



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION III  
2443 WARRENVILLE ROAD, SUITE 210  
LISLE, IL 60532-4352

March 24, 2011

Mr. Barry Allen  
FirstEnergy Nuclear Operating Company  
Davis-Besse Nuclear Power Station  
5501 North State Route 2, Mail Stop A-DB-3080  
Oak Harbor, OH 43449-9760

**SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION - NOTIFICATION OF NRC  
INSPECTION AND REQUEST FOR INFORMATION**

Dear Mr. Allen:

On July 18, 2011, the U.S. Nuclear Regulatory Commission (NRC) will begin an inspection of the replacement reactor vessel head design and fabrication records NRC Procedure 71007, "Reactor Vessel Head Replacement Inspection" at the Davis-Besse Nuclear Power Station. This on-site inspection is scheduled to be performed beginning the week of July 18, 2011, and is scheduled to conclude on September 29, 2011.

Experience has shown that this inspection is resource intensive both for the NRC inspector and your staff. In order to minimize the impact to your on-site resources, and to ensure a productive inspection for both sides, we have enclosed a request for documents needed for this inspection. These documents have been divided into two groups. The first group identifies information necessary to ensure that the inspector is adequately prepared. The second group identifies the information the inspector will need upon arrival at the site and subsequent inspection weeks. 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 on-site portions of the inspection.

We have discussed the schedule for these inspection activities with your staff and understand that our regulatory contact for this inspection will be Mr. T. Chowdhary of your organization. If there are any questions about this inspection or the material requested, please contact the lead inspector Mr. M. Holmberg at (630) 829-9748.

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.

B. Allen

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Sincerely,

/RA/

David Hills, Chief  
Engineering Branch 1  
Division of Reactor Safety

Docket Nos. 50-346  
License Nos. NPF-3

Enclosure: Head Design and Fabrication Inspection Document Request

cc w/encl: Distribution via Listserve

HEAD DESIGN AND FABRICATION INSPECTION  
DOCUMENT REQUEST

**Inspection Dates:** July 18, 2011 through September 29, 2011

**Inspection Procedures:** IP 71007 "Reactor Vessel Head Replacement Inspection"

**Inspectors:** Mel Holmberg, Senior Reactor Engineer  
(630) 829-9748  
[Mel.holmerg@nrc.gov](mailto:Mel.holmerg@nrc.gov)

James Neurauter, Senior Reactor Engineer  
(630) 829-9828  
[James.neurauter@nrc.gov](mailto:James.neurauter@nrc.gov)

**A. Information Requested for the In-Office Preparation Week**

The following information (electronic copy CD ROM if possible) is requested by July 5, 2011, to facilitate the selection of specific items that will be reviewed during the on-site inspection weeks. The inspector may select specific items from the information requested below and request a list of additional documents needed on-site to your staff. If you have any questions regarding this information, please call the inspector as soon as possible.

1. A list with number, title and short description of the calculations, modification packages (and identify modifications or analysis which require a 10 CFR 50.59 Safety Evaluation), related to permanent or temporary modification of safety-related equipment or structures important to safety in support reactor vessel head replacement. Specifically, this list should include:
  - a. Replacement reactor vessel closure head (RVCH);
  - b. Modification of the RVCH (e.g., head vent line);
  - c. Integrated Head Assembly;
  - d. Replacement control rod drive mechanism (CRDM) housings;
  - e. Containment vessel access opening and restoration;
  - f. Shield building opening and restoration; and
  - g. Head load lifts, head storage in containment, or head load drop analysis.
2. For each activity identified in Item 1 above, provide the work order number, site lead for that activity (and contact information) and applicable schedule for implementing the activity.

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3. Provide the schedule for any welding (including dates for welder qualifications) and nondestructive examination (NDE) activities to be completed on the RVCH at the Davis-Besse site.
4. Provide an overview description of the fabrication history including sub-vendors, dates and sequence of assembly for the materials used in construction of the RVCH and CRDM housings (e.g., SA 508 head forging sub-vendor xx – on yy date, SB-167 penetration tubing sub-vendor dd, on tt date, Type 308 cladding of head by vendor zz on yy date, etc.) and reference the fabrication records, which support this history.
5. Provide a list (with short description) of the applicable Design Specifications, Design Reports, Design Calculations, Code Edition and Addendas (including Code Cases) and ASME or ASTM material specifications (as applicable) for:
  - a. Design of the RVCH;
  - b. Construction/Fabrication of the RVCH;
  - c. Construction/Fabrication of the RVCH head vent line;
  - d. Pre-service NDE of the RVCH (including vent line);
  - e. Design of the Integrated Head Assembly;
  - f. Construction/Fabrication of the Integrated Head Assembly;
  - g. Containment Vessel design;
  - h. Containment Vessel Fabrication;
  - i. Containment Vessel NDE;
  - j. Shield Building Design; and
  - k. Shield Building construction/fabrication.
6. Provide a list of other design and fabrication related documents supporting head replacement if not already provided above (i.e., design and fabrication drawings, ASME Code reconciliations, non-conformance and deviation reports).
7. A copy of the following documents related heavy load control during removal of the old reactor vessel head and installation of the replacement reactor vessel head:
  - a. Davis-Besse submittals as a result of NRC December 22, 1980, generic letter (GL) (unnumbered) and GL 81-07, Control of Heavy Loads regarding NUREG-0612, Control of Heavy Loads at Nuclear Power Plants, six-month response (Phase I) and 9-month response (Phase II);

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- b. Davis-Besse corrective action report that evaluated NRC Regulatory Issue Summary 2005-25, A Clarification of NRC Guidelines for Control of Heavy Loads;
- c. Current reactor head drop analysis (WCAPs). Where applicable, other supporting documentation that demonstrates equipment to maintain safe shutdown will be unaffected and potential offsite releases at the exclusion boundary will be within 10 CFR Part 100 limits;
- d. Calculations for rigging and special lifting devices associated with the replacement reactor vessel head;
- e. Documents that establish the lift weight for the existing reactor vessel head and the replacement reactor vessel head;
- f. Title 10 CFR 50.59 screening and/or evaluation associated with a postulated reactor head drop for the replacement reactor vessel head;
- g. Procedure for control of Heavy Loads;
- h. An electronic copy of the Davis-Besse UFSAR; and
- i. Copy of procedures related to 10 CFR 50.59 evaluations and screenings.

**B. *Information to be Provided at the Entrance Meeting***

The following information is requested to be provided to the inspectors at the entrance meeting on July 18, 2011. If some of the requested information is not available by this date, please identify the dates when this information will be provided to the inspector to complete the NRC's review of head fabrication records. If you have any questions regarding this information, please call the inspector as soon as possible.

- 1. Copy available (at on-site location for NRC review) of the applicable Edition/Addenda for the ASME Code Sections II, III, V, IX, XI, and Code Cases applicable to fabrication of the replacement head and the editions applicable to fabrication of the CRDM housings.
- 2. Copy available (at on-site location for NRC review) of the ASTM Standards applicable to the material specifications used in the replacement head and in the CRDM housings.
- 3. Copy of the receipt inspection checklist used to confirm lack of shipping damage to the replacement head and CRDM housings. Additionally, the inspector requests to observe any QC or QA examinations of the head, which occur during the scheduled onsite inspection weeks.

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4. Copy of the as-built fabrication drawing(s) (D-size) for the replacement head, penetration nozzles and CRDM housings including drawings that provide details, which include head cladding thickness measurements and required nondestructive examinations (NDE).
5. Index with short description of the radiographic records for the replacement head and CRDM housings including access to these records and a film reader.
6. Index with short description of the Audit/Surveillance reports for the replacement head and CRDM housing fabrication and an index with short description of audit or surveillance report findings (NCR, CRs, etc.).
7. Copy of contract or purchase orders that identify the specifications for materials used in the replacement head (including penetration nozzles) and CRDM housings. For these components copies of heat treatment records including:
  - a. plots of furnace temperature vs time (if available) or documentation that required temperatures and times were achieved to meet material specifications;
  - b. audits or surveillance reports (including non-conformance or deficiency reports with resolution) of vendor heat treatment procedures, including furnace calibration, numbers and placement of thermocouples and quenching/cooling rates; and
  - c. Certified Mill Test Reports (CMTRs).
8. Identify areas repaired in the head forging, penetration nozzles (and associated attachment welds) and head cladding and identify if these repairs were made prior to or following component heat treatments to meet the material specifications (include non-conformance or deficiency reports with resolution for each repair).

For these components provide a copy of:

- a. documents with detailed records of the location and type of repairs made including how the applicable Code and contract specifications were met for the repaired areas;
  - b. CMTRs for weld filler materials used in these repairs; and
  - c. audit or surveillance records of welder qualifications for welders that performed repair work and any non-conformance reports.
9. Copy of the Code Data Report(s) for the replacement head, which confirms that the head meets applicable design requirements and was certified by a professional engineer. This documentation should include confirmation that the original vessel N-stamp remains valid and may include rubbings taken of the NPT stamp on the replacement head.

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10. Copy of the Design Specifications for the original and replacement head certified by a professional engineer.
11. Copy of the Certified Design Report reconciling the design changes and changes in Code requirements for the replacement head and CRDM housings (e.g., Code Reconciliation Reports).
12. Copy of ASME Section III certifications for registered professional engineers that certified Design Specifications and Design Reports for the RVCH were in accordance with ASME Section III requirements.
13. Copy of fracture toughness test reports for the replacement reactor vessel head material that demonstrate compliance with ASME Code and Design Specification requirements.
14. Copy of Audits or Surveillance Reports of:
  - a. machining completed on the vessel head forging or penetration nozzles;
  - b. part identification and traceability;
  - c. drawing and drawing change controls; and
  - d. welder qualifications for welders that performed welding of nozzle-to-head welds or head cladding.

These audits should include any non-conformance or deficiency reports with the approved resolution.
15. Copies of Section XI replacement head and CRDM housing preservice examination records including preservice volumetric examination records for the penetration nozzle-to-head welds, which may be used as baseline inspections for subsequent inservice examinations required by NRC regulation 10 CFR 50.55a(g)(6)(ii)(D). Additionally, a copy of the ASME Code Section III data package including hydrostatic test records for the replacement vessel head.
16. Copies of fabrication process sheets or other records, which confirm that the required finished machining of surfaces was completed as specified on the fabrication drawings or contract specifications for the replacement head. Copies of contract specifications for surface finish on the replacement vessel head subcomponents.
17. For the head forging, penetration nozzles and head cladding copies of the nondestructive examination (NDE) records (if available) or records that the required NDE was completed to meet the material specifications (e.g., verification steps in vendor's fabrication traveler/plan or weld data sheets).

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18. Copies of welding records for the head cladding and penetration nozzle-to-head welds including: weld procedures and supporting procedure qualification records, weld data sheets and CMTRs. If these records are not available, provide audit or surveillance records of these activities including any non-conformance reports and resolution.
19. Provide weld procedures and supporting records as discussed in Item 16 for the modifications to the RVCH (e.g., head vent line).
20. Provide weld procedures and supporting records as discussed in Item 16 to be used for the containment access opening and restoration.
21. Access to radiographic film viewer to support review of CRDM housing radiographic records.
22. Name(s) and phone numbers for the regulatory and technical contacts including the site management and engineering organizational chart and RVCH project organizational chart.

**C. *Information to be Provided for the Second Onsite Inspection Week***

The following information is requested to be provided to the inspectors at the beginning of the second on-site inspection week on August 1, 2011. If some of the requested information is not available by this date, please identify the dates when this information will be provided to the inspector to complete the NRC's review of head fabrication records. If you have any questions regarding this information, please call the inspector as soon as possible.

- 1 Copy available (at on-site location for NRC review) of the following design change packages including supporting calculations, analysis and 10 CFR 50.59 safety evaluations:
  - a. RVCH and CRDM housings;
  - b. Integrated Head Assembly;
  - c. Containment Vessel Access Opening/Restoration; and
  - d. Shield Building Access Opening/Restoration.
- 2 Copy available (at on-site location for NRC review) of the updated UFSAR and applicable Edition/Addenda of the Design Codes for each of the components identified in Item 1 above.
- 3 Copy of the applicable drawing(s) (D-size) for each of the components identified in Item 1 above.



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- 4 Copy (at on-site location for NRC review) of the following vessel head replacement analysis:
  - a. Head lifts;
  - b. Head and associated lifting load postulated drop; and
  - c. Head storage in containment.

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

B. Allen

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Sincerely,

/RA/

David E. Hills, Chief  
Engineering Branch 1  
Division of Reactor Safety

Docket Nos. 50-346  
License Nos. NPF-3

Enclosure: Head Design and Fabrication Inspection Document Request

cc w/encl: Distribution via Listserve

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Letter to Mr. Barry Allen from Mr. David E. Hills dated March 24, 2011.

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