



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

November 3, 2015

Mr. Lawrence J. Weber
Senior Vice President and Chief
Nuclear Officer
Indiana Michigan Power Company
Nuclear Generation Group
One Cook Place
Bridgman, MI 49106

SUBJECT: NUCLEAR REGULATORY COMMISSION REPORT FOR THE AUDIT OF INDIANA MICHIGAN POWER COMPANY'S FLOOD HAZARD REEVALUATION REPORT SUBMITTALS RELATING TO THE NEAR-TERM TASK FORCE RECOMMENDATION 2.1-FLOODING FOR DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2 (TAC NOS. MF6096 AND MF6097)

Dear Mr. Weber:

By letter dated June 4, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15152A083), the U.S. Nuclear Regulatory Commission (NRC) informed you of the staff's plan to conduct a regulatory audit of Indiana Michigan Power Company's (the licensee) Flood Hazard Reevaluation Report (FHRR) submittal related to the Near-Term Task Force Recommendation 2.1-Flooding for Donald C. Cook Nuclear Plant, Units 1 and 2. The audit was intended to support the NRC staff review of the licensee's FHRR and the subsequent issuance of a staff assessment.

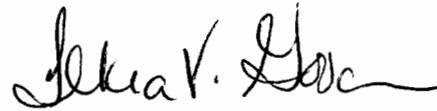
The audit was conducted on October 14, 2015, and was performed consistent with NRC Office of Nuclear Reactor Regulation, Office Instruction LIC-111, "Regulatory Audits," dated December 29, 2008, (ADAMS Accession No. ML082900195). Therefore, the purpose of this letter is to provide you with the final audit report, which summarizes and documents the NRC's regulatory audit of the licensee's FHRR submittal.

L. Weber

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If you have any questions, please contact me at (301) 415-6197 or by e-mail at Tekia.Govan@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Tekia V. Govan". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Tekia V. Govan, Project Manager
Office of Nuclear Reactor Regulation
Japan Lessons-Learned Division
Hazards Management Branch

Docket Nos. 50-315 and 50-316

Enclosure:
Audit Report

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NUCLEAR REGULATORY COMMISSION AUDIT REPORT FOR THE AUDIT OF INDIANA
MICHIGAN POWER COMPANY'S FLOOD HAZARD REEVALUATION REPORT SUBMITTALS
RELATING TO THE NEAR-TERM TASK FORCE RECOMMENDATION 2.1-FLOODING FOR
DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2

BACKGROUND AND AUDIT BASIS

By letter dated March 12, 2012, the U.S. Nuclear Regulatory Commission (NRC) issued a request for information to all power reactor licensees and holders of construction permits in active or deferred status, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.54(f) "Conditions of license" (hereafter referred to as the "50.54(f) letter"). The request was issued in connection with implementing lessons-learned from the 2011 accident at the Fukushima Dai-ichi nuclear power plant, as documented in The Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident. Recommendation 2.1 in that document recommended that the NRC staff issue orders to all licensees to reevaluate seismic and flooding for their sites against current NRC requirements and guidance. Subsequent Staff Requirements Memoranda associated with Commission Papers SECY 11-0124 and SECY-11-0137, instructed the NRC staff to issue requests for information to licensees pursuant to 10 CFR 50.54(f).

By letter dated March 6, 2015, Indiana Michigan Power Company (the licensee) submitted its Flood Hazard Reevaluation Reports (FHRRs) for Donald C. Cook Nuclear Plants, Units 1 and 2 (D.C. Cook) ((Agencywide Documents Access and Management System (ADAMS) Accession No. ML15069A334). The NRC is in the process of reviewing the aforementioned submittal and has completed a regulatory audit of the licensee to better understand the development of the submittal, identify any similarities/differences with past work completed and ultimately aid in its review of licensees' FHRR. This audit summary is being completed in accordance with the guidance set forth in NRC Office of Nuclear Reactor Regulation, Office Instruction LIC-111, "Regulatory Audits," dated December 29, 2008, ADAMS Accession No. ML082900195).

AUDIT LOCATION AND DATES

The audit was completed by document review via a webinar session in conjunction with the use of the licensee's established electronic reading room (ERR) and teleconference on October 14, 2015, from 1:00pm to 2:00pm.

Enclosure

AUDIT TEAM

Title	Team Member	Organization
Team Leader, NRR/JLD	Tekia Govan	NRC
Technical Monitor	Richard Rivera-Lugo	NRC
Technical Staff	Peter Chaput	NRC
Technical Staff	Kevin Quinlan	NRC
Technical Staff	Lyle Hibler	NRC

A list of the Licensee's participants can be found in Attachment 2.

DOCUMENTS AUDITED

Attachment 1 of this report contains a list which details the documents that were reviewed by the NRC staff, in part or in whole, as part of this audit. The documents were located in an electronic reading room during the NRC staff's review. The documents, or portions thereof, that were used by the staff as part of the technical analysis and/or as reference in the completion of the staff assessment, were submitted by the licensee and docketed for completeness of information, as necessary. These documents are identified in Table 1.

AUDIT ACTIVITIES

In general, the audit activities consisted mainly of the following actions:

- Review background information on site topography and geographical characteristics of the watershed.
- Review site physical features and plant layout.
- Understand the selection of important assumptions and parameters that would be the basis for evaluating the individual flood causing mechanisms described in the 50.54(f) letter.
- Review model input/output files to computer analyses such as Delft-3D and FLO-2D to have an understanding of how modeling assumptions were programmed and executed.

Table 1 summarizes specific technical topics (and resolution) of important items that were discussed and clarified during the audit. The items discussed in Table 1 may be referenced/mentioned in the staff assessment in more detail.

Table 1: Technical Topics of Discussion

Info Need No.	Information Need Description	Post-Audit Status
1	The licensee is requested to clarify, and where necessary correct, the comparison of the reevaluated flood hazard to the current design bases.	Response in the electronic reading room (ERR) is sufficient. The NRC staff would like this response from the ERR to be placed on the docket to support the interim hazard letter.
2	Provide the justification for using the Holland, MI wave information as representative of the site wave characterization. Reference as necessary appropriate ERR document(s) and figures and other information to support this assumption.	Response in ERR is sufficient. The NRC staff would like this response from the ERR to be placed on the docket to support the interim hazard letter.
3	Provide a discussion of the uncertainty associated with the extrapolated wave runup estimation method and provide a justification for not using a more rigorous method to develop the wave runup estimate.	Response in ERR is sufficient. The NRC staff would like this response from the ERR to be placed on the docket to support the staff assessment.
4	Provide a discussion of the Case 3 conditions analyzed with the SSPMP rainfall hydrograph (e.g. rooftop drains plugged, protected storm drainage system), and the Case 2 conditions analyzed using the HMR rainfall hydrograph.	Response in ERR is sufficient. Technical staff would like the response placed on the docket to support the staff assessment. The NRC staff reviewed the June 16, 2015, docketed submittal and confirmed that the LIP input and output files were docketed. Therefore the licensee does not need to docket the files as requested during the audit.
5	Provide a discussion of the plugged roof drainage analyzed with additional runoff to adjacent cells in the Case 3 analysis.	Response in ERR is sufficient. The NRC staff would like this response from the ERR to be placed on the docket to support the staff assessment.

Info Need No.	Information Need Description	Post-Audit Status
6	<p>The licensee is requested to provide the applicable flood event duration parameters (see definition and Figure 6 of the Guidance for Performing an Integrated Assessment, (Japan Lessons-Learned Directorate) (JLD) Interim Staff Guidance (ISG) JLD-ISG-2012-05) associated with mechanisms that trigger an Integrated Assessment using the results of the flood hazard reevaluation. This includes (as applicable) the warning time the site will have to prepare for the event (e.g., the time between notification of an impending flood event and arrival of floodwaters on site) and the period of time the site is expected to be inundated for the mechanisms that are not bounded by the current design basis. The licensee is also requested to provide the basis or source of information for the flood event duration, which may include a description of relevant forecasting methods (e.g., products from local, regional, or national weather forecasting centers) and/or timing information derived from the hazard analysis.</p>	<p>Withdrawn – This information need is being withdrawn and will be revisited during the review of the mitigation strategies assessment.</p>

Info Need No.	Information Need Description	Post-Audit Status
7	<p>The licensee is requested to provide the flood height and associated effects (as defined in Section 9 of JLD-ISG-2012-05) that are not described for LIP. This includes the following quantified information for each mechanism (as applicable):</p> <ul style="list-style-type: none">• Wind waves and run up,• Hydrodynamic loading, including debris,• Effects caused by sediment deposition and erosion (e.g., flow velocities, scour),• Concurrent site conditions, including adverse weather,• Groundwater ingress <p>Provide the analysis used to support the conclusions for associated effects. It is requested that the licensee provide analysis of associated effects for these flood causing mechanisms or a clear statement with justification as to why these effects are excluded.</p>	Withdrawn – This information need is being withdrawn and will be revisited during the review of the mitigation strategies assessment.

During the audit the licensee committed to provide all requested audit responses on the docket by November 13, 2015.

EXIT MEETING/BRIEFING

On October 15, 2015, the NRC staff closed out the discussion of the technical topics described above. There are no outstanding information needs remaining as a result of this audit.

ATTACHMENT 1
ERR Reference List

1. Document No. MD-12-FLOOD-005-N, Rev 0, "Local Intense Precipitation (LIP) Generated Flood Elevations, Cook Nuclear Plant Flood Hazard Re-evaluation"
2. Document No. MD-12-FLOOD-007-N, Rev 0, "Ice Induced Flooding at the D.C. Cook Nuclear Power Plant Units 1 and 2"
3. Document No. MD-12-FLOOD-009-N, Rev 0, "Probable Maximum Flood (PMF), Cook Nuclear Plant Flood Hazard Re-evaluation"
4. Document No. MD-12-FLOOD-012-N, Rev 0, "Site-Specific Probable Maximum Precipitation (PMP) for Cook Nuclear Plant Flood Hazard Re-evaluation"
5. Document No. MD-12-FLOOD-014-N, Rev 1, "Site-Specific Local Intense Precipitation (LIP) Generated Flood Elevations, Cook Nuclear Plant Flood Hazard Re-evaluation"

ATTACHMENT 2
List of D. C. Cook Audit Participants

<u>Name</u>	<u>Title</u>	<u>Organization</u>
1) John R. Anderson	Fukushima Project Manager	Indiana Michigan Power
2) Lee J. Bush	Fukushima Portfolio Manager	Indiana Michigan Power
3) Brenda G. Kovarik	Fukushima Technical Consultant	Indiana Michigan Power
4) Michael S. Dschida	CNP Flood Protection Program Owner	
5) Joseph R. Waters	Fukushima Licensing Engineer	Indiana Michigan Power
6) Rebecca A. Leneway	Fukushima Project Specialist	Indiana Michigan Power
7) Mitchell R. Peters	Principal Engineer	Alden Research Laboratory

L. Weber

-2-

If you have any questions, please contact me at (301) 415-6197 or by e-mail at Tekia.Govan@nrc.gov.

Sincerely,

/RA/

Tekia V. Govan, Project Manager
Office of Nuclear Reactor Regulation
Japan Lessons-Learned Division
Hazards Management Branch

Docket Nos. 50-315 and 50-316

Enclosure:
Audit Report

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OFFICE	NRR/JLD/JHMB/PM	NRR/JLD/JHMB/LA	NRR/JLD/JHMB/BC	NRR/JLD/JHMB/PM
NAME	TGovan	SLent	MShams (MMarshall) for	TGovan
DATE	10/27/2015	10/30/2015	111/3/2015	11/3/2015

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