From:<eddie.grant@exeloncorp.com>To:<jps1@nrc.gov>Date:4/19/05 2:03PMSubject:Hydrology discussion items

Attached is an Excel spreadsheet with the remaining discussion items in the hydrology area.

Let me know when you are ready to discuss...

Also, the NRC reviewers were considering our verbal discussion from the March 31 meeting on Open Item 2.4-15. Have they determined if they will be needing additional information or discussion?

Thanks, Eddie R. Grant Early Site Permit Project 610.765.5001 voice 610.765.5755 fax 850.598.9801 cell

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Chapter.Page	DSER §	Subject	For discussion
Text 2.055	2.4.1.1	Text states: During emergency operation, CPS Unit 1 UHS discharges into the submerged UHS pond downstream (i.e.,	This text confuses ESP and CPS information. Suggested clarifications: During
		south) of the baffle, allowing mixing and heat exchange to the atmosphere to occur before the discharge reaches the	CPS emergency operation, CPS Unit 1 shutdown service water discharges
		intake. The ESP facility would have a similar intake and UHS blowdown discharge layout (Figure 2.4-3).	into the submerged UHS pond downstream (i.e., south) of the baffle, allowing
			mixing and heat exchange to the atmosphere to occur before the discharge
			reaches the CPS intake. The ESP facility would have a similar intake for
			normally be to the discharge flume as indicated in SSAR 3.2.2.2 An alternate
			discharge near the intake may be required for heating during cold weather
			only. The ESP UHS blowdown discharge will be to outlet canal, only for
			blowdown, not cooling circulation. This also affects DSER Figure 2.4-3.
Text 2.056	2.4.1.1	Text states: The shutdown service water return lines are located above the supply lines, following the same path as the	This appears to be a near quote from an RAI response which actually says:
		supply lines to about 175 ft, where supply lines turn east, then southwest, and finally slope downward to the discharge	The shutdown service water return lines are located above the supply lines,
		location in the CPS submerged UHS pond at an elevation of 675 ft MSL.	following the same path as the supply lines to about 175 ft east of where
			supply lines turn east, where they turn southwest, and finally slope downward
			to the discharge location in the CPS submerged OFIS poind at an elevation of 675 ft MSI
			ors it wise.
Toyt 2.057	2/11	Toy't states. The applicant stated that the piping for the ESD facility would be routed in a mapper similar to the evicting	The E0 ft congration is only for where the piping is parallel, it connot be mat
Text 2.057	2.4.1.1	Text states: The applicant stated that the piping for the ESP facility would be fouled in a manner similar to the existing	The 50 It separation is only for where the piping is parallel, it cannot be met when the piping must cross
		stated that the ESP facility piping would be located south of the existing CPS piping and would be routed a sufficient	which the piping must cross.
		distance south before it turned east in order to provide adequate clearance and cover where it passed over the sloping	
		CPS discharge piping to the submerged UHS pond. The applicant stated that the ESP facility piping elevation would be	
		selected to provide a vertical clearance of 3 ft 9 in. between itself and the existing CPS discharge piping.	
Text 2.059	2.4.1.2	Text states: Although the applicant does not indicate how the individual sections of SSAR Section 2.4 address the	What is meant by this? What was the Staff expecting that prompted this
	2.4.2.2	hydrology-related site suitability criteria in RS-002, Attachment 2, the staff finds that it has correctly identified the	comment? Related to conclusion on 2-65?
	2.4.7.2	applicable regulations and guidance.	
	2.4.9.2		
	2.4.11.2		
Text 2.065	2.4.1.4	Text states: The review guidance in RS-002, Attachment 2, Section 2.4.1 provides that the SSAR should address the	Of these requirements, 100.21(d) is the most specific. This regulation is
	2.4.2.4	requirements of 10 CFR Parts 52 and 100 as they relate to identifying and evaluating hydrologic features of the site.	addressed in SSAR 3.4.1.4.4.
	2.4.13.4	Although the applicant did not specifically address the above regulations in SSAR Section 2.4.1	
Text 2.068	2.4.2.2	Text states: Important PPE parameters for safety assessment include, but are not limited to, precipitation (e.g.,	The examples are site characteristics, not plant parameters.
	2.4.4.2	maximum design rainfall rate and snow load) and the allowable site water level (e.g., maximum allowable flood or	
	2.4.6.2	tsunami and maximum allowable ground water level). [Wording is similar in each section.]	
	2.4.8.2		
	2.4.12.2 2 <u>4</u> 12 2		
Text 2.073	2.4.3.1	Text states: Section 2.3.1.2.3 shows the estimated weight of this combined snow accumulation as 35 psf.	This was revised by RAI response to 40 psf.
			1

Chapter.Page	DSER §	Subject	For discussion
Text 2.075	2.4.3.1	Text states: In response to RAI 2.4.3-2, the applicant stated that it had previously estimated a maximum wave runup elevation, caused by a sustained 40-mph overland wind speed acting on the PMF water surface elevation, at the dam and at the CPS site of 711 ft MSL and reported it in CPS USAR Section 2.4.2.2. Section 2.4.10 of the CPS USAR uses a 48-mph overland windspeed coincident with the PMF for design of the CPS circulating-water screen house. The applicant stated that use of these windspeeds did not result in any safety-related issues for CPS Unit 1 since it determined that the site grade is 22.2 ft above the wave runup water surface elevation and 27.1 ft above the PMF water surface elevation. Therefore, the applicant concluded that the CPS plant facility will not flood under any circumstances.	The ESP applicant does not issue nor report any findings in the CPS USAR. Only the CPS license holder can do that. Further, the ESP applicant has not made, and does not make, any conclusions regarding the CPS plant facility.
Text 2.076	2.4.3.2	Text states: PMF estimates are needed for all adjacent streams or rivers and site drainage (including the consideration of PMP on the roofs of safety-related structures).	PMP is not dependent on the PMF; it is the other way around - the PMF is dependent on the PMP.
Text 2.061	2.4.3.3 2.4.5.3	Text states: The influence of coincident wind wave activity caused an increase in the water surface elevation. The staff conservatively estimated the probable maximum windstorm (PMWS), as defined by ANSI/ANS 2.8-1992, to be equivalent to 100 mph. This windstorm is based upon the location of the site, which is within 150 mi of the Great Lakes.	It is not clear why the Staff would use 100 mph as PMWS when it has essentially agreed that 75 mph is the site characteristic for maximum basic wind speed and that 96 mph is acceptable as 3-second gust wind speed (DSER 2.3.1.3) Additionally, two paragraphs later the Staff finds the response to RAI 2.4.3-2 (which used 52 mph to calculate wave run-up - also per the ANSI/ANS 2.8 Std) acceptable. Also in 2.4.10 (pg 2-124).
Text 2.086	2.4.4.3	Text states: The applicant should consider the effects of the failure of the Dawson Lake dam in SSAR Section 2.4.4	Is this a request, or just a suggestion?
Text 2.087	2.4.4.3	Text states: Even if the maximum water surface elevation in Clinton Lake were to be augmented by 3.1 ft because of a breach of the two upstream dams, leading to a <b>water surface elevation of 724.8 ft MSL in Clinton Lake</b> , the ESP site, located at 735 ft MSL, would be safe from flooding.	Top of the dam at 711.8 ft msl; 13 ft > top of dam; & 10 ft > Staff's PMF. Not clear that the Lake can hold this much water. Seems inappropriate to call this "maximum water surface elevation" - perhaps "maximum level of water impacts"?
Text 2.100	2.4.7.1	Text states: The applicant stated that a warming line from the hot side of the cooling towers would be provided to the ESP facility intake to prevent formation of frazil ice at the intake for NHS cooling tower makeup. The applicant also stated that it would design these features independently of the existing CPS facility.	Not exactly. The response indicated that "a means will be provided to prevent the frazil ice formation." The warming line was an example possiblity only. The means is not yet determined. ESP applicant does not want to limit the facility design if possible.
Text 2.103	2.4.7.3	Text states: Using this relationship, the staff estimated a stage of 22.8 ft corresponding to a discharge of 7500 cfs, and an ice-jam-induced stage increase of 2.0 ft. If an ice-jam-induced flood were to augment the PMF, the maximum expected water surface elevation in Clinton Lake would be 723.7 ft MSL.	Top of the dam at 711.8 ft msl; ~12 ft > top of dam; & 9 ft > Staff's PMF. This value also includes wave run-up and seiche. Difficult to presume waves and ice. Also, not clear that the Lake can hold this much water. Seems inappropriate to call this "maximum water surface elevation" - perhaps "maximum level of water impacts"? PMP is a summer or fall event (2-116), not winter.
Text 2.106	2.4.7.3	Text states: According to the CPS environmental report (ER) Figure 5.3-1, the ESP facility UHS intake would be located at an elevation of 668 ft MSL, which is below the lake bottom mentioned in the RAI response.	Why reference ER; this information was provided response to RAI 2.4.7-3 as discussed in DSER section 2.4.7.1 (pg 2-99). Also referenced in PC 2.4-7 discussion.
Text 2.106	2.4.7.3	Text states: According to the CPS environmental report (ER) Figure 5.3-1	This should be a reference to the ESP ER Figure.
Text 2.110	2.4.8.1	Text states: The applicant states in SSAR Section 2.4.8.1.5 that the existing submerged UHS pond would serve as the source of makeup water for the safety-related cooling tower(s) for the ESP facility when water from Clinton Lake was not available. The new intake structure, which would be located next to the existing screen house for the CPS intake, would supply the makeup water.	CPS UHS will provide makeup to ESP UHS if one is required. New intake structure will be ~65 ft south of the CPS intake per corrections letter of Dec. 7.

Chapter.Page	DSER §	Subject	For discussion
Text 2.111	2.4.8.1	Text states: The applicant stated that it periodically measures the volume in the submerged UHS pond and recently measured the volume as 1022 ac-ft.	The UHS volume is periodically measured but not by the applicant. This is done by CPS personnel.
Text 2.113	2.4.8.1	Text states: The applicant conducts annual surveys as part of the submerged UHS pond sedimentation monitoring program, and it also monitors sediment accumulation after a major flood passes through the cooling lake.	These surveys and monitoring are by CPS, not the ESP applicant.
Text 2.124	2.4.10.3	The Staff again uses a 100 mph PMWS. Same as on page 2-81.	See 2.081 wrt 100 mph PMWS.
Text 2.125	2.4.11.1	Text states: The applicant stated that the original CPS drawdown analysis evaluated the ability of Clinton Lake to provide cooling tower(s) makeup water to the ESP facility in addition to meeting the cooling water requirements of the existing CPS Unit 1.	The original CPS analysis was used to evaluate the ESP needs; but the original analysis did not evaluate the ESP.
Text 2.126	2.4.11.1	Text states: The applicant stated that the water required for the ESP facility would be supplied from a new intake structure located next to the existing CPS intake structure.	New intake structure will be ~65 ft south of the CPS intake per corrections letter of Dec. 7, item E100-1.
Text 2.127	2.4.11.1	Text states:The applicant also stated that blowdown from the ESP facility's safety-related cooling tower(s) would be discharged to the existing CPS discharge flume. The applicant stated that credit was taken for return of the blowdown water volume to the submerged UHS pond when determining the capability of the submerged UHS pond to supply water to the CPS and the ESP facility.	SSAR actually says: The blowdown from the safety-related cooling tower(s) is discharged to the existing discharge flume for the CPS Facility <b>and no credit</b> has been taken for the return of blowdown to the CPS UHS pond in determining its capability to supply water to the EGC ESP Facility.
Text 2.128	2.4.11.1	Text states: The applicant stated that it monitors the submerged UHS pond for sediment accumulation periodically and after a major flood passes through Clinton Lake. The applicant stated that, after the ESP facility was constructed, it might reduce the allowable sediment accumulation in the submerged UHS pond.	The SSAR actually says that the CPS UHS pond is monitored. The CPS personnel do this monitoring, not the ESP applicant. Further, any reduction in the allowable sediment accumulation in the CPS UHS pond would be done by the COL applicant/licensee, not the permit holder.
Text 2.129	2.4.11.2	Text states: Acceptance is based primarily on the adequacy of the UHS to supply cooling water for normal operation, anticipated operational occurrences, safe shutdown, cooldown (first 30 days), and long-term cooling (periods in excess of 30 days) during adverse natural conditions.	For ESP, are we not just determining the available water? Determination of adequacy will require evaluation of the available water against the design needs - this will occur at COL.
Text 2.132	2.4.11.3	Text states: The water surface elevation of 677 ft MSL in Clinton Lake would be identified as the shutdown water surface elevation for the ESP facility, and would be imposed as a permit condition on the COL applicant after completion of the staff's review.	NRC should only identify the site characteristics for ESP. How the site characteristics will impact design and operation should be identified and discussed with the COL applicant.
Text 2.142	2.4.14	Table 2.4.14-1 - Staff's Proposed Site Characteristics Related to Hydrology	Facility Boundary is a plant parameter.
Text 2.142	2.4.14	Table 2.4.14-1 - Staff's Proposed Site Characteristics Related to Hydrology	What is basis for Staff proposed value of highest groundwater elevation? This does not appear to be discussed in the DSER.
Text 3.007	3.2.2.1	Text states: The applicant indicates that the UHS pond is a submerged pond created by a submerged dam across the North Fork of Salt Creek downstream of the plant intake. This submerged pond maintains adequate capacity for 30 days of UHS operation in case the Clinton Lake Dam fails. This UHS pond would be shared with the existing CPS Unit 1. A baffle in the UHS pond is part of the UHS system design for the existing unit. In response to RAI 3.2.2-2, the applicant stated that the maintenance of the integrity of the UHS baffle is not required for the ESP facility's UHS operation.	The submerged pond is the CPS UHS. The ESP UHS, if one is needed, will be mechanical draft cooling tower and basin. The ESP UHS will take makeup from the CPS UHS if the lake is not available.