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Ref: 10 CFR 50.54(f)

November 27, 2012
Serial: HNP-12-118

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
11555 Rockville Pike
Rockville, MD 20852

Subject: Shearon Harris Nuclear Power Plant, Unit No. 1, Response to Recommendation 2.3 Flooding Walkdown of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident

Reference: Request For Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3 of The Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, Dated March 12, 2012

Ladies and Gentlemen:

By letter dated March 12, 2012, the Nuclear Regulatory Commission (NRC) issued a Request for Information (Reference) requesting licensees to provide information regarding recommendation 2.3 (Flooding) to support the evaluation of the NRC staff recommendations for the Near-Term Task Force (NTTF) review of the accident at the Fukushima Dai-ichi nuclear facility.

By this letter, Carolina Power & Light Company (CP&L) submits the Shearon Harris Nuclear Power Plant, Unit No. 1, response regarding the performance of flooding walkdowns to identify and address degraded, non-conforming or unanalyzed conditions and to verify the current plant configuration with the current flooding licensing basis.

The information provided herein and the activities described in this report are consistent with the guidance provided in NEI 12-07 "Guidelines for Performing Verification Walkdowns of Plant Flood Protection Features," dated May 2012.

Enclosure 1 to this letter provides the requested information.

This letter contains one new regulatory commitment as follows:

There are 110 features that have not yet been inspected due to restricted access. All will be inspected before the end of the Fall of 2013 refueling outage currently scheduled for November 2013.

A001
NRR

If you have any questions regarding this submittal, please contact Mr. Dave Corlett, Supervisor – Licensing/Regulatory Programs, at (919) 362-3137.

I declare under the penalty of perjury that the foregoing is true and correct. Executed on November 27, 2012.

Sincerely,

George T. Hamrick

Enclosure 1: Flooding Walkdown Submittal

cc: Mr. J. D. Austin, NRC Sr. Resident Inspector, HNP
Ms. A. T. Billoch Colón, NRC Project Manager, HNP
Mr. V. M. McCree, NRC Regional Administrator, Region II

ENCLOSURE 1
FLOODING WALKDOWN SUBMITTAL

CAROLINA POWER & LIGHT COMPANY

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400
RENEWED LICENSE NO. NPF-63

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1 RESPONSE TO RECOMMENDATION 2.3 FLOODING WALKDOWN OF THE NEAR-TERM TASK FORCE REVIEW OF INSIGHTS FROM THE FUKUSHIMA DAI-ICHI ACCIDENT

13 pages

Shearon Harris Nuclear Power Plant, Unit No. 1 Flood Protection Features Walkdown Report

1.0 Executive Summary

This report summarizes the results of the flooding walkdowns performed at Shearon Harris Nuclear Power Plant, Unit No. 1 (HNP) in response to the March 12, 2012 NRC 50.54(f) Request for Information, Item 2.3. The flooding walkdowns were performed in compliance with the NRC-endorsed implementing guidance NEI 12-07 Revision 0-A, "Guidelines for Performing Verification Walkdowns of Plant Flood Protection Features". This report follows the direction provided in Appendix D of NEI 12-07.

HNP is situated at elevation 260 ft. mean sea level (MSL) between two reservoirs. The Probable Maximum Flood (PMF) with a designed wind wave activity results in the design basis flood hazard level for the reservoirs; a maximum water level of 243.1 ft. MSL for the Main Dam, 258.0 ft. for the Auxiliary Dam, and 257.7 ft. for the plant site. Local intense precipitation results in a flood level of 14.8 in. at the site. Flood protection features are protected up to a minimum level of 261 ft.

The walkdown was completed by personnel trained to the requirements of NEI 12-07. The walkdown resulted in the identification of several deficiencies. Temporary measures have been put in place to correct deficiencies that threatened safety-related equipment. Though several features were not available due to restricted access, they are scheduled to be inspected before the end of the refueling outage in the Fall of 2013. Some inaccessible features were reasonably justified to adequately perform their credited flood protection function. The monitoring and maintenance programs were determined to adequately ensure that the flood protection and mitigation features would continue to perform their credited functions.

2.0 Design Basis Flood Hazard Level

HNP lies within the floodplain of Buckhorn Creek in Wake and Chatham Counties of North Carolina. The Main Dam constructed on Buckhorn Creek approximately 2.5 mi north of its confluence with the Cape Fear River created the 4,000 acre Main Reservoir. The Auxiliary Dam created the smaller 317 acre Auxiliary Reservoir. Each dam is equipped with an uncontrolled spillway. The plant island is bounded by the Main Reservoir on the east, south, and southwest sides and by the Auxiliary Reservoir on the west and northwest sides. During normal operation, the Main Reservoir functions as a storage reservoir and is used as the source of cooling tower makeup water. The Main Reservoir also serves as an alternative source of emergency service water supply or Ultimate Heat Sink. The Auxiliary Reservoir has a separating dike and channel to prevent discharged emergency service water from flowing directly back to the emergency water intake area.

The Probable Maximum Flood (PMF) on streams and rivers and a designed wind wave activity in the reservoirs was considered as a flood hazard. The PMF was estimated using hypothetical flood characteristics considered to be the most severe reasonably possible at a particular location based on comprehensive hydrometeorological analysis of critical runoff-producing precipitation and hydrologic factors favorable for maximum flood runoff. This was developed by creation of a unit hydrograph for the Buckhorn Creek drainage basin and hydrographs for each sub-basin and application of the probable maximum precipitation (PMP) to the hydrographs. An antecedent precipitation with an intensity of ½ PMP was also applied to the unit hydrograph with appropriate infiltration losses to develop the estimated flood hydrograph for each sub-basin in order to have a more conservative estimate of the PMF still water level in the Main and Auxiliary Reservoirs.

The total inflow to the Main Reservoir was the summation of the outflow from all sub-basins located above the Main Dam. After obtaining the inflow hydrograph, the PMF was then routed through the reservoirs to estimate the PMF still water level in the reservoirs. For the PMP of the local drainage study, Hydrometeorological Report Nos. 51 and 52 of NOAA and Corps of Engineers were used. The PMF elevations were computed based on unit rainfall periods derived from a six-hour rainfall distribution curve applicable to the North Carolina region. A storm duration of 36 hours was computed for the PMP. The coincident wind wave activities for the PMF were determined in accordance with the procedures and methods presented in the U.S. Army Corps of Engineers' ETL 1110-2-221 and in the Shore Protection Manual.

With the known PMF flow over the spillways of both reservoirs, the PMF stillwater levels in the reservoirs were determined by the corresponding spillway rating curves. For the most severe cases analyzed, the PMF flow over the Auxiliary Reservoir Spillway is 5,030 cubic feet per second (cfs), and the corresponding water level elevation in the Auxiliary Reservoir is 256 ft. MSL, the PMF flow over the Main Reservoir Spillway is 14,190 cfs, and the water level elevation in the Main Reservoir is 238.9 ft. MSL. The maximum wave runup at the Main Dam is 4.1 ft. This value in combination with the wind setup of 0.1 ft., and the PMF stillwater elevation of 238.9 ft. MSL produces a probable maximum water level at the Main Dam of approximately 243.1 ft. MSL. This maximum water level is 16.9 ft. below the top of the Main Dam, 260 ft. MSL. The maximum wave runup on the upstream face of the Auxiliary Dam is 1.9 ft., which in conjunction with the wind setup of 0.1 ft., and the PMF stillwater level of 256.0 ft. MSL, yields a probable maximum water level at the Auxiliary Dam of 258.0 ft. MSL. This maximum water level is 2.0 ft. below the top of the Auxiliary Dam.

The plant is generally protected from wind-generated waves by high ground from all quadrants. On the plant island, the southerly till portion of the Emergency Service Water Intake Channel and the embankment faces of the plant island which face the Main Reservoir are protected by sacrificial fill. The maximum wave runup and wind setup level on the side of the plant island is 1.7 ft. For a maximum PMF stillwater level of 256 ft. MSL in the Auxiliary Reservoir, the maximum water level is estimated to be 257.7 ft. MSL, which is 2.3 ft. below the plant grade of 260 ft. MSL.

The Probable Maximum Hurricane (PMH) wind wave activity when the water levels in the reservoirs are at normal operation level was considered as a flood hazard. The wind setup and wave runup values were calculated using the NOAA HUR 7-97 report that describes a hypothetical hurricane having that combination of characteristics which will make it the most severe that can probably occur in the particular region. The maximum gradient overland wind speed at the site was calculated to be 123 mph. Because the top of the Main Dam is 40 ft. above the normal water level in the Main Reservoir, wave action was not considered on the Main Dam. The wind setup, wave height, and wave period for the critical locations at the Auxiliary Dam and around the plant island were calculated based on known values of fetch, water depth, and wind speed. With a maximum runup of 3.8 ft., a wind setup of 0.4 ft., and the normal reservoir water level, the maximum water level elevation for the Auxiliary Reservoir was calculated to 256.2 ft. MSL, which is 3.8 ft. below the top of the Auxiliary Dam. The maximum runup at the plant island was calculated to be 2.7 ft., which combined with a wind setup of 0.2 ft. and a normal operation water level in the Auxiliary Reservoir, resulted in a maximum water elevation of 254.9 ft. MSL, which is 5.1 ft. below the grade elevation of the plant island. The results of the PMH are bounded by the results of the PMF.

The site is subject to local intense precipitation. The depths used for the PMP study were developed from the U.S. Weather Bureau's Hydrometeorological Report No. 33. Since losses in unpaved areas were not considered during the PMP, the capacity for the plant site drainage for run-off is four inches per hour. As a result, the accumulated water depth during the PMP considered is approximately 14.8 in. Dynamic effect of wind on storm water accumulated on the plant grade was assumed to be insignificant and not considered.

The design basis groundwater level is 251 ft. MSL.

Failure of the Auxiliary Dam, Auxiliary Reservoir Separating Dike, or Main Dam would not result in any rise of water level above Elevation 258.0 ft. MSL and therefore the plant site at elevation 260 ft. MSL will not be flooded by dam failure. Tsunamis, seiches, channel diversion, and flooding from ice or snow melt were screened out as not applicable to the HNP site.

Values for the flood level in the original design specifications were slightly different than those presented in the Updated Final Safety Analysis Report due to the fact that the original design specifications were based on the assumption that the water level of the Main Reservoir would be raised to meet the needs of four units. However, the additional units were never built and the water level of the Main Reservoir was never raised to this assumed height.

3.0 Licensing Basis Flood Protection and Mitigation Features

The plant grade is 260 ft. MSL and all structures on the plant site are protected to at least elevation 261 ft. MSL, which is above the flood hazard level of 257.7 ft. MSL.

The Main Dam and Spillway, Auxiliary Dam and Spillway, Auxiliary Reservoir Separating Dike, Auxiliary Reservoir Channel, Emergency Service Water Intake Channel, Emergency Service Water Discharge Channel, Emergency Service Water Screening Structure, Emergency Service Water Discharge Structure, and Emergency Service Water and Cooling Tower Make-Up Water Intake Structure are designed to withstand the effects of the design basis flood hazard level or flood condition. The manholes for electrical cables of the Auxiliary and Emergency Power System, cables of the Auxiliary and Emergency Power System, Diesel Fuel Oil Storage Tank Building (DFOSTB), Diesel Generator Building (DGB), Tank Building, Waste Processing Building (WPB), Fuel Handling Unloading Area Building, Fuel Handling Building (FHB), Reactor Auxiliary Building (RAB), Containment Building (CB), and part of the Turbine Building (TB) are positioned to preclude effects of the design basis flood level or flood condition.

The top of the Main Dam is 16.9 ft. above its maximum water level and will therefore not be overtopped. The top of the Auxiliary Dam at 260 ft. MSL is 2.0 ft. higher than its maximum water level. The Auxiliary Separating Dike with its crest at 255 ft. will be subjected to overtopping due to waves generated by the PMH wind action on the normal reservoir level or the PMF with associated winds. The upstream and downstream slopes of the dike are protected by riprap. The Main and Auxiliary Dams will not be subjected to any dynamic forces due to flooding, other than local wave action which is dissipated by the use of riprap. The dams and associated spillways have been designed for hydrostatic forces corresponding to the PMF levels in the two reservoirs. The downstream face of the Main Dam is protected by a layer of oversized rock.

The embankment of the plant island along the Main Reservoir is protected by sacrificial spoil fill. The berm of the spoil fill at elevation 245 ft. MSL is above the maximum Main Reservoir water level and it has a width of 300 ft. on the south and southeast exposures. The extent of erosion due to the two worst fetches is estimated to be 150 ft. resulting from a PMH duration of 48 hours. Therefore, the 300 ft. wide sacrificial spoil fill provides a conservative design. After the event, the eroded portion will be inspected, restored, and stabilized where required.

The maximum elevation to which water will pond on the plant site during a PMP event assuming the entire drainage system became blocked would be 261.27 ft. The storm runoff will flow freely into the Main and Auxiliary reservoirs through the open channels and flow over the plant roads. Ponding to this elevation will not impact the ability to safely shutdown. Safety-related structures which have entrances at elevation 261 ft. are protected against ponding through either artificial barriers such as watertight or airtight doors, or low structural barriers such as curbs (minimum curb elevation is 262.0 ft.). The only exceptions to that criteria are entrances to the WPB which are not protected above 261.06 ft., but do not provide access to areas that house any safety-related equipment.

The PMP storm water collected in the area between the Retaining Wall and the Fuel Handling Building is pumped out to the storm drainage system using sumps and pumps. In addition to the direct rainfall and groundwater infiltration through the retaining wall, this area collects storm water as overflow from the WPB and the FHB if the drains are assumed to be plugged during the PMP occurrence. If the failure of pumps occurs, the water will accumulate to a level below elevation 236 ft. in this area. Openings in the FHB and the WPB below elevation 236 ft. have been closed and other penetrations sealed to preclude access of storm water to safety-related areas inside the buildings.

The storm water from the cancelled Unit No. 2 Reactor Auxiliary Building and the Containment Building drains in to the centrally located sump and is pumped into the plant drainage system. The sump and pump are sized for the design basis rain fall intensity. However, the wall heights are adequate to accommodate the PMP considering pump failure. Openings below 243.0 ft. have been closed and waterproofed to minimize water seepage from this area into Unit No. 1 structures.

Safety related buildings other than the Emergency Service Water Intake Structure, Screen Structure and Discharge Structure have structural features surrounding their roofs that would impound rainwater on the roofs assuming that the roof drains are plugged. In general, the ponding is caused by curbing whose height varies depending on the roof but is a maximum of one foot above the high point of the surrounded roof. In addition to curbing around roof edges, the portions of the RAB roofs which wrap around the west side of the CB is partially surrounded by taller structures. Also, the Tank Building has two areas without roofs where walls enclose the tanks. If the regular roof drains are plugged during a local intense PMP event, the storm water will pond on the roof and overflow the curbs. For the local intense PMP event, the water level on roofs will exceed the top of the surrounding curb by less than three inches except for some areas of the RAB roof which are surrounded by higher walls. In these areas the accumulated water depth will exceed the top elevation of the curb by a maximum of 1.5 ft. The open areas of the Tank Building which are surrounded by 25 ft. walls will not overflow, however, rainwater will accumulate to a depth of 23.36 ft. The floor of the unroofed areas of the Tank Building and the roofs of safety-related buildings where water accumulates are strong enough to withstand the ponding load in addition to other dead and live loads that can reasonably be expected to occur coincident with the PMP. The varying depths of water on a given roof due to the slope of the roof were accounted for in determining the structural adequacy.

The design basis groundwater level for the plant site was established to be 251 ft. MSL and the subsurface portions of Seismic Category I structures on the plant island are designed for hydrostatic loading with groundwater at elevation 251 ft. HNP structures contain openings and penetrations below grade in exterior walls of structures housing safety-related equipment. The CB, FHB, WPB, RAB, Tank Building, TB, and Fuel Handling Unloading Area are separated by seismic gaps, which are cut off from groundwater by horizontal waterstops between the base mats and vertical waterstops. The exterior walls of the FHB, WPB, RAB, Tank Building, TB, and Fuel Unloading Area are in direct contact with soil and exposed to groundwater. The DGB, DFOSTB, Emergency Service Water Screening Structure, and the Emergency Service Water and Cooling Tower Make-up Water Intake Structure also have penetrations below grade. Penetrations for pipes and electrical conduits have been sealed with waterstops and boots in structures housing safety-related equipment. Exterior walls of the buildings which are exposed to groundwater have been provided with impervious bithuthene waterproofing membrane up to elevation 259 ft. and the vertical and horizontal construction joints in the walls below grade and in the mats except for the construction joints in the northwest corner walls of the WPB have been provided with waterstops. Any inleakage through the waterproofing membrane, construction joints or cracks in the reinforced concrete walls or base mats will be handled by floor drains routed to associated sumps and pumps. Any water in the seismic gaps will be drained into the lowest building through weepholes at the lowest level of the gap and will be drained by the Floor Drain System. Any groundwater seeping through the vertical joints in the retaining wall or coming out of the retaining wall drainage system will be collected into drainage sumps and pumped out to the storm drainage system.

Electrical manholes and duct runs for Auxiliary and Emergency Power System cables are capable of normal function while completely or partially flooded. The duct runs are sloped towards the electrical manholes and groundwater in the PVC conduit will be drained to the electrical manhole. The electrical manholes have been provided with collection sumps for water coming through PVC conduits or cracks in the reinforced concrete walls or slabs of the manholes. When necessary, the water in the sumps will be removed by portable pumps.

The CB is a steel-lined reinforced concrete structure. To preclude external water pressure on the steel liner, a continuous impervious PVC waterproofing membrane has been placed between the containment foundation mat and the foundation rock. The waterproofing membrane is continuous under the mat and terminates in the waterstops at the joint with adjacent structures. Leakage through the waterproofing membrane will be drained through porous concrete drains placed between the membrane and the mat. The porous concrete drains lead to two sumps in the RAB mat. Each sump contains two full capacity pumps for redundancy. The porous concrete drains are interconnected so that water at any place has two paths for egress. The pumps discharge water to the HVAC Condensate Drainage System. In case of failure of the sump pumps, water will overflow the pump casing pipe at elevation 194 ft. and will be

drained by the Floor Drain System. Since the top of the casing pipe is at elevation 194 ft. and the steel liner at the reactor cavity is at 210 ft., no water pressure will be exerted on the liner.

The RWST level transmitters are located in the RWST pit area approximately 1.5 ft. above grade. The RWST level transmitters are protected from flooding conditions by providing a completely submersible transmitter installation and are fully capable of providing their design basis operation during and after maximum PMP flooding event.

Safety-related equipment will not be jeopardized as a result of the maximum still water level or wave run-up associated with the PMF or storm water accumulated at the plant site due to a PMP; therefore, it will not be necessary to bring the reactor to cold shutdown for flood conditions. The flood protection and mitigation features are not associated with a unique mode of operation of the plant.

4.0 Room Warning Systems to Detect Water

Water level warning systems exist in sumps of safety-related buildings (Containment and Reactor Auxiliary Building) for the purpose of detecting internal flooding. While not specifically credited for external flooding, these systems would be available to detect water entering from an external source.

5.0 Flood Protection Features Effectiveness

A. Acceptance Criteria

Rip-rap: There is no significant discrepancy between current and original design dimensions, which may affect the intended functionality.

Concrete structure, building walls: There is no sign of structural degradation or opening, no apparent degradation in structural members, no water stains emanating from surface, no leakage on interior surface, and no surface cracks more than 0.04 inches in width. There is no significant discrepancy between current and original design dimensions, which may affect the intended functionality.

Penetrations: There is no sign of water stains below the penetrations, openings or holes. They are sealed and absent of corrosion on exposed steel surfaces. There is no significant discrepancy between the current and original design characteristics that may affect the intended functionality. Existing and adequate monitoring and maintenance programs are in place.

Swales/Channels: There are no apparent signs of slope failure, obstructions, or erosion. There is no significant discrepancy between current and original design configurations. Existing and adequate monitoring and maintenance programs are in place.

Floor Hatches: There is no sign of structural degradation or any openings. There is no significant discrepancy between current and original critical characteristics. Existing and adequate monitoring and maintenance programs are in place.

Credited Non-Watertight Doors: There are no signs of degraded door seals or broken/cracked door jams, fittings, or fasteners. There is no significant discrepancy between current and original critical characteristics. Existing and adequate monitoring and maintenance programs are in place.

B. Effectiveness of Flood Protection Features at HNP

The deficiencies identified at HNP include several inadequate seals, two curb openings that are lower than the roof curb height, a fire door whose seal is below the flood height, a gap between a curb and wall, and an electrical manhole with a torn waterstop seal. The seals have been scheduled for repair, a temporary measure put in place for the curb openings, and the fire door analyzed to not be an immediate flooding threat as it would take over a day for water to reach safety-related equipment. Upon correction of the stated deficiencies, the features will effectively perform their credited flood protection function under all plant configurations.

Flood protection features were reviewed to ensure that their flood protection function is adequately maintained. The review ensured that the feature is included in a periodic test, monitoring, or inspection program, verified that testing, monitoring, or inspection is being performed, and determined that the scope of the testing, monitoring, and inspection programs is adequate to confirm the flood protection function of the credited features at HNP.

6.0 Flood Protection Walkdown Implementation Process

A. Methodology of Walkdown

Walkdowns were completed in compliance with the guidance in NEI-12-07.

B. Organization and Training

The Flooding Walkdown Team for HNP consisted of flooding walkdown engineers (FWEs), site support engineers, licensing basis reviewers, and plant operations personnel. The site support engineers consisted of at least one mechanical engineer and one civil engineer and identified features to be inspected and prepared the walkdown forms. At least one mechanical and one civil engineer were assigned as FWEs, selected for experience in evaluation of structures and equipment, knowledge of nuclear design standards, and understanding of sources of external flooding. Before completing the walkdowns, the FWEs completed general and site licensing basis training, which included familiarization with walkdown scope, preliminary analysis activities, field walkdown approach, and documentation, in addition to the required NANTeL "Generic Training for Flooding Walkdowns" completed by the walkdown team members.

7.0 Flood Protection Walkdown Results

A. Identified Deficiencies

A total of 38 deficient features were identified during the walkdowns at HNP. The identified deficiencies consisted of two curb openings that are lower than the roof curb height, a fire door whose seal is below the flood height, a gap between a curb and wall, an unsealed tubular steel opening in a floor slab, an ethafoam isolation joint instead of a vertical waterstop, an electrical manhole with a torn waterstop seal, signs of past or present leakage around conduits, and missing conduit covers or seals. Feature condition descriptions and resolutions are detailed for each deficiency below.

Work Request (WR), Work Order (WO), Condition Report (CR), Engineering Change (EC)

Deficient Features

#	Feature ID	Location Description	Description of Condition	CAP Entry
1	E4052A	Wall B RAB btwn col Kz & L @ el 261.67	Gasket out of place on cover, Metal Cover missing	WR issued WO issued
2	E4962	WPB Wall 1 btwn Col. S & Sz @ el 236		
3	E1785*	FHB Wall L, btwn col. 71 & 69 @ el 216		
4	URS-139	WPB Wall 1 btwn col. S & Sz1 @ el	visible water leak; no ID number found on pipe, Aux Condensate Line	WR issued WO issued

Deficient Features

#	Feature ID	Location Description	Description of Condition	CAP Entry
4	URS-139	WPB Wall 1 btwn col. S & Sz1 @ el 236	visible water leak; no ID number found on pipe, Aux Condensate Line	WR issued WO issued
5	E2943	FHB Wall N btwn col. 53 & 55 @ el 236	no signs of leakage but seal appears to be cracked	WR issued WO issued
6	RAB-WP-1A	RAB roof, east side of steam tunnel penthouse	Two openings below roof PMP flood elevation. Flow path leads to Steam Tunnel.	CR issued WR issued WO issued EC issued
7	RAB-WP-1B			
8	1FP-D0253	Door on roof of RAB elev. 289, north of containment building	Flood elevation above door seal by 3', door not water tight and accesses safety related equipment	CRs issued to implement corrective action
9	P-3373	RAB roof near stairway to missile shield @ el 309	Heavily cracked sealant & section loss of pipe penetration along floor; lower gasket hose clamped; unable to see upper hose clamp seal	WR issued, WO issued
10	E1931	DFOSB wall 2, 18'-3" east of center of hallway @ el 253.25	Efflorescence buildup around penetration and dried water stain.	WR issued, WO issued
11	E1932	DFOSB 13'-9" east of center of hallway, Floor El. 242.25	Some water leakage from penetration. Corrosion on plug. Efflorescence buildup around penetration.	WR issued, WO issued
12	E1963	DFOSB 9'-3" east of center of hallway, Floor El. 242.25	Reflective foil covering seal. Corrosion on plug. Efflorescence buildup on left side of penetration.	WR issued, WO issued
13	E1964	DFOSB 4'-9" east of center of hallway, Floor El. 242.25	Very small water stain. Slight corrosion on plugs. No cracks or holes. Efflorescence buildup around penetration.	WR issued, WO issued
14	P3405	FHB wall L, between Col. 71 & 69, Floor El. 216	Not sealed at bottom. No cracks or holes. Water stain below penetration. No standing water.	WR issued, WO issued
15	P3407	FHB wall L, between Col. 57z & 55, Floor El. 216	Minor leakage/water stains. No standing water.	WR issued, WO issued

Deficient Features

#	Feature ID	Location Description	Description of Condition	CAP Entry
16	P3408	FHB wall L, between Col. 55 & 53, Floor El. 216	Minor leakage from bottom of seal. Water stain below penetration. No standing water.	WR issued, WO issued
17	TB-P-24	TANK BLDG 1, wall B between Col. 8 & 10, Floor El. 236	Water leaking from edge of seal; standing water present	WR issued, WO issued
18	Turbine Building Hatch	Access hatch to 4' wide space between Wall B (RAB) and Wall Ay (Turbine Building) Floor El. 261 near Col. 23 along Wall B	Concrete curb does not connect to Wall B, approximately 1" gap on each side of hatch that will allow PMP flood water to enter space below	CR issued to implement corrective action
19	70	Electrical Manhole against the South wall of Tank building 1	Manhole has settled up to 6" and has torn the waterstop seal.	CR issued to implement corrective action
20	Floor Opening	Turbine Building El. 261, North East of stairs leading to El. 240	Opening in floor could allow PMP flooding to reach the RCA doors leading to RAB El. 236	CR issued to implement corrective action
21	TB-P-14	TANK BLDG 1, wall 8 between Col. Fy & Fu, Floor El. 236	These features are Deficient due to manhole M70 waterstop deficiency.	CR issued to implement corrective action
22	TB-P-15			
23	TB-P-16			
24	TB-P-18			
25	TB-P-19			
26	E4993	TANK BLDG 1, wall 8 between Col. E & Fr	These features are Deficient due to manhole M70 waterstop deficiency.	CR issued to implement corrective action
27	E5022	TANK BLDG 1, wall 8 between Col. E & Fz		
28	E5024	TANK BLDG 1, wall 8 between Col. E & Fr		

Deficient Features

#	Feature ID	Location Description	Description of Condition	CAP Entry
29	E5030A	BETWEEN WALL 13 & 15, COL. Fv & G, BELOW FLOOR @ el 259.84	These features are Deficient due to manhole M70 waterstop deficiency but sealed with MS-5 which is able to provide flood protection but is not the credited feature.	CR issued to implement corrective action
30	E5031A	BETWEEN WALL 13 & 15, COL. Fv & G, BELOW FLOOR		
31	E5032A	BETWEEN WALL 13, COL. Fz & Fv, BELOW FLOOR	These features are Deficient due to manhole M70 waterstop deficiency but sealed with MS-5 which is able to provide flood protection but is not the credited feature.	CR issued to implement corrective action
32	E5033A	BETWEEN WALL 13 & 15, COL. Fz & Fv, BELOW FLOOR		
33	E5034A	BETWEEN WALL 13 & 15, COL. Fz & Fv, BELOW FLOOR	These features are Deficient due to manhole M70 waterstop deficiency but sealed with MS-5 which is able to provide flood protection but is not the credited feature.	CR issued to implement corrective action
34	E5035A	BETWEEN WALL 13 & 15, COL. Fz & Fv, BELOW FLOOR		
35	E5036A	BETWEEN WALL 13 & 15, COL. Fz & Fv, BELOW FLOOR	These features are Deficient due to manhole M70 waterstop deficiency but sealed with MS-5 which is able to provide flood protection but is not the credited feature.	CR issued to implement corrective action
36	E5044A	BETWEEN WALL 13, COL. Fz & Fv, BELOW FLOOR		
37	E5045A	BETWEEN WALL 13 & 15, COL. Fz & Fv, BELOW FLOOR		
38	Vertical WS Col. 44	BETWEEN WALL B & Ay, COL. 44, BELOW 261 FLOOR & ABOVE 240 FLOOR	No waterstop exists at intersection of wall B and wall 44.	CR issued to implement corrective action

* = Item is on both the Restricted Access list and Deficiency list

B. Flood Protection Features That Could Not Be Inspected

A few general areas were identified as inaccessible and will not be able to be inspected. Not all penetrations were able to be accessed in the seismic gaps between safety-related structures. Three

penetrations through a seismic gap were inspected as a representative sample and many others were viewed from afar. None of these penetrations showed any signs of leakage, thus providing reasonable assurance that the similar penetrations will perform their flood protection function effectively.

Several vertical and horizontal waterstops were inaccessible due to various circumstances, including: burial under asphalt and soil, underneath a settled manhole, location below electrical conduits and location below the TB floor.

There were 19 inaccessible penetrations. Four penetrations appear to be credited with Type B2 boot seals, preventing visual inspection of the seal. One of the penetrations is leaking and scheduled for repair. During the repair, visual inspection of all four may be possible depending on the repair method chosen. However, the others show no signs of leakage. The remaining 15 inaccessible penetrations have a metal shroud around the pipe covering the seal preventing a visual inspection of the seal. No signs of leakage were observed around these penetrations.

Inaccessible features for HNP are identified below.

- Waterstops, vertical and horizontal
    - in the seismic gaps between safety related structures – Any water that makes it into the seismic gap will be drained to the lowest point in the gap then through weepholes at the buildings lowest floor elevation and into the floor drain system. Three penetrations through the seismic gap were inspected as a representative sample for Features E86, H 59, and P330. No items from the sample showed signs of leakage or had seals between the pipe and the penetration. Many of the other penetrations though the seismic gap were viewed from afar as a general walk though. None of these items showed any signs of leakage. Reactor Auxiliary Building South Wall-Composite Penetrations MAS.
    - in space between manhole 70 and Tank Building 1 – The manhole has settled up to 6 inches which has exposed a portion of the waterstop. The rest of the waterstop is buried and therefore inaccessible. Manhole 70 is listed as a deficiency.
    - at connection of electrical conduit duct bank and the Waste Processing Building – There are two locations one near the south east corner (penetrations E4959 and E4960) and one near the south west corner (penetrations E4961 and E4962). The waterstops are located between the wall and the duct bank and are buried under asphalt and soil. No signs of leakage observed where the conduits enter the Waste Processing Building.
    - at intersection of pipe tunnel (under Turbine building) and RAB wall B – The intersection is below Class 1 electrical conduits and the 261 floor of the Turbine building. It is between columns 24 and 43. Waterstops protect this intersection from flooding. Inside the pipe tunnel standing water was observed at bottom of stairs on the 236 elevation in front of entrance to RAB, door 1FP-D0602. A non credited temporary dam was installed with a non-credited temporary sump pump. These items currently capture and discharge any inleakage through the pipe tunnel walls. The tunnel is inspected on a regular basis.
    - around a 4 foot wide space between the RAB and the Turbine building – This area is protected from flooding by the horizontal waterstop between the Turbine building foundation and the RAB wall B. And vertically along the southern outer wall of the Turbine building and the RAB. The northern vertical seal at

intersection of column 44 and wall B is listed as a deficient feature since no waterstop is shown on plans.

- Penetrations URS-136, URS-138, URS-140, and URS-141 appear to be credited with Type B2 boot seals for flood protection. URS-139 is leaking and requires repair. When repair is underway inspection of these other penetrations may be possible depending on the repair method decided upon. Currently none of the penetrations are showing signs of leakage except URS-139.

- Pipe penetrations (URS-F409, URS-F410, URS-F411, URS-F413, URS-F414, URS-F415, & URS-F416) within the open RMWST tank enclosure have type C penetrations through the 261 floor elevation but have a metal shroud around the pipe covering the seal. Disassembly and reassembly of the shroud would be required to inspect the seal. The area was observed holding water with no signs of leakage below the tank from floor elevation 236.

- Pipe penetrations (URS-F400, URS-F401, URS-F403, URS-F405, URS-F406, URS-F407, URS-F408, & URS-F418) within the open RWST tank enclosure have type C penetrations through the 261 floor elevation but have a metal shroud around the pipe covering the seal. Disassembly and reassembly of the shroud would be required to inspect the seal. The area was observed holding water with no signs of leakage below the tank from floor elevation 236.

Additionally, there are 110 features that have not yet been inspected due to restricted access. All are due to be inspected before the end of the Fall of 2013 refueling outage. The features and their justification for restricted access are detailed in the table below.

Feature	Condition
FHB Walls L and N, nine penetrations RAB Wall 45, three penetrations	Partially visible from floor below. Access restricted, scaffold required for complete inspection of seal. Plate on exterior wall. No apparent water leakage through seal on inside.
RAB Wall 45, two penetrations	Visible from left side. Cabinet in front of penetration limits visibility. No stains or signs of leakage.
Tank Building 1 Wall 8, nine penetrations DFOSB East Hallway, three penetrations WPB Wall 1, four penetrations	Partially visible, ladder access limited by overhead equipment. No signs of leakage.
Tank Building 1 Wall 8, two penetrations	Limited visibility from floor below. View restricted by duct work. No visible signs of leakage.
Wall B, 10 penetrations	Seals inspected were fire seals or type B1 seals (not flood protection). Flood protection seals in pipe tunnel to be inspected with other restricted access items. Ladder required for inspection along wall Aa.

Feature	Condition
RAB Wall B, four penetrations Wall B, four penetrations Tank Building 1 Wall B, three penetrations	Entry into confined space necessary. Ladder or scaffolding required for inspection of seals along wall Ay.
Under Blue Heaven, 12 penetrations	Restricted access due to confined space.
WPB, nine penetrations	Hatches below PMP flood elevation. Unable to inspect seal of concrete cover under existing metal cover.
RAB roof, four penetrations DGB, 19 penetrations	Concrete hatch covered by metal cover. Seal around concrete cover to be inspected at a later date.
Wall N, three penetrations	Seal only partially visible, scaffolding required for full inspection.
Wall 45, 10 penetrations	Inspection of feature restricted, scaffolding required.

8.0 Documentation of Available Physical Margins (APMs)

APMs have been collected and documented in the walkdown record forms and are available for use in the flood hazard reevaluations performed in response to Item 2.1: Flooding in the 50.54(f) letter.

9.0 Planned and Newly Installed Flood Protection and Mitigation Measures

As detailed in Section 7.0.A, two low curb areas on the roof of the Reactor Auxiliary Building were identified as being pathways for PMP flood waters assuming all roof drains are blocked and floodwater reaches a maximum stage of three inches above the curb elevation. The plant initiated mitigation includes ordering sand and sand bags delivered to site and installed as a temporary measure. Drainage calculations have been reevaluated by plant engineering and permanent options are currently being reviewed.