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Docket No. 50-346

Mr. Richard P. Crouse
Vice President, Nuclear
Toledo Edison Company
Edison Plaza
300 Madison Avenue
Toledo, Ohio 43652

Dear Mr. Crouse:

Subject: Reactor Vessel Head Vent - Interim Exemption

By letter dated July 1, 1982 (No. 835), you requested an exemption from certain requirements of 10 CFR 50.44(c)(3)(iii) for the Davis-Besse Nuclear Power Station, Unit No. 1. Specifically, relief from the requirement to install a reactor vessel head vent was requested. The exemption request was based upon the assertion that other methods are available to vent non-condensible gas trapped under the vessel head and, therefore, the head vent is not necessary.

Our letter of February 22, 1983, informed you that only interim relief from the implementation schedule could be considered because of the lack of supporting system data. The interim relief would permit sufficient time to conduct the necessary integral systems tests and develop data to support a full term exemption. We have reviewed your response, dated March 9, 1983 (No. 916), to our letter. Based upon the information and commitments in that letter and our judgment that the conditions which would require a vessel head vent are unlikely to occur in the interim period, the Commission has granted an exemption extending the date from which the installation schedule for the reactor vessel head vent is established. This date is extended to December 31, 1985, from July 1, 1982. Therefore, unless modified by future Commission action, a reactor vessel head vent must be installed and be operable before startup from the first scheduled outage beginning after December 31, 1985, and of sufficient duration to permit the required modifications.

A copy of the Exemption is being filed with the Office of the Federal Register for publication.

Sincerely,

"ORIGINAL SIGNED BY
JOHN F. STOLZ"

John F. Stolz, Chief
Operating Reactors Branch #4
Division of Licensing

NRC see note to Stolz 8/30/83

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Enclosure:
Exemption

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

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September 7, 1983

Docket No. **50-346**

Docketing and Service Section
Office of the Secretary of the Commission

SUBJECT: **DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1**

Two signed originals of the Federal Register Notice identified below are enclosed for your transmittal to the Office of the Federal Register for publication. Additional conformed copies (**6**) of the Notice are enclosed for your use.

☐ Notice of Receipt of Application for Construction Permit(s) and Operating License(s).

☐ Notice of Receipt of Partial Application for Construction Permit(s) and Facility License(s): Time for Submission of Views on Antitrust Matters.

☐ Notice of Availability of Applicant's Environmental Report.

☐ Notice of Proposed Issuance of Amendment to Facility Operating License.

☐ Notice of Receipt of Application for Facility License(s); Notice of Availability of Applicant's Environmental Report; and Notice of Consideration of Issuance of Facility License(s) and Notice of Opportunity for Hearing.

☐ Notice of Availability of NRC Draft/Final Environmental Statement.

☐ Notice of Limited Work Authorization.

☐ Notice of Availability of Safety Evaluation Report.

☐ Notice of Issuance of Construction Permit(s).

☐ Notice of Issuance of Facility Operating License(s) or Amendment(s).

XX Other: **Exemption from 10 CFR 50.44(c)(3)(iii) requirements to install reactor vessel head vent.**

Division of Licensing, ORB#4
Office of Nuclear Reactor Regulation

Enclosure:
As Stated

OFFICE→	ORB#4:DL					
SURNAME→	RIngram;cf					
DATE→	9/9/83					

NRC FORM 102 (1-76)

Toledo Edison Company

cc w/enclosure(s):

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of TOLEDO EDISON COMPANY AND THE CLEVELAND ELECTRIC ILLUMINATING COMPANY (Davis-Besse Nuclear Power Station, Unit No. 1)	))))))	Docket No. 50-346

EXEMPTION

I.

The Toledo Edison Company and the Cleveland Electric Illuminating Company (the licensees) hold Facility Operating License No. NPF-3, which authorizes The Toledo Edison Company to operate the Davis-Besse Nuclear Power Station, Unit No. 1 (the facility) at steady-state power levels not in excess of 2772 megawatts thermal. This license provides, among other things, that it is subject to all rules, regulations and Orders of the Nuclear Regulatory Commission (the Commission) now or hereafter in effect. The facility is a pressurized water reactor (PWR) located at the licensees' site in Ottawa County, Ohio.

II.

On December 2, 1981, the Commission published a revised Section 10 CFR 50.44, "Standards for Combustible Gas Control System in Light-Water-Cooled Power Reactors (46 FR 58484). Section 10 CFR 50.44(c)(3)(iii) of the regulation requires:

> "To provide improved operational capability to maintain adequate core cooling following an accident, by the end of the first scheduled outage beginning after July 1, 1982, and of sufficient

duration to permit required modifications, each light-water nuclear power reactor shall be provided with high point vents for the reactor coolant system, for the reactor vessel head, and for other systems required to maintain adequate core cooling if the accumulation of noncondensable gases would cause the loss of function of these systems."

The vent for the reactor vessel head is the subject of this exemption.

By letter dated July 1, 1982, the licensees requested an exemption from the requirement of 10 CFR 50.44(c)(3)(iii) for a reactor vessel head vent. The licensees, by letter dated January 30, 1980, committed to install high point vents at the top of the hot leg U-bends and at the top of the pressurizer. The installation of these vents will be completed prior to startup, scheduled for September 1983, from the current refueling. The licensees' exemption request stated that installing an additional vent in the reactor vessel head would not be necessary to vent noncondensable gas trapped under the vessel head to prevent the loss of natural circulation.

III.

We have reviewed the licensees' exemption request and the bases for that request. However, the lack of integral system test data which would demonstrate the feasibility of this approach and the lack of a verified code capable of modeling the complex phenomena associated with noncondensable gas in contact with steam-water mixtures prevents our concluding that noncondensable gases that evolve in the primary system can be safely vented by the hot leg high point vents alone.

The Davis-Besse facility is expected to have the capability of venting noncondensable gas through the hot leg vents before natural circulation could be lost. However, if gas were trapped under the reactor vessel head, the procedure by which the gas could be vented through the hot leg vents by the operator during any required depressurization could be difficult. It is our understanding that the head venting capability via the hot leg vents has not been analyzed with a verified computer code capable of treating noncondensable gases in contact with steam-water mixtures, nor has any acceptable analysis been verified against integral systems data applicable to the Babcock and Wilcox (B&W) reactor coolant system configuration. As such, we do not have sufffcient assurance from the licensees that venting noncondensable gases under the reactor vessel head via the hot leg high point vents only can be safely and successfully accomplished. The ability of the operator to safely accomplish head venting via the hot legs has not been demonstrated, either with a simulator, a test facility, or a verified analysis code. The consequences of excessive depressurization and resultant interruption of natural circulation through the venting process have not been examined. The staff believes that the ability of the operator to safely and successfully vent noncondensable gas trapped under the vessel head with hot leg vents and in the absence of vessel head vents should be confirmed by (1) conducting experiments in an appropriate integral system test facility to verify analytical methods and venting procedures, or (2) demonstrating, with a simulator, the ability of the operators to perform safely and successfully head venting via the hot legs. The simulator must be shown to be capable of properly simulating the phenomena of interest by verification against appropriate integral system test data. Such test

data could be obtained as p t of the test program requir to verify small break Loss of Coolant Accident methodology in Item II.K.3.30 of NUREG-0737.

By letter dated March 9, 1983, the licensees committed to participate in the B&W Owners Group Integral System Test program to demonstrate the efficacy of their proposed method of noncondensable gas removal from the reactor vessel head and to submit their evaluation of the test results to verify analytical methods and operating procedures. The licensees further committed to have the hot leg vents installed and declared operable, have procedures in place and operators trained for using these vents to vent noncondensable gases trapped under the reactor head prior to startup, scheduled for September 1983, from the current refueling outage.

Our present judgment is that the sequence of events necessary to lead to a degraded core condition which might involve the need to remove noncondensable gas from the vessel head region is of sufficient low probability that it is unlikely to occur during the interim period needed to obtain the necessary experimental data. Therefore, until the test results are received and reviewed, an interim exemption should be granted.

IV.

Accordingly, the Commission had determined that, pursuant to 10 CFR 50.12, an interim exemption is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest.

The requested exemption from the requirements of 10 CFR 50.44(c)(3)(iii) pertaining to the installation of a reactor vessel head vent is hereby granted, modified and conditioned as follows:

The date July 1, 1982, from which the installation schedule for the reactor vessel head vent is established, is extended to December 31, 1985, which means that the head vents must be installed by the end of the first scheduled outage of sufficient duration after that date to permit the required modification. This exemption is based upon the Commission's expectation that sufficient actual test data will be available by mid-1985 to permit the licensees to make a decision and plan accordingly even though the Integral System Test Report may not have been issued in final form. The licensees shall conduct or participate in the B&W Owners Group Integral Test System Test Program to demonstrate the efficacy of their proposed method for noncondensable gas removal from the reactor vessel head and submit their evaluation of the test results to the NRC. It is recognized by the Commission that this testing is expected to confirm that the hot leg high point vents are sufficient to remove any noncondensable gases trapped in the reactor vessel head and that a head vent is not necessary for this purpose.

Prior to startup from the current refueling outage, the hot leg vents shall be operable and the licensees shall have procedures in place and operators trained for using the hot leg vents to vent non-condensable gases trapped under the reactor head.

The Commission has determined that the granting of this exemption will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4), an environmental impact statement, or negative declaration and environmental impact appraisal need not be prepared in connection with this action.

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Darrell G. Eisenhut, Director
Division of Licensing

Dated at Bethesda, Maryland,
this 7th day of September 1983.