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SCHOOL OF ENGINEERING

DEPARTMENT OF NUCLEAR ENGINEERING
NUCLEAR REACTOR PROGRAM
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January 26, 1983

NRP-RGC-83-15

Mr. Caudle Julian
Nuclear Regulatory Commission
Region II
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303

Docket No. 50-297

Dear Mr. Julian:

By letter dated 21 April 1982, Subject: Report Nos. 50-297/82-01 and 50-111/82-02, we were informed of the results of the PULSTAR inspection that occurred on 15 - 19 March, 1982. In the supporting section entitled "Details", Section 13, Radiation Control (first paragraph), "... the inspector questioned whether a monthly radionuclide analysis should be performed to determine the major radioisotopes present and their concentration but a more detailed analysis could provide early warning of fuel clad deterioration, experimental failure, or other anomalies."

We have studied this question and have reached the following conclusions:

1. As the inspector stated in his report, the Reactor Health Physics Section is fulfilling our Technical Specifications requirements.
2. An early detection of a failure cannot be made by analysis at monthly intervals.
3. Early detection of a failure must be made by a detection system or systems operating concurrently with the reactor, or, by analytical techniques that are performed very frequently during reactor operation, or both.

Whenever the PULSTAR is operating, the following detection systems are functional:

1. N-16 Channel
2. Stack Gas Monitor (Required)
3. Particulate Monitor (Required)
4. Auxiliary Monitor (Back-up)
5. Filter GM Monitor (Back-up)
6. Area Monitor on the Primary System Demineralizer (not required)

The N-16 channel is a gamma sensitive ion chamber that surveys the primary water flow immediately after leaving the pool. Principally, this

channel is used for power level determination; however, it may yield the first indication of cladding failure, etc. (See Paragraph 4.1.5, Page 4-7, PULSTAR Operations Manual.)

Monitors Nos. 2, 3, 4 and 5, above, are in the air exhaust system from the reactor bay and, hence, would respond to any activity included in the exhaust air; such as Ar-41, and fission products.

The monitor on the Primary System Demineralizer detects the radioactivity collected on the ion exchange resins. Any radioactive isotope (gamma emitter) will be monitored at this point.

Any one or all of these monitors, which are functioning during reactor operation, would provide earlier warning of a fuel cladding deterioration, experiment failure, or other anomaly than would a detailed spectral analysis made once a month.

The above monitor systems are under the observation of the Reactor Operator who records each value in the Console Log approximately hourly.

If one or more of these monitor systems evidences an increased reading, this change is closely followed; should the increase continue, the Operator will notify the Reactor Operations Manager (or Designated Senior Operator) and the Reactor Health Physicist. An investigation of the cause of the increased monitor reading follows immediately. As a part of this investigation, as required, a detailed spectral analysis would be made of the suspected source(s) of the increased radiation. Appropriate actions would be taken to correct or to mitigate the cause.

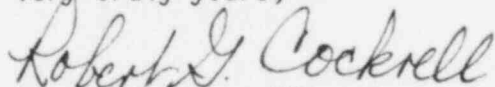
In view of the above, if the objective is the early detection of a potential hazard, then all functioning detection systems associated with the reactor need to be observed and the readings evaluated on a regular basis. This is accomplished and documented on PULSTAR. The operating personnel, including the Health Physics Section, are trained to spot, to report, and to investigate situations that appear to be abnormal. The results of the investigation determines the action(s) to be taken, which may vary from correcting the situation to a reactor shutdown.

Since the inspection in March, 1982, the reactor water, taken after a minimum of one hour operation, has been analyzed for radioisotopic content on a monthly basis. The analysis shall be continued.

Since we believe that our present procedure provides us with the capability of early detection of fuel clad failure that is more than adequate to meet technical specifications, we prefer to continue with established procedures and not implement a new procedure which may be interesting but is not likely to give us an earlier warning of fuel clad failure.

We respectfully request your concurrence with this position in the light of the information presented in this letter.

Very truly yours,



Robert G. Cockrell
Director, Nuclear Reactor Program

RGC:lpe

cc: Dr. Paul Turinsky
Mr. T. C. Bray
Mr. R. D. Cross