

September 12, 2003

NG-03-0654

Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
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DUANE ARNOLD ENERGY CENTER  
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SUBJECT: CHANGE OF COMMITMENT TO REGULATORY GUIDE 1.97

REFERENCES: 1) R. PULSIFER (USNRC) TO L. LIU (IELP), "DUANE ARNOLD ENERGY CENTER – CONFORMANCE TO REGULATORY GUIDE 1.97, REV. 2 (TAC M84788)," AUGUST 4, 1993.  
2) D. MINECK (IELP) TO DR. T. MURLEY (USNRC), "UPDATE OF CONFORMANCE TO R.G. 1.97, REVISION 2," NG-89-0057, MAY 3, 1989.  
3) J. HALL (USNRC) TO L. LIU (IELP), "EMERGENCY RESPONSE CAPABILITY – CONFORMANCE TO REGULATORY GUIDE 1.97, REVISION 2 (MULTIPLANT ACTION A-17, TAC NO. 51087)," MAY 9, 1990.

In the Reference 1 letter, the Staff found the Duane Arnold Energy Center (DAEC) in conformance with the requirements of Regulatory Guide 1.97, Rev. 2 (RG 1.97), with justified deviations. In Reference 2, the DAEC committed to comply with RG 1.97 for the indication of Standby Liquid Control System (SLCS) flow rate (RG 1.97 Variable D-17 for Boiling Water Reactors). Variable D-17 is a RG 1.97 Category 2 instrument. Category 2 requires instrumentation to be environmentally qualified in accordance with RG 1.89. At the time of the Reference 2 commitment, the location of the SLCS flow instrument was designated as an environmentally mild area and no special qualification was required. Subsequently, we have determined that this area is potentially harsh for radiation to certain electronic components. Because the existing instrumentation contains electronics that are sensitive to radiation, it is not qualifiable under RG 1.89. Therefore, we request to deviate from RG 1.97 by downgrading this instrumentation to Category 3 requirements, which does not require conformance to RG 1.89. As noted in the Safety Evaluation contained in Reference 3, Staff approval is required for any such deviation. The attachment to this letter contains the justification for this deviation.

This letter contains the following change in previous commitment:

Revise DAEC RG 1.97 Program for SLCS flow indication (Variable D-17) from Category 2 to Category 3 qualification.

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Please contact this office if you have any questions regarding this matter.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark A. Peifer".

Mark A. Peifer  
Site Vice President, Duane Arnold Energy Center

Attachment: Justification for Deviation from Regulatory Guide 1.97 Requirements

CC Regional Administrator, USNRC, Region III  
NRC Project Manager (DAEC)  
NRC Resident Inspector (DAEC)

## Justification for Deviation from Regulatory Guide 1.97

### Background

In the original submittal of our Regulatory Guide (RG) 1.97 program (Reference 1), we justified deviating from the requirements of RG 1.97 for the indication of Standby Liquid Control System (SLCS) flow (Variable D-17 for Boiling Water Reactors). Specifically, in Issue 11 in that submittal, we stated that in lieu of installing instrumentation to measure SLCS flow, (none existed at that time), we would use other alternate indications of SLCS operation, the stated purpose of D-17. (RG 1.97 Type D variables are those that monitor system operation.)

In Reference 2, the Staff accepted our deviation for Variable D-17.

Subsequently, as part of the modifications made to the SLCS for the ATWS Rule (10 CFR 50.62), the DAEC installed instrumentation to measure the SLCS flow. (It should be noted that the ATWS rule did not require such flow instrumentation to be installed.) Therefore, in our Reference 3 submittal, we withdrew our previous deviation and committed to complying with RG 1.97 for a Category 2 instrument for variable D-17. At the time, we believed that this instrumentation met the requirements for environmental qualification, as specified in RG 1.97 for Category 2.

The Staff accepted our revised commitment in Reference 4.

### Problem Statement

The DAEC Environmental Qualification (EQ) program has two mission times – one hour and 30 days post-accident. Because the mission time for SLCS is greater than one hour, it falls into the 30-day category. The DAEC EQ program designates the area where this flow transmitter is located as “harsh” for radiation only for equipment with a mission time of 30 days post-accident.

During an EQ program review of another component in the area, we discovered that this transmitter, an ultrasonic flow meter, contains electronics that are sensitive to radiation. A detailed radiation study determined that, at the specific installation location of this transmitter, the 30-day radiation dose exceeds that for qualification of such electronic components. However, while this study determined that the instrument would remain operable for its actual mission time of approximately two hours, this flow transmitter is not qualified under the DAEC EQ program. Thus, we currently do not meet our previous RG 1.97 commitment to provide a Category 2 instrument for this variable.

Consequently, we evaluated various options of qualifying the existing instrument; replacing the existing instrument with one that is qualified; or, to keep the existing equipment and withdraw our previous RG 1.97 commitment to Category 2 and revert back to our original position for Category 3, which the NRC previously accepted.

We have determined that the only practical solution is to withdraw our commitment to Category 2, as the manufacturer of the existing equipment does not make a RG 1.89 qualified instrument, and given the unique nature of the SLCS fluid (sodium pentaborate in a heated solution), conventional flow indication techniques (dP cells, orifices, etc), that do not contain electronics and could be qualified, are subject to plugging and not practical for this application.

Justification for RG 1.97 Category 3

As originally argued in Issue 11 of Reference 1, SLCS flow is not considered a "key variable" indication for monitoring system operation at the DAEC. Several additional indications are available to the operator in the control room, such as pump running indicator lights, pump discharge pressure, and SLCS tank level, that indicate system operation.

Because the mission of SLCS is to inject a specified quantity of sodium pentaborate into the reactor, i.e., "Cold Shutdown Boron Weight" per Emergency Operating Procedures and 660 parts per million (ppm) of boron per the design basis (General Design Criterion 26), SLCS tank level (Variable D-18) is the "key variable," not SLCS flow rate. DAEC complies with the RG 1.97 requirement for Category 2 instrumentation for tank level indication (Reference 4).

Although the ATWS rule specified a requirement for SLCS injection flow rate, this instrument is not used to verify conformance to that requirement, nor is it used to verify conformance to the Technical Specification requirements for SLCS flow rate (SR 3.1.7.6).

Therefore, this flow instrument does not perform a critical function at the DAEC that requires it to be environmentally qualified. Thus, SLCS flow indication at the DAEC should be designated as a "backup variable" under RG 1.97 and qualified to Category 3 requirements. The existing instrumentation meets Category 3 requirements.

References

- 1) R. McGaughy (IELP) to H. Denton (USNRC), "Regulatory Guide 1.97," NG-85-2423, July 3, 1985.
- 2) R. Gilbert (USNRC) to L. Liu (USNRC), "Emergency Response Capability – Conformance to R.G. 1.97, Rev. 2: Request for Additional Information," January 13, 1987.
- 3) D. Mineck (IELP) to Dr. T. Murley (USNRC), "Update of Conformance to R.G. 1.97, Revision 2," NG-89-0057, May 3, 1989.
- 4) J. Hall (USNRC) TO L. Liu (IELP), "Emergency Response Capability – Conformance to Regulatory Guide 1.97, Revision 2 (Multiplant Action A-17, TAC NO. 51087)," May 9, 1990.
- 5) R. McGaughy (IELP) to H. Denton (USNRC), "Emergency Response Capability – Conformance to Regulatory Guide 1.97, Revision 2: Response to Request for Additional Information," NG-87-1032, March 31, 1987.