210E+06	1.07
179.0	1.478E+07	86.1	.0	71.5	71.5	8.392E+07	Trn A	6.150E+06	6.210E+06	1.07
180.0	1.472E+07	86.1	.0	71.5	71.5	8.394E+07	Trn A	6.150E+06	6.210E+06	1.07
181.0	1.465E+07	86.1	.0	71.5	71.5	8.396E+07	Trn A	6.150E+06	6.210E+06	1.07
182.0	1.459E+07	86.1	.0	71.5	71.5	8.399E+07	Trn A	6.150E+06	6.210E+06	1.07
183.0	1.452E+07	86.1	.0	71.5	71.5	8.401E+07	Trn A	6.150E+06	6.210E+06	1.07
184.0	1.446E+07	86.1	.0	71.5	71.5	8.403E+07	Trn A	6.150E+06	6.210E+06	1.07
185.0	1.440E+07	86.1	.0	71.5	71.5	8.405E+07	Trn A	6.150E+06	6.210E+06	1.07
186.0	1.433E+07	86.1	.0	71.5	71.5	8.407E+07	Trn A	6.150E+06	6.210E+06	1.07
187.0	1.427E+07	86.1	.0	71.5	71.5	8.409E+07	Trn A	6.150E+06	6.210E+06	1.07
188.0	1.421E+07	86.1	.0	71.5	71.5	8.411E+07	Trn A	6.150E+06	6.210E+06	1.07
189.0	1.414E+07	86.1	.0	71.5	71.5	8.413E+07	Trn A	6.150E+06	6.210E+06	1.07
190.0	1.408E+07	86.1	.0	71.5	71.5	8.415E+07	Trn A	6.150E+06	6.210E+06	1.07
191.0	1.402E+07	86.1	.0	71.5	71.5	8.417E+07	Trn A	6.150E+06	6.210E+06	1.07
192.0	1.395E+07	86.1	.0	71.5	71.5	8.419E+07	Trn A	6.150E+06	6.210E+06	1.07
193.0	1.389E+07	86.1	.0	71.5	71.5	8.400E+07	Trn A	6.150E+06	6.210E+06	1.07
194.0	1.382E+07	86.1	.0	71.5	71.5	8.381E+07	Trn A	6.150E+06	6.210E+06	1.07
195.0	1.376E+07	86.1	.0	71.5	71.5	8.362E+07	Trn A	6.150E+06	6.210E+06	1.07
196.0	1.370E+07	86.1	.0	71.5	71.5	8.343E+07	Trn A	6.150E+06	6.210E+06	1.07
197.0	1.363E+07	86.1	.0	71.5	71.5	8.324E+07	Trn A	6.150E+06	6.210E+06	1.07
198.0	1.357E+07	86.1	.0	71.5	71.5	8.305E+07	Trn A	6.150E+06	6.210E+06	1.07
199.0	1.351E+07	86.1	.0	71.5	71.5	8.287E+07	Trn A	6.150E+06	6.210E+06	1.07
200.0	1.345E+07	86.0	.0	71.5	71.5	8.268E+07	Trn A	6.150E+06	6.210E+06	1.07
201.0	1.338E+07	86.0	.0	71.5	71.5	8.249E+07	Trn A	6.150E+06	6.210E+06	1.07
202.0	1.332E+07	86.0	.0	71.5	71.5	8.230E+07	Trn A	6.150E+06	6.210E+06	1.07
203.0	1.326E+07	85.9	.0	71.5	71.5	8.211E+07	Trn A	6.150E+06	6.210E+06	1.07
204.0	1.319E+07	85.9	.0	71.5	71.5	8.192E+07	Trn A	6.150E+06	6.210E+06	1.07
205.0	1.313E+07	85.9	.0	71.5	71.5	8.173E+07	Trn A	6.150E+06	6.210E+06	1.07
206.0	1.307E+07	85.9	.0	71.5	71.5	8.154E+07	Trn A	6.150E+06	6.210E+06	1.07
207.0	1.301E+07	85.9	.0	71.5	71.5	8.135E+07	Trn A	6.150E+06	6.210E+06	1.07
208.0	1.295E+07	85.9	.0	71.5	71.5	8.116E+07	Trn A	6.150E+06	6.210E+06	1.07
209.0	1.289E+07	85.8	.0	71.5	71.5	8.097E+07	Trn A	6.150E+06	6.210E+06	1.07
210.0	1.282E+07	85.8	.0	71.5	71.5	8.078E+07	Trn A	6.150E+06	6.210E+06	1.07
211.0	1.276E+07	85.7	.0	71.5	71.5	8.060E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 100 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=88F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
212.0	1.270E+07	85.7	.0	71.5	71.5	8.041E+07	Trn A	6.150E+06	6.210E+06	1.07
213.0	1.264E+07	85.7	.0	71.5	71.5	8.022E+07	Trn A	6.150E+06	6.210E+06	1.07
214.0	1.258E+07	85.7	.0	71.5	71.5	8.003E+07	Trn A	6.150E+06	6.210E+06	1.07
215.0	1.252E+07	85.6	.0	71.5	71.5	7.984E+07	Trn A	6.150E+06	6.210E+06	1.07
216.0	1.246E+07	85.6	.0	71.5	71.5	7.965E+07	Trn A	6.150E+06	6.210E+06	1.07
217.0	1.240E+07	85.6	.0	71.5	71.5	7.969E+07	Trn A	6.150E+06	6.210E+06	1.07
218.0	1.234E+07	85.6	.0	71.5	71.5	7.972E+07	Trn A	6.150E+06	6.210E+06	1.07
219.0	1.228E+07	85.6	.0	71.5	71.5	7.976E+07	Trn A	6.150E+06	6.210E+06	1.07
220.0	1.222E+07	85.5	.0	71.5	71.5	7.980E+07	Trn A	6.150E+06	6.210E+06	1.07
221.0	1.216E+07	85.5	.0	71.5	71.5	7.984E+07	Trn A	6.150E+06	6.210E+06	1.07
222.0	1.210E+07	85.6	.0	71.5	71.5	7.987E+07	Trn A	6.150E+06	6.210E+06	1.07
223.0	1.204E+07	85.6	.0	71.5	71.5	7.991E+07	Trn A	6.150E+06	6.210E+06	1.07
224.0	1.198E+07	85.6	.0	71.5	71.5	7.995E+07	Trn A	6.150E+06	6.210E+06	1.07
225.0	1.192E+07	85.6	.0	71.5	71.5	7.999E+07	Trn A	6.150E+06	6.210E+06	1.07
226.0	1.186E+07	85.6	.0	71.5	71.5	8.002E+07	Trn A	6.150E+06	6.210E+06	1.07
227.0	1.180E+07	85.6	.0	71.5	71.5	8.006E+07	Trn A	6.150E+06	6.210E+06	1.07
228.0	1.174E+07	85.6	.0	71.5	71.5	8.010E+07	Trn A	6.150E+06	6.210E+06	1.07
229.0	1.168E+07	85.6	.0	71.5	71.5	8.014E+07	Trn A	6.150E+06	6.210E+06	1.07
230.0	1.161E+07	85.6	.0	71.5	71.5	8.017E+07	Trn A	6.150E+06	6.210E+06	1.07
231.0	1.155E+07	85.6	.0	71.5	71.5	8.021E+07	Trn A	6.150E+06	6.210E+06	1.07
232.0	1.149E+07	85.6	.0	71.5	71.5	8.025E+07	Trn A	6.150E+06	6.210E+06	1.07
233.0	1.143E+07	85.6	.0	71.5	71.5	8.029E+07	Trn A	6.150E+06	6.210E+06	1.07
234.0	1.137E+07	85.6	.0	71.5	71.5	8.032E+07	Trn A	6.150E+06	6.210E+06	1.07
235.0	1.131E+07	85.6	.0	71.5	71.5	8.036E+07	Trn A	6.150E+06	6.210E+06	1.07
236.0	1.125E+07	85.6	.0	71.5	71.5	8.040E+07	Trn A	6.150E+06	6.210E+06	1.07
237.0	1.119E+07	85.6	.0	71.5	71.5	8.044E+07	Trn A	6.150E+06	6.210E+06	1.07
238.0	1.113E+07	85.6	.0	71.5	71.5	8.047E+07	Trn A	6.150E+06	6.210E+06	1.07
239.0	1.107E+07	85.6	.0	71.5	71.5	8.051E+07	Trn A	6.150E+06	6.210E+06	1.07
240.0	1.101E+07	85.6	.0	71.5	71.5	8.055E+07	Trn A	6.150E+06	6.210E+06	1.07

Stop - Program terminated.

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 101 of 166
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10. UHSSIM input/output for Fan3_87F, 3-Fan Case with IBT of 87 °F

Fan3_87F.inp

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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=87F
# design wet-bulb temperature [F], design dry-bulb temperature [F],
# design hot-water temperature [F], design pressure [psia], design solids [ppt]
# 0 => F, psia, btu/hr, lbm/hr units
82, 98, 129.0, 14.696, 0.0, 0
# initial basin mass [lbm], initial basin temperature [F], initial solids [ppt],
# number of towers, starting time of simulation [hr]
29843200, 87, 0, 2, 0.
# Time Period Data -- every 0.1 hour for 10 hr then every hour up to 10 days
# step size, number of steps
0.1,100
1,230
*
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,6.15e6,6.21e6,1.07
240.0,6.15e6,6.21e6,1.07
*
# Train B
Trn B
0.0,2.05e6,0.0,1.07
240.0,2.05e6,0.0,1.07
*
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
0 s 3.2565E+08
50 s 3.2565E+08
101 s 3.2565E+08
116 s 3.1609E+08
120 s 3.1487E+08
150 s 3.1640E+08
300 s 3.1640E+08
900 s 3.1640E+08
1800 s 3.0196E+08
2704 s 2.8660E+08
2706 s 4.4627E+08
3600 s 4.3946E+08
2 h 2.2984E+08
4 h 1.4731E+08
6 h 1.4644E+08
9 h 1.4354E+08
12 h 1.4254E+08
18 h 1.5095E+08
24 h 1.4834E+08
36 h 1.2219E+08
2 d 1.1371E+08
3 d 1.0513E+08
4 d 9.6311E+07
5 d 9.1747E+07
6 d 8.5844E+07
7 d 8.3698E+07
8 d 8.4190E+07
9 d 7.9649E+07
10 d 8.0549E+07
*
# Ambient Data Supplied by Bechtel Power Corp.
# TIME WB DB P
# (hr) (F) (F) (psia)
0, 73.6, 73.6, 14.7
240, 73.6, 73.6, 14.7

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Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 102 of 166
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Pan3_87F.out

Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=87F

Initial Basin Mass 2.984E+07 lbm
Initial Basin Temperature 87.0 F
Initial Basin Solids .0 ppt

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
.0	2.984E+07	87.0	.0	73.6	73.6	3.257E+08	Trn A	6.150E+06	6.210E+06	1.07
.1	2.983E+07	87.4	.0	73.6	73.6	3.164E+08	Trn A	6.150E+06	6.210E+06	1.07
.2	2.981E+07	87.7	.0	73.6	73.6	3.164E+08	Trn A	6.150E+06	6.210E+06	1.07
.3	2.979E+07	88.0	.0	73.6	73.6	3.135E+08	Trn A	6.150E+06	6.210E+06	1.07
.4	2.977E+07	88.4	.0	73.6	73.6	3.077E+08	Trn A	6.150E+06	6.210E+06	1.07
.5	2.976E+07	88.7	.0	73.6	73.6	3.020E+08	Trn A	6.150E+06	6.210E+06	1.07
.6	2.974E+07	89.0	.0	73.6	73.6	2.958E+08	Trn A	6.150E+06	6.210E+06	1.07
.7	2.972E+07	89.3	.0	73.6	73.6	2.897E+08	Trn A	6.150E+06	6.210E+06	1.07
.8	2.970E+07	89.7	.0	73.6	73.6	4.449E+08	Trn A	6.150E+06	6.210E+06	1.07
.9	2.967E+07	90.2	.0	73.6	73.6	4.422E+08	Trn A	6.150E+06	6.210E+06	1.07
1.0	2.965E+07	90.6	.0	73.6	73.6	4.395E+08	Trn A	6.150E+06	6.210E+06	1.07
1.1	2.962E+07	91.0	.0	73.6	73.6	4.185E+08	Trn A	6.150E+06	6.210E+06	1.07
1.2	2.960E+07	91.4	.0	73.6	73.6	3.975E+08	Trn A	6.150E+06	6.210E+06	1.07
1.3	2.957E+07	91.8	.0	73.6	73.6	3.766E+08	Trn A	6.150E+06	6.210E+06	1.07
1.4	2.955E+07	92.1	.0	73.6	73.6	3.556E+08	Trn A	6.150E+06	6.210E+06	1.07
1.5	2.953E+07	92.5	.0	73.6	73.6	3.346E+08	Trn A	6.150E+06	6.210E+06	1.07
1.6	2.951E+07	92.7	.0	73.6	73.6	3.137E+08	Trn A	6.150E+06	6.210E+06	1.07
1.7	2.949E+07	93.0	.0	73.6	73.6	2.927E+08	Trn A	6.150E+06	6.210E+06	1.07
1.8	2.947E+07	93.2	.0	73.6	73.6	2.718E+08	Trn A	6.150E+06	6.210E+06	1.07
1.9	2.945E+07	93.4	.0	73.6	73.6	2.508E+08	Trn A	6.150E+06	6.210E+06	1.07
2.0	2.944E+07	93.5	.0	73.6	73.6	2.298E+08	Trn A	6.150E+06	6.210E+06	1.07
2.1	2.942E+07	93.7	.0	73.6	73.6	2.257E+08	Trn A	6.150E+06	6.210E+06	1.07
2.2	2.941E+07	93.8	.0	73.6	73.6	2.216E+08	Trn A	6.150E+06	6.210E+06	1.07
2.3	2.939E+07	93.9	.0	73.6	73.6	2.175E+08	Trn A	6.150E+06	6.210E+06	1.07
2.4	2.938E+07	94.0	.0	73.6	73.6	2.133E+08	Trn A	6.150E+06	6.210E+06	1.07
2.5	2.936E+07	94.1	.0	73.6	73.6	2.092E+08	Trn A	6.150E+06	6.210E+06	1.07
2.6	2.935E+07	94.2	.0	73.6	73.6	2.051E+08	Trn A	6.150E+06	6.210E+06	1.07
2.7	2.933E+07	94.3	.0	73.6	73.6	2.010E+08	Trn A	6.150E+06	6.210E+06	1.07
2.8	2.932E+07	94.4	.0	73.6	73.6	1.968E+08	Trn A	6.150E+06	6.210E+06	1.07
2.9	2.931E+07	94.5	.0	73.6	73.6	1.927E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 103 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=87F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
3.0	2.929E+07	94.6	.0	73.6	73.6	1.886E+08	Trn A	6.150E+06	6.210E+06	1.07
3.1	2.928E+07	94.6	.0	73.6	73.6	1.844E+08	Trn A	6.150E+06	6.210E+06	1.07
3.2	2.926E+07	94.7	.0	73.6	73.6	1.803E+08	Trn A	6.150E+06	6.210E+06	1.07
3.3	2.925E+07	94.7	.0	73.6	73.6	1.762E+08	Trn A	6.150E+06	6.210E+06	1.07
3.4	2.924E+07	94.8	.0	73.6	73.6	1.721E+08	Trn A	6.150E+06	6.210E+06	1.07
3.5	2.922E+07	94.8	.0	73.6	73.6	1.679E+08	Trn A	6.150E+06	6.210E+06	1.07
3.6	2.921E+07	94.8	.0	73.6	73.6	1.638E+08	Trn A	6.150E+06	6.210E+06	1.07
3.7	2.920E+07	94.8	.0	73.6	73.6	1.597E+08	Trn A	6.150E+06	6.210E+06	1.07
3.8	2.919E+07	94.9	.0	73.6	73.6	1.556E+08	Trn A	6.150E+06	6.210E+06	1.07
3.9	2.918E+07	94.9	.0	73.6	73.6	1.514E+08	Trn A	6.150E+06	6.210E+06	1.07
4.0	2.916E+07	94.9	.0	73.6	73.6	1.473E+08	Trn A	6.150E+06	6.210E+06	1.07
4.1	2.915E+07	94.9	.0	73.6	73.6	1.473E+08	Trn A	6.150E+06	6.210E+06	1.07
4.2	2.914E+07	94.9	.0	73.6	73.6	1.472E+08	Trn A	6.150E+06	6.210E+06	1.07
4.3	2.913E+07	94.9	.0	73.6	73.6	1.472E+08	Trn A	6.150E+06	6.210E+06	1.07
4.4	2.912E+07	94.9	.0	73.6	73.6	1.471E+08	Trn A	6.150E+06	6.210E+06	1.07
4.5	2.910E+07	94.9	.0	73.6	73.6	1.471E+08	Trn A	6.150E+06	6.210E+06	1.07
4.6	2.909E+07	94.9	.0	73.6	73.6	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.7	2.908E+07	94.9	.0	73.6	73.6	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.8	2.907E+07	94.9	.0	73.6	73.6	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.9	2.906E+07	94.9	.0	73.6	73.6	1.469E+08	Trn A	6.150E+06	6.210E+06	1.07
5.0	2.904E+07	94.9	.0	73.6	73.6	1.469E+08	Trn A	6.150E+06	6.210E+06	1.07
5.1	2.903E+07	94.9	.0	73.6	73.6	1.468E+08	Trn A	6.150E+06	6.210E+06	1.07
5.2	2.902E+07	94.9	.0	73.6	73.6	1.468E+08	Trn A	6.150E+06	6.210E+06	1.07
5.3	2.901E+07	94.9	.0	73.6	73.6	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.4	2.900E+07	94.9	.0	73.6	73.6	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.5	2.899E+07	94.9	.0	73.6	73.6	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.6	2.897E+07	94.8	.0	73.6	73.6	1.466E+08	Trn A	6.150E+06	6.210E+06	1.07
5.7	2.896E+07	94.8	.0	73.6	73.6	1.466E+08	Trn A	6.150E+06	6.210E+06	1.07
5.8	2.895E+07	94.8	.0	73.6	73.6	1.465E+08	Trn A	6.150E+06	6.210E+06	1.07
5.9	2.894E+07	94.8	.0	73.6	73.6	1.465E+08	Trn A	6.150E+06	6.210E+06	1.07
6.0	2.893E+07	94.8	.0	73.6	73.6	1.464E+08	Trn A	6.150E+06	6.210E+06	1.07
6.1	2.891E+07	94.8	.0	73.6	73.6	1.463E+08	Trn A	6.150E+06	6.210E+06	1.07
6.2	2.890E+07	94.8	.0	73.6	73.6	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07
6.3	2.889E+07	94.8	.0	73.6	73.6	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 104 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=87F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
6.4	2.888E+07	94.8	.0	73.6	73.6	1.461E+08	Trn A	6.150E+06	6.210E+06	1.07
6.5	2.887E+07	94.8	.0	73.6	73.6	1.460E+08	Trn A	6.150E+06	6.210E+06	1.07
6.6	2.886E+07	94.8	.0	73.6	73.6	1.459E+08	Trn A	6.150E+06	6.210E+06	1.07
6.7	2.884E+07	94.8	.0	73.6	73.6	1.458E+08	Trn A	6.150E+06	6.210E+06	1.07
6.8	2.883E+07	94.8	.0	73.6	73.6	1.457E+08	Trn A	6.150E+06	6.210E+06	1.07
6.9	2.882E+07	94.8	.0	73.6	73.6	1.456E+08	Trn A	6.150E+06	6.210E+06	1.07
7.0	2.881E+07	94.8	.0	73.6	73.6	1.455E+08	Trn A	6.150E+06	6.210E+06	1.07
7.1	2.880E+07	94.8	.0	73.6	73.6	1.454E+08	Trn A	6.150E+06	6.210E+06	1.07
7.2	2.878E+07	94.8	.0	73.6	73.6	1.453E+08	Trn A	6.150E+06	6.210E+06	1.07
7.3	2.877E+07	94.8	.0	73.6	73.6	1.452E+08	Trn A	6.150E+06	6.210E+06	1.07
7.4	2.876E+07	94.8	.0	73.6	73.6	1.451E+08	Trn A	6.150E+06	6.210E+06	1.07
7.5	2.875E+07	94.8	.0	73.6	73.6	1.450E+08	Trn A	6.150E+06	6.210E+06	1.07
7.6	2.874E+07	94.8	.0	73.6	73.6	1.449E+08	Trn A	6.150E+06	6.210E+06	1.07
7.7	2.873E+07	94.8	.0	73.6	73.6	1.448E+08	Trn A	6.150E+06	6.210E+06	1.07
7.8	2.871E+07	94.8	.0	73.6	73.6	1.447E+08	Trn A	6.150E+06	6.210E+06	1.07
7.9	2.870E+07	94.8	.0	73.6	73.6	1.446E+08	Trn A	6.150E+06	6.210E+06	1.07
8.0	2.869E+07	94.8	.0	73.6	73.6	1.445E+08	Trn A	6.150E+06	6.210E+06	1.07
8.1	2.868E+07	94.8	.0	73.6	73.6	1.444E+08	Trn A	6.150E+06	6.210E+06	1.07
8.2	2.867E+07	94.8	.0	73.6	73.6	1.443E+08	Trn A	6.150E+06	6.210E+06	1.07
8.3	2.866E+07	94.8	.0	73.6	73.6	1.442E+08	Trn A	6.150E+06	6.210E+06	1.07
8.4	2.864E+07	94.8	.0	73.6	73.6	1.441E+08	Trn A	6.150E+06	6.210E+06	1.07
8.5	2.863E+07	94.8	.0	73.6	73.6	1.440E+08	Trn A	6.150E+06	6.210E+06	1.07
8.6	2.862E+07	94.8	.0	73.6	73.6	1.439E+08	Trn A	6.150E+06	6.210E+06	1.07
8.7	2.861E+07	94.8	.0	73.6	73.6	1.438E+08	Trn A	6.150E+06	6.210E+06	1.07
8.8	2.860E+07	94.7	.0	73.6	73.6	1.437E+08	Trn A	6.150E+06	6.210E+06	1.07
8.9	2.859E+07	94.7	.0	73.6	73.6	1.436E+08	Trn A	6.150E+06	6.210E+06	1.07
9.0	2.857E+07	94.7	.0	73.6	73.6	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.1	2.856E+07	94.7	.0	73.6	73.6	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.2	2.855E+07	94.7	.0	73.6	73.6	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.3	2.854E+07	94.7	.0	73.6	73.6	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.4	2.853E+07	94.7	.0	73.6	73.6	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.5	2.852E+07	94.7	.0	73.6	73.6	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.6	2.851E+07	94.7	.0	73.6	73.6	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07
9.7	2.849E+07	94.7	.0	73.6	73.6	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 105 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=87F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
9.8	2.848E+07	94.7	.0	73.6	73.6	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07
9.9	2.847E+07	94.7	.0	73.6	73.6	1.432E+08	Trn A	6.150E+06	6.210E+06	1.07
10.0	2.846E+07	94.7	.0	73.6	73.6	1.432E+08	Trn A	6.150E+06	6.210E+06	1.07
11.0	2.834E+07	94.6	.0	73.6	73.6	1.429E+08	Trn A	6.150E+06	6.210E+06	1.07
12.0	2.823E+07	94.6	.0	73.6	73.6	1.425E+08	Trn A	6.150E+06	6.210E+06	1.07
13.0	2.811E+07	94.6	.0	73.6	73.6	1.439E+08	Trn A	6.150E+06	6.210E+06	1.07
14.0	2.800E+07	94.6	.0	73.6	73.6	1.453E+08	Trn A	6.150E+06	6.210E+06	1.07
15.0	2.788E+07	94.6	.0	73.6	73.6	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
16.0	2.776E+07	94.6	.0	73.6	73.6	1.481E+08	Trn A	6.150E+06	6.210E+06	1.07
17.0	2.764E+07	94.7	.0	73.6	73.6	1.495E+08	Trn A	6.150E+06	6.210E+06	1.07
18.0	2.752E+07	94.7	.0	73.6	73.6	1.509E+08	Trn A	6.150E+06	6.210E+06	1.07
19.0	2.740E+07	94.8	.0	73.6	73.6	1.505E+08	Trn A	6.150E+06	6.210E+06	1.07
20.0	2.728E+07	94.8	.0	73.6	73.6	1.501E+08	Trn A	6.150E+06	6.210E+06	1.07
21.0	2.716E+07	94.9	.0	73.6	73.6	1.496E+08	Trn A	6.150E+06	6.210E+06	1.07
22.0	2.704E+07	94.9	.0	73.6	73.6	1.492E+08	Trn A	6.150E+06	6.210E+06	1.07
23.0	2.693E+07	94.9	.0	73.6	73.6	1.488E+08	Trn A	6.150E+06	6.210E+06	1.07
24.0	2.681E+07	94.9	.0	73.6	73.6	1.483E+08	Trn A	6.150E+06	6.210E+06	1.07
25.0	2.669E+07	94.9	.0	73.6	73.6	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07
26.0	2.657E+07	94.8	.0	73.6	73.6	1.440E+08	Trn A	6.150E+06	6.210E+06	1.07
27.0	2.645E+07	94.8	.0	73.6	73.6	1.418E+08	Trn A	6.150E+06	6.210E+06	1.07
28.0	2.634E+07	94.7	.0	73.6	73.6	1.396E+08	Trn A	6.150E+06	6.210E+06	1.07
29.0	2.623E+07	94.6	.0	73.6	73.6	1.374E+08	Trn A	6.150E+06	6.210E+06	1.07
30.0	2.611E+07	94.4	.0	73.6	73.6	1.353E+08	Trn A	6.150E+06	6.210E+06	1.07
31.0	2.600E+07	94.3	.0	73.6	73.6	1.331E+08	Trn A	6.150E+06	6.210E+06	1.07
32.0	2.589E+07	94.1	.0	73.6	73.6	1.309E+08	Trn A	6.150E+06	6.210E+06	1.07
33.0	2.579E+07	93.9	.0	73.6	73.6	1.287E+08	Trn A	6.150E+06	6.210E+06	1.07
34.0	2.568E+07	93.8	.0	73.6	73.6	1.265E+08	Trn A	6.150E+06	6.210E+06	1.07
35.0	2.558E+07	93.6	.0	73.6	73.6	1.244E+08	Trn A	6.150E+06	6.210E+06	1.07
36.0	2.548E+07	93.4	.0	73.6	73.6	1.222E+08	Trn A	6.150E+06	6.210E+06	1.07
37.0	2.538E+07	93.2	.0	73.6	73.6	1.215E+08	Trn A	6.150E+06	6.210E+06	1.07
38.0	2.528E+07	93.0	.0	73.6	73.6	1.208E+08	Trn A	6.150E+06	6.210E+06	1.07
39.0	2.518E+07	92.8	.0	73.6	73.6	1.201E+08	Trn A	6.150E+06	6.210E+06	1.07
40.0	2.508E+07	92.7	.0	73.6	73.6	1.194E+08	Trn A	6.150E+06	6.210E+06	1.07
41.0	2.498E+07	92.6	.0	73.6	73.6	1.187E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 106 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=87F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
42.0	2.489E+07	92.4	.0	73.6	73.6	1.180E+08	Trn A	6.150E+06	6.210E+06	1.07
43.0	2.479E+07	92.3	.0	73.6	73.6	1.172E+08	Trn A	6.150E+06	6.210E+06	1.07
44.0	2.470E+07	92.2	.0	73.6	73.6	1.165E+08	Trn A	6.150E+06	6.210E+06	1.07
45.0	2.460E+07	92.1	.0	73.6	73.6	1.158E+08	Trn A	6.150E+06	6.210E+06	1.07
46.0	2.451E+07	92.0	.0	73.6	73.6	1.151E+08	Trn A	6.150E+06	6.210E+06	1.07
47.0	2.442E+07	91.9	.0	73.6	73.6	1.144E+08	Trn A	6.150E+06	6.210E+06	1.07
48.0	2.433E+07	91.8	.0	73.6	73.6	1.137E+08	Trn A	6.150E+06	6.210E+06	1.07
49.0	2.424E+07	91.7	.0	73.6	73.6	1.134E+08	Trn A	6.150E+06	6.210E+06	1.07
50.0	2.415E+07	91.6	.0	73.6	73.6	1.130E+08	Trn A	6.150E+06	6.210E+06	1.07
51.0	2.406E+07	91.5	.0	73.6	73.6	1.126E+08	Trn A	6.150E+06	6.210E+06	1.07
52.0	2.397E+07	91.4	.0	73.6	73.6	1.123E+08	Trn A	6.150E+06	6.210E+06	1.07
53.0	2.388E+07	91.4	.0	73.6	73.6	1.119E+08	Trn A	6.150E+06	6.210E+06	1.07
54.0	2.379E+07	91.3	.0	73.6	73.6	1.116E+08	Trn A	6.150E+06	6.210E+06	1.07
55.0	2.370E+07	91.3	.0	73.6	73.6	1.112E+08	Trn A	6.150E+06	6.210E+06	1.07
56.0	2.361E+07	91.2	.0	73.6	73.6	1.109E+08	Trn A	6.150E+06	6.210E+06	1.07
57.0	2.352E+07	91.1	.0	73.6	73.6	1.105E+08	Trn A	6.150E+06	6.210E+06	1.07
58.0	2.344E+07	91.1	.0	73.6	73.6	1.101E+08	Trn A	6.150E+06	6.210E+06	1.07
59.0	2.335E+07	91.0	.0	73.6	73.6	1.098E+08	Trn A	6.150E+06	6.210E+06	1.07
60.0	2.326E+07	91.0	.0	73.6	73.6	1.094E+08	Trn A	6.150E+06	6.210E+06	1.07
61.0	2.318E+07	90.9	.0	73.6	73.6	1.091E+08	Trn A	6.150E+06	6.210E+06	1.07
62.0	2.309E+07	90.9	.0	73.6	73.6	1.087E+08	Trn A	6.150E+06	6.210E+06	1.07
63.0	2.300E+07	90.8	.0	73.6	73.6	1.083E+08	Trn A	6.150E+06	6.210E+06	1.07
64.0	2.292E+07	90.8	.0	73.6	73.6	1.080E+08	Trn A	6.150E+06	6.210E+06	1.07
65.0	2.283E+07	90.7	.0	73.6	73.6	1.076E+08	Trn A	6.150E+06	6.210E+06	1.07
66.0	2.275E+07	90.7	.0	73.6	73.6	1.073E+08	Trn A	6.150E+06	6.210E+06	1.07
67.0	2.266E+07	90.7	.0	73.6	73.6	1.069E+08	Trn A	6.150E+06	6.210E+06	1.07
68.0	2.258E+07	90.6	.0	73.6	73.6	1.066E+08	Trn A	6.150E+06	6.210E+06	1.07
69.0	2.250E+07	90.6	.0	73.6	73.6	1.062E+08	Trn A	6.150E+06	6.210E+06	1.07
70.0	2.241E+07	90.5	.0	73.6	73.6	1.058E+08	Trn A	6.150E+06	6.210E+06	1.07
71.0	2.233E+07	90.5	.0	73.6	73.6	1.055E+08	Trn A	6.150E+06	6.210E+06	1.07
72.0	2.225E+07	90.4	.0	73.6	73.6	1.051E+08	Trn A	6.150E+06	6.210E+06	1.07
73.0	2.216E+07	90.4	.0	73.6	73.6	1.048E+08	Trn A	6.150E+06	6.210E+06	1.07
74.0	2.208E+07	90.4	.0	73.6	73.6	1.044E+08	Trn A	6.150E+06	6.210E+06	1.07
75.0	2.200E+07	90.3	.0	73.6	73.6	1.040E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 107 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=87F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
76.0	2.192E+07	90.3	.0	73.6	73.6	1.037E+08	Trn A	6.150E+06	6.210E+06	1.07
77.0	2.184E+07	90.2	.0	73.6	73.6	1.033E+08	Trn A	6.150E+06	6.210E+06	1.07
78.0	2.175E+07	90.2	.0	73.6	73.6	1.029E+08	Trn A	6.150E+06	6.210E+06	1.07
79.0	2.167E+07	90.1	.0	73.6	73.6	1.026E+08	Trn A	6.150E+06	6.210E+06	1.07
80.0	2.159E+07	90.1	.0	73.6	73.6	1.022E+08	Trn A	6.150E+06	6.210E+06	1.07
81.0	2.151E+07	90.0	.0	73.6	73.6	1.018E+08	Trn A	6.150E+06	6.210E+06	1.07
82.0	2.143E+07	90.0	.0	73.6	73.6	1.015E+08	Trn A	6.150E+06	6.210E+06	1.07
83.0	2.135E+07	90.0	.0	73.6	73.6	1.011E+08	Trn A	6.150E+06	6.210E+06	1.07
84.0	2.127E+07	89.9	.0	73.6	73.6	1.007E+08	Trn A	6.150E+06	6.210E+06	1.07
85.0	2.120E+07	89.9	.0	73.6	73.6	1.004E+08	Trn A	6.150E+06	6.210E+06	1.07
86.0	2.112E+07	89.8	.0	73.6	73.6	9.999E+07	Trn A	6.150E+06	6.210E+06	1.07
87.0	2.104E+07	89.8	.0	73.6	73.6	9.962E+07	Trn A	6.150E+06	6.210E+06	1.07
88.0	2.096E+07	89.7	.0	73.6	73.6	9.925E+07	Trn A	6.150E+06	6.210E+06	1.07
89.0	2.088E+07	89.7	.0	73.6	73.6	9.888E+07	Trn A	6.150E+06	6.210E+06	1.07
90.0	2.081E+07	89.6	.0	73.6	73.6	9.852E+07	Trn A	6.150E+06	6.210E+06	1.07
91.0	2.073E+07	89.6	.0	73.6	73.6	9.815E+07	Trn A	6.150E+06	6.210E+06	1.07
92.0	2.065E+07	89.5	.0	73.6	73.6	9.778E+07	Trn A	6.150E+06	6.210E+06	1.07
93.0	2.057E+07	89.5	.0	73.6	73.6	9.741E+07	Trn A	6.150E+06	6.210E+06	1.07
94.0	2.050E+07	89.5	.0	73.6	73.6	9.705E+07	Trn A	6.150E+06	6.210E+06	1.07
95.0	2.042E+07	89.4	.0	73.6	73.6	9.668E+07	Trn A	6.150E+06	6.210E+06	1.07
96.0	2.035E+07	89.4	.0	73.6	73.6	9.631E+07	Trn A	6.150E+06	6.210E+06	1.07
97.0	2.027E+07	89.3	.0	73.6	73.6	9.612E+07	Trn A	6.150E+06	6.210E+06	1.07
98.0	2.020E+07	89.3	.0	73.6	73.6	9.593E+07	Trn A	6.150E+06	6.210E+06	1.07
99.0	2.012E+07	89.3	.0	73.6	73.6	9.574E+07	Trn A	6.150E+06	6.210E+06	1.07
100.0	2.005E+07	89.2	.0	73.6	73.6	9.555E+07	Trn A	6.150E+06	6.210E+06	1.07
101.0	1.997E+07	89.2	.0	73.6	73.6	9.536E+07	Trn A	6.150E+06	6.210E+06	1.07
102.0	1.990E+07	89.1	.0	73.6	73.6	9.517E+07	Trn A	6.150E+06	6.210E+06	1.07
103.0	1.982E+07	89.1	.0	73.6	73.6	9.498E+07	Trn A	6.150E+06	6.210E+06	1.07
104.0	1.975E+07	89.1	.0	73.6	73.6	9.479E+07	Trn A	6.150E+06	6.210E+06	1.07
105.0	1.968E+07	89.1	.0	73.6	73.6	9.460E+07	Trn A	6.150E+06	6.210E+06	1.07
106.0	1.960E+07	89.0	.0	73.6	73.6	9.441E+07	Trn A	6.150E+06	6.210E+06	1.07
107.0	1.953E+07	89.0	.0	73.6	73.6	9.422E+07	Trn A	6.150E+06	6.210E+06	1.07
108.0	1.946E+07	89.0	.0	73.6	73.6	9.403E+07	Trn A	6.150E+06	6.210E+06	1.07
109.0	1.938E+07	88.9	.0	73.6	73.6	9.384E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 108 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=87F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
110.0	1.931E+07	88.9	.0	73.6	73.6	9.365E+07	Trn A	6.150E+06	6.210E+06	1.07
111.0	1.924E+07	88.9	.0	73.6	73.6	9.346E+07	Trn A	6.150E+06	6.210E+06	1.07
112.0	1.917E+07	88.9	.0	73.6	73.6	9.327E+07	Trn A	6.150E+06	6.210E+06	1.07
113.0	1.909E+07	88.9	.0	73.6	73.6	9.308E+07	Trn A	6.150E+06	6.210E+06	1.07
114.0	1.902E+07	88.8	.0	73.6	73.6	9.289E+07	Trn A	6.150E+06	6.210E+06	1.07
115.0	1.895E+07	88.8	.0	73.6	73.6	9.270E+07	Trn A	6.150E+06	6.210E+06	1.07
116.0	1.888E+07	88.8	.0	73.6	73.6	9.251E+07	Trn A	6.150E+06	6.210E+06	1.07
117.0	1.881E+07	88.8	.0	73.6	73.6	9.232E+07	Trn A	6.150E+06	6.210E+06	1.07
118.0	1.873E+07	88.7	.0	73.6	73.6	9.213E+07	Trn A	6.150E+06	6.210E+06	1.07
119.0	1.866E+07	88.7	.0	73.6	73.6	9.194E+07	Trn A	6.150E+06	6.210E+06	1.07
120.0	1.859E+07	88.7	.0	73.6	73.6	9.175E+07	Trn A	6.150E+06	6.210E+06	1.07
121.0	1.852E+07	88.7	.0	73.6	73.6	9.150E+07	Trn A	6.150E+06	6.210E+06	1.07
122.0	1.845E+07	88.6	.0	73.6	73.6	9.126E+07	Trn A	6.150E+06	6.210E+06	1.07
123.0	1.838E+07	88.6	.0	73.6	73.6	9.101E+07	Trn A	6.150E+06	6.210E+06	1.07
124.0	1.831E+07	88.6	.0	73.6	73.6	9.076E+07	Trn A	6.150E+06	6.210E+06	1.07
125.0	1.824E+07	88.5	.0	73.6	73.6	9.052E+07	Trn A	6.150E+06	6.210E+06	1.07
126.0	1.817E+07	88.5	.0	73.6	73.6	9.027E+07	Trn A	6.150E+06	6.210E+06	1.07
127.0	1.810E+07	88.5	.0	73.6	73.6	9.003E+07	Trn A	6.150E+06	6.210E+06	1.07
128.0	1.803E+07	88.5	.0	73.6	73.6	8.978E+07	Trn A	6.150E+06	6.210E+06	1.07
129.0	1.796E+07	88.4	.0	73.6	73.6	8.953E+07	Trn A	6.150E+06	6.210E+06	1.07
130.0	1.789E+07	88.4	.0	73.6	73.6	8.929E+07	Trn A	6.150E+06	6.210E+06	1.07
131.0	1.782E+07	88.4	.0	73.6	73.6	8.904E+07	Trn A	6.150E+06	6.210E+06	1.07
132.0	1.775E+07	88.3	.0	73.6	73.6	8.880E+07	Trn A	6.150E+06	6.210E+06	1.07
133.0	1.768E+07	88.3	.0	73.6	73.6	8.855E+07	Trn A	6.150E+06	6.210E+06	1.07
134.0	1.761E+07	88.3	.0	73.6	73.6	8.830E+07	Trn A	6.150E+06	6.210E+06	1.07
135.0	1.754E+07	88.2	.0	73.6	73.6	8.806E+07	Trn A	6.150E+06	6.210E+06	1.07
136.0	1.748E+07	88.2	.0	73.6	73.6	8.781E+07	Trn A	6.150E+06	6.210E+06	1.07
137.0	1.741E+07	88.2	.0	73.6	73.6	8.757E+07	Trn A	6.150E+06	6.210E+06	1.07
138.0	1.734E+07	88.1	.0	73.6	73.6	8.732E+07	Trn A	6.150E+06	6.210E+06	1.07
139.0	1.727E+07	88.1	.0	73.6	73.6	8.707E+07	Trn A	6.150E+06	6.210E+06	1.07
140.0	1.721E+07	88.1	.0	73.6	73.6	8.683E+07	Trn A	6.150E+06	6.210E+06	1.07
141.0	1.714E+07	88.0	.0	73.6	73.6	8.658E+07	Trn A	6.150E+06	6.210E+06	1.07
142.0	1.707E+07	88.0	.0	73.6	73.6	8.634E+07	Trn A	6.150E+06	6.210E+06	1.07
143.0	1.701E+07	88.0	.0	73.6	73.6	8.609E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 109 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=87F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
144.0	1.694E+07	88.0	.0	73.6	73.6	8.584E+07	Trn A	6.150E+06	6.210E+06	1.07
145.0	1.687E+07	87.9	.0	73.6	73.6	8.575E+07	Trn A	6.150E+06	6.210E+06	1.07
146.0	1.681E+07	87.9	.0	73.6	73.6	8.567E+07	Trn A	6.150E+06	6.210E+06	1.07
147.0	1.674E+07	87.9	.0	73.6	73.6	8.558E+07	Trn A	6.150E+06	6.210E+06	1.07
148.0	1.667E+07	87.8	.0	73.6	73.6	8.549E+07	Trn A	6.150E+06	6.210E+06	1.07
149.0	1.661E+07	87.8	.0	73.6	73.6	8.540E+07	Trn A	6.150E+06	6.210E+06	1.07
150.0	1.654E+07	87.8	.0	73.6	73.6	8.531E+07	Trn A	6.150E+06	6.210E+06	1.07
151.0	1.648E+07	87.8	.0	73.6	73.6	8.522E+07	Trn A	6.150E+06	6.210E+06	1.07
152.0	1.641E+07	87.8	.0	73.6	73.6	8.513E+07	Trn A	6.150E+06	6.210E+06	1.07
153.0	1.635E+07	87.8	.0	73.6	73.6	8.504E+07	Trn A	6.150E+06	6.210E+06	1.07
154.0	1.628E+07	87.8	.0	73.6	73.6	8.495E+07	Trn A	6.150E+06	6.210E+06	1.07
155.0	1.621E+07	87.7	.0	73.6	73.6	8.486E+07	Trn A	6.150E+06	6.210E+06	1.07
156.0	1.615E+07	87.8	.0	73.6	73.6	8.477E+07	Trn A	6.150E+06	6.210E+06	1.07
157.0	1.608E+07	87.7	.0	73.6	73.6	8.468E+07	Trn A	6.150E+06	6.210E+06	1.07
158.0	1.602E+07	87.7	.0	73.6	73.6	8.459E+07	Trn A	6.150E+06	6.210E+06	1.07
159.0	1.595E+07	87.7	.0	73.6	73.6	8.450E+07	Trn A	6.150E+06	6.210E+06	1.07
160.0	1.589E+07	87.7	.0	73.6	73.6	8.441E+07	Trn A	6.150E+06	6.210E+06	1.07
161.0	1.582E+07	87.6	.0	73.6	73.6	8.432E+07	Trn A	6.150E+06	6.210E+06	1.07
162.0	1.576E+07	87.6	.0	73.6	73.6	8.423E+07	Trn A	6.150E+06	6.210E+06	1.07
163.0	1.569E+07	87.6	.0	73.6	73.6	8.415E+07	Trn A	6.150E+06	6.210E+06	1.07
164.0	1.563E+07	87.6	.0	73.6	73.6	8.406E+07	Trn A	6.150E+06	6.210E+06	1.07
165.0	1.556E+07	87.6	.0	73.6	73.6	8.397E+07	Trn A	6.150E+06	6.210E+06	1.07
166.0	1.550E+07	87.6	.0	73.6	73.6	8.388E+07	Trn A	6.150E+06	6.210E+06	1.07
167.0	1.544E+07	87.6	.0	73.6	73.6	8.379E+07	Trn A	6.150E+06	6.210E+06	1.07
168.0	1.537E+07	87.6	.0	73.6	73.6	8.370E+07	Trn A	6.150E+06	6.210E+06	1.07
169.0	1.531E+07	87.6	.0	73.6	73.6	8.372E+07	Trn A	6.150E+06	6.210E+06	1.07
170.0	1.524E+07	87.6	.0	73.6	73.6	8.374E+07	Trn A	6.150E+06	6.210E+06	1.07
171.0	1.518E+07	87.6	.0	73.6	73.6	8.376E+07	Trn A	6.150E+06	6.210E+06	1.07
172.0	1.511E+07	87.5	.0	73.6	73.6	8.378E+07	Trn A	6.150E+06	6.210E+06	1.07
173.0	1.505E+07	87.5	.0	73.6	73.6	8.380E+07	Trn A	6.150E+06	6.210E+06	1.07
174.0	1.499E+07	87.5	.0	73.6	73.6	8.382E+07	Trn A	6.150E+06	6.210E+06	1.07
175.0	1.492E+07	87.5	.0	73.6	73.6	8.384E+07	Trn A	6.150E+06	6.210E+06	1.07
176.0	1.486E+07	87.5	.0	73.6	73.6	8.386E+07	Trn A	6.150E+06	6.210E+06	1.07
177.0	1.479E+07	87.5	.0	73.6	73.6	8.388E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 110 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=87F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
178.0	1.473E+07	87.5	.0	73.6	73.6	8.390E+07	Trn A	6.150E+06	6.210E+06	1.07
179.0	1.466E+07	87.6	.0	73.6	73.6	8.392E+07	Trn A	6.150E+06	6.210E+06	1.07
180.0	1.460E+07	87.6	.0	73.6	73.6	8.394E+07	Trn A	6.150E+06	6.210E+06	1.07
181.0	1.454E+07	87.6	.0	73.6	73.6	8.396E+07	Trn A	6.150E+06	6.210E+06	1.07
182.0	1.447E+07	87.6	.0	73.6	73.6	8.399E+07	Trn A	6.150E+06	6.210E+06	1.07
183.0	1.441E+07	87.6	.0	73.6	73.6	8.401E+07	Trn A	6.150E+06	6.210E+06	1.07
184.0	1.434E+07	87.6	.0	73.6	73.6	8.403E+07	Trn A	6.150E+06	6.210E+06	1.07
185.0	1.428E+07	87.6	.0	73.6	73.6	8.405E+07	Trn A	6.150E+06	6.210E+06	1.07
186.0	1.421E+07	87.6	.0	73.6	73.6	8.407E+07	Trn A	6.150E+06	6.210E+06	1.07
187.0	1.415E+07	87.6	.0	73.6	73.6	8.409E+07	Trn A	6.150E+06	6.210E+06	1.07
188.0	1.408E+07	87.6	.0	73.6	73.6	8.411E+07	Trn A	6.150E+06	6.210E+06	1.07
189.0	1.402E+07	87.6	.0	73.6	73.6	8.413E+07	Trn A	6.150E+06	6.210E+06	1.07
190.0	1.396E+07	87.6	.0	73.6	73.6	8.415E+07	Trn A	6.150E+06	6.210E+06	1.07
191.0	1.389E+07	87.6	.0	73.6	73.6	8.417E+07	Trn A	6.150E+06	6.210E+06	1.07
192.0	1.383E+07	87.6	.0	73.6	73.6	8.419E+07	Trn A	6.150E+06	6.210E+06	1.07
193.0	1.376E+07	87.6	.0	73.6	73.6	8.400E+07	Trn A	6.150E+06	6.210E+06	1.07
194.0	1.370E+07	87.6	.0	73.6	73.6	8.381E+07	Trn A	6.150E+06	6.210E+06	1.07
195.0	1.363E+07	87.6	.0	73.6	73.6	8.362E+07	Trn A	6.150E+06	6.210E+06	1.07
196.0	1.357E+07	87.6	.0	73.6	73.6	8.343E+07	Trn A	6.150E+06	6.210E+06	1.07
197.0	1.351E+07	87.6	.0	73.6	73.6	8.324E+07	Trn A	6.150E+06	6.210E+06	1.07
198.0	1.344E+07	87.5	.0	73.6	73.6	8.305E+07	Trn A	6.150E+06	6.210E+06	1.07
199.0	1.338E+07	87.5	.0	73.6	73.6	8.287E+07	Trn A	6.150E+06	6.210E+06	1.07
200.0	1.331E+07	87.5	.0	73.6	73.6	8.268E+07	Trn A	6.150E+06	6.210E+06	1.07
201.0	1.325E+07	87.4	.0	73.6	73.6	8.249E+07	Trn A	6.150E+06	6.210E+06	1.07
202.0	1.319E+07	87.4	.0	73.6	73.6	8.230E+07	Trn A	6.150E+06	6.210E+06	1.07
203.0	1.312E+07	87.4	.0	73.6	73.6	8.211E+07	Trn A	6.150E+06	6.210E+06	1.07
204.0	1.306E+07	87.4	.0	73.6	73.6	8.192E+07	Trn A	6.150E+06	6.210E+06	1.07
205.0	1.300E+07	87.3	.0	73.6	73.6	8.173E+07	Trn A	6.150E+06	6.210E+06	1.07
206.0	1.293E+07	87.3	.0	73.6	73.6	8.154E+07	Trn A	6.150E+06	6.210E+06	1.07
207.0	1.287E+07	87.3	.0	73.6	73.6	8.135E+07	Trn A	6.150E+06	6.210E+06	1.07
208.0	1.281E+07	87.3	.0	73.6	73.6	8.116E+07	Trn A	6.150E+06	6.210E+06	1.07
209.0	1.275E+07	87.3	.0	73.6	73.6	8.097E+07	Trn A	6.150E+06	6.210E+06	1.07
210.0	1.269E+07	87.2	.0	73.6	73.6	8.078E+07	Trn A	6.150E+06	6.210E+06	1.07
211.0	1.262E+07	87.2	.0	73.6	73.6	8.060E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 111 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=87F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
212.0	1.256E+07	87.2	.0	73.6	73.6	8.041E+07	Trn A	6.150E+06	6.210E+06	1.07
213.0	1.250E+07	87.1	.0	73.6	73.6	8.022E+07	Trn A	6.150E+06	6.210E+06	1.07
214.0	1.244E+07	87.1	.0	73.6	73.6	8.003E+07	Trn A	6.150E+06	6.210E+06	1.07
215.0	1.238E+07	87.1	.0	73.6	73.6	7.984E+07	Trn A	6.150E+06	6.210E+06	1.07
216.0	1.232E+07	87.1	.0	73.6	73.6	7.965E+07	Trn A	6.150E+06	6.210E+06	1.07
217.0	1.225E+07	87.1	.0	73.6	73.6	7.969E+07	Trn A	6.150E+06	6.210E+06	1.07
218.0	1.219E+07	87.0	.0	73.6	73.6	7.972E+07	Trn A	6.150E+06	6.210E+06	1.07
219.0	1.213E+07	87.0	.0	73.6	73.6	7.976E+07	Trn A	6.150E+06	6.210E+06	1.07
220.0	1.207E+07	87.0	.0	73.6	73.6	7.980E+07	Trn A	6.150E+06	6.210E+06	1.07
221.0	1.201E+07	87.0	.0	73.6	73.6	7.984E+07	Trn A	6.150E+06	6.210E+06	1.07
222.0	1.195E+07	87.0	.0	73.6	73.6	7.987E+07	Trn A	6.150E+06	6.210E+06	1.07
223.0	1.189E+07	87.0	.0	73.6	73.6	7.991E+07	Trn A	6.150E+06	6.210E+06	1.07
224.0	1.183E+07	87.0	.0	73.6	73.6	7.995E+07	Trn A	6.150E+06	6.210E+06	1.07
225.0	1.177E+07	87.0	.0	73.6	73.6	7.999E+07	Trn A	6.150E+06	6.210E+06	1.07
226.0	1.170E+07	87.0	.0	73.6	73.6	8.002E+07	Trn A	6.150E+06	6.210E+06	1.07
227.0	1.164E+07	87.0	.0	73.6	73.6	8.006E+07	Trn A	6.150E+06	6.210E+06	1.07
228.0	1.158E+07	87.0	.0	73.6	73.6	8.010E+07	Trn A	6.150E+06	6.210E+06	1.07
229.0	1.152E+07	87.0	.0	73.6	73.6	8.014E+07	Trn A	6.150E+06	6.210E+06	1.07
230.0	1.146E+07	87.0	.0	73.6	73.6	8.017E+07	Trn A	6.150E+06	6.210E+06	1.07
231.0	1.140E+07	87.1	.0	73.6	73.6	8.021E+07	Trn A	6.150E+06	6.210E+06	1.07
232.0	1.134E+07	87.1	.0	73.6	73.6	8.025E+07	Trn A	6.150E+06	6.210E+06	1.07
233.0	1.128E+07	87.1	.0	73.6	73.6	8.029E+07	Trn A	6.150E+06	6.210E+06	1.07
234.0	1.121E+07	87.1	.0	73.6	73.6	8.032E+07	Trn A	6.150E+06	6.210E+06	1.07
235.0	1.115E+07	87.1	.0	73.6	73.6	8.036E+07	Trn A	6.150E+06	6.210E+06	1.07
236.0	1.109E+07	87.1	.0	73.6	73.6	8.040E+07	Trn A	6.150E+06	6.210E+06	1.07
237.0	1.103E+07	87.1	.0	73.6	73.6	8.044E+07	Trn A	6.150E+06	6.210E+06	1.07
238.0	1.097E+07	87.1	.0	73.6	73.6	8.047E+07	Trn A	6.150E+06	6.210E+06	1.07
239.0	1.091E+07	87.1	.0	73.6	73.6	8.051E+07	Trn A	6.150E+06	6.210E+06	1.07
240.0	1.085E+07	87.1	.0	73.6	73.6	8.055E+07	Trn A	6.150E+06	6.210E+06	1.07
Stop - Program terminated.										

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 112 of 166
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11. UHSSIM input/output for Fan3_85F, 3-Fan Case with IBT of 85 °F

Fan3_85F.inp

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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=85F
# design wet-bulb temperature [F], design dry-bulb temperature [F],
# design hot-water temperature [F], design pressure [psia], design solids [ppt]
# 0 => F, psia, btu/hr, lbm/hr units
92, 98, 129.0, 14.696, 0.0, 0
# initial basin mass [lbm], initial basin temperature [F], initial solids [ppt],
# number of towers, starting time of simulation [hr]
29843200, 85, 0, 2, 0.
# Time Period Data -- every 0.1 hour for 10 hr then every hour up to 10 days
# step size, number of steps
0.1,100
1.230
*
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,6.15e6,6.21e6,1.07
240.0,6.15e6,6.21e6,1.07
*
# Train B
Trn B
0.0,2.05e6,0.0,1.07
240.0,2.05e6,0.0,1.07
*
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
0 s 3.2565E+08
50 s 3.2565E+08
101 s 3.2565E+08
116 s 3.1609E+08
120 s 3.1487E+08
150 s 3.1640E+08
300 s 3.1640E+08
900 s 3.1640E+08
1800 s 3.0196E+08
2704 s 2.8660E+08
2706 s 4.4627E+08
3600 s 4.3946E+08
2 h 2.2984E+08
4 h 1.4731E+08
6 h 1.4644E+08
9 h 1.4354E+08
12 h 1.4254E+08
18 h 1.5095E+08
24 h 1.4834E+08
36 h 1.2219E+08
2 d 1.1371E+08
3 d 1.0513E+08
4 d 9.6311E+07
5 d 9.1747E+07
6 d 8.5844E+07
7 d 8.3698E+07
8 d 8.4190E+07
9 d 7.9649E+07
10 d 8.0549E+07
*
# Ambient Data Supplied by Bechtel Power Corp.
# TIME WB DB P
# (hr) (F) (F) (psia)
0, 73.6, 73.6, 14.7
240, 73.6, 73.6, 14.7

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Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 113 of 166
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Fan3_85F.out

Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=85F

Initial Basin Mass 2.984E+07 lbm
Initial Basin Temperature 85.0 F
Initial Basin Solids .0 ppt

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
.0	2.984E+07	85.0	.0	73.6	73.6	3.257E+08	Trn A	6.150E+06	6.210E+06	1.07
.1	2.983E+07	85.4	.0	73.6	73.6	3.164E+08	Trn A	6.150E+06	6.210E+06	1.07
.2	2.981E+07	85.8	.0	73.6	73.6	3.164E+08	Trn A	6.150E+06	6.210E+06	1.07
.3	2.979E+07	86.1	.0	73.6	73.6	3.135E+08	Trn A	6.150E+06	6.210E+06	1.07
.4	2.978E+07	86.5	.0	73.6	73.6	3.077E+08	Trn A	6.150E+06	6.210E+06	1.07
.5	2.976E+07	86.8	.0	73.6	73.6	3.020E+08	Trn A	6.150E+06	6.210E+06	1.07
.6	2.974E+07	87.2	.0	73.6	73.6	2.958E+08	Trn A	6.150E+06	6.210E+06	1.07
.7	2.973E+07	87.5	.0	73.6	73.6	2.897E+08	Trn A	6.150E+06	6.210E+06	1.07
.8	2.971E+07	87.9	.0	73.6	73.6	4.449E+08	Trn A	6.150E+06	6.210E+06	1.07
.9	2.968E+07	88.4	.0	73.6	73.6	4.422E+08	Trn A	6.150E+06	6.210E+06	1.07
1.0	2.966E+07	88.8	.0	73.6	73.6	4.395E+08	Trn A	6.150E+06	6.210E+06	1.07
1.1	2.963E+07	89.3	.0	73.6	73.6	4.185E+08	Trn A	6.150E+06	6.210E+06	1.07
1.2	2.961E+07	89.7	.0	73.6	73.6	3.975E+08	Trn A	6.150E+06	6.210E+06	1.07
1.3	2.959E+07	90.1	.0	73.6	73.6	3.766E+08	Trn A	6.150E+06	6.210E+06	1.07
1.4	2.957E+07	90.5	.0	73.6	73.6	3.556E+08	Trn A	6.150E+06	6.210E+06	1.07
1.5	2.955E+07	90.8	.0	73.6	73.6	3.346E+08	Trn A	6.150E+06	6.210E+06	1.07
1.6	2.953E+07	91.1	.0	73.6	73.6	3.137E+08	Trn A	6.150E+06	6.210E+06	1.07
1.7	2.951E+07	91.4	.0	73.6	73.6	2.927E+08	Trn A	6.150E+06	6.210E+06	1.07
1.8	2.949E+07	91.6	.0	73.6	73.6	2.718E+08	Trn A	6.150E+06	6.210E+06	1.07
1.9	2.947E+07	91.8	.0	73.6	73.6	2.508E+08	Trn A	6.150E+06	6.210E+06	1.07
2.0	2.946E+07	92.0	.0	73.6	73.6	2.298E+08	Trn A	6.150E+06	6.210E+06	1.07
2.1	2.944E+07	92.2	.0	73.6	73.6	2.257E+08	Trn A	6.150E+06	6.210E+06	1.07
2.2	2.943E+07	92.3	.0	73.6	73.6	2.216E+08	Trn A	6.150E+06	6.210E+06	1.07
2.3	2.941E+07	92.5	.0	73.6	73.6	2.175E+08	Trn A	6.150E+06	6.210E+06	1.07
2.4	2.940E+07	92.6	.0	73.6	73.6	2.133E+08	Trn A	6.150E+06	6.210E+06	1.07
2.5	2.939E+07	92.7	.0	73.6	73.6	2.092E+08	Trn A	6.150E+06	6.210E+06	1.07
2.6	2.937E+07	92.9	.0	73.6	73.6	2.051E+08	Trn A	6.150E+06	6.210E+06	1.07
2.7	2.936E+07	93.0	.0	73.6	73.6	2.010E+08	Trn A	6.150E+06	6.210E+06	1.07
2.8	2.934E+07	93.1	.0	73.6	73.6	1.968E+08	Trn A	6.150E+06	6.210E+06	1.07
2.9	2.933E+07	93.2	.0	73.6	73.6	1.927E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 114 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=85F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
3.0	2.932E+07	93.3	.0	73.6	73.6	1.886E+08	Trn A	6.150E+06	6.210E+06	1.07
3.1	2.930E+07	93.3	.0	73.6	73.6	1.844E+08	Trn A	6.150E+06	6.210E+06	1.07
3.2	2.929E+07	93.4	.0	73.6	73.6	1.803E+08	Trn A	6.150E+06	6.210E+06	1.07
3.3	2.928E+07	93.5	.0	73.6	73.6	1.762E+08	Trn A	6.150E+06	6.210E+06	1.07
3.4	2.927E+07	93.5	.0	73.6	73.6	1.721E+08	Trn A	6.150E+06	6.210E+06	1.07
3.5	2.925E+07	93.6	.0	73.6	73.6	1.679E+08	Trn A	6.150E+06	6.210E+06	1.07
3.6	2.924E+07	93.6	.0	73.6	73.6	1.638E+08	Trn A	6.150E+06	6.210E+06	1.07
3.7	2.923E+07	93.7	.0	73.6	73.6	1.597E+08	Trn A	6.150E+06	6.210E+06	1.07
3.8	2.922E+07	93.7	.0	73.6	73.6	1.556E+08	Trn A	6.150E+06	6.210E+06	1.07
3.9	2.921E+07	93.7	.0	73.6	73.6	1.514E+08	Trn A	6.150E+06	6.210E+06	1.07
4.0	2.919E+07	93.8	.0	73.6	73.6	1.473E+08	Trn A	6.150E+06	6.210E+06	1.07
4.1	2.918E+07	93.8	.0	73.6	73.6	1.473E+08	Trn A	6.150E+06	6.210E+06	1.07
4.2	2.917E+07	93.8	.0	73.6	73.6	1.472E+08	Trn A	6.150E+06	6.210E+06	1.07
4.3	2.916E+07	93.8	.0	73.6	73.6	1.472E+08	Trn A	6.150E+06	6.210E+06	1.07
4.4	2.915E+07	93.8	.0	73.6	73.6	1.471E+08	Trn A	6.150E+06	6.210E+06	1.07
4.5	2.914E+07	93.8	.0	73.6	73.6	1.471E+08	Trn A	6.150E+06	6.210E+06	1.07
4.6	2.913E+07	93.9	.0	73.6	73.6	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.7	2.911E+07	93.9	.0	73.6	73.6	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.8	2.910E+07	93.9	.0	73.6	73.6	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.9	2.909E+07	93.9	.0	73.6	73.6	1.469E+08	Trn A	6.150E+06	6.210E+06	1.07
5.0	2.908E+07	93.9	.0	73.6	73.6	1.469E+08	Trn A	6.150E+06	6.210E+06	1.07
5.1	2.907E+07	93.9	.0	73.6	73.6	1.468E+08	Trn A	6.150E+06	6.210E+06	1.07
5.2	2.906E+07	93.9	.0	73.6	73.6	1.468E+08	Trn A	6.150E+06	6.210E+06	1.07
5.3	2.905E+07	93.9	.0	73.6	73.6	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.4	2.903E+07	94.0	.0	73.6	73.6	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.5	2.902E+07	94.0	.0	73.6	73.6	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.6	2.901E+07	94.0	.0	73.6	73.6	1.466E+08	Trn A	6.150E+06	6.210E+06	1.07
5.7	2.900E+07	94.0	.0	73.6	73.6	1.466E+08	Trn A	6.150E+06	6.210E+06	1.07
5.8	2.899E+07	94.0	.0	73.6	73.6	1.465E+08	Trn A	6.150E+06	6.210E+06	1.07
5.9	2.898E+07	94.0	.0	73.6	73.6	1.465E+08	Trn A	6.150E+06	6.210E+06	1.07
6.0	2.897E+07	94.0	.0	73.6	73.6	1.464E+08	Trn A	6.150E+06	6.210E+06	1.07
6.1	2.895E+07	94.0	.0	73.6	73.6	1.463E+08	Trn A	6.150E+06	6.210E+06	1.07
6.2	2.894E+07	94.0	.0	73.6	73.6	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07
6.3	2.893E+07	94.1	.0	73.6	73.6	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 115 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=85F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
6.4	2.892E+07	94.1	.0	73.6	73.6	1.461E+08	Trn A	6.150E+06	6.210E+06	1.07
6.5	2.891E+07	94.1	.0	73.6	73.6	1.460E+08	Trn A	6.150E+06	6.210E+06	1.07
6.6	2.890E+07	94.1	.0	73.6	73.6	1.459E+08	Trn A	6.150E+06	6.210E+06	1.07
6.7	2.888E+07	94.1	.0	73.6	73.6	1.458E+08	Trn A	6.150E+06	6.210E+06	1.07
6.8	2.887E+07	94.1	.0	73.6	73.6	1.457E+08	Trn A	6.150E+06	6.210E+06	1.07
6.9	2.886E+07	94.1	.0	73.6	73.6	1.456E+08	Trn A	6.150E+06	6.210E+06	1.07
7.0	2.885E+07	94.1	.0	73.6	73.6	1.455E+08	Trn A	6.150E+06	6.210E+06	1.07
7.1	2.884E+07	94.1	.0	73.6	73.6	1.454E+08	Trn A	6.150E+06	6.210E+06	1.07
7.2	2.883E+07	94.1	.0	73.6	73.6	1.453E+08	Trn A	6.150E+06	6.210E+06	1.07
7.3	2.882E+07	94.1	.0	73.6	73.6	1.452E+08	Trn A	6.150E+06	6.210E+06	1.07
7.4	2.880E+07	94.1	.0	73.6	73.6	1.451E+08	Trn A	6.150E+06	6.210E+06	1.07
7.5	2.879E+07	94.2	.0	73.6	73.6	1.450E+08	Trn A	6.150E+06	6.210E+06	1.07
7.6	2.878E+07	94.2	.0	73.6	73.6	1.449E+08	Trn A	6.150E+06	6.210E+06	1.07
7.7	2.877E+07	94.2	.0	73.6	73.6	1.448E+08	Trn A	6.150E+06	6.210E+06	1.07
7.8	2.876E+07	94.2	.0	73.6	73.6	1.447E+08	Trn A	6.150E+06	6.210E+06	1.07
7.9	2.875E+07	94.2	.0	73.6	73.6	1.446E+08	Trn A	6.150E+06	6.210E+06	1.07
8.0	2.874E+07	94.2	.0	73.6	73.6	1.445E+08	Trn A	6.150E+06	6.210E+06	1.07
8.1	2.872E+07	94.2	.0	73.6	73.6	1.444E+08	Trn A	6.150E+06	6.210E+06	1.07
8.2	2.871E+07	94.2	.0	73.6	73.6	1.443E+08	Trn A	6.150E+06	6.210E+06	1.07
8.3	2.870E+07	94.2	.0	73.6	73.6	1.442E+08	Trn A	6.150E+06	6.210E+06	1.07
8.4	2.869E+07	94.2	.0	73.6	73.6	1.441E+08	Trn A	6.150E+06	6.210E+06	1.07
8.5	2.868E+07	94.2	.0	73.6	73.6	1.440E+08	Trn A	6.150E+06	6.210E+06	1.07
8.6	2.867E+07	94.2	.0	73.6	73.6	1.439E+08	Trn A	6.150E+06	6.210E+06	1.07
8.7	2.866E+07	94.2	.0	73.6	73.6	1.438E+08	Trn A	6.150E+06	6.210E+06	1.07
8.8	2.864E+07	94.2	.0	73.6	73.6	1.437E+08	Trn A	6.150E+06	6.210E+06	1.07
8.9	2.863E+07	94.2	.0	73.6	73.6	1.436E+08	Trn A	6.150E+06	6.210E+06	1.07
9.0	2.862E+07	94.2	.0	73.6	73.6	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.1	2.861E+07	94.2	.0	73.6	73.6	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.2	2.860E+07	94.2	.0	73.6	73.6	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.3	2.859E+07	94.2	.0	73.6	73.6	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.4	2.858E+07	94.2	.0	73.6	73.6	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.5	2.856E+07	94.2	.0	73.6	73.6	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.6	2.855E+07	94.2	.0	73.6	73.6	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07
9.7	2.854E+07	94.2	.0	73.6	73.6	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 116 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=85F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
9.8	2.853E+07	94.2	.0	73.6	73.6	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07
9.9	2.852E+07	94.2	.0	73.6	73.6	1.432E+08	Trn A	6.150E+06	6.210E+06	1.07
10.0	2.851E+07	94.2	.0	73.6	73.6	1.432E+08	Trn A	6.150E+06	6.210E+06	1.07
11.0	2.839E+07	94.3	.0	73.6	73.6	1.429E+08	Trn A	6.150E+06	6.210E+06	1.07
12.0	2.828E+07	94.3	.0	73.6	73.6	1.425E+08	Trn A	6.150E+06	6.210E+06	1.07
13.0	2.816E+07	94.3	.0	73.6	73.6	1.439E+08	Trn A	6.150E+06	6.210E+06	1.07
14.0	2.805E+07	94.3	.0	73.6	73.6	1.453E+08	Trn A	6.150E+06	6.210E+06	1.07
15.0	2.793E+07	94.4	.0	73.6	73.6	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
16.0	2.782E+07	94.4	.0	73.6	73.6	1.481E+08	Trn A	6.150E+06	6.210E+06	1.07
17.0	2.770E+07	94.5	.0	73.6	73.6	1.495E+08	Trn A	6.150E+06	6.210E+06	1.07
18.0	2.758E+07	94.6	.0	73.6	73.6	1.509E+08	Trn A	6.150E+06	6.210E+06	1.07
19.0	2.746E+07	94.7	.0	73.6	73.6	1.505E+08	Trn A	6.150E+06	6.210E+06	1.07
20.0	2.734E+07	94.7	.0	73.6	73.6	1.501E+08	Trn A	6.150E+06	6.210E+06	1.07
21.0	2.722E+07	94.8	.0	73.6	73.6	1.496E+08	Trn A	6.150E+06	6.210E+06	1.07
22.0	2.710E+07	94.8	.0	73.6	73.6	1.492E+08	Trn A	6.150E+06	6.210E+06	1.07
23.0	2.698E+07	94.8	.0	73.6	73.6	1.488E+08	Trn A	6.150E+06	6.210E+06	1.07
24.0	2.686E+07	94.9	.0	73.6	73.6	1.483E+08	Trn A	6.150E+06	6.210E+06	1.07
25.0	2.675E+07	94.8	.0	73.6	73.6	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07
26.0	2.663E+07	94.8	.0	73.6	73.6	1.440E+08	Trn A	6.150E+06	6.210E+06	1.07
27.0	2.651E+07	94.7	.0	73.6	73.6	1.418E+08	Trn A	6.150E+06	6.210E+06	1.07
28.0	2.640E+07	94.6	.0	73.6	73.6	1.396E+08	Trn A	6.150E+06	6.210E+06	1.07
29.0	2.628E+07	94.5	.0	73.6	73.6	1.374E+08	Trn A	6.150E+06	6.210E+06	1.07
30.0	2.617E+07	94.4	.0	73.6	73.6	1.353E+08	Trn A	6.150E+06	6.210E+06	1.07
31.0	2.606E+07	94.3	.0	73.6	73.6	1.331E+08	Trn A	6.150E+06	6.210E+06	1.07
32.0	2.595E+07	94.1	.0	73.6	73.6	1.309E+08	Trn A	6.150E+06	6.210E+06	1.07
33.0	2.585E+07	93.9	.0	73.6	73.6	1.287E+08	Trn A	6.150E+06	6.210E+06	1.07
34.0	2.574E+07	93.7	.0	73.6	73.6	1.265E+08	Trn A	6.150E+06	6.210E+06	1.07
35.0	2.564E+07	93.6	.0	73.6	73.6	1.244E+08	Trn A	6.150E+06	6.210E+06	1.07
36.0	2.554E+07	93.4	.0	73.6	73.6	1.222E+08	Trn A	6.150E+06	6.210E+06	1.07
37.0	2.544E+07	93.2	.0	73.6	73.6	1.215E+08	Trn A	6.150E+06	6.210E+06	1.07
38.0	2.534E+07	93.0	.0	73.6	73.6	1.208E+08	Trn A	6.150E+06	6.210E+06	1.07
39.0	2.524E+07	92.8	.0	73.6	73.6	1.201E+08	Trn A	6.150E+06	6.210E+06	1.07
40.0	2.514E+07	92.7	.0	73.6	73.6	1.194E+08	Trn A	6.150E+06	6.210E+06	1.07
41.0	2.504E+07	92.6	.0	73.6	73.6	1.187E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 117 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=85F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
42.0	2.495E+07	92.4	.0	73.6	73.6	1.180E+08	Trn A	6.150E+06	6.210E+06	1.07
43.0	2.485E+07	92.3	.0	73.6	73.6	1.172E+08	Trn A	6.150E+06	6.210E+06	1.07
44.0	2.476E+07	92.2	.0	73.6	73.6	1.165E+08	Trn A	6.150E+06	6.210E+06	1.07
45.0	2.466E+07	92.1	.0	73.6	73.6	1.158E+08	Trn A	6.150E+06	6.210E+06	1.07
46.0	2.457E+07	92.0	.0	73.6	73.6	1.151E+08	Trn A	6.150E+06	6.210E+06	1.07
47.0	2.448E+07	91.9	.0	73.6	73.6	1.144E+08	Trn A	6.150E+06	6.210E+06	1.07
48.0	2.439E+07	91.8	.0	73.6	73.6	1.137E+08	Trn A	6.150E+06	6.210E+06	1.07
49.0	2.430E+07	91.7	.0	73.6	73.6	1.134E+08	Trn A	6.150E+06	6.210E+06	1.07
50.0	2.421E+07	91.6	.0	73.6	73.6	1.130E+08	Trn A	6.150E+06	6.210E+06	1.07
51.0	2.412E+07	91.5	.0	73.6	73.6	1.126E+08	Trn A	6.150E+06	6.210E+06	1.07
52.0	2.403E+07	91.4	.0	73.6	73.6	1.123E+08	Trn A	6.150E+06	6.210E+06	1.07
53.0	2.394E+07	91.4	.0	73.6	73.6	1.119E+08	Trn A	6.150E+06	6.210E+06	1.07
54.0	2.385E+07	91.3	.0	73.6	73.6	1.116E+08	Trn A	6.150E+06	6.210E+06	1.07
55.0	2.376E+07	91.3	.0	73.6	73.6	1.112E+08	Trn A	6.150E+06	6.210E+06	1.07
56.0	2.367E+07	91.2	.0	73.6	73.6	1.109E+08	Trn A	6.150E+06	6.210E+06	1.07
57.0	2.358E+07	91.1	.0	73.6	73.6	1.105E+08	Trn A	6.150E+06	6.210E+06	1.07
58.0	2.350E+07	91.1	.0	73.6	73.6	1.101E+08	Trn A	6.150E+06	6.210E+06	1.07
59.0	2.341E+07	91.0	.0	73.6	73.6	1.098E+08	Trn A	6.150E+06	6.210E+06	1.07
60.0	2.332E+07	91.0	.0	73.6	73.6	1.094E+08	Trn A	6.150E+06	6.210E+06	1.07
61.0	2.324E+07	90.9	.0	73.6	73.6	1.091E+08	Trn A	6.150E+06	6.210E+06	1.07
62.0	2.315E+07	90.9	.0	73.6	73.6	1.087E+08	Trn A	6.150E+06	6.210E+06	1.07
63.0	2.306E+07	90.8	.0	73.6	73.6	1.083E+08	Trn A	6.150E+06	6.210E+06	1.07
64.0	2.298E+07	90.8	.0	73.6	73.6	1.080E+08	Trn A	6.150E+06	6.210E+06	1.07
65.0	2.289E+07	90.7	.0	73.6	73.6	1.076E+08	Trn A	6.150E+06	6.210E+06	1.07
66.0	2.281E+07	90.7	.0	73.6	73.6	1.073E+08	Trn A	6.150E+06	6.210E+06	1.07
67.0	2.272E+07	90.7	.0	73.6	73.6	1.069E+08	Trn A	6.150E+06	6.210E+06	1.07
68.0	2.264E+07	90.6	.0	73.6	73.6	1.066E+08	Trn A	6.150E+06	6.210E+06	1.07
69.0	2.256E+07	90.6	.0	73.6	73.6	1.062E+08	Trn A	6.150E+06	6.210E+06	1.07
70.0	2.247E+07	90.5	.0	73.6	73.6	1.058E+08	Trn A	6.150E+06	6.210E+06	1.07
71.0	2.239E+07	90.5	.0	73.6	73.6	1.055E+08	Trn A	6.150E+06	6.210E+06	1.07
72.0	2.231E+07	90.4	.0	73.6	73.6	1.051E+08	Trn A	6.150E+06	6.210E+06	1.07
73.0	2.222E+07	90.4	.0	73.6	73.6	1.048E+08	Trn A	6.150E+06	6.210E+06	1.07
74.0	2.214E+07	90.4	.0	73.6	73.6	1.044E+08	Trn A	6.150E+06	6.210E+06	1.07
75.0	2.206E+07	90.3	.0	73.6	73.6	1.040E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 118 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=85F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
76.0	2.198E+07	90.3	.0	73.6	73.6	1.037E+08	Trn A	6.150E+06	6.210E+06	1.07
77.0	2.190E+07	90.2	.0	73.6	73.6	1.033E+08	Trn A	6.150E+06	6.210E+06	1.07
78.0	2.181E+07	90.2	.0	73.6	73.6	1.029E+08	Trn A	6.150E+06	6.210E+06	1.07
79.0	2.173E+07	90.1	.0	73.6	73.6	1.026E+08	Trn A	6.150E+06	6.210E+06	1.07
80.0	2.165E+07	90.1	.0	73.6	73.6	1.022E+08	Trn A	6.150E+06	6.210E+06	1.07
81.0	2.157E+07	90.1	.0	73.6	73.6	1.018E+08	Trn A	6.150E+06	6.210E+06	1.07
82.0	2.149E+07	90.0	.0	73.6	73.6	1.015E+08	Trn A	6.150E+06	6.210E+06	1.07
83.0	2.141E+07	90.0	.0	73.6	73.6	1.011E+08	Trn A	6.150E+06	6.210E+06	1.07
84.0	2.133E+07	89.9	.0	73.6	73.6	1.007E+08	Trn A	6.150E+06	6.210E+06	1.07
85.0	2.125E+07	89.9	.0	73.6	73.6	1.004E+08	Trn A	6.150E+06	6.210E+06	1.07
86.0	2.118E+07	89.8	.0	73.6	73.6	9.999E+07	Trn A	6.150E+06	6.210E+06	1.07
87.0	2.110E+07	89.8	.0	73.6	73.6	9.962E+07	Trn A	6.150E+06	6.210E+06	1.07
88.0	2.102E+07	89.7	.0	73.6	73.6	9.925E+07	Trn A	6.150E+06	6.210E+06	1.07
89.0	2.094E+07	89.7	.0	73.6	73.6	9.888E+07	Trn A	6.150E+06	6.210E+06	1.07
90.0	2.086E+07	89.6	.0	73.6	73.6	9.852E+07	Trn A	6.150E+06	6.210E+06	1.07
91.0	2.079E+07	89.6	.0	73.6	73.6	9.815E+07	Trn A	6.150E+06	6.210E+06	1.07
92.0	2.071E+07	89.5	.0	73.6	73.6	9.778E+07	Trn A	6.150E+06	6.210E+06	1.07
93.0	2.063E+07	89.5	.0	73.6	73.6	9.741E+07	Trn A	6.150E+06	6.210E+06	1.07
94.0	2.056E+07	89.5	.0	73.6	73.6	9.705E+07	Trn A	6.150E+06	6.210E+06	1.07
95.0	2.048E+07	89.4	.0	73.6	73.6	9.668E+07	Trn A	6.150E+06	6.210E+06	1.07
96.0	2.041E+07	89.4	.0	73.6	73.6	9.631E+07	Trn A	6.150E+06	6.210E+06	1.07
97.0	2.033E+07	89.3	.0	73.6	73.6	9.612E+07	Trn A	6.150E+06	6.210E+06	1.07
98.0	2.026E+07	89.3	.0	73.6	73.6	9.593E+07	Trn A	6.150E+06	6.210E+06	1.07
99.0	2.018E+07	89.3	.0	73.6	73.6	9.574E+07	Trn A	6.150E+06	6.210E+06	1.07
100.0	2.011E+07	89.2	.0	73.6	73.6	9.555E+07	Trn A	6.150E+06	6.210E+06	1.07
101.0	2.003E+07	89.2	.0	73.6	73.6	9.536E+07	Trn A	6.150E+06	6.210E+06	1.07
102.0	1.996E+07	89.1	.0	73.6	73.6	9.517E+07	Trn A	6.150E+06	6.210E+06	1.07
103.0	1.988E+07	89.1	.0	73.6	73.6	9.498E+07	Trn A	6.150E+06	6.210E+06	1.07
104.0	1.981E+07	89.1	.0	73.6	73.6	9.479E+07	Trn A	6.150E+06	6.210E+06	1.07
105.0	1.974E+07	89.1	.0	73.6	73.6	9.460E+07	Trn A	6.150E+06	6.210E+06	1.07
106.0	1.966E+07	89.0	.0	73.6	73.6	9.441E+07	Trn A	6.150E+06	6.210E+06	1.07
107.0	1.959E+07	89.0	.0	73.6	73.6	9.422E+07	Trn A	6.150E+06	6.210E+06	1.07
108.0	1.952E+07	89.0	.0	73.6	73.6	9.403E+07	Trn A	6.150E+06	6.210E+06	1.07
109.0	1.944E+07	89.0	.0	73.6	73.6	9.384E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 119 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=85F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
110.0	1.937E+07	88.9	.0	73.6	73.6	9.365E+07	Trn A	6.150E+06	6.210E+06	1.07
111.0	1.930E+07	88.9	.0	73.6	73.6	9.346E+07	Trn A	6.150E+06	6.210E+06	1.07
112.0	1.923E+07	88.9	.0	73.6	73.6	9.327E+07	Trn A	6.150E+06	6.210E+06	1.07
113.0	1.915E+07	88.9	.0	73.6	73.6	9.308E+07	Trn A	6.150E+06	6.210E+06	1.07
114.0	1.908E+07	88.8	.0	73.6	73.6	9.289E+07	Trn A	6.150E+06	6.210E+06	1.07
115.0	1.901E+07	88.8	.0	73.6	73.6	9.270E+07	Trn A	6.150E+06	6.210E+06	1.07
116.0	1.894E+07	88.8	.0	73.6	73.6	9.251E+07	Trn A	6.150E+06	6.210E+06	1.07
117.0	1.886E+07	88.8	.0	73.6	73.6	9.232E+07	Trn A	6.150E+06	6.210E+06	1.07
118.0	1.879E+07	88.7	.0	73.6	73.6	9.213E+07	Trn A	6.150E+06	6.210E+06	1.07
119.0	1.872E+07	88.7	.0	73.6	73.6	9.194E+07	Trn A	6.150E+06	6.210E+06	1.07
120.0	1.865E+07	88.7	.0	73.6	73.6	9.175E+07	Trn A	6.150E+06	6.210E+06	1.07
121.0	1.858E+07	88.7	.0	73.6	73.6	9.150E+07	Trn A	6.150E+06	6.210E+06	1.07
122.0	1.851E+07	88.6	.0	73.6	73.6	9.126E+07	Trn A	6.150E+06	6.210E+06	1.07
123.0	1.844E+07	88.6	.0	73.6	73.6	9.101E+07	Trn A	6.150E+06	6.210E+06	1.07
124.0	1.837E+07	88.6	.0	73.6	73.6	9.076E+07	Trn A	6.150E+06	6.210E+06	1.07
125.0	1.830E+07	88.5	.0	73.6	73.6	9.052E+07	Trn A	6.150E+06	6.210E+06	1.07
126.0	1.823E+07	88.5	.0	73.6	73.6	9.027E+07	Trn A	6.150E+06	6.210E+06	1.07
127.0	1.816E+07	88.5	.0	73.6	73.6	9.003E+07	Trn A	6.150E+06	6.210E+06	1.07
128.0	1.809E+07	88.5	.0	73.6	73.6	8.978E+07	Trn A	6.150E+06	6.210E+06	1.07
129.0	1.802E+07	88.4	.0	73.6	73.6	8.953E+07	Trn A	6.150E+06	6.210E+06	1.07
130.0	1.795E+07	88.4	.0	73.6	73.6	8.929E+07	Trn A	6.150E+06	6.210E+06	1.07
131.0	1.788E+07	88.4	.0	73.6	73.6	8.904E+07	Trn A	6.150E+06	6.210E+06	1.07
132.0	1.781E+07	88.3	.0	73.6	73.6	8.880E+07	Trn A	6.150E+06	6.210E+06	1.07
133.0	1.774E+07	88.3	.0	73.6	73.6	8.855E+07	Trn A	6.150E+06	6.210E+06	1.07
134.0	1.767E+07	88.3	.0	73.6	73.6	8.830E+07	Trn A	6.150E+06	6.210E+06	1.07
135.0	1.760E+07	88.2	.0	73.6	73.6	8.806E+07	Trn A	6.150E+06	6.210E+06	1.07
136.0	1.754E+07	88.2	.0	73.6	73.6	8.781E+07	Trn A	6.150E+06	6.210E+06	1.07
137.0	1.747E+07	88.2	.0	73.6	73.6	8.757E+07	Trn A	6.150E+06	6.210E+06	1.07
138.0	1.740E+07	88.1	.0	73.6	73.6	8.732E+07	Trn A	6.150E+06	6.210E+06	1.07
139.0	1.733E+07	88.1	.0	73.6	73.6	8.707E+07	Trn A	6.150E+06	6.210E+06	1.07
140.0	1.727E+07	88.1	.0	73.6	73.6	8.683E+07	Trn A	6.150E+06	6.210E+06	1.07
141.0	1.720E+07	88.0	.0	73.6	73.6	8.658E+07	Trn A	6.150E+06	6.210E+06	1.07
142.0	1.713E+07	88.0	.0	73.6	73.6	8.634E+07	Trn A	6.150E+06	6.210E+06	1.07
143.0	1.706E+07	88.0	.0	73.6	73.6	8.609E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 120 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=85F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
144.0	1.700E+07	88.0	.0	73.6	73.6	8.584E+07	Trn A	6.150E+06	6.210E+06	1.07
145.0	1.693E+07	87.9	.0	73.6	73.6	8.575E+07	Trn A	6.150E+06	6.210E+06	1.07
146.0	1.687E+07	87.9	.0	73.6	73.6	8.567E+07	Trn A	6.150E+06	6.210E+06	1.07
147.0	1.680E+07	87.9	.0	73.6	73.6	8.558E+07	Trn A	6.150E+06	6.210E+06	1.07
148.0	1.673E+07	87.9	.0	73.6	73.6	8.549E+07	Trn A	6.150E+06	6.210E+06	1.07
149.0	1.667E+07	87.8	.0	73.6	73.6	8.540E+07	Trn A	6.150E+06	6.210E+06	1.07
150.0	1.660E+07	87.8	.0	73.6	73.6	8.531E+07	Trn A	6.150E+06	6.210E+06	1.07
151.0	1.654E+07	87.8	.0	73.6	73.6	8.522E+07	Trn A	6.150E+06	6.210E+06	1.07
152.0	1.647E+07	87.8	.0	73.6	73.6	8.513E+07	Trn A	6.150E+06	6.210E+06	1.07
153.0	1.640E+07	87.8	.0	73.6	73.6	8.504E+07	Trn A	6.150E+06	6.210E+06	1.07
154.0	1.634E+07	87.7	.0	73.6	73.6	8.495E+07	Trn A	6.150E+06	6.210E+06	1.07
155.0	1.627E+07	87.7	.0	73.6	73.6	8.486E+07	Trn A	6.150E+06	6.210E+06	1.07
156.0	1.621E+07	87.7	.0	73.6	73.6	8.477E+07	Trn A	6.150E+06	6.210E+06	1.07
157.0	1.614E+07	87.7	.0	73.6	73.6	8.468E+07	Trn A	6.150E+06	6.210E+06	1.07
158.0	1.608E+07	87.7	.0	73.6	73.6	8.459E+07	Trn A	6.150E+06	6.210E+06	1.07
159.0	1.601E+07	87.7	.0	73.6	73.6	8.450E+07	Trn A	6.150E+06	6.210E+06	1.07
160.0	1.595E+07	87.7	.0	73.6	73.6	8.441E+07	Trn A	6.150E+06	6.210E+06	1.07
161.0	1.588E+07	87.7	.0	73.6	73.6	8.432E+07	Trn A	6.150E+06	6.210E+06	1.07
162.0	1.582E+07	87.7	.0	73.6	73.6	8.423E+07	Trn A	6.150E+06	6.210E+06	1.07
163.0	1.575E+07	87.6	.0	73.6	73.6	8.415E+07	Trn A	6.150E+06	6.210E+06	1.07
164.0	1.569E+07	87.6	.0	73.6	73.6	8.406E+07	Trn A	6.150E+06	6.210E+06	1.07
165.0	1.562E+07	87.6	.0	73.6	73.6	8.397E+07	Trn A	6.150E+06	6.210E+06	1.07
166.0	1.556E+07	87.6	.0	73.6	73.6	8.388E+07	Trn A	6.150E+06	6.210E+06	1.07
167.0	1.550E+07	87.6	.0	73.6	73.6	8.379E+07	Trn A	6.150E+06	6.210E+06	1.07
168.0	1.543E+07	87.6	.0	73.6	73.6	8.370E+07	Trn A	6.150E+06	6.210E+06	1.07
169.0	1.537E+07	87.6	.0	73.6	73.6	8.372E+07	Trn A	6.150E+06	6.210E+06	1.07
170.0	1.530E+07	87.6	.0	73.6	73.6	8.374E+07	Trn A	6.150E+06	6.210E+06	1.07
171.0	1.524E+07	87.6	.0	73.6	73.6	8.376E+07	Trn A	6.150E+06	6.210E+06	1.07
172.0	1.517E+07	87.5	.0	73.6	73.6	8.378E+07	Trn A	6.150E+06	6.210E+06	1.07
173.0	1.511E+07	87.5	.0	73.6	73.6	8.380E+07	Trn A	6.150E+06	6.210E+06	1.07
174.0	1.504E+07	87.5	.0	73.6	73.6	8.382E+07	Trn A	6.150E+06	6.210E+06	1.07
175.0	1.498E+07	87.5	.0	73.6	73.6	8.384E+07	Trn A	6.150E+06	6.210E+06	1.07
176.0	1.492E+07	87.5	.0	73.6	73.6	8.386E+07	Trn A	6.150E+06	6.210E+06	1.07
177.0	1.485E+07	87.5	.0	73.6	73.6	8.388E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 121 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=85F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
178.0	1.479E+07	87.5	.0	73.6	73.6	8.390E+07	Trn A	6.150E+06	6.210E+06	1.07
179.0	1.472E+07	87.6	.0	73.6	73.6	8.392E+07	Trn A	6.150E+06	6.210E+06	1.07
180.0	1.466E+07	87.6	.0	73.6	73.6	8.394E+07	Trn A	6.150E+06	6.210E+06	1.07
181.0	1.459E+07	87.6	.0	73.6	73.6	8.396E+07	Trn A	6.150E+06	6.210E+06	1.07
182.0	1.453E+07	87.6	.0	73.6	73.6	8.399E+07	Trn A	6.150E+06	6.210E+06	1.07
183.0	1.447E+07	87.6	.0	73.6	73.6	8.401E+07	Trn A	6.150E+06	6.210E+06	1.07
184.0	1.440E+07	87.6	.0	73.6	73.6	8.403E+07	Trn A	6.150E+06	6.210E+06	1.07
185.0	1.434E+07	87.6	.0	73.6	73.6	8.405E+07	Trn A	6.150E+06	6.210E+06	1.07
186.0	1.427E+07	87.6	.0	73.6	73.6	8.407E+07	Trn A	6.150E+06	6.210E+06	1.07
187.0	1.421E+07	87.6	.0	73.6	73.6	8.409E+07	Trn A	6.150E+06	6.210E+06	1.07
188.0	1.414E+07	87.6	.0	73.6	73.6	8.411E+07	Trn A	6.150E+06	6.210E+06	1.07
189.0	1.408E+07	87.6	.0	73.6	73.6	8.413E+07	Trn A	6.150E+06	6.210E+06	1.07
190.0	1.401E+07	87.6	.0	73.6	73.6	8.415E+07	Trn A	6.150E+06	6.210E+06	1.07
191.0	1.395E+07	87.6	.0	73.6	73.6	8.417E+07	Trn A	6.150E+06	6.210E+06	1.07
192.0	1.389E+07	87.6	.0	73.6	73.6	8.419E+07	Trn A	6.150E+06	6.210E+06	1.07
193.0	1.382E+07	87.6	.0	73.6	73.6	8.400E+07	Trn A	6.150E+06	6.210E+06	1.07
194.0	1.376E+07	87.6	.0	73.6	73.6	8.381E+07	Trn A	6.150E+06	6.210E+06	1.07
195.0	1.369E+07	87.6	.0	73.6	73.6	8.362E+07	Trn A	6.150E+06	6.210E+06	1.07
196.0	1.363E+07	87.6	.0	73.6	73.6	8.343E+07	Trn A	6.150E+06	6.210E+06	1.07
197.0	1.356E+07	87.5	.0	73.6	73.6	8.324E+07	Trn A	6.150E+06	6.210E+06	1.07
198.0	1.350E+07	87.5	.0	73.6	73.6	8.305E+07	Trn A	6.150E+06	6.210E+06	1.07
199.0	1.344E+07	87.5	.0	73.6	73.6	8.287E+07	Trn A	6.150E+06	6.210E+06	1.07
200.0	1.337E+07	87.5	.0	73.6	73.6	8.268E+07	Trn A	6.150E+06	6.210E+06	1.07
201.0	1.331E+07	87.5	.0	73.6	73.6	8.249E+07	Trn A	6.150E+06	6.210E+06	1.07
202.0	1.325E+07	87.4	.0	73.6	73.6	8.230E+07	Trn A	6.150E+06	6.210E+06	1.07
203.0	1.318E+07	87.4	.0	73.6	73.6	8.211E+07	Trn A	6.150E+06	6.210E+06	1.07
204.0	1.312E+07	87.4	.0	73.6	73.6	8.192E+07	Trn A	6.150E+06	6.210E+06	1.07
205.0	1.306E+07	87.4	.0	73.6	73.6	8.173E+07	Trn A	6.150E+06	6.210E+06	1.07
206.0	1.299E+07	87.3	.0	73.6	73.6	8.154E+07	Trn A	6.150E+06	6.210E+06	1.07
207.0	1.293E+07	87.3	.0	73.6	73.6	8.135E+07	Trn A	6.150E+06	6.210E+06	1.07
208.0	1.287E+07	87.3	.0	73.6	73.6	8.116E+07	Trn A	6.150E+06	6.210E+06	1.07
209.0	1.281E+07	87.3	.0	73.6	73.6	8.097E+07	Trn A	6.150E+06	6.210E+06	1.07
210.0	1.274E+07	87.2	.0	73.6	73.6	8.078E+07	Trn A	6.150E+06	6.210E+06	1.07
211.0	1.268E+07	87.2	.0	73.6	73.6	8.060E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 122 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=85F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
212.0	1.262E+07	87.2	.0	73.6	73.6	8.041E+07	Trn A	6.150E+06	6.210E+06	1.07
213.0	1.256E+07	87.2	.0	73.6	73.6	8.022E+07	Trn A	6.150E+06	6.210E+06	1.07
214.0	1.250E+07	87.1	.0	73.6	73.6	8.003E+07	Trn A	6.150E+06	6.210E+06	1.07
215.0	1.244E+07	87.1	.0	73.6	73.6	7.984E+07	Trn A	6.150E+06	6.210E+06	1.07
216.0	1.237E+07	87.1	.0	73.6	73.6	7.965E+07	Trn A	6.150E+06	6.210E+06	1.07
217.0	1.231E+07	87.1	.0	73.6	73.6	7.969E+07	Trn A	6.150E+06	6.210E+06	1.07
218.0	1.225E+07	87.1	.0	73.6	73.6	7.972E+07	Trn A	6.150E+06	6.210E+06	1.07
219.0	1.219E+07	87.0	.0	73.6	73.6	7.976E+07	Trn A	6.150E+06	6.210E+06	1.07
220.0	1.213E+07	87.0	.0	73.6	73.6	7.980E+07	Trn A	6.150E+06	6.210E+06	1.07
221.0	1.207E+07	87.0	.0	73.6	73.6	7.984E+07	Trn A	6.150E+06	6.210E+06	1.07
222.0	1.201E+07	87.0	.0	73.6	73.6	7.987E+07	Trn A	6.150E+06	6.210E+06	1.07
223.0	1.195E+07	87.0	.0	73.6	73.6	7.991E+07	Trn A	6.150E+06	6.210E+06	1.07
224.0	1.189E+07	87.0	.0	73.6	73.6	7.995E+07	Trn A	6.150E+06	6.210E+06	1.07
225.0	1.182E+07	87.0	.0	73.6	73.6	7.999E+07	Trn A	6.150E+06	6.210E+06	1.07
226.0	1.176E+07	87.0	.0	73.6	73.6	8.002E+07	Trn A	6.150E+06	6.210E+06	1.07
227.0	1.170E+07	87.0	.0	73.6	73.6	8.006E+07	Trn A	6.150E+06	6.210E+06	1.07
228.0	1.164E+07	87.0	.0	73.6	73.6	8.010E+07	Trn A	6.150E+06	6.210E+06	1.07
229.0	1.158E+07	87.0	.0	73.6	73.6	8.014E+07	Trn A	6.150E+06	6.210E+06	1.07
230.0	1.152E+07	87.1	.0	73.6	73.6	8.017E+07	Trn A	6.150E+06	6.210E+06	1.07
231.0	1.146E+07	87.1	.0	73.6	73.6	8.021E+07	Trn A	6.150E+06	6.210E+06	1.07
232.0	1.140E+07	87.1	.0	73.6	73.6	8.025E+07	Trn A	6.150E+06	6.210E+06	1.07
233.0	1.133E+07	87.1	.0	73.6	73.6	8.029E+07	Trn A	6.150E+06	6.210E+06	1.07
234.0	1.127E+07	87.1	.0	73.6	73.6	8.032E+07	Trn A	6.150E+06	6.210E+06	1.07
235.0	1.121E+07	87.1	.0	73.6	73.6	8.036E+07	Trn A	6.150E+06	6.210E+06	1.07
236.0	1.115E+07	87.1	.0	73.6	73.6	8.040E+07	Trn A	6.150E+06	6.210E+06	1.07
237.0	1.109E+07	87.1	.0	73.6	73.6	8.044E+07	Trn A	6.150E+06	6.210E+06	1.07
238.0	1.103E+07	87.1	.0	73.6	73.6	8.047E+07	Trn A	6.150E+06	6.210E+06	1.07
239.0	1.097E+07	87.1	.0	73.6	73.6	8.051E+07	Trn A	6.150E+06	6.210E+06	1.07
240.0	1.090E+07	87.1	.0	73.6	73.6	8.055E+07	Trn A	6.150E+06	6.210E+06	1.07

Stop - Program terminated.

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 123 of 166
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12. UHSSIM input/output for *Fan3_80F*, 3-Fan Case with IBT of 80 °F

Fan3_80F.inp

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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=80F
# design wet-bulb temperature [F], design dry-bulb temperature [F],
# design hot-water temperature [F], design pressure [psia], design solids [ppt]
# 0 => F, psia, btu/hr, lbm/hr units
82, 98, 129.0, 14.696, 0.0, 0
# initial basin mass [lbm], initial basin temperature [F], initial solids [ppt],
# number of towers, starting time of simulation [hr]
29843200, 80, 0, 2, 0.
# Time Period Data -- every 0.1 hour for 10 hr then every hour up to 10 days
# step size, number of steps
0.1,100
1,230
*
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,6.15e6,6.21e6,1.07
240.0,6.15e6,6.21e6,1.07
*
# Train B
Trn B
0.0,2.05e6,0.0,1.07
240.0,2.05e6,0.0,1.07
*
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
0 s 3.2565E+08
50 s 3.2565E+08
101 s 3.2565E+08
116 s 3.1609E+08
120 s 3.1487E+08
150 s 3.1640E+08
300 s 3.1640E+08
900 s 3.1640E+08
1800 s 3.0196E+08
2704 s 2.8660E+08
2706 s 4.4627E+08
3600 s 4.3946E+08
2 h 2.2984E+08
4 h 1.4731E+08
6 h 1.4644E+08
9 h 1.4354E+08
12 h 1.4254E+08
18 h 1.5095E+08
24 h 1.4834E+08
36 h 1.2219E+08
2 d 1.1371E+08
3 d 1.0513E+08
4 d 9.6311E+07
5 d 9.1747E+07
6 d 8.5844E+07
7 d 8.3698E+07
8 d 8.4190E+07
9 d 7.9649E+07
10 d 8.0549E+07
*
# Ambient Data Supplied by Bechtel Power Corp.
# TIME WB DB P
# (hr) (F) (F) (psia)
0, 73.9, 73.9, 14.7
240, 73.9, 73.9, 14.7
*

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Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 124 of 166
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Fan3_80F.out

Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=80F

Initial Basin Mass 2.984E+07 lbm
Initial Basin Temperature 80.0 F
Initial Basin Solids .0 ppt

time	basin	basin	basin	dry-bulb	wet-bulb	heat load	tower	water	air	KaV/L
[hr]	mass	temp	solids	temp	temp	[btu/hr]		flow rate	flow rate	[-]
[hr]	[lbm]	[F]	[ppt]	[F]	[F]			[lbm/hr]	[lbm/hr]	
0.0	2.984E+07	80.0	.0	73.9	73.9	3.257E+08	Trn A	6.150E+06	6.210E+06	1.07
.1	2.983E+07	80.5	.0	73.9	73.9	3.164E+08	Trn A	6.150E+06	6.210E+06	1.07
.2	2.981E+07	80.9	.0	73.9	73.9	3.164E+08	Trn A	6.150E+06	6.210E+06	1.07
.3	2.980E+07	81.4	.0	73.9	73.9	3.135E+08	Trn A	6.150E+06	6.210E+06	1.07
.4	2.979E+07	81.8	.0	73.9	73.9	3.077E+08	Trn A	6.150E+06	6.210E+06	1.07
.5	2.977E+07	82.2	.0	73.9	73.9	3.020E+08	Trn A	6.150E+06	6.210E+06	1.07
.6	2.976E+07	82.7	.0	73.9	73.9	2.958E+08	Trn A	6.150E+06	6.210E+06	1.07
.7	2.974E+07	83.0	.0	73.9	73.9	2.897E+08	Trn A	6.150E+06	6.210E+06	1.07
.8	2.973E+07	83.5	.0	73.9	73.9	4.449E+08	Trn A	6.150E+06	6.210E+06	1.07
.9	2.970E+07	84.1	.0	73.9	73.9	4.422E+08	Trn A	6.150E+06	6.210E+06	1.07
1.0	2.968E+07	84.6	.0	73.9	73.9	4.395E+08	Trn A	6.150E+06	6.210E+06	1.07
1.1	2.966E+07	85.2	.0	73.9	73.9	4.185E+08	Trn A	6.150E+06	6.210E+06	1.07
1.2	2.963E+07	85.7	.0	73.9	73.9	3.975E+08	Trn A	6.150E+06	6.210E+06	1.07
1.3	2.961E+07	86.1	.0	73.9	73.9	3.766E+08	Trn A	6.150E+06	6.210E+06	1.07
1.4	2.959E+07	86.6	.0	73.9	73.9	3.556E+08	Trn A	6.150E+06	6.210E+06	1.07
1.5	2.958E+07	87.0	.0	73.9	73.9	3.346E+08	Trn A	6.150E+06	6.210E+06	1.07
1.6	2.956E+07	87.3	.0	73.9	73.9	3.137E+08	Trn A	6.150E+06	6.210E+06	1.07
1.7	2.954E+07	87.7	.0	73.9	73.9	2.927E+08	Trn A	6.150E+06	6.210E+06	1.07
1.8	2.953E+07	88.0	.0	73.9	73.9	2.718E+08	Trn A	6.150E+06	6.210E+06	1.07
1.9	2.951E+07	88.3	.0	73.9	73.9	2.508E+08	Trn A	6.150E+06	6.210E+06	1.07
2.0	2.950E+07	88.5	.0	73.9	73.9	2.298E+08	Trn A	6.150E+06	6.210E+06	1.07
2.1	2.948E+07	88.7	.0	73.9	73.9	2.257E+08	Trn A	6.150E+06	6.210E+06	1.07
2.2	2.947E+07	88.9	.0	73.9	73.9	2.216E+08	Trn A	6.150E+06	6.210E+06	1.07
2.3	2.946E+07	89.1	.0	73.9	73.9	2.175E+08	Trn A	6.150E+06	6.210E+06	1.07
2.4	2.944E+07	89.3	.0	73.9	73.9	2.133E+08	Trn A	6.150E+06	6.210E+06	1.07
2.5	2.943E+07	89.5	.0	73.9	73.9	2.092E+08	Trn A	6.150E+06	6.210E+06	1.07
2.6	2.942E+07	89.7	.0	73.9	73.9	2.051E+08	Trn A	6.150E+06	6.210E+06	1.07
2.7	2.941E+07	89.8	.0	73.9	73.9	2.010E+08	Trn A	6.150E+06	6.210E+06	1.07
2.8	2.939E+07	90.0	.0	73.9	73.9	1.968E+08	Trn A	6.150E+06	6.210E+06	1.07
2.9	2.938E+07	90.1	.0	73.9	73.9	1.927E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 125 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=80F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
3.0	2.937E+07	90.3	.0	73.9	73.9	1.886E+08	Trn A	6.150E+06	6.210E+06	1.07
3.1	2.936E+07	90.4	.0	73.9	73.9	1.844E+08	Trn A	6.150E+06	6.210E+06	1.07
3.2	2.935E+07	90.5	.0	73.9	73.9	1.803E+08	Trn A	6.150E+06	6.210E+06	1.07
3.3	2.933E+07	90.6	.0	73.9	73.9	1.762E+08	Trn A	6.150E+06	6.210E+06	1.07
3.4	2.932E+07	90.7	.0	73.9	73.9	1.721E+08	Trn A	6.150E+06	6.210E+06	1.07
3.5	2.931E+07	90.8	.0	73.9	73.9	1.679E+08	Trn A	6.150E+06	6.210E+06	1.07
3.6	2.930E+07	90.9	.0	73.9	73.9	1.638E+08	Trn A	6.150E+06	6.210E+06	1.07
3.7	2.929E+07	91.0	.0	73.9	73.9	1.597E+08	Trn A	6.150E+06	6.210E+06	1.07
3.8	2.928E+07	91.1	.0	73.9	73.9	1.556E+08	Trn A	6.150E+06	6.210E+06	1.07
3.9	2.927E+07	91.1	.0	73.9	73.9	1.514E+08	Trn A	6.150E+06	6.210E+06	1.07
4.0	2.926E+07	91.2	.0	73.9	73.9	1.473E+08	Trn A	6.150E+06	6.210E+06	1.07
4.1	2.925E+07	91.3	.0	73.9	73.9	1.473E+08	Trn A	6.150E+06	6.210E+06	1.07
4.2	2.924E+07	91.3	.0	73.9	73.9	1.472E+08	Trn A	6.150E+06	6.210E+06	1.07
4.3	2.923E+07	91.4	.0	73.9	73.9	1.472E+08	Trn A	6.150E+06	6.210E+06	1.07
4.4	2.922E+07	91.4	.0	73.9	73.9	1.471E+08	Trn A	6.150E+06	6.210E+06	1.07
4.5	2.921E+07	91.5	.0	73.9	73.9	1.471E+08	Trn A	6.150E+06	6.210E+06	1.07
4.6	2.920E+07	91.5	.0	73.9	73.9	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.7	2.918E+07	91.6	.0	73.9	73.9	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.8	2.917E+07	91.6	.0	73.9	73.9	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.9	2.916E+07	91.7	.0	73.9	73.9	1.469E+08	Trn A	6.150E+06	6.210E+06	1.07
5.0	2.915E+07	91.7	.0	73.9	73.9	1.469E+08	Trn A	6.150E+06	6.210E+06	1.07
5.1	2.914E+07	91.8	.0	73.9	73.9	1.468E+08	Trn A	6.150E+06	6.210E+06	1.07
5.2	2.913E+07	91.8	.0	73.9	73.9	1.468E+08	Trn A	6.150E+06	6.210E+06	1.07
5.3	2.912E+07	91.9	.0	73.9	73.9	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.4	2.911E+07	91.9	.0	73.9	73.9	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.5	2.910E+07	92.0	.0	73.9	73.9	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.6	2.909E+07	92.0	.0	73.9	73.9	1.466E+08	Trn A	6.150E+06	6.210E+06	1.07
5.7	2.908E+07	92.0	.0	73.9	73.9	1.466E+08	Trn A	6.150E+06	6.210E+06	1.07
5.8	2.907E+07	92.1	.0	73.9	73.9	1.465E+08	Trn A	6.150E+06	6.210E+06	1.07
5.9	2.906E+07	92.1	.0	73.9	73.9	1.465E+08	Trn A	6.150E+06	6.210E+06	1.07
6.0	2.905E+07	92.2	.0	73.9	73.9	1.464E+08	Trn A	6.150E+06	6.210E+06	1.07
6.1	2.904E+07	92.2	.0	73.9	73.9	1.463E+08	Trn A	6.150E+06	6.210E+06	1.07
6.2	2.903E+07	92.3	.0	73.9	73.9	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07
6.3	2.901E+07	92.3	.0	73.9	73.9	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 126 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=80F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
6.4	2.900E+07	92.3	.0	73.9	73.9	1.461E+08	Trn A	6.150E+06	6.210E+06	1.07
6.5	2.899E+07	92.4	.0	73.9	73.9	1.460E+08	Trn A	6.150E+06	6.210E+06	1.07
6.6	2.898E+07	92.4	.0	73.9	73.9	1.459E+08	Trn A	6.150E+06	6.210E+06	1.07
6.7	2.897E+07	92.4	.0	73.9	73.9	1.458E+08	Trn A	6.150E+06	6.210E+06	1.07
6.8	2.896E+07	92.5	.0	73.9	73.9	1.457E+08	Trn A	6.150E+06	6.210E+06	1.07
6.9	2.895E+07	92.5	.0	73.9	73.9	1.456E+08	Trn A	6.150E+06	6.210E+06	1.07
7.0	2.894E+07	92.6	.0	73.9	73.9	1.455E+08	Trn A	6.150E+06	6.210E+06	1.07
7.1	2.893E+07	92.6	.0	73.9	73.9	1.454E+08	Trn A	6.150E+06	6.210E+06	1.07
7.2	2.892E+07	92.6	.0	73.9	73.9	1.453E+08	Trn A	6.150E+06	6.210E+06	1.07
7.3	2.891E+07	92.6	.0	73.9	73.9	1.452E+08	Trn A	6.150E+06	6.210E+06	1.07
7.4	2.890E+07	92.7	.0	73.9	73.9	1.451E+08	Trn A	6.150E+06	6.210E+06	1.07
7.5	2.888E+07	92.7	.0	73.9	73.9	1.450E+08	Trn A	6.150E+06	6.210E+06	1.07
7.6	2.887E+07	92.7	.0	73.9	73.9	1.449E+08	Trn A	6.150E+06	6.210E+06	1.07
7.7	2.886E+07	92.8	.0	73.9	73.9	1.448E+08	Trn A	6.150E+06	6.210E+06	1.07
7.8	2.885E+07	92.8	.0	73.9	73.9	1.447E+08	Trn A	6.150E+06	6.210E+06	1.07
7.9	2.884E+07	92.8	.0	73.9	73.9	1.446E+08	Trn A	6.150E+06	6.210E+06	1.07
8.0	2.883E+07	92.9	.0	73.9	73.9	1.445E+08	Trn A	6.150E+06	6.210E+06	1.07
8.1	2.882E+07	92.9	.0	73.9	73.9	1.444E+08	Trn A	6.150E+06	6.210E+06	1.07
8.2	2.881E+07	92.9	.0	73.9	73.9	1.443E+08	Trn A	6.150E+06	6.210E+06	1.07
8.3	2.880E+07	92.9	.0	73.9	73.9	1.442E+08	Trn A	6.150E+06	6.210E+06	1.07
8.4	2.879E+07	93.0	.0	73.9	73.9	1.441E+08	Trn A	6.150E+06	6.210E+06	1.07
8.5	2.878E+07	93.0	.0	73.9	73.9	1.440E+08	Trn A	6.150E+06	6.210E+06	1.07
8.6	2.876E+07	93.0	.0	73.9	73.9	1.439E+08	Trn A	6.150E+06	6.210E+06	1.07
8.7	2.875E+07	93.0	.0	73.9	73.9	1.438E+08	Trn A	6.150E+06	6.210E+06	1.07
8.8	2.874E+07	93.1	.0	73.9	73.9	1.437E+08	Trn A	6.150E+06	6.210E+06	1.07
8.9	2.873E+07	93.1	.0	73.9	73.9	1.436E+08	Trn A	6.150E+06	6.210E+06	1.07
9.0	2.872E+07	93.1	.0	73.9	73.9	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.1	2.871E+07	93.1	.0	73.9	73.9	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.2	2.870E+07	93.2	.0	73.9	73.9	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.3	2.869E+07	93.2	.0	73.9	73.9	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.4	2.868E+07	93.2	.0	73.9	73.9	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.5	2.867E+07	93.2	.0	73.9	73.9	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.6	2.866E+07	93.2	.0	73.9	73.9	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07
9.7	2.864E+07	93.3	.0	73.9	73.9	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 127 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=80F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
9.8	2.863E+07	93.3	.0	73.9	73.9	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07
9.9	2.862E+07	93.3	.0	73.9	73.9	1.432E+08	Trn A	6.150E+06	6.210E+06	1.07
10.0	2.861E+07	93.3	.0	73.9	73.9	1.432E+08	Trn A	6.150E+06	6.210E+06	1.07
11.0	2.850E+07	93.5	.0	73.9	73.9	1.429E+08	Trn A	6.150E+06	6.210E+06	1.07
12.0	2.839E+07	93.6	.0	73.9	73.9	1.425E+08	Trn A	6.150E+06	6.210E+06	1.07
13.0	2.828E+07	93.8	.0	73.9	73.9	1.439E+08	Trn A	6.150E+06	6.210E+06	1.07
14.0	2.817E+07	93.9	.0	73.9	73.9	1.453E+08	Trn A	6.150E+06	6.210E+06	1.07
15.0	2.805E+07	94.0	.0	73.9	73.9	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
16.0	2.794E+07	94.2	.0	73.9	73.9	1.481E+08	Trn A	6.150E+06	6.210E+06	1.07
17.0	2.782E+07	94.3	.0	73.9	73.9	1.495E+08	Trn A	6.150E+06	6.210E+06	1.07
18.0	2.770E+07	94.5	.0	73.9	73.9	1.509E+08	Trn A	6.150E+06	6.210E+06	1.07
19.0	2.759E+07	94.6	.0	73.9	73.9	1.505E+08	Trn A	6.150E+06	6.210E+06	1.07
20.0	2.747E+07	94.7	.0	73.9	73.9	1.501E+08	Trn A	6.150E+06	6.210E+06	1.07
21.0	2.735E+07	94.8	.0	73.9	73.9	1.496E+08	Trn A	6.150E+06	6.210E+06	1.07
22.0	2.723E+07	94.8	.0	73.9	73.9	1.492E+08	Trn A	6.150E+06	6.210E+06	1.07
23.0	2.711E+07	94.9	.0	73.9	73.9	1.488E+08	Trn A	6.150E+06	6.210E+06	1.07
24.0	2.699E+07	94.9	.0	73.9	73.9	1.483E+08	Trn A	6.150E+06	6.210E+06	1.07
25.0	2.687E+07	94.9	.0	73.9	73.9	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07
26.0	2.676E+07	94.9	.0	73.9	73.9	1.440E+08	Trn A	6.150E+06	6.210E+06	1.07
27.0	2.664E+07	94.8	.0	73.9	73.9	1.418E+08	Trn A	6.150E+06	6.210E+06	1.07
28.0	2.653E+07	94.8	.0	73.9	73.9	1.396E+08	Trn A	6.150E+06	6.210E+06	1.07
29.0	2.641E+07	94.7	.0	73.9	73.9	1.374E+08	Trn A	6.150E+06	6.210E+06	1.07
30.0	2.630E+07	94.5	.0	73.9	73.9	1.353E+08	Trn A	6.150E+06	6.210E+06	1.07
31.0	2.619E+07	94.4	.0	73.9	73.9	1.331E+08	Trn A	6.150E+06	6.210E+06	1.07
32.0	2.608E+07	94.2	.0	73.9	73.9	1.309E+08	Trn A	6.150E+06	6.210E+06	1.07
33.0	2.597E+07	94.1	.0	73.9	73.9	1.287E+08	Trn A	6.150E+06	6.210E+06	1.07
34.0	2.587E+07	93.9	.0	73.9	73.9	1.265E+08	Trn A	6.150E+06	6.210E+06	1.07
35.0	2.577E+07	93.7	.0	73.9	73.9	1.244E+08	Trn A	6.150E+06	6.210E+06	1.07
36.0	2.566E+07	93.5	.0	73.9	73.9	1.222E+08	Trn A	6.150E+06	6.210E+06	1.07
37.0	2.556E+07	93.3	.0	73.9	73.9	1.215E+08	Trn A	6.150E+06	6.210E+06	1.07
38.0	2.546E+07	93.2	.0	73.9	73.9	1.208E+08	Trn A	6.150E+06	6.210E+06	1.07
39.0	2.536E+07	93.0	.0	73.9	73.9	1.201E+08	Trn A	6.150E+06	6.210E+06	1.07
40.0	2.527E+07	92.9	.0	73.9	73.9	1.194E+08	Trn A	6.150E+06	6.210E+06	1.07
41.0	2.517E+07	92.7	.0	73.9	73.9	1.187E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 128 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=80F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
42.0	2.507E+07	92.6	.0	73.9	73.9	1.180E+08	Trn A	6.150E+06	6.210E+06	1.07
43.0	2.498E+07	92.5	.0	73.9	73.9	1.172E+08	Trn A	6.150E+06	6.210E+06	1.07
44.0	2.488E+07	92.4	.0	73.9	73.9	1.165E+08	Trn A	6.150E+06	6.210E+06	1.07
45.0	2.479E+07	92.3	.0	73.9	73.9	1.158E+08	Trn A	6.150E+06	6.210E+06	1.07
46.0	2.470E+07	92.2	.0	73.9	73.9	1.151E+08	Trn A	6.150E+06	6.210E+06	1.07
47.0	2.461E+07	92.1	.0	73.9	73.9	1.144E+08	Trn A	6.150E+06	6.210E+06	1.07
48.0	2.451E+07	92.0	.0	73.9	73.9	1.137E+08	Trn A	6.150E+06	6.210E+06	1.07
49.0	2.442E+07	91.9	.0	73.9	73.9	1.134E+08	Trn A	6.150E+06	6.210E+06	1.07
50.0	2.433E+07	91.8	.0	73.9	73.9	1.130E+08	Trn A	6.150E+06	6.210E+06	1.07
51.0	2.424E+07	91.7	.0	73.9	73.9	1.126E+08	Trn A	6.150E+06	6.210E+06	1.07
52.0	2.415E+07	91.6	.0	73.9	73.9	1.123E+08	Trn A	6.150E+06	6.210E+06	1.07
53.0	2.406E+07	91.6	.0	73.9	73.9	1.119E+08	Trn A	6.150E+06	6.210E+06	1.07
54.0	2.397E+07	91.5	.0	73.9	73.9	1.116E+08	Trn A	6.150E+06	6.210E+06	1.07
55.0	2.388E+07	91.4	.0	73.9	73.9	1.112E+08	Trn A	6.150E+06	6.210E+06	1.07
56.0	2.380E+07	91.4	.0	73.9	73.9	1.109E+08	Trn A	6.150E+06	6.210E+06	1.07
57.0	2.371E+07	91.3	.0	73.9	73.9	1.105E+08	Trn A	6.150E+06	6.210E+06	1.07
58.0	2.362E+07	91.3	.0	73.9	73.9	1.101E+08	Trn A	6.150E+06	6.210E+06	1.07
59.0	2.353E+07	91.2	.0	73.9	73.9	1.098E+08	Trn A	6.150E+06	6.210E+06	1.07
60.0	2.345E+07	91.2	.0	73.9	73.9	1.094E+08	Trn A	6.150E+06	6.210E+06	1.07
61.0	2.336E+07	91.1	.0	73.9	73.9	1.091E+08	Trn A	6.150E+06	6.210E+06	1.07
62.0	2.327E+07	91.1	.0	73.9	73.9	1.087E+08	Trn A	6.150E+06	6.210E+06	1.07
63.0	2.319E+07	91.0	.0	73.9	73.9	1.083E+08	Trn A	6.150E+06	6.210E+06	1.07
64.0	2.310E+07	91.0	.0	73.9	73.9	1.080E+08	Trn A	6.150E+06	6.210E+06	1.07
65.0	2.302E+07	90.9	.0	73.9	73.9	1.076E+08	Trn A	6.150E+06	6.210E+06	1.07
66.0	2.293E+07	90.9	.0	73.9	73.9	1.073E+08	Trn A	6.150E+06	6.210E+06	1.07
67.0	2.285E+07	90.9	.0	73.9	73.9	1.069E+08	Trn A	6.150E+06	6.210E+06	1.07
68.0	2.276E+07	90.8	.0	73.9	73.9	1.066E+08	Trn A	6.150E+06	6.210E+06	1.07
69.0	2.268E+07	90.8	.0	73.9	73.9	1.062E+08	Trn A	6.150E+06	6.210E+06	1.07
70.0	2.259E+07	90.7	.0	73.9	73.9	1.058E+08	Trn A	6.150E+06	6.210E+06	1.07
71.0	2.251E+07	90.7	.0	73.9	73.9	1.055E+08	Trn A	6.150E+06	6.210E+06	1.07
72.0	2.243E+07	90.6	.0	73.9	73.9	1.051E+08	Trn A	6.150E+06	6.210E+06	1.07
73.0	2.235E+07	90.6	.0	73.9	73.9	1.048E+08	Trn A	6.150E+06	6.210E+06	1.07
74.0	2.226E+07	90.6	.0	73.9	73.9	1.044E+08	Trn A	6.150E+06	6.210E+06	1.07
75.0	2.218E+07	90.5	.0	73.9	73.9	1.040E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 129 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=80F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
76.0	2.210E+07	90.5	.0	73.9	73.9	1.037E+08	Trn A	6.150E+06	6.210E+06	1.07
77.0	2.202E+07	90.4	.0	73.9	73.9	1.033E+08	Trn A	6.150E+06	6.210E+06	1.07
78.0	2.194E+07	90.4	.0	73.9	73.9	1.029E+08	Trn A	6.150E+06	6.210E+06	1.07
79.0	2.185E+07	90.3	.0	73.9	73.9	1.026E+08	Trn A	6.150E+06	6.210E+06	1.07
80.0	2.177E+07	90.3	.0	73.9	73.9	1.022E+08	Trn A	6.150E+06	6.210E+06	1.07
81.0	2.169E+07	90.2	.0	73.9	73.9	1.018E+08	Trn A	6.150E+06	6.210E+06	1.07
82.0	2.161E+07	90.2	.0	73.9	73.9	1.015E+08	Trn A	6.150E+06	6.210E+06	1.07
83.0	2.153E+07	90.2	.0	73.9	73.9	1.011E+08	Trn A	6.150E+06	6.210E+06	1.07
84.0	2.145E+07	90.1	.0	73.9	73.9	1.007E+08	Trn A	6.150E+06	6.210E+06	1.07
85.0	2.138E+07	90.1	.0	73.9	73.9	1.004E+08	Trn A	6.150E+06	6.210E+06	1.07
86.0	2.130E+07	90.0	.0	73.9	73.9	9.999E+07	Trn A	6.150E+06	6.210E+06	1.07
87.0	2.122E+07	90.0	.0	73.9	73.9	9.962E+07	Trn A	6.150E+06	6.210E+06	1.07
88.0	2.114E+07	89.9	.0	73.9	73.9	9.925E+07	Trn A	6.150E+06	6.210E+06	1.07
89.0	2.106E+07	89.9	.0	73.9	73.9	9.888E+07	Trn A	6.150E+06	6.210E+06	1.07
90.0	2.098E+07	89.8	.0	73.9	73.9	9.852E+07	Trn A	6.150E+06	6.210E+06	1.07
91.0	2.091E+07	89.8	.0	73.9	73.9	9.815E+07	Trn A	6.150E+06	6.210E+06	1.07
92.0	2.083E+07	89.8	.0	73.9	73.9	9.778E+07	Trn A	6.150E+06	6.210E+06	1.07
93.0	2.075E+07	89.7	.0	73.9	73.9	9.741E+07	Trn A	6.150E+06	6.210E+06	1.07
94.0	2.068E+07	89.7	.0	73.9	73.9	9.705E+07	Trn A	6.150E+06	6.210E+06	1.07
95.0	2.060E+07	89.6	.0	73.9	73.9	9.668E+07	Trn A	6.150E+06	6.210E+06	1.07
96.0	2.053E+07	89.6	.0	73.9	73.9	9.631E+07	Trn A	6.150E+06	6.210E+06	1.07
97.0	2.045E+07	89.5	.0	73.9	73.9	9.612E+07	Trn A	6.150E+06	6.210E+06	1.07
98.0	2.038E+07	89.5	.0	73.9	73.9	9.593E+07	Trn A	6.150E+06	6.210E+06	1.07
99.0	2.030E+07	89.5	.0	73.9	73.9	9.574E+07	Trn A	6.150E+06	6.210E+06	1.07
100.0	2.023E+07	89.4	.0	73.9	73.9	9.555E+07	Trn A	6.150E+06	6.210E+06	1.07
101.0	2.015E+07	89.4	.0	73.9	73.9	9.536E+07	Trn A	6.150E+06	6.210E+06	1.07
102.0	2.008E+07	89.3	.0	73.9	73.9	9.517E+07	Trn A	6.150E+06	6.210E+06	1.07
103.0	2.000E+07	89.3	.0	73.9	73.9	9.498E+07	Trn A	6.150E+06	6.210E+06	1.07
104.0	1.993E+07	89.3	.0	73.9	73.9	9.479E+07	Trn A	6.150E+06	6.210E+06	1.07
105.0	1.985E+07	89.3	.0	73.9	73.9	9.460E+07	Trn A	6.150E+06	6.210E+06	1.07
106.0	1.978E+07	89.2	.0	73.9	73.9	9.441E+07	Trn A	6.150E+06	6.210E+06	1.07
107.0	1.971E+07	89.2	.0	73.9	73.9	9.422E+07	Trn A	6.150E+06	6.210E+06	1.07
108.0	1.963E+07	89.2	.0	73.9	73.9	9.403E+07	Trn A	6.150E+06	6.210E+06	1.07
109.0	1.956E+07	89.2	.0	73.9	73.9	9.384E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 130 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=80F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
110.0	1.949E+07	89.1	.0	73.9	73.9	9.365E+07	Trn A	6.150E+06	6.210E+06	1.07
111.0	1.942E+07	89.1	.0	73.9	73.9	9.346E+07	Trn A	6.150E+06	6.210E+06	1.07
112.0	1.934E+07	89.1	.0	73.9	73.9	9.327E+07	Trn A	6.150E+06	6.210E+06	1.07
113.0	1.927E+07	89.1	.0	73.9	73.9	9.308E+07	Trn A	6.150E+06	6.210E+06	1.07
114.0	1.920E+07	89.0	.0	73.9	73.9	9.289E+07	Trn A	6.150E+06	6.210E+06	1.07
115.0	1.913E+07	89.0	.0	73.9	73.9	9.270E+07	Trn A	6.150E+06	6.210E+06	1.07
116.0	1.905E+07	89.0	.0	73.9	73.9	9.251E+07	Trn A	6.150E+06	6.210E+06	1.07
117.0	1.898E+07	89.0	.0	73.9	73.9	9.232E+07	Trn A	6.150E+06	6.210E+06	1.07
118.0	1.891E+07	88.9	.0	73.9	73.9	9.213E+07	Trn A	6.150E+06	6.210E+06	1.07
119.0	1.884E+07	88.9	.0	73.9	73.9	9.194E+07	Trn A	6.150E+06	6.210E+06	1.07
120.0	1.877E+07	88.9	.0	73.9	73.9	9.175E+07	Trn A	6.150E+06	6.210E+06	1.07
121.0	1.870E+07	88.9	.0	73.9	73.9	9.150E+07	Trn A	6.150E+06	6.210E+06	1.07
122.0	1.862E+07	88.8	.0	73.9	73.9	9.126E+07	Trn A	6.150E+06	6.210E+06	1.07
123.0	1.855E+07	88.8	.0	73.9	73.9	9.101E+07	Trn A	6.150E+06	6.210E+06	1.07
124.0	1.848E+07	88.8	.0	73.9	73.9	9.076E+07	Trn A	6.150E+06	6.210E+06	1.07
125.0	1.841E+07	88.7	.0	73.9	73.9	9.052E+07	Trn A	6.150E+06	6.210E+06	1.07
126.0	1.834E+07	88.7	.0	73.9	73.9	9.027E+07	Trn A	6.150E+06	6.210E+06	1.07
127.0	1.827E+07	88.7	.0	73.9	73.9	9.003E+07	Trn A	6.150E+06	6.210E+06	1.07
128.0	1.820E+07	88.7	.0	73.9	73.9	8.978E+07	Trn A	6.150E+06	6.210E+06	1.07
129.0	1.813E+07	88.6	.0	73.9	73.9	8.953E+07	Trn A	6.150E+06	6.210E+06	1.07
130.0	1.806E+07	88.6	.0	73.9	73.9	8.929E+07	Trn A	6.150E+06	6.210E+06	1.07
131.0	1.799E+07	88.6	.0	73.9	73.9	8.904E+07	Trn A	6.150E+06	6.210E+06	1.07
132.0	1.792E+07	88.5	.0	73.9	73.9	8.880E+07	Trn A	6.150E+06	6.210E+06	1.07
133.0	1.786E+07	88.5	.0	73.9	73.9	8.855E+07	Trn A	6.150E+06	6.210E+06	1.07
134.0	1.779E+07	88.5	.0	73.9	73.9	8.830E+07	Trn A	6.150E+06	6.210E+06	1.07
135.0	1.772E+07	88.4	.0	73.9	73.9	8.806E+07	Trn A	6.150E+06	6.210E+06	1.07
136.0	1.765E+07	88.4	.0	73.9	73.9	8.781E+07	Trn A	6.150E+06	6.210E+06	1.07
137.0	1.758E+07	88.4	.0	73.9	73.9	8.757E+07	Trn A	6.150E+06	6.210E+06	1.07
138.0	1.751E+07	88.3	.0	73.9	73.9	8.732E+07	Trn A	6.150E+06	6.210E+06	1.07
139.0	1.745E+07	88.3	.0	73.9	73.9	8.707E+07	Trn A	6.150E+06	6.210E+06	1.07
140.0	1.738E+07	88.3	.0	73.9	73.9	8.683E+07	Trn A	6.150E+06	6.210E+06	1.07
141.0	1.731E+07	88.3	.0	73.9	73.9	8.658E+07	Trn A	6.150E+06	6.210E+06	1.07
142.0	1.724E+07	88.2	.0	73.9	73.9	8.634E+07	Trn A	6.150E+06	6.210E+06	1.07
143.0	1.718E+07	88.2	.0	73.9	73.9	8.609E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 131 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=80F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
144.0	1.711E+07	88.2	.0	73.9	73.9	8.584E+07	Trn A	6.150E+06	6.210E+06	1.07
145.0	1.704E+07	88.1	.0	73.9	73.9	8.575E+07	Trn A	6.150E+06	6.210E+06	1.07
146.0	1.698E+07	88.1	.0	73.9	73.9	8.567E+07	Trn A	6.150E+06	6.210E+06	1.07
147.0	1.691E+07	88.1	.0	73.9	73.9	8.558E+07	Trn A	6.150E+06	6.210E+06	1.07
148.0	1.685E+07	88.1	.0	73.9	73.9	8.549E+07	Trn A	6.150E+06	6.210E+06	1.07
149.0	1.678E+07	88.0	.0	73.9	73.9	8.540E+07	Trn A	6.150E+06	6.210E+06	1.07
150.0	1.671E+07	88.0	.0	73.9	73.9	8.531E+07	Trn A	6.150E+06	6.210E+06	1.07
151.0	1.665E+07	88.0	.0	73.9	73.9	8.522E+07	Trn A	6.150E+06	6.210E+06	1.07
152.0	1.658E+07	88.0	.0	73.9	73.9	8.513E+07	Trn A	6.150E+06	6.210E+06	1.07
153.0	1.652E+07	88.0	.0	73.9	73.9	8.504E+07	Trn A	6.150E+06	6.210E+06	1.07
154.0	1.645E+07	88.0	.0	73.9	73.9	8.495E+07	Trn A	6.150E+06	6.210E+06	1.07
155.0	1.639E+07	87.9	.0	73.9	73.9	8.486E+07	Trn A	6.150E+06	6.210E+06	1.07
156.0	1.632E+07	87.9	.0	73.9	73.9	8.477E+07	Trn A	6.150E+06	6.210E+06	1.07
157.0	1.626E+07	87.9	.0	73.9	73.9	8.468E+07	Trn A	6.150E+06	6.210E+06	1.07
158.0	1.619E+07	87.9	.0	73.9	73.9	8.459E+07	Trn A	6.150E+06	6.210E+06	1.07
159.0	1.613E+07	87.9	.0	73.9	73.9	8.450E+07	Trn A	6.150E+06	6.210E+06	1.07
160.0	1.606E+07	87.9	.0	73.9	73.9	8.441E+07	Trn A	6.150E+06	6.210E+06	1.07
161.0	1.599E+07	87.9	.0	73.9	73.9	8.432E+07	Trn A	6.150E+06	6.210E+06	1.07
162.0	1.593E+07	87.9	.0	73.9	73.9	8.423E+07	Trn A	6.150E+06	6.210E+06	1.07
163.0	1.587E+07	87.8	.0	73.9	73.9	8.415E+07	Trn A	6.150E+06	6.210E+06	1.07
164.0	1.580E+07	87.8	.0	73.9	73.9	8.406E+07	Trn A	6.150E+06	6.210E+06	1.07
165.0	1.574E+07	87.8	.0	73.9	73.9	8.397E+07	Trn A	6.150E+06	6.210E+06	1.07
166.0	1.567E+07	87.8	.0	73.9	73.9	8.388E+07	Trn A	6.150E+06	6.210E+06	1.07
167.0	1.561E+07	87.8	.0	73.9	73.9	8.379E+07	Trn A	6.150E+06	6.210E+06	1.07
168.0	1.554E+07	87.8	.0	73.9	73.9	8.370E+07	Trn A	6.150E+06	6.210E+06	1.07
169.0	1.548E+07	87.8	.0	73.9	73.9	8.372E+07	Trn A	6.150E+06	6.210E+06	1.07
170.0	1.541E+07	87.8	.0	73.9	73.9	8.374E+07	Trn A	6.150E+06	6.210E+06	1.07
171.0	1.535E+07	87.8	.0	73.9	73.9	8.376E+07	Trn A	6.150E+06	6.210E+06	1.07
172.0	1.528E+07	87.8	.0	73.9	73.9	8.378E+07	Trn A	6.150E+06	6.210E+06	1.07
173.0	1.522E+07	87.7	.0	73.9	73.9	8.380E+07	Trn A	6.150E+06	6.210E+06	1.07
174.0	1.516E+07	87.7	.0	73.9	73.9	8.382E+07	Trn A	6.150E+06	6.210E+06	1.07
175.0	1.509E+07	87.7	.0	73.9	73.9	8.384E+07	Trn A	6.150E+06	6.210E+06	1.07
176.0	1.503E+07	87.7	.0	73.9	73.9	8.386E+07	Trn A	6.150E+06	6.210E+06	1.07
177.0	1.496E+07	87.7	.0	73.9	73.9	8.388E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 132 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=80F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
178.0	1.490E+07	87.7	.0	73.9	73.9	8.390E+07	Trn A	6.150E+06	6.210E+06	1.07
179.0	1.483E+07	87.7	.0	73.9	73.9	8.392E+07	Trn A	6.150E+06	6.210E+06	1.07
180.0	1.477E+07	87.8	.0	73.9	73.9	8.394E+07	Trn A	6.150E+06	6.210E+06	1.07
181.0	1.470E+07	87.8	.0	73.9	73.9	8.396E+07	Trn A	6.150E+06	6.210E+06	1.07
182.0	1.464E+07	87.8	.0	73.9	73.9	8.399E+07	Trn A	6.150E+06	6.210E+06	1.07
183.0	1.458E+07	87.8	.0	73.9	73.9	8.401E+07	Trn A	6.150E+06	6.210E+06	1.07
184.0	1.451E+07	87.8	.0	73.9	73.9	8.403E+07	Trn A	6.150E+06	6.210E+06	1.07
185.0	1.445E+07	87.8	.0	73.9	73.9	8.405E+07	Trn A	6.150E+06	6.210E+06	1.07
186.0	1.438E+07	87.8	.0	73.9	73.9	8.407E+07	Trn A	6.150E+06	6.210E+06	1.07
187.0	1.432E+07	87.8	.0	73.9	73.9	8.409E+07	Trn A	6.150E+06	6.210E+06	1.07
188.0	1.425E+07	87.8	.0	73.9	73.9	8.411E+07	Trn A	6.150E+06	6.210E+06	1.07
189.0	1.419E+07	87.8	.0	73.9	73.9	8.413E+07	Trn A	6.150E+06	6.210E+06	1.07
190.0	1.412E+07	87.8	.0	73.9	73.9	8.415E+07	Trn A	6.150E+06	6.210E+06	1.07
191.0	1.406E+07	87.8	.0	73.9	73.9	8.417E+07	Trn A	6.150E+06	6.210E+06	1.07
192.0	1.399E+07	87.8	.0	73.9	73.9	8.419E+07	Trn A	6.150E+06	6.210E+06	1.07
193.0	1.393E+07	87.8	.0	73.9	73.9	8.400E+07	Trn A	6.150E+06	6.210E+06	1.07
194.0	1.386E+07	87.8	.0	73.9	73.9	8.381E+07	Trn A	6.150E+06	6.210E+06	1.07
195.0	1.380E+07	87.8	.0	73.9	73.9	8.362E+07	Trn A	6.150E+06	6.210E+06	1.07
196.0	1.374E+07	87.8	.0	73.9	73.9	8.343E+07	Trn A	6.150E+06	6.210E+06	1.07
197.0	1.367E+07	87.7	.0	73.9	73.9	8.324E+07	Trn A	6.150E+06	6.210E+06	1.07
198.0	1.361E+07	87.7	.0	73.9	73.9	8.305E+07	Trn A	6.150E+06	6.210E+06	1.07
199.0	1.354E+07	87.7	.0	73.9	73.9	8.287E+07	Trn A	6.150E+06	6.210E+06	1.07
200.0	1.348E+07	87.7	.0	73.9	73.9	8.268E+07	Trn A	6.150E+06	6.210E+06	1.07
201.0	1.342E+07	87.7	.0	73.9	73.9	8.249E+07	Trn A	6.150E+06	6.210E+06	1.07
202.0	1.335E+07	87.6	.0	73.9	73.9	8.230E+07	Trn A	6.150E+06	6.210E+06	1.07
203.0	1.329E+07	87.6	.0	73.9	73.9	8.211E+07	Trn A	6.150E+06	6.210E+06	1.07
204.0	1.323E+07	87.6	.0	73.9	73.9	8.192E+07	Trn A	6.150E+06	6.210E+06	1.07
205.0	1.316E+07	87.6	.0	73.9	73.9	8.173E+07	Trn A	6.150E+06	6.210E+06	1.07
206.0	1.310E+07	87.5	.0	73.9	73.9	8.154E+07	Trn A	6.150E+06	6.210E+06	1.07
207.0	1.304E+07	87.5	.0	73.9	73.9	8.135E+07	Trn A	6.150E+06	6.210E+06	1.07
208.0	1.298E+07	87.5	.0	73.9	73.9	8.116E+07	Trn A	6.150E+06	6.210E+06	1.07
209.0	1.291E+07	87.5	.0	73.9	73.9	8.097E+07	Trn A	6.150E+06	6.210E+06	1.07
210.0	1.285E+07	87.4	.0	73.9	73.9	8.078E+07	Trn A	6.150E+06	6.210E+06	1.07
211.0	1.279E+07	87.4	.0	73.9	73.9	8.060E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 133 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=80F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
212.0	1.273E+07	87.4	.0	73.9	73.9	8.041E+07	Trn A	6.150E+06	6.210E+06	1.07
213.0	1.266E+07	87.4	.0	73.9	73.9	8.022E+07	Trn A	6.150E+06	6.210E+06	1.07
214.0	1.260E+07	87.3	.0	73.9	73.9	8.003E+07	Trn A	6.150E+06	6.210E+06	1.07
215.0	1.254E+07	87.3	.0	73.9	73.9	7.984E+07	Trn A	6.150E+06	6.210E+06	1.07
216.0	1.248E+07	87.3	.0	73.9	73.9	7.965E+07	Trn A	6.150E+06	6.210E+06	1.07
217.0	1.242E+07	87.3	.0	73.9	73.9	7.969E+07	Trn A	6.150E+06	6.210E+06	1.07
218.0	1.236E+07	87.3	.0	73.9	73.9	7.972E+07	Trn A	6.150E+06	6.210E+06	1.07
219.0	1.230E+07	87.3	.0	73.9	73.9	7.976E+07	Trn A	6.150E+06	6.210E+06	1.07
220.0	1.224E+07	87.2	.0	73.9	73.9	7.980E+07	Trn A	6.150E+06	6.210E+06	1.07
221.0	1.217E+07	87.2	.0	73.9	73.9	7.984E+07	Trn A	6.150E+06	6.210E+06	1.07
222.0	1.211E+07	87.2	.0	73.9	73.9	7.987E+07	Trn A	6.150E+06	6.210E+06	1.07
223.0	1.205E+07	87.2	.0	73.9	73.9	7.991E+07	Trn A	6.150E+06	6.210E+06	1.07
224.0	1.199E+07	87.2	.0	73.9	73.9	7.995E+07	Trn A	6.150E+06	6.210E+06	1.07
225.0	1.193E+07	87.2	.0	73.9	73.9	7.999E+07	Trn A	6.150E+06	6.210E+06	1.07
226.0	1.187E+07	87.2	.0	73.9	73.9	8.002E+07	Trn A	6.150E+06	6.210E+06	1.07
227.0	1.181E+07	87.2	.0	73.9	73.9	8.006E+07	Trn A	6.150E+06	6.210E+06	1.07
228.0	1.175E+07	87.3	.0	73.9	73.9	8.010E+07	Trn A	6.150E+06	6.210E+06	1.07
229.0	1.168E+07	87.3	.0	73.9	73.9	8.014E+07	Trn A	6.150E+06	6.210E+06	1.07
230.0	1.162E+07	87.3	.0	73.9	73.9	8.017E+07	Trn A	6.150E+06	6.210E+06	1.07
231.0	1.156E+07	87.3	.0	73.9	73.9	8.021E+07	Trn A	6.150E+06	6.210E+06	1.07
232.0	1.150E+07	87.3	.0	73.9	73.9	8.025E+07	Trn A	6.150E+06	6.210E+06	1.07
233.0	1.144E+07	87.3	.0	73.9	73.9	8.029E+07	Trn A	6.150E+06	6.210E+06	1.07
234.0	1.138E+07	87.3	.0	73.9	73.9	8.032E+07	Trn A	6.150E+06	6.210E+06	1.07
235.0	1.132E+07	87.3	.0	73.9	73.9	8.036E+07	Trn A	6.150E+06	6.210E+06	1.07
236.0	1.125E+07	87.3	.0	73.9	73.9	8.040E+07	Trn A	6.150E+06	6.210E+06	1.07
237.0	1.119E+07	87.3	.0	73.9	73.9	8.044E+07	Trn A	6.150E+06	6.210E+06	1.07
238.0	1.113E+07	87.3	.0	73.9	73.9	8.047E+07	Trn A	6.150E+06	6.210E+06	1.07
239.0	1.107E+07	87.3	.0	73.9	73.9	8.051E+07	Trn A	6.150E+06	6.210E+06	1.07
240.0	1.101E+07	87.3	.0	73.9	73.9	8.055E+07	Trn A	6.150E+06	6.210E+06	1.07

Stop - Program terminated.

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 134 of 166
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13. UHSSIM input/output for Fan3_75F, 3-Fan Case with IBT of 75 °F

Fan3_75F.inp

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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=75F
# design wet-bulb temperature [F], design dry-bulb temperature [F],
# design hot-water temperature [F], design pressure [psia], design solids [ppt]
# 0 => F, psia, btu/hr, lbm/hr units
82, 98, 129.0, 14.696, 0.0, 0
# initial basin mass [lbm], initial basin temperature [F], initial solids [ppt],
# number of towers, starting time of simulation [hr]
29843200, 75, 0, 2, 0.
# Time Period Data -- every 0.1 hour for 10 hr then every hour up to 10 days
# step size, number of steps
0.1,100
1,230
*
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,6.15e6,6.21e6,1.07
240.0,6.15e6,6.21e6,1.07
*
# Train B
Trn B
0.0,2.05e6,0.0,1.07
240.0,2.05e6,0.0,1.07
*
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
    0 s    3.2565E+08
    50 s    3.2565E+08
   101 s    3.2565E+08
   116 s    3.1609E+08
   120 s    3.1487E+08
   150 s    3.1640E+08
   300 s    3.1640E+08
   900 s    3.1640E+08
  1800 s    3.0196E+08
  2704 s    2.8660E+08
  2706 s    4.4627E+08
  3600 s    4.3946E+08
    2 h    2.2984E+08
    4 h    1.4731E+08
    6 h    1.4644E+08
    9 h    1.4354E+08
   12 h    1.4254E+08
   18 h    1.5095E+08
   24 h    1.4834E+08
   36 h    1.2219E+08
    2 d    1.1371E+08
    3 d    1.0513E+08
    4 d    9.6311E+07
    5 d    9.1747E+07
    6 d    8.5844E+07
    7 d    8.3698E+07
    8 d    8.4190E+07
    9 d    7.9649E+07
   10 d    8.0549E+07
*
# Ambient Data Supplied by Bechtel Power Corp.
# TIME WB DB P
# (hr) (F) (F) (psia)
    0, 74.0, 74.0, 14.7
   240, 74.0, 74.0, 14.7
*

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Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 135 of 166
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Fan3_75F.out

Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=75F

Initial Basin Mass 2.984E+07 lbm
Initial Basin Temperature 75.0 F
Initial Basin Solids .0 ppt

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
.0	2.984E+07	75.0	.0	74.0	74.0	3.257E+08	Trn A	6.150E+06	6.210E+06	1.07
.1	2.983E+07	75.6	.0	74.0	74.0	3.164E+08	Trn A	6.150E+06	6.210E+06	1.07
.2	2.982E+07	76.1	.0	74.0	74.0	3.164E+08	Trn A	6.150E+06	6.210E+06	1.07
.3	2.981E+07	76.6	.0	74.0	74.0	3.135E+08	Trn A	6.150E+06	6.210E+06	1.07
.4	2.979E+07	77.1	.0	74.0	74.0	3.077E+08	Trn A	6.150E+06	6.210E+06	1.07
.5	2.978E+07	77.6	.0	74.0	74.0	3.020E+08	Trn A	6.150E+06	6.210E+06	1.07
.6	2.977E+07	78.1	.0	74.0	74.0	2.958E+08	Trn A	6.150E+06	6.210E+06	1.07
.7	2.976E+07	78.6	.0	74.0	74.0	2.897E+08	Trn A	6.150E+06	6.210E+06	1.07
.8	2.974E+07	79.1	.0	74.0	74.0	4.449E+08	Trn A	6.150E+06	6.210E+06	1.07
.9	2.972E+07	79.8	.0	74.0	74.0	4.422E+08	Trn A	6.150E+06	6.210E+06	1.07
1.0	2.970E+07	80.4	.0	74.0	74.0	4.395E+08	Trn A	6.150E+06	6.210E+06	1.07
1.1	2.968E+07	81.0	.0	74.0	74.0	4.185E+08	Trn A	6.150E+06	6.210E+06	1.07
1.2	2.966E+07	81.6	.0	74.0	74.0	3.975E+08	Trn A	6.150E+06	6.210E+06	1.07
1.3	2.964E+07	82.1	.0	74.0	74.0	3.766E+08	Trn A	6.150E+06	6.210E+06	1.07
1.4	2.962E+07	82.6	.0	74.0	74.0	3.556E+08	Trn A	6.150E+06	6.210E+06	1.07
1.5	2.960E+07	83.1	.0	74.0	74.0	3.346E+08	Trn A	6.150E+06	6.210E+06	1.07
1.6	2.959E+07	83.5	.0	74.0	74.0	3.137E+08	Trn A	6.150E+06	6.210E+06	1.07
1.7	2.957E+07	83.9	.0	74.0	74.0	2.927E+08	Trn A	6.150E+06	6.210E+06	1.07
1.8	2.956E+07	84.3	.0	74.0	74.0	2.718E+08	Trn A	6.150E+06	6.210E+06	1.07
1.9	2.954E+07	84.6	.0	74.0	74.0	2.508E+08	Trn A	6.150E+06	6.210E+06	1.07
2.0	2.953E+07	84.9	.0	74.0	74.0	2.298E+08	Trn A	6.150E+06	6.210E+06	1.07
2.1	2.952E+07	85.2	.0	74.0	74.0	2.257E+08	Trn A	6.150E+06	6.210E+06	1.07
2.2	2.951E+07	85.5	.0	74.0	74.0	2.216E+08	Trn A	6.150E+06	6.210E+06	1.07
2.3	2.950E+07	85.7	.0	74.0	74.0	2.175E+08	Trn A	6.150E+06	6.210E+06	1.07
2.4	2.949E+07	85.9	.0	74.0	74.0	2.133E+08	Trn A	6.150E+06	6.210E+06	1.07
2.5	2.947E+07	86.2	.0	74.0	74.0	2.092E+08	Trn A	6.150E+06	6.210E+06	1.07
2.6	2.946E+07	86.4	.0	74.0	74.0	2.051E+08	Trn A	6.150E+06	6.210E+06	1.07
2.7	2.945E+07	86.6	.0	74.0	74.0	2.010E+08	Trn A	6.150E+06	6.210E+06	1.07
2.8	2.944E+07	86.8	.0	74.0	74.0	1.968E+08	Trn A	6.150E+06	6.210E+06	1.07
2.9	2.943E+07	87.0	.0	74.0	74.0	1.927E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 136 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=75F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
3.0	2.942E+07	87.2	.0	74.0	74.0	1.886E+08	Trn A	6.150E+06	6.210E+06	1.07
3.1	2.941E+07	87.4	.0	74.0	74.0	1.844E+08	Trn A	6.150E+06	6.210E+06	1.07
3.2	2.940E+07	87.5	.0	74.0	74.0	1.803E+08	Trn A	6.150E+06	6.210E+06	1.07
3.3	2.939E+07	87.7	.0	74.0	74.0	1.762E+08	Trn A	6.150E+06	6.210E+06	1.07
3.4	2.938E+07	87.8	.0	74.0	74.0	1.721E+08	Trn A	6.150E+06	6.210E+06	1.07
3.5	2.937E+07	88.0	.0	74.0	74.0	1.679E+08	Trn A	6.150E+06	6.210E+06	1.07
3.6	2.936E+07	88.1	.0	74.0	74.0	1.638E+08	Trn A	6.150E+06	6.210E+06	1.07
3.7	2.935E+07	88.2	.0	74.0	74.0	1.597E+08	Trn A	6.150E+06	6.210E+06	1.07
3.8	2.934E+07	88.4	.0	74.0	74.0	1.556E+08	Trn A	6.150E+06	6.210E+06	1.07
3.9	2.933E+07	88.5	.0	74.0	74.0	1.514E+08	Trn A	6.150E+06	6.210E+06	1.07
4.0	2.932E+07	88.6	.0	74.0	74.0	1.473E+08	Trn A	6.150E+06	6.210E+06	1.07
4.1	2.931E+07	88.7	.0	74.0	74.0	1.473E+08	Trn A	6.150E+06	6.210E+06	1.07
4.2	2.930E+07	88.8	.0	74.0	74.0	1.472E+08	Trn A	6.150E+06	6.210E+06	1.07
4.3	2.929E+07	88.8	.0	74.0	74.0	1.472E+08	Trn A	6.150E+06	6.210E+06	1.07
4.4	2.928E+07	88.9	.0	74.0	74.0	1.471E+08	Trn A	6.150E+06	6.210E+06	1.07
4.5	2.927E+07	89.0	.0	74.0	74.0	1.471E+08	Trn A	6.150E+06	6.210E+06	1.07
4.6	2.926E+07	89.1	.0	74.0	74.0	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.7	2.925E+07	89.2	.0	74.0	74.0	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.8	2.924E+07	89.3	.0	74.0	74.0	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.9	2.923E+07	89.4	.0	74.0	74.0	1.469E+08	Trn A	6.150E+06	6.210E+06	1.07
5.0	2.922E+07	89.5	.0	74.0	74.0	1.469E+08	Trn A	6.150E+06	6.210E+06	1.07
5.1	2.921E+07	89.5	.0	74.0	74.0	1.468E+08	Trn A	6.150E+06	6.210E+06	1.07
5.2	2.920E+07	89.6	.0	74.0	74.0	1.468E+08	Trn A	6.150E+06	6.210E+06	1.07
5.3	2.919E+07	89.7	.0	74.0	74.0	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.4	2.918E+07	89.8	.0	74.0	74.0	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.5	2.917E+07	89.9	.0	74.0	74.0	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.6	2.916E+07	89.9	.0	74.0	74.0	1.466E+08	Trn A	6.150E+06	6.210E+06	1.07
5.7	2.915E+07	90.0	.0	74.0	74.0	1.466E+08	Trn A	6.150E+06	6.210E+06	1.07
5.8	2.914E+07	90.1	.0	74.0	74.0	1.465E+08	Trn A	6.150E+06	6.210E+06	1.07
5.9	2.913E+07	90.2	.0	74.0	74.0	1.465E+08	Trn A	6.150E+06	6.210E+06	1.07
6.0	2.912E+07	90.2	.0	74.0	74.0	1.464E+08	Trn A	6.150E+06	6.210E+06	1.07
6.1	2.911E+07	90.3	.0	74.0	74.0	1.463E+08	Trn A	6.150E+06	6.210E+06	1.07
6.2	2.910E+07	90.4	.0	74.0	74.0	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07
6.3	2.909E+07	90.4	.0	74.0	74.0	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 137 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=75F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
6.4	2.908E+07	90.5	.0	74.0	74.0	1.461E+08	Trn A	6.150E+06	6.210E+06	1.07
6.5	2.907E+07	90.6	.0	74.0	74.0	1.460E+08	Trn A	6.150E+06	6.210E+06	1.07
6.6	2.906E+07	90.6	.0	74.0	74.0	1.459E+08	Trn A	6.150E+06	6.210E+06	1.07
6.7	2.905E+07	90.7	.0	74.0	74.0	1.458E+08	Trn A	6.150E+06	6.210E+06	1.07
6.8	2.904E+07	90.8	.0	74.0	74.0	1.457E+08	Trn A	6.150E+06	6.210E+06	1.07
6.9	2.903E+07	90.8	.0	74.0	74.0	1.456E+08	Trn A	6.150E+06	6.210E+06	1.07
7.0	2.902E+07	90.9	.0	74.0	74.0	1.455E+08	Trn A	6.150E+06	6.210E+06	1.07
7.1	2.901E+07	90.9	.0	74.0	74.0	1.454E+08	Trn A	6.150E+06	6.210E+06	1.07
7.2	2.900E+07	91.0	.0	74.0	74.0	1.453E+08	Trn A	6.150E+06	6.210E+06	1.07
7.3	2.899E+07	91.1	.0	74.0	74.0	1.452E+08	Trn A	6.150E+06	6.210E+06	1.07
7.4	2.898E+07	91.1	.0	74.0	74.0	1.451E+08	Trn A	6.150E+06	6.210E+06	1.07
7.5	2.897E+07	91.2	.0	74.0	74.0	1.450E+08	Trn A	6.150E+06	6.210E+06	1.07
7.6	2.896E+07	91.2	.0	74.0	74.0	1.449E+08	Trn A	6.150E+06	6.210E+06	1.07
7.7	2.895E+07	91.3	.0	74.0	74.0	1.448E+08	Trn A	6.150E+06	6.210E+06	1.07
7.8	2.894E+07	91.3	.0	74.0	74.0	1.447E+08	Trn A	6.150E+06	6.210E+06	1.07
7.9	2.893E+07	91.4	.0	74.0	74.0	1.446E+08	Trn A	6.150E+06	6.210E+06	1.07
8.0	2.892E+07	91.4	.0	74.0	74.0	1.445E+08	Trn A	6.150E+06	6.210E+06	1.07
8.1	2.891E+07	91.5	.0	74.0	74.0	1.444E+08	Trn A	6.150E+06	6.210E+06	1.07
8.2	2.890E+07	91.5	.0	74.0	74.0	1.443E+08	Trn A	6.150E+06	6.210E+06	1.07
8.3	2.889E+07	91.6	.0	74.0	74.0	1.442E+08	Trn A	6.150E+06	6.210E+06	1.07
8.4	2.888E+07	91.6	.0	74.0	74.0	1.441E+08	Trn A	6.150E+06	6.210E+06	1.07
8.5	2.887E+07	91.7	.0	74.0	74.0	1.440E+08	Trn A	6.150E+06	6.210E+06	1.07
8.6	2.886E+07	91.7	.0	74.0	74.0	1.439E+08	Trn A	6.150E+06	6.210E+06	1.07
8.7	2.885E+07	91.8	.0	74.0	74.0	1.438E+08	Trn A	6.150E+06	6.210E+06	1.07
8.8	2.884E+07	91.8	.0	74.0	74.0	1.437E+08	Trn A	6.150E+06	6.210E+06	1.07
8.9	2.883E+07	91.8	.0	74.0	74.0	1.436E+08	Trn A	6.150E+06	6.210E+06	1.07
9.0	2.882E+07	91.9	.0	74.0	74.0	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.1	2.881E+07	91.9	.0	74.0	74.0	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.2	2.880E+07	92.0	.0	74.0	74.0	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.3	2.879E+07	92.0	.0	74.0	74.0	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.4	2.878E+07	92.1	.0	74.0	74.0	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.5	2.876E+07	92.1	.0	74.0	74.0	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.6	2.875E+07	92.1	.0	74.0	74.0	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07
9.7	2.874E+07	92.2	.0	74.0	74.0	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 138 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=75F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
9.8	2.873E+07	92.2	.0	74.0	74.0	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07
9.9	2.872E+07	92.2	.0	74.0	74.0	1.432E+08	Trn A	6.150E+06	6.210E+06	1.07
10.0	2.871E+07	92.3	.0	74.0	74.0	1.432E+08	Trn A	6.150E+06	6.210E+06	1.07
11.0	2.861E+07	92.6	.0	74.0	74.0	1.429E+08	Trn A	6.150E+06	6.210E+06	1.07
12.0	2.850E+07	92.9	.0	74.0	74.0	1.425E+08	Trn A	6.150E+06	6.210E+06	1.07
13.0	2.839E+07	93.1	.0	74.0	74.0	1.439E+08	Trn A	6.150E+06	6.210E+06	1.07
14.0	2.828E+07	93.4	.0	74.0	74.0	1.453E+08	Trn A	6.150E+06	6.210E+06	1.07
15.0	2.817E+07	93.6	.0	74.0	74.0	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
16.0	2.805E+07	93.8	.0	74.0	74.0	1.481E+08	Trn A	6.150E+06	6.210E+06	1.07
17.0	2.794E+07	94.0	.0	74.0	74.0	1.495E+08	Trn A	6.150E+06	6.210E+06	1.07
18.0	2.782E+07	94.2	.0	74.0	74.0	1.509E+08	Trn A	6.150E+06	6.210E+06	1.07
19.0	2.771E+07	94.4	.0	74.0	74.0	1.505E+08	Trn A	6.150E+06	6.210E+06	1.07
20.0	2.759E+07	94.5	.0	74.0	74.0	1.501E+08	Trn A	6.150E+06	6.210E+06	1.07
21.0	2.747E+07	94.6	.0	74.0	74.0	1.496E+08	Trn A	6.150E+06	6.210E+06	1.07
22.0	2.735E+07	94.7	.0	74.0	74.0	1.492E+08	Trn A	6.150E+06	6.210E+06	1.07
23.0	2.723E+07	94.8	.0	74.0	74.0	1.488E+08	Trn A	6.150E+06	6.210E+06	1.07
24.0	2.712E+07	94.8	.0	74.0	74.0	1.483E+08	Trn A	6.150E+06	6.210E+06	1.07
25.0	2.700E+07	94.9	.0	74.0	74.0	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07
26.0	2.688E+07	94.9	.0	74.0	74.0	1.440E+08	Trn A	6.150E+06	6.210E+06	1.07
27.0	2.676E+07	94.8	.0	74.0	74.0	1.418E+08	Trn A	6.150E+06	6.210E+06	1.07
28.0	2.665E+07	94.8	.0	74.0	74.0	1.396E+08	Trn A	6.150E+06	6.210E+06	1.07
29.0	2.654E+07	94.7	.0	74.0	74.0	1.374E+08	Trn A	6.150E+06	6.210E+06	1.07
30.0	2.643E+07	94.5	.0	74.0	74.0	1.353E+08	Trn A	6.150E+06	6.210E+06	1.07
31.0	2.632E+07	94.4	.0	74.0	74.0	1.331E+08	Trn A	6.150E+06	6.210E+06	1.07
32.0	2.621E+07	94.3	.0	74.0	74.0	1.309E+08	Trn A	6.150E+06	6.210E+06	1.07
33.0	2.610E+07	94.1	.0	74.0	74.0	1.287E+08	Trn A	6.150E+06	6.210E+06	1.07
34.0	2.600E+07	93.9	.0	74.0	74.0	1.265E+08	Trn A	6.150E+06	6.210E+06	1.07
35.0	2.589E+07	93.8	.0	74.0	74.0	1.244E+08	Trn A	6.150E+06	6.210E+06	1.07
36.0	2.579E+07	93.6	.0	74.0	74.0	1.222E+08	Trn A	6.150E+06	6.210E+06	1.07
37.0	2.569E+07	93.4	.0	74.0	74.0	1.215E+08	Trn A	6.150E+06	6.210E+06	1.07
38.0	2.559E+07	93.2	.0	74.0	74.0	1.208E+08	Trn A	6.150E+06	6.210E+06	1.07
39.0	2.549E+07	93.1	.0	74.0	74.0	1.201E+08	Trn A	6.150E+06	6.210E+06	1.07
40.0	2.539E+07	92.9	.0	74.0	74.0	1.194E+08	Trn A	6.150E+06	6.210E+06	1.07
41.0	2.530E+07	92.8	.0	74.0	74.0	1.187E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 139 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=75F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
42.0	2.520E+07	92.7	.0	74.0	74.0	1.180E+08	Trn A	6.150E+06	6.210E+06	1.07
43.0	2.510E+07	92.5	.0	74.0	74.0	1.172E+08	Trn A	6.150E+06	6.210E+06	1.07
44.0	2.501E+07	92.4	.0	74.0	74.0	1.165E+08	Trn A	6.150E+06	6.210E+06	1.07
45.0	2.492E+07	92.3	.0	74.0	74.0	1.158E+08	Trn A	6.150E+06	6.210E+06	1.07
46.0	2.482E+07	92.2	.0	74.0	74.0	1.151E+08	Trn A	6.150E+06	6.210E+06	1.07
47.0	2.473E+07	92.1	.0	74.0	74.0	1.144E+08	Trn A	6.150E+06	6.210E+06	1.07
48.0	2.464E+07	92.0	.0	74.0	74.0	1.137E+08	Trn A	6.150E+06	6.210E+06	1.07
49.0	2.455E+07	91.9	.0	74.0	74.0	1.134E+08	Trn A	6.150E+06	6.210E+06	1.07
50.0	2.446E+07	91.8	.0	74.0	74.0	1.130E+08	Trn A	6.150E+06	6.210E+06	1.07
51.0	2.437E+07	91.8	.0	74.0	74.0	1.126E+08	Trn A	6.150E+06	6.210E+06	1.07
52.0	2.428E+07	91.7	.0	74.0	74.0	1.123E+08	Trn A	6.150E+06	6.210E+06	1.07
53.0	2.419E+07	91.6	.0	74.0	74.0	1.119E+08	Trn A	6.150E+06	6.210E+06	1.07
54.0	2.410E+07	91.6	.0	74.0	74.0	1.116E+08	Trn A	6.150E+06	6.210E+06	1.07
55.0	2.401E+07	91.5	.0	74.0	74.0	1.112E+08	Trn A	6.150E+06	6.210E+06	1.07
56.0	2.392E+07	91.4	.0	74.0	74.0	1.109E+08	Trn A	6.150E+06	6.210E+06	1.07
57.0	2.383E+07	91.4	.0	74.0	74.0	1.105E+08	Trn A	6.150E+06	6.210E+06	1.07
58.0	2.375E+07	91.4	.0	74.0	74.0	1.101E+08	Trn A	6.150E+06	6.210E+06	1.07
59.0	2.366E+07	91.3	.0	74.0	74.0	1.098E+08	Trn A	6.150E+06	6.210E+06	1.07
60.0	2.357E+07	91.3	.0	74.0	74.0	1.094E+08	Trn A	6.150E+06	6.210E+06	1.07
61.0	2.348E+07	91.2	.0	74.0	74.0	1.091E+08	Trn A	6.150E+06	6.210E+06	1.07
62.0	2.340E+07	91.2	.0	74.0	74.0	1.087E+08	Trn A	6.150E+06	6.210E+06	1.07
63.0	2.331E+07	91.1	.0	74.0	74.0	1.083E+08	Trn A	6.150E+06	6.210E+06	1.07
64.0	2.323E+07	91.1	.0	74.0	74.0	1.080E+08	Trn A	6.150E+06	6.210E+06	1.07
65.0	2.314E+07	91.0	.0	74.0	74.0	1.076E+08	Trn A	6.150E+06	6.210E+06	1.07
66.0	2.306E+07	91.0	.0	74.0	74.0	1.073E+08	Trn A	6.150E+06	6.210E+06	1.07
67.0	2.297E+07	90.9	.0	74.0	74.0	1.069E+08	Trn A	6.150E+06	6.210E+06	1.07
68.0	2.289E+07	90.9	.0	74.0	74.0	1.066E+08	Trn A	6.150E+06	6.210E+06	1.07
69.0	2.280E+07	90.8	.0	74.0	74.0	1.062E+08	Trn A	6.150E+06	6.210E+06	1.07
70.0	2.272E+07	90.8	.0	74.0	74.0	1.058E+08	Trn A	6.150E+06	6.210E+06	1.07
71.0	2.264E+07	90.7	.0	74.0	74.0	1.055E+08	Trn A	6.150E+06	6.210E+06	1.07
72.0	2.255E+07	90.7	.0	74.0	74.0	1.051E+08	Trn A	6.150E+06	6.210E+06	1.07
73.0	2.247E+07	90.7	.0	74.0	74.0	1.048E+08	Trn A	6.150E+06	6.210E+06	1.07
74.0	2.239E+07	90.6	.0	74.0	74.0	1.044E+08	Trn A	6.150E+06	6.210E+06	1.07
75.0	2.230E+07	90.6	.0	74.0	74.0	1.040E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 140 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=75F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
76.0	2.222E+07	90.5	.0	74.0	74.0	1.037E+08	Trn A	6.150E+06	6.210E+06	1.07
77.0	2.214E+07	90.5	.0	74.0	74.0	1.033E+08	Trn A	6.150E+06	6.210E+06	1.07
78.0	2.206E+07	90.5	.0	74.0	74.0	1.029E+08	Trn A	6.150E+06	6.210E+06	1.07
79.0	2.198E+07	90.4	.0	74.0	74.0	1.026E+08	Trn A	6.150E+06	6.210E+06	1.07
80.0	2.190E+07	90.4	.0	74.0	74.0	1.022E+08	Trn A	6.150E+06	6.210E+06	1.07
81.0	2.182E+07	90.3	.0	74.0	74.0	1.018E+08	Trn A	6.150E+06	6.210E+06	1.07
82.0	2.174E+07	90.3	.0	74.0	74.0	1.015E+08	Trn A	6.150E+06	6.210E+06	1.07
83.0	2.166E+07	90.2	.0	74.0	74.0	1.011E+08	Trn A	6.150E+06	6.210E+06	1.07
84.0	2.158E+07	90.2	.0	74.0	74.0	1.007E+08	Trn A	6.150E+06	6.210E+06	1.07
85.0	2.150E+07	90.1	.0	74.0	74.0	1.004E+08	Trn A	6.150E+06	6.210E+06	1.07
86.0	2.142E+07	90.1	.0	74.0	74.0	9.999E+07	Trn A	6.150E+06	6.210E+06	1.07
87.0	2.134E+07	90.1	.0	74.0	74.0	9.962E+07	Trn A	6.150E+06	6.210E+06	1.07
88.0	2.126E+07	90.0	.0	74.0	74.0	9.925E+07	Trn A	6.150E+06	6.210E+06	1.07
89.0	2.119E+07	90.0	.0	74.0	74.0	9.888E+07	Trn A	6.150E+06	6.210E+06	1.07
90.0	2.111E+07	89.9	.0	74.0	74.0	9.852E+07	Trn A	6.150E+06	6.210E+06	1.07
91.0	2.103E+07	89.9	.0	74.0	74.0	9.815E+07	Trn A	6.150E+06	6.210E+06	1.07
92.0	2.095E+07	89.8	.0	74.0	74.0	9.778E+07	Trn A	6.150E+06	6.210E+06	1.07
93.0	2.088E+07	89.8	.0	74.0	74.0	9.741E+07	Trn A	6.150E+06	6.210E+06	1.07
94.0	2.080E+07	89.7	.0	74.0	74.0	9.705E+07	Trn A	6.150E+06	6.210E+06	1.07
95.0	2.073E+07	89.7	.0	74.0	74.0	9.668E+07	Trn A	6.150E+06	6.210E+06	1.07
96.0	2.065E+07	89.6	.0	74.0	74.0	9.631E+07	Trn A	6.150E+06	6.210E+06	1.07
97.0	2.057E+07	89.6	.0	74.0	74.0	9.612E+07	Trn A	6.150E+06	6.210E+06	1.07
98.0	2.050E+07	89.6	.0	74.0	74.0	9.593E+07	Trn A	6.150E+06	6.210E+06	1.07
99.0	2.042E+07	89.5	.0	74.0	74.0	9.574E+07	Trn A	6.150E+06	6.210E+06	1.07
100.0	2.035E+07	89.5	.0	74.0	74.0	9.555E+07	Trn A	6.150E+06	6.210E+06	1.07
101.0	2.027E+07	89.4	.0	74.0	74.0	9.536E+07	Trn A	6.150E+06	6.210E+06	1.07
102.0	2.020E+07	89.4	.0	74.0	74.0	9.517E+07	Trn A	6.150E+06	6.210E+06	1.07
103.0	2.013E+07	89.4	.0	74.0	74.0	9.498E+07	Trn A	6.150E+06	6.210E+06	1.07
104.0	2.005E+07	89.4	.0	74.0	74.0	9.479E+07	Trn A	6.150E+06	6.210E+06	1.07
105.0	1.998E+07	89.3	.0	74.0	74.0	9.460E+07	Trn A	6.150E+06	6.210E+06	1.07
106.0	1.990E+07	89.3	.0	74.0	74.0	9.441E+07	Trn A	6.150E+06	6.210E+06	1.07
107.0	1.983E+07	89.3	.0	74.0	74.0	9.422E+07	Trn A	6.150E+06	6.210E+06	1.07
108.0	1.976E+07	89.2	.0	74.0	74.0	9.403E+07	Trn A	6.150E+06	6.210E+06	1.07
109.0	1.968E+07	89.2	.0	74.0	74.0	9.384E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 141 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=75F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
110.0	1.961E+07	89.2	.0	74.0	74.0	9.365E+07	Trn A	6.150E+06	6.210E+06	1.07
111.0	1.954E+07	89.2	.0	74.0	74.0	9.346E+07	Trn A	6.150E+06	6.210E+06	1.07
112.0	1.946E+07	89.1	.0	74.0	74.0	9.327E+07	Trn A	6.150E+06	6.210E+06	1.07
113.0	1.939E+07	89.1	.0	74.0	74.0	9.308E+07	Trn A	6.150E+06	6.210E+06	1.07
114.0	1.932E+07	89.1	.0	74.0	74.0	9.289E+07	Trn A	6.150E+06	6.210E+06	1.07
115.0	1.925E+07	89.1	.0	74.0	74.0	9.270E+07	Trn A	6.150E+06	6.210E+06	1.07
116.0	1.918E+07	89.0	.0	74.0	74.0	9.251E+07	Trn A	6.150E+06	6.210E+06	1.07
117.0	1.910E+07	89.0	.0	74.0	74.0	9.232E+07	Trn A	6.150E+06	6.210E+06	1.07
118.0	1.903E+07	89.0	.0	74.0	74.0	9.213E+07	Trn A	6.150E+06	6.210E+06	1.07
119.0	1.896E+07	89.0	.0	74.0	74.0	9.194E+07	Trn A	6.150E+06	6.210E+06	1.07
120.0	1.889E+07	88.9	.0	74.0	74.0	9.175E+07	Trn A	6.150E+06	6.210E+06	1.07
121.0	1.882E+07	88.9	.0	74.0	74.0	9.150E+07	Trn A	6.150E+06	6.210E+06	1.07
122.0	1.875E+07	88.9	.0	74.0	74.0	9.126E+07	Trn A	6.150E+06	6.210E+06	1.07
123.0	1.868E+07	88.9	.0	74.0	74.0	9.101E+07	Trn A	6.150E+06	6.210E+06	1.07
124.0	1.860E+07	88.8	.0	74.0	74.0	9.076E+07	Trn A	6.150E+06	6.210E+06	1.07
125.0	1.853E+07	88.8	.0	74.0	74.0	9.052E+07	Trn A	6.150E+06	6.210E+06	1.07
126.0	1.846E+07	88.8	.0	74.0	74.0	9.027E+07	Trn A	6.150E+06	6.210E+06	1.07
127.0	1.839E+07	88.8	.0	74.0	74.0	9.003E+07	Trn A	6.150E+06	6.210E+06	1.07
128.0	1.832E+07	88.7	.0	74.0	74.0	8.978E+07	Trn A	6.150E+06	6.210E+06	1.07
129.0	1.825E+07	88.7	.0	74.0	74.0	8.953E+07	Trn A	6.150E+06	6.210E+06	1.07
130.0	1.818E+07	88.7	.0	74.0	74.0	8.929E+07	Trn A	6.150E+06	6.210E+06	1.07
131.0	1.812E+07	88.6	.0	74.0	74.0	8.904E+07	Trn A	6.150E+06	6.210E+06	1.07
132.0	1.805E+07	88.6	.0	74.0	74.0	8.880E+07	Trn A	6.150E+06	6.210E+06	1.07
133.0	1.798E+07	88.6	.0	74.0	74.0	8.855E+07	Trn A	6.150E+06	6.210E+06	1.07
134.0	1.791E+07	88.6	.0	74.0	74.0	8.830E+07	Trn A	6.150E+06	6.210E+06	1.07
135.0	1.784E+07	88.5	.0	74.0	74.0	8.806E+07	Trn A	6.150E+06	6.210E+06	1.07
136.0	1.777E+07	88.5	.0	74.0	74.0	8.781E+07	Trn A	6.150E+06	6.210E+06	1.07
137.0	1.770E+07	88.5	.0	74.0	74.0	8.757E+07	Trn A	6.150E+06	6.210E+06	1.07
138.0	1.764E+07	88.4	.0	74.0	74.0	8.732E+07	Trn A	6.150E+06	6.210E+06	1.07
139.0	1.757E+07	88.4	.0	74.0	74.0	8.707E+07	Trn A	6.150E+06	6.210E+06	1.07
140.0	1.750E+07	88.4	.0	74.0	74.0	8.683E+07	Trn A	6.150E+06	6.210E+06	1.07
141.0	1.743E+07	88.3	.0	74.0	74.0	8.658E+07	Trn A	6.150E+06	6.210E+06	1.07
142.0	1.737E+07	88.3	.0	74.0	74.0	8.634E+07	Trn A	6.150E+06	6.210E+06	1.07
143.0	1.730E+07	88.3	.0	74.0	74.0	8.609E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 142 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=75F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
144.0	1.723E+07	88.2	.0	74.0	74.0	8.584E+07	Trn A	6.150E+06	6.210E+06	1.07
145.0	1.717E+07	88.2	.0	74.0	74.0	8.575E+07	Trn A	6.150E+06	6.210E+06	1.07
146.0	1.710E+07	88.2	.0	74.0	74.0	8.567E+07	Trn A	6.150E+06	6.210E+06	1.07
147.0	1.703E+07	88.2	.0	74.0	74.0	8.558E+07	Trn A	6.150E+06	6.210E+06	1.07
148.0	1.697E+07	88.1	.0	74.0	74.0	8.549E+07	Trn A	6.150E+06	6.210E+06	1.07
149.0	1.690E+07	88.1	.0	74.0	74.0	8.540E+07	Trn A	6.150E+06	6.210E+06	1.07
150.0	1.684E+07	88.1	.0	74.0	74.0	8.531E+07	Trn A	6.150E+06	6.210E+06	1.07
151.0	1.677E+07	88.1	.0	74.0	74.0	8.522E+07	Trn A	6.150E+06	6.210E+06	1.07
152.0	1.670E+07	88.1	.0	74.0	74.0	8.513E+07	Trn A	6.150E+06	6.210E+06	1.07
153.0	1.664E+07	88.0	.0	74.0	74.0	8.504E+07	Trn A	6.150E+06	6.210E+06	1.07
154.0	1.657E+07	88.0	.0	74.0	74.0	8.495E+07	Trn A	6.150E+06	6.210E+06	1.07
155.0	1.651E+07	88.0	.0	74.0	74.0	8.486E+07	Trn A	6.150E+06	6.210E+06	1.07
156.0	1.644E+07	88.0	.0	74.0	74.0	8.477E+07	Trn A	6.150E+06	6.210E+06	1.07
157.0	1.638E+07	88.0	.0	74.0	74.0	8.468E+07	Trn A	6.150E+06	6.210E+06	1.07
158.0	1.631E+07	88.0	.0	74.0	74.0	8.459E+07	Trn A	6.150E+06	6.210E+06	1.07
159.0	1.625E+07	88.0	.0	74.0	74.0	8.450E+07	Trn A	6.150E+06	6.210E+06	1.07
160.0	1.618E+07	87.9	.0	74.0	74.0	8.441E+07	Trn A	6.150E+06	6.210E+06	1.07
161.0	1.612E+07	87.9	.0	74.0	74.0	8.432E+07	Trn A	6.150E+06	6.210E+06	1.07
162.0	1.605E+07	87.9	.0	74.0	74.0	8.423E+07	Trn A	6.150E+06	6.210E+06	1.07
163.0	1.599E+07	87.9	.0	74.0	74.0	8.415E+07	Trn A	6.150E+06	6.210E+06	1.07
164.0	1.592E+07	87.9	.0	74.0	74.0	8.406E+07	Trn A	6.150E+06	6.210E+06	1.07
165.0	1.586E+07	87.9	.0	74.0	74.0	8.397E+07	Trn A	6.150E+06	6.210E+06	1.07
166.0	1.579E+07	87.9	.0	74.0	74.0	8.388E+07	Trn A	6.150E+06	6.210E+06	1.07
167.0	1.573E+07	87.9	.0	74.0	74.0	8.379E+07	Trn A	6.150E+06	6.210E+06	1.07
168.0	1.566E+07	87.9	.0	74.0	74.0	8.370E+07	Trn A	6.150E+06	6.210E+06	1.07
169.0	1.560E+07	87.9	.0	74.0	74.0	8.372E+07	Trn A	6.150E+06	6.210E+06	1.07
170.0	1.553E+07	87.9	.0	74.0	74.0	8.374E+07	Trn A	6.150E+06	6.210E+06	1.07
171.0	1.547E+07	87.8	.0	74.0	74.0	8.376E+07	Trn A	6.150E+06	6.210E+06	1.07
172.0	1.540E+07	87.8	.0	74.0	74.0	8.378E+07	Trn A	6.150E+06	6.210E+06	1.07
173.0	1.534E+07	87.8	.0	74.0	74.0	8.380E+07	Trn A	6.150E+06	6.210E+06	1.07
174.0	1.528E+07	87.8	.0	74.0	74.0	8.382E+07	Trn A	6.150E+06	6.210E+06	1.07
175.0	1.521E+07	87.8	.0	74.0	74.0	8.384E+07	Trn A	6.150E+06	6.210E+06	1.07
176.0	1.515E+07	87.8	.0	74.0	74.0	8.386E+07	Trn A	6.150E+06	6.210E+06	1.07
177.0	1.508E+07	87.8	.0	74.0	74.0	8.388E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 143 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=75F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
178.0	1.502E+07	87.8	.0	74.0	74.0	8.390E+07	Trn A	6.150E+06	6.210E+06	1.07
179.0	1.495E+07	87.8	.0	74.0	74.0	8.392E+07	Trn A	6.150E+06	6.210E+06	1.07
180.0	1.489E+07	87.8	.0	74.0	74.0	8.394E+07	Trn A	6.150E+06	6.210E+06	1.07
181.0	1.482E+07	87.8	.0	74.0	74.0	8.396E+07	Trn A	6.150E+06	6.210E+06	1.07
182.0	1.476E+07	87.8	.0	74.0	74.0	8.399E+07	Trn A	6.150E+06	6.210E+06	1.07
183.0	1.470E+07	87.8	.0	74.0	74.0	8.401E+07	Trn A	6.150E+06	6.210E+06	1.07
184.0	1.463E+07	87.8	.0	74.0	74.0	8.403E+07	Trn A	6.150E+06	6.210E+06	1.07
185.0	1.457E+07	87.9	.0	74.0	74.0	8.405E+07	Trn A	6.150E+06	6.210E+06	1.07
186.0	1.450E+07	87.9	.0	74.0	74.0	8.407E+07	Trn A	6.150E+06	6.210E+06	1.07
187.0	1.444E+07	87.9	.0	74.0	74.0	8.409E+07	Trn A	6.150E+06	6.210E+06	1.07
188.0	1.437E+07	87.9	.0	74.0	74.0	8.411E+07	Trn A	6.150E+06	6.210E+06	1.07
189.0	1.431E+07	87.8	.0	74.0	74.0	8.413E+07	Trn A	6.150E+06	6.210E+06	1.07
190.0	1.424E+07	87.8	.0	74.0	74.0	8.415E+07	Trn A	6.150E+06	6.210E+06	1.07
191.0	1.418E+07	87.8	.0	74.0	74.0	8.417E+07	Trn A	6.150E+06	6.210E+06	1.07
192.0	1.411E+07	87.8	.0	74.0	74.0	8.419E+07	Trn A	6.150E+06	6.210E+06	1.07
193.0	1.405E+07	87.8	.0	74.0	74.0	8.400E+07	Trn A	6.150E+06	6.210E+06	1.07
194.0	1.398E+07	87.8	.0	74.0	74.0	8.381E+07	Trn A	6.150E+06	6.210E+06	1.07
195.0	1.392E+07	87.8	.0	74.0	74.0	8.362E+07	Trn A	6.150E+06	6.210E+06	1.07
196.0	1.386E+07	87.8	.0	74.0	74.0	8.343E+07	Trn A	6.150E+06	6.210E+06	1.07
197.0	1.379E+07	87.8	.0	74.0	74.0	8.324E+07	Trn A	6.150E+06	6.210E+06	1.07
198.0	1.373E+07	87.8	.0	74.0	74.0	8.305E+07	Trn A	6.150E+06	6.210E+06	1.07
199.0	1.366E+07	87.8	.0	74.0	74.0	8.287E+07	Trn A	6.150E+06	6.210E+06	1.07
200.0	1.360E+07	87.8	.0	74.0	74.0	8.268E+07	Trn A	6.150E+06	6.210E+06	1.07
201.0	1.354E+07	87.7	.0	74.0	74.0	8.249E+07	Trn A	6.150E+06	6.210E+06	1.07
202.0	1.347E+07	87.7	.0	74.0	74.0	8.230E+07	Trn A	6.150E+06	6.210E+06	1.07
203.0	1.341E+07	87.7	.0	74.0	74.0	8.211E+07	Trn A	6.150E+06	6.210E+06	1.07
204.0	1.335E+07	87.7	.0	74.0	74.0	8.192E+07	Trn A	6.150E+06	6.210E+06	1.07
205.0	1.328E+07	87.6	.0	74.0	74.0	8.173E+07	Trn A	6.150E+06	6.210E+06	1.07
206.0	1.322E+07	87.6	.0	74.0	74.0	8.154E+07	Trn A	6.150E+06	6.210E+06	1.07
207.0	1.316E+07	87.6	.0	74.0	74.0	8.135E+07	Trn A	6.150E+06	6.210E+06	1.07
208.0	1.309E+07	87.6	.0	74.0	74.0	8.116E+07	Trn A	6.150E+06	6.210E+06	1.07
209.0	1.303E+07	87.5	.0	74.0	74.0	8.097E+07	Trn A	6.150E+06	6.210E+06	1.07
210.0	1.297E+07	87.5	.0	74.0	74.0	8.078E+07	Trn A	6.150E+06	6.210E+06	1.07
211.0	1.291E+07	87.5	.0	74.0	74.0	8.060E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 144 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=75F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	Kav/L [-]
212.0	1.285E+07	87.5	.0	74.0	74.0	8.041E+07	Trn A	6.150E+06	6.210E+06	1.07
213.0	1.278E+07	87.4	.0	74.0	74.0	8.022E+07	Trn A	6.150E+06	6.210E+06	1.07
214.0	1.272E+07	87.4	.0	74.0	74.0	8.003E+07	Trn A	6.150E+06	6.210E+06	1.07
215.0	1.266E+07	87.4	.0	74.0	74.0	7.984E+07	Trn A	6.150E+06	6.210E+06	1.07
216.0	1.260E+07	87.4	.0	74.0	74.0	7.965E+07	Trn A	6.150E+06	6.210E+06	1.07
217.0	1.254E+07	87.3	.0	74.0	74.0	7.969E+07	Trn A	6.150E+06	6.210E+06	1.07
218.0	1.248E+07	87.3	.0	74.0	74.0	7.972E+07	Trn A	6.150E+06	6.210E+06	1.07
219.0	1.242E+07	87.3	.0	74.0	74.0	7.976E+07	Trn A	6.150E+06	6.210E+06	1.07
220.0	1.235E+07	87.3	.0	74.0	74.0	7.980E+07	Trn A	6.150E+06	6.210E+06	1.07
221.0	1.229E+07	87.3	.0	74.0	74.0	7.984E+07	Trn A	6.150E+06	6.210E+06	1.07
222.0	1.223E+07	87.3	.0	74.0	74.0	7.987E+07	Trn A	6.150E+06	6.210E+06	1.07
223.0	1.217E+07	87.3	.0	74.0	74.0	7.991E+07	Trn A	6.150E+06	6.210E+06	1.07
224.0	1.211E+07	87.3	.0	74.0	74.0	7.995E+07	Trn A	6.150E+06	6.210E+06	1.07
225.0	1.205E+07	87.3	.0	74.0	74.0	7.999E+07	Trn A	6.150E+06	6.210E+06	1.07
226.0	1.199E+07	87.3	.0	74.0	74.0	8.002E+07	Trn A	6.150E+06	6.210E+06	1.07
227.0	1.193E+07	87.3	.0	74.0	74.0	8.006E+07	Trn A	6.150E+06	6.210E+06	1.07
228.0	1.186E+07	87.3	.0	74.0	74.0	8.010E+07	Trn A	6.150E+06	6.210E+06	1.07
229.0	1.180E+07	87.3	.0	74.0	74.0	8.014E+07	Trn A	6.150E+06	6.210E+06	1.07
230.0	1.174E+07	87.3	.0	74.0	74.0	8.017E+07	Trn A	6.150E+06	6.210E+06	1.07
231.0	1.168E+07	87.3	.0	74.0	74.0	8.021E+07	Trn A	6.150E+06	6.210E+06	1.07
232.0	1.162E+07	87.3	.0	74.0	74.0	8.025E+07	Trn A	6.150E+06	6.210E+06	1.07
233.0	1.156E+07	87.3	.0	74.0	74.0	8.029E+07	Trn A	6.150E+06	6.210E+06	1.07
234.0	1.150E+07	87.3	.0	74.0	74.0	8.032E+07	Trn A	6.150E+06	6.210E+06	1.07
235.0	1.143E+07	87.4	.0	74.0	74.0	8.036E+07	Trn A	6.150E+06	6.210E+06	1.07
236.0	1.137E+07	87.4	.0	74.0	74.0	8.040E+07	Trn A	6.150E+06	6.210E+06	1.07
237.0	1.131E+07	87.4	.0	74.0	74.0	8.044E+07	Trn A	6.150E+06	6.210E+06	1.07
238.0	1.125E+07	87.4	.0	74.0	74.0	8.047E+07	Trn A	6.150E+06	6.210E+06	1.07
239.0	1.119E+07	87.4	.0	74.0	74.0	8.051E+07	Trn A	6.150E+06	6.210E+06	1.07
240.0	1.113E+07	87.4	.0	74.0	74.0	8.055E+07	Trn A	6.150E+06	6.210E+06	1.07

Stop - Program terminated.

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 145 of 166
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14. UHSSIM input/output for Fan3_70F, 3-Fan Case with IBT of 70 °F

Fan3_70F.inp

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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=70F
# design wet-bulb temperature [F], design dry-bulb temperature [F],
# design hot-water temperature [F], design pressure [psia], design solids [ppt]
# 0 => F, psia, btu/hr, lbm/hr units
82, 98, 129.0, 14.696, 0.0, 0
# initial basin mass [lbm], initial basin temperature [F], initial solids [ppt],
# number of towers, starting time of simulation [hr]
29843200, 70, 0, 2, 0.
# Time Period Data -- every 0.1 hour for 10 hr then every hour up to 10 days
# step size, number of steps
0.1,100
1,230
*
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,6.15e6,6.21e6,1.07
240.0,6.15e6,6.21e6,1.07
*
# Train B
Trn B
0.0,2.05e6,0.0,1.07
240.0,2.05e6,0.0,1.07
*
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
0 s 3.2565E+08
50 s 3.2565E+08
101 s 3.2565E+08
116 s 3.1609E+08
120 s 3.1487E+08
150 s 3.1640E+08
300 s 3.1640E+08
900 s 3.1640E+08
1800 s 3.0196E+08
2704 s 2.8660E+08
2706 s 4.4627E+08
3600 s 4.3946E+08
2 h 2.2984E+08
4 h 1.4731E+08
6 h 1.4644E+08
9 h 1.4354E+08
12 h 1.4254E+08
18 h 1.5095E+08
24 h 1.4834E+08
36 h 1.2219E+08
2 d 1.1371E+08
3 d 1.0513E+08
4 d 9.6311E+07
5 d 9.1747E+07
6 d 8.5844E+07
7 d 8.3698E+07
8 d 8.4190E+07
9 d 7.9649E+07
10 d 8.0549E+07
*
# Ambient Data Supplied by Bechtel Power Corp.
# TIME WB DB P
# (hr) (F) (F) (psia)
0, 74.2, 74.2, 14.7
240, 74.2, 74.2, 14.7

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Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 146 of 166
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Fan3_70F.out

Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=70F

Initial Basin Mass 2.984E+07 lbm
Initial Basin Temperature 70.0 F
Initial Basin Solids .0 ppt

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
.0	2.984E+07	70.0	.0	74.2	74.2	3.257E+08	Trn A	6.150E+06	6.210E+06	1.07
.1	2.983E+07	70.6	.0	74.2	74.2	3.164E+08	Trn A	6.150E+06	6.210E+06	1.07
.2	2.982E+07	71.2	.0	74.2	74.2	3.164E+08	Trn A	6.150E+06	6.210E+06	1.07
.3	2.981E+07	71.8	.0	74.2	74.2	3.135E+08	Trn A	6.150E+06	6.210E+06	1.07
.4	2.980E+07	72.4	.0	74.2	74.2	3.077E+08	Trn A	6.150E+06	6.210E+06	1.07
.5	2.979E+07	73.0	.0	74.2	74.2	3.020E+08	Trn A	6.150E+06	6.210E+06	1.07
.6	2.978E+07	73.6	.0	74.2	74.2	2.958E+08	Trn A	6.150E+06	6.210E+06	1.07
.7	2.977E+07	74.1	.0	74.2	74.2	2.897E+08	Trn A	6.150E+06	6.210E+06	1.07
.8	2.976E+07	74.7	.0	74.2	74.2	4.449E+08	Trn A	6.150E+06	6.210E+06	1.07
.9	2.974E+07	75.4	.0	74.2	74.2	4.422E+08	Trn A	6.150E+06	6.210E+06	1.07
1.0	2.972E+07	76.1	.0	74.2	74.2	4.395E+08	Trn A	6.150E+06	6.210E+06	1.07
1.1	2.970E+07	76.8	.0	74.2	74.2	4.185E+08	Trn A	6.150E+06	6.210E+06	1.07
1.2	2.968E+07	77.4	.0	74.2	74.2	3.975E+08	Trn A	6.150E+06	6.210E+06	1.07
1.3	2.966E+07	78.1	.0	74.2	74.2	3.766E+08	Trn A	6.150E+06	6.210E+06	1.07
1.4	2.965E+07	78.6	.0	74.2	74.2	3.556E+08	Trn A	6.150E+06	6.210E+06	1.07
1.5	2.963E+07	79.2	.0	74.2	74.2	3.346E+08	Trn A	6.150E+06	6.210E+06	1.07
1.6	2.962E+07	79.7	.0	74.2	74.2	3.137E+08	Trn A	6.150E+06	6.210E+06	1.07
1.7	2.961E+07	80.1	.0	74.2	74.2	2.927E+08	Trn A	6.150E+06	6.210E+06	1.07
1.8	2.959E+07	80.5	.0	74.2	74.2	2.718E+08	Trn A	6.150E+06	6.210E+06	1.07
1.9	2.958E+07	80.9	.0	74.2	74.2	2.508E+08	Trn A	6.150E+06	6.210E+06	1.07
2.0	2.957E+07	81.3	.0	74.2	74.2	2.298E+08	Trn A	6.150E+06	6.210E+06	1.07
2.1	2.956E+07	81.6	.0	74.2	74.2	2.257E+08	Trn A	6.150E+06	6.210E+06	1.07
2.2	2.955E+07	81.9	.0	74.2	74.2	2.216E+08	Trn A	6.150E+06	6.210E+06	1.07
2.3	2.954E+07	82.2	.0	74.2	74.2	2.175E+08	Trn A	6.150E+06	6.210E+06	1.07
2.4	2.953E+07	82.5	.0	74.2	74.2	2.133E+08	Trn A	6.150E+06	6.210E+06	1.07
2.5	2.952E+07	82.8	.0	74.2	74.2	2.092E+08	Trn A	6.150E+06	6.210E+06	1.07
2.6	2.951E+07	83.1	.0	74.2	74.2	2.051E+08	Trn A	6.150E+06	6.210E+06	1.07
2.7	2.950E+07	83.3	.0	74.2	74.2	2.010E+08	Trn A	6.150E+06	6.210E+06	1.07
2.8	2.949E+07	83.6	.0	74.2	74.2	1.968E+08	Trn A	6.150E+06	6.210E+06	1.07
2.9	2.948E+07	83.8	.0	74.2	74.2	1.927E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 147 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=70F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
3.0	2.947E+07	84.1	.0	74.2	74.2	1.886E+08	Trn A	6.150E+06	6.210E+06	1.07
3.1	2.946E+07	84.3	.0	74.2	74.2	1.844E+08	Trn A	6.150E+06	6.210E+06	1.07
3.2	2.945E+07	84.5	.0	74.2	74.2	1.803E+08	Trn A	6.150E+06	6.210E+06	1.07
3.3	2.944E+07	84.7	.0	74.2	74.2	1.762E+08	Trn A	6.150E+06	6.210E+06	1.07
3.4	2.943E+07	84.9	.0	74.2	74.2	1.721E+08	Trn A	6.150E+06	6.210E+06	1.07
3.5	2.942E+07	85.1	.0	74.2	74.2	1.679E+08	Trn A	6.150E+06	6.210E+06	1.07
3.6	2.941E+07	85.3	.0	74.2	74.2	1.638E+08	Trn A	6.150E+06	6.210E+06	1.07
3.7	2.941E+07	85.4	.0	74.2	74.2	1.597E+08	Trn A	6.150E+06	6.210E+06	1.07
3.8	2.940E+07	85.6	.0	74.2	74.2	1.556E+08	Trn A	6.150E+06	6.210E+06	1.07
3.9	2.939E+07	85.7	.0	74.2	74.2	1.514E+08	Trn A	6.150E+06	6.210E+06	1.07
4.0	2.938E+07	85.9	.0	74.2	74.2	1.473E+08	Trn A	6.150E+06	6.210E+06	1.07
4.1	2.937E+07	86.0	.0	74.2	74.2	1.473E+08	Trn A	6.150E+06	6.210E+06	1.07
4.2	2.936E+07	86.2	.0	74.2	74.2	1.472E+08	Trn A	6.150E+06	6.210E+06	1.07
4.3	2.936E+07	86.3	.0	74.2	74.2	1.472E+08	Trn A	6.150E+06	6.210E+06	1.07
4.4	2.935E+07	86.4	.0	74.2	74.2	1.471E+08	Trn A	6.150E+06	6.210E+06	1.07
4.5	2.934E+07	86.5	.0	74.2	74.2	1.471E+08	Trn A	6.150E+06	6.210E+06	1.07
4.6	2.933E+07	86.7	.0	74.2	74.2	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.7	2.932E+07	86.8	.0	74.2	74.2	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.8	2.931E+07	86.9	.0	74.2	74.2	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.9	2.930E+07	87.0	.0	74.2	74.2	1.469E+08	Trn A	6.150E+06	6.210E+06	1.07
5.0	2.929E+07	87.1	.0	74.2	74.2	1.469E+08	Trn A	6.150E+06	6.210E+06	1.07
5.1	2.929E+07	87.3	.0	74.2	74.2	1.468E+08	Trn A	6.150E+06	6.210E+06	1.07
5.2	2.928E+07	87.4	.0	74.2	74.2	1.468E+08	Trn A	6.150E+06	6.210E+06	1.07
5.3	2.927E+07	87.5	.0	74.2	74.2	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.4	2.926E+07	87.6	.0	74.2	74.2	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.5	2.925E+07	87.7	.0	74.2	74.2	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.6	2.924E+07	87.8	.0	74.2	74.2	1.466E+08	Trn A	6.150E+06	6.210E+06	1.07
5.7	2.923E+07	87.9	.0	74.2	74.2	1.466E+08	Trn A	6.150E+06	6.210E+06	1.07
5.8	2.922E+07	88.0	.0	74.2	74.2	1.465E+08	Trn A	6.150E+06	6.210E+06	1.07
5.9	2.921E+07	88.1	.0	74.2	74.2	1.465E+08	Trn A	6.150E+06	6.210E+06	1.07
6.0	2.920E+07	88.2	.0	74.2	74.2	1.464E+08	Trn A	6.150E+06	6.210E+06	1.07
6.1	2.920E+07	88.3	.0	74.2	74.2	1.463E+08	Trn A	6.150E+06	6.210E+06	1.07
6.2	2.919E+07	88.4	.0	74.2	74.2	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07
6.3	2.918E+07	88.5	.0	74.2	74.2	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 148 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=70F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
6.4	2.917E+07	88.6	.0	74.2	74.2	1.461E+08	Trn A	6.150E+06	6.210E+06	1.07
6.5	2.916E+07	88.7	.0	74.2	74.2	1.460E+08	Trn A	6.150E+06	6.210E+06	1.07
6.6	2.915E+07	88.8	.0	74.2	74.2	1.459E+08	Trn A	6.150E+06	6.210E+06	1.07
6.7	2.914E+07	88.9	.0	74.2	74.2	1.458E+08	Trn A	6.150E+06	6.210E+06	1.07
6.8	2.913E+07	89.0	.0	74.2	74.2	1.457E+08	Trn A	6.150E+06	6.210E+06	1.07
6.9	2.912E+07	89.1	.0	74.2	74.2	1.456E+08	Trn A	6.150E+06	6.210E+06	1.07
7.0	2.911E+07	89.2	.0	74.2	74.2	1.455E+08	Trn A	6.150E+06	6.210E+06	1.07
7.1	2.910E+07	89.3	.0	74.2	74.2	1.454E+08	Trn A	6.150E+06	6.210E+06	1.07
7.2	2.909E+07	89.4	.0	74.2	74.2	1.453E+08	Trn A	6.150E+06	6.210E+06	1.07
7.3	2.908E+07	89.4	.0	74.2	74.2	1.452E+08	Trn A	6.150E+06	6.210E+06	1.07
7.4	2.907E+07	89.5	.0	74.2	74.2	1.451E+08	Trn A	6.150E+06	6.210E+06	1.07
7.5	2.906E+07	89.6	.0	74.2	74.2	1.450E+08	Trn A	6.150E+06	6.210E+06	1.07
7.6	2.905E+07	89.7	.0	74.2	74.2	1.449E+08	Trn A	6.150E+06	6.210E+06	1.07
7.7	2.904E+07	89.8	.0	74.2	74.2	1.448E+08	Trn A	6.150E+06	6.210E+06	1.07
7.8	2.903E+07	89.8	.0	74.2	74.2	1.447E+08	Trn A	6.150E+06	6.210E+06	1.07
7.9	2.902E+07	89.9	.0	74.2	74.2	1.446E+08	Trn A	6.150E+06	6.210E+06	1.07
8.0	2.901E+07	90.0	.0	74.2	74.2	1.445E+08	Trn A	6.150E+06	6.210E+06	1.07
8.1	2.900E+07	90.1	.0	74.2	74.2	1.444E+08	Trn A	6.150E+06	6.210E+06	1.07
8.2	2.900E+07	90.1	.0	74.2	74.2	1.443E+08	Trn A	6.150E+06	6.210E+06	1.07
8.3	2.899E+07	90.2	.0	74.2	74.2	1.442E+08	Trn A	6.150E+06	6.210E+06	1.07
8.4	2.898E+07	90.3	.0	74.2	74.2	1.441E+08	Trn A	6.150E+06	6.210E+06	1.07
8.5	2.897E+07	90.3	.0	74.2	74.2	1.440E+08	Trn A	6.150E+06	6.210E+06	1.07
8.6	2.896E+07	90.4	.0	74.2	74.2	1.439E+08	Trn A	6.150E+06	6.210E+06	1.07
8.7	2.895E+07	90.5	.0	74.2	74.2	1.438E+08	Trn A	6.150E+06	6.210E+06	1.07
8.8	2.894E+07	90.5	.0	74.2	74.2	1.437E+08	Trn A	6.150E+06	6.210E+06	1.07
8.9	2.893E+07	90.6	.0	74.2	74.2	1.436E+08	Trn A	6.150E+06	6.210E+06	1.07
9.0	2.892E+07	90.7	.0	74.2	74.2	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.1	2.891E+07	90.7	.0	74.2	74.2	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.2	2.890E+07	90.8	.0	74.2	74.2	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.3	2.889E+07	90.8	.0	74.2	74.2	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.4	2.888E+07	90.9	.0	74.2	74.2	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.5	2.887E+07	91.0	.0	74.2	74.2	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.6	2.886E+07	91.0	.0	74.2	74.2	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07
9.7	2.885E+07	91.1	.0	74.2	74.2	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 149 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=70F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
9.8	2.884E+07	91.1	.0	74.2	74.2	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07
9.9	2.883E+07	91.2	.0	74.2	74.2	1.432E+08	Trn A	6.150E+06	6.210E+06	1.07
10.0	2.882E+07	91.2	.0	74.2	74.2	1.432E+08	Trn A	6.150E+06	6.210E+06	1.07
11.0	2.871E+07	91.7	.0	74.2	74.2	1.429E+08	Trn A	6.150E+06	6.210E+06	1.07
12.0	2.861E+07	92.1	.0	74.2	74.2	1.425E+08	Trn A	6.150E+06	6.210E+06	1.07
13.0	2.850E+07	92.5	.0	74.2	74.2	1.439E+08	Trn A	6.150E+06	6.210E+06	1.07
14.0	2.840E+07	92.8	.0	74.2	74.2	1.453E+08	Trn A	6.150E+06	6.210E+06	1.07
15.0	2.829E+07	93.2	.0	74.2	74.2	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
16.0	2.817E+07	93.5	.0	74.2	74.2	1.481E+08	Trn A	6.150E+06	6.210E+06	1.07
17.0	2.806E+07	93.7	.0	74.2	74.2	1.495E+08	Trn A	6.150E+06	6.210E+06	1.07
18.0	2.795E+07	94.0	.0	74.2	74.2	1.509E+08	Trn A	6.150E+06	6.210E+06	1.07
19.0	2.783E+07	94.2	.0	74.2	74.2	1.505E+08	Trn A	6.150E+06	6.210E+06	1.07
20.0	2.771E+07	94.4	.0	74.2	74.2	1.501E+08	Trn A	6.150E+06	6.210E+06	1.07
21.0	2.760E+07	94.5	.0	74.2	74.2	1.496E+08	Trn A	6.150E+06	6.210E+06	1.07
22.0	2.748E+07	94.7	.0	74.2	74.2	1.492E+08	Trn A	6.150E+06	6.210E+06	1.07
23.0	2.736E+07	94.8	.0	74.2	74.2	1.488E+08	Trn A	6.150E+06	6.210E+06	1.07
24.0	2.724E+07	94.8	.0	74.2	74.2	1.483E+08	Trn A	6.150E+06	6.210E+06	1.07
25.0	2.713E+07	94.9	.0	74.2	74.2	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07
26.0	2.701E+07	94.9	.0	74.2	74.2	1.440E+08	Trn A	6.150E+06	6.210E+06	1.07
27.0	2.689E+07	94.9	.0	74.2	74.2	1.418E+08	Trn A	6.150E+06	6.210E+06	1.07
28.0	2.678E+07	94.8	.0	74.2	74.2	1.396E+08	Trn A	6.150E+06	6.210E+06	1.07
29.0	2.667E+07	94.7	.0	74.2	74.2	1.374E+08	Trn A	6.150E+06	6.210E+06	1.07
30.0	2.655E+07	94.6	.0	74.2	74.2	1.353E+08	Trn A	6.150E+06	6.210E+06	1.07
31.0	2.644E+07	94.5	.0	74.2	74.2	1.331E+08	Trn A	6.150E+06	6.210E+06	1.07
32.0	2.634E+07	94.4	.0	74.2	74.2	1.309E+08	Trn A	6.150E+06	6.210E+06	1.07
33.0	2.623E+07	94.2	.0	74.2	74.2	1.287E+08	Trn A	6.150E+06	6.210E+06	1.07
34.0	2.612E+07	94.0	.0	74.2	74.2	1.265E+08	Trn A	6.150E+06	6.210E+06	1.07
35.0	2.602E+07	93.9	.0	74.2	74.2	1.244E+08	Trn A	6.150E+06	6.210E+06	1.07
36.0	2.592E+07	93.7	.0	74.2	74.2	1.222E+08	Trn A	6.150E+06	6.210E+06	1.07
37.0	2.582E+07	93.5	.0	74.2	74.2	1.215E+08	Trn A	6.150E+06	6.210E+06	1.07
38.0	2.572E+07	93.3	.0	74.2	74.2	1.208E+08	Trn A	6.150E+06	6.210E+06	1.07
39.0	2.562E+07	93.2	.0	74.2	74.2	1.201E+08	Trn A	6.150E+06	6.210E+06	1.07
40.0	2.552E+07	93.0	.0	74.2	74.2	1.194E+08	Trn A	6.150E+06	6.210E+06	1.07
41.0	2.542E+07	92.9	.0	74.2	74.2	1.187E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 150 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=70F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
42.0	2.533E+07	92.8	.0	74.2	74.2	1.180E+08	Trn A	6.150E+06	6.210E+06	1.07
43.0	2.523E+07	92.7	.0	74.2	74.2	1.172E+08	Trn A	6.150E+06	6.210E+06	1.07
44.0	2.514E+07	92.6	.0	74.2	74.2	1.165E+08	Trn A	6.150E+06	6.210E+06	1.07
45.0	2.504E+07	92.4	.0	74.2	74.2	1.158E+08	Trn A	6.150E+06	6.210E+06	1.07
46.0	2.495E+07	92.3	.0	74.2	74.2	1.151E+08	Trn A	6.150E+06	6.210E+06	1.07
47.0	2.486E+07	92.2	.0	74.2	74.2	1.144E+08	Trn A	6.150E+06	6.210E+06	1.07
48.0	2.477E+07	92.2	.0	74.2	74.2	1.137E+08	Trn A	6.150E+06	6.210E+06	1.07
49.0	2.468E+07	92.1	.0	74.2	74.2	1.134E+08	Trn A	6.150E+06	6.210E+06	1.07
50.0	2.458E+07	92.0	.0	74.2	74.2	1.130E+08	Trn A	6.150E+06	6.210E+06	1.07
51.0	2.449E+07	91.9	.0	74.2	74.2	1.126E+08	Trn A	6.150E+06	6.210E+06	1.07
52.0	2.440E+07	91.8	.0	74.2	74.2	1.123E+08	Trn A	6.150E+06	6.210E+06	1.07
53.0	2.432E+07	91.7	.0	74.2	74.2	1.119E+08	Trn A	6.150E+06	6.210E+06	1.07
54.0	2.423E+07	91.7	.0	74.2	74.2	1.116E+08	Trn A	6.150E+06	6.210E+06	1.07
55.0	2.414E+07	91.6	.0	74.2	74.2	1.112E+08	Trn A	6.150E+06	6.210E+06	1.07
56.0	2.405E+07	91.6	.0	74.2	74.2	1.109E+08	Trn A	6.150E+06	6.210E+06	1.07
57.0	2.396E+07	91.5	.0	74.2	74.2	1.105E+08	Trn A	6.150E+06	6.210E+06	1.07
58.0	2.387E+07	91.5	.0	74.2	74.2	1.101E+08	Trn A	6.150E+06	6.210E+06	1.07
59.0	2.379E+07	91.4	.0	74.2	74.2	1.098E+08	Trn A	6.150E+06	6.210E+06	1.07
60.0	2.370E+07	91.4	.0	74.2	74.2	1.094E+08	Trn A	6.150E+06	6.210E+06	1.07
61.0	2.361E+07	91.3	.0	74.2	74.2	1.091E+08	Trn A	6.150E+06	6.210E+06	1.07
62.0	2.353E+07	91.3	.0	74.2	74.2	1.087E+08	Trn A	6.150E+06	6.210E+06	1.07
63.0	2.344E+07	91.2	.0	74.2	74.2	1.083E+08	Trn A	6.150E+06	6.210E+06	1.07
64.0	2.335E+07	91.2	.0	74.2	74.2	1.080E+08	Trn A	6.150E+06	6.210E+06	1.07
65.0	2.327E+07	91.1	.0	74.2	74.2	1.076E+08	Trn A	6.150E+06	6.210E+06	1.07
66.0	2.318E+07	91.1	.0	74.2	74.2	1.073E+08	Trn A	6.150E+06	6.210E+06	1.07
67.0	2.310E+07	91.0	.0	74.2	74.2	1.069E+08	Trn A	6.150E+06	6.210E+06	1.07
68.0	2.301E+07	91.0	.0	74.2	74.2	1.066E+08	Trn A	6.150E+06	6.210E+06	1.07
69.0	2.293E+07	91.0	.0	74.2	74.2	1.062E+08	Trn A	6.150E+06	6.210E+06	1.07
70.0	2.285E+07	90.9	.0	74.2	74.2	1.058E+08	Trn A	6.150E+06	6.210E+06	1.07
71.0	2.276E+07	90.9	.0	74.2	74.2	1.055E+08	Trn A	6.150E+06	6.210E+06	1.07
72.0	2.268E+07	90.8	.0	74.2	74.2	1.051E+08	Trn A	6.150E+06	6.210E+06	1.07
73.0	2.260E+07	90.8	.0	74.2	74.2	1.048E+08	Trn A	6.150E+06	6.210E+06	1.07
74.0	2.251E+07	90.7	.0	74.2	74.2	1.044E+08	Trn A	6.150E+06	6.210E+06	1.07
75.0	2.243E+07	90.7	.0	74.2	74.2	1.040E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 151 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=70F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
76.0	2.235E+07	90.7	.0	74.2	74.2	1.037E+08	Trn A	6.150E+06	6.210E+06	1.07
77.0	2.227E+07	90.6	.0	74.2	74.2	1.033E+08	Trn A	6.150E+06	6.210E+06	1.07
78.0	2.219E+07	90.6	.0	74.2	74.2	1.029E+08	Trn A	6.150E+06	6.210E+06	1.07
79.0	2.211E+07	90.5	.0	74.2	74.2	1.026E+08	Trn A	6.150E+06	6.210E+06	1.07
80.0	2.202E+07	90.5	.0	74.2	74.2	1.022E+08	Trn A	6.150E+06	6.210E+06	1.07
81.0	2.194E+07	90.4	.0	74.2	74.2	1.018E+08	Trn A	6.150E+06	6.210E+06	1.07
82.0	2.186E+07	90.4	.0	74.2	74.2	1.015E+08	Trn A	6.150E+06	6.210E+06	1.07
83.0	2.178E+07	90.3	.0	74.2	74.2	1.011E+08	Trn A	6.150E+06	6.210E+06	1.07
84.0	2.170E+07	90.3	.0	74.2	74.2	1.007E+08	Trn A	6.150E+06	6.210E+06	1.07
85.0	2.163E+07	90.3	.0	74.2	74.2	1.004E+08	Trn A	6.150E+06	6.210E+06	1.07
86.0	2.155E+07	90.2	.0	74.2	74.2	9.999E+07	Trn A	6.150E+06	6.210E+06	1.07
87.0	2.147E+07	90.2	.0	74.2	74.2	9.962E+07	Trn A	6.150E+06	6.210E+06	1.07
88.0	2.139E+07	90.1	.0	74.2	74.2	9.925E+07	Trn A	6.150E+06	6.210E+06	1.07
89.0	2.131E+07	90.1	.0	74.2	74.2	9.888E+07	Trn A	6.150E+06	6.210E+06	1.07
90.0	2.123E+07	90.0	.0	74.2	74.2	9.852E+07	Trn A	6.150E+06	6.210E+06	1.07
91.0	2.116E+07	90.0	.0	74.2	74.2	9.815E+07	Trn A	6.150E+06	6.210E+06	1.07
92.0	2.108E+07	89.9	.0	74.2	74.2	9.778E+07	Trn A	6.150E+06	6.210E+06	1.07
93.0	2.100E+07	89.9	.0	74.2	74.2	9.741E+07	Trn A	6.150E+06	6.210E+06	1.07
94.0	2.093E+07	89.9	.0	74.2	74.2	9.705E+07	Trn A	6.150E+06	6.210E+06	1.07
95.0	2.085E+07	89.8	.0	74.2	74.2	9.668E+07	Trn A	6.150E+06	6.210E+06	1.07
96.0	2.077E+07	89.8	.0	74.2	74.2	9.631E+07	Trn A	6.150E+06	6.210E+06	1.07
97.0	2.070E+07	89.7	.0	74.2	74.2	9.612E+07	Trn A	6.150E+06	6.210E+06	1.07
98.0	2.062E+07	89.7	.0	74.2	74.2	9.593E+07	Trn A	6.150E+06	6.210E+06	1.07
99.0	2.055E+07	89.7	.0	74.2	74.2	9.574E+07	Trn A	6.150E+06	6.210E+06	1.07
100.0	2.047E+07	89.6	.0	74.2	74.2	9.555E+07	Trn A	6.150E+06	6.210E+06	1.07
101.0	2.040E+07	89.6	.0	74.2	74.2	9.536E+07	Trn A	6.150E+06	6.210E+06	1.07
102.0	2.032E+07	89.5	.0	74.2	74.2	9.517E+07	Trn A	6.150E+06	6.210E+06	1.07
103.0	2.025E+07	89.5	.0	74.2	74.2	9.498E+07	Trn A	6.150E+06	6.210E+06	1.07
104.0	2.018E+07	89.5	.0	74.2	74.2	9.479E+07	Trn A	6.150E+06	6.210E+06	1.07
105.0	2.010E+07	89.5	.0	74.2	74.2	9.460E+07	Trn A	6.150E+06	6.210E+06	1.07
106.0	2.003E+07	89.4	.0	74.2	74.2	9.441E+07	Trn A	6.150E+06	6.210E+06	1.07
107.0	1.995E+07	89.4	.0	74.2	74.2	9.422E+07	Trn A	6.150E+06	6.210E+06	1.07
108.0	1.988E+07	89.4	.0	74.2	74.2	9.403E+07	Trn A	6.150E+06	6.210E+06	1.07
109.0	1.981E+07	89.4	.0	74.2	74.2	9.384E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 152 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=70F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
110.0	1.973E+07	89.3	.0	74.2	74.2	9.365E+07	Trn A	6.150E+06	6.210E+06	1.07
111.0	1.966E+07	89.3	.0	74.2	74.2	9.346E+07	Trn A	6.150E+06	6.210E+06	1.07
112.0	1.959E+07	89.3	.0	74.2	74.2	9.327E+07	Trn A	6.150E+06	6.210E+06	1.07
113.0	1.952E+07	89.3	.0	74.2	74.2	9.308E+07	Trn A	6.150E+06	6.210E+06	1.07
114.0	1.944E+07	89.2	.0	74.2	74.2	9.289E+07	Trn A	6.150E+06	6.210E+06	1.07
115.0	1.937E+07	89.2	.0	74.2	74.2	9.270E+07	Trn A	6.150E+06	6.210E+06	1.07
116.0	1.930E+07	89.2	.0	74.2	74.2	9.251E+07	Trn A	6.150E+06	6.210E+06	1.07
117.0	1.923E+07	89.2	.0	74.2	74.2	9.232E+07	Trn A	6.150E+06	6.210E+06	1.07
118.0	1.915E+07	89.1	.0	74.2	74.2	9.213E+07	Trn A	6.150E+06	6.210E+06	1.07
119.0	1.908E+07	89.1	.0	74.2	74.2	9.194E+07	Trn A	6.150E+06	6.210E+06	1.07
120.0	1.901E+07	89.1	.0	74.2	74.2	9.175E+07	Trn A	6.150E+06	6.210E+06	1.07
121.0	1.894E+07	89.1	.0	74.2	74.2	9.150E+07	Trn A	6.150E+06	6.210E+06	1.07
122.0	1.887E+07	89.0	.0	74.2	74.2	9.126E+07	Trn A	6.150E+06	6.210E+06	1.07
123.0	1.880E+07	89.0	.0	74.2	74.2	9.101E+07	Trn A	6.150E+06	6.210E+06	1.07
124.0	1.873E+07	89.0	.0	74.2	74.2	9.076E+07	Trn A	6.150E+06	6.210E+06	1.07
125.0	1.866E+07	89.0	.0	74.2	74.2	9.052E+07	Trn A	6.150E+06	6.210E+06	1.07
126.0	1.859E+07	88.9	.0	74.2	74.2	9.027E+07	Trn A	6.150E+06	6.210E+06	1.07
127.0	1.852E+07	88.9	.0	74.2	74.2	9.003E+07	Trn A	6.150E+06	6.210E+06	1.07
128.0	1.845E+07	88.9	.0	74.2	74.2	8.978E+07	Trn A	6.150E+06	6.210E+06	1.07
129.0	1.838E+07	88.8	.0	74.2	74.2	8.953E+07	Trn A	6.150E+06	6.210E+06	1.07
130.0	1.831E+07	88.8	.0	74.2	74.2	8.929E+07	Trn A	6.150E+06	6.210E+06	1.07
131.0	1.824E+07	88.8	.0	74.2	74.2	8.904E+07	Trn A	6.150E+06	6.210E+06	1.07
132.0	1.817E+07	88.7	.0	74.2	74.2	8.880E+07	Trn A	6.150E+06	6.210E+06	1.07
133.0	1.810E+07	88.7	.0	74.2	74.2	8.855E+07	Trn A	6.150E+06	6.210E+06	1.07
134.0	1.803E+07	88.7	.0	74.2	74.2	8.830E+07	Trn A	6.150E+06	6.210E+06	1.07
135.0	1.796E+07	88.6	.0	74.2	74.2	8.806E+07	Trn A	6.150E+06	6.210E+06	1.07
136.0	1.789E+07	88.6	.0	74.2	74.2	8.781E+07	Trn A	6.150E+06	6.210E+06	1.07
137.0	1.782E+07	88.6	.0	74.2	74.2	8.757E+07	Trn A	6.150E+06	6.210E+06	1.07
138.0	1.776E+07	88.6	.0	74.2	74.2	8.732E+07	Trn A	6.150E+06	6.210E+06	1.07
139.0	1.769E+07	88.5	.0	74.2	74.2	8.707E+07	Trn A	6.150E+06	6.210E+06	1.07
140.0	1.762E+07	88.5	.0	74.2	74.2	8.683E+07	Trn A	6.150E+06	6.210E+06	1.07
141.0	1.755E+07	88.5	.0	74.2	74.2	8.658E+07	Trn A	6.150E+06	6.210E+06	1.07
142.0	1.749E+07	88.4	.0	74.2	74.2	8.634E+07	Trn A	6.150E+06	6.210E+06	1.07
143.0	1.742E+07	88.4	.0	74.2	74.2	8.609E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 153 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=70F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
144.0	1.735E+07	88.4	.0	74.2	74.2	8.584E+07	Trn A	6.150E+06	6.210E+06	1.07
145.0	1.729E+07	88.3	.0	74.2	74.2	8.575E+07	Trn A	6.150E+06	6.210E+06	1.07
146.0	1.722E+07	88.3	.0	74.2	74.2	8.567E+07	Trn A	6.150E+06	6.210E+06	1.07
147.0	1.715E+07	88.3	.0	74.2	74.2	8.558E+07	Trn A	6.150E+06	6.210E+06	1.07
148.0	1.709E+07	88.3	.0	74.2	74.2	8.549E+07	Trn A	6.150E+06	6.210E+06	1.07
149.0	1.702E+07	88.2	.0	74.2	74.2	8.540E+07	Trn A	6.150E+06	6.210E+06	1.07
150.0	1.696E+07	88.2	.0	74.2	74.2	8.531E+07	Trn A	6.150E+06	6.210E+06	1.07
151.0	1.689E+07	88.2	.0	74.2	74.2	8.522E+07	Trn A	6.150E+06	6.210E+06	1.07
152.0	1.682E+07	88.2	.0	74.2	74.2	8.513E+07	Trn A	6.150E+06	6.210E+06	1.07
153.0	1.676E+07	88.2	.0	74.2	74.2	8.504E+07	Trn A	6.150E+06	6.210E+06	1.07
154.0	1.669E+07	88.2	.0	74.2	74.2	8.495E+07	Trn A	6.150E+06	6.210E+06	1.07
155.0	1.663E+07	88.2	.0	74.2	74.2	8.486E+07	Trn A	6.150E+06	6.210E+06	1.07
156.0	1.656E+07	88.1	.0	74.2	74.2	8.477E+07	Trn A	6.150E+06	6.210E+06	1.07
157.0	1.650E+07	88.2	.0	74.2	74.2	8.468E+07	Trn A	6.150E+06	6.210E+06	1.07
158.0	1.643E+07	88.1	.0	74.2	74.2	8.459E+07	Trn A	6.150E+06	6.210E+06	1.07
159.0	1.637E+07	88.1	.0	74.2	74.2	8.450E+07	Trn A	6.150E+06	6.210E+06	1.07
160.0	1.630E+07	88.1	.0	74.2	74.2	8.441E+07	Trn A	6.150E+06	6.210E+06	1.07
161.0	1.623E+07	88.1	.0	74.2	74.2	8.432E+07	Trn A	6.150E+06	6.210E+06	1.07
162.0	1.617E+07	88.1	.0	74.2	74.2	8.423E+07	Trn A	6.150E+06	6.210E+06	1.07
163.0	1.610E+07	88.0	.0	74.2	74.2	8.415E+07	Trn A	6.150E+06	6.210E+06	1.07
164.0	1.604E+07	88.0	.0	74.2	74.2	8.406E+07	Trn A	6.150E+06	6.210E+06	1.07
165.0	1.597E+07	88.0	.0	74.2	74.2	8.397E+07	Trn A	6.150E+06	6.210E+06	1.07
166.0	1.591E+07	88.0	.0	74.2	74.2	8.388E+07	Trn A	6.150E+06	6.210E+06	1.07
167.0	1.585E+07	88.0	.0	74.2	74.2	8.379E+07	Trn A	6.150E+06	6.210E+06	1.07
168.0	1.578E+07	88.0	.0	74.2	74.2	8.370E+07	Trn A	6.150E+06	6.210E+06	1.07
169.0	1.572E+07	88.0	.0	74.2	74.2	8.372E+07	Trn A	6.150E+06	6.210E+06	1.07
170.0	1.565E+07	88.0	.0	74.2	74.2	8.374E+07	Trn A	6.150E+06	6.210E+06	1.07
171.0	1.559E+07	88.0	.0	74.2	74.2	8.376E+07	Trn A	6.150E+06	6.210E+06	1.07
172.0	1.552E+07	88.0	.0	74.2	74.2	8.378E+07	Trn A	6.150E+06	6.210E+06	1.07
173.0	1.546E+07	88.0	.0	74.2	74.2	8.380E+07	Trn A	6.150E+06	6.210E+06	1.07
174.0	1.539E+07	88.0	.0	74.2	74.2	8.382E+07	Trn A	6.150E+06	6.210E+06	1.07
175.0	1.533E+07	88.0	.0	74.2	74.2	8.384E+07	Trn A	6.150E+06	6.210E+06	1.07
176.0	1.526E+07	88.0	.0	74.2	74.2	8.386E+07	Trn A	6.150E+06	6.210E+06	1.07
177.0	1.520E+07	88.0	.0	74.2	74.2	8.388E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 154 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=70F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
178.0	1.514E+07	88.0	.0	74.2	74.2	8.390E+07	Trn A	6.150E+06	6.210E+06	1.07
179.0	1.507E+07	88.0	.0	74.2	74.2	8.392E+07	Trn A	6.150E+06	6.210E+06	1.07
180.0	1.501E+07	88.0	.0	74.2	74.2	8.394E+07	Trn A	6.150E+06	6.210E+06	1.07
181.0	1.494E+07	88.0	.0	74.2	74.2	8.396E+07	Trn A	6.150E+06	6.210E+06	1.07
182.0	1.488E+07	88.0	.0	74.2	74.2	8.399E+07	Trn A	6.150E+06	6.210E+06	1.07
183.0	1.481E+07	88.0	.0	74.2	74.2	8.401E+07	Trn A	6.150E+06	6.210E+06	1.07
184.0	1.475E+07	88.0	.0	74.2	74.2	8.403E+07	Trn A	6.150E+06	6.210E+06	1.07
185.0	1.468E+07	88.0	.0	74.2	74.2	8.405E+07	Trn A	6.150E+06	6.210E+06	1.07
186.0	1.462E+07	88.0	.0	74.2	74.2	8.407E+07	Trn A	6.150E+06	6.210E+06	1.07
187.0	1.455E+07	88.0	.0	74.2	74.2	8.409E+07	Trn A	6.150E+06	6.210E+06	1.07
188.0	1.449E+07	88.0	.0	74.2	74.2	8.411E+07	Trn A	6.150E+06	6.210E+06	1.07
189.0	1.442E+07	88.0	.0	74.2	74.2	8.413E+07	Trn A	6.150E+06	6.210E+06	1.07
190.0	1.436E+07	88.0	.0	74.2	74.2	8.415E+07	Trn A	6.150E+06	6.210E+06	1.07
191.0	1.429E+07	88.0	.0	74.2	74.2	8.417E+07	Trn A	6.150E+06	6.210E+06	1.07
192.0	1.423E+07	88.0	.0	74.2	74.2	8.419E+07	Trn A	6.150E+06	6.210E+06	1.07
193.0	1.416E+07	88.0	.0	74.2	74.2	8.400E+07	Trn A	6.150E+06	6.210E+06	1.07
194.0	1.410E+07	88.0	.0	74.2	74.2	8.381E+07	Trn A	6.150E+06	6.210E+06	1.07
195.0	1.404E+07	88.0	.0	74.2	74.2	8.362E+07	Trn A	6.150E+06	6.210E+06	1.07
196.0	1.397E+07	88.0	.0	74.2	74.2	8.343E+07	Trn A	6.150E+06	6.210E+06	1.07
197.0	1.391E+07	88.0	.0	74.2	74.2	8.324E+07	Trn A	6.150E+06	6.210E+06	1.07
198.0	1.384E+07	87.9	.0	74.2	74.2	8.305E+07	Trn A	6.150E+06	6.210E+06	1.07
199.0	1.378E+07	87.9	.0	74.2	74.2	8.287E+07	Trn A	6.150E+06	6.210E+06	1.07
200.0	1.371E+07	87.9	.0	74.2	74.2	8.268E+07	Trn A	6.150E+06	6.210E+06	1.07
201.0	1.365E+07	87.9	.0	74.2	74.2	8.249E+07	Trn A	6.150E+06	6.210E+06	1.07
202.0	1.359E+07	87.9	.0	74.2	74.2	8.230E+07	Trn A	6.150E+06	6.210E+06	1.07
203.0	1.352E+07	87.8	.0	74.2	74.2	8.211E+07	Trn A	6.150E+06	6.210E+06	1.07
204.0	1.346E+07	87.8	.0	74.2	74.2	8.192E+07	Trn A	6.150E+06	6.210E+06	1.07
205.0	1.340E+07	87.8	.0	74.2	74.2	8.173E+07	Trn A	6.150E+06	6.210E+06	1.07
206.0	1.333E+07	87.8	.0	74.2	74.2	8.154E+07	Trn A	6.150E+06	6.210E+06	1.07
207.0	1.327E+07	87.7	.0	74.2	74.2	8.135E+07	Trn A	6.150E+06	6.210E+06	1.07
208.0	1.321E+07	87.7	.0	74.2	74.2	8.116E+07	Trn A	6.150E+06	6.210E+06	1.07
209.0	1.315E+07	87.7	.0	74.2	74.2	8.097E+07	Trn A	6.150E+06	6.210E+06	1.07
210.0	1.308E+07	87.6	.0	74.2	74.2	8.078E+07	Trn A	6.150E+06	6.210E+06	1.07
211.0	1.302E+07	87.6	.0	74.2	74.2	8.060E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 155 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=70F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
212.0	1.296E+07	87.6	.0	74.2	74.2	8.041E+07	Trn A	6.150E+06	6.210E+06	1.07
213.0	1.290E+07	87.6	.0	74.2	74.2	8.022E+07	Trn A	6.150E+06	6.210E+06	1.07
214.0	1.284E+07	87.5	.0	74.2	74.2	8.003E+07	Trn A	6.150E+06	6.210E+06	1.07
215.0	1.277E+07	87.5	.0	74.2	74.2	7.984E+07	Trn A	6.150E+06	6.210E+06	1.07
216.0	1.271E+07	87.5	.0	74.2	74.2	7.965E+07	Trn A	6.150E+06	6.210E+06	1.07
217.0	1.265E+07	87.5	.0	74.2	74.2	7.969E+07	Trn A	6.150E+06	6.210E+06	1.07
218.0	1.259E+07	87.5	.0	74.2	74.2	7.972E+07	Trn A	6.150E+06	6.210E+06	1.07
219.0	1.253E+07	87.4	.0	74.2	74.2	7.976E+07	Trn A	6.150E+06	6.210E+06	1.07
220.0	1.247E+07	87.4	.0	74.2	74.2	7.980E+07	Trn A	6.150E+06	6.210E+06	1.07
221.0	1.241E+07	87.4	.0	74.2	74.2	7.984E+07	Trn A	6.150E+06	6.210E+06	1.07
222.0	1.235E+07	87.4	.0	74.2	74.2	7.987E+07	Trn A	6.150E+06	6.210E+06	1.07
223.0	1.228E+07	87.4	.0	74.2	74.2	7.991E+07	Trn A	6.150E+06	6.210E+06	1.07
224.0	1.222E+07	87.4	.0	74.2	74.2	7.995E+07	Trn A	6.150E+06	6.210E+06	1.07
225.0	1.216E+07	87.5	.0	74.2	74.2	7.999E+07	Trn A	6.150E+06	6.210E+06	1.07
226.0	1.210E+07	87.5	.0	74.2	74.2	8.002E+07	Trn A	6.150E+06	6.210E+06	1.07
227.0	1.204E+07	87.5	.0	74.2	74.2	8.006E+07	Trn A	6.150E+06	6.210E+06	1.07
228.0	1.198E+07	87.5	.0	74.2	74.2	8.010E+07	Trn A	6.150E+06	6.210E+06	1.07
229.0	1.192E+07	87.5	.0	74.2	74.2	8.014E+07	Trn A	6.150E+06	6.210E+06	1.07
230.0	1.185E+07	87.5	.0	74.2	74.2	8.017E+07	Trn A	6.150E+06	6.210E+06	1.07
231.0	1.179E+07	87.5	.0	74.2	74.2	8.021E+07	Trn A	6.150E+06	6.210E+06	1.07
232.0	1.173E+07	87.5	.0	74.2	74.2	8.025E+07	Trn A	6.150E+06	6.210E+06	1.07
233.0	1.167E+07	87.5	.0	74.2	74.2	8.029E+07	Trn A	6.150E+06	6.210E+06	1.07
234.0	1.161E+07	87.5	.0	74.2	74.2	8.032E+07	Trn A	6.150E+06	6.210E+06	1.07
235.0	1.155E+07	87.5	.0	74.2	74.2	8.036E+07	Trn A	6.150E+06	6.210E+06	1.07
236.0	1.148E+07	87.5	.0	74.2	74.2	8.040E+07	Trn A	6.150E+06	6.210E+06	1.07
237.0	1.142E+07	87.5	.0	74.2	74.2	8.044E+07	Trn A	6.150E+06	6.210E+06	1.07
238.0	1.136E+07	87.5	.0	74.2	74.2	8.047E+07	Trn A	6.150E+06	6.210E+06	1.07
239.0	1.130E+07	87.5	.0	74.2	74.2	8.051E+07	Trn A	6.150E+06	6.210E+06	1.07
240.0	1.124E+07	87.5	.0	74.2	74.2	8.055E+07	Trn A	6.150E+06	6.210E+06	1.07

Stop - Program terminated.

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 156 of 166
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15. UHSSIM input/output for Fan3_65F, 3-Fan Case with IBT of 65 °F

Fan3_65F.inp

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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=65F
# design wet-bulb temperature [F], design dry-bulb temperature [F],
# design hot-water temperature [F], design pressure [psia], design solids [ppt]
# 0 => F, psia, btu/hr, lbm/hr units
82, 98, 129.0, 14.696, 0.0, 0
# initial basin mass [lbm], initial basin temperature [F], initial solids [ppt],
# number of towers, starting time of simulation [hr]
29843200, 65, 0, 2, 0.
# Time Period Data -- every 0.1 hour for 10 hr then every hour up to 10 days
# step size, number of steps
0.1,100
1,230
*
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,6.15e6,6.21e6,1.07
240.0,6.15e6,6.21e6,1.07
*
# Train B
Trn B
0.0,2.05e6,0.0,1.07
240.0,2.05e6,0.0,1.07
*
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
      0 s  3.2565E+08
      50 s  3.2565E+08
     101 s  3.2565E+08
     116 s  3.1609E+08
     120 s  3.1487E+08
     150 s  3.1640E+08
     300 s  3.1640E+08
     900 s  3.1640E+08
    1800 s  3.0196E+08
    2704 s  2.8660E+08
    2706 s  4.4627E+08
    3600 s  4.3946E+08
       2 h  2.2984E+08
       4 h  1.4731E+08
       6 h  1.4644E+08
       9 h  1.4354E+08
      12 h  1.4254E+08
      18 h  1.5095E+08
      24 h  1.4834E+08
      36 h  1.2219E+08
       2 d  1.1371E+08
       3 d  1.0513E+08
       4 d  9.6311E+07
       5 d  9.1747E+07
       6 d  8.5844E+07
       7 d  8.3698E+07
       8 d  8.4190E+07
       9 d  7.9649E+07
      10 d  8.0549E+07
*
# Ambient Data Supplied by Bechtel Power Corp.
# TIME  WB      DB      P
# (hr)  (F)      (F)      (psia)
      0,   74.4,   74.4,   14.7
     240,  74.4,   74.4,   14.7
*

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Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 157 of 166
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Fan3_65F.out

Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=65F

Initial Basin Mass 2.984E+07 lbm
Initial Basin Temperature 65.0 F
Initial Basin Solids .0 ppt

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
.0	2.984E+07	65.0	.0	74.4	74.4	3.257E+08	Trn A	6.150E+06	6.210E+06	1.07
.1	2.983E+07	65.7	.0	74.4	74.4	3.164E+08	Trn A	6.150E+06	6.210E+06	1.07
.2	2.983E+07	66.4	.0	74.4	74.4	3.164E+08	Trn A	6.150E+06	6.210E+06	1.07
.3	2.982E+07	67.1	.0	74.4	74.4	3.135E+08	Trn A	6.150E+06	6.210E+06	1.07
.4	2.981E+07	67.7	.0	74.4	74.4	3.077E+08	Trn A	6.150E+06	6.210E+06	1.07
.5	2.980E+07	68.4	.0	74.4	74.4	3.020E+08	Trn A	6.150E+06	6.210E+06	1.07
.6	2.979E+07	69.0	.0	74.4	74.4	2.958E+08	Trn A	6.150E+06	6.210E+06	1.07
.7	2.978E+07	69.6	.0	74.4	74.4	2.897E+08	Trn A	6.150E+06	6.210E+06	1.07
.8	2.977E+07	70.3	.0	74.4	74.4	4.449E+08	Trn A	6.150E+06	6.210E+06	1.07
.9	2.975E+07	71.1	.0	74.4	74.4	4.422E+08	Trn A	6.150E+06	6.210E+06	1.07
1.0	2.974E+07	71.9	.0	74.4	74.4	4.395E+08	Trn A	6.150E+06	6.210E+06	1.07
1.1	2.972E+07	72.6	.0	74.4	74.4	4.185E+08	Trn A	6.150E+06	6.210E+06	1.07
1.2	2.970E+07	73.3	.0	74.4	74.4	3.975E+08	Trn A	6.150E+06	6.210E+06	1.07
1.3	2.969E+07	74.0	.0	74.4	74.4	3.766E+08	Trn A	6.150E+06	6.210E+06	1.07
1.4	2.967E+07	74.6	.0	74.4	74.4	3.556E+08	Trn A	6.150E+06	6.210E+06	1.07
1.5	2.966E+07	75.2	.0	74.4	74.4	3.346E+08	Trn A	6.150E+06	6.210E+06	1.07
1.6	2.965E+07	75.8	.0	74.4	74.4	3.137E+08	Trn A	6.150E+06	6.210E+06	1.07
1.7	2.964E+07	76.3	.0	74.4	74.4	2.927E+08	Trn A	6.150E+06	6.210E+06	1.07
1.8	2.962E+07	76.8	.0	74.4	74.4	2.718E+08	Trn A	6.150E+06	6.210E+06	1.07
1.9	2.961E+07	77.2	.0	74.4	74.4	2.508E+08	Trn A	6.150E+06	6.210E+06	1.07
2.0	2.961E+07	77.6	.0	74.4	74.4	2.298E+08	Trn A	6.150E+06	6.210E+06	1.07
2.1	2.960E+07	78.0	.0	74.4	74.4	2.257E+08	Trn A	6.150E+06	6.210E+06	1.07
2.2	2.959E+07	78.4	.0	74.4	74.4	2.216E+08	Trn A	6.150E+06	6.210E+06	1.07
2.3	2.958E+07	78.8	.0	74.4	74.4	2.175E+08	Trn A	6.150E+06	6.210E+06	1.07
2.4	2.957E+07	79.1	.0	74.4	74.4	2.133E+08	Trn A	6.150E+06	6.210E+06	1.07
2.5	2.956E+07	79.4	.0	74.4	74.4	2.092E+08	Trn A	6.150E+06	6.210E+06	1.07
2.6	2.955E+07	79.8	.0	74.4	74.4	2.051E+08	Trn A	6.150E+06	6.210E+06	1.07
2.7	2.954E+07	80.1	.0	74.4	74.4	2.010E+08	Trn A	6.150E+06	6.210E+06	1.07
2.8	2.953E+07	80.4	.0	74.4	74.4	1.968E+08	Trn A	6.150E+06	6.210E+06	1.07
2.9	2.953E+07	80.7	.0	74.4	74.4	1.927E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 158 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=65F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
3.0	2.952E+07	80.9	.0	74.4	74.4	1.886E+08	Trn A	6.150E+06	6.210E+06	1.07
3.1	2.951E+07	81.2	.0	74.4	74.4	1.844E+08	Trn A	6.150E+06	6.210E+06	1.07
3.2	2.950E+07	81.5	.0	74.4	74.4	1.803E+08	Trn A	6.150E+06	6.210E+06	1.07
3.3	2.949E+07	81.7	.0	74.4	74.4	1.762E+08	Trn A	6.150E+06	6.210E+06	1.07
3.4	2.949E+07	82.0	.0	74.4	74.4	1.721E+08	Trn A	6.150E+06	6.210E+06	1.07
3.5	2.948E+07	82.2	.0	74.4	74.4	1.679E+08	Trn A	6.150E+06	6.210E+06	1.07
3.6	2.947E+07	82.4	.0	74.4	74.4	1.638E+08	Trn A	6.150E+06	6.210E+06	1.07
3.7	2.946E+07	82.6	.0	74.4	74.4	1.597E+08	Trn A	6.150E+06	6.210E+06	1.07
3.8	2.945E+07	82.8	.0	74.4	74.4	1.556E+08	Trn A	6.150E+06	6.210E+06	1.07
3.9	2.945E+07	83.0	.0	74.4	74.4	1.514E+08	Trn A	6.150E+06	6.210E+06	1.07
4.0	2.944E+07	83.2	.0	74.4	74.4	1.473E+08	Trn A	6.150E+06	6.210E+06	1.07
4.1	2.943E+07	83.4	.0	74.4	74.4	1.473E+08	Trn A	6.150E+06	6.210E+06	1.07
4.2	2.942E+07	83.5	.0	74.4	74.4	1.472E+08	Trn A	6.150E+06	6.210E+06	1.07
4.3	2.942E+07	83.7	.0	74.4	74.4	1.472E+08	Trn A	6.150E+06	6.210E+06	1.07
4.4	2.941E+07	83.9	.0	74.4	74.4	1.471E+08	Trn A	6.150E+06	6.210E+06	1.07
4.5	2.940E+07	84.0	.0	74.4	74.4	1.471E+08	Trn A	6.150E+06	6.210E+06	1.07
4.6	2.939E+07	84.2	.0	74.4	74.4	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.7	2.939E+07	84.3	.0	74.4	74.4	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.8	2.938E+07	84.5	.0	74.4	74.4	1.470E+08	Trn A	6.150E+06	6.210E+06	1.07
4.9	2.937E+07	84.7	.0	74.4	74.4	1.469E+08	Trn A	6.150E+06	6.210E+06	1.07
5.0	2.936E+07	84.8	.0	74.4	74.4	1.469E+08	Trn A	6.150E+06	6.210E+06	1.07
5.1	2.935E+07	85.0	.0	74.4	74.4	1.468E+08	Trn A	6.150E+06	6.210E+06	1.07
5.2	2.935E+07	85.1	.0	74.4	74.4	1.468E+08	Trn A	6.150E+06	6.210E+06	1.07
5.3	2.934E+07	85.3	.0	74.4	74.4	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.4	2.933E+07	85.4	.0	74.4	74.4	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.5	2.932E+07	85.6	.0	74.4	74.4	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
5.6	2.931E+07	85.7	.0	74.4	74.4	1.466E+08	Trn A	6.150E+06	6.210E+06	1.07
5.7	2.930E+07	85.8	.0	74.4	74.4	1.466E+08	Trn A	6.150E+06	6.210E+06	1.07
5.8	2.930E+07	86.0	.0	74.4	74.4	1.465E+08	Trn A	6.150E+06	6.210E+06	1.07
5.9	2.929E+07	86.1	.0	74.4	74.4	1.465E+08	Trn A	6.150E+06	6.210E+06	1.07
6.0	2.928E+07	86.2	.0	74.4	74.4	1.464E+08	Trn A	6.150E+06	6.210E+06	1.07
6.1	2.927E+07	86.4	.0	74.4	74.4	1.463E+08	Trn A	6.150E+06	6.210E+06	1.07
6.2	2.926E+07	86.5	.0	74.4	74.4	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07
6.3	2.925E+07	86.6	.0	74.4	74.4	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 159 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=65F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
6.4	2.925E+07	86.7	.0	74.4	74.4	1.461E+08	Trn A	6.150E+06	6.210E+06	1.07
6.5	2.924E+07	86.9	.0	74.4	74.4	1.460E+08	Trn A	6.150E+06	6.210E+06	1.07
6.6	2.923E+07	87.0	.0	74.4	74.4	1.459E+08	Trn A	6.150E+06	6.210E+06	1.07
6.7	2.922E+07	87.1	.0	74.4	74.4	1.458E+08	Trn A	6.150E+06	6.210E+06	1.07
6.8	2.921E+07	87.2	.0	74.4	74.4	1.457E+08	Trn A	6.150E+06	6.210E+06	1.07
6.9	2.920E+07	87.3	.0	74.4	74.4	1.456E+08	Trn A	6.150E+06	6.210E+06	1.07
7.0	2.919E+07	87.5	.0	74.4	74.4	1.455E+08	Trn A	6.150E+06	6.210E+06	1.07
7.1	2.918E+07	87.6	.0	74.4	74.4	1.454E+08	Trn A	6.150E+06	6.210E+06	1.07
7.2	2.918E+07	87.7	.0	74.4	74.4	1.453E+08	Trn A	6.150E+06	6.210E+06	1.07
7.3	2.917E+07	87.8	.0	74.4	74.4	1.452E+08	Trn A	6.150E+06	6.210E+06	1.07
7.4	2.916E+07	87.9	.0	74.4	74.4	1.451E+08	Trn A	6.150E+06	6.210E+06	1.07
7.5	2.915E+07	88.0	.0	74.4	74.4	1.450E+08	Trn A	6.150E+06	6.210E+06	1.07
7.6	2.914E+07	88.1	.0	74.4	74.4	1.449E+08	Trn A	6.150E+06	6.210E+06	1.07
7.7	2.913E+07	88.2	.0	74.4	74.4	1.448E+08	Trn A	6.150E+06	6.210E+06	1.07
7.8	2.912E+07	88.3	.0	74.4	74.4	1.447E+08	Trn A	6.150E+06	6.210E+06	1.07
7.9	2.911E+07	88.4	.0	74.4	74.4	1.446E+08	Trn A	6.150E+06	6.210E+06	1.07
8.0	2.910E+07	88.5	.0	74.4	74.4	1.445E+08	Trn A	6.150E+06	6.210E+06	1.07
8.1	2.909E+07	88.6	.0	74.4	74.4	1.444E+08	Trn A	6.150E+06	6.210E+06	1.07
8.2	2.908E+07	88.7	.0	74.4	74.4	1.443E+08	Trn A	6.150E+06	6.210E+06	1.07
8.3	2.908E+07	88.8	.0	74.4	74.4	1.442E+08	Trn A	6.150E+06	6.210E+06	1.07
8.4	2.907E+07	88.9	.0	74.4	74.4	1.441E+08	Trn A	6.150E+06	6.210E+06	1.07
8.5	2.906E+07	89.0	.0	74.4	74.4	1.440E+08	Trn A	6.150E+06	6.210E+06	1.07
8.6	2.905E+07	89.1	.0	74.4	74.4	1.439E+08	Trn A	6.150E+06	6.210E+06	1.07
8.7	2.904E+07	89.1	.0	74.4	74.4	1.438E+08	Trn A	6.150E+06	6.210E+06	1.07
8.8	2.903E+07	89.2	.0	74.4	74.4	1.437E+08	Trn A	6.150E+06	6.210E+06	1.07
8.9	2.902E+07	89.3	.0	74.4	74.4	1.436E+08	Trn A	6.150E+06	6.210E+06	1.07
9.0	2.901E+07	89.4	.0	74.4	74.4	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.1	2.900E+07	89.5	.0	74.4	74.4	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.2	2.899E+07	89.6	.0	74.4	74.4	1.435E+08	Trn A	6.150E+06	6.210E+06	1.07
9.3	2.898E+07	89.6	.0	74.4	74.4	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.4	2.897E+07	89.7	.0	74.4	74.4	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.5	2.896E+07	89.8	.0	74.4	74.4	1.434E+08	Trn A	6.150E+06	6.210E+06	1.07
9.6	2.895E+07	89.9	.0	74.4	74.4	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07
9.7	2.894E+07	89.9	.0	74.4	74.4	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 160 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=65F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
9.8	2.893E+07	90.0	.0	74.4	74.4	1.433E+08	Trn A	6.150E+06	6.210E+06	1.07
9.9	2.892E+07	90.1	.0	74.4	74.4	1.432E+08	Trn A	6.150E+06	6.210E+06	1.07
10.0	2.891E+07	90.2	.0	74.4	74.4	1.432E+08	Trn A	6.150E+06	6.210E+06	1.07
11.0	2.982E+07	90.8	.0	74.4	74.4	1.429E+08	Trn A	6.150E+06	6.210E+06	1.07
12.0	2.872E+07	91.4	.0	74.4	74.4	1.425E+08	Trn A	6.150E+06	6.210E+06	1.07
13.0	2.861E+07	91.9	.0	74.4	74.4	1.439E+08	Trn A	6.150E+06	6.210E+06	1.07
14.0	2.851E+07	92.3	.0	74.4	74.4	1.453E+08	Trn A	6.150E+06	6.210E+06	1.07
15.0	2.840E+07	92.7	.0	74.4	74.4	1.467E+08	Trn A	6.150E+06	6.210E+06	1.07
16.0	2.829E+07	93.1	.0	74.4	74.4	1.481E+08	Trn A	6.150E+06	6.210E+06	1.07
17.0	2.818E+07	93.4	.0	74.4	74.4	1.495E+08	Trn A	6.150E+06	6.210E+06	1.07
18.0	2.807E+07	93.7	.0	74.4	74.4	1.509E+08	Trn A	6.150E+06	6.210E+06	1.07
19.0	2.795E+07	94.0	.0	74.4	74.4	1.505E+08	Trn A	6.150E+06	6.210E+06	1.07
20.0	2.783E+07	94.2	.0	74.4	74.4	1.501E+08	Trn A	6.150E+06	6.210E+06	1.07
21.0	2.772E+07	94.4	.0	74.4	74.4	1.496E+08	Trn A	6.150E+06	6.210E+06	1.07
22.0	2.760E+07	94.6	.0	74.4	74.4	1.492E+08	Trn A	6.150E+06	6.210E+06	1.07
23.0	2.748E+07	94.7	.0	74.4	74.4	1.488E+08	Trn A	6.150E+06	6.210E+06	1.07
24.0	2.737E+07	94.8	.0	74.4	74.4	1.483E+08	Trn A	6.150E+06	6.210E+06	1.07
25.0	2.725E+07	94.9	.0	74.4	74.4	1.462E+08	Trn A	6.150E+06	6.210E+06	1.07
26.0	2.713E+07	94.9	.0	74.4	74.4	1.440E+08	Trn A	6.150E+06	6.210E+06	1.07
27.0	2.702E+07	94.9	.0	74.4	74.4	1.418E+08	Trn A	6.150E+06	6.210E+06	1.07
28.0	2.690E+07	94.8	.0	74.4	74.4	1.396E+08	Trn A	6.150E+06	6.210E+06	1.07
29.0	2.679E+07	94.8	.0	74.4	74.4	1.374E+08	Trn A	6.150E+06	6.210E+06	1.07
30.0	2.668E+07	94.7	.0	74.4	74.4	1.353E+08	Trn A	6.150E+06	6.210E+06	1.07
31.0	2.657E+07	94.6	.0	74.4	74.4	1.331E+08	Trn A	6.150E+06	6.210E+06	1.07
32.0	2.646E+07	94.4	.0	74.4	74.4	1.309E+08	Trn A	6.150E+06	6.210E+06	1.07
33.0	2.635E+07	94.3	.0	74.4	74.4	1.287E+08	Trn A	6.150E+06	6.210E+06	1.07
34.0	2.625E+07	94.1	.0	74.4	74.4	1.265E+08	Trn A	6.150E+06	6.210E+06	1.07
35.0	2.615E+07	94.0	.0	74.4	74.4	1.244E+08	Trn A	6.150E+06	6.210E+06	1.07
36.0	2.604E+07	93.8	.0	74.4	74.4	1.222E+08	Trn A	6.150E+06	6.210E+06	1.07
37.0	2.594E+07	93.6	.0	74.4	74.4	1.215E+08	Trn A	6.150E+06	6.210E+06	1.07
38.0	2.584E+07	93.4	.0	74.4	74.4	1.208E+08	Trn A	6.150E+06	6.210E+06	1.07
39.0	2.574E+07	93.3	.0	74.4	74.4	1.201E+08	Trn A	6.150E+06	6.210E+06	1.07
40.0	2.565E+07	93.1	.0	74.4	74.4	1.194E+08	Trn A	6.150E+06	6.210E+06	1.07
41.0	2.555E+07	93.0	.0	74.4	74.4	1.187E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 161 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=65F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
42.0	2.545E+07	92.9	.0	74.4	74.4	1.180E+08	Trn A	6.150E+06	6.210E+06	1.07
43.0	2.536E+07	92.8	.0	74.4	74.4	1.172E+08	Trn A	6.150E+06	6.210E+06	1.07
44.0	2.526E+07	92.7	.0	74.4	74.4	1.165E+08	Trn A	6.150E+06	6.210E+06	1.07
45.0	2.517E+07	92.6	.0	74.4	74.4	1.158E+08	Trn A	6.150E+06	6.210E+06	1.07
46.0	2.508E+07	92.5	.0	74.4	74.4	1.151E+08	Trn A	6.150E+06	6.210E+06	1.07
47.0	2.498E+07	92.4	.0	74.4	74.4	1.144E+08	Trn A	6.150E+06	6.210E+06	1.07
48.0	2.489E+07	92.3	.0	74.4	74.4	1.137E+08	Trn A	6.150E+06	6.210E+06	1.07
49.0	2.480E+07	92.2	.0	74.4	74.4	1.134E+08	Trn A	6.150E+06	6.210E+06	1.07
50.0	2.471E+07	92.1	.0	74.4	74.4	1.130E+08	Trn A	6.150E+06	6.210E+06	1.07
51.0	2.462E+07	92.0	.0	74.4	74.4	1.126E+08	Trn A	6.150E+06	6.210E+06	1.07
52.0	2.453E+07	91.9	.0	74.4	74.4	1.123E+08	Trn A	6.150E+06	6.210E+06	1.07
53.0	2.444E+07	91.9	.0	74.4	74.4	1.119E+08	Trn A	6.150E+06	6.210E+06	1.07
54.0	2.435E+07	91.8	.0	74.4	74.4	1.116E+08	Trn A	6.150E+06	6.210E+06	1.07
55.0	2.426E+07	91.8	.0	74.4	74.4	1.112E+08	Trn A	6.150E+06	6.210E+06	1.07
56.0	2.417E+07	91.7	.0	74.4	74.4	1.109E+08	Trn A	6.150E+06	6.210E+06	1.07
57.0	2.408E+07	91.6	.0	74.4	74.4	1.105E+08	Trn A	6.150E+06	6.210E+06	1.07
58.0	2.400E+07	91.6	.0	74.4	74.4	1.101E+08	Trn A	6.150E+06	6.210E+06	1.07
59.0	2.391E+07	91.5	.0	74.4	74.4	1.098E+08	Trn A	6.150E+06	6.210E+06	1.07
60.0	2.382E+07	91.5	.0	74.4	74.4	1.094E+08	Trn A	6.150E+06	6.210E+06	1.07
61.0	2.373E+07	91.4	.0	74.4	74.4	1.091E+08	Trn A	6.150E+06	6.210E+06	1.07
62.0	2.365E+07	91.4	.0	74.4	74.4	1.087E+08	Trn A	6.150E+06	6.210E+06	1.07
63.0	2.356E+07	91.4	.0	74.4	74.4	1.083E+08	Trn A	6.150E+06	6.210E+06	1.07
64.0	2.348E+07	91.3	.0	74.4	74.4	1.080E+08	Trn A	6.150E+06	6.210E+06	1.07
65.0	2.339E+07	91.3	.0	74.4	74.4	1.076E+08	Trn A	6.150E+06	6.210E+06	1.07
66.0	2.330E+07	91.2	.0	74.4	74.4	1.073E+08	Trn A	6.150E+06	6.210E+06	1.07
67.0	2.322E+07	91.2	.0	74.4	74.4	1.069E+08	Trn A	6.150E+06	6.210E+06	1.07
68.0	2.314E+07	91.1	.0	74.4	74.4	1.066E+08	Trn A	6.150E+06	6.210E+06	1.07
69.0	2.305E+07	91.1	.0	74.4	74.4	1.062E+08	Trn A	6.150E+06	6.210E+06	1.07
70.0	2.297E+07	91.0	.0	74.4	74.4	1.058E+08	Trn A	6.150E+06	6.210E+06	1.07
71.0	2.288E+07	91.0	.0	74.4	74.4	1.055E+08	Trn A	6.150E+06	6.210E+06	1.07
72.0	2.280E+07	91.0	.0	74.4	74.4	1.051E+08	Trn A	6.150E+06	6.210E+06	1.07
73.0	2.272E+07	90.9	.0	74.4	74.4	1.048E+08	Trn A	6.150E+06	6.210E+06	1.07
74.0	2.263E+07	90.9	.0	74.4	74.4	1.044E+08	Trn A	6.150E+06	6.210E+06	1.07
75.0	2.255E+07	90.8	.0	74.4	74.4	1.040E+08	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 162 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=65F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
76.0	2.247E+07	90.8	.0	74.4	74.4	1.037E+08	Trn A	6.150E+06	6.210E+06	1.07
77.0	2.239E+07	90.7	.0	74.4	74.4	1.033E+08	Trn A	6.150E+06	6.210E+06	1.07
78.0	2.231E+07	90.7	.0	74.4	74.4	1.029E+08	Trn A	6.150E+06	6.210E+06	1.07
79.0	2.223E+07	90.7	.0	74.4	74.4	1.026E+08	Trn A	6.150E+06	6.210E+06	1.07
80.0	2.214E+07	90.6	.0	74.4	74.4	1.022E+08	Trn A	6.150E+06	6.210E+06	1.07
81.0	2.206E+07	90.6	.0	74.4	74.4	1.018E+08	Trn A	6.150E+06	6.210E+06	1.07
82.0	2.198E+07	90.5	.0	74.4	74.4	1.015E+08	Trn A	6.150E+06	6.210E+06	1.07
83.0	2.190E+07	90.5	.0	74.4	74.4	1.011E+08	Trn A	6.150E+06	6.210E+06	1.07
84.0	2.182E+07	90.4	.0	74.4	74.4	1.007E+08	Trn A	6.150E+06	6.210E+06	1.07
85.0	2.174E+07	90.4	.0	74.4	74.4	1.004E+08	Trn A	6.150E+06	6.210E+06	1.07
86.0	2.167E+07	90.3	.0	74.4	74.4	9.999E+07	Trn A	6.150E+06	6.210E+06	1.07
87.0	2.159E+07	90.3	.0	74.4	74.4	9.962E+07	Trn A	6.150E+06	6.210E+06	1.07
88.0	2.151E+07	90.3	.0	74.4	74.4	9.925E+07	Trn A	6.150E+06	6.210E+06	1.07
89.0	2.143E+07	90.2	.0	74.4	74.4	9.888E+07	Trn A	6.150E+06	6.210E+06	1.07
90.0	2.135E+07	90.2	.0	74.4	74.4	9.852E+07	Trn A	6.150E+06	6.210E+06	1.07
91.0	2.128E+07	90.1	.0	74.4	74.4	9.815E+07	Trn A	6.150E+06	6.210E+06	1.07
92.0	2.120E+07	90.1	.0	74.4	74.4	9.778E+07	Trn A	6.150E+06	6.210E+06	1.07
93.0	2.112E+07	90.0	.0	74.4	74.4	9.741E+07	Trn A	6.150E+06	6.210E+06	1.07
94.0	2.104E+07	90.0	.0	74.4	74.4	9.705E+07	Trn A	6.150E+06	6.210E+06	1.07
95.0	2.097E+07	89.9	.0	74.4	74.4	9.668E+07	Trn A	6.150E+06	6.210E+06	1.07
96.0	2.089E+07	89.9	.0	74.4	74.4	9.631E+07	Trn A	6.150E+06	6.210E+06	1.07
97.0	2.082E+07	89.9	.0	74.4	74.4	9.612E+07	Trn A	6.150E+06	6.210E+06	1.07
98.0	2.074E+07	89.8	.0	74.4	74.4	9.593E+07	Trn A	6.150E+06	6.210E+06	1.07
99.0	2.067E+07	89.8	.0	74.4	74.4	9.574E+07	Trn A	6.150E+06	6.210E+06	1.07
100.0	2.059E+07	89.7	.0	74.4	74.4	9.555E+07	Trn A	6.150E+06	6.210E+06	1.07
101.0	2.052E+07	89.7	.0	74.4	74.4	9.536E+07	Trn A	6.150E+06	6.210E+06	1.07
102.0	2.044E+07	89.7	.0	74.4	74.4	9.517E+07	Trn A	6.150E+06	6.210E+06	1.07
103.0	2.037E+07	89.6	.0	74.4	74.4	9.498E+07	Trn A	6.150E+06	6.210E+06	1.07
104.0	2.029E+07	89.6	.0	74.4	74.4	9.479E+07	Trn A	6.150E+06	6.210E+06	1.07
105.0	2.022E+07	89.6	.0	74.4	74.4	9.460E+07	Trn A	6.150E+06	6.210E+06	1.07
106.0	2.015E+07	89.6	.0	74.4	74.4	9.441E+07	Trn A	6.150E+06	6.210E+06	1.07
107.0	2.007E+07	89.5	.0	74.4	74.4	9.422E+07	Trn A	6.150E+06	6.210E+06	1.07
108.0	2.000E+07	89.5	.0	74.4	74.4	9.403E+07	Trn A	6.150E+06	6.210E+06	1.07
109.0	1.992E+07	89.5	.0	74.4	74.4	9.384E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 163 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=65F

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
110.0	1.985E+07	89.5	.0	74.4	74.4	9.365E+07	Trn A	6.150E+06	6.210E+06	1.07
111.0	1.978E+07	89.4	.0	74.4	74.4	9.346E+07	Trn A	6.150E+06	6.210E+06	1.07
112.0	1.971E+07	89.4	.0	74.4	74.4	9.327E+07	Trn A	6.150E+06	6.210E+06	1.07
113.0	1.963E+07	89.4	.0	74.4	74.4	9.308E+07	Trn A	6.150E+06	6.210E+06	1.07
114.0	1.956E+07	89.4	.0	74.4	74.4	9.289E+07	Trn A	6.150E+06	6.210E+06	1.07
115.0	1.949E+07	89.3	.0	74.4	74.4	9.270E+07	Trn A	6.150E+06	6.210E+06	1.07
116.0	1.942E+07	89.3	.0	74.4	74.4	9.251E+07	Trn A	6.150E+06	6.210E+06	1.07
117.0	1.934E+07	89.3	.0	74.4	74.4	9.232E+07	Trn A	6.150E+06	6.210E+06	1.07
118.0	1.927E+07	89.3	.0	74.4	74.4	9.213E+07	Trn A	6.150E+06	6.210E+06	1.07
119.0	1.920E+07	89.2	.0	74.4	74.4	9.194E+07	Trn A	6.150E+06	6.210E+06	1.07
120.0	1.913E+07	89.2	.0	74.4	74.4	9.175E+07	Trn A	6.150E+06	6.210E+06	1.07
121.0	1.906E+07	89.2	.0	74.4	74.4	9.150E+07	Trn A	6.150E+06	6.210E+06	1.07
122.0	1.899E+07	89.2	.0	74.4	74.4	9.126E+07	Trn A	6.150E+06	6.210E+06	1.07
123.0	1.891E+07	89.1	.0	74.4	74.4	9.101E+07	Trn A	6.150E+06	6.210E+06	1.07
124.0	1.884E+07	89.1	.0	74.4	74.4	9.076E+07	Trn A	6.150E+06	6.210E+06	1.07
125.0	1.877E+07	89.1	.0	74.4	74.4	9.052E+07	Trn A	6.150E+06	6.210E+06	1.07
126.0	1.870E+07	89.1	.0	74.4	74.4	9.027E+07	Trn A	6.150E+06	6.210E+06	1.07
127.0	1.863E+07	89.0	.0	74.4	74.4	9.003E+07	Trn A	6.150E+06	6.210E+06	1.07
128.0	1.856E+07	89.0	.0	74.4	74.4	8.978E+07	Trn A	6.150E+06	6.210E+06	1.07
129.0	1.849E+07	89.0	.0	74.4	74.4	8.953E+07	Trn A	6.150E+06	6.210E+06	1.07
130.0	1.842E+07	88.9	.0	74.4	74.4	8.929E+07	Trn A	6.150E+06	6.210E+06	1.07
131.0	1.835E+07	88.9	.0	74.4	74.4	8.904E+07	Trn A	6.150E+06	6.210E+06	1.07
132.0	1.828E+07	88.9	.0	74.4	74.4	8.880E+07	Trn A	6.150E+06	6.210E+06	1.07
133.0	1.821E+07	88.8	.0	74.4	74.4	8.855E+07	Trn A	6.150E+06	6.210E+06	1.07
134.0	1.815E+07	88.8	.0	74.4	74.4	8.830E+07	Trn A	6.150E+06	6.210E+06	1.07
135.0	1.808E+07	88.8	.0	74.4	74.4	8.806E+07	Trn A	6.150E+06	6.210E+06	1.07
136.0	1.801E+07	88.7	.0	74.4	74.4	8.781E+07	Trn A	6.150E+06	6.210E+06	1.07
137.0	1.794E+07	88.7	.0	74.4	74.4	8.757E+07	Trn A	6.150E+06	6.210E+06	1.07
138.0	1.787E+07	88.7	.0	74.4	74.4	8.732E+07	Trn A	6.150E+06	6.210E+06	1.07
139.0	1.780E+07	88.7	.0	74.4	74.4	8.707E+07	Trn A	6.150E+06	6.210E+06	1.07
140.0	1.774E+07	88.6	.0	74.4	74.4	8.683E+07	Trn A	6.150E+06	6.210E+06	1.07
141.0	1.767E+07	88.6	.0	74.4	74.4	8.658E+07	Trn A	6.150E+06	6.210E+06	1.07
142.0	1.760E+07	88.6	.0	74.4	74.4	8.634E+07	Trn A	6.150E+06	6.210E+06	1.07
143.0	1.754E+07	88.5	.0	74.4	74.4	8.609E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 164 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=65F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
144.0	1.747E+07	88.5	.0	74.4	74.4	8.584E+07	Trn A	6.150E+06	6.210E+06	1.07
145.0	1.740E+07	88.5	.0	74.4	74.4	8.575E+07	Trn A	6.150E+06	6.210E+06	1.07
146.0	1.734E+07	88.5	.0	74.4	74.4	8.567E+07	Trn A	6.150E+06	6.210E+06	1.07
147.0	1.727E+07	88.4	.0	74.4	74.4	8.558E+07	Trn A	6.150E+06	6.210E+06	1.07
148.0	1.720E+07	88.4	.0	74.4	74.4	8.549E+07	Trn A	6.150E+06	6.210E+06	1.07
149.0	1.714E+07	88.4	.0	74.4	74.4	8.540E+07	Trn A	6.150E+06	6.210E+06	1.07
150.0	1.707E+07	88.4	.0	74.4	74.4	8.531E+07	Trn A	6.150E+06	6.210E+06	1.07
151.0	1.700E+07	88.3	.0	74.4	74.4	8.522E+07	Trn A	6.150E+06	6.210E+06	1.07
152.0	1.694E+07	88.3	.0	74.4	74.4	8.513E+07	Trn A	6.150E+06	6.210E+06	1.07
153.0	1.687E+07	88.3	.0	74.4	74.4	8.504E+07	Trn A	6.150E+06	6.210E+06	1.07
154.0	1.681E+07	88.3	.0	74.4	74.4	8.495E+07	Trn A	6.150E+06	6.210E+06	1.07
155.0	1.674E+07	88.3	.0	74.4	74.4	8.486E+07	Trn A	6.150E+06	6.210E+06	1.07
156.0	1.668E+07	88.3	.0	74.4	74.4	8.477E+07	Trn A	6.150E+06	6.210E+06	1.07
157.0	1.661E+07	88.3	.0	74.4	74.4	8.468E+07	Trn A	6.150E+06	6.210E+06	1.07
158.0	1.654E+07	88.3	.0	74.4	74.4	8.459E+07	Trn A	6.150E+06	6.210E+06	1.07
159.0	1.648E+07	88.2	.0	74.4	74.4	8.450E+07	Trn A	6.150E+06	6.210E+06	1.07
160.0	1.641E+07	88.2	.0	74.4	74.4	8.441E+07	Trn A	6.150E+06	6.210E+06	1.07
161.0	1.635E+07	88.2	.0	74.4	74.4	8.432E+07	Trn A	6.150E+06	6.210E+06	1.07
162.0	1.628E+07	88.2	.0	74.4	74.4	8.423E+07	Trn A	6.150E+06	6.210E+06	1.07
163.0	1.622E+07	88.2	.0	74.4	74.4	8.415E+07	Trn A	6.150E+06	6.210E+06	1.07
164.0	1.615E+07	88.2	.0	74.4	74.4	8.406E+07	Trn A	6.150E+06	6.210E+06	1.07
165.0	1.609E+07	88.1	.0	74.4	74.4	8.397E+07	Trn A	6.150E+06	6.210E+06	1.07
166.0	1.602E+07	88.1	.0	74.4	74.4	8.388E+07	Trn A	6.150E+06	6.210E+06	1.07
167.0	1.596E+07	88.1	.0	74.4	74.4	8.379E+07	Trn A	6.150E+06	6.210E+06	1.07
168.0	1.589E+07	88.1	.0	74.4	74.4	8.370E+07	Trn A	6.150E+06	6.210E+06	1.07
169.0	1.583E+07	88.1	.0	74.4	74.4	8.372E+07	Trn A	6.150E+06	6.210E+06	1.07
170.0	1.576E+07	88.1	.0	74.4	74.4	8.374E+07	Trn A	6.150E+06	6.210E+06	1.07
171.0	1.570E+07	88.1	.0	74.4	74.4	8.376E+07	Trn A	6.150E+06	6.210E+06	1.07
172.0	1.564E+07	88.1	.0	74.4	74.4	8.378E+07	Trn A	6.150E+06	6.210E+06	1.07
173.0	1.557E+07	88.1	.0	74.4	74.4	8.380E+07	Trn A	6.150E+06	6.210E+06	1.07
174.0	1.551E+07	88.1	.0	74.4	74.4	8.382E+07	Trn A	6.150E+06	6.210E+06	1.07
175.0	1.544E+07	88.1	.0	74.4	74.4	8.384E+07	Trn A	6.150E+06	6.210E+06	1.07
176.0	1.538E+07	88.1	.0	74.4	74.4	8.386E+07	Trn A	6.150E+06	6.210E+06	1.07
177.0	1.531E+07	88.1	.0	74.4	74.4	8.388E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 165 of 166
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Vogtle UHS Initial Basin Temp. (IBT) & Max WB: 3-fan mode, IBT=65F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
178.0	1.525E+07	88.1	.0	74.4	74.4	8.390E+07	Trn A	6.150E+06	6.210E+06	1.07
179.0	1.518E+07	88.1	.0	74.4	74.4	8.392E+07	Trn A	6.150E+06	6.210E+06	1.07
180.0	1.512E+07	88.1	.0	74.4	74.4	8.394E+07	Trn A	6.150E+06	6.210E+06	1.07
181.0	1.505E+07	88.1	.0	74.4	74.4	8.396E+07	Trn A	6.150E+06	6.210E+06	1.07
182.0	1.499E+07	88.1	.0	74.4	74.4	8.399E+07	Trn A	6.150E+06	6.210E+06	1.07
183.0	1.492E+07	88.1	.0	74.4	74.4	8.401E+07	Trn A	6.150E+06	6.210E+06	1.07
184.0	1.486E+07	88.1	.0	74.4	74.4	8.403E+07	Trn A	6.150E+06	6.210E+06	1.07
185.0	1.479E+07	88.1	.0	74.4	74.4	8.405E+07	Trn A	6.150E+06	6.210E+06	1.07
186.0	1.473E+07	88.1	.0	74.4	74.4	8.407E+07	Trn A	6.150E+06	6.210E+06	1.07
187.0	1.467E+07	88.1	.0	74.4	74.4	8.409E+07	Trn A	6.150E+06	6.210E+06	1.07
188.0	1.460E+07	88.1	.0	74.4	74.4	8.411E+07	Trn A	6.150E+06	6.210E+06	1.07
189.0	1.454E+07	88.1	.0	74.4	74.4	8.413E+07	Trn A	6.150E+06	6.210E+06	1.07
190.0	1.447E+07	88.1	.0	74.4	74.4	8.415E+07	Trn A	6.150E+06	6.210E+06	1.07
191.0	1.441E+07	88.1	.0	74.4	74.4	8.417E+07	Trn A	6.150E+06	6.210E+06	1.07
192.0	1.434E+07	88.1	.0	74.4	74.4	8.419E+07	Trn A	6.150E+06	6.210E+06	1.07
193.0	1.428E+07	88.1	.0	74.4	74.4	8.400E+07	Trn A	6.150E+06	6.210E+06	1.07
194.0	1.421E+07	88.1	.0	74.4	74.4	8.391E+07	Trn A	6.150E+06	6.210E+06	1.07
195.0	1.415E+07	88.1	.0	74.4	74.4	8.362E+07	Trn A	6.150E+06	6.210E+06	1.07
196.0	1.408E+07	88.1	.0	74.4	74.4	8.343E+07	Trn A	6.150E+06	6.210E+06	1.07
197.0	1.402E+07	88.1	.0	74.4	74.4	8.324E+07	Trn A	6.150E+06	6.210E+06	1.07
198.0	1.395E+07	88.1	.0	74.4	74.4	8.305E+07	Trn A	6.150E+06	6.210E+06	1.07
199.0	1.389E+07	88.1	.0	74.4	74.4	8.287E+07	Trn A	6.150E+06	6.210E+06	1.07
200.0	1.383E+07	88.0	.0	74.4	74.4	8.268E+07	Trn A	6.150E+06	6.210E+06	1.07
201.0	1.376E+07	88.0	.0	74.4	74.4	8.249E+07	Trn A	6.150E+06	6.210E+06	1.07
202.0	1.370E+07	88.0	.0	74.4	74.4	8.230E+07	Trn A	6.150E+06	6.210E+06	1.07
203.0	1.363E+07	87.9	.0	74.4	74.4	8.211E+07	Trn A	6.150E+06	6.210E+06	1.07
204.0	1.357E+07	87.9	.0	74.4	74.4	8.192E+07	Trn A	6.150E+06	6.210E+06	1.07
205.0	1.351E+07	87.9	.0	74.4	74.4	8.173E+07	Trn A	6.150E+06	6.210E+06	1.07
206.0	1.344E+07	87.9	.0	74.4	74.4	8.154E+07	Trn A	6.150E+06	6.210E+06	1.07
207.0	1.338E+07	87.9	.0	74.4	74.4	8.135E+07	Trn A	6.150E+06	6.210E+06	1.07
208.0	1.332E+07	87.8	.0	74.4	74.4	8.116E+07	Trn A	6.150E+06	6.210E+06	1.07
209.0	1.326E+07	87.8	.0	74.4	74.4	8.097E+07	Trn A	6.150E+06	6.210E+06	1.07
210.0	1.319E+07	87.8	.0	74.4	74.4	8.078E+07	Trn A	6.150E+06	6.210E+06	1.07
211.0	1.313E+07	87.8	.0	74.4	74.4	8.060E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S31	Sheet: Attachment 1 166 of 166
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Vogtle UHS Initial Basin Temp.(IBT) & Max WB: 3-fan mode, IBT=65F

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
212.0	1.307E+07	87.7	.0	74.4	74.4	8.041E+07	Trn A	6.150E+06	6.210E+06	1.07
213.0	1.301E+07	87.7	.0	74.4	74.4	8.022E+07	Trn A	6.150E+06	6.210E+06	1.07
214.0	1.295E+07	87.7	.0	74.4	74.4	8.003E+07	Trn A	6.150E+06	6.210E+06	1.07
215.0	1.288E+07	87.7	.0	74.4	74.4	7.984E+07	Trn A	6.150E+06	6.210E+06	1.07
216.0	1.282E+07	87.6	.0	74.4	74.4	7.965E+07	Trn A	6.150E+06	6.210E+06	1.07
217.0	1.276E+07	87.6	.0	74.4	74.4	7.969E+07	Trn A	6.150E+06	6.210E+06	1.07
218.0	1.270E+07	87.6	.0	74.4	74.4	7.972E+07	Trn A	6.150E+06	6.210E+06	1.07
219.0	1.264E+07	87.6	.0	74.4	74.4	7.976E+07	Trn A	6.150E+06	6.210E+06	1.07
220.0	1.258E+07	87.6	.0	74.4	74.4	7.980E+07	Trn A	6.150E+06	6.210E+06	1.07
221.0	1.252E+07	87.6	.0	74.4	74.4	7.984E+07	Trn A	6.150E+06	6.210E+06	1.07
222.0	1.245E+07	87.6	.0	74.4	74.4	7.987E+07	Trn A	6.150E+06	6.210E+06	1.07
223.0	1.239E+07	87.6	.0	74.4	74.4	7.991E+07	Trn A	6.150E+06	6.210E+06	1.07
224.0	1.233E+07	87.6	.0	74.4	74.4	7.995E+07	Trn A	6.150E+06	6.210E+06	1.07
225.0	1.227E+07	87.6	.0	74.4	74.4	7.999E+07	Trn A	6.150E+06	6.210E+06	1.07
226.0	1.221E+07	87.6	.0	74.4	74.4	8.002E+07	Trn A	6.150E+06	6.210E+06	1.07
227.0	1.215E+07	87.6	.0	74.4	74.4	8.006E+07	Trn A	6.150E+06	6.210E+06	1.07
228.0	1.209E+07	87.6	.0	74.4	74.4	8.010E+07	Trn A	6.150E+06	6.210E+06	1.07
229.0	1.202E+07	87.6	.0	74.4	74.4	8.014E+07	Trn A	6.150E+06	6.210E+06	1.07
230.0	1.196E+07	87.6	.0	74.4	74.4	8.017E+07	Trn A	6.150E+06	6.210E+06	1.07
231.0	1.190E+07	87.6	.0	74.4	74.4	8.021E+07	Trn A	6.150E+06	6.210E+06	1.07
232.0	1.184E+07	87.6	.0	74.4	74.4	8.025E+07	Trn A	6.150E+06	6.210E+06	1.07
233.0	1.178E+07	87.6	.0	74.4	74.4	8.029E+07	Trn A	6.150E+06	6.210E+06	1.07
234.0	1.172E+07	87.6	.0	74.4	74.4	8.032E+07	Trn A	6.150E+06	6.210E+06	1.07
235.0	1.165E+07	87.6	.0	74.4	74.4	8.036E+07	Trn A	6.150E+06	6.210E+06	1.07
236.0	1.159E+07	87.6	.0	74.4	74.4	8.040E+07	Trn A	6.150E+06	6.210E+06	1.07
237.0	1.153E+07	87.6	.0	74.4	74.4	8.044E+07	Trn A	6.150E+06	6.210E+06	1.07
238.0	1.147E+07	87.6	.0	74.4	74.4	8.047E+07	Trn A	6.150E+06	6.210E+06	1.07
239.0	1.141E+07	87.6	.0	74.4	74.4	8.051E+07	Trn A	6.150E+06	6.210E+06	1.07
240.0	1.135E+07	87.7	.0	74.4	74.4	8.055E+07	Trn A	6.150E+06	6.210E+06	1.07

Stop - Program terminated.

**Vogtle Electric Generating Plant, Units 1 and 2
License Amendment Request to Revise
Technical Specification 3.7.9 Ultimate Heat Sink (UHS)**

Enclosure 6

Calculation X4C1202S30 "NSCW Cooling Tower Fan Success Criteria Analysis"

Calculation Number:
X4C1202S30

Plant: Vogtle Electric Generating Plant	Unit: <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 1 & 2	Discipline: Mechanical
Title: NSCW Cooling Tower Fan Success Criteria Analysis		Subject: System 1202
Purpose / Objective: Evaluate the performance of NSCW cooling tower with out-of-service fans for the purpose of developing basis for amendment to Technical Specification 3.7.9 Ultimate Heat Sink.		
System or Equipment Tag Numbers: 1/2-1202-W4-001, 1/2-1202-W4-002		

Contents

Topic	Page	Attachments (Computer Printouts, Technical Papers, Sketches, Correspondence)	# of Pages
Purpose of Calculation	1	ATTACHMENT 1	1
Summary of Conclusions	7	ATTACHMENT 2	3
Methodology	1	ATTACHMENT 3	25
Assumptions	1		
Design Inputs	2		
Body of Calculation	5		
References	7		
Total # of Pages including cover sheet & Attachments :		37	

Nuclear Quality Level

<input checked="" type="checkbox"/> Safety-Related	<input type="checkbox"/> Safety Significant	<input type="checkbox"/> Non- Safety -Significant
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Version Record

Version No.	Description	Originator Printed Name Initial / Date	Reviewer Printed Name Initial / Date	Approval 1 Printed Name Initial / Date	Approval 2 Printed Name Initial / Date
1	Issued per RER VC110595501 Ver. 1	D. Zheng DZ 7/25/11	M. W. Zelinsky mwz 7/25/11	A. T. Vieira G. Brauer ATV 7/25/11 GB 7/25/11	MARK SERRA MS 7/25/11

Notes:

- Version 1 of this calculation corresponds to Nuclear/Mechanical Staff Calc. 550-66-Vogtle, Revision 1.

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: 1 of 7
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I. *Purpose of Calculation*

The purpose of this calculation is to evaluate the performance of the Nuclear Service Cooling Water (NSCW) cooling tower with out-of-service fans. The maximum wet bulb temperatures necessary to ensure the Ultimate Heat Sink (UHS) temperature stays below 95 °F are determined for the proposed scenarios in Attachment 1.

The impetus for this evaluation of NSCW Cooling Tower performance with out-of-service fans is the need to develop basis for amendment to T.S. 3.7.9 UHS. Therefore, bounding and conservative assumptions are made, which at times go beyond Design Bases assumptions; thus, the results of the evaluation will not be regarded as Design Basis, and will not supplant existing Design Basis calculations. Design Basis calculations which are the foundation for regulatory limits will stand on their own, with their conclusions unaffected by the results of this evaluation. This evaluation will be used as conservative basis input to the amendment to T.S. 3.7.9.

This calculation is categorized as Safety-Related.

II. *Methodology*

The Bechtel proprietary computer program UHSSIM is used in this evaluation. There is no revision number associated with UHSSIM. Documentation and validation of UHSSIM are provided in Attachments A and B of [2].

The programs were run on Bechtel System FREDDB40351B (Brand: HP Compaq, CPU: Pentium 4 3.2GHz, OS: Microsoft Windows XP Professional). The user verified the successful completion of the power-on-self-test (POST) for the particular computer configuration prior to making all runs. A front-end validation was performed by re-running the UHSSIM input documented in the Att. 7 of [2] and obtained identical results to the UHSSIM output documented in the Att. 8 of [2].

UHSSIM input and output files for this calculation are listed in Attachment 3.

III. *Assumptions*

1. In the current Vogtle UHS design, there are two independent NSCW trains each with its own cooling tower [1]. Each train contains a four-cell mechanical draft tower using four induced draft fans (one fan per cell). Single-train is conservatively assumed for this NSCW cooling tower fan success criteria analysis. NSCW cooling tower fan success criteria case scenario descriptions are proposed by Southern Nuclear Company (SNC) [3] and provided as Attachment 1.
2. For various fan out-of-service cases, water is expected to run through the out-of-service cooling tower cell(s) and dumped into the cooling basin without dissipating heat to the outside ambient. Due to the limitation of the UHSSIM computer program, it allows only

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: 2 of 7
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one set of heat rejection rate data and up to two tower trains. Per sensitivity runs (not documented), the heat rejection rate per train will be split proportionally per the water flow rate. Hence, two trains are modeled for this NSCW cooling tower fan success criteria analysis, with Train-A lumping the intact cells with normal water flow rates of 2.05E6 lbm/hr per cell and normal air flow rates of 2.07E6 lbm/hr per fan and Train-B contains the out-of-service cell(s) with normal water flow rates of 2.05E6 lbm/hr per cell and zero air flow rates. Normal water flow rate per cell and normal air flow rate per fan are per sht. 9 of [1].

3. It is assumed that the existing design data used in [1], such as the NSCW pump flow and tower fan performance data, is applicable to this UHS evaluation. The tower heat rejection rates for various NSCW cooling tower fan success criteria case scenarios are calculated separately in Attachment 2.
4. The ambient dry bulb temperature is assumed to be identical to the wet bulb temperature. Wet bulb temperature is the lowest temperature that can be obtained by evaporating water into the air at a constant pressure. It is always lower than the dry bulb temperature, but will be identical with 100% relative humidity. Per sensitivity runs (not documented), assuming dry bulb temperature identical to the wet bulb temperature conservatively maximizes the basin return temperature.
5. The ambient pressure is assumed at 14.7 psia. The variation of ambient pressure is expected to be small and the impact of ambient pressure changes is negligible.
6. The cooling tower basin is assumed to be initially at a temperature of 90 °F. Similar to UHSSIM case in [1], the water in the basin is assumed to be pure water.

IV. *Design Inputs*

The NSCW supply temperature required for operation of the Diesel Generators and ECCS pumps has a design basis of 95 °F. The maximum wet bulb temperature (and dry bulb temperature) necessary to ensure the UHS temperature stays below 95 °F is determined iteratively by UHSSIM, with the as-built cooling tower performance characteristic, number of out-of-service fans and heat loads as design inputs. A 30 hour duration is conservatively used for each fan out-of-service case.

The UHSSIM input parameters are:

- 1st Card – Design Data: per tower design parameters on sht. I-5 of [1]

design wet bulb temperature =	82 °F
design dry bulb temperature =	98 °F
design hot water temperature =	129 F
design pressure =	14.696 psia
design solids content =	0 ppt
units flag =	0

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: 3 of 7
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- 2nd Card – Initial Conditions: per sht. I-5 of [1] and Sec. III *Assumptions*
initial basin mass = 29,843,200 lbm
initial basin temperature = 90 °F
initial solids content = 0 ppt
number of towers = 2
start time = 0.0 hr
- 3rd Card – Printout Control: results are printed every 0.5 hour for 30 hours
printout step size = 0.5 hr
printout step numbers = 60
- 4th Card – Tower Operation Data: per Sec. III *Assumptions*, Train-A lumped the intact cells and Train-B lumped the out-of-service cells. Time dependent lumped tower water flow rate and fan air flow rate in lbm/hr are listed below per different alignments of tower fan operation conditions. The cooling tower characteristics KaV/L of 1.07 is per sht. I-5 of [1] and applied to both trains.

0 Fan Out-of Service Conditions:

```
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,8.20e6,8.28e6,1.07
720.0,8.20e6,8.28e6,1.07
*
# Train B
Trn B
0.0,0e6,0.0,1.07
720.,0e6,0.0,1.07
*
```

1 Fan Out-of Service Conditions:

```
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,6.15e6,6.21e6,1.07
720.0,6.15e6,6.21e6,1.07
*
# Train B
Trn B
0.0,2.05e6,0.0,1.07
720.,2.05e6,0.0,1.07
*
```

2 Fans Out-of Service Conditions:

```
# Tower Operating Data
# 5 character tower ID
```

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: 4 of 7
--	---	--------------------------------

```
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,4.10e6,4.14e6,1.07
720.0,4.10e6,4.14e6,1.07
*
# Train B
Trn B
0.0,4.10e6,0.0,1.07
720.,4.10e6,0.0,1.07
*
```

3 Fans Out-of Service Conditions:

```
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,2.05e6,2.07e6,1.07
720.0,2.05e6,2.07e6,1.07
*
# Train B
Trn B
0.0,6.15e6,0.0,1.07
720.,6.15e6,0.0,1.07
*
```

- **5th Card – Heat Load**

The time dependent total tower heat rejection rates for various scenarios are determined per Attachment 2 and inputted to the 5th Card as time in hour and heat rejection rate in Btu/hr.

Fan Success Criteria Case 1: Transient without LOSP Load

```
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
0.00 h 64.90E6
4.00 h 64.90E6
4.01 h 63.17E6
20.00 h 63.17E6
20.01 h 59.30E6
720.00 h 59.30E6
*
```

Fan Success Criteria Case 2: Transient with LOSP Load

```
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
0.00 h 76.82E6
4.00 h 76.82E6
4.01 h 75.09E6
20.00 h 75.09E6
20.01 h 71.22E6
720.00 h 71.22E6
*
```

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: 5 of 7
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- 6th Card – Meteorological Data:
Meteorological conditions (wet bulb temperature in °F, dry bulb temperature in °F, and ambient pressure in psia) are maintained constant. These values, as shown in Table V-1, are determined iteratively to ensure the UHS basin temperature stays below the requirement.

V. *Body of Calculation*

The meteorological conditions (wet bulb, dry bulb, and ambient pressure) are provided as part of the UHSSIM inputs, and the maximum wet bulb temperature is determined iteratively by maintaining the UHSSIM output basin temperature below 95 °F for the 30 hour duration. Attachment 3 lists UHSSIM input and output files for different case scenarios with the number of fans out-of-service and the NSCW supply not to exceed 95 °F.

Table V-1 shows the maximum wet bulb temperature necessary to ensure the temperature of the NSCW supply does not exceed 95 °F for each of the fan success criteria cases with the number of fans out-of-service. Figures V-1 and V-2 are plots for Cases 1 and 2 and the NSCW supply temperatures of 95 °F to show the No. of fans available vs. the wet bulb temperature.

Table V-1 Maximum Wet Bulb Temperature Necessary to Ensure NSCW Supply Temperature Not to Exceed 95 °F

Case	Description	Maximum Wet Bulb Temperature °F Requiring the No. of NSCW CT Fans shown (with the NSCW supply not to exceed 95 °F)			
		1 Fan	2 Fans	3 Fans	4 Fans
1. Transient w/o LOSP	Transient resulting in Rx trip with no LOSP. Cooldown only to hot shutdown. Single train NSCW operation.	33.0°F	77.9°F	87.1°F	91.3°F
2. Transient w/ LOSP	Transient resulting in Rx trip with LOSP. Cooldown only to hot shutdown. Single train NSCW operation.	0.5°F	73.5°F	85.5°F	90.6°F

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: 6 of 7
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Figure V-1: NSCW Supply Temperature not to Exceed 95°F (Case 1)

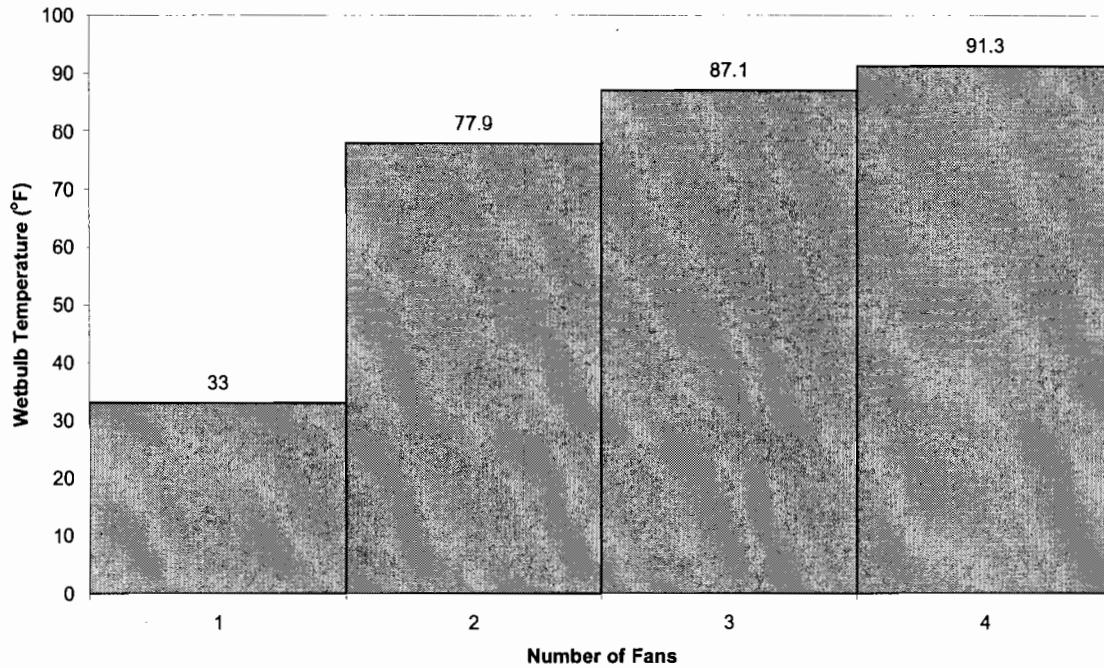
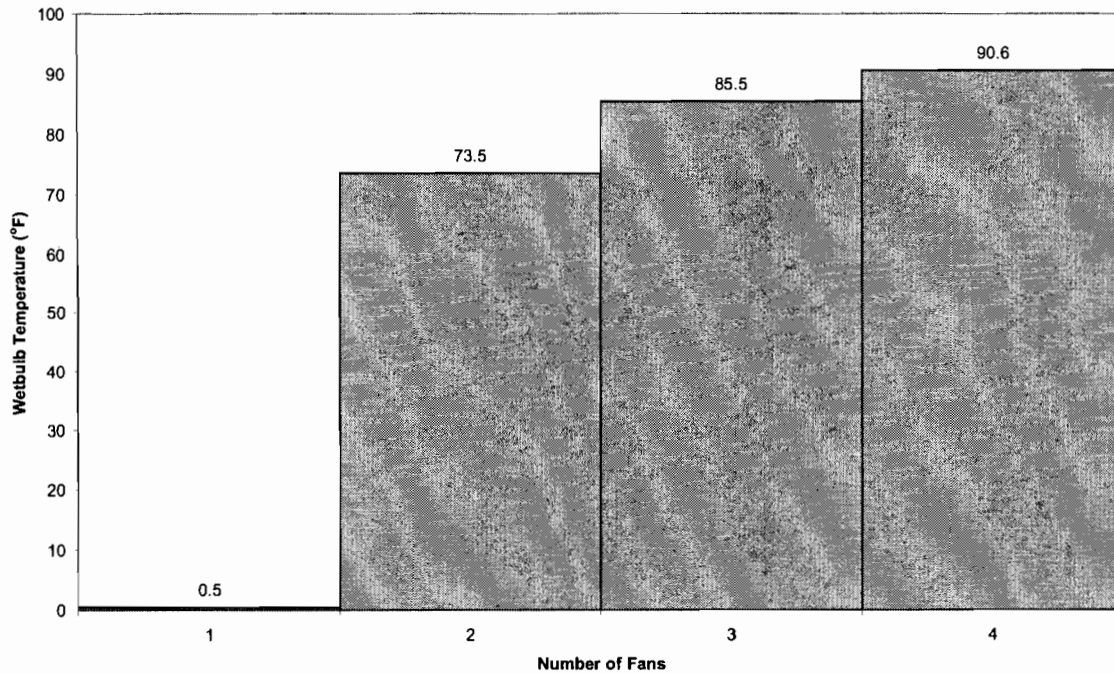


Figure V-2: NSCW Supply Temperature not to Exceed 95 °F (Case 2)



Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: 7 of 7
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VI. *References*

- [1]. X4C1202V54, Ver. 2, “*Maximum Ultimate Heat Sink Temperature (post LOCA)*”.
- [2]. X4C1202S26, Ver. 5, “*Ultimate Heat Sink Analysis*”.
- [3]. Email from Jennings, Willie J. (SNC) to Zheng, Dong (Bechtel), Subject: *Purpose of Calculation S30 and Definition of Cases Write up*, July 25, 2011, 2:01 pm (with 1 attachment, provided as Attachment 1 of this calculation).

Attachment 2 contains additional references for heat load modeling.

VII. *Summary of Conclusions*

The maximum wet bulb temperature necessary to ensure the temperature of the NSCW supply does not exceed 95 °F for each of the fan success criteria cases with the number of fans out-of-service are summarized in Table V-1 and Figures V-1 and V-2.

Per Sec. I *Purpose of Calculation*, this evaluation of NSCW Cooling Tower performance with out-of-service fans will not be regarded as Design Basis and will not supplant existing Design Basis calculations. These results will be used as conservative basis input to the amendment to T.S. 3.7.9, UHS for Vogtle.

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 1 1 of 1
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ATTACHMENT 1**NSCW COOLING TOWER FAN SUCCESS CRITERIA CASE SCENARIOS**

(per case descriptions attached in [3])

INTRODUCTION

The impetus for this evaluation of NSCW Cooling Tower performance with out-of-service fans is the need to develop basis for an amendment to technical Specification 3.7.9 UHS. Therefore, bounding and conservative assumptions are made, which at times go beyond Design Bases assumptions; thus, the results of the evaluation will not be regarded as Design Basis, and will not supplant existing Design Basis calculations. Design Basis calculations which are the foundation for regulatory limits will stand on their own, with their conclusions unaffected by the results of this evaluation. This evaluation will be used as conservative basis input to the amendment to Tech. Spec. 3.7.9 for Vogtle.

CASE 1

Transient Without LOSP Load -

Case 1 is plant trip from 100% Rated Thermal Power and cooldown on AFW and ARVs initially to hot shutdown; assume only a single train of NSCW.

Electrical power is normal offsite power feed being available for both Train A and Train B.

CASE 2

Transient With LOSP Load -

Case 2 is plant trip co-incident with a Loss of Offsite Power (LOSP) from 100% Rated Thermal Power and cooldown on AFW and ARVs initially to hot shutdown, assume only a single train of NSCW.

The definition of Loss of Offsite Power is de-energization of the 1E 4160 VAC buses, 1/2AA02 and 1/2BA03; for the purposes of this evaluation, 1 of these busses is re-energized by the Emergency Diesel Generator and the other is not. Therefore, a conservative assumption for the purpose of compiling heat loads, is that power is still available to the RCPs.

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 2 1 of 3
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ATTACHMENT 2

NSCW COOLING TOWER FAN SUCCESS CRITERIA CASE HEAT LOADS

Attachment 2 Prepared by: S. L. Gubin

Date: 7/21/2011

Attachment 2 Checked by: M. W. Zelinsky

Date: 7/21/2011

NSCW UHS Analysis Heat Loads

	Case 1		Case 2		Case 3		Case 4	
Component	Transient w/o LOSP Load (10⁶ BTU/hr)	Ref.	Transient w/ LOSP Load (10⁶ BTU/hr)	Ref.	N/A		N/A	
NSCW LOADS								
CCW Pump Motor Coolers	0.14	1, pg. 30	0.14	1, pg. 29				
NSCW Pump Pumping Loss	3.57	1, pg. 30	3.57	1, pg. 29				
NSCW Pump Motor Coolers	0.14	1, pg. 30	0.14	1, pg. 29				
CB Engineered Safety Features Chiller	0.00	1, pg. 26	5.15	1, pg. 26				
RHR Pump and Motor	0.00	1, pg. 30, Note 1	0.00	1, pg. 29, Note 1				
Centrifugal Charging Pump Motor Cooler, LO Cooler	0.20	1, pg. 30	0.20	1, pg. 29				
Diesel Generator Water Jacket Coolers	0.00	1, pg. 30	17.10	1, pg. 29				
Pipe Penetration Area (One Train)	0.00	1, pg. 30	0.00	1, pg. 29				
Containment Spray Pump and Motor	0.00	1, pg. 30	0.00	1, pg. 29				
SI Pump LO Cooler, Motor Cooler	0.00	1, pg. 30	0.00	1, pg. 29				
Reactor Cavity Cooling Coil (One Train)	0.50	1, pg. 30	0.25	1, pg. 29				
CTB Auxiliary Air Cooling Coil	3.17	7, pg. 6	0.00	1, pg. 29				
Containment Air Fan Coolers (4 Coolers)	10.42	1, pg. 30	10.42	1, pg. 29				
Transfer Pump	0.08	1, pg. 29, 30	0.08	1, pg. 29				

Southern Nuclear Design Calculations

Plant:
Vogtle Units 1 & 2

Calculation Number:
X4C1202S30

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NSCW UHS Analysis Heat Loads

	Case 1		Case 2		Case 3		Case 4	
Component	Transient w/o LOSP Load (10 ⁶ BTU/hr)	Ref.	Transient w/ LOSP Load (10 ⁶ BTU/hr)	Ref.	N/A		N/A	
CCW and RHR LOADS								
RHR Pump Seal Cooler	0.00	Note 5	0.00	Note 5				
RHR Heat Exchanger	0	Note 5	0	Note 5				
CCW Pump	1.48	2, pg. 27	1.48	2, pg. 27				
Spent Fuel Pool Pump	0.38	2, pg. 27	0.38	2, pg. 27				
Spent Fuel Pool Heat Exchanger	23.64	6, pgs. 1-3,4 Note 6	23.64	6, pgs. 1-3,4 Note 6				
ACCW LOADS								
Reactor Coolant Drain Tank Heat Exchanger	0.00	4, Pg. 8A Note 3	0.00	4, Pg. 8A Note 3				
Excess Letdown Heat Exchanger	0.00	4, Pg. 8A	0.00	4, Pg. 8A				
RCPs (Motor Air Coolers, Lube Oil Coolers, Thermal Barrier)	11.49	4, Pg. 8A, 15	5.55	4, Pg. 8A, 16				
Catalytic Hydrogen Recombiner	0.07	4, Pg. 8A	0.00	4, Pg. 8A				
Waste Gas Compressor	0.14	4, Pg. 8A	0.00	4, Pg. 8A				
Seal Water Heat Exchanger	1.98	4, Pg. 8A	1.98	4, Pg. 8A				
Letdown Heat Exchanger beginning at 0, 4 and 20 hrs	6.53, 4.80, 0.93	4, Pg. 8A	6.53, 4.80, 0.93	4, Pg. 8A				
Recycle Evaporator Package	0.00	4, Pg. 6	0.00	4, Pg. 6				
Sample Coolers	0.66	4, Pg. 8A	0.00	4, Pg. 8A				
Waste Evaporator Package	0.00	4, Pg. 6	0.00	4, Pg. 6				
Waste Evaporator Steam Supply System	0.00	4, Pg. 7	0.00	4, Pg. 7				
Normal Charging Pump	0.10	4, Pg. 8A	0.00	4, Pg. 8A				
ACCW Pumps and Motors	0.21	4, Pg. 8A	0.21	4, Pg. 8A				

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 2 3 of 3
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NSCW UHS Analysis Heat Loads

	Case 1		Case 2		Case 3		Case 4	
Component	Transient w/o LOSP Load (10⁶ BTU/hr)	Ref.	Transient w/ LOSP Load (10⁶ BTU/hr)	Ref.	N/A		N/A	
Total NSCW Heat Loads	64.90, 63.17, 59.30	Heat loads beginning at 0, 4, and 20 hrs	76.82, 75.09, 71.22	Heat loads beginning at 0, 4, and 20 hrs				

Notes:

- 1) Starts when reactor enters shutdown cooling, not part of this analysis.
- 2) N/A
- 3) Is dropped from service at reactor trip.
- 4) N/A
- 5) The reactor is assumed to be bottled up at hot standby throughout the event relying entirely on sufficient CST capacity to forgo the need to enter Shutdown Cooling.
- 6) Uses Unit 2 values as the Unit 2 fuel pool has a slightly larger capacity.

Case Definitions:

Case 1 – Transient resulting in Rx trip with no LOSP. Single train NSCW operation. Assumes that the loads of a normal shutdown or cooldown would still be carried by the system.

Case 2 – Transient resulting in Rx trip with LOSP. Single train NSCW operation. Assumes that those systems started on a LOP (CB ESF Chillers, DGs) will continue to operate throughout.

Case 3 – N/A

Case 4 – N/A

References:

- 1) X4C1202V03, Ver. 9
- 2) X4C1205V04, Ver. 2
- 3) N/A
- 4) X4C1217V02, Ver. 8
- 5) X4C1202V07, Ver. 6
- 6) X4C1202V54, Ver. 2
- 7) X4C1515S01, Ver. 0

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 3 1 of 25
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ATTACHMENT 3

UHSSIM Input/Output Listing

Attachment 3 Prepared by: D. Zheng

Date: 7/21/2011

Attachment 3 Checked by: M. W. Zelinsky

Date: 7/21/2011

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3. UHSSIM input/output Case1-1_95F for Case #1 (Transient without LOSP Load) with 1 fan out-of-service and required NSCW supply of 95 °F	8
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7. UHSSIM input/output Case2-1_95F for Case #2 (Transient with LOSP Load) with 1 fan out-of-service and required NSCW supply of 95 °F	20
8. UHSSIM input/output Case2-0_95F for Case #2 (Transient with LOSP Load) with 0 fan out-of-service and required NSCW supply of 95 °F	23

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1. UHSSIM input/output Case1-3_95F for Case #1 (Transient without LOSP Load)
with 3 fans out-of-service and required NSCW supply of 95 °F

Case1-3_95F.inp

```

Vogtle MUR Out-Of-Service Fan UHS Case 1-3: 3 fan OOS, KaV/L=1.07, 0 solids, 95 F limit
# design wet-bulb temperature [F], design dry-bulb temperature [F],
# design hot-water temperature [F], design pressure [psia], design solids [ppt]
# 0 => F, psia, btu/hr, lbm/hr units
82, 98, 129.0, 14.696, 0.0, 0
# initial basin mass [lbm], initial basin temperature [F], initial solids [ppt],
# number of towers, starting time of simulation [hr]
29843200, 90, 0, 2, 0.
# Time Period Data -- every half hour for 30 hours
# step size, number of steps
0.5,60
*
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,2.05e6,2.07e6,1.07
720.0,2.05e6,2.07e6,1.07
*
# Train B
Trn B
0.0,6.15e6,0.0e6,1.07
720.,6.15e6,0.0e6,1.07
*
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
0.00 h 64.90E6
4.00 h 64.90E6
4.01 h 63.17E6
20.00 h 63.17E6
20.01 h 59.30E6
720.00 h 59.30E6
*
# Ambient Data Supplied by Bechtel Power Corp.
# TIME   WB      DB      P
# (hr)   (F)     (F)     (psia)
#       0,    33.0,   33.0,   14.70
#       720,  33.0,   33.0,   14.70
..

```


Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 3 3 of 25
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Case1-3_95F.out

Vogtle MUR Out-Of-Service Fan UHS Case 1-3: 3 fan OOS, KaV/L=1.07, 0 solids, 95

Initial Basin Mass 2.984E+07 lbm
Initial Basin Temperature 90.0 F
Initial Basin Solids .0 ppt

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
.0	2.984E+07	90.0	.0	33.0	33.0	6.490E+07	Trn A	2.050E+06	2.070E+06	1.07
.5	2.983E+07	90.2	.0	33.0	33.0	6.490E+07	Trn A	2.050E+06	2.070E+06	1.07
1.0	2.981E+07	90.4	.0	33.0	33.0	6.490E+07	Trn A	2.050E+06	2.070E+06	1.07
1.5	2.979E+07	90.6	.0	33.0	33.0	6.490E+07	Trn A	2.050E+06	2.070E+06	1.07
2.0	2.977E+07	90.7	.0	33.0	33.0	6.490E+07	Trn A	2.050E+06	2.070E+06	1.07
2.5	2.975E+07	90.9	.0	33.0	33.0	6.490E+07	Trn A	2.050E+06	2.070E+06	1.07
3.0	2.974E+07	91.1	.0	33.0	33.0	6.490E+07	Trn A	2.050E+06	2.070E+06	1.07
3.5	2.972E+07	91.2	.0	33.0	33.0	6.490E+07	Trn A	2.050E+06	2.070E+06	1.07
4.0	2.970E+07	91.4	.0	33.0	33.0	6.490E+07	Trn A	2.050E+06	2.070E+06	1.07
4.5	2.968E+07	91.6	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
5.0	2.966E+07	91.7	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
5.5	2.964E+07	91.8	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
6.0	2.963E+07	92.0	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
6.5	2.961E+07	92.1	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
7.0	2.959E+07	92.2	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
7.5	2.957E+07	92.3	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
8.0	2.955E+07	92.4	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
8.5	2.953E+07	92.6	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
9.0	2.951E+07	92.7	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
9.5	2.950E+07	92.8	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
10.0	2.948E+07	92.9	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
10.5	2.946E+07	93.0	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
11.0	2.944E+07	93.1	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
11.5	2.942E+07	93.2	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
12.0	2.940E+07	93.3	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
12.5	2.938E+07	93.4	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
13.0	2.936E+07	93.5	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
13.5	2.934E+07	93.6	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
14.0	2.932E+07	93.7	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
14.5	2.930E+07	93.8	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 3 4 of 25
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Vogtle MUR Out-Of-Service Fan UHS Case 1-3: 3 fan OOS, KaV/L=1.07, 0 solids, 95

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
15.0	2.929E+07	93.9	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
15.5	2.927E+07	94.0	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
16.0	2.925E+07	94.0	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
16.5	2.923E+07	94.1	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
17.0	2.921E+07	94.2	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
17.5	2.919E+07	94.3	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
18.0	2.917E+07	94.4	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
18.5	2.915E+07	94.4	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
19.0	2.913E+07	94.5	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
19.5	2.911E+07	94.6	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
20.0	2.909E+07	94.7	.0	33.0	33.0	6.317E+07	Trn A	2.050E+06	2.070E+06	1.07
20.5	2.907E+07	94.7	.0	33.0	33.0	5.930E+07	Trn A	2.050E+06	2.070E+06	1.07
21.0	2.905E+07	94.7	.0	33.0	33.0	5.930E+07	Trn A	2.050E+06	2.070E+06	1.07
21.5	2.903E+07	94.8	.0	33.0	33.0	5.930E+07	Trn A	2.050E+06	2.070E+06	1.07
22.0	2.901E+07	94.8	.0	33.0	33.0	5.930E+07	Trn A	2.050E+06	2.070E+06	1.07
22.5	2.899E+07	94.8	.0	33.0	33.0	5.930E+07	Trn A	2.050E+06	2.070E+06	1.07
23.0	2.897E+07	94.8	.0	33.0	33.0	5.930E+07	Trn A	2.050E+06	2.070E+06	1.07
23.5	2.895E+07	94.8	.0	33.0	33.0	5.930E+07	Trn A	2.050E+06	2.070E+06	1.07
24.0	2.893E+07	94.8	.0	33.0	33.0	5.930E+07	Trn A	2.050E+06	2.070E+06	1.07
24.5	2.891E+07	94.8	.0	33.0	33.0	5.930E+07	Trn A	2.050E+06	2.070E+06	1.07
25.0	2.889E+07	94.8	.0	33.0	33.0	5.930E+07	Trn A	2.050E+06	2.070E+06	1.07
25.5	2.887E+07	94.9	.0	33.0	33.0	5.930E+07	Trn A	2.050E+06	2.070E+06	1.07
26.0	2.885E+07	94.9	.0	33.0	33.0	5.930E+07	Trn A	2.050E+06	2.070E+06	1.07
26.5	2.883E+07	94.9	.0	33.0	33.0	5.930E+07	Trn A	2.050E+06	2.070E+06	1.07
27.0	2.881E+07	94.9	.0	33.0	33.0	5.930E+07	Trn A	2.050E+06	2.070E+06	1.07
27.5	2.879E+07	94.9	.0	33.0	33.0	5.930E+07	Trn A	2.050E+06	2.070E+06	1.07
28.0	2.877E+07	94.9	.0	33.0	33.0	5.930E+07	Trn A	2.050E+06	2.070E+06	1.07
28.5	2.875E+07	94.9	.0	33.0	33.0	5.930E+07	Trn A	2.050E+06	2.070E+06	1.07
29.0	2.873E+07	94.9	.0	33.0	33.0	5.930E+07	Trn A	2.050E+06	2.070E+06	1.07
29.5	2.871E+07	94.9	.0	33.0	33.0	5.930E+07	Trn A	2.050E+06	2.070E+06	1.07
30.0	2.869E+07	94.9	.0	33.0	33.0	5.930E+07	Trn A	2.050E+06	2.070E+06	1.07

Stop - Program terminated.

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 3 5 of 25
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2. UHSSIM input/output Case1-2_95F for Case #1 (Transient without LOSP Load)
with 2 fans out-of-service and required NSCW supply of 95 °F

Case1-2_95F.inp

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Vogtle MUR Out-Of-Service Fan UHS Case 1-2: 2 fan OOS, KaV/L=1.07, 0 solids, 95 F limit
# design wet-bulb temperature [F], design dry-bulb temperature [F],
# design hot-water temperature [F], design pressure [psia], design solids [ppt]
# 0 => F, psia, btu/hr, lbm/hr units
82, 98, 129.0, 14.696, 0.0, 0
# initial basin mass [lbm], initial basin temperature [F], initial solids [ppt],
# number of towers, starting time of simulation [hr]
29843200, 90, 0, 2, 0.
# Time Period Data -- every half hour for 30 hours
# step size, number of steps
0.5,60
*
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,4.10e6,4.14e6,1.07
720.0,4.10e6,4.14e6,1.07
*
# Train B
Trn B
0.0,4.10e6,0.00e6,1.07
720.0,4.10e6,0.00e6,1.07
*
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
0.00 h 64.90E6
4.00 h 64.90E6
4.01 h 63.17E6
20.00 h 63.17E6
20.01 h 59.30E6
720.00 h 59.30E6*
# Ambient Data Supplied by Bechtel Power Corp.
# TIME   WB      DB      P
# (hr)   (F)     (F)     (psia)
#       0,    77.9,   77.9,   14.70
#       720,  77.9,   77.9,   14.70
•

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Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 3 6 of 25
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Case1-2_95F.out

Vogtle MUR Out-Of-Service Fan UHS Case 1-2: 2 fan OOS, KaV/L=1.07, 0 solids, 95

Initial Basin Mass 2.984E+07 lbm
Initial Basin Temperature 90.0 F
Initial Basin Solids .0 ppt

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
0.0	2.984E+07	90.0	.0	77.9	77.9	6.490E+07	Trn A	4.100E+06	4.140E+06	1.07
.5	2.982E+07	90.3	.0	77.9	77.9	6.490E+07	Trn A	4.100E+06	4.140E+06	1.07
1.0	2.981E+07	90.5	.0	77.9	77.9	6.490E+07	Trn A	4.100E+06	4.140E+06	1.07
1.5	2.979E+07	90.8	.0	77.9	77.9	6.490E+07	Trn A	4.100E+06	4.140E+06	1.07
2.0	2.977E+07	91.0	.0	77.9	77.9	6.490E+07	Trn A	4.100E+06	4.140E+06	1.07
2.5	2.975E+07	91.3	.0	77.9	77.9	6.490E+07	Trn A	4.100E+06	4.140E+06	1.07
3.0	2.973E+07	91.5	.0	77.9	77.9	6.490E+07	Trn A	4.100E+06	4.140E+06	1.07
3.5	2.970E+07	91.7	.0	77.9	77.9	6.490E+07	Trn A	4.100E+06	4.140E+06	1.07
4.0	2.968E+07	91.9	.0	77.9	77.9	6.490E+07	Trn A	4.100E+06	4.140E+06	1.07
4.5	2.966E+07	92.1	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
5.0	2.964E+07	92.3	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
5.5	2.962E+07	92.4	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
6.0	2.960E+07	92.6	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
6.5	2.958E+07	92.7	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
7.0	2.956E+07	92.9	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
7.5	2.954E+07	93.0	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
8.0	2.951E+07	93.1	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
8.5	2.949E+07	93.2	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
9.0	2.947E+07	93.4	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
9.5	2.945E+07	93.5	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
10.0	2.942E+07	93.6	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
10.5	2.940E+07	93.7	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
11.0	2.938E+07	93.8	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
11.5	2.936E+07	93.9	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
12.0	2.933E+07	93.9	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
12.5	2.931E+07	94.0	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
13.0	2.929E+07	94.1	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
13.5	2.926E+07	94.2	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
14.0	2.924E+07	94.3	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
14.5	2.922E+07	94.3	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 3 7 of 25
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Vogtle MUR Out-Of-Service Fan UHS Case 1-2: 2 fan OOS, KaV/L=1.07, 0 solids, 95

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
15.0	2.919E+07	94.4	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
15.5	2.917E+07	94.5	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
16.0	2.915E+07	94.5	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
16.5	2.912E+07	94.6	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
17.0	2.910E+07	94.6	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
17.5	2.908E+07	94.7	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
18.0	2.905E+07	94.7	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
18.5	2.903E+07	94.8	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
19.0	2.900E+07	94.8	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
19.5	2.898E+07	94.9	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
20.0	2.896E+07	94.9	.0	77.9	77.9	6.317E+07	Trn A	4.100E+06	4.140E+06	1.07
20.5	2.893E+07	94.9	.0	77.9	77.9	5.930E+07	Trn A	4.100E+06	4.140E+06	1.07
21.0	2.891E+07	94.9	.0	77.9	77.9	5.930E+07	Trn A	4.100E+06	4.140E+06	1.07
21.5	2.888E+07	94.9	.0	77.9	77.9	5.930E+07	Trn A	4.100E+06	4.140E+06	1.07
22.0	2.886E+07	94.9	.0	77.9	77.9	5.930E+07	Trn A	4.100E+06	4.140E+06	1.07
22.5	2.884E+07	94.9	.0	77.9	77.9	5.930E+07	Trn A	4.100E+06	4.140E+06	1.07
23.0	2.881E+07	94.9	.0	77.9	77.9	5.930E+07	Trn A	4.100E+06	4.140E+06	1.07
23.5	2.879E+07	94.9	.0	77.9	77.9	5.930E+07	Trn A	4.100E+06	4.140E+06	1.07
24.0	2.877E+07	94.9	.0	77.9	77.9	5.930E+07	Trn A	4.100E+06	4.140E+06	1.07
24.5	2.874E+07	94.9	.0	77.9	77.9	5.930E+07	Trn A	4.100E+06	4.140E+06	1.07
25.0	2.872E+07	94.9	.0	77.9	77.9	5.930E+07	Trn A	4.100E+06	4.140E+06	1.07
25.5	2.870E+07	94.9	.0	77.9	77.9	5.930E+07	Trn A	4.100E+06	4.140E+06	1.07
26.0	2.867E+07	94.9	.0	77.9	77.9	5.930E+07	Trn A	4.100E+06	4.140E+06	1.07
26.5	2.865E+07	94.9	.0	77.9	77.9	5.930E+07	Trn A	4.100E+06	4.140E+06	1.07
27.0	2.863E+07	94.9	.0	77.9	77.9	5.930E+07	Trn A	4.100E+06	4.140E+06	1.07
27.5	2.860E+07	94.9	.0	77.9	77.9	5.930E+07	Trn A	4.100E+06	4.140E+06	1.07
28.0	2.858E+07	94.9	.0	77.9	77.9	5.930E+07	Trn A	4.100E+06	4.140E+06	1.07
28.5	2.856E+07	94.9	.0	77.9	77.9	5.930E+07	Trn A	4.100E+06	4.140E+06	1.07
29.0	2.853E+07	94.9	.0	77.9	77.9	5.930E+07	Trn A	4.100E+06	4.140E+06	1.07
29.5	2.851E+07	94.9	.0	77.9	77.9	5.930E+07	Trn A	4.100E+06	4.140E+06	1.07
30.0	2.848E+07	94.9	.0	77.9	77.9	5.930E+07	Trn A	4.100E+06	4.140E+06	1.07

Stop - Program terminated.

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 3 8 of 25
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3. UHSSIM input/output *Case1-1_95F* for Case #1 (Transient without LOSP Load)
with 1 fan out-of-service and required NSCW supply of 95 °F

Case1-1_95F.inp

```

Vogtle MUR Out-Of-Service Fan UHS Case 1-1: 1 fan OOS, KaV/L=1.07, 0 solids, 95 F limit
# design wet-bulb temperature [F], design dry-bulb temperature [F],
# design hot-water temperature [F], design pressure [psia], design solids [ppt]
# 0 => F, psia, btu/hr, lbm/hr units
82, 98, 129.0, 14.696, 0.0, 0
# initial basin mass [lbm], initial basin temperature [F], initial solids [ppt],
# number of towers, starting time of simulation [hr]
29843200, 90, 0, 2, 0.
# Time Period Data -- every half hour for 30 hours
# step size, number of steps
0.5,60
*
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,6.15e6,6.21e6,1.07
720.0,6.15e6,6.21e6,1.07
*
# Train B
Trn B
0.0,2.05e6,0.0e6,1.07
720.,2.05e6,0.0e6,1.07
*
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
0.00 h 64.90E6
4.00 h 64.90E6
4.01 h 63.17E6
20.00 h 63.17E6
20.01 h 59.30E6
720.00 h 59.30E6
*
# Ambient Data Supplied by Bechtel Power Corp.
# TIME WB DB P
# (hr) (F) (F) (psia)
0, 87.1, 87.1, 14.70
720, 87.1, 87.1, 14.70

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Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 3 9 of 25
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Case1-1_95F.out

Vogtle MUR Out-Of-Service Fan UHS Case 1-1: 1 fan OOS, KaV/L=1.07, 0 solids, 95

Initial Basin Mass 2.984E+07 lbm
Initial Basin Temperature 90.0 F
Initial Basin Solids .0 ppt

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
.0	2.984E+07	90.0	.0	87.1	87.1	6.490E+07	Trn A	6.150E+06	6.210E+06	1.07
.5	2.983E+07	90.4	.0	87.1	87.1	6.490E+07	Trn A	6.150E+06	6.210E+06	1.07
1.0	2.981E+07	90.7	.0	87.1	87.1	6.490E+07	Trn A	6.150E+06	6.210E+06	1.07
1.5	2.979E+07	91.0	.0	87.1	87.1	6.490E+07	Trn A	6.150E+06	6.210E+06	1.07
2.0	2.977E+07	91.3	.0	87.1	87.1	6.490E+07	Trn A	6.150E+06	6.210E+06	1.07
2.5	2.975E+07	91.6	.0	87.1	87.1	6.490E+07	Trn A	6.150E+06	6.210E+06	1.07
3.0	2.973E+07	91.9	.0	87.1	87.1	6.490E+07	Trn A	6.150E+06	6.210E+06	1.07
3.5	2.971E+07	92.1	.0	87.1	87.1	6.490E+07	Trn A	6.150E+06	6.210E+06	1.07
4.0	2.969E+07	92.3	.0	87.1	87.1	6.490E+07	Trn A	6.150E+06	6.210E+06	1.07
4.5	2.967E+07	92.5	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
5.0	2.965E+07	92.7	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
5.5	2.963E+07	92.9	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
6.0	2.960E+07	93.0	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
6.5	2.958E+07	93.2	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
7.0	2.956E+07	93.3	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
7.5	2.954E+07	93.4	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
8.0	2.951E+07	93.5	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
8.5	2.949E+07	93.7	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
9.0	2.947E+07	93.8	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
9.5	2.944E+07	93.9	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
10.0	2.942E+07	93.9	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
10.5	2.940E+07	94.0	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
11.0	2.937E+07	94.1	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
11.5	2.935E+07	94.2	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
12.0	2.933E+07	94.2	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
12.5	2.930E+07	94.3	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
13.0	2.928E+07	94.4	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
13.5	2.925E+07	94.4	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
14.0	2.923E+07	94.5	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
14.5	2.920E+07	94.5	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 3 10 of 25
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Vogtle MUR Out-Of-Service Fan UHS Case 1-1: 1 fan OOS, KaV/L=1.07, 0 solids, 95

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
15.0	2.918E+07	94.6	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
15.5	2.915E+07	94.6	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
16.0	2.913E+07	94.6	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
16.5	2.910E+07	94.7	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
17.0	2.908E+07	94.7	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
17.5	2.905E+07	94.7	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
18.0	2.903E+07	94.8	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
18.5	2.900E+07	94.8	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
19.0	2.898E+07	94.8	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
19.5	2.895E+07	94.8	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
20.0	2.893E+07	94.9	.0	87.1	87.1	6.317E+07	Trn A	6.150E+06	6.210E+06	1.07
20.5	2.890E+07	94.9	.0	87.1	87.1	5.930E+07	Trn A	6.150E+06	6.210E+06	1.07
21.0	2.888E+07	94.9	.0	87.1	87.1	5.930E+07	Trn A	6.150E+06	6.210E+06	1.07
21.5	2.885E+07	94.9	.0	87.1	87.1	5.930E+07	Trn A	6.150E+06	6.210E+06	1.07
22.0	2.883E+07	94.9	.0	87.1	87.1	5.930E+07	Trn A	6.150E+06	6.210E+06	1.07
22.5	2.881E+07	94.9	.0	87.1	87.1	5.930E+07	Trn A	6.150E+06	6.210E+06	1.07
23.0	2.878E+07	94.8	.0	87.1	87.1	5.930E+07	Trn A	6.150E+06	6.210E+06	1.07
23.5	2.876E+07	94.8	.0	87.1	87.1	5.930E+07	Trn A	6.150E+06	6.210E+06	1.07
24.0	2.873E+07	94.8	.0	87.1	87.1	5.930E+07	Trn A	6.150E+06	6.210E+06	1.07
24.5	2.871E+07	94.8	.0	87.1	87.1	5.930E+07	Trn A	6.150E+06	6.210E+06	1.07
25.0	2.868E+07	94.8	.0	87.1	87.1	5.930E+07	Trn A	6.150E+06	6.210E+06	1.07
25.5	2.866E+07	94.8	.0	87.1	87.1	5.930E+07	Trn A	6.150E+06	6.210E+06	1.07
26.0	2.864E+07	94.8	.0	87.1	87.1	5.930E+07	Trn A	6.150E+06	6.210E+06	1.07
26.5	2.861E+07	94.8	.0	87.1	87.1	5.930E+07	Trn A	6.150E+06	6.210E+06	1.07
27.0	2.859E+07	94.8	.0	87.1	87.1	5.930E+07	Trn A	6.150E+06	6.210E+06	1.07
27.5	2.856E+07	94.8	.0	87.1	87.1	5.930E+07	Trn A	6.150E+06	6.210E+06	1.07
28.0	2.854E+07	94.8	.0	87.1	87.1	5.930E+07	Trn A	6.150E+06	6.210E+06	1.07
28.5	2.851E+07	94.8	.0	87.1	87.1	5.930E+07	Trn A	6.150E+06	6.210E+06	1.07
29.0	2.849E+07	94.8	.0	87.1	87.1	5.930E+07	Trn A	6.150E+06	6.210E+06	1.07
29.5	2.847E+07	94.8	.0	87.1	87.1	5.930E+07	Trn A	6.150E+06	6.210E+06	1.07
30.0	2.844E+07	94.8	.0	87.1	87.1	5.930E+07	Trn A	6.150E+06	6.210E+06	1.07

Stop - Program terminated.

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 3 11 of 25
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4. UHSSIM input/output *Case1-0_95F* for Case #1 (Transient without LOSP Load)
with 0 fan out-of-service and required NSCW supply of 95 °F

Case1-0_95F.inp

```
Vogtle MUR Out-Of-Service Fan UHS Case 1-0: single NSCW train, all 4 fans running, 95 F limit
# Cooling Tower Characteristics KaV/L=1.07, 0 solids condition, wet-bulb depression of 16 F
# design wet-bulb temperature [F], design dry-bulb temperature [F],
# design hot-water temperature [F], design pressure [psia], design solids [ppt]
# 0 => F, psia, btu/hr, lbm/hr units
82, 98, 129.0, 14.696, 0.0, 0
# initial basin mass [lbm], initial basin temperature [F], initial solids [ppt],
# number of towers, starting time of simulation [hr]
29843200, 90, 0, 2, 0.
# Time Period Data -- every half hour for 30 hours
# step size, number of steps
0.5,60
*
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,8.20e6,8.28e6,1.07
720.0,8.20e6,8.28e6,1.07
*
# Train B
Trn B
0.0,0.00e6,0.00e6,1.07
720.0,0.00e6,0.00e6,1.07
*
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
0.00 h 64.90E6
4.00 h 64.90E6
4.01 h 63.17E6
20.00 h 63.17E6
20.01 h 59.30E6
720.00 h 59.30E6
*
# Ambient Data Supplied by Bechtel Power Corp.
# TIME WB DB P
# (hr) (F) (F) (psia)
0, 91.3, 91.3, 14.70
720, 91.3, 91.3, 14.70
.
```

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 3 12 of 25
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Case1-0_95F.out

Vogtle MUR Out-Of-Service Fan UHS Case 1-0: single NSCW train, all 4 fans runnin

Initial Basin Mass 2.984E+07 lbm
Initial Basin Temperature 90.0 F
Initial Basin Solids .0 ppt

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
.0	2.984E+07	90.0	.0	91.3	91.3	6.490E+07	Trn A	8.200E+06	8.280E+06	1.07
.5	2.983E+07	90.5	.0	91.3	91.3	6.490E+07	Trn A	8.200E+06	8.280E+06	1.07
1.0	2.981E+07	90.9	.0	91.3	91.3	6.490E+07	Trn A	8.200E+06	8.280E+06	1.07
1.5	2.979E+07	91.3	.0	91.3	91.3	6.490E+07	Trn A	8.200E+06	8.280E+06	1.07
2.0	2.978E+07	91.6	.0	91.3	91.3	6.490E+07	Trn A	8.200E+06	8.280E+06	1.07
2.5	2.976E+07	91.9	.0	91.3	91.3	6.490E+07	Trn A	8.200E+06	8.280E+06	1.07
3.0	2.974E+07	92.2	.0	91.3	91.3	6.490E+07	Trn A	8.200E+06	8.280E+06	1.07
3.5	2.972E+07	92.5	.0	91.3	91.3	6.490E+07	Trn A	8.200E+06	8.280E+06	1.07
4.0	2.970E+07	92.7	.0	91.3	91.3	6.490E+07	Trn A	8.200E+06	8.280E+06	1.07
4.5	2.968E+07	92.9	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
5.0	2.965E+07	93.1	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
5.5	2.963E+07	93.3	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
6.0	2.961E+07	93.5	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
6.5	2.959E+07	93.6	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
7.0	2.957E+07	93.7	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
7.5	2.954E+07	93.8	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
8.0	2.952E+07	94.0	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
8.5	2.950E+07	94.1	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
9.0	2.947E+07	94.1	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
9.5	2.945E+07	94.2	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
10.0	2.942E+07	94.3	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
10.5	2.940E+07	94.4	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
11.0	2.937E+07	94.4	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
11.5	2.935E+07	94.5	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
12.0	2.932E+07	94.5	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
12.5	2.930E+07	94.6	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
13.0	2.927E+07	94.6	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
13.5	2.925E+07	94.6	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
14.0	2.922E+07	94.7	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
14.5	2.920E+07	94.7	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 3 13 of 25
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Vogtle MUR Out-Of-Service Fan UHS Case 1-0: single NSCW train, all 4 fans runnin

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
15.0	2.917E+07	94.7	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
15.5	2.915E+07	94.7	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
16.0	2.912E+07	94.8	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
16.5	2.910E+07	94.8	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
17.0	2.907E+07	94.8	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
17.5	2.905E+07	94.8	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
18.0	2.902E+07	94.8	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
18.5	2.899E+07	94.9	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
19.0	2.897E+07	94.9	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
19.5	2.894E+07	94.9	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
20.0	2.892E+07	94.9	.0	91.3	91.3	6.317E+07	Trn A	8.200E+06	8.280E+06	1.07
20.5	2.889E+07	94.9	.0	91.3	91.3	5.930E+07	Trn A	8.200E+06	8.280E+06	1.07
21.0	2.887E+07	94.9	.0	91.3	91.3	5.930E+07	Trn A	8.200E+06	8.280E+06	1.07
21.5	2.884E+07	94.9	.0	91.3	91.3	5.930E+07	Trn A	8.200E+06	8.280E+06	1.07
22.0	2.882E+07	94.9	.0	91.3	91.3	5.930E+07	Trn A	8.200E+06	8.280E+06	1.07
22.5	2.879E+07	94.9	.0	91.3	91.3	5.930E+07	Trn A	8.200E+06	8.280E+06	1.07
23.0	2.877E+07	94.9	.0	91.3	91.3	5.930E+07	Trn A	8.200E+06	8.280E+06	1.07
23.5	2.874E+07	94.9	.0	91.3	91.3	5.930E+07	Trn A	8.200E+06	8.280E+06	1.07
24.0	2.872E+07	94.8	.0	91.3	91.3	5.930E+07	Trn A	8.200E+06	8.280E+06	1.07
24.5	2.869E+07	94.8	.0	91.3	91.3	5.930E+07	Trn A	8.200E+06	8.280E+06	1.07
25.0	2.867E+07	94.8	.0	91.3	91.3	5.930E+07	Trn A	8.200E+06	8.280E+06	1.07
25.5	2.864E+07	94.8	.0	91.3	91.3	5.930E+07	Trn A	8.200E+06	8.280E+06	1.07
26.0	2.862E+07	94.8	.0	91.3	91.3	5.930E+07	Trn A	8.200E+06	8.280E+06	1.07
26.5	2.859E+07	94.8	.0	91.3	91.3	5.930E+07	Trn A	8.200E+06	8.280E+06	1.07
27.0	2.857E+07	94.8	.0	91.3	91.3	5.930E+07	Trn A	8.200E+06	8.280E+06	1.07
27.5	2.855E+07	94.8	.0	91.3	91.3	5.930E+07	Trn A	8.200E+06	8.280E+06	1.07
28.0	2.852E+07	94.8	.0	91.3	91.3	5.930E+07	Trn A	8.200E+06	8.280E+06	1.07
28.5	2.850E+07	94.8	.0	91.3	91.3	5.930E+07	Trn A	8.200E+06	8.280E+06	1.07
29.0	2.847E+07	94.8	.0	91.3	91.3	5.930E+07	Trn A	8.200E+06	8.280E+06	1.07
29.5	2.845E+07	94.8	.0	91.3	91.3	5.930E+07	Trn A	8.200E+06	8.280E+06	1.07
30.0	2.842E+07	94.8	.0	91.3	91.3	5.930E+07	Trn A	8.200E+06	8.280E+06	1.07

Stop - Program terminated.

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 3 14 of 25
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5. UHSSIM input/output Case2-3_95F for Case #2 (Transient with LOSP Load)
with 3 fans out-of-service and required NSCW supply of 95 °F

Case2-3_95F.inp

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Vogtle MUR Out-Of-Service Fan UHS Case 1-3: 3 fan OOS, KaV/L=1.07, 0 solids, 95 F limit
# design wet-bulb temperature [F], design dry-bulb temperature [F],
# design hot-water temperature [F], design pressure [psia], design solids [ppt]
# 0 => F, psia, btu/hr, lbm/hr units
82, 98, 129.0, 14.696, 0.0, 0
# initial basin mass [lbm], initial basin temperature [F], initial solids [ppt],
# number of towers, starting time of simulation [hr]
29843200, 90, 0, 2, 0.
# Time Period Data -- every half hour for 30 hours
# step size, number of steps
0.5,60
*
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,2.05e6,2.07e6,1.07
720.0,2.05e6,2.07e6,1.07
*
# Train B
Trn B
0.0,6.15e6,0.0e6,1.07
720.,6.15e6,0.0e6,1.07
*
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
0.00 h 76.82E6
4.00 h 76.82E6
4.01 h 75.09E6
20.00 h 75.09E6
20.01 h 71.22E6
720.00 h 71.22E6
*
# Ambient Data Supplied by Bechtel Power Corp.
# TIME   WB      DB      P
# (hr)   (F)     (F)     (psia)
0,      0.5,    0.5,    14.70
720,    0.5,    0.5,    14.70

```

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 3 15 of 25
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Case2-3_95F.out

Vogtle MUR Out-Of-Service Fan UHS Case 1-3: 3 fan OOS, KaV/L=1.07, 0 solids, 95

Initial Basin Mass 2.984E+07 lbm
Initial Basin Temperature 90.0 F
Initial Basin Solids .0 ppt

time	basin	basin	basin	dry-bulb	wet-bulb	heat load	tower	water	air	KaV/L
[hr]	mass	temp	solids	temp	temp	[btu/hr]		flow rate	flow rate	[-]
[hr]	[lbm]	[F]	[ppt]	[F]	[F]			[lbm/hr]	[lbm/hr]	
.0	2.984E+07	90.0	.0	.5	.5	7.682E+07	Trn A	2.050E+06	2.070E+06	1.07
.5	2.983E+07	90.2	.0	.5	.5	7.682E+07	Trn A	2.050E+06	2.070E+06	1.07
1.0	2.981E+07	90.4	.0	.5	.5	7.682E+07	Trn A	2.050E+06	2.070E+06	1.07
1.5	2.979E+07	90.5	.0	.5	.5	7.682E+07	Trn A	2.050E+06	2.070E+06	1.07
2.0	2.977E+07	90.7	.0	.5	.5	7.682E+07	Trn A	2.050E+06	2.070E+06	1.07
2.5	2.976E+07	90.9	.0	.5	.5	7.682E+07	Trn A	2.050E+06	2.070E+06	1.07
3.0	2.974E+07	91.1	.0	.5	.5	7.682E+07	Trn A	2.050E+06	2.070E+06	1.07
3.5	2.972E+07	91.2	.0	.5	.5	7.682E+07	Trn A	2.050E+06	2.070E+06	1.07
4.0	2.970E+07	91.4	.0	.5	.5	7.682E+07	Trn A	2.050E+06	2.070E+06	1.07
4.5	2.969E+07	91.5	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
5.0	2.967E+07	91.6	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
5.5	2.965E+07	91.8	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
6.0	2.963E+07	91.9	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
6.5	2.961E+07	92.0	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
7.0	2.960E+07	92.2	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
7.5	2.958E+07	92.3	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
8.0	2.956E+07	92.4	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
8.5	2.954E+07	92.5	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
9.0	2.952E+07	92.6	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
9.5	2.951E+07	92.7	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
10.0	2.949E+07	92.8	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
10.5	2.947E+07	93.0	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
11.0	2.945E+07	93.1	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
11.5	2.943E+07	93.2	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
12.0	2.941E+07	93.3	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
12.5	2.940E+07	93.4	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
13.0	2.938E+07	93.5	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
13.5	2.936E+07	93.6	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
14.0	2.934E+07	93.7	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
14.5	2.932E+07	93.7	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 3 16 of 25
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Vogtle MUR Out-Of-Service Fan UHS Case 1-3: 3 fan OOS, KaV/L=1.07, 0 solids, 95

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
15.0	2.930E+07	93.8	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
15.5	2.929E+07	93.9	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
16.0	2.927E+07	94.0	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
16.5	2.925E+07	94.1	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
17.0	2.923E+07	94.2	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
17.5	2.921E+07	94.3	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
18.0	2.919E+07	94.3	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
18.5	2.917E+07	94.4	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
19.0	2.915E+07	94.5	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
19.5	2.913E+07	94.6	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
20.0	2.912E+07	94.6	.0	.5	.5	7.509E+07	Trn A	2.050E+06	2.070E+06	1.07
20.5	2.910E+07	94.7	.0	.5	.5	7.122E+07	Trn A	2.050E+06	2.070E+06	1.07
21.0	2.908E+07	94.7	.0	.5	.5	7.122E+07	Trn A	2.050E+06	2.070E+06	1.07
21.5	2.906E+07	94.7	.0	.5	.5	7.122E+07	Trn A	2.050E+06	2.070E+06	1.07
22.0	2.904E+07	94.7	.0	.5	.5	7.122E+07	Trn A	2.050E+06	2.070E+06	1.07
22.5	2.902E+07	94.7	.0	.5	.5	7.122E+07	Trn A	2.050E+06	2.070E+06	1.07
23.0	2.900E+07	94.7	.0	.5	.5	7.122E+07	Trn A	2.050E+06	2.070E+06	1.07
23.5	2.898E+07	94.8	.0	.5	.5	7.122E+07	Trn A	2.050E+06	2.070E+06	1.07
24.0	2.896E+07	94.8	.0	.5	.5	7.122E+07	Trn A	2.050E+06	2.070E+06	1.07
24.5	2.895E+07	94.8	.0	.5	.5	7.122E+07	Trn A	2.050E+06	2.070E+06	1.07
25.0	2.893E+07	94.8	.0	.5	.5	7.122E+07	Trn A	2.050E+06	2.070E+06	1.07
25.5	2.891E+07	94.8	.0	.5	.5	7.122E+07	Trn A	2.050E+06	2.070E+06	1.07
26.0	2.889E+07	94.8	.0	.5	.5	7.122E+07	Trn A	2.050E+06	2.070E+06	1.07
26.5	2.887E+07	94.8	.0	.5	.5	7.122E+07	Trn A	2.050E+06	2.070E+06	1.07
27.0	2.885E+07	94.9	.0	.5	.5	7.122E+07	Trn A	2.050E+06	2.070E+06	1.07
27.5	2.883E+07	94.9	.0	.5	.5	7.122E+07	Trn A	2.050E+06	2.070E+06	1.07
28.0	2.881E+07	94.9	.0	.5	.5	7.122E+07	Trn A	2.050E+06	2.070E+06	1.07
28.5	2.879E+07	94.9	.0	.5	.5	7.122E+07	Trn A	2.050E+06	2.070E+06	1.07
29.0	2.878E+07	94.9	.0	.5	.5	7.122E+07	Trn A	2.050E+06	2.070E+06	1.07
29.5	2.876E+07	94.9	.0	.5	.5	7.122E+07	Trn A	2.050E+06	2.070E+06	1.07
30.0	2.874E+07	94.9	.0	.5	.5	7.122E+07	Trn A	2.050E+06	2.070E+06	1.07

Stop - Program terminated.

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 3 17 of 25
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6. UHSSIM input/output Case2-2 95F for Case #2 (Transient with LOSP Load)
with 2 fans out-of-service and required NSCW supply of 95 °F

Case2-2_95F.inp

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Vogtle MUR Out-Of-Service Fan UHS Case 1-2: 2 fan OOS, KaV/L=1.07, 0 solids, 95 F limit
# design wet-bulb temperature [F], design dry-bulb temperature [F],
# design hot-water temperature [F], design pressure [psia], design solids [ppt]
# 0 => F, psia, btu/hr, lbm/hr units
82, 98, 129.0, 14.696, 0.0, 0
# initial basin mass [lbm], initial basin temperature [F], initial solids [ppt],
# number of towers, starting time of simulation [hr]
29843200, 90, 0, 2, 0.
# Time Period Data -- every half hour for 30 hours
# step size, number of steps
0.5,60
*
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,4.10e6,4.14e6,1.07
720.0,4.10e6,4.14e6,1.07
*
# Train B
Trn B
0.0,4.10e6,0.00e6,1.07
720.0,4.10e6,0.00e6,1.07
*
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
0.00 h 76.82E6
4.00 h 76.82E6
4.01 h 75.09E6
20.00 h 75.09E6
20.01 h 71.22E6
720.00 h 71.22E6
*
# Ambient Data Supplied by Bechtel Power Corp.
# TIME WB DB P
# (hr) (F) (F) (psia)
0, 73.5, 73.5, 14.70
720, 73.5, 73.5, 14.70

```

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 3 18 of 25
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Case2-2_95F.out

Vogtle MUR Out-Of-Service Fan UHS Case 1-2: 2 fan OOS, KaV/L=1.07, 0 solids, 95

Initial Basin Mass 2.984E+07 lbm
Initial Basin Temperature 90.0 F
Initial Basin Solids .0 ppt

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
.0	2.984E+07	90.0	.0	73.5	73.5	7.682E+07	Trn A	4.100E+06	4.140E+06	1.07
.5	2.982E+07	90.3	.0	73.5	73.5	7.682E+07	Trn A	4.100E+06	4.140E+06	1.07
1.0	2.980E+07	90.5	.0	73.5	73.5	7.682E+07	Trn A	4.100E+06	4.140E+06	1.07
1.5	2.977E+07	90.8	.0	73.5	73.5	7.682E+07	Trn A	4.100E+06	4.140E+06	1.07
2.0	2.975E+07	91.0	.0	73.5	73.5	7.682E+07	Trn A	4.100E+06	4.140E+06	1.07
2.5	2.972E+07	91.3	.0	73.5	73.5	7.682E+07	Trn A	4.100E+06	4.140E+06	1.07
3.0	2.970E+07	91.5	.0	73.5	73.5	7.682E+07	Trn A	4.100E+06	4.140E+06	1.07
3.5	2.967E+07	91.7	.0	73.5	73.5	7.682E+07	Trn A	4.100E+06	4.140E+06	1.07
4.0	2.965E+07	91.9	.0	73.5	73.5	7.682E+07	Trn A	4.100E+06	4.140E+06	1.07
4.5	2.962E+07	92.1	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
5.0	2.960E+07	92.2	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
5.5	2.957E+07	92.4	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
6.0	2.955E+07	92.5	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
6.5	2.952E+07	92.7	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
7.0	2.949E+07	92.8	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
7.5	2.947E+07	93.0	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
8.0	2.944E+07	93.1	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
8.5	2.941E+07	93.2	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
9.0	2.939E+07	93.3	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
9.5	2.936E+07	93.4	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
10.0	2.933E+07	93.5	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
10.5	2.931E+07	93.6	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
11.0	2.928E+07	93.7	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
11.5	2.925E+07	93.8	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
12.0	2.923E+07	93.9	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
12.5	2.920E+07	94.0	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
13.0	2.917E+07	94.1	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
13.5	2.914E+07	94.1	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
14.0	2.912E+07	94.2	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
14.5	2.909E+07	94.3	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 3 19 of 25
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Vogtle MUR Out-Of-Service Fan UHS Case 1-2: 2 fan OOS, KaV/L=1.07, 0 solids, 95

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
15.0	2.906E+07	94.3	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
15.5	2.903E+07	94.4	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
16.0	2.900E+07	94.5	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
16.5	2.898E+07	94.5	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
17.0	2.895E+07	94.6	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
17.5	2.892E+07	94.6	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
18.0	2.889E+07	94.7	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
18.5	2.886E+07	94.7	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
19.0	2.883E+07	94.8	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
19.5	2.881E+07	94.8	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
20.0	2.878E+07	94.9	.0	73.5	73.5	7.509E+07	Trn A	4.100E+06	4.140E+06	1.07
20.5	2.875E+07	94.9	.0	73.5	73.5	7.122E+07	Trn A	4.100E+06	4.140E+06	1.07
21.0	2.872E+07	94.9	.0	73.5	73.5	7.122E+07	Trn A	4.100E+06	4.140E+06	1.07
21.5	2.869E+07	94.9	.0	73.5	73.5	7.122E+07	Trn A	4.100E+06	4.140E+06	1.07
22.0	2.866E+07	94.9	.0	73.5	73.5	7.122E+07	Trn A	4.100E+06	4.140E+06	1.07
22.5	2.864E+07	94.9	.0	73.5	73.5	7.122E+07	Trn A	4.100E+06	4.140E+06	1.07
23.0	2.861E+07	94.9	.0	73.5	73.5	7.122E+07	Trn A	4.100E+06	4.140E+06	1.07
23.5	2.858E+07	94.9	.0	73.5	73.5	7.122E+07	Trn A	4.100E+06	4.140E+06	1.07
24.0	2.855E+07	94.9	.0	73.5	73.5	7.122E+07	Trn A	4.100E+06	4.140E+06	1.07
24.5	2.852E+07	94.9	.0	73.5	73.5	7.122E+07	Trn A	4.100E+06	4.140E+06	1.07
25.0	2.850E+07	94.9	.0	73.5	73.5	7.122E+07	Trn A	4.100E+06	4.140E+06	1.07
25.5	2.847E+07	94.9	.0	73.5	73.5	7.122E+07	Trn A	4.100E+06	4.140E+06	1.07
26.0	2.844E+07	94.9	.0	73.5	73.5	7.122E+07	Trn A	4.100E+06	4.140E+06	1.07
26.5	2.841E+07	94.9	.0	73.5	73.5	7.122E+07	Trn A	4.100E+06	4.140E+06	1.07
27.0	2.838E+07	94.9	.0	73.5	73.5	7.122E+07	Trn A	4.100E+06	4.140E+06	1.07
27.5	2.836E+07	94.9	.0	73.5	73.5	7.122E+07	Trn A	4.100E+06	4.140E+06	1.07
28.0	2.833E+07	94.8	.0	73.5	73.5	7.122E+07	Trn A	4.100E+06	4.140E+06	1.07
28.5	2.830E+07	94.8	.0	73.5	73.5	7.122E+07	Trn A	4.100E+06	4.140E+06	1.07
29.0	2.827E+07	94.8	.0	73.5	73.5	7.122E+07	Trn A	4.100E+06	4.140E+06	1.07
29.5	2.824E+07	94.8	.0	73.5	73.5	7.122E+07	Trn A	4.100E+06	4.140E+06	1.07
30.0	2.822E+07	94.8	.0	73.5	73.5	7.122E+07	Trn A	4.100E+06	4.140E+06	1.07

Stop - Program terminated.

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 3 20 of 25
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7. UHSSIM input/output Case2-1 95F for Case #2 (Transient with LOSP Load) with 1 fan out-of-service and required NSCW supply of 95 °F

Case2-1_95F.inp

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Vogtle MUR Out-Of-Service Fan UHS Case 2-1: 1 fan OOS, KaV/L=1.07, 0 solids, 95 F limit
# design wet-bulb temperature [F], design dry-bulb temperature [F],
# design hot-water temperature [F], design pressure [psia], design solids [ppt]
# 0 => F, psia, btu/hr, lbm/hr units
82, 98, 129.0, 14.696, 0.0, 0
# initial basin mass [lbm], initial basin temperature [F], initial solids [ppt],
# number of towers, starting time of simulation [hr]
29843200, 90, 0, 2, 0.
# Time Period Data -- every half hour for 30 hours
# step size, number of steps
0.5,60
*
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,6.15e6,6.21e6,1.07
720.0,6.15e6,6.21e6,1.07
*
# Train B
Trn B
0.0,2.05e6,0.0,1.07
720.,2.05e6,0.0,1.07
*
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
0.00 h 76.82E6
4.00 h 76.82E6
4.01 h 75.09E6
20.00 h 75.09E6
20.01 h 71.22E6
720.00 h 71.22E6
*
# Ambient Data Supplied by Bechtel Power Corp.
# TIME WB DB P
# (hr) (F) (F) (psia)
0, 85.5, 85.5, 14.70
720, 85.5, 85.5, 14.70
.
```

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 3 21 of 25
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Case2-1_95F.out

Vogtle MUR Out-Of-Service Fan UHS Case 2-1: 1 fan OOS, KaV/L=1.07, 0 solids, 95

Initial Basin Mass 2.984E+07 lbm
Initial Basin Temperature 90.0 F
Initial Basin Solids .0 ppt

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
.0	2.984E+07	90.0	.0	85.5	85.5	7.682E+07	Trn A	6.150E+06	6.210E+06	1.07
.5	2.982E+07	90.4	.0	85.5	85.5	7.682E+07	Trn A	6.150E+06	6.210E+06	1.07
1.0	2.980E+07	90.7	.0	85.5	85.5	7.682E+07	Trn A	6.150E+06	6.210E+06	1.07
1.5	2.978E+07	91.0	.0	85.5	85.5	7.682E+07	Trn A	6.150E+06	6.210E+06	1.07
2.0	2.975E+07	91.3	.0	85.5	85.5	7.682E+07	Trn A	6.150E+06	6.210E+06	1.07
2.5	2.973E+07	91.6	.0	85.5	85.5	7.682E+07	Trn A	6.150E+06	6.210E+06	1.07
3.0	2.970E+07	91.9	.0	85.5	85.5	7.682E+07	Trn A	6.150E+06	6.210E+06	1.07
3.5	2.968E+07	92.1	.0	85.5	85.5	7.682E+07	Trn A	6.150E+06	6.210E+06	1.07
4.0	2.965E+07	92.3	.0	85.5	85.5	7.682E+07	Trn A	6.150E+06	6.210E+06	1.07
4.5	2.963E+07	92.5	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
5.0	2.960E+07	92.7	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
5.5	2.957E+07	92.9	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
6.0	2.955E+07	93.0	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
6.5	2.952E+07	93.2	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
7.0	2.949E+07	93.3	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
7.5	2.947E+07	93.5	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
8.0	2.944E+07	93.6	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
8.5	2.941E+07	93.7	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
9.0	2.938E+07	93.8	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
9.5	2.935E+07	93.9	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
10.0	2.933E+07	94.0	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
10.5	2.930E+07	94.1	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
11.0	2.927E+07	94.2	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
11.5	2.924E+07	94.2	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
12.0	2.921E+07	94.3	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
12.5	2.918E+07	94.4	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
13.0	2.915E+07	94.4	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
13.5	2.912E+07	94.5	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
14.0	2.910E+07	94.5	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
14.5	2.907E+07	94.6	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 3 22 of 25
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Vogtle MUR Out-Of-Service Fan UHS Case 2-1: 1 fan OOS, KaV/L=1.07, 0 solids, 95

time [hr]	basin mass [lbm]	basin temp [F]	basin solids [ppt]	dry-bulb temp [F]	wet-bulb temp [F]	heat load [btu/hr]	tower	water flow rate [lbm/hr]	air flow rate [lbm/hr]	KaV/L [-]
15.0	2.904E+07	94.6	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
15.5	2.901E+07	94.7	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
16.0	2.898E+07	94.7	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
16.5	2.895E+07	94.7	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
17.0	2.892E+07	94.8	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
17.5	2.889E+07	94.8	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
18.0	2.886E+07	94.8	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
18.5	2.883E+07	94.8	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
19.0	2.880E+07	94.9	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
19.5	2.877E+07	94.9	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
20.0	2.874E+07	94.9	.0	85.5	85.5	7.509E+07	Trn A	6.150E+06	6.210E+06	1.07
20.5	2.871E+07	94.9	.0	85.5	85.5	7.122E+07	Trn A	6.150E+06	6.210E+06	1.07
21.0	2.868E+07	94.9	.0	85.5	85.5	7.122E+07	Trn A	6.150E+06	6.210E+06	1.07
21.5	2.865E+07	94.9	.0	85.5	85.5	7.122E+07	Trn A	6.150E+06	6.210E+06	1.07
22.0	2.862E+07	94.9	.0	85.5	85.5	7.122E+07	Trn A	6.150E+06	6.210E+06	1.07
22.5	2.859E+07	94.9	.0	85.5	85.5	7.122E+07	Trn A	6.150E+06	6.210E+06	1.07
23.0	2.856E+07	94.9	.0	85.5	85.5	7.122E+07	Trn A	6.150E+06	6.210E+06	1.07
23.5	2.853E+07	94.9	.0	85.5	85.5	7.122E+07	Trn A	6.150E+06	6.210E+06	1.07
24.0	2.850E+07	94.9	.0	85.5	85.5	7.122E+07	Trn A	6.150E+06	6.210E+06	1.07
24.5	2.847E+07	94.9	.0	85.5	85.5	7.122E+07	Trn A	6.150E+06	6.210E+06	1.07
25.0	2.844E+07	94.9	.0	85.5	85.5	7.122E+07	Trn A	6.150E+06	6.210E+06	1.07
25.5	2.842E+07	94.9	.0	85.5	85.5	7.122E+07	Trn A	6.150E+06	6.210E+06	1.07
26.0	2.839E+07	94.8	.0	85.5	85.5	7.122E+07	Trn A	6.150E+06	6.210E+06	1.07
26.5	2.836E+07	94.8	.0	85.5	85.5	7.122E+07	Trn A	6.150E+06	6.210E+06	1.07
27.0	2.833E+07	94.8	.0	85.5	85.5	7.122E+07	Trn A	6.150E+06	6.210E+06	1.07
27.5	2.830E+07	94.8	.0	85.5	85.5	7.122E+07	Trn A	6.150E+06	6.210E+06	1.07
28.0	2.827E+07	94.8	.0	85.5	85.5	7.122E+07	Trn A	6.150E+06	6.210E+06	1.07
28.5	2.824E+07	94.8	.0	85.5	85.5	7.122E+07	Trn A	6.150E+06	6.210E+06	1.07
29.0	2.821E+07	94.8	.0	85.5	85.5	7.122E+07	Trn A	6.150E+06	6.210E+06	1.07
29.5	2.818E+07	94.8	.0	85.5	85.5	7.122E+07	Trn A	6.150E+06	6.210E+06	1.07
30.0	2.815E+07	94.8	.0	85.5	85.5	7.122E+07	Trn A	6.150E+06	6.210E+06	1.07

Stop - Program terminated.

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 3 23 of 25
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8. UHSSIM input/output Case2-0 95F for Case #2 (Transient with LOSP Load) with 0 fan out-of-service and required NSCW supply of 95 °F

Case2-0_95F.inp

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Vogtle MUR Out-Of-Service Fan UHS Case 2-0: single NSCW train, all 4 fans running, 95 F limit
# Cooling Tower Characteristics KaV/L=1.07, 0 solids condition, wet-bulb depression of 16 F
# design wet-bulb temperature [F], design dry-bulb temperature [F],
# design hot-water temperature [F], design pressure [psia], design solids [ppt]
# 0 => F, psia, btu/hr, lbm/hr units
82, 98, 129.0, 14.696, 0.0, 0
# initial basin mass [lbm], initial basin temperature [F], initial solids [ppt],
# number of towers, starting time of simulation [hr]
29843200, 90, 0, 2, 0.
# Time Period Data -- every half hour for 30 hours
# step size, number of steps
0.5,60
*
# Tower Operating Data
# 5 character tower ID
# time [hr], water flow rate [lbm/hr], air flow rate [lbm/hr], KaV/L
# Train A
Trn A
0.0,8.20e6,8.28e6,1.07
720.0,8.20e6,8.28e6,1.07
*
# Train B
Trn B
0.0,0.00e6,0.00e6,1.07
720.0,0.00e6,0.00e6,1.07
*
# Heat Rejection Data
# time, time units (s = second, h = hour, d = day), plant heat
# rejection [btu/hr]
0.00 h 76.82E6
4.00 h 76.82E6
4.01 h 75.09E6
20.00 h 75.09E6
20.01 h 71.22E6
720.00 h 71.22E6
*
# Ambient Data Supplied by Bechtel Power Corp.
# TIME WB DB P
# (hr) (F) (F) (psia)
0, 90.6, 90.6, 14.70
720, 90.6, 90.6, 14.70
•

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Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 3 24 of 25
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Case2-0_95F.out

Vogtle MUR Out-Of-Service Fan UHS Case 2-0: single NSCW train, all 4 fans running

Initial Basin Mass 2.984E+07 lbm
Initial Basin Temperature 90.0 F
Initial Basin Solids .0 ppt

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
.0	2.984E+07	90.0	.0	90.6	90.6	7.682E+07	Trn A	8.200E+06	8.280E+06	1.07
.5	2.982E+07	90.5	.0	90.6	90.6	7.682E+07	Trn A	8.200E+06	8.280E+06	1.07
1.0	2.980E+07	90.9	.0	90.6	90.6	7.682E+07	Trn A	8.200E+06	8.280E+06	1.07
1.5	2.978E+07	91.3	.0	90.6	90.6	7.682E+07	Trn A	8.200E+06	8.280E+06	1.07
2.0	2.976E+07	91.6	.0	90.6	90.6	7.682E+07	Trn A	8.200E+06	8.280E+06	1.07
2.5	2.973E+07	91.9	.0	90.6	90.6	7.682E+07	Trn A	8.200E+06	8.280E+06	1.07
3.0	2.971E+07	92.2	.0	90.6	90.6	7.682E+07	Trn A	8.200E+06	8.280E+06	1.07
3.5	2.968E+07	92.5	.0	90.6	90.6	7.682E+07	Trn A	8.200E+06	8.280E+06	1.07
4.0	2.966E+07	92.7	.0	90.6	90.6	7.682E+07	Trn A	8.200E+06	8.280E+06	1.07
4.5	2.963E+07	93.0	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
5.0	2.961E+07	93.1	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
5.5	2.958E+07	93.3	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
6.0	2.955E+07	93.5	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
6.5	2.952E+07	93.6	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
7.0	2.950E+07	93.7	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
7.5	2.947E+07	93.9	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
8.0	2.944E+07	94.0	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
8.5	2.941E+07	94.1	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
9.0	2.938E+07	94.1	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
9.5	2.935E+07	94.2	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
10.0	2.932E+07	94.3	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
10.5	2.929E+07	94.4	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
11.0	2.927E+07	94.4	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
11.5	2.924E+07	94.5	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
12.0	2.921E+07	94.5	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
12.5	2.918E+07	94.6	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
13.0	2.915E+07	94.6	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
13.5	2.912E+07	94.6	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
14.0	2.909E+07	94.7	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
14.5	2.906E+07	94.7	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07

Southern Nuclear Design Calculations

Plant: Vogtle Units 1 & 2	Calculation Number: X4C1202S30	Sheet: Attachment 3 25 of 25
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Vogtle MUR Out-Of-Service Fan UHS Case 2-0: single NSCW train, all 4 fans runnin

time	basin mass	basin temp	basin solids	dry-bulb temp	wet-bulb temp	heat load	tower	water flow rate	air flow rate	KaV/L
[hr]	[lbm]	[F]	[ppt]	[F]	[F]	[btu/hr]		[lbm/hr]	[lbm/hr]	[-]
15.0	2.902E+07	94.7	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
15.5	2.899E+07	94.7	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
16.0	2.896E+07	94.8	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
16.5	2.893E+07	94.8	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
17.0	2.890E+07	94.8	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
17.5	2.887E+07	94.8	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
18.0	2.884E+07	94.8	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
18.5	2.881E+07	94.8	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
19.0	2.878E+07	94.9	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
19.5	2.875E+07	94.9	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
20.0	2.872E+07	94.9	.0	90.6	90.6	7.509E+07	Trn A	8.200E+06	8.280E+06	1.07
20.5	2.869E+07	94.9	.0	90.6	90.6	7.122E+07	Trn A	8.200E+06	8.280E+06	1.07
21.0	2.866E+07	94.9	.0	90.6	90.6	7.122E+07	Trn A	8.200E+06	8.280E+06	1.07
21.5	2.863E+07	94.9	.0	90.6	90.6	7.122E+07	Trn A	8.200E+06	8.280E+06	1.07
22.0	2.860E+07	94.9	.0	90.6	90.6	7.122E+07	Trn A	8.200E+06	8.280E+06	1.07
22.5	2.857E+07	94.9	.0	90.6	90.6	7.122E+07	Trn A	8.200E+06	8.280E+06	1.07
23.0	2.854E+07	94.9	.0	90.6	90.6	7.122E+07	Trn A	8.200E+06	8.280E+06	1.07
23.5	2.851E+07	94.8	.0	90.6	90.6	7.122E+07	Trn A	8.200E+06	8.280E+06	1.07
24.0	2.848E+07	94.8	.0	90.6	90.6	7.122E+07	Trn A	8.200E+06	8.280E+06	1.07
24.5	2.845E+07	94.8	.0	90.6	90.6	7.122E+07	Trn A	8.200E+06	8.280E+06	1.07
25.0	2.842E+07	94.8	.0	90.6	90.6	7.122E+07	Trn A	8.200E+06	8.280E+06	1.07
25.5	2.839E+07	94.8	.0	90.6	90.6	7.122E+07	Trn A	8.200E+06	8.280E+06	1.07
26.0	2.836E+07	94.8	.0	90.6	90.6	7.122E+07	Trn A	8.200E+06	8.280E+06	1.07
26.5	2.833E+07	94.8	.0	90.6	90.6	7.122E+07	Trn A	8.200E+06	8.280E+06	1.07
27.0	2.830E+07	94.8	.0	90.6	90.6	7.122E+07	Trn A	8.200E+06	8.280E+06	1.07
27.5	2.827E+07	94.8	.0	90.6	90.6	7.122E+07	Trn A	8.200E+06	8.280E+06	1.07
28.0	2.824E+07	94.8	.0	90.6	90.6	7.122E+07	Trn A	8.200E+06	8.280E+06	1.07
28.5	2.821E+07	94.8	.0	90.6	90.6	7.122E+07	Trn A	8.200E+06	8.280E+06	1.07
29.0	2.818E+07	94.8	.0	90.6	90.6	7.122E+07	Trn A	8.200E+06	8.280E+06	1.07
29.5	2.816E+07	94.8	.0	90.6	90.6	7.122E+07	Trn A	8.200E+06	8.280E+06	1.07
30.0	2.813E+07	94.8	.0	90.6	90.6	7.122E+07	Trn A	8.200E+06	8.280E+06	1.07

Stop - Program terminated.