



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, ILLINOIS 60532-4352

July 31, 2023

David Rhoades
Senior Vice President
Constellation Energy Generation, LLC
President and Chief Nuclear Officer (CNO)
Constellation Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: BYRON STATION - REQUEST FOR INFORMATION FOR THE NRC
QUADRENNIAL COMPREHENSIVE ENGINEERING TEAM INSPECTION:
INSPECTION REPORT 05000454/2024010 AND 05000455/2024010

Dear David Rhoades:

On January 22, 2024, the U.S. Nuclear Regulatory Commission (NRC) will begin a quadrennial baseline Comprehensive Engineering Team Inspection (CETI) at Byron Station. This inspection will be performed in accordance with NRC Inspection Procedure 71111.21M.

The CETI focuses on the design, maintenance, and operation of risk-significant components with low margin, or associated with an accident scenario, or a specific system. The inspection also monitors the implementation of changes to structures, systems, and components as modifications to one system may also affect the design bases and functioning of interfacing systems as well as introduce the potential for common-cause failures. The components, modifications, 50.59 Evaluations, 50.59 Screenings and Operating Experiences to be reviewed during this baseline inspection will be identified as part of the preparation for the inspection and finalized during the first onsite inspection week. Additionally, the inspection team may request scenarios to be performed on the simulator. This request would require support from your simulator staff to validate scenarios, simulator time, and a crew to perform the actions which would most likely occur during the second onsite week. The team will work closely with your staff early on during the inspection process to ensure this activity can be accomplished with minimal impact.

The inspection will include 2 weeks onsite. The inspection team will consist of seven NRC inspectors who will focus on engineering/maintenance/operations of the selected components modifications, 50.59 Evaluations, 50.59 Screenings and Operating Experiences. The current inspection schedule is as follows:

- Preparation week: January 15–19, 2024
- Onsite weeks: January 22–26, 2024, and February 5–9, 2024

Experience with previous baseline design/modification inspections of similar depth and length has shown that this type of inspection is extremely resource intensive, both for the NRC inspectors and the licensee staff. In order to minimize the inspection impact on the site and to ensure a productive inspection for both parties, we have enclosed a request for information needed for the inspection.

It is important that all of these documents are up-to-date and complete in order to minimize the number of additional documents requested during the preparation and/or the onsite portions of the inspection. Insofar as possible, this information should be provided electronically to the lead inspector. The information request has been divided into five groups, with their respective due dates:

- **August 28, 2023** - The First Group lists information necessary for our initial risk-informed scoping activities.
- **September 18, 2023** - The Second Group lists information necessary for our initial inspection scoping activities (preliminary sample selections).
 - **November 3, 2023** - The lead inspector will communicate the preliminary samples selected. This will include Components, Modifications, 50.59 Evaluations and 50.59 Screenings.
- **January 5, 2024** - The Third Group of documents requested are those items needed to support our in-office preparation activities. During the in-office preparation activities, the team may identify additional information needed to support the inspection.
- **January 22, 2024** - The Fourth Group includes the additional information identified during the in-office preparation as well as plant-specific reference material. This information should be available to the team onsite.
- **After January 22, 2024** - The Fifth Group includes supporting information to be provided throughout the inspection. Specifically, corrective action documents and questions developed during the inspection are requested to be provided as the documents are generated.

In addition, the enclosure includes information and requests addressing inspection logistics.

The lead inspector for this inspection is Thomas Hartman. We understand that our licensing contact for this inspection is Jerry Armstrong of your organization. If there are any questions about the inspection or the material requested in the enclosure, please contact the lead inspector at 630-829-9884 or via email at Thomas.Hartman@nrc.gov.

This letter does not contain new or amended information collection requirements subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing information collection requirements were approved by the Office of Management and Budget, Control Number 3150-0011. The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid Office of Management and Budget Control Number.

This letter and its enclosure will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,



Signed by Hartman, Thomas
on 07/31/23

Thomas Hartman
Senior Project Engineer
Engineering and Reactor Projects Branch
Division of Operating Reactor Safety

Docket Nos. 05000454 and 05000455
License Nos. NPF-37 and NPF-66

Enclosure:
Design Bases Inspection
Document Request

cc: Distribution via LISTSERV®

Letter to David Rhoades from Thomas Hartman dated July 31, 2023.

SUBJECT: BYRON STATION - REQUEST FOR INFORMATION FOR THE NRC
QUADRENNIAL COMPREHENSIVE ENGINEERING TEAM INSPECTION:
INSPECTION REPORT 05000454/2024010 AND 05000455/2024010

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COMPREHENSIVE ENGINEERING TEAM INSPECTION DOCUMENT REQUEST

COMPREHENSIVE ENGINEERING TEAM INSPECTION REQUEST FOR INFORMATION

I. ADMINISTRATIVE INSPECTION INFORMATION

Inspection Report Number:	05000454/2024010 and 05000455/2024010
Onsite Inspection Dates:	January 22–26, 2024, and February 5–9, 2024
Inspection Procedure:	IP 71111.21M, “Comprehensive Engineering Team Inspection”
Lead Inspector:	Thomas Hartman, Senior Project Engineer, RIII/DORS 630-829-9884 Thomas.Hartman@nrc.gov
Teammates:	Ijaz Hafeez, Senior Reactor Inspector, RIII/DORS Matthew Domke, Reactor Inspector, RIII/DORS Kevin Fay, Reactor Inspector, RIII/DORS Eric Magnuson, Reactor Inspector, RIII/DORS Courtney St. Peters, Resident Inspector, RIII/DORS Muzammil Siddiqui, Reactor Inspector, RIII/DORS

II. LOGISTICS

Email the following inspection logistics to the lead inspector by **December 21, 2023**, or sooner:

1. Entrance meeting time and location.
2. Room number/name and location of the room to be used by the inspection team while onsite.
3. Current management and engineering organizational chart.
4. Response team contact information (names and phone numbers) and team roles (e.g., management sponsor, lead, inspector counterpart).
5. Any potential resource conflicts during the inspection (e.g., emergency drills and all-staff meetings).
6. Available times, during the Monday and Tuesday of the second onsite week, to use the simulator to run scenarios. An operations crew to support this effort will also be required.

Due to the ongoing COVID-19 situation, additional logistics related with inspector presence onsite will be coordinated closer to the actual start of the inspection. Reach out to the Team Lead for questions or comments.

Enclosure

COMPREHENSIVE ENGINEERING TEAM INSPECTION DOCUMENT REQUEST

III. INFORMATION REQUEST

Contact the lead inspector as soon as possible if you have any questions regarding this information request. Provide the information electronically in "PDF" files, Excel, or other searchable formats, preferably via an electronic sharing service (CERTREC, ShareFile, Box, etc.). Specific Excel formats for various enclosure items may be requested to assist in inspection sample selection. If you do not have access to any of these services or similar, we can provide you access to "Box," which can be used to upload/download and share documents. The files should contain descriptive names and be indexed and hyperlinked to facilitate ease of use. Information in "lists" should contain enough information to be easily understood by someone who has knowledge of light-water reactor technology.

1. Information Requested to Support Risk-Informed Selections

The following information is requested by **August 28, 2023**, or sooner, to facilitate the initial risk scoping required to support the sample selections.

Note: If you are unable to provide items 1.1. through 1.6.2. as requested, please reach out to the Team Lead as soon as possible.

- 1.1. Risk-Ranking of the top 500 components from your site-specific probabilistic safety analysis (PSA) sorted by Birnbaum Worth. Include values for Risk-Achievement Worth, Risk-Reduction Worth, and Fussell-Veseley. Please provide the ranking in an excel spreadsheet that contains the importance measures and the description of the basic event (e.g., not just the basic event designator).
- 1.2. Risk-ranking of the top 500 components (i.e., Large Early Release Frequency (LERF)) from your site-specific PSA similar to the request in item 1.1. (Provide in Excel format.)
- 1.3. Provide a list of the top 500 cut-sets from your PSA. Provide the descriptions of the basic events in the list of cut-sets. (Provide in Excel format.)
- 1.4. Provide a list of the top 100 cut-sets for each initiator modeled in the PSA that contributes more than 5 percent to the baseline plant core damage frequency. (Provide in Excel format.)
- 1.5. Copies of PSA "system notebooks," Human Error Reliability Analysis Notebook, Internal Flood scenario notebook and latest internal event PSA summary document.
- 1.6. For Fire PSA Model:
 - 1.6.1 Provide the fire Probabilistic Risk Assessment (PRA) quantification notebook.
 - 1.6.2 Provide importance measures ranked, preferably by Birnbaum but if not available, by Risk-Achievement Worth (RAW) for the top 500 basic events for the fire PRA. (Provide in Excel format.).

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- 1.7. List of systems, system numbers/designators, and corresponding system names.
- 1.8. List of high-risk Maintenance Rule systems/components based on engineering or expert panel judgment (i.e., those systems/components not identified high risk in the PSA).
- 1.9. Electronic copies of simplified plant drawings (if available). Note: these may be uncontrolled documents such as big notes, training diagrams, etc.
- 1.10. Electronic copies of updated final safety analysis report (UFSAR), Technical Specifications, Technical Specifications Bases, and Technical Requirements Manual.

2. Information Requested for Preliminary Selection of Samples

The following information is requested by **September 18, 2023**, or sooner, to facilitate the initial sample selection.

- 2.1. Provide copies of the emergency operating procedures and abnormal operating procedures.
- 2.2. Provide the in-service testing (IST) program document.
- 2.3. Copies of procedures addressing the following: modifications, design changes, set point changes, equivalency evaluations or suitability analyses, commercial grade dedications, post-modification testing, 10 CFR 50.59 evaluations and screenings, and UFSAR updates.
- 2.4. Structures, systems, and components (SSCs) in the Maintenance Rule (a)(1) category for the last 4 years.
- 2.5. A list of operating experience evaluations for the last 4 years.
- 2.6. Information of any common-cause failure of components experienced in the last 4 years at your facility.
- 2.7. List of Root Cause Evaluations associated with component failures or design issues initiated/completed in the last 4 years.
- 2.8. List of open operability evaluations.
- 2.9. Procedures addressing time-critical and/or risk-significant operator actions. If not part of the procedure, include a list of all time-critical and/or risk-significant operator actions. Identify those actions that do not have job performance measures.
- 2.10. List of "permanent plant modifications" to SSCs that are field work complete. Do not include canceled or still in process modifications. For the purpose of this inspection, permanent plant modifications include permanent:

COMPREHENSIVE ENGINEERING TEAM INSPECTION DOCUMENT REQUEST

- 2.10.1 Plant changes, design changes, set point changes, completed in the last 4 years;
 - 2.10.2 Equivalency evaluations, and suitability analyses completed in the last 4 years;
 - 2.10.3 Procedure changes for Emergency Operating Procedures (EOPs), Abnormal Operating Procedures (AOPs), surveillances, and test procedures in the last 4 years; and
 - 2.10.4 Calculation changes that have been issued for use in the last 4 years.
- 2.11. A list of corrective action documents (open and closed) in the last 4 years that address permanent plant modifications issues, concerns, or processes. These documents should also include the corrective action documents associated with the modification implementation.
- 2.12. List of all 10 CFR 50.59 completed evaluations involving (a) calculations, (b) procedure revisions, (c) changes to the facility (modifications), (d) non-routine operating configurations, or (e) departures in methods of analyses. The list should NOT include any evaluations which concluded a license amendment was required. Include evaluations performed over the last 4 years. This list should include 50.59 evaluations for the following:
- 2.12.1 Changes that have been made under the provisions of 10 CFR 50.59 that have been updated in accordance with 10 CFR 50.71(e)(4);
 - 2.12.2 Modifications that are field work complete; and
 - 2.12.3 Changes to calculations (or initiation of new calculations) that have been issued. The list should contain the number and title of each document, a brief description of the change, and the corresponding number and type of the affected document (i.e., the modification or procedure to which the evaluation applies).
- 2.13. A list of all 10 CFR 50.59 changes that have been screened out as not requiring a full evaluation involving (i.e., just a 50.59 Screening): (a) calculations; (b) procedure revisions; (c) changes to the facility (modifications); (d) non-routine operating configurations; or (e) departures in methods of analyses.

The list should contain the number and title of each document, a brief description of the change, and the corresponding number and type of the affected document (i.e., the modification or procedure to which the evaluation applies).

COMPREHENSIVE ENGINEERING TEAM INSPECTION DOCUMENT REQUEST

2.14. A list of any modifications, procedure revisions, or the UFSAR changes where it was determined that 10 CFR 50.59 did not apply.

2.15. A list of corrective action documents (open and closed) that address 10 CFR 50.59 issues, concerns, or processes. These documents should also include the associated corrective action documents and the 50.59 change implementation.

The list should contain the number, title, and revision (or date) of each document, the affected system and corresponding documentation (if applicable).

2.16. UFSAR updates submitted in accordance with 10 CFR 50.71(e)(4). Provide copies of the complete submittal.

2.17. Copy of the UFSAR change log or a synopsis of the changes. This should include all of the changes made to the UFSAR that were incorporated in the last 10 CFR 50.71(e)(4) submittal.

3. **Information Requested for the Preliminary Selected Samples to be Available by January 5, 2024.**

This information should be separated for each selected sample, especially if provided electronically (e.g., folder with component or modification name that includes calculations, condition reports, maintenance history, etc.).

3.1. Corrective Action Program procedures, including the operability/functionality determination procedure.

3.2. Quality Assurance Program document/procedure.

3.3. A copy of any internal/external self-assessments and associated corrective action documents generated in preparation for the inspection.

3.4. A copy of engineering/operations related audits completed in the last 2 years.

For the selected **Components**:

3.5. System Health Reports, System Descriptions, Design-Basis Documents, and/or Training Lesson Plans associated with each of the selected components.

3.6. List of condition reports (corrective action documents) associated with each of the selected components for the last 4 years. (Excel format preferred.)

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- 3.7. For each selected component list of the maintenance history (corrective, preventive, and elective) over the last 10 years. Identify frequency of preventive maintenance activities.
- 3.8. Aging Management Program documents applicable to each selected component.
- 3.9. Provide an all-inclusive list of calculation revisions in effect associated with each of the selected components. Include document number, title, and revision number.
- 3.10. Copies of calculations associated with each of the selected components, excluding data files. If number of applicable responses under this request, for a specific component, is excessive (e.g., more than 10 calculations), you may reach out to the Team Lead to for an alternative. [Pipe stress calculations excluded from this request.]
- 3.11. Electronic copies of electrical drawings (ac and dc) and key diagrams.
- 3.12. Electronic copy of Piping and Instrumentation Drawings (P&IDs) (if available).
- 3.13. Copies of operability evaluations (open/closed for last 4 years) associated with each of the selected components and plans for restoring operability, if applicable.
- 3.14. Copies of operator work-around evaluations associated with each of the selected components and plans for resolution, if applicable.
- 3.15. Copies of any open temporary modifications associated with each of the selected components, if applicable.
- 3.16. Trend data on the selected electrical/mechanical components' performance for last 4 years. (For example, pumps' performance including in-service testing, other vibration monitoring, oil sample results, etc., for valves: stroke time and leak rate results, diagnostic trend data, etc.)
- 3.17. Provide copies of the normal and alarm response procedures associated with the selected components and selected scenarios (if any).
- 3.18. Completed tests and surveillances for each selected component performed during the last 3 years. For those tests and surveillances performed at a periodicity of greater than 3 years, provide the latest two performed. Include the associated acceptance criteria basis calculations. For those specific tests or surveillances performed at a periodicity resulting in excessive responses to this request, you may reach out to the Team Lead for an alternative.

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For the selected **Modifications, 50.59 Evaluations and 50.59 Screenings:**

- 3.19. For each of the selected modifications, provide the engineering change package.
- 3.20. Provide a copy of each selected 50.59 Evaluation.
- 3.21. Provide copies of the selected 50.59 Screenings.
- 3.22. The selected Modifications, 50.59 Evaluations and 50.59 Screenings will be further filtered by the inspectors until the final samples are selected. Once these are selected (during the preparation week and the first onsite week) the site should be prepared to provide other supporting documents for the selected item. Examples of supporting documents include:
 - Design drawings supporting the change
 - Procedures, calculations, etc. affected by the change
 - Post-modification test packages
 - UFSAR change papers generated (e.g., marked off pages)

4. Additional Information to be Provided on January 22, 2024, When the Team is Onsite

- 4.1. During the in-office preparation activities, the team will be making final selections and may identify additional information needed to support the inspection.
- 4.2. Schedule of any testing/maintenance activities to be conducted on the selected components during the two onsite inspection weeks.

5. Information Requested to be Provided Throughout the Inspection

- 5.1. Any corrective action documents generated as a result of the team's questions during this inspection as the documents are generated.
- 5.2. List of questions and/or document requests submitted by the team and their status (e.g., open, closed) sorted by inspector. Provide daily by 2:00 p.m., plant local time, to each inspector. It is recommended to provide the team leader with a master list sorted by inspector and each inspector with a list containing only the items originated by that inspector.
- 5.3. If available in hardcopy form, one complete set of P&IDs and simplified drawings (e.g., training schematics). If any of these documents is not available in hardcopy form, contact the lead inspector.

COMPREHENSIVE ENGINEERING TEAM INSPECTION DOCUMENT REQUEST

- 5.4. Please ensure that other supporting documents for the selected items have been located and are readily retrievable as the inspection team will likely be requesting these documents during the inspection. Examples of supporting documents are:
- 5.4.1 Individual Plant Examination/Probabilistic Risk Assessment report;
 - 5.4.2 Procurement documents for components and modifications selected (verify retrievable);
 - 5.4.3 Plant procedures (normal, abnormal, emergency, surveillance, etc.);
 - 5.4.4 Vendor manuals;
 - 5.4.5 Historical revisions of the Final Safety Analysis Report (FSAR), including the Original FSAR and Original Safety Evaluation Report; and
 - 5.4.6 Copy of electrical drawings, key diagrams, and isometrics (paper copies).

If you have questions regarding the information requested, please contact the lead inspector.