The Light company Houston Lighting & Power P.O. Box 1700 Houston, Texas 77001 (713) 228-9211

February 26, 1985
ST-HL-AE-1198
File Number: G3.8

Mr. Hugh L. Thompson, Jr., Director
Division of Licensing
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Thompson:

South Texas Project
Units 1 & 2
Docket Nos. STN 50-498, STN 50-499
Interim Response to NRC Generic Letter 83-28
"Required Actions Based on Generic Implications
of Salem ATWS Events"

Generic Letter 83-28, dated July 8, 1983, required that Houston Lighting & Power Company (HL&P) respond to numerous concerns regarding generic implications of the Salem ATWS events. HL&P's responses to several of the areas of concern are attached. The remainder of the responses are expected to be included in a report to be submitted in June, 1985.

If there are any questions, please contact Mr. Michael E. Powell at (713)993-1328.

Very truly yours,

J. G. Dewease
Vice President
Nuclear Plant Operations

PLW/ggs

Attachment

W2B/PLW/r

A003
1/1

cc:

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Washington, DC 20555

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter	§	
	§	
Houston Lighting & Power	§	Docket Nos. 50-498
Company, et al.,	§	50-499
	§	
South Texas Project	§	
Units 1 and 2	§	

AFFIDAVIT

J. G. Dewease being duly sworn, hereby deposes and says that he is Vice President, Nuclear Plant Operations, of Houston Lighting & Power Company; that he is duly authorized to sign and file with the Nuclear Regulatory Commission the attached response to NRC Generic Letter 83-28; is familiar with the content thereof; and that the matters set forth therein are true and correct to the best of his knowledge and belief.

J. G. Dewease

J. G. Dewease
Vice President
Nuclear Plant Operations

STATE OF TEXAS §
§
COUNTY OF HARRIS §

Subscribed and sworn to before me, a Notary Public in and for Harris County, Texas this 26th day of February, 1985.

Bunly Duncan

Notary Public in and for the
State of Texas

My commission expires:
March 3, 1985

W2/NRC1/1

South Texas Project
Units 1 & 2
Docket Nos. STN 50-498, STN 50-499
Interim Response to Generic Letter 83-28

1.2 Post-Trip Review - Data and Information Capability

Equipment supplied to the South Texas Project has the capability to record, recall, and display data and information to permit diagnoses of the causes of unscheduled reactor shutdowns prior to restart and for ascertaining the proper functioning of safety-related equipment. This capability is provided by the following three systems:

a) Proteus Computer System

b) Qualified Display Processing System (QDPS)

c) Emergency Response Facilities Data Acquisition and Display System (ERFDADS)

The Proteus Computer System is designed to provide supervision of the Reactor Control and Protection Systems, the NSSS process systems, and the secondary systems, with online data acquisition, alarming, logging, and data reduction.

The QDPS has the capability to monitor the status of selected critical plant variables using qualified safety grade instrumentation. These variables, selected per Regulatory Guide 1.97, are necessary for event diagnosis, performing immediate preplanned operator action, and taking the plant to a safe shutdown condition.

The ERFDADS monitors plant parameters required by NUREG-0696. The ERFDADS does not perform or support any safety-related function, but enhances the capability of the operator to mitigate the consequences of a plant incident.

1.2.1 Capability for Assessing Sequence of Events (on-off indications)

1.2.1.1 Equipment

The Proteus Computer System provides a Sequence of Events (SOE) recording function to monitor the exact sequence of operations to permit analysis of the event. This system is available to control room monitors and is capable of performing the following functions:

a) Scanning - The system has the capability to scan the following types of inputs:

   i) Contact inputs - Used for determining the status of "ON/OFF" devices such as operator switches, limit switches, pressure switches, etc.

   ii) Analog inputs - Used for converting continuously changing variables from devices such as strain gauges, RTD's, and milliamp transmitters to digital values for computer processing.

   iii) Process interrupts - Used for detecting the occurrence of a change in state of a device, such as a reactor trip signal.

b) Processing - The input signal processing capability of the system includes the following functions:

   i) Read the value of all analog inputs in a pre-established manner.

   ii) Check the reasonableness of the reading.

   iii) Convert the values into engineering units and store them at predetermined locations.

   iv) Maintain or update information words that describe the quality of each input.

   v) Check the range of calculated variables for alarm conditions.

c) Alarming - The system has the capability for several types of alarm indications, which include:

   i) High and/or low transducer range limits

   ii) High and/or low fixed operating limits

   iii) High and/or low variable operating limits

   iv) Deadbands on fixed operating limits

   v) Digital state alarm

   vi) Action limits

1.2.1.1 (Cont.)

d) Transforms - The system has the capability to perform time function calculations on analog variables. These transforms include:

i) Smoothed value

ii) Running average

iii) Time weighted over 10 minutes, 1 hour, or 1 day

iv) Sample time average over 1 minute

v) Integrated value over 1 day

vi) Maximum/minimum value over 1 hour or 1 day

Proteus processes up to 350 contract closure inputs. An event sequence is initiated when any of the inputs identified as a SOE trigger input changes state. The system immediately scans all SOE contacts and compares the new scanned values with old scanned values to determine which changes occurred at the time of the initial event. The first forty interrupts are guaranteed for sequence; interrupts due to contact bounce are not included. A dedicated printer is provided in the control room to print logs of the sequence of events.

1.2.1.2 Parameters Monitored

All inputs causing either turbine trip or reactor trip are monitored as SOE points in the Proteus Computer System.

1.2.1.3 Time Discrimination Between Events

The scanning resolution between two SOE events is four milliseconds.

1.2.1.4 Display Format

The system records the time of day that the sequence was triggered, point identification, and the status of the contact initiating the sequence. The point identification status of the contact and time relative to the start of the sequence is stored for all SOE inputs that change during the event, in order of their occurrence.

1.2.1.5 Data and Information Retention

The SOE data is stored for retrieval in a software buffer and printed out on the dedicated printer after 60 seconds or when the software buffer is full.

1.2.1.6 Power Source

The Proteus Computer System has a non-Class 1E uninterruptible power supply that provides power for 10 minutes following loss of offsite power.

1.2.2 Capability for Assessing the Time History of Analog Variables

The capability for determining the cause of an unscheduled shutdown is provided by the Proteus Computer System analog trend logs. Additional capability for monitoring trend history is provided in the ERFDADS.

1.2.2.1 Equipment

See Item 1.2.1.1.

1.2.2.2 Parameters Monitored

The Proteus Computer System has an automatic logging function that performs periodic collection of selected groups of process variables and subsequently prints out the collected data at predetermined times. The available logs can be categorized as follows:

a) Fixed Logs - Typically, data is collected every hour on the hour and printed out at midnight. These logs are designed to meet requirements for station performance evaluation.

b) Temporary Logs - These logs are constructed by the operator by means of operator console functions. Collection, printout intervals, and output devices are specified by the operator.

c) Trip Logs - Trip logs provide the capability of printing out the values of preselected groups of addressable variables collected over preselected time intervals immediately preceding and following an event such as a plant trip or an operator initiated trigger.

A trip log consists of up to 5 pages of points. Each page consists of one group of up to 13 points. Up to 40 values for each point in the log can be collected before printout. The system has provisions to provide up to four pre-trip logs and four post-trip logs.

The criteria for parameters selected and sampling rate will be provided in the June submittal.

1.2.2.3 Duration of Time History

Fifty analog inputs are measured once each ten seconds for the ten minute period immediately preceding and the ten minute period following a plant trip. This is accomplished by adding the new values to the top of the list and erasing the values older than ten minutes prior to the trip. Upon receipt of the predesignated signal, or on demand, a selected five to twenty minute portion of these 5000 values is printed on the digital trip sequence printer.

The initiation of the operation data log is from the required status of any one of the three contact closure inputs (turbine trip, reactor trip, and manual trip) or the required rate of change of any one of three analog inputs.

1.2.2.4 Format for Displaying Data

The format for displaying data, including range, resolution, and engineering units will be provided in the June submittal.

1.2.2.5 Capability for Retention of Data, Information, and Physical Evidence

The trip log is printed out on the digital trip sequence printer.

1.2.2.6 Power Source

The system is powered by a non-Class 1E power source that provides an uninterrupted power supply for 10 minutes following loss of offsite power.

1.2.3 Other Data and Information Provided

Additional data and redundant information (i.e., backup capability) is available via the QDPS and ERFDADS.

1.2.3.1 QDPS

The Plant Safety Monitoring System (PSMS), which is a part of the QDPS, performs the following functions:

i) Implements additional qualified channels to meet Regulatory Guide 1.97 requirements for category 1 and 2 variables.

ii) Isolates qualified signals to make them available to other non-qualified equipment such as recorders, indicators, or the ERFDADS.

iii) Provides consolidated, unambiguous, human-factored displays.

1.2.3.1 (Cont'd)

The capabilities of this system include: displaying monitored analog variables; alarming; analog trending for 30 minutes; and recording of selected variables.

The QDPS is redundant, and has on-line testability.

The QDPS is powered by Class 1E power sources and can function on an uninterrupted basis for two hours after a major power failure.

1.2.3.2 ERFDADS

The ERFDADS performs the following functions:

i) Provides continuous indication of plant parameters and derived variables representative of the safety status of the plant.

ii) Aids the operators in the detection of abnormal operating conditions.

iii) Assists in the identification of the causes leading to any abnormalities.

iv) Provides selectable trend displays on a real time basis.

v) Provides long term historical storage capability for variables monitored by QDPS computers.

The system is redundant and is powered by a non-Class 1E power source that provides an uninterrupted power supply for two hours following loss of offsite power.

1.2.4 Schedule for Planned Changes

No changes are currently planned.

2.1 Equipment Classification and Vendor Interface (Reactor Trip System Components)

(A response to the position on equipment classification of Reactor Trip System components will be provided in the June, 1985, report.)

The STP vendor interface program for Reactor Trip System components is conducted in the same manner as for all safety-related components. A summary report of the STP vendor interface program is provided under item 2.2.

2.2 Equipment Classification and Vendor Interface (Programs for All Safety-Related Components)

(A report describing the STP equipment classification program for safety-related components will be included in the June, 1985, submittal.)

INPO formed a Nuclear Utility Task Action Committee (NUTAC) to address the handling of vendor technical information. This program, Vendor Equipment Technical Information Program (VETIP), was submitted to the NRC staff for review in March 1984. HL&P intends to implement the recommendations in VETIP for the South Texas Project prior to scheduled fuel load. As a part of this program, HL&P intends to be an active participant in the NPRDS and SEE-IN programs established by INPO. Furthermore, HL&P fully supports the program enhancements recommended by VETIP.

Westinghouse, the NSSS supplier for STP, has a technical bulletin system in place. This system requires that HL&P acknowledge to Westinghouse that a bulletin has been received. The system also requires that, each year, Westinghouse distribute a list of all technical bulletins issued. This index enables HL&P to verify that all bulletins have been received.

In addition, HL&P is a participant in the Westinghouse Owners Group.

4.1 Reactor Trip System Reliability (Vendor-Related Modifications)

The reactor trip breakers used on the STPEGS are Westinghouse Model DS-416. HL&P has been informed by Westinghouse that a design discrepancy had been identified in the undervoltage attachment and that Westinghouse intended to replace the undervoltage attachments on DS-416 reactor trip switchgear. Field change notices have been issued by Westinghouse for installation and adjustment of the replacements. Completion of the work for STPEGS Unit 1 is expected to be completed by February 1986. A schedule for Unit 2 has not yet been issued, but the work will be completed before fuel load in that unit.

Subsequent to the Salem event, Westinghouse issued three Technical Bulletins affecting reactor trip switchgear and another related to potential undetectable failure on the solid state protection system (SSPS) actuation. The bulletins and their status are summarized below:

83-02, Rev. 1	DB-50 RTB Maintenance	Not applicable to STP.
83-03	DB and DS Circuit Shunt and Undervoltage Coils	Appended to PIP Vol. 9-1, Section 11, "Rod Control System"
84-01	Potential Undetectable Failure in SSPS	Field change notice for circuit modification to be issued by W
84-02	DS/DSL Breakers Potential Wire Damage	Appended to Reactor Trip Switchgear Instruction Book

In summary, all vendor-related modifications affecting reactor trip system reliability are being tracked and scheduled for implementation prior to fuel load.

4.3 Reactor Trip System Reliability (Automatic Actuation of Shunt Trip Attachment for Westinghouse and B&W Plants)

HL&P has accepted a proposal from Westinghouse to provide automatic reactor trip system actuation of the breaker shunt trip attachments. The automatic shunt trip modification is based on the generic design developed by Westinghouse under the sponsorship of the Westinghouse Owners Group. This generic design was submitted to the NRC on June 14, 1983. A Safety Evaluation Report was issued on August 10, 1983, which endorsed the proposed design. The modification provides for automatic actuation of the reactor trip breaker shunt trip mechanism on any signal which activates the undervoltage trip. Plant specific information regarding the modification will be provided with the June submittal.