

NRC Question Response Form

Request Number: 23

Status:

Requested By (Inspector name):

Date Requested:

Question / Document Request: Q D (circle one)

System:

Detailed Question or Request:

What water levels would be encountered by operations manually operating valves in the containment spray rooms?

Initiated By (individual taking the request): Ritter

Assigned To (Person responding to request):

Date Assigned:

CAP / Work Order Issued? Yes / No (circle one) Number: _____

Response (include a list of documents provided):

The main floor area of containment spray pump rooms is approximately 9" lower than 695' elevation in the Aux Building. However, water entering the Aux Building would be a relatively slow rate (compared to the flow area of the water path) and other areas would accumulate and hold up water prior to entering the containment spray rooms for either unit.

Calculation ENG-ME-529 documents several areas that are below the 695' grade. The three of significance are the Component Cooling Heat Exchanger area and the two pipe trenches. The combined total volume (below 695') for these three areas is 4474 ft³ (2,123 ft³ + 2,351 ft³ = 4474 ft³).

Calculation ENG-ME-759 documents that the modeled net floor area of the Aux Building is 1,540.4 Ft². The Aux Building is modeled as control volume 12 in the GOTHIC flood model. The ground elevation of control volume 12 is modeled at 690' elevation. Therefore, in GOTHIC water will accumulate in this volume and will not flow back into the turbine building unless water level in the Aux Building exceeds 695' in the model. Unless Aux Building water level exceeds 695' in the model, there is no back pressure from elevation head on the flooding source resulting in conservatively high flow rates modeled into the Aux Building. As shown below, the volume released in the Aux Building is minimal even with these conservatisms. This is largely due to door seals present on the doors leading from the Turbine building to the Aux Building.

The height determined for final water level in the Aux Building (in volume 12 of the model) for a sample of the unit 1 events:

Model #	EC#	Flood Rate	Flood Duration	Final Volume 12 Height (above 690' elevation)	Volume released into aux building in the modeled time (Ft ³)
Run 31B	15656	18,000 gpm	3600 seconds	1.576'	2428
Run 43	15656	10,000 gpm	7200 seconds	1.665'	2565
Run 44B	15656	7,500 gpm	10800 seconds	1.621'	2497
Run 30K U1save bat	16153	30,000 gpm	4200 seconds	4.125'	6354
Run_30K_U1_save_MDAFP	16153	30,000 gpm	1600 seconds	0.519'	799
Run_30K_U1_Save_TDAFP	16153	30,000 gpm	2300 seconds	1.861'	2867

As can be seen, only the most severe flooding events results in water exceeding the capacity of the component cooling heat exchanger area and pipe trenches. The height of water in the containment spray rooms will be zero for the five of the six events cited above. For model "Run 30K U1 Save Bat", the actual height of water is not known can be interpreted from GOTHIC runs. However, ENG-ME-529 indicates the total capacity below 695' elevation is 7,702 ft³. Therefore, at most the operators may be standing in water equal to the difference between 695' elevation and the elevation of the containment spray room floor (694'-2") or 10" of water.

However, it should also be noted that for operations to access the areas where the manual valves are located, personnel would be required to traverse areas with very shallow water (i.e. water migrating across the aux building floor to the CC heat exchanger area and the pipe trenches). Due to the small average flow rates (in the largest case 6354ft³/14,400 seconds = 0.44 Ft³/sec) and the large flow available area of the building, the water height would be minimal and would not hinder operations ability to access these areas.

Results from unit 2 were not included in this discussion as they would be bounded by unit 1 events. Unit 2 has a hold up volume prior to entering the aux building (D3 room) which would reduce the pressure head available at the last restriction prior to the Aux Building. Secondly, the door from unit 2 into the Aux building is a single wide door whereas the doors from unit 1 TB into the Aux

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building is a double wide door (hence twice the probable flow area from the unit 1 TB compared to unit 2 TB).

Lastly, it should be noted that while operations can access the valves from the floor of the containment spray pump room (in most cases), there is piping available at approximately 695.5' elevation that could be easily be used as a work platform for operating these valves manually.

Is this an equipment issue that affects plant operability? Yes No

If yes, contact the Shift Manager immediately. _____

Date/Contacted By

Completed By: *Thomas Ross*

Date Completed: *7/16/10*

Peer / Tech Review / Validation By: *Ben Hill*

Date Completed: *7-16-10*

Team Leader / Supervisor Review / Approval: *Sean Ford*
Sean Ford

Date Completed: *7-16-10*

Additional Info Attached? Yes No [forward a copy to Regulatory Affairs]

NRC Question Response Form

Reviewer Verification Guidance

- Data Requests:
 - Is the information provided complete? Was any material removed from the information provided?
 - Is the information provided correct? Was the preparer of the response a subject matter expert?
- Information Requests:
 - Does the response answer the question being asked? Is the response on topic and clear?
 - Are inputs and assumptions appropriately validated?
 - If there is an embedded calculation, is the math correct?

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- Is the response well formulated? Was enough work put into the response?
- Does the response reflect a differing professional opinion between the preparer and the inspector? Is the response professional in tone? Is the response argumentative?
- Is there a condition adverse to quality? Has a CAP been initiated?