

NRR-PMDAPEm Resource

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Sent: Friday, May 12, 2017 11:22 AM
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Subject: [External_Sender] Oyster Creek Response to NRC Flood MSA Audit Review Questions
Attachments: Oyster Creek MSA RAI Responses 05-12-17.docx

Tekia – Responses to the NRC audit review questions on the Oyster Creek Flood MSA, as discussed on May 4, 2017, are provided in the attached file.

Please let me know if any additional information is needed.

Thanks.
Dave Distel

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Hearing Identifier: NRR_PMDA
Email Number: 3517

Mail Envelope Properties (4BCCAD574B0D614096E6221C12ED97D8D07A99B7)

Subject: [External_Sender] Oyster Creek Response to NRC Flood MSA Audit Review Questions
Sent Date: 5/12/2017 11:21:48 AM
Received Date: 5/12/2017 11:22:55 AM
From: Distel, David J:(GenCo-Nuc)
Created By: David.Distel@exeloncorp.com

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Post Office: exchm-omf-24.exelonds.com

Files	Size	Date & Time
MESSAGE	1180	5/12/2017 11:22:55 AM
Oyster Creek MSA RAI Responses 05-12-17.docx		319149

Options

Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

**OYSTER CREEK NUCLEAR POWER STATION
MITIGATING STRATEGIES ASSESSMENT (MSA)
RESPONSE TO NRC'S REQUEST FOR ADDITIONAL INFORMATION
REQUEST ISSUED VIA CONFERENCE CALL ON MAY 4, 2017
RESPONSES PROVIDED MAY 12, 2017**

1. Request:

Discuss the basis for why the FLEX actions are not impacted by PMSS flood debris. In particular, describe FLEX actions required to be taken at the Intake Structure and the potential impact of PMSS flood debris.

Response:

The Oyster Creek FLEX Pump hose staging area is at approximately elevation 13 feet MSL. Procedure FSG-05 contains guidance to move the pump to higher elevation (23 feet MSL), as required during a flood event, prior to the Probable Maximum Storm Surge (PMSS) levels reaching grade. Hoses will be run from the "PUMP location" to the "suction location" on the roadway of the intake structure. It is noted that there is no physical entry into the intake structure itself for FLEX implementation. (See Figure 1 below.) As shown in Figure 6.3 of Calculation C-1302-120-E310-014, the area where the FLEX pump will be located during a flood ("PUMP location" on Figure 1 below) is shielded from large debris loads by structures to the east. Even delivery of smaller debris from the west to the "PUMP location", between the Intake Structure and Turbine Building, will be restricted by the limited draft depth of approximately 0.2 foot stillwater (using the nominal site grade elevation of 23.0 feet MSL) and 0 to 2.7 feet of wave runup. (See the March 12, 2015, Flood Hazard Reevaluation Report submittal, Enclosure 2, Table 2.)

In general, debris from a PMSS flooding event is not expected to impact FLEX storage and deployment. All required FLEX equipment (Generator, Flex Pump, F-750, Refueling) will be stored above the water level during a PMSS flooding event. (See Section 6.1, "Protection of FLEX Equipment", of the December 16, 2016, MSA Report.) Similar to the discussion above, the primary haul paths are largely or, in the case of the NW FLEX Pad, entirely shielded from large debris by structures to the east. The limited draft depth from shallow stillwater and wave runup heights will also restrict delivery of even small debris to the haul paths.

For debris blocking the haul paths, per the FLEX Validation Plan (OP-OC-118-1001, Rev 0), debris removal can be performed with the F-750 or Front End Loader. Oyster Creek's FLEX Validation Plan indicates that minimal debris removal is expected from operators since there are two available paths for each pad so it is assumed that one of the paths will have minimal debris. To be conservative, an additional 20 minutes was included in Action Item 8 – Subtask 'a' of the Validation Plan to account for debris/snow removal required by the F-750 or Front End Loader that will impact travel time.

In conclusion, debris loads are not expected to impact the FLEX deployment and implementation due to the shielding of large debris by structures to the east of the FLEX staging

area (near the Intake Structure) and much of the haul paths, along with restrictions to debris transport by the shallow stillwater depths.



Figure 1 (Elevations shown in NAVD88; 0.02 foot lower than MSL)

2. Request:

Provide additional information supporting basis that deployment of FLEX equipment during the PMSS is not impacted considering postulated 1.9 feet wind-wave runup conditions. Specifically address ability of the FLEX truck to deploy FLEX equipment through 1.9 feet of wind-wave runup.

Response:

Per Section 6.1, "Deployment of FLEX Equipment", of the December 16, 2016, MSA Report, wind generated waves will not affect the deployment of the FLEX equipment since the waves are at a maximum intermittent runup depth of approximately 1.9 feet (wave runup elevation of 25.4 feet MSL minus plant grade elevation 23.5 feet MSL) along the NW and SE haul path. Using a nominal site grade elevation of 23.0 feet MSL, the maximum intermittent runup depth is approximately 2.4 feet along the haul path. The FLEX equipment, at the storage locations, is at elevation 27.5 feet MSL, 2.1 feet of margin above the wind-wave runup elevation of 25.4 feet MSL. Alternate paths, past the ISFSI facility and Warehouse, for both NW and SE FLEX storage locations are available; both of which have more margin to transport equipment to the deployment location at the Turbine building NW wall.

For the initiating event that would cause the PMSS (hurricane), the site will have ample warning time to pre-deploy the FLEX equipment. If pre-deployment is not credited and, per the MSA, an ELAP is conservatively assumed to occur at the peak flood level, sufficient time margin is available to avoid traversing through the peak stillwater and wind-wave runup. Per Table 2 of

the March 12, 2015, Flood Hazard Reevaluation submittal, the period of inundation is only approximately 0.3 hour (18 minutes). Action Item 8 (FLEX pump deployment and connection) of the FLEX Validation Plan shows a Time Margin estimate of 23 minutes, providing enough flexibility for operators to delay deployment until floodwaters recede.

Further assurance that wind-wave runup will not impede deployment of FLEX equipment is the available clearance of the truck used to haul the equipment. The FLEX truck is a F-750 XL Super Duty truck, weighing 30,000 pounds (GVW), with a:

- Height to fender of 4 feet;
- Height to door base/stair of 3 feet; and
- Height to base of pump trailer 3 feet above grade (4 feet to any equipment).

The peak stillwater elevation is 23.2 feet MSL, only approximately 0.2-foot depth above nominal site grade elevation of 23.0 feet MSL. The dimensions of the truck provide adequate clearance to traverse the peak stillwater depths if necessary. From Calculation C-1302-120-E310-010, the maximum intermittent wave runup depth of approximately 2.4 feet are for “non-breaking, fully reflected standing waves”, which is also not expected to impede deployment.

In conclusion, the site’s FLEX strategy provides numerous and redundant measures for deploying FLEX equipment during a hurricane-induced PMSS flood event, including pre-deployment during the warning time period of the hurricane, alternative haul paths from two storage locations, and hauling equipment capable of traversing peak floodwaters if necessary.