

Iowa Electric Light and Power Company

June 4, 1993  
NG-93-2078

JOHN F. FRANZ, JR.  
VICE PRESIDENT, NUCLEAR

Dr. Thomas E. Murley, Director  
Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Mail Station P1-137  
Washington, DC 20555

Subject: Duane Arnold Energy Center  
Docket No: 50-331  
Op. License No: DPR-49  
Response to NRC Request for Review of  
DAEC Conformance to NEDO-31558,  
"Position on NRC Regulatory Guide 1.97,  
Revision 3, Requirements for Post  
Accident Neutron Monitoring System"  
Reference: NRC letter, Pulsifer (NRC) to Liu  
(IELP), dated April 7, 1993  
File: A-100, A-370, C-51

Dear Dr. Murley:

The referenced letter requested that we compare the Duane Arnold Energy Center (DAEC) neutron monitoring systems (NMS) with the criteria stated in the BWR Owners' Group report, NEDO-31558. That report formed the basis for NRC's acceptance of alternate criteria for neutron monitoring instrumentation in lieu of the Category 1 criteria stated in Regulatory Guide 1.97.

We have completed our initial review of the DAEC's conformance to the criteria described in NEDO-31558. We have concluded that the DAEC NMS conforms to eight of the 16 criteria (see attached summary of the preliminary comparison). The remainder of the criteria will require further analyses. These analyses will be completed in December 1994. This schedule is due to the complexity of the reviews and particularly due to the fact that the post-Anticipated Transient Without Scram (ATWS) environment has not yet been defined at the DAEC. (This definition is currently scheduled to be completed in August 1994.) Upon completion of the ATWS environmental analysis, equipment qualification and function time can be assessed.

Any modifications necessary for the DAEC to conform to the criteria of NEDO-31558 will be completed prior to startup from Refuel Outage (RFO) 14, currently planned for the fall of 1996.

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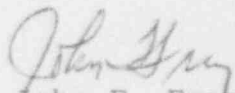
Dr. Thomas E. Murley  
NG-93-2078  
June 4, 1993  
Page 2

This schedule is necessary to support long-range planning and budgeting for outage scope and procurement of potentially long lead time materials. The scope of any necessary modifications will not be known until late 1994, so that those modifications can not be adequately planned for RFO 13, which is currently scheduled for the spring of 1995.

Considering the nature and complexity of the evaluations and analyses necessary to resolve this issue, we believe that the above schedule is reasonable. In addition, we have discussed this matter with other licensees having similar neutron monitoring systems and are considering a joint approach. Such an effort would allow consolidation of resources and, overall, a more comprehensive product.

Should you have any questions regarding this matter, please contact this office.

Very truly yours,



John F. Franz  
Vice President, Nuclear

JFF/SCR/pjv

Attachment: Comparison of DAEC Neutron Monitoring  
Instrumentation to the Criteria of NEDO-31558

cc: S. Catron  
L. Liu  
L. Root  
R. Pulsifer (NRC-NRR)  
J. Martin (Region III)  
NRC Resident Office  
DCRC

Comparison of DAEC Neutron  
Monitoring Instrumentation to the  
Criteria of NEDO-31558

<u>Criteria</u>	<u>NEDO-31558</u>	<u>DAEC NMS</u>
Range	1 to 100%	1 to 100%
Accuracy	±2% rated power	±2% full scale (125% rated power)
Response Characteristic	5 sec/10% change	1 sec/100% change
Equipment Qualification	Operate in ATWS Environment	Note 1
Function Time	1 hour	Note 2
Seismic Qualification	Not Required	Safety related portions are seismically qualified
Redundancy and Separation	Redundant to assure reliability	Note 3
Power Sources	Uninterruptible and reliable power sources	Note 4
Channel Availability	Available prior to an accident	Available prior to an accident
Quality Assurance	Limited QA based on requirements from NRC Generic Letter 85-06	Note 5
Display and Recording	Continuous Recording	Continuous Recording
Equipment Identification	In accordance with DCRDR	Not currently labelled consistent with other R.G. 1.97 instrumentation

<u>Criteria</u>	<u>NEDO-31558</u>	<u>DAEC NMS</u>
Interfaces	No interference with RPS trip functions	No interference with RPS trip functions
Service, Test and Calibration	Establish in-plant procedures	Note 6
Human Factors	Incorporate Human Factors Engineering (HFE) principles	HFE principles incorporated
Direct Measurement	Direct measurement of neutron flux	Direct measurement of neutron flux

Note 1: The environmental effect of an ATWS has not been defined for DAEC. It is anticipated that only the primary containment atmosphere will be affected, but no analysis has been performed to date. That analysis will be extremely complex and, therefore will not be completed before August of 1994. After the post-ATWS environment has been defined, the equipment which would be affected will be evaluated for qualification.

Note 2: All equipment in the Neutron Monitoring System (NMS) is located in a mild environment except those items which are inside primary containment. Upon completion of the analysis described above, the equipment located inside primary containment will be evaluated for function time in a post-ATWS environment.

Note 3: Engineering will review configuration of power range neutron monitoring instrumentation and indication to determine which modifications are necessary to ensure reliability. A key input to this review will be to determine the necessary degree of redundancy to meet this criteria. A careful review of DAEC design documents and operational use of the NMS under accident conditions will be necessary in order to establish the required degree of redundancy.

Note 4: The safety related portions of the NMS are powered by the Reactor Protection System (RPS) motor-generator (M-G) set. This power supply is not designed to be uninterruptible because the system is fail-safe (reactor scram on loss of power). The NMS also is fail-safe (initiate reactor scram) on loss of power. The Control Room front panel indications are

susceptible to a failure of a single power source (Uninterruptible AC). However, this indication is available in the Control Room back panel area.

Note 5: Engineering will review the NMS to assure that quality assurance requirements are in place consistent with Generic Letter 85-06, "Quality Assurance Guidance for ATWS Equipment that is not Safety Related."

Note 6: Engineering will review the NMS procedures to assure control of service, testing and calibration of NMS from sensors to displays, including recorders.