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WILLIAM D. HARRINGTON  
SENIOR VICE PRESIDENT  
NUCLEAR

June 13, 1985

BECO 85-107

Mr. Domenic B. Vassallo, Chief  
Operating Reactors Branch #2  
Division of Licensing  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D. C. 20555

License DPR-35  
Docket 50-293

Safety Parameter Display System (SPDS)

Dear Sir:

By letter of March 21, 1985, the NRC provided a Safety Evaluation (SE) for our proposed SPDS which was described in a Boston Edison Company (BECO) submittal of August 10, 1984. The March 21, 1985 submittal also requested further information on three areas contained in our August 10, 1984 submittal. In reviewing the SE, BECO identified a fourth item which we wish to clarify. The following narrative addresses the four items.

Item 1

The staff finds that the process variables selected for the Pilgrim SPDS would be acceptable with the addition of a Containment Radiation Monitor to identify the status of the Radioactivity Control Safety Function during periods when the containment is isolated. In addition, the staff requests the licensee to submit for confirmatory review identification of all specific radiation monitors used by the SPDS in monitoring the Radioactivity Control Safety Function.

Response

The addition of a Containment Radiation Monitor stems from Revision 3 of the EPG's. As you noted earlier in the SE, the variables we selected conform to the guidance of Revision 2, which was the official guidance at the time BECO began this effort.

We and our vendor, General Electric, are reviewing the possible incorporation of Revision 3 into the SPDS project along with the associated costs and justifications for not incorporating it. We will provide the results at the conclusion of the review.

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Since the incorporation of Revision 3 may require a change to the list of the radiation monitors used by the SPDS in monitoring the Radioactivity Control Safety Function, we will provide the list with the review results.

Item 2

We (NRC) noted that the RPV CONTROL display formats were very dense with information. We request that Boston Edison provide information which clearly demonstrates that use of these cluttered display formats will not result in operator errors or to redesign the display formats to eliminate the clutter.

Response

The display "clutter" in the RPV Control Display has been under discussion between NRC and GE. It is BECo's understanding that GE and NRC have reached agreement in generically resolving this issue by reducing the total number of letters in the system status information. BECo does not have the details of this modification, but will describe them as they relate to Pilgrim's SPDS when we respond to Item 1.

Item 3

Adequate information was not provided by the licensee for the staff to confirm that the SPDS will be suitably isolated from electrical and electronic interference with equipment and sensors that are used in safety systems.

Response

The GE ERIS data acquisition system uses fiber optics between IE hardware and non-IE hardware. The digital and analog modules which interface with IE plant systems have been qualified IE, and are physically isolated from other safety trains and non-IE signals per the requirements of the PNPS FSAR. These modules are connected to the non-IE portion of ERIS by fiber optics. Where non-fiber optics connections are required beyond the input modules, the multiplexers are qualified IE and fiber optics connect the multiplexers to the non-IE portion of ERIS. Pilgrim has the same data acquisition hardware as is used for GE ERIS. These features and qualifications were discussed by GE with the NRC during the audit of the Generic ERIS, and was found acceptable in the SER for the Generic ERIS.

For information, we provide a portion of the GESSAR II SPDS SER concerning electrical and electronic isolation:

The staff (NRC) audited the General Electric design for the adequacy of the isolators (fiber optics) between the safety systems and the SPDS. The fiber optics serve as the interface between Class IE inputs and the data multiplexer within the ERIS. The fiber optics cable used in the system varies in length from two the 5000 feet. This unique isolator possesses

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inherent characteristics that cannot be found in other isolators within nuclear power plants. For example, one of the tests that must be performed to qualify an isolator is the application of maximum credible fault (voltage, current) to the input of the device to verify that the fault does not propagate or degrade the input (Class 1E) side. This postulated failure does not affect fiber optic cable because optical fibers are totally dielectric (i.e., the electrical energy resulting from the fault will not propagate through the fiber). Another characteristic of the fiber optic cable is its non-susceptibility to the coupling of cross-talk and electromagnetic interference (EMI). Ground loop problems, inherent to copper cables, are also eliminated.

As part of the qualification program for the isolators, General Electric performed environmental (IEEE-323-1974) and seismic (IEEE-384-1975) qualification tests. Based on our audit of the above information, the staff concludes that the fiber optic cables are qualified isolation devices and are acceptable for interfacing the ERIS/SPDS with safety systems.

Item 4

In the reactor shutdown mode of operation, such as the performance of core alterations, a reactor scram occurs if the signals from the Source Range Monitor of the neutron flux exceed the high-high trip setpoint.

Response

We wish to correct this. Early in Pilgrim's history such a Source Range Monitor scram function existed during core alterations. It was determined that this did not contribute significantly to safety, and therefore was not needed. This feature was subsequently eliminated.

Very truly yours,

*J Edward Howard*  
For W D HARRINGTON

PMK/kmc