



Forgetting About the Sun:

two different issues that arise for API000 Rev 19
Calculations

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Forgetting About the Sun Issue #1: Forgetting about Heat of Solar Radiation on the Exterior Surface of the Concrete Shield Building

- Rev 19 analyses per Appendix H (as of June 30th, 2011):
 - falsely assumes that range of exterior surface temps of concrete shield building is same as range of the outdoor ambient air temperatures.
 - analyses and conclusions incorrect because temp of concrete shield building exterior surface can be much hotter than ambient due to solar radiation, and much cooler than ambient due to radiation to night sky.
 - variety of calcs should be affected: calculation of peak containment pressure, thermal loads, stresses & displacements of concrete shield building, concrete max temperature, PCS water tank temperature, etc.



Forgetting About the Sun Issue #1: Forgetting about Heat of Solar Radiation on the Exterior Surface of the Concrete Shield Building



The sun heats surfaces exposed to it by radiation.

It increases surface temperatures of the things it shines on.

The API000 concrete shield building is no exception.

(Similarly, when sun not shining, heat is radiated back to night sky, decreasing surface temperatures.)



Forgetting About the Sun Issue # 2:

Forgetting about solar radiation on exterior surface of physical models of evaporative cooling of containment used to validate WGOTHIC computer code (?)

- Calculations of peak containment pressure, which depends upon evaporative cooling of the steel containment dome wetted by Passive Containment Cooling System flow, were redone for API1000 Rev. 19.
- API1000 Rev 19 calcs of peak containment pressure used WGOTHIC computer code; WGOTHIC was validated by comparing its calculated results to experimental ones for a physical model test in which dome was wetted.
- But test model was out in the sun (?), so solar radiation would have aided evaporation -- how did the validation of WGOTHIC account for that? If effect of the sun not accounted for, the validation of WGOTHIC for analyses of Passive Containment Cooling System effectiveness in accident mitigation is not valid. *Did they remember to account for the sun or did they not? If so, how?*



Forgetting About the Sun Issue # 2:

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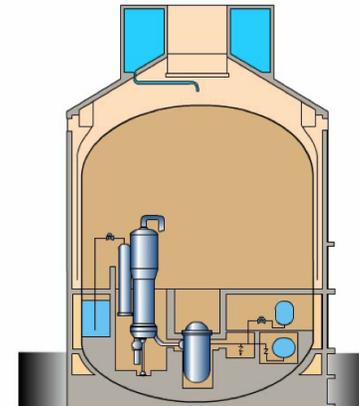
Westinghouse Non-Proprietary Class 3



Figure 6-6: Large Scale Test Facility

APP-067-SLR-097 Rev. 2

Passive Containment Cooling



The test setup used to validate WGOTHIC code (methodology of calculation of peak containment pressure) is pictured on the left; the situation to which WGOTHIC was applied is on the right.

One is in the sun; the other is not.

How was the difference accounted for in interpreting test results to validate calc methodology in WGOTHIC computer code?



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the Exterior Surface of the API000 Concrete
Shield Building

Forgetting About the Sun
Issue # 2:

Forgetting about solar radiation on exterior
surface of physical models of evaporative
cooling used to validate WGOthic
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The opportunity to do something
about this
will soon pass you by.

Thank You.