

Jersey Central Power & Light Company  
New Jersey Power & Light Company

MADISON AVENUE AT PUNCH BOWL ROAD • MORRISTOWN, N. J. • Jefferson 9-6111

November 3, 1969

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Dr. Peter A. Morris  
Director  
Division of Reactor Licensing  
United States Atomic Energy Commission  
Washington, D. C. 20545

Dear Dr. Morris:

Re: Report of Abnormal Occurrence  
Oyster Creek Nuclear Generating Station - Unit No. 1  
September 9, 1969

SUBJECT

Turbine Initial Pressure Regulator (operating or electric pressure regulator) malfunction caused an unplanned reactor trip at the Oyster Creek Nuclear Generating Station of the Jersey Central Power & Light Company on September 9, 1969. Reference AEC Operating License DPR-16, Technical Specification, thereof, Section I - Definitions, Sub-Paragraph 1.15C, and Section 6.3 "Actions to be Taken in the Event of an Abnormal Occurrence in Plant Operation."

SITUATION

The start-up testing of the Oyster Creek reactor was in progress with the reactor in the "Start-Up Mode" at a power level of approximately 40 MWT and 970 psig. The reactor was steaming with steam being supplied to the steam jet air ejectors, the turbine gland seal system and being dumped to the condensers through the bypass valves. The electric pressure regulator was controlling the reactor pressure; the back up or mechanical pressure regulator was set at approximately 1020 psig and the turbine load limit was set at zero (preventing any control valve opening). The control room operator was in the process of adjusting the electric pressure regulator set point when the regulator signal went full scale and caused the bypass valves to go full open. The reactor began to depressurize. The operator then raised the set point to its maximum setting, but the regulator still called for full oper. The reactor scram occurred at 2:16 p.m. on September 9, 1969. The next operator action was the closing of the inside main steam isolation valves which caused an increase in reactor pressure and a decrease in reactor level. Approximately 10<sup>4</sup> seconds after the scram, the reactor low-low level trip occurred causing reactor isolation, containment isolation, core spray and containment spray preliminary actuation, emergency diesels to idle, recirculation pumps to trip, standby gas treatment system operation and isolation condenser operation. Reactor level began to increase at approximately 105 to 120 seconds due to

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### SITUATION (continued)

feedwater flow increase and at approximately 120 seconds due to isolation condenser valves opening. When water level returned to 12' 2" above the core (at approximately 180 seconds), the operator tripped the core spray pumps while reactor pressure was still around 600 psig.

### CAUSE AND RESULTS

Examination of station records disclosed the fact that due to depressurization, the indicated recirculation loop flows decreased to and passed through zero which brought the flow biased trip line down to the operating power level and caused the reactor to trip. The strong downscale output of the recirculation flow measuring circuits was apparently due to depressurization effects at the flow nozzles and to the fact that the instrument calibration at ambient conditions resulted in a negative flow input at operating temperatures.

The depressurization of the reactor vessel caused by the open bypass valves was terminated with the closure of the inside main stream isolation valves approximately ninety seconds after the bypass valves had been opened. After the reactor had been shut down, the electric pressure regulator was still calling for full bypass valve opening. While checking the circuitry, the signal cleared and it was not possible to determine the exact cause of the failure.

### CORRECTIVE ACTION TAKEN

The amplifier and its output circuitry that supplied the signal to open the bypass valves was removed from the electric regulator and returned to the manufacturer's shop for testing. As of this date, no official report of the test results has been received. The defective amplifier was replaced with identical equipment and has operated satisfactorily ever since. In addition, a power cutoff switch was installed on the main control panel at the location of the electric regulator controls so that if a similar situation should develop, the operator can cut off all power to the regulator and cause the valves to move in the close direction. With the electric regulator out of service in this manner, the mechanical or backup regulator will take over the reactor operating pressure control system. Operating personnel have also been instructed to be prepared to adjust feedwater flow due to the manual operation of the feedwater control during this light load period and to run two condensate pumps to insure adequate feed pump suction at all times.

### NUCLEAR SAFETY SIGNIFICANCE

Pressure regulator malfunctions have been analyzed and discussion of the effect of opening the bypass valves is presented in the FDSAR, Section VII-8-1 as revised 11/1/67 and Figure VII-8-1a as revised 12/19/67. As stated therein, blowdown from the hot standby condition leads to the most rapid depressurization rate. In the actual event, the depressurization rate was less than the previously analyzed case. (actual data superimposed on attached Figure VII-8-1a) There was a decrease in reactor water temperature of approximately 125° F in 5½ minutes for an average rate of 23° F per minute. All measured vessel metal temperatures

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NUCLEAR SAFETY SIGNIFICANCE (continued)

indicated a rate of change of less than  $100^{\circ}$  F/hour and all auxiliary systems activated by the low-low water level signal functioned properly.

CONCLUSION

In conclusion, the transient associated with this event was less severe than the previously analyzed event as presented in the FDSAR and all nuclear safety systems functioned properly.

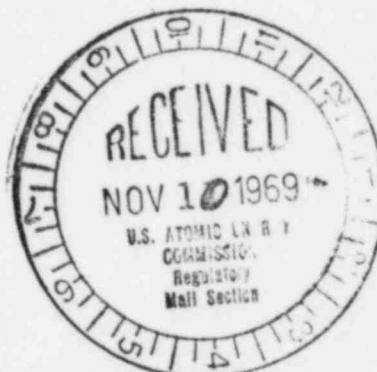
Very truly yours,

*George Kelcec*

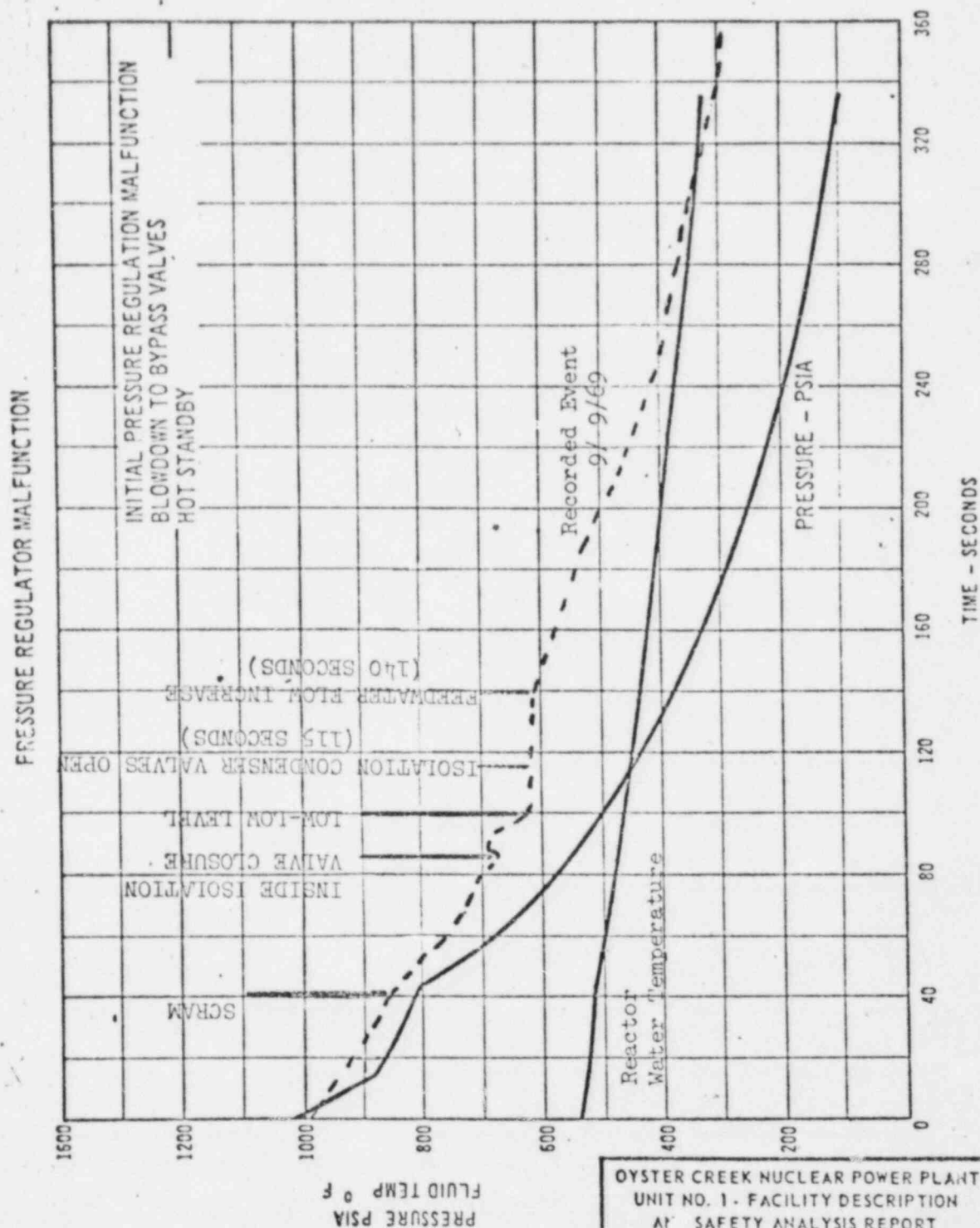
George Kelcec  
Manager of Generating Stations

CK/jc

cc: Mr. R. W. Kirkman  
Director  
Division of Compliance  
Region I  
US AEC  
970 Broad Street  
Newark, N. J. 07102



Added Event of 9/9/69  
Revised 12/19/67



OYSTER CREEK NUCLEAR POWER PLANT  
UNIT NO. 1 - FACILITY DESCRIPTION  
AT SAFETY ANALYSIS REPORT

Pressure Regulator Malfunction -  
1600 MWt - Sheet 1

FIGURE VII-8-1a