

October 31, 1985

Docket No. 50-414

Mr. H. B. Tucker, Vice President  
Nuclear Production Department  
Duke Power Company  
422 South Church Street  
Charlotte, North Carolina 28242

Dear Mr. Tucker:

Subject: Catawba Nuclear Station, Unit 2 - Request for Additional Information  
Concerning the Safety Parameter Display System (SPDS)

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On May 14 and 15, 1985, the NRC staff and its consultants conducted an audit of the Catawba Unit 2 SPDS. By letter dated September 10, 1985, we transmitted to you the report containing the SPDS audit results, and informed you that our review is continuing in the areas of Procedures and Systems Review and the Instrumentation and Control Systems. Presently, we have completed our review of those areas, and find that additional information, as identified in the enclosure, is requested by the staff to complete its review.

Please provide the additional information requested in the enclosure as soon as possible. Should you have questions regarding this matter, please contact the Project Manager, Kahtan Jabbour, at 301-492-9789.

The reporting and/or recordkeeping requirements contained in this letter affect fewer than ten respondents; therefore, OMB clearance is not required under P.L. 96-511.

Sincerely,

*Elinor G. Adensam*

Elinor G. Adensam, Chief  
Licensing Branch No. 4  
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Enclosure:  
As stated

cc: See next page

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REQUEST FOR ADDITIONAL INFORMATION  
CONCERNING THE CATAWBA UNIT 2  
SAFETY PARAMETER DISPLAY SYSTEM (SPDS)

PROCEDURES AND SYSTEMS REVIEW BRANCH

Parameter Selection

As a result of its review, the staff noted that the following variables are not proposed for the Catawba SPDS

1. Hot Leg Temperature
2. RHR Flow Rate
3. Stack Monitor
4. Steam Generator (or steamline) Radiation
5. Containment Isolation

Hot leg temperature is a key indicator used in the ERGs (Revision 1, "ES-0.1, Attachment A," "Generic Instrumentation," page 3) to determine the viability of natural circulation as a mode of heat removal. Reference 1 indicates "NC System temperature" as a proposed variable, but does not specify hot leg temperature.

During RHR and ECCS modes of cooling when steam generators are not available, RHR flow is a key indicator to monitor the viability of the heat removal system. Steamline (or steam generator) radiation, in conjunction with containment radiation and reactor stack radiation, gives a rapid assessment of radiation status for the most likely radioactive release paths to accomplish the "Radioactivity Control" safety function. For a rapid assessment of Radioactivity control, the applicant has not demonstrated how radiation in the secondary system (steam generators and steamlines) is monitored by SPDS when the steam generators and/or their steamlines are isolated. The analysis should be expanded to include this discussion.

Containment isolation is an important parameter for use in making a rapid assessment of "Containment Conditions." In particular, a determination that known process pathways through containment have been secured provides significant additional assurance of containment integrity.

The above variables do, for given scenarios, provide unique inputs to the determinations of status for their respective CSFs, which have not been discussed by the applicant as being satisfied by other variables in the proposed Catawba SPDS list. The applicant should address these variables and their functions by: (1) adding the variables to the Catawba SPDS, (2) providing alternate added variables along with justifications that these alternates accomplish the same safety functions for all scenarios, or (3) providing justification that variables currently on the Catawba SPDS do in fact accomplish the same safety functions for all scenarios.

#### Parameter Validation

In References 1-3, the applicant discusses its program for validation of the Catawba SPDS variables. In that discussion the applicant references validation programs for the Westinghouse Owners Group ERGs and Duke Power's Emergency Procedure Guidelines for Catawba. Also referenced is the task analysis performed by Duke Power's Control Room Design Review Team. Included is a description of a "control board mockup" walk-through of a scenario developed using plant emergency procedures and the Westinghouse ERGs. A detailed description of the event scenario was not provided. However, a more detailed presentation of Verification and Validation (V&V) program plans was presented at an audit review. As noted in the audit report (Reference 4), the V&V program is not complete, but will be completed after the Catawba simulator is installed in 1988.

Although this program may provide a proper framework for validation of the SPDS variable set, the staff recommends that future validation exercises (particularly those using the simulator) include a spectrum of events which would challenge both the near-term and long-term scenario monitoring capabilities of the SPDS. Such a spectrum of events might include: Large LOCA, Loss of Main Feedwater, Core Power Excursion, Steam Generator Tube Rupture with Loss of Offsite Power, Large Steamline Break, and one or more Severe Accident cases.

The applicant should respond to the staff's recommendation by providing a list of the transients/scenarios that will be used to validate the Catawba SPDS variable set.

#### HUMAN FACTORS ENGINEERING BRANCH

##### Scope of SPDS

In its SPDS safety analysis, the applicant defines the Catawba SPDS as the six Critical Safety Function (CSF) color blocks that are driven by logic that is based on Westinghouse Owners' Group decision trees which are part of the symptom-oriented emergency procedures.

The staff finds this position unacceptable on the basis that the six CSF color blocks alone do not give sufficient information to accurately determine plant safety status. The staff requires that the actual value of each of the SPDS parameters be readily available to the operator.

It appears that this information may already be available on the Operator Aid Computer, of which SPDS is a part.

The applicant should clarify/redefine its position regarding the scope of the SPDS.

#### REFERENCE

1. Letter from H.B. Tucker (DPC) to E. Adensam (NRC) dated March 28, 1984, forwarding Revision 4 to response to supplement 1 to NUREG-0737.
2. Letter from H.B. Tucker (DPC) to H. Denton (NRC) dated October 18, 1984.
3. Letter from H.B. Tucker (DPC) to H. Denton (NRC) dated January 23, 1985
4. Letter from E. Adensam (NRC) to H. B. Tucker (DPC) dated September 10, 1985