

Attachment to LER 80-029/01T-0

This report is separated into two parts; Part I provides a description of the system and Part II provides a chronology of events surrounding the violation of Technical Specification identified on July 16, 1980.

I. Pressure Boundary Leak Detection System (C-19)

The Reactor Pressure Boundary Leak Detection Monitor combines particulate monitoring, iodine monitoring, and gas monitoring into a single three channel series system. It is designed to measure and record Beta-plus-Gamma activity detectable in the particulate sample, radioactivity from iodine vapor present in the sample after filtration, and Beta-Gamma activity residual in the sample gas after particulate and iodine filtering.

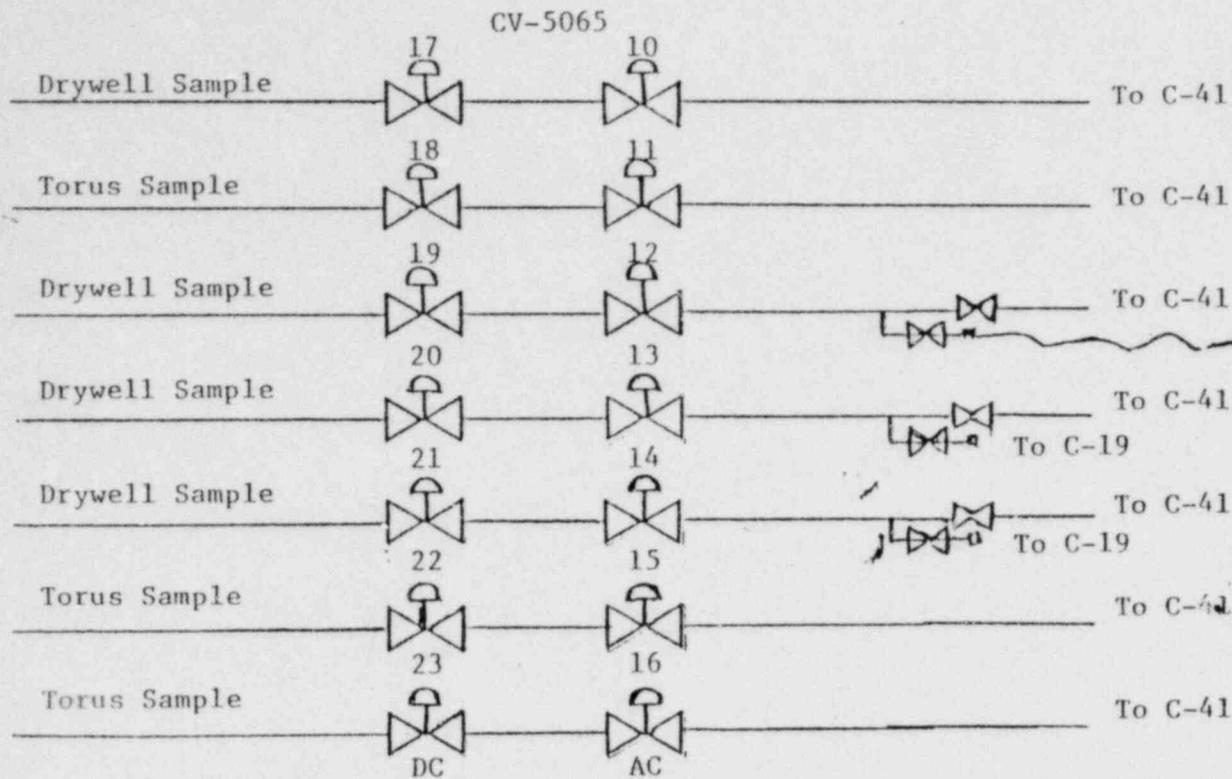
The particulate monitor detects, measures, records, and provides an alarm from the radioactivity collected from the sample on filter paper. The filter paper may be moved at a continuous rate, or stopped and used as a fixed filter.

The iodine monitor makes use of an activated charcoal cartridge for concentrating the iodine, with a spectrometer grade scintillation detector measuring the buildup of iodine activity.

After the particulate and iodine filters, the residual gas is passed through a heavily shielded one liter chamber where it is presented to a GM tube which measures both Beta and Gamma activity from the sample within the chamber. The detectors feed into a counting ratemeter and a three channel graphic recorder. Independent alarm signals are provided for each channel.

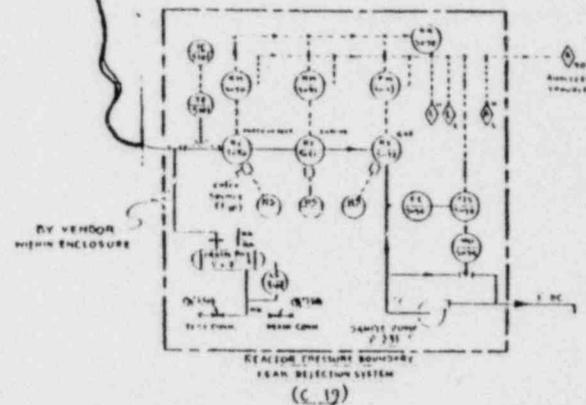
The C-19 portable cart assembly contains a top mounted amber lamp for low level alarm (indicating a level less than normal background and possible instrument malfunction), and a top mounted red lamp in conjunction with a bell for high radiation warning. The blower-regulator assembly is equipped with a small red light at the outlet end of the cart (near the magnehelic gage) which indicates low sample flow when continuously illuminated (possible clogged filter paper), and a small amber lamp in the same area which indicates high sample flow when continuously illuminated (possible rupture of the filter paper). Additionally, a common alarm on panel C-903 in the control room will alarm on High Radiation, Downscale Radiation Indication and Loss of Power. No control room alarm indicator monitors C-19 flow levels.

The sample flow to C-19 passes through one of seven sample lines which feed the O² Analyzer (C-41). The tap off this line is downstream of the solenoid operated control valves which are a part of the Primary Containment Isolation Logic. The seven sample lines to the O² Analyzer are shown on P&ID M-227, and the intertie to C-19 is illustrated on M-239 (see attached diagram for clarification).



NOTES:

1. Seven sample lines to C-41 (O² Analyzer)
2. All seven DC Solenoids controlled by one switch from Control Room Panel C-904.
3. All seven AC Solenoids controlled by one switch from Control Room Panel C-904.
4. Three Drywell Sample Lines with taps to C-19 from CV-5065-12, 13, and 14.
5. C-19 tied to line from CV-5065-12.
6. Torus sample valve 5065-23 was valve which failed timing.



II. Chronology of Events

July 1, 1980; 12:00 a.m. - 0800 a.m.

Surveillance testing was conducted to verify operability of O² Analyzer isolation valves. SV-5065-23 failed to meet the acceptance criteria for closing time. A Failure and Malfunction Report (F&M 80-80) and a Maintenance Request (MR 80-572) was issued to investigate and correct malfunction. The control switches on Panel C-904 were positioned to close all O² Analyzer Isolation Valves and cautioned tagged by the Watch Engineer. The Caution Tag noted that SV-5065-23 was INOP and that valves should remain closed except during daily sampling of Containment O² concentration per OPER-09.

July 1, 1980; 0800 a.m. - 1600 p.m.

Watch Engineer recognized fact that the 4th of July weekend was coming up and designated MR 80-572 as an 'A' priority requiring immediate repairs. He contacted the Chief Technical Engineer and requested wires lifted on solenoids for SV-5065-16 and 23. This allowed him to meet the requirements of Technical Specification 3.7.D.1 and 2 and continue operation of the O² analyzer in the normal manner. The wires were lifted, the O² analyzer returned to service and investigation begun.

Concurrent with the actions being taken for the O² Analyzer, it was discovered that the MYLAR window on C-19 was ruptured. Panel C-19 was removed from service and MR 80-570 issued to repair the instrument.

I&C's investigation determined the problem to be electrical in nature so the Watch Engineer contacted the Acting Chief Maintenance Engineer and requested electrical maintenance to investigate SV-5065-23.

At approximately 1500 p.m., the electrical engineer requested the wires be returned to normal on SV-5065-16 and 23 so that they could stroke the valves during their investigation. The wires were replaced and subsequent investigation revealed the position indication was misaligned. He informed the Watch Engineer of his findings and told him that repairs would be started in the morning (7-2-80).

It was at this point that the system broke down for the following three reasons. (1) The maintenance request to repair SV-5065-23 was down graded to a 'B' priority because of overtime involved and the fact that it was an indication problem only. (2) The power to SV-5065-16 and 23 was not removed to return these valves to the conditions established earlier in the day. Again the problem was indication not operability. (3) No one recognized impact on operability of C-19.

July 2 through 7, 1980

The repairs to SV-5065-23 were not initiated on July 2, 1980 as planned, However, there was not immediate need, since the established conditions satisfied the requirements for containment isolation.

During this period of time, the Operations Group opened the seven sample lines to the O² analyzer daily and obtained containment oxygen values as required by OPER-09. After approximately five minutes, the sample lines were again closed. There was no Technical Specification violation in functioning this way because SV-5065-23 operated properly, it just did not indicate that fact, and oxygen samples are only required twice a week.

It was also known that C-19 was INOP because there was a trouble annunciator on Panel C-903 in the Control Room. However, C-19 was INOP for repairs of its own and no one had yet related the effect of isolating the O² analyzer on C-19.

July 7, 1980; 0800 a.m. - 1600 p.m.

During the 0830 a.m. meeting, C-19 was discussed with regard to the MYLAR window problem and it was noted that if repairs were not completed by the end of the day, station shutdown would be required.

The repairs were completed, calibration and source checks were conducted and the system declared operable.

When C-19 was declared operable and returned to service (power turned on), the annunciator on Panel C-903 in the Control Room cleared. The operator at Panel C-19 observed that there were no malfunction alarms illuminated on the panel, there was flow, and the radiation monitors were indicating radiation. Subsequent investigation revealed that in leakage through a flange seal on the C-19 unit permitted a positive flow indication.

July 15, 1980; 1600PM - 2400PM

After drawing the weekly Iodine sample at C-19 and analyzing the results, it was noted that the results were significantly lower than normal (E-13 vice E-9). The Senior Chemical Engineer checked the valve line up and noted that C-19 was isolated because the valves to the O² Analyzer were all closed. The same lines feed both analyzers.

The Senior Chemical Engineer immediately went to the Control Room and questioned why the O² analyzer was isolated. It was at this time that it was realized that isolation of the O² analyzer on July 1, 1980 had also isolated C-19.

Discussion

Discussions with the Watch Engineer, who was on duty July 1st and the Senior Chemical Engineer, were conducted by the Methods, Compliance and Training Group Leader on July 15, 1980. These discussions plus observations by the Methods, Compliance and Training Group Leader identified the following conditions which contributed to this event.

1. Station personnel did not consider the isolation of the O² Analyzer System to effect any other system.
2. Repairs to SV-5065-23 were not completed as planned.
3. Failure of the MYLAR window at approximately the same time confused the issue since the C-19 panel was inoperable and clearly annunciated on Panel C-903 in the Control Room.
4. When Panel C-19 was repaired on 7-7-80 and returned to service, the failure annunciator cleared on Panel C-903 in the Control Room giving a false indication of operability.
5. The conditions for operability of Panel C-19 as stated on OPER 09 test #21 were verified to be acceptable daily as required.
6. Flow was indicated on the monitor at all times indicating in leakage into the system.

Corrective Actions

1. Caution tagged O² Analyzer valve control switches in Control Room to prohibit closing for other than testing purposes.
2. Review requirements for containment atmospheric sampling and practicality of current Technical Specifications.
3. Proposal of new atmospheric monitoring system completely separated from O² analyzer isolation scheme pending resolution of Item 2.
4. Installation of a Status Board in the Station Manager's office which will clearly identify all Technical Specification related systems which are inoperable or are having maintenance performed on them.