

April 6, 2000

Mr. R. P. Powers
Senior Vice President
Nuclear Generation Group
American Electric Power Company
500 Circle Drive
Buchanan, MI 49107-1395

SUBJECT: NRC RADIATION PROTECTION AND CHEMISTRY INSPECTION REPORT
50-315/2000006(DRS); 50-316/2000006(DRS)

Dear Mr. Powers:

On March 10, 2000, the NRC completed an inspection of the chemistry program at your D. C. Cook, Units 1 and 2 reactor facilities. The results of this inspection were discussed on that date with Mr. J. Pollock and other members of your staff. The enclosed report summarizes the results of that inspection. One non-cited violation of NRC requirements was identified.

The inspection was an examination of activities conducted under your license as they relate to chemistry and radiation safety, to compliance with the Commission's rules and regulations, and with the conditions of your license. The inspection consisted of a review of organization and staffing of the chemistry program, the water chemistry control program, quality assurance activities, chemistry technician performance and training, and testing of engineered safety feature ventilation and filtration systems. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations of activities, and discussions with personnel.

We concluded that the water chemistry program was well implemented. Laboratory quality control was effective, ensuring that laboratory instrumentation operated within statistical control limits. We also found that the chemistry program had a strong self assessment capability, and that much effort had been expended to identify and correct program deficiencies. The chemistry technician continuing training program was well structured and contained modules for restart activities. The engineered safety feature filtration systems were properly maintained and tested.

Based on the results of this inspection, the NRC has determined that one violation of NRC requirements occurred concerning the failure to sample primary system coolant as required by Technical Specifications. This violation is being treated as a Non-Cited Violation (NCV), consistent with Section VII.B.1 of the NRC Enforcement Policy. The NCV is described in the subject inspection report. If you contest the violation or the severity level of this NCV, you

should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, Region III, and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

In accordance with 10 CFR 2.790 of the NRC'S "Rules of Practice," a copy of this letter, its enclosure, and your response if you choose to respond, will be placed in the NRC Public Electronic Reading Room (PERR) link at the NRC home page, namely <http://www.nrc.gov/NRC/ADAMS/index.html>.

We will gladly discuss any question you have concerning this inspection

Sincerely,

/RA/

John A. Grobe, Director
Division of Reactor Safety

Docket Nos. 50-315; 50-316
License Nos. DPR-58; DPR-74

Enclosure: Inspection Report 50-315/2000006(DRS);
50-316/2000006(DRS)

cc w/encl: A. C. Bakken III, Site Vice President
J. Pollock, Plant Manager
M. Rencheck, Vice President, Nuclear Engineering
R. Whale, Michigan Public Service Commission
Michigan Department of Environmental Quality
Emergency Management Division
MI Department of State Police
D. Lochbaum, Union of Concerned Scientists

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: 50-315; 50-316
License Nos: DPR-58; DPR-74

Report No: 50-315/2000006(DRS); 50-316/2000006(DRS)

Licensee: American Electric Power Company

Facility: Donald C. Cook Nuclear Generating Plant

Location: 1 Cook Place
Bridgman, MI 49106

Dates: March 6-10, 2000

Inspector: J. House, Senior Radiation Specialist

Approved by: Wayne Slawinski, Acting Chief, Plant Support Branch
Division of Reactor Safety

EXECUTIVE SUMMARY

D. C. Cook, Units 1 and 2
NRC Inspection Report 50-315/2000006(DRS); 50-316/2000006(DRS)

This routine inspection of the radiation protection and chemistry program included a review of the organization and staffing of the chemistry group, the water chemistry control program, chemistry quality control and testing of the engineered safety feature (ESF) filtration system for control room habitability. The inspection also reviewed chemistry self-assessment capabilities and chemistry technician continuing training.

- The primary and secondary water chemistry program had been reviewed in depth by the chemistry staff and vendor consultants, and several program enhancements are planned as a result. These enhancements together with the existing program should provide long term operating conditions that will minimize corrosion in the primary and secondary systems (Section R1.1).
- The licensee tested the engineered safety feature (ESF) ventilation filtration systems as required. Test results indicated that system performance was within specifications (Section R1.2).
- The station's continuing training program for chemistry personnel was effective in providing technicians with necessary skills and knowledge. The program was well structured, containing refresher material relevant to program restart and included training for new equipment. The training laboratory was very well equipped (Section R5.1).
- Chemistry management was technically strong and experienced. The chemistry organization appeared to be large enough and technically qualified to support the restart (Section R6.1).
- The laboratory instrument quality control (QC) program was effectively implemented and analytical instruments generally operated within statistical control limits. The licensee had established and staffed a QC chemist position in order to better manage laboratory QC. The licensee's QC program was capable of performing accurate chemical/radio-chemical measurements (Section R7.1).
- Assessments of the chemistry program were of sufficient scope and depth to identify deficiencies, and included areas where corrective actions had been warranted in the past. Findings were adequately documented and corrective actions were in progress or had been completed (Section R7.2).
- Reactor coolant system (RCS) chemistry had not been analyzed for fluorides and chlorides while the unit was defueled, as required by Technical Specification (T/S) 3.4.7. This resulted in a non-cited violation (Section R8.3).

Report Details

IV. Plant Support

R1 Radiological Protection and Chemistry Controls

R1.1 Water Chemistry Control Program

a. Inspection Scope (84750)

The inspector reviewed the licensee's water chemistry control program for the control and mitigation of chemical contaminants in the primary and secondary water systems. This included a review of licensee assessments of the water quality program, changes and enhancements to the program, improved secondary side sampling capability, upgraded in-line instrumentation, and discussions with cognizant individuals.

b. Observations and Findings

The licensee performed an extensive review of the station's primary and secondary water chemistry programs which was documented in:

“Programmatic Readiness Review Presentation for the Primary Water Chemistry Program,” October 1, 1999.

“Programmatic Readiness Review Presentation for the Secondary Water Chemistry Program,” October 1, 1999.

This review resulted from a self-assessment of the station's primary and secondary chemistry programs which was initiated in July 1999, as part of a programmatic review for compliance with Nuclear Energy Institute (NEI) document 97-06. NEI-97-06 included a commitment to follow the intent of the Electric Power Research Institute (EPRI) Guidelines. These guidelines were the basis for the licensee's review. Although NEI 97-06 commits the licensee to the latest versions of the EPRI pressurized water reactor guidelines, the licensee has had a long-standing commitment to follow the EPRI guidelines. This commitment, which was common in the industry, was never a formal regulatory requirement.

The licensee brought in vendor consultants with experience in nuclear plant water chemistry and the EPRI Guidelines, to determine how the station's chemistry program matched the requirements of the Guidelines. All of the requirements and recommendations contained within the text of the Guidelines were used in the current program assessment, and not just the key parameters and their limits as has been the normal industry practice in the past. Items noted for improvement or change were documented and were being tracked in condition reports (CRs). These items will provide enhancements to the existing program and should enable the licensee to achieve their goal of creating an industry-leading Primary and Secondary Water Chemistry Program. The improvement process is ongoing and will continue after the Unit 2 startup.

The licensee had upgraded sampling systems and in-line instrumentation as part of the chemistry program enhancement. New secondary system sampling panels had been installed, along with new in-line instrumentation for real time analysis of steam generator blow-down.

The inspector reviewed the boron concentration of the spent fuel pool (SFP) for parts of 1999 and 2000. This was a Technical Specification (T/S) requirement. The SFP boron levels met the T/S limit of 2400 parts per million (ppm).

c. Conclusions

The primary and secondary water chemistry program had been reviewed in depth by the chemistry staff and vendor consultants, and several program enhancements were planned as a result. These enhancements together with the existing program should provide long term operating conditions that will minimize corrosion in the primary and secondary systems.

R1.2 Engineered Safety Feature (ESF) Ventilation Filtration Testing

a. Inspection Scope (84750)

The inspector reviewed the licensee's testing of the ESF ventilation systems, including the results of high efficiency particulate air (HEPA) and charcoal filter testing.

b. Observations and Findings

The inspector noted that the licensee tested the ESF ventilation system's HEPA and charcoal filters in accordance with the requirements of the following procedures:

12 EHP 4030 STP.229, "Control Room Emergency Ventilation Test," Revision 3, October 9, 1997

12 EHP 4030 STP.228, "Engineered Safety Features Exhaust Unit Surveillance Tests," Revision 0, January 23, 1995

12 EHP 4030 STP.230, "Spent Fuel Storage Pool Exhaust Ventilation Tests," Revision 0, November 4, 1998

The inspector reviewed the most recent test results for the control room emergency ventilation systems, filter operability, and charcoal adsorption tests. The tests were performed in accordance with the applicable procedures. The results were within the required limits and were obtained using proper industry standards.

c. Conclusions

The licensee tested ESF ventilation filtration systems as required. Test results indicated that system performance was within specifications.

R5 Staff Training and Qualification in Radiological Protection and Chemistry

R5.1 Training of Chemistry Personnel

a. Inspection Scope (84750)

The inspector interviewed chemistry training personnel, reviewed the program description and discussed the restart chemistry program with chemistry and training personnel. This was done to assess the adequacy of the licensee's chemistry training program and the ability of the chemistry technicians to perform tasks during and after start up that had not been routinely performed due to the extended shut down.

b. Observations and Findings

Chemistry technician training was described in TPD.600.CHM, "Chemistry Technician Training Program Description," Revision 0, June 24, 1999, and consisted of initial and continuing phases. The chemistry department head was the program owner, and the program was governed by the Chemistry Training Program Review Committee and the Curriculum Development Committee. The chemistry organization had a major role in the training function. The licensee's restart training program was reviewed because the plant had been shut-down for a significant period of time and chemistry technicians had not performed a number of tasks that were required during operation. In addition, during the extended shut down, new sampling panels and in-line monitoring equipment had been obtained. The shift work familiarization training for restart was part of the continuing training schedule and included:

- Review of industry events
- Review of on-line instrumentation and procedures
- Cation column alignment
- Batching condensate chemical feed
- Batching feed water chemical feed
- Auxiliary building instrumentation review
- Reactor coolant system hydrogen and total gas sampling
- Primary chemical additions
- Corrosion product monitoring
- Inductively coupled plasma methods for corrosion products
- Counting room calculations/instrumentation
- Review mode 1-5 schedule
- Steam generator sample panel

Discussions with chemistry and training personnel indicated that the restart training program had been designed to provide the needed refresher for chemistry technicians in those areas, such as sampling and chemical additions, that had not been exercised during the extended shut down. Continuing training for the post accident sampling system and recently acquired in-line monitoring equipment for steam generator blow down analyses was scheduled during the current year.

The inspector toured the training facility's chemistry laboratory which was equipped with state of the art instrumentation. Major equipment included an inductively coupled plasma spectrophotometer, a mass spectrometer, and ion chromatography equipment. The licensee has placed an emphasis on acquiring equipment for monitoring corrosion products. This is part of the overall program to monitor water quality and provide an optimal operating environment for the steam generators.

c. Conclusions

The station's continuing training program for chemistry personnel was effective in providing technicians with necessary skills and knowledge. The program was well structured, containing refresher material relevant to program restart and included training for new equipment. The training laboratory was very well equipped.

R6. RP&C Organization and Administration

a. Inspection Scope (84750)

The inspector reviewed the chemistry organization and staffing plan and recent changes made to the chemistry organization.

b. Observations and Findings

The Rad-Chem Environmental Department contains the chemistry, radiation protection and environmental groups. The Chemistry, Radiation Protection, and Environmental Superintendents along with the Senior Staff Chemist reported to the Rad-Chem Environmental Manager who reported directly to the plant manager. The organization chart indicated that approximately 19 chemistry technicians (15 were senior technicians) were divided into three groups, with each group reporting to a supervisor. In addition a support group, consisting of chemistry specialists including QC and unit specialists, reported to a fourth supervisor. The four supervisors reported to the Chemistry Superintendent. Chemistry management was technically strong and had extensive experience which included work at other utilities.

c. Conclusions

Chemistry management was technically strong and experienced. The chemistry organization appeared to be large enough and technically qualified to support the restart.

R7 Quality Assurance in Radiological Protection and Chemistry Activities

R7.1 Laboratory and Instrument Quality Control Programs

a. Inspection Scope (84750)

The inspector reviewed the laboratory quality control (QC) programs for analytical and radio-chemistry instrumentation, including the inter-laboratory and intra-laboratory

comparison programs. The review included procedures, program descriptions, quality control records and discussions with cognizant chemistry personnel.

b. Observations and Findings

The chemistry QC program was managed by an industry experienced quality control chemist, who had been recently hired to provide oversight and expertise to the program. The QC program was described in procedure THI-6020.ADM.001 "Quality Control", Revision 0, January 31, 2000. This document provided definitions for QC parameters and processes, management responsibilities and program responsibilities. Areas covered by the QC procedure included:

- Control chart preparation
- Statistical use of control chart data
- Inter-laboratory comparison program
- Intra-laboratory comparison program
- Instrument calibration

Independent controls (standards of known concentration) were used to monitor the daily performance of chemistry analytical instrumentation, and this data was recorded on control charts. The inspector reviewed selected QC data for portions of 1999 and 2000 and concluded that the procedural requirements had been met, and that the laboratory analytical instruments were operating under statistical control.

The inter-laboratory cross check program was implemented as required by procedure. The vendor supplied program was performed quarterly. Each set of unknowns normally contained two primary system species and two secondary system species, each in the appropriate matrix. Results from the program for the past two years were mixed, with most of the comparisons being in agreement with the vendor data. However, some of the comparisons were inconsistent with vendor data (disagreements) and had not improved over several quarters. The investigation into the discrepancies was on-going. This will have no significant impact on chemistry support during restart.

One of the improvements instituted by the QC chemist was to resume the analytical intra-laboratory cross check program which evaluates the analytical performance of all of the chemistry technicians. The laboratory had utilized this program in the past but had discontinued it several years ago. The licensee planned to provide the chemistry technicians with different unknowns on a quarterly basis, such that during the year the technicians would be tested on all of the analyses performed in the laboratory. This program had just been restarted for the first quarter of 2000.

The radio-chemistry program was well managed and staffed by persons with strong radio-chemical skills. A review of radio-chemistry data, including instrument control charts and the vendor supplied inter-laboratory cross check program results, indicated that gamma spectroscopy and liquid scintillation instrumentation were properly calibrated and operating under statistical control.

c. Conclusions

The laboratory instrument quality control program was effectively implemented. Analytical instruments generally operated within statistical control limits. The licensee had established and staffed a QC chemist position in order to better manage laboratory QC. There were several disagreements in the inter-laboratory comparison program, however, the QC chemist was investigating these. The licensee's QC program was capable of performing accurate chemical and radio-chemical measurements.

R7.2 Quality Assurance Program Implementation

a. Inspection Scope (84750)

The inspector reviewed internal assessments of the chemistry organization to evaluate whether the chemistry program had effectively identified and resolved problems. Specifically, this included seven assessments conducted over the past 12 months which focused on chemistry management, operations and technician performance.

b. Observations and Findings

The chemistry organization's internal assessments addressed specific areas, were thorough and probing, and of sufficient depth to identify deficiencies. The following assessments were reviewed by the inspector:

Functional Area Assessment Report for Chemistry, RST-1999-001-CHM
November 3, 1999

Chemistry Condition Report Initiation Threshold Self Assessment, SA-1999-
CHM-002, November 22-30, 1999

Chemistry Procedure Quality and Error Potential Assessment, SA-2000-CHM-
008, February 2-29, 2000

Chemistry Leadership Plan, Revision 8, February 8, 2000

Leadership Plan Action Changes and Closure Self-Assessment, October 12-15,
1999

Laboratory Quality Control, Assessment Number 99-06, February 26-March 11,
1999

Organization and Administration, Assessment Number CHM 99-04,
February 10-11, 1999

Areas reviewed were chemistry management and laboratory performance including quality control, procedures and the condition reporting system. Findings were documented in the assessments and also in condition reports. Document reviews and discussions with licensee representatives indicated that the assessment findings were being addressed. The inspector confirmed during a review of the laboratory quality

control program that weaknesses identified during these assessments had been addressed, as was evidenced by the resumption of the intra-laboratory comparison program.

c. Conclusions

Assessments of the chemistry program were of sufficient scope and depth to identify deficiencies, and included areas where corrective actions had been warranted in the past. Findings were adequately documented and corrective actions were in progress or had been completed.

R8 Miscellaneous RP&C Issues

- R8.1 (Closed) VIO 50-315/98006-04; 50-316/98006-04: Failure to follow Procedure No. 12 THP 6010 RPP.120, Revision 0, "Issue and Control of Dosimetry." On November 6, 1997, two workers entered the Unit 2 regenerative heat exchanger room, an extreme high radiation area (EHRA), with their electronic dosimeters (EDs) in the off mode. The workers identified that their EDs were not on after having been in the room for about seven minutes. Both workers notified the coverage radiation protection technician (RPT) and left the radiologically controlled area (RCA).

The inspector reviewed the closure package which included Condition Report 97-3153, and Procedure RP-L-9806, "ALNOR Electronic Dosimeter and Dosimeter Reader Lab," Revision 0, September 14, 1998. Based on enhanced training for RP personnel in ED use, this item is closed.

- R8.2 (Closed) VIO 50-315/98006-06; 50-316/98006-06: Failure to follow Procedure No. PMP 6010 RPP.006, Revision 7, "Radiation Work Permit Program," On February 12, 1998, while observing work being performed in the lower ice condenser the inspectors identified several workers who were not wearing two sets of gloves as required by radiation work permit (RWP) No. 981040. Additionally, the ice crew workers stated to the inspectors that this practice had been occurring for two to three weeks. The inspectors were concerned that radiation protection (RP) had failed to identify this during their walk downs of the area. The workers were removing staples from a netting material and indicated that the nature and detail of the work made wearing two sets of gloves impractical. The inspectors discussed this with RP management who stated that workers having problems performing their job while following RWP dress requirements were expected to discuss the issue with RP management so that the requirement could be re-evaluated. The job was stopped and the workers supervisor was counseled.

The inspector reviewed the closure package which included Condition Report 98-4573. Based on the licensee's evaluation of the conditions surrounding the events, enhanced training and supervision for workers, this item is closed.

- R8.3 (Closed) LER 50-315/99-004-01: On February 16, 1999, chemistry personnel determined that Unit 2 reactor coolant system (RCS) chemistry had not been analyzed for fluorides and chlorides while the unit was defueled, as required by Technical Specification (TS) requirement 3.4.7. The analyses required "at all times", were not

performed from October 30 to November 23, 1997. Unit 2 has remained in Mode 5 or 6 since that time. Additional investigation by the licensee identified a total of ten periods, for both units since 1989, when the chemistry analysis had not been performed.

Technical Specification 3.4.7 states, in part, that the reactor coolant system chemistry shall be maintained within the limits specified in Table 3.4.1 at all times and Table 4.4-3 requires chloride and fluoride be analyzed 3 times per 7 days with the maximum time between analyses being 72 hours. However, as described above, RCS chemistry had not been analyzed as required.

This failure to sample primary coolant was a violation of Technical Specification 3.4.7. This Severity Level IV violation is being treated as a Non-Cited Violation (NCV), consistent with Section VII. B. 1 of the NRC Enforcement Policy (NCV 50-315/2000006-01(DRS); (NCV 50-316/2000006-01(DRS)).

This sampling failure was licensee identified, documented in Condition Report 99-2928 and was subject to a root cause analysis. Based on the results of the root cause analysis and the corrective actions, this item is closed.

IV. Management Meetings

X1 Exit Meeting Summary

The inspector presented the inspection results to members of licensee management at the conclusion of the inspection on March 10, 2000. The licensee acknowledged the findings presented. The licensee did not identify any information discussed as being proprietary.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

A. Fucsko, Quality Control Chemist
R. Godley, Director, Regulatory Affairs
D. Kozin, General Support Supervisor
W. Kropp, Director, Performance Assurance
D. Naughton, System Engineer
T. O'Leary, RadChem Environmental Manager
J. Piazza, Chemistry Superintendent
J. Pollock, Plant Manager
T. Summers, Chemistry Supervisor

INSPECTION PROCEDURES USED

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

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-315/316-2000006-01	NCV	Failure to sample primary coolant
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Closed

50-315/316-98006-04	VIO	Failure to turn on Electronic Dosemeter
50-315/316-98006-06	VIO	Failure to follow RWP dress requirement
50-315-99-004-01	LER/NCV	Failure to sample primary coolant

Discussed

None

LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
CR	Condition Report
CRC	Curriculum Review Committee
CVCS	Chemical Volume Control System
ED	Electronic Dosimeter
EHRA	Extreme High Radiation Area
EPRI	Electric Power Research Institute
ESF	Engineered Safety Features
HEPA	High Efficiency Particulate Air
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
ppm	Parts per Million
QC	Quality Control
RCA	Radiologically Controlled Area
RCS	Reactor Coolant System
RP	Radiation Protection
RPT	Radiation Protection Technician
RWP	Radiation Work Permit
SFP	Spent Fuel Pool
SG	Steam Generator
TS	Technical Specifications

PARTIAL LIST OF DOCUMENTS REVIEWED

Procedures

12-THP-6020.CHM.110, Revision 4, RCS Chemistry-Shutdown/Refueling, January 28, 2000
12-THP-6020.CHM.202, Revision 6, Condensate and Feed Water, April 3, 1998
12-THP-6020.CHM.201, Revision 12, Steam Generator Chemistry Specifications, February 19, 2000
THI-6020.ADM.001, Revision 3, Quality Control, January 31, 2000
12-THP-6020.CHM.101, Revision 8, Reactor Coolant, February 10, 1998
12- EHP- 4030. STP.229, Revision 3, Control Room Emergency Ventilation Test, October 9, 1997
12-EHP 4030 STP.228, Revision 0, Engineered Safety Features Exhaust Unit Surveillance Tests, January 25, 1995
12-EHP 4030 STP.230, Revision 0, Spent Fuel Storage Pool Exhaust Ventilation Tests, November 4, 1998
TPD.600.CHM, Revision 0, Chemistry Technician Training Program Description, June 24, 1999

Assessments

Functional Area Assessment Report for Chemistry, RST-1999-001-CHM, November 3, 1999
Chemistry Condition Report Initiation Threshold Self-Assessment, SA-1999-CHM-002, November 22-30, 1999
Chemistry Procedure Quality and Error Potential Assessment, SA-2000-CHM-008, February 2-29, 2000
Chemistry Leadership Plan, Revision 8, February 8, 2000
Leadership Plan Action Changes and Closure Self-Assessment, October 12-15, 1999
Laboratory Quality Control, Assessment Number 99-06, February 26-March 11, 1999
Organization and Administration, Assessment Number CHM 99-04, February 10-11, 1999

Condition Reports

Condition Report 98-4573
Condition Report 99-2928

Miscellaneous

Programmatic Readiness Review Presentation for the Primary Water Chemistry Program, October 1, 1999
Programmatic Readiness Review Presentation for the Secondary Water Chemistry Program, October 1, 1999
Licensee Event Report 50-315-99-004-01; Failure to sample primary coolant
Closure Package: Violation 50-315/316-98006-04; Failure to Turn on Electronic Dosimeter
Closure Package: Violation 50-315/316-98006-06; Failure to follow RWP Dress Requirement