**GPU Nuclear**

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February 3, 1986
RFW-0776

John A. Zwolinski, Chief
Operating Reactors Branch No. 5
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Zwolinski:

Subject: Oyster Creek Nuclear Generating Station
Docket No. 50-219
Isolation Condenser Vent Exemption

Pursuant to your letter of August 30, 1985 concerning GPUN's request for exemption from 10CFR50.44(c)(3)(iii), please find attached our response. Should you have any questions, please contact Mr. M. W. Laggart at (201) 299-2341.

Very truly yours,

R. F. Wilson
Vice President
Technical Functions

RFW:gpa
2799f
Attachment

cc: Administrator, Region I
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NRC Resident Inspector
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ATTACHMENT

# OYSTER CREEK ISOLATION CONDENSER VENT EXEMPTION REQUEST

## NRC Request

1. The analysis in Attachment II to the July 23, 1985 exemption request is incomplete. Low pressure systems are always assumed to be available in the analysis, provided the reactor can be depressurized. Other events which result in hydrogen generation plus the need for the isolation condensers may be postulated. One example of such an event would involve a LOCA with core damage followed by isolation of the break and a loss of low pressure systems (CRD and feedwater also not available). In order to adequately assess the impact of isolation condenser venting versus no venting, the full spectrum of events requiring isolation condenser venting must be analyzed. Please provide these additional analyses.

## GPUN Response

All cases (both with and without low pressure systems available) were evaluated in the risk assessment and are included in the Event Sequence Diagrams and Event Trees. However, our analysis discussed only those small break LOCA sequences in which adequate long-term isolation condenser performance was required to successfully depressurize the reactor vessel and result in low pressure (core spray) injection.

The type of event referred to is of very low frequency and has no impact on the need for Isolation Condenser (IC) venting. The Core Spray System (CSS) is a highly redundant system containing two completely independent loops, each with two trains of pumps (main and booster). Realistic system performance analysis over the small break size range show that operation of a single main pump and associated booster pump is sufficient to prevent significant fuel clad damage. As a result of the high reliability of the CSS, sequences in which it is not available have very low frequencies.

We can use the Event Trees to determine sequences in which the CSS fails and leads to a core damage condition. Using the LOCA below core outside containment Event Tree, core damage sequence #14 involves the path requiring IC operation (and possible venting) and failure of the CSS. The mean frequency is $2.36 \times 10^{-8}$/year. Similarly, for the LOCA below core inside containment Event Tree, core damage sequences #31, 32 and 33 involve the path requiring IC operation (and possible venting) and failure of the CSS. The mean frequency for these sequences is $1.34 \times 10^{-10}$/year. The total frequency for these LOCA conditions with the IC initially available and failure of the CSS is therefore $2.37 \times 10^{-8}$/year.

Taking a broader view, we can examine all sequences in which the Automatic Depressurization System (ADS) fails (LOCA below core outside containment) and ADS and Feedwater fail (LOCA below core inside containment) to determine the potential impact of venting on reaching core damage conditions. Sequences potentially requiring IC venting result in end states #9 through 15 for the LOCA below core outside containment. Sequences 9 through 11 were previously evaluated. Sequences #12 through 15 are core damage end states with a mean frequency of $5.69 \times 10^{-8}$/ year.

Similarly, sequences #25 through 36 are the end states that potentially require IC venting for the LOCA below core inside containment. Sequences 25 and 26 were previously evaluated. Sequences #27 through 36 are core damage end states with a mean frequency of $1.58 \times 10^{-10}$/year. When all sequence frequencies are corrected for the range of break sizes as was done in our previous report:

| | |
|---|---|
| LOCA below core<br>Outside containment | |
| Sequences 9-11 | $1.76 \times 10^{-5}$ |
| Sequences 12-15 | $4.55 \times 10^{-8}$ |
| LOCA below core<br>Inside containment | |
| Sequences 25-26 | $5.15 \times 10^{-8}$ |
| Sequences 27-36 | $1.26 \times 10^{-10}$ |
| TOTAL | $1.770 \times 10^{-5}$ |

This total is only 0.3% larger than the frequency calculated for Attachment II to our exemption request ($1.765 \times 10^{-5}$) which was rounded and reported as $1.77 \times 10^{-5}$. This, combined with the conservatisms previously discussed (in Attachment II of our previous exemption request) confirms our conclusion that isolation condenser venting can be of little benefit in reducing core damage frequency, and should not be required for the Oyster Creek Nuclear Generating Station.

NRC Request

2. Are there any negative safety implications to adding isolation condenser vents?

GPUN Response

GPUN is not aware of any negative safety implications associated with the addition of the isolation condenser vents.

NRC Request

3. Will the installation of isolation condenser vents involve a significant increase in radiation exposure for workers?

GPUN Response

GPUN estimates that 5-10 man rem would be associated with the installation of the isolation condenser vents.