PDR

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ENGINEERING AND RESEARCH DEPARTMENT

July 30, 1979

Mr. Leo Beltracchi
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Leo,

As per our telephone conversation, I am submitting a very brief description of our system. When I return from vacation, I will be able to follow through in much more detail.

Sincerely yours,

John W. McElroy,
Research Engineer

JWM:sw

Enclosure

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RELIEF VALVE POSITION MONITORING
ACOUSTIC MONITORING SYSTEM

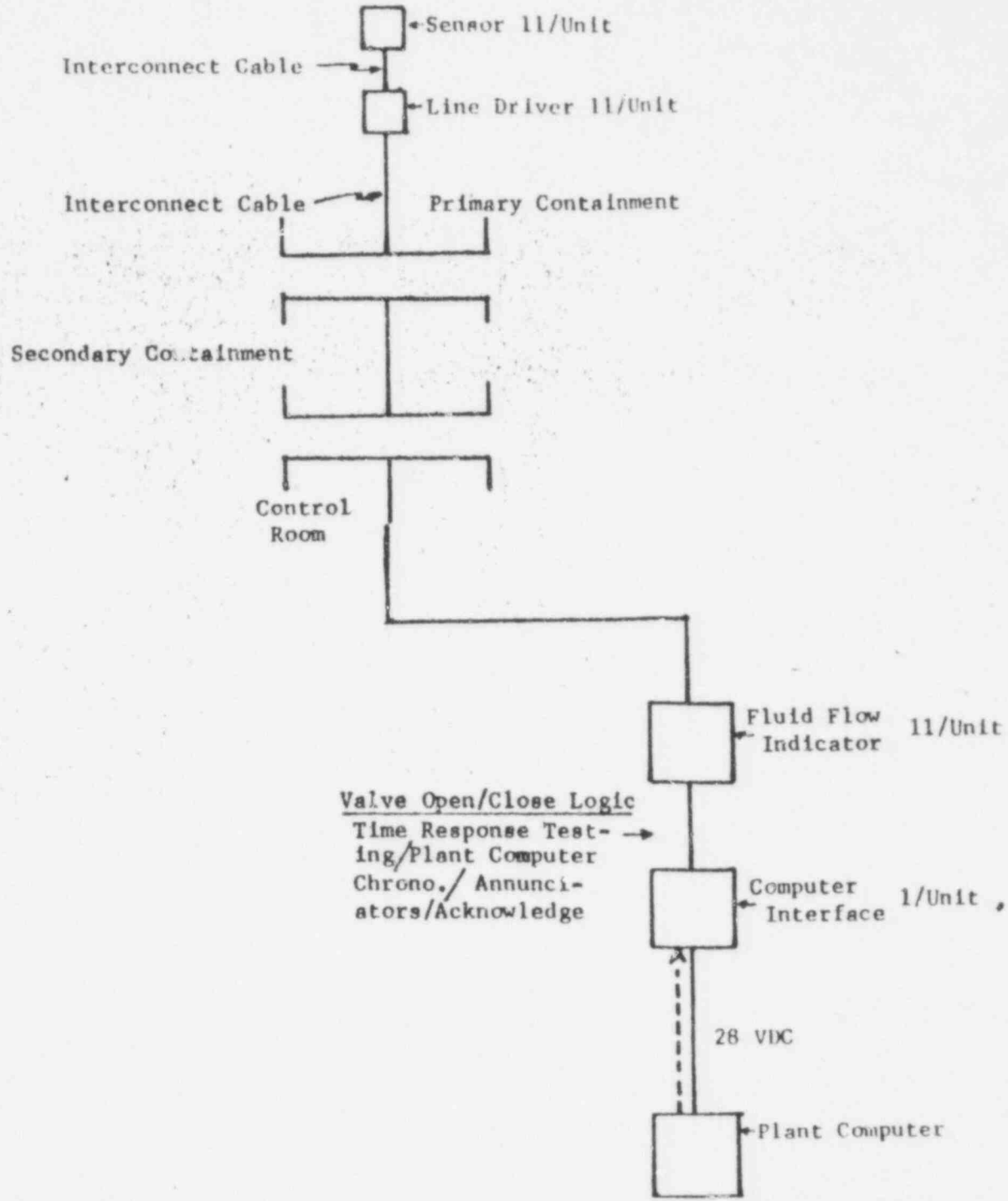
The following is a brief description of the acoustic monitoring system which for the past few years has been used to indication relief valve position at Peach Bottom Nuclear Power Station. Any further information should be requested through the co-ordinator of the acoustic program at Philadelphia Electric.

Through the application of a sensor, specifically one that can provide frequency response to 50 kHz, located on the discharge line of the relief valve and the appropriate electronics, see figure 1, the operator can have the capability of knowing the condition of each of the valves. An actuation would stimulate the sensor by a signal to noise ratio of at least 1000. This simulation results in the "valve open" light to energize and the "valve acknowledge" light to energize. The stimulation also energizes voltage input for the plant computer to chronologically record the opening. When the valve closes the "valve closed" light energized, the "valve open" light goes off and the "valve acknowledge" light stays on until the operator acknowledges the opening and reviews how many and when the opening (s) occurred on the plant computer. The system also provides a readout to insure that the valve has resealed properly.

The benefits of such a system has been itemized by the nuclear industry as follows (assuming the plant computer can accommodate these inputs).

1. Provides an immediate signal of valve operation to the plant operator.
2. Provides a record of the number of actuations and approximate set and reset pressure for each valve (reactor pressure).
3. Provides an accurate record of SRV sequencing during pressure transients on first as well as subsequent actuations on any given valve.

4. Provides the factual data base whereby containment fatigue loading calculations may use the actual number of SRV actuations rather than conservative design predictions for usage factor analyses. At one operating plant where instrumentation has been installed for three years, there has been a reduction in the 40 year projected usage factor of about 95%.
5. May permit the use of more realistic SRV blowdown valves (rather than conservative estimates) in transient analyses. This would permit the analysis to more accurately predict actual transient pressure response.


Sensor 11/Unit
Interconnect Cable
Line Driver 11/Unit
Interconnect Cable
Primary Containment
Secondary Containment
Control Room
Fluid Flow Indicator
11/Unit
Valve Open/Close Logic
Time Response Testing/Plant Computer Chrono./ Annunciators/Acknowledge
Computer Interface
1/Unit
28 VDC
Plant Computer