The intent of this document is to compare the contents of the NEI example of a relatively “simple” integrated assessment against:

- The key components of an integrated assessment involving a flood protection evaluation using the guidance in JLD-ISG-2012-05, Sections 5 and 6
- The documentation requirements described in Section 8 of JLD-ISG-2012-05.

Components of the integrated assessment involving evaluation of flood protection:

- Table 1: Hazard definition: Identification of Applicable Flood Mechanisms and Plant Conditions (Section 5.1)
- Table 2: Identification of Controlling Flood Parameters (Section 5.2)
- Table 3: Collection of Critical Plant Elevations and Protection of Equipment (Section 5.3)
- Table 4: Flood protection performance criteria (Section 6.2)
- Table 5: Justification of flood protection performance

Documentation of integrated assessment

- Table 6: Documentation – Integrated assessment procedure
- Table 7: Documentation – Controlling flood mechanisms
- Table 8: Documentation – Evaluation of flood protection
- Table 9: Documentation – Peer Review

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Table 1: Hazard definition: Identification of Applicable Flood Mechanisms and Plant Conditions (Section 5.1)

Relevant information	Section from NEI example	Comments
the expected plant mode(s) during the flood event duration	Sections 5.1 and 5.2	See last paragraph of each section
available instrumentation and communication mechanisms associated with each flood mechanism, if applicable (e.g. river forecasts, dam condition reports, river gauges)	Section 5.1	Section 5.1 addresses LIP (7th paragraph of section). No specific discussion for dam failure (likely not applicable)
the availability of and access to onsite and offsite resources (including personnel) and consumables (e.g., fuel)	Section 5.1	Section 5.1 addresses LIP (9th paragraph of section). No specific discussion for dam failure (likely not applicable)
accessibility considerations to and from the site and around the site that may affect protective and mitigating actions	Section 5.1	Section 5.1 addresses LIP (9th paragraph of section). No specific discussion for dam failure (likely not applicable)
the effect of flood conditions on the availability of the UHS and offsite power	Section 5.1	Section 5.1 addresses LIP (9th paragraph of section). No specific discussion for dam failure
other relevant plant-specific conditions		

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Table 2: Identification of Controlling Flood Parameters (Section 5.2)

Relevant information	Section from NEI example	Comments
Flood height	Sections 5.1, 5.2, and 6.2	See Table 6.3
Associated effects	See comments	▪ wind waves and run-up effects: Section 5.2 ▪ hydrodynamic loading, including debris: no specific discussion (likely not applicable) ▪ effects caused by sediment deposition and erosion: no specific discussion (likely not applicable) ▪ concurrent site conditions, including adverse weather conditions: no specific discussion (likely not applicable) ▪ groundwater ingress: Infiltration discussed in section 7.3 ▪ other pertinent factors:
Flood event duration	Section 5.1	Need to distinguish the following: ▪ flood event duration ▪ duration of ponding above grade ▪ duration of rainfall event
Warning time	Section 8	See 4th paragraph of section
intermediate water surface elevations that trigger actions by plant personnel	Not included – Not applicable	No manual actions associated with site response to flooding
plant mode(s) of operation during the flood event duration	Sections 5.1 and 5.2	See last paragraph of sections
Other relevant plant-specific factors		

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Table 3: Collection of Critical Plant Elevations and Protection of Equipment (Section 5.3)

Relevant information	Section from NEI example	Comments
the critical elevations of plant equipment that is important to safety and the safety functions affected when the critical elevation of the equipment is reached	Section 6.1	
the flood protection features or systems used to protect each piece or group of critical plant equipment (e.g., a site levee, a Category 1 wall and flood doors, or a sandbag barrier) and any procedures required to install, construct, or otherwise implement the flood protection	Section 7	
the manner by which the equipment could be subjected to flooding (e.g., site inundation or building leakage)	Section 7	
potential pathways for ingress of water (e.g., through conduits or ducts)	Section 7	

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Table 4: Flood protection performance criteria (Section 6.2)

Relevant information	Section from NEI example	Comments
Provide an understanding of potential failure modes of the flood protection system, including consideration of potential ingress pathways for floodwaters	See comment	No explicit discussion of failure modes because site protected by topography and site grading
Demonstrate the soundness of the individual flood protection features under the loads (i.e., flood height and associated effects) due to the flood scenario parameters and confirm that the features are: ▪ in satisfactory condition; ▪ higher than the reevaluated flood height; and ▪ structurally adequate based on quantitative engineering evaluations	Section 7	
Demonstrate that the performance, characteristics, and configuration of the flood protection feature(s) conforms to accepted practices and is sufficiently robust (e.g., demonstrates an appropriate factor of safety) ▪ comparison against appropriate, present-day design codes and standards ▪ comparison against NUREG-0800, Sections 3.4.1 and 3.4.2 (Refs. 6 and 7) ▪ assessment of exterior and incorporated flood protection features as described in Section A.1.1 to Appendix A of this guidance ▪ justification and quantification (if applicable) of the reliability of active features as described in Section A.1.2 of Appendix A to this guidance ▪ assessment of temporary features as described in Section A.1.3	See comment	See subsections of section 7 (related to performance criteria and justification of performance) for explanation of whether various criteria and standards are applicable to site flood protection.
Perform a qualitative assessment of operational	Not included	Not included because site protected from external flooding

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requirements such as surveillance, inspection, design control, maintenance, procurement, and testing.		by topography and site grading
Develop a timeline showing all manual actions, including cues, indications, and notifications.	Not included – Not applicable	Manual actions not required
Evaluate whether manual actions (including construction, installation, or other actions) are feasible and reliable as described in Appendix C to this guidance, including justification and documentation as described in Section C.6 of Appendix C. Also evaluate the continued ability of the operating crew to monitor and control the plant to maintain key safety functions.	Not included – Not applicable	Manual actions not required
Demonstrate that necessary consumables are available and will remain accessible for the entire flood event duration.	Sections 5.1 and 5.2	
Evaluate the flood protection system as a whole as described in Section A.2 of Appendix A to this guidance	Not included – Not applicable	Not included because site protected from external flooding by topography and site grading
Include sensitivity studies, if uncertainty about the construction or characteristics of a flood protection feature or system exists (e.g., uncertainty about the parameters of concrete used in the construction of a concrete wall).	Not included – Not applicable	Not included because site protected from external flooding by topography and site grading

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Table 5: Justification of flood protection performance

Relevant information	Section from NEI example	Comments
Justification that flood protection system is capable of withstanding the flood height and associated effects for a set of flood scenario parameters	Section 7	Sections 7.1.3, 7.2.3, 7.3.1.3, 7.3.2.3, 7.3.3.3
Margin	See comment	▪ physical barrier dimensions: Table 6-3 ▪ structural/other performance capacity: Not included because site protected from external flooding by topography and site grading ▪ time/staffing: not included because manual actions not required
Identification of any flood protection features or systems that are unable to reliably accommodate the flood height and associated effects for a set of flood scenario parameters with margin	Not included – Not applicable	Flood protection (site topography and grading) found sufficient.
Proposed modifications (if applicable) and justification of performance	Not included – Not applicable	Flood protection (site topography and grading) found sufficient.

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Table 6: Documentation – Integrated assessment procedure

Documentation	Section from NEI example	Comments
Describe the methodologies used to demonstrate the effectiveness of: ▪ flood protection features and systems; and ▪ approach(es) used for mitigation	See comment	Section 2.0 of the example is labeled “Integrated Assessment Procedure.”
Describe any plant system models, including modifications made to existing internal event model(s), for the evaluation of the plant’s flood protection and mitigation capability	See comment	Section 2.0 of the example is labeled “Integrated Assessment Procedure.” There is no discussion of plant models contained in Section 2.0, presumably because such models were not utilized.

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Table 7: Documentation – Controlling flood mechanisms

Documentation	Section from NEI example	Comments
the plant mode(s), including the duration of time the plant is expected to remain in each mode	Sections 5.1 and 5.2 Section 8.0	Section 5.1: LIP Section 5.2: Dam failures Section 8.0: Evaluation results
the availability and quality of cues, indications and notifications, including water gauges, meteorological gauges, weather and tsunami forecasting tools, or similar instrumentation and communication mechanisms, as well as any durable agreements in place to ensure notification from offsite entities	Section 5.1	Section 5.1: Entry conditions for procedures associated with LIP response
the basis for action by plant operators in response to onsite cues and indications or notification from offsite entities (e.g., plant response to notification of an upstream dam failure)	Section 5.1	Section 5.1 states: “Units 1 & 2 is subject to tropical storms, heavy rains, and hurricanes. Units 1 & 2 procedure 1234-B, “Severe Weather Checklist,” provides instructions for preparing the plant to withstand the effects of a severe weather event such as a hurricane, tornado, or heavy rain event.” It also describes entry conditions for the procedure.
the availability of and access to onsite and offsite resources and consumables	Section 5.1	
accessibility considerations to and from the site and around the site that may impact protective and mitigating actions	Section 5.1 and 5.2	LIP: Section 5.1 Dam failures: Section 5.2
the condition and access to the ultimate heat sink	Section 5.1	LIP: Section 5.1 Dam failures: Not explicitly discussed
availability of offsite power	Not included	
structures and systems important to safety affected by the flood scenario parameters	See comments	Section 5.1: “a 0.3 feet APM exists between the peak flood height during the LIP event and the lowest SSC floor elevation important to safety” Section 8.0: “Units 1 & 2 is a plant with all SSCs important

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		to safety constructed above the maximum estimated flood stage.”
availability of staff and accessibility to and from the site for staff augmentation	Section 5.1 and 5.2	LIP: Section 5.1 Dam failures: Section 5.2

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Table 8: Documentation – Evaluation of flood protection

Documentation	Section from NEI example	Comments
Describe all site flood protection systems, including all manual actions necessary for the implementation of flood protection; the number of staff necessary to implement flood protection procedures, any necessary qualifications and training; and the ability of offsite staff to return to the site under the anticipated conditions.	Section 7.0	
Describe performance criteria used to evaluate flood protection, including any codes or standards used in the evaluation	See comment	Site topography: Section 7.1.1 Site drainage: Section 7.2.1 Incorporated features: ▪ Concrete walls: Section 7.3.1.1 ▪ Penetration seals: Section 7.3.2.1 ▪ Waterstops: Section 7.3.3.1
Provide technical justification for all assumptions (including the failure modes considered) used to demonstrate the effectiveness of flood protection features	See comment	No explicit discussion of assumptions but this is likely not applicable due to protection by topography and grading
For each set of flood scenario parameters, document credible flood protection failure modes identified and the justification for any flood protection failure modes that were deemed not credible:	See comment	No explicit discussion of failure modes because site protected by topography and site grading Site topography: Section 7.1 Site drainage: Section 7.2 Incorporated features: Section 7.3 ▪ Concrete walls ▪ Penetration seals ▪ Waterstops
For each set of flood scenario parameters, the condition of flood protection features	Section 5.1 and 5.2	
For each set of flood scenario parameters, results of	See comments	▪ Flood protection evaluation described in the following

quantitative engineering evaluations, including: ▪ justification of the structurally adequacy of features; ▪ expected leakage through barriers; and ▪ implications of identified deficiencies		sections: – Site topography: Section 7.1.2 – Site drainage: Section 7.2.2 – Incorporated features: • Concrete walls: Section 7.3.1.2 • Penetration seals: Section 7.3.2.2 • Waterstops: Section 7.3.3.2 ▪ No discussion of in-leakage ▪ Flood protection performance justification described in the following sections: – Site topography: Section 7.1.3 – Site drainage: Section 7.2.3 – Incorporated features: • Concrete walls: Section 7.3.1.3 • Penetration seals: Section 7.3.2.3 • Waterstops: Section 7.3.3.3
For each set of flood scenario parameters, results of evaluations of whether the performance, characteristics, and configuration of the flood protection feature(s) conforms to accepted practices and is sufficiently robust ▪ comparison against appropriate, present-day design codes and standards ▪ comparison against NUREG-0800, Sections 3.4.1 and 3.4.2 (Refs. 6 and 7) ▪ assessment of exterior and incorporated flood protection features as described in Section A.1.1 to Appendix A of this guidance ▪ justification and quantification (if applicable) of the reliability of active features as described in Section A.1.2 of Appendix A to this guidance ▪ assessment of temporary features as described in	See comment	See subsections of section 7 (related to performance criteria and justification of performance) for explanation of whether various criteria and standards are applicable to site flood protection.

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Section A.1.3		
Provide a discussion of any defense-in-depth considerations that are maintained under each set of flood scenario parameters	Not included	
Discuss any additional margin beyond the postulated scenarios for the flood protection system(s).	See comment	▪ physical barrier dimensions: Table 6-3 ▪ structural/other performance capacity: Not included because site protected from external flooding by topography and site grading ▪ time/staffing: not included because manual actions not required
If flood protection features are not shown to be reliable and have margin, document and describe at what flood height and under what associated effects, the flood protection feature or system is able to reliably accommodate a flood	Not included – Not applicable	Flood protection (site topography and grading) found sufficient.
Provide a summary list of any flood protection features or systems determined not to be capable of performing its intended safety function under the reevaluated hazard	Not included – Not applicable	Flood protection (site topography and grading) found sufficient.
If modifications are proposed, provide justification that the modified flood protection is reliable and has margin through comparison against established performance criteria or quantification of reliability	Not included – Not applicable	Flood protection (site topography and grading) found sufficient.

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Table 9: Documentation – Peer Review

Documentation	Section from NEI example	Comments
a description of the peer review process	Section A.1.1	Section not populated; preparer’s note included instead
the names and credentials (e.g., training, experience, capabilities, and background) of the peer review team members and leader, as well as the areas on which each reviewer concentrated	Section A.1.2	Section not populated; preparer’s note included instead
a description of how the assembled peer review team met the reviewer attributes	Section A.1.2	Section not populated; preparer’s note included instead
a discussion of the key findings and a discussion as to how the findings were addressed	Section A.1.3	Section not populated; preparer’s note included instead
an assessment of the disposition of comments made by peer reviewers	Section A.1.3	Section not populated; preparer’s note included instead
a review of the final integrated assessment report	Section A.1.4??	Section not populated; preparer’s note included instead
the conclusions of the peer review team as to the completeness, accuracy, and technical bases of the integrated assessment	Section A.1.4	Section not populated; preparer’s note included instead

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