

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Ncs: 50-454; 50-455
Licenses No: NPF-37; NPF-66

Reports No: 50-454/97014(DRS); 50-455/97014(DRS)

Licensee: Commonwealth Edison Company

Facility: Byron Generating Station, Units 1 & 2

Location: 4450 North German Church Road
Byron, IL 61010

Dates: July 14-18, 1997

Inspector: D. Hart, Radiation Specialist

Approved by: G. L. Shear, Chief, Plant Support Branch 2
Division of Reactor Safety

EXECUTIVE SUMMARY

Byron Generating Station, Units 1 & 2
NRC Inspection Reports 50-454/97014; 50-455/97014

The inspection included a review of the effluent radiation monitoring system, the control room and auxiliary building filtered heating, ventilation, and air-conditioning systems (HVAC), and the radiological environmental monitoring program (REMP). Special emphasis was placed on operability, and material condition of these systems.

Plant Support

- There has been no discernable impact on the environment from plant operations. Specific aspects of the REMP program, including material condition of air sampling equipment, sample collection and contractor oversight were appropriately implemented. An apparent discrepancy between the actual and described locations of some of the thermoluminescent dosimeters (TLD) may have resulted in some environmental sectors not being monitored as required. The licensee's resolution of this discrepancy is being tracked as an unresolved item (Section R1.1).
- Quantification of gaseous and liquid discharges was completed in accordance with the appropriate procedures, and the inspector established that offsite doses were calculated using Off-site Dose Calculation Manual (ODCM) methodology (Section R1.2).
- Overall, the radiation monitoring system provided appropriate operability and reliability. The monitoring equipment was in good condition with the exception of the two steam jet air ejector monitors, which were experiencing recurring problems with the pump diaphragms due to ammonia in the system. These problems were being effectively resolved by the system engineer (Section R2.1).
- Inspections of the control room and auxiliary building HVAC systems identified no material condition issues. A review of recent in-place filter testing results did not identify any problems (Section R2.2).
- The site quality verification (SQV) audit was thorough and provided good recommendations. Discussions with SQV personnel indicated that most of the recommendations have been completed or are in process. A radiation protection self assessment showed that they are identifying similar issues to SQV (Section R7.1).

Report Details

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 Radiological Environmental Monitoring Program

a. Inspection Scope (84750)

The inspector reviewed the implementation of the Radiological Environmental Monitoring Program (REMP) based on requirements of the Off-site Dose Calculation Manual (ODCM). The inspector also observed air, water, and milk sample collection and examined air sampling equipment. The 1995 and 1996 Annual Radiological Environmental Operating Reports (AORs) were reviewed to ensure that the reports were submitted as required and to evaluate the effect of plant operations on the environment.

b. Observations and Findings

The material condition of the air sampling equipment was very good, and sampling was performed in accordance with procedures. Communications between the contract sample collector and the licensee were effective. The AORs for 1995 and 1996 presented the data in an organized manner and appropriate documentation for missed samples was included. The AOR data demonstrated that there was no discernable radiological impact on the environment due to plant operations.

However, the inspector identified a discrepancy between the actual location of some environmental thermoluminescent dosimeters (TLD) and their location as described in the ODCM and other implementing documents. Specifically, the discrepancies concerned those dosimeters located in the southwest and west-southwest sectors. A preliminary licensee review could not determine if these sectors were monitored as required. The licensee review identified that the problem had apparently existed since 1989 and that it had not been found during routine program audits. Commonwealth Edison corporate personnel were in the process of reviewing the REMP programs at all six nuclear facilities. As part of this review, the actual location of the REMP sampling stations including TLD's will be verified. Because the possibility exists that the above sectors may not have been monitored, this item will be tracked as an Unresolved Item (URI 50-454/455-97014-01).

c. Conclusions

There has been no discernable impact on the environment from plant operations. Specific aspects of the REMP program, including material condition of air sampling equipment, sample collection and contractor oversight were appropriately implemented. An apparent discrepancy between the actual and described locations of some of the TLD's may have resulted in some environmental sectors not being monitored as required. The licensee's resolution of this discrepancy is being tracked as an unresolved item.

R1.2 Gaseous and Liquid Effluents

The inspector reviewed the gaseous and liquid effluent release program, including recent release packages, the ODCM, the Annual Radiological Effluent Release Report for 1995 and 1996, and a walkdown of the radioactive waste (radwaste) systems. There were no significant changes in the liquid and gaseous effluent systems as described in the ODCM and the final safety analysis report .

Quantification of gaseous and liquid discharges were completed in accordance with the appropriate procedures, and the inspector determined that offsite doses were calculated using ODCM methodology. For 1996 the total liquid release activity was about 707 Curies (Ci) and the gaseous releases about 64 Ci. The liquids had remained approximately the same as in 1995 (677 Ci) whereas, the gaseous release activity had decreased from about 119 Ci. The decrease was due to efforts by the radwaste operators to hold the gas longer for more radioactive decay. Unit 1 has contributed over twice as much activity to the releases as unit 2, owing to continuing problems with the unit 1 steam generator tubes. Once the steam generators have been replaced (Nov 1997-Jan 1998) a decrease in the gaseous release activity was expected. The total releases for Byron station were below regulatory limits. There were no abnormal releases for 1996 or 1997, and the material condition of the system was good.

R2 **Status of RP&C Facilities and Equipment**

R2.1 Radiation Monitoring System

a. Inspection Scope (84750)

The inspector reviewed the station's radiation monitoring system, with an emphasis on operability and reliability of the radiation monitors. Alarm setpoint calculations, basis methodologies and applicable records were also reviewed. System engineering, instrument and control maintenance, chemistry, and radiation protection personnel were interviewed regarding the operation of the system.

b. Observations and Findings

During the system walkdown, the inspector observed overall good material condition and few work request tags on the effluent monitors. One exception, was the two steam jet air ejector monitors (1/2PRO27J) which were experiencing recurrent problems owing to ammonia in the system resulting in deterioration of the monitors' pump's rubber diaphragm. This problem was identified through the self assessment process and was being effectively addressed by the associated system engineer. In the interim, the chemistry staff had performed compensatory sampling as required.

The inspector reviewed the basis document referenced for the calculation of the alarm setpoints for the process radiation monitors. Radiation protection was in the process of revising the setpoint document, however the current version's format has been modified for easier reference. The calibration records for several monitors were reviewed and the inspector observed a calibration of OPRO33J, a control room outside air intake monitor. The workers were part of an instrumentation and

control team dedicated to radiation monitors, they were familiar with the procedures and equipment. No problems were identified.

c. Conclusions

Overall the gaseous and liquid radiation monitoring instrumentation was well maintained. Effective actions were being taken to resolve recurrent operability problems with the steam jet air ejector radiation monitors identified through licensee self-assessments.

R2.2 Control Room and Auxiliary Building Filtered Heating, Ventilation, and Air-Conditioning Systems (HVAC)

The inspector examined the control room and auxiliary building HVAC systems and reviewed recent in-place filter testing results for the HVAC systems. No problems were noted during the walkdown and the systems were found to be in good condition. The inspector observed the change out of one set of prefilters. The workers were knowledgeable about the job and no problems were identified. A review of recent in-place filter testing results indicated the testing was appropriately conducted and that the system was meeting the applicable performance requirements.

R7 Quality Assurance in RP&C Activities

R7.1 Radiation Monitoring, REMP, and Effluent Audits

The inspector reviewed the recent self assessment done by radiation protection and also the site quality verification (SQV) audit of radiation monitors. The two separate assessments had similar findings in the common areas evaluated. The SQV audit was thorough and provided good recommendations. Through discussions with SQV personnel it was indicated that most of the recommendations have been completed or are being completed.

The last REMP/Effluent audit examined other areas and was a shared resource audit. This audit did not identify the problem with the TLD locations (section R1.1). Over all this audit was not as thorough as more recent audits. The licensee agreed and had revised their procedures to include a more thorough review.

V. Management Meetings

X1 Exit Meeting Summary

On July 18, 1997, the inspector presented the inspection results to licensee management. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

P. Casarotto, System Engineer
R. Colglazier, NRC Coordinator
W. Grundmann, Chemistry Supervisor
K. Kofron, Station Manager
M. Marchionda, Technical Lead Health Physicist
D. Mead, Lead Chemist
D. Starke, Quality Chemist
D. Thompson, Technical Health Physicist

INSPECTION PROCEDURE USED

IP 84750: Radioactive Waste Treatment, and Effluent and Environmental Monitoring

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-454/455-97014-01	URI	Environmental TLD's are not in all meteorological sectors as stated in the ODCM
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LIST OF ACRONYMS USED

AOR	Annual Radiological Environmental Operating Report
HVAC	Heating, Ventilation, and Air-Conditioning
ODCM	Offsite Dose Calculation Manual
REMP	Radiological Environmental Monitoring Program
RP&C	Radiation Protection & Chemistry
SQV	Site Quality Verification
TLD	Thermoluminescent Dosimeter
URI	Unresolved Item

LIST OF DOCUMENTS REVIEWED

Teledyne Isotopes TIML-SPM-1 "Sampling Procedures Manual"

FSAR section 11.5 Process and Effluent Radiological Monitoring and Sampling Systems

FSAR section 9.4 Air Conditioning, Heating, Cooling, and Ventilation Systems

FSAR section 11.2 Liquid Waste Management Systems

Byron Action Items Description Report

Byron Procedure BRP 5820-14 (rev. 10) Process Radiation Monitoring System Alert/High Alarm Setpoints

BRP 6110-6 (rev. 3) Determination of Compliance With 10CFR20 Liquid Release Limits

BRP 6110-7 (rev. 1) Determination of Compliance With 10CFR20 Airborne Release Limits

Liquid Release Form For Release Tank OWX01T Release No. 70380

Gaseous Effluent Release Form Type: Waste Gas Decay Tank Release No. 70377

SQV Audit QAA 06-96-03

SQV Audit QAS 06-97-015

Annual Radiological Effluent Release Report 1996

Annual Radiological Effluent Release Report Addendum 1996

Annual Radiological Effluent Release Report 1995

Annual Radiological Environmental Operating Report 1996

Annual Radiological Environmental Operating Report 1995

Offsite Dose Calculation Manual

Chemistry Aid 97-27

Problem Identification Form B1997-02482

7/1/97

To: Joe Bauer

Subject: Self Assessment on Radiation Monitor LCOARs

Introduction

A self assessment of area and process radiation monitor LCOARs was initiated from PIR 454-201-96-1719. The self assessment began in March 1997 and was completed in June 1997. The mission of the assessment was to improve the process for tracking radiation monitor LCOARs and reduce the potential for human error. It was apparent that after several LERs and PIFs over the years, corrective actions had disguised the true requirements of the program. As a result, guidance on LCOAR handling has been put in multiple procedures, a department policy, and applicable BOSSs.

Rather than re-patching the program, I sponsored a multi-disciplined task force to try to create a 'perfect' LCOAR process. We met formally on 3/3/97 and 4/3/97. Several side bar meetings were conducted to address individual action items as needed. Represented in the task force were Radiation Protection management and bargaining unit, Chemistry management and bargaining unit, Instrument Maintenance management and bargaining unit, System Engineering, and Operating.

The brainstorming portion of the meeting was very successful. Everyone had at least one improvement suggestion, and it was evident that the process was cumbersome from several perspectives. We also tried to understand why the process existed as it did and question the expectations. The pertinent issues identified have been summarized below with corrective actions.

Findings and Corrective Actions

1. The RP/Chemistry split of radiation monitors and LCOAR responsibilities was reviewed. For example, why does Chemistry pull all liquid skids and sample the waste gas decay tank while RP samples all remaining process skids; can Chemistry review the isotopic against the action level and not route the package for review; and when Chemistry pulls the sample should they own the package?

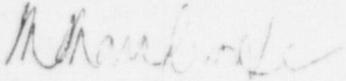
Several side bar meetings were held between RP and Chemistry and a variety of union representation. The focus of the action was to have consistent ownership relating to pulling samples and LCOAR review. Initially, the RPTs suggested turning over all radiation monitor sampling to Chemistry. The primary focus of this suggestion was to alleviate the RPTs from completing the sample tracking log and isotopic request form. Concerns about this new program have since abated and the process has been streamlined slightly by reducing expectations for routine samples and training fuel handling and rad waste to submit their own samples. Since Chemistry did not have the staff to increase their work load, the RPTs evaluated taking all radiation monitor samples for consistency. Concerns over the union agreement arose, but it appeared that all other stations except Braidwood handle radiation monitor sampling and LCOAR packages different than Byron. Essentially, it was determined that any change in ownership would require a significant amount of training (either for Chemistry or RP). As a compromise, RP and Chemistry agreed to perform an effectiveness review of LCOAR handling in one year. Although it seemed that the split of work was inconsistent, it had not contributed to any PIFs. NTS item 454-521-97-selfassess-01 will tack the completion of the effectiveness review.

2. Byron currently will allow continued operation as long as the LCOAR action doesn't specifically state to suspend all releases. Braidwood does not interpret the LCOAR the same. To compensate, they temporarily declare the skid operable to reinitialize the clock. We need to standardize this with Braidwood and Regulatory Assurance recommended a formal interpretation. David A. Thompson met with Travis Johnson at Braidwood and did not reach agreement on this issue. NTS item 454-521-97-selfassess-02 will track resolution of this item.
3. Byron and Braidwood revised ODCM to alleviate the requirement of the 1/27/001 LCOAR. Previously, the action was to isolate purges which would have resulted in plant shutdown due to containment pressure which wasn't consistent with other effluent path monitors. Now the LCOAR requires real time monitoring for up to 7 days. However, no standards have been established for this monitoring. Byron and Braidwood still need to resolve this issue. NTS item 454-521-97-selfassess-02 will track resolution of this item.
4. We evaluated the requirement for Operating to review and sign each sample on the LCOAR sample log sheet. The Operating review creates an additional step for RP in the routing and did not appear to add value from an RP perspective. The SRO on our team got feedback from his peers that the review and signature were not adding value to Operating and they preferred to only be notified of a discrepancy or out of spec sample. I completed procedure revision requests for all applicable LCOARs to eliminate the SRO sample review. There were 2 commitments in one of the LCOAR procedures from 1988 associated with both the RP and SRO review. After an LER due to a missed LCOAR sample, we committed to have the RP review performed at the same frequency as the sample. After the LER was submitted, another commitment was documented that both the RP and SRO review would be done on the sample frequency basis. I wrote a justification to Regulatory Assurance to eliminate the SRO review because it was not documented in the LER and all radiation monitors requiring LCOAR sampling are now in Admin Tech Requirements except the 1/2PR011 which will be maintained with an SRO sample notification of results.
5. The logbook LCOAR concept was not addressed in RP procedures. For Operating, they should be treated as notification of LCOAR and if not restored within a certain timeframe (typically their shift), the LCOAR package is initiated with the logbook entry time. Sampling should be established for a logbook LCOAR as with a routine LCOAR. This has been added to BRP 5820-12.
6. BRP 5820-4 solely addresses the 28 skid LCOAR sampling and alternative sampling options. This skid has had the most changes to its requirements and vaguely resembles the actual Admin Tech Requirement. BRP 5820-4 has been deleted and its criteria have been incorporated into BRP 5820-12. The revisions include an explanation of sampling strategy (e.g. when to use 28 vs 29) to meet OBCS 11.2.1.2-1 continuous monitoring documentation. It also defines when a LCOAR folder is needed and how to handle multiple channels in LCOAR. The sampling frequency was reduced from the department policy criteria for particulate and iodine channels to meet Admin Tech Requirements which is weekly. In addition, alternate sampling methods were added to the procedure as an attachment. Now all LCOAR guidance is in one procedure.

The RP Department policy calls for initial LCOAR sampling and samples every 8 hours at 0400/1200/2000. Randy Tucker helped me review all Admin Tech Requirements and Tech Specs against BRP 5820-12 and the department policy to reduce over-sampling. The following are a list of items that were addressed in the procedure revision:

- No monitors are required to have an initial sample except per the policy. The 28 skid will still have an initial sample to reduce overlap data in effluent calculations.
 - The procedure did not distinguish between Tech Spec monitors and those governed by Admin Tech Requirements.
 - The procedure did not clearly define how many channels each monitor had (e.g. particulate, iodine, gas) and the different actions based on channel or number of channels inoperable.
 - The LLD for the liquid samples was in error although it was conservative.
 - There was no allowance in the policy for using the required sample frequency or something longer than every 8 hours which is often beneficial in logbook LCOARs and in place of containment entry for the _PR011 skid.
 - The 28 skid was extremely over-sampled as stated above.
 - The picture in the procedure of the temporary sample skid was not reproduced well after copying. Arrangements have been made for the company photographer, but until a reproducible photo is obtained it was deleted.
8. A concern was raised about the ramifications of using an inoperable radiation monitor to obtain a sample. I consulted Regulatory Assurance, and they stated that as long as the reason for inoperability does not affect the sample results, the skid may be used. I added this to BRP 5820-12.
 9. Operating requested that RP notify the Center Desk NSO when starting and finishing all filter changes instead of the Shift Supervisor. The procedure has been revised and this was discussed at a department tailgate.
 10. It was recognized that the control room rad monitors are the only ones that have a filter changeout checklist. The RPTs indicated that they found it valuable and did not want it deleted. If the new procedure revision does not appear to alleviate the concerns with the vent stack monitors, they might benefit from a checklist also. This will be evaluated in the effectiveness review.
 11. The IM's believed that a lot of radiation monitors were alarming due to dirty filters as a result of infrequent changeout. The frequency of changeouts was reduced a few years ago after a thorough review of work history. The IM's provided a list of monitors affected by infrequent changeout and BRP 6020-2T2 was revised accordingly. Approximately 20 rad monitor filter changeouts were increased from monthly to bimonthly.
 12. The RPLS had concerns about receiving the LCOAR package from Operating. The Shift Supervisor cannot leave the control room to deliver the package to obtain the RPLS signature and sometimes, the RPLS is too busy to retrieve the package. The Admin RPLS has defined his expectation that RP will go to the control room to sign the package, and if the RPLS is not available, the RPLS will team with the Shift Supervisor to obtain a runner from Operating or RP. Regardless, the RPLS will prioritize meeting LCOAR requirements even if the signature is delayed to obtain a runner.
 13. The IM's stated that gaskets have been found missing on 1/2PR027 and 0PR002. The gasket SI's have been added to BRP 5820-8 and a TRR was written to train the techs on replacement.
 14. RP evaluated putting LCOAR packages on the LAN to eliminate hand carrying a folder of paperwork. However, based on the acceptance of CAPSYS, it was determined that this was not viable.

15. The IM's were concerned that RP does not know when radiation monitors are on the work control schedule and cannot support filter changeouts. After investigation, it was identified that surveillances are difficult to track on EWCS and do not issue an RWP request which would trigger review of RP impact. However, Barry Barton is sensitive to the radiation monitor calibrations as they show up on the daily schedule and will put critical rad monitor work on the RPLS work schedule. A problem is that the IM's reschedule surveillances frequently because they have a long work window. The IM's have agreed to try to notify us one day in advance to schedule support for filter changeouts.
16. SED tracks total time radiation monitors are in LCOAR. Sometimes packages are held open to test during release which adds to the LCOAR time. SED needs Operating to be aware of the priority to close paperwork. The Shift Supervisor stressed this at his peer tailgate.



Marri Marchionda