



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR
REGULATION RELATING TO THE ASME CODE SECTION XI
INSERVICE INSPECTION REQUIREMENTS
TOLEDO EDISON COMPANY
AND
CLEVELAND ELECTRIC ILLUMINATING COMPANY
DAVIS-BESSE NUCLEAR POWER STATION, UNIT 1
DOCKET NO. 50-346

I. Introduction

Paragraph 10 CFR 50.55a(g)(4) requires that throughout the service life of a boiling or pressurized water-cooled nuclear power facility, components (including supports) which are classified as ASME Code Class 1, Class 2 and Class 3 shall meet the requirements set forth in the applicable Section XI editions and addenda of the ASME Boiler and Pressure Vessel Code to the extent practical within the limitations of design, geometry and materials of construction of the components.

By letter dated June 27, 1977 supplemented by letter dated November 22, 1977, the licensee submitted a proposed Inservice Inspection Program for Davis-Besse Unit 1 with requests for relief from certain requirements of the ASME Code. The proposed program was based on the 1974 Edition of the ASME Code, Section XI through Summer 1975 Addenda. The NRC, on January 3, 1979, authorized the licensee to implement the proposed program on an interim basis

pending completion of detailed NRC review of the program and final findings regarding the acceptability of the proposed program.

By letter dated May 15, 1980 and supplemented by letters dated December 15, 1980, March 20, 1981, June 10, 1981 and February 16, 1982, the licensee proposed a new Inservice Inspection Program which was updated to meet the requirements of the 1977 Edition of the ASME Code, Section XI through Summer 1978 Addenda. This review is an evaluation of the licensee's Inservice Inspection Program as referenced above, Section III entitled "Weld, Supports, Components, and Bolting Inspection Programs," and Section IV entitled, "System Pressure Test Program," hereinafter referred to as the Inservice Inspection Program. Sections I and II of the licensee's Inservice Inspection Program are not evaluated in this report. These sections will be the subject of a separate Safety Evaluation Report.

This report evaluates the extent to which the Davis-Besse ISI Program complies with the requirements of the 1977 Edition including Addenda through Summer 1978 of Section XI of the ASME Code. The licensee has determined that conformance with certain code requirements is impractical and has requested relief from these requirements. We have evaluated the licensee's bases for these determinations. The results of our evaluation are discussed in subsequent paragraphs of this report.

II. Evaluation of the Initial Ten-Year Inservice Inspection Program

- A. The Davis-Besse operating license was issued on April 22, 1977. Paragraph 50.55 a(g)(4)(i) requires that inservice examinations of components and system pressure tests, conducted during the initial 120-month inspection interval shall comply with the requirements in the latest edition and addenda of the Code incorporated by reference in paragraph (b) of this section on the date 12 months prior to the date of issuance of the operating license, subject to the limitations and modifications listed in paragraph (b) of this section.

In the case of Davis-Besse the majority of the examination requirements of the 1977 Edition including Addenda of the Code through the Summer 1978 of Section XI will be performed during the remainder of the ten-year inspection interval. We have concluded that failure to complete exactly 100% of the inservice examination of the welds identified in this report, because of changes in the requirements between the Code editions, will not affect the assurance that the existing structural integrity will be maintained.

- B. In some instances where the required examinations will not be performed to the full extent specified by the applicable ASME Code, we will usually require that alternative or supplemental examinations be conducted and be made as a part of the Inservice Inspection Program. In cases where parts of the required examination areas cannot be effectively examined because of a combination of component design or current inspection technique limitations,

we will continue to evaluate the development of new or improved volumetric examination techniques. As improvements in these areas are achieved, we will require that these new techniques be made a part of the inservice examination requirements of those components or welds which received a limited examination.

C. We have reviewed the referenced licensee's Inservice Inspection Program for the remainder of the ten-year interval which started on November 21, 1977. Although examinations performed to date have been based on the 1974 Edition including Addenda through Summer 1975, our review indicates that:

- (1) The revised Inservice Inspection Program meets the requirements of the 1977 Edition of Section XI including Addenda through Summer 1978, except where the licensee requested written relief from the Code requirements that are impractical.
- (2) The revised Inservice Inspection Program is acceptable for use during the remainder of the ten-year interval which started on November 21, 1977.

III. Evaluation of Relief Requests

The licensee has requested written relief from two (2) examination requirements that he has determined to be impractical in accordance with Paragraph 50.55 a(g)(5)(iii). We have evaluated the information in the referenced letters and have determined that the examination requirements, from which relief is requested, are impractical. We have further determined that life, property or common defense will not be endangered as a result of not performing these examinations. We have reached the conclusion that relief should be granted as authorized by

10 CFR 50 paragraph 50.55a(g)(6) and that granting such relief is in the public interest giving due consideration to the burden upon the licensee if the requirements were imposed. The following paragraphs discuss details of the specific relief requests.

A. Examination of Reactor Coolant Pumps, P36-1, P36-2, P36-3, and P36-4

Code Examination Requirement

Volumetric and surface examinations are required for pump casing welds. This examination may be deferred to the end of the inspection interval.

Relief Request

Relief was requested to eliminate the volumetric examination.

Licensee's Basis for Request

The reactor coolant pump casing welds are too thick for examination by using present state-of-the art ultrasonic techniques. For a baseline, these welds are radiographed. However, for inservice examination, the background radiation will be too high, making radiography impractical. A surface examination will be performed.

Staff Evaluation

The ultrasonic examination of cast stainless steel materials does not produce reliable results for the detection of service induced flaws. The material properties of thick-walled cast stainless steel components attenuates and scatters ultrasound to the degree that examinations are effectively impossible. The licensee has committed to perform a surface examination of these components.

The only feasible method of performing the required examination is by radiography using a portable linear accelerator (LINAC). This inspection tool is a one-of-a-kind experimental device developed by EPRI for this type of examination. Disassembly of the pump is required for effective radiography. Experience with other utilities has indicated that several months are required to perform the entire examination with the portable LINAC. We have determined that disassembly of a pump solely for the purpose of performing this volumetric examination is impractical considering the significant man-rem exposure associated with the disassembly and the long plant outage time.

We have also concluded that relief to eliminate the required volumetric examination during this inspection interval is justifiable unless: (1) the pump is disassembled for maintenance or repair to the extent that the welds are accessible for examination, (2) the portable LINAC is available during the scheduled period of maintenance or repair, and (3) the existing background radiation is sufficiently low to be able to perform radiography.

We have concluded that performing a surface examination is adequate to establish the existing structural integrity of the reactor coolant pump casing welds considering the inherent fracture toughness of the material of construction.

B. Examination of the Control Rod Drive Nozzle Flange Bolts and Nuts
Code Examination Requirement

A visual examination (VT-1) of all bolts and nuts is required.

Relief Request

Relief was requested to perform a visual examination on 10 percent of peripheral CRDM's to coincide with the inspection requirement of Category B-0 "Pressure Retaining Welds in CRD Housings."

Licensee's Basis for Request

It is impractical to visually examine the eight flange bolts on each of the 69 CRDM's from the platform of the head service structure, approximately 20 feet above the flange surface. Most of the peripheral CRDM bolts can be observed through the twelve (12) inch diameter ports in the service structure.

Staff Evaluation

Section XI of the ASME Code requires that the welds in the reactor vessel control rod housings be examined on a sampling basis. We have determined that visual examination of all the control rod drive nozzle flange bolts and nuts is impractical with the existing design. We have reached the conclusion that visual examination of 10 percent of the peripheral bolts and nuts is adequate to detect a generic failure condition that the ASME Code examination intends to detect. Therefore, we have determined that the licensee has proposed an acceptable alternative examination method to ensure the integrity of these components.

IV. Conclusions

We have concluded that the revised ISI program Sections III and IV, meet the requirements of the 1977 Edition of Section XI Code including Addenda through Summer 1978 except where the written relief is granted and that the program is acceptable for use during the remainder of the ten-year inspection interval which began on November 21, 1977. Relief is granted based on our finding that certain specific requirements of Section XI of the ASME Boiler and Pressure Vessel Code, 1977 Edition through Summer 1978 addenda, are impractical to implement and would result in unusual difficulties without a compensating increase in the level of quality and safety. The granting of this relief is in the public interest giving due consideration to the burden upon the licensee if the requirements were imposed. We further conclude that granting this relief will not endanger life or property or common defense and security and is authorized by law.

We have determined that the granting of relief does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that granting relief involves an action which is insignificant from the standpoint of environmental impact and that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the granting of this relief.

V. References:

- A. Licensee letter dated May 15, 1980 (Serial No. 616)
- B. Licensee letter dated December 15, 1980 (Serial No. 671)
- C. Licensee letter dated March 31, 1981 (Serial No. 702)
- D. Licensee letter dated June 10, 1981 (Serial No. 715)
- E. Licensee letter dated February 16, 1982 (Serial No. 784)

The following NRC personnel have contributed to this Safety Evaluation:
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Dated: May 5, 1982