

**From:** "Robert L Gill Jr" <rlgill@duke-energy.com>  
**To:** OWFN\_DO.owf4\_po(JMS3)  
**Date:** Fri, Nov 5, 1999 12:27 PM  
**Subject:** RV Leak-off Line Question

Joe,

The following is Oconee specific information relative to the RV leak-off lines and some initial thoughts on how to resolve.

Please refer to drawings OLRFD-100A-1.1, -2.1, -3.1. Note the two lines (blue highlight)(Line 11) in the center of the drawings. These are the RV leakoff lines. Blue highlight means that they are within the scope of license renewal for Oconee. They are seismic as well as labeled Class BC and thus meet the two of the criteria contained in the Oconee License Renewal Scoping Methodology (see our discussion in Section 2.2.1 of the Application). Please now refer to Section 2.5.12 of Exhibit A of the Application - RCS Vents, Drains, and Instrument Lines. The RV leak-off lines are included within this commodity group of small bore RCS piping.

Section 3.5.12 of the Application provides the aging management review. The internal environment of the RV leak-off lines is normally air or, in the event the inner o-ring leaks, treated(borated) water. It would seem to me that an aging management review of the RV Leak-off line is bounded by the aging management review that has already been performed on other small bore non-class 1 piping that is continually exposed to treated water. Any leakage through the inner o-ring would be promptly revealed and timely actions would be taken by the plant staff. These lines would not be exposed to water for very long. Because these RV leak-off lines are normally dry, they should see less aging than those exposed to treated(borated) water.

Call if we need to discuss further, Bob

Enclosure 1

## Reactor Vessel Monitoring Pipe Questions

The small bore piping examinations are focused on piping limited to cracking due to thermal fatigue - in contrast, the concern with the RV leak-off line relates to stress corrosion cracking (SCC). Therefore, it is not clear that the proposed small bore piping examinations will bound postulated degradation of the RV leak-off line. Please address the following issues related to this:

- a. Since the RV leak-off line is expected to be susceptible to SCC and not thermal fatigue, how will the proposed examinations of small bore piping bound the expected behavior for the RV leak-off line? To demonstrate that the small bore piping bounds the behavior of the RV leak-off line, compare the relative susceptibility (i.e. stress, environment and materials) to SCC of the RV leak-off line to the small bore piping that is proposed for examination.
- b. What is the applicant's experience with the RV leak-off line, including any indications of degradation, inspection results, etc.?
- c. Are there any existing aging management measures, such as blowing the line clear after refueling, walkdowns, etc., that could serve to indicate the presence or mitigate the degradation?
- d. Describe the stress levels in the line during operation, in particular the accommodation of thermal expansion in the line during plant start-up?

### Reactor Vessel Monitoring Pipe Amended Questions

- a. What is the applicant's experience with the reactor vessel leak-off line, including any indications of degradation, inspection results, etc.? Is there any indication that stagnant water may collect in any portions of the piping?
- b. Are there any existing aging management measures, such as blowing the line clear after refueling, walkdowns, etc., that could serve to indicate the presence or mitigate the degradation? Is the reactor vessel leak-off line visually accessible?
- c. In the proposed response to the reactor vessel leak-off line Duke mentions that the lines are seismic as well as labeled Class BC. Please describe piping class BC and why the lines are not considered Class 1

**BAW-2248 Renewal Applicant Action Items**

<b>Renewal Applicant Action Items for <u>BAW-2248</u> (NRC Letter dated October 27, 1999)</b>	<b><u>Oconee - Specific Response</u></b>
The following are license renewal applicant action items to be addressed in the plant-specific license renewal application when incorporating Babcock and Wilcox Owners Group (B&WOG) topical report BAW-2248 in a renewal application:	

<p><b>Renewal Applicant Action Items for <u>BAW-2248</u> (NRC Letter dated October 27, 1999)</b></p>	<p><b><u>Oconee - Specific Response</u></b></p>
<p>(1) The license renewal applicant is to verify that the critical parameters for the plant are bounded by the topical report. Further, the renewal applicant is to commit to programs described as necessary in the topical report to manage the effects of aging during the period of extended operation on the functionality of the reactor vessel components. Applicants for license renewal will be responsible for describing any such commitments and identifying the appropriate regulatory control. Any deviations from the aging management programs within this topical report described as necessary to manage the effects of aging during the period of extended operation and to maintain the functionality of the reactor vessel internal components or other information presented in the report, such as materials of construction, will have to be identified by the renewal applicant and evaluated on a plant-specific basis in accordance with 10 CFR 54.21(a)(3) and (c)(1).</p>	<p>Duke participated in the development of BAW-2248 by providing Oconee-specific design and operational information. Duke has reviewed the current design and operation of the Oconee reactor vessel internals using the process described in Sections 2.4.1 and 2.4.2 of the Application. Duke has determined that the Oconee reactor vessel internals are bounded by the descriptions contained in BAW-2248 with the exception of the thermal shield and thermal shield upper restraint, which is within scope for Oconee.</p> <p>Also see pages 2-20 and 3-87 of the Oconee SER dated June 16, 1999 for resolution of this item.</p>
<p>(2) A summary description of the programs and evaluation of time-limited aging analyses (TLAAs) is to be provided in the license renewal final safety analysis report (FSAR) supplement in accordance with 10 CFR 54.21(d).</p>	<p>See Exhibit B of the Application for the summary description of the credited programs and activities.</p> <p>Oconee SER Open Item 3.0-1 applies.</p>

<b>Renewal Applicant Action Items for <u>BAW-2248</u> (NRC Letter dated October 27, 1999)</b>	<b><u>Oconee - Specific Response</u></b>
<p>(3) License renewal applicants must identify whether the intended function of the reactor vessel internals (RVI) is to provide shielding for the reactor pressure vessel (RPV). If not an intended function, the license renewal applicant should provide justification for that conclusion. Should a license renewal applicant determine that the RVI's intended function is to provide shielding for the RPV, then the items that support this intended function, such as, the thermal shield and the thermal shield upper restraint assemblies, must be identified and reviewed in accordance with 10 CFR 54.21(a)(3).</p>	<p>Section 2.4.6 and Table 2.4-4 of Exhibit A of the Application states that the Oconee reactor vessel internals provide gamma and neutron shielding of the reactor vessels.</p> <p>Also see pages 2-20 and 3-87 of the Oconee SER dated June 16, 1999 which address this topic.</p>
<p>(4) Applicants must commit to participation in the B&amp;WOG reactor vessel internal aging management program (RVIAMP), and any other industry programs as appropriate, to continue the investigation of potential aging effects for RVI components and to establish monitoring and inspection programs for RVI components. The applicant shall provide to the NRC written reports on the status of the RVIAMP on approximately an annual basis, commencing within one year of the issuance of the renewed license.</p>	<p>New</p> <p>Suggest addressing this item as part of the resolution of SER Open Item 3.0-1. Incorporate this commitment into the summary description of the RVIAMP that will be added to the revised UFSAR Supplement.</p> <p>An update annually, or on a frequency as otherwise agreed to by the NRC and the licensees, would be acceptable to Duke.</p>

<p><b>Renewal Applicant Action Items for</b> <b><u>BAW-2248</u></b> (NRC Letter dated October 27, 1999)</p>	<p><b><u>Oconee - Specific Response</u></b></p>
<p>(5) The applicant must describe plans for augmented inspection of RVI components for management of stress corrosion cracking/ irradiation-assisted stress corrosion cracking (SCC/IASCC) and loss of fracture toughness (neutron embrittlement) of the RVI components. This description should specify the sample size, the examination method, acceptance criteria and timing of the inspection, or the process to be used to specify these items.</p>	<p>See Duke response to Oconee SER Open Item 3.4.3.3-3 provided by letter dated October 15, 1999.</p>

<p><b>Renewal Applicant Action Items for <u>BAW-2248</u> (NRC Letter dated October 27, 1999)</b></p>	<p><b><u>Oconee - Specific Response</u></b></p>
<p>(6) According to the B&amp;WOG, one of its objectives in BAW-2248 states, "It is intended that NRC review and approval of this report will allow that no further review of the matters described herein will be needed when the report is incorporated by reference in a plant specific renewal license application." The license renewal applicant must address matters not described in the report, such as the baffle-former bolt cracking issues addressed in Section 3.3.1 of this SE pertaining to Refs. 1 and 2, with regard to the industry issues task group (ITG) project, initiated after April 23, 1998, to address generic RVI materials issues. The B&amp;WOG indicates this industry effort resulted in subsequent changes in the B&amp;WOG RVI aging management program. The ITG is currently addressing the issues of cracking of baffle bolts. The B&amp;WOG indicates that the changes in the aging management program now requires the applicants to be responsible for using the industry ITG project developed information to determine the necessary steps (e.g., inspection, operability determinations, and replacements) to manage the applicable baffle bolt aging effects.</p>	<p>See Duke response to Oconee SER Open Item 3.4.3.3-4 provided by letter dated October 15, 1999.</p>

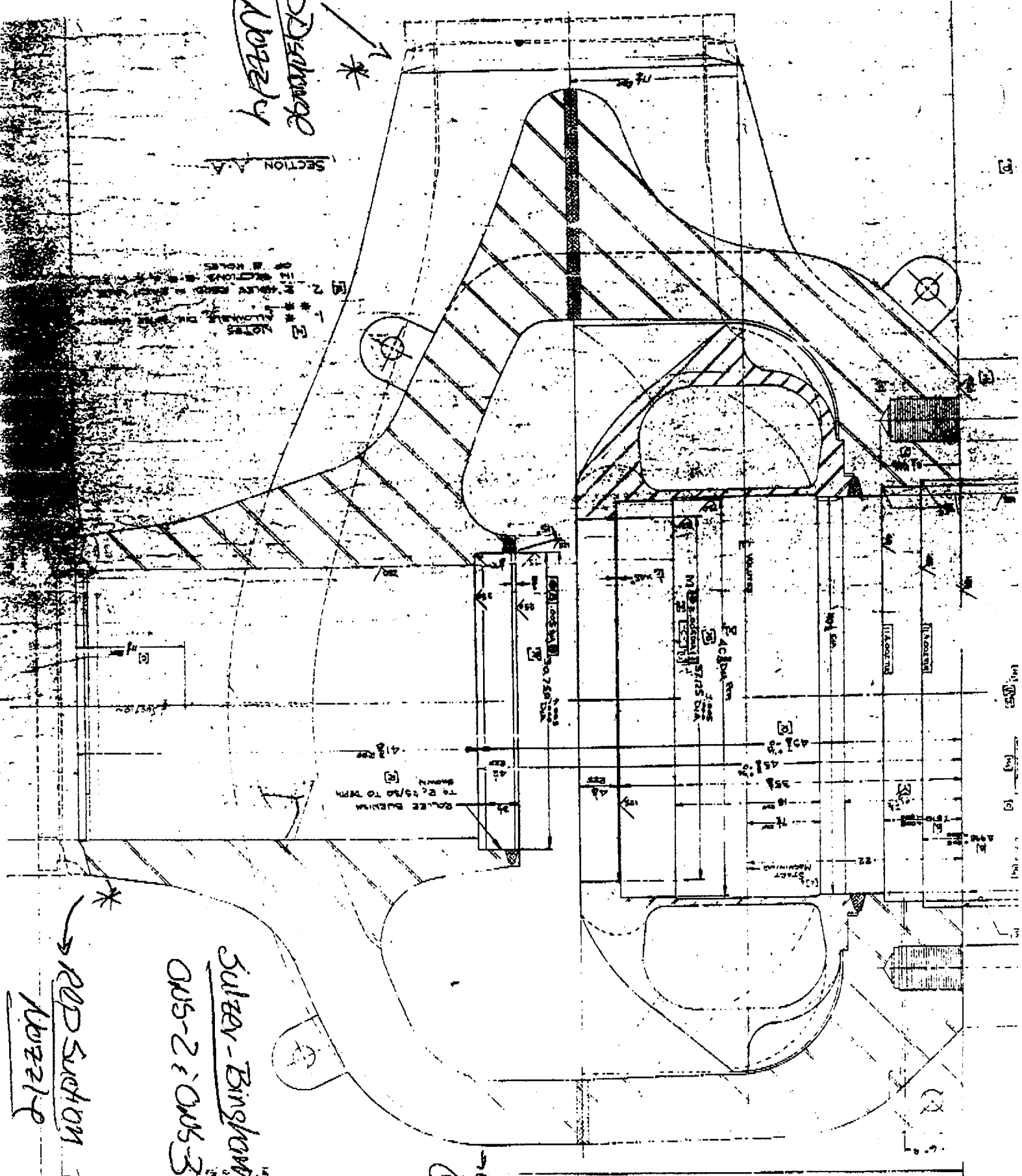


<b>Renewal Applicant Action Items for BAW-2248</b> (NRC Letter dated October 27, 1999)	<b><u>Oconee - Specific Response</u></b>
(7) The applicant must describe plans for augmented inspection of RVI components for management of loss of fracture toughness due to thermal aging embrittlement of the RVI components. This description should specify the sample size, the examination method, acceptance criteria and timing of the inspection, or the process to be used to specify these items.	See Duke response to Oconee SER Open Item 3.4.3.3-5 provided by letter dated October 15, 1999.
(8) The applicant must describe plans for management of stress relaxation for bolted closures of the RVI. This description should specify the critical locations, and monitoring and inspection techniques, and timing of the inspection, or the process to be used to specify these items.	New See Table 3.4-1 of the Application, page 3.4-45; Loss of Closure Integrity has been identified as an applicable aging effect. The ISI Plan, Examination Category B-N-3, as well as the RVI AMP have been credited to manage this aging effect. The RVI AMP is described in our letter dated October 15, 1999. The UFSAR Supplement summary description of the RVI - Inspection of Non-Bolted Items could be revised to include loss of bolted closure integrity as an aging effect to be managed.
(9) The applicant must describe plans for augmented inspection of RVI components for management of change of dimension (void swelling) of the RVI components. This description should specify the sample size, the examination method, acceptance criteria and timing of the inspection, or the process to be used to specify these items.	See Duke response to Oconee SER Open Item 3.4.3.2-2 provided by letter dated October 15, 1999.

<b>Renewal Applicant Action Items for BAW-2248</b> (NRC Letter dated October 27, 1999)	<b><u>Oconee - Specific Response</u></b>
(10) If flaws have been detected in the reactor vessel internals, a TLAAs plant-specific evaluation must be performed to determine the flaw growth acceptance in accordance with the ASME B&PV Code, Section XI, inservice inspection requirements.	See Duke response to Oconee SER Open Item 4.2.5.3-2 provided by letter dated October 15, 1999.
(11) The applicant must address the plant-specific plans to continue monitoring and tracking design transient occurrences.	New This item will be addressed by the Oconee Thermal Fatigue Management Program. The Oconee Thermal Fatigue Management Program is described in Section 5.4.1.3 of the Application as supplemented by letters dated February 17, and March 29, 1999.
(12) Plant-specific analysis is required to demonstrate that, under loss-of-coolant-accident (LOCA) and seismic loading, the internals have adequate ductility to absorb local strain at the regions of maximum stress intensity and that irradiation accumulated at the expiration of the renewal license will not adversely affect deformation limits. The RVIAMP must develop data to demonstrate that the internals will meet the deformation limits at the expiration of the renewal license.	See Duke response to Oconee SER Open Item 4.2.5.3-1 provided by letter dated October 15, 1999.

*ADD Drainage  
Wozzly*

SECTION A-A



NOTES  
 1. \* \* \* \* \*  
 2. \* \* \* \* \*  
 3. \* \* \* \* \*

TO 2.25/10 TO 2.25/10

MECHANICAL STAIRS DOWN

MECHANICAL STAIRS UP

MECHANICAL

*ADD Suction  
Wozzly*

*Sulzer - Bingham  
OHS-2 & OHS-3*

*ADD  
Basin*

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