U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-331
License No:	DPR-49
Report No:	50-331/97013(DRS)
Licensee:	IES Utilities Inc.
Facility:	Duane Arnold Energy Center
Location:	IES Utilities Inc. 200 First Street SE P.O. Box 351 Cedar Rapids, IA 52406-0351
Dates:	August 11 - 15, 1997
Inspector:	Kara N. Selburg, Radiation Specialist
Approved by:	Gary L. Shear, Chief, Plant Support 2 Division of Reactor Safety

EXECUTIVE SUMMARY

Duane Arnold Energy Center, Unit 1
NRC Inspection Report 50-331/97013

This inspection included a review of the radiation protection and chemistry programs. Specifically, the inspector reviewed the radiation protection and chemistry instrumentation programs, the internal dosimetry program, and the post accident sampling system (PASS).

- The licensee was effectively implementing the internal dosimetry program (Sections R1.1, R1.2, R1.3).

- The health physics department created several ALARA initiatives which increased the overall radiological protection and safety of radiation workers (Section R1.4).

- The licensee was adequately maintaining hand-held radiation detection and chemistry instrumentation in accordance with procedures (Section R2.1).

- The licensee's response to a 10 CFR Part 21 notification on an electrometer with a potentially faulty component was good (Section R2.2).

- The licensee effectively addressed and corrected an increasing trend in the number of personnel entering the controlled area without the appropriate dosimetry (Section R4.1).

- A technician performing a routine surveillance on the PASS system appeared knowledgeable of the system's performance (Section R5.1).

- Numerous improvements implemented regarding communications between the maintenance department and radiation protection department personnel effectively corrected a violation regarding the failure of mechanical maintenance personnel to comply with health physics instructions (Section R8.2).

Report Details

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 Internal Dosimetry Program

a. Inspection Scope (IP 83750)

The inspector reviewed the licensee's internal dosimetry program. The inspector interviewed numerous personnel, and reviewed the following documents which evaluated the need for internal dose monitoring at the facility:

- "Passive Internal Monitoring Program at the DAEC Revised," NG-93-1691, dated April 21, 1993;
- "Prospective Evaluation of the Need for Internal Monitoring at the DAEC Revised," NG-93-1692, dated April 21, 1993; and
- "Periodic Evaluation on the Need for Internal Monitoring at the Duane Arnold Energy Center," Calculation No. 96-005A, NG-96-1358, dated June 18, 1996.

b. Observations and Findings

The Eberline PCM-1B whole body counters were installed at the Health Physics Access Control point and were used as a contamination check for personnel exiting the power block. NNC Model Gamma-10 portal monitors were installed at the security egress point and at the Health Physics Control point, and were used to detect either the diversion of special nuclear material or gross contamination levels. The licensee performed an evaluation in 1993 to determine if these instruments could be effectively used to monitor workers for internally deposited radioactivity.

The licensee performed a prospective evaluation (NG-93-1692) which determined that personnel at the facility did not need to be monitored for an internal dose based on the criteria specified in 10 CFR 20.1204. The evaluation determined that workers in every classification at the facility were not likely to receive, in one year, an intake in excess of 10 percent of the Annual Limit on Intake (ALI). Therefore, the facility discontinued routine in-vivo bioassays (ie. whole body counts). This determination was based on an evaluation of past internal exposures, an evaluation of the maximum likely internal exposure, and a comparison of maximum permissible concentrations versus derived air concentrations (DAC).

The licensee subsequently performed a periodic perspective evaluation in 1996 (NG-96-1358) to verify that the original determination not to monitor was accurate. The methodology used in the 1996 evaluation was based on a DAC-hour evaluation of the air sample data, an assessment of internal committed effective dose equivalent

determinations, and a 10 CFR Part 61 Radioactive Waste Chain evaluation. This evaluation again concluded the following: workers would not have received 10 percent of an ALI based on DAC-hour estimate for the highest exposed worker; internal evaluations performed on workers with suspected intakes confirmed that passive whole body monitoring alarms were low enough to ensure that intakes with the potential of exceeding 10 percent of an ALI were properly addressed; and the 10 CFR Part 61 sample results indicated that no substantial change in the radionuclide mix had occurred since the original prospective evaluation. Therefore, the licensee determined that monitoring was still not required.

While no monitoring was required to meet the applicable regulations, the licensee used the portal monitors and whole body counters as part of the passive surveillance program. Each radiation worker was procedurally required to use a whole body counter upon exiting the power block, and a portal monitor when exiting the radiologically restricted area. The licensee performed tests of the Gamma-10 portal monitors and the PCM-1B whole body counters, and determined that the detection of 1 percent of an ALI was possible. These tests were performed using a phantom and placing cobalt-60 (Co-60) contaminated organs in the phantom's lung or gastrointestinal track compartments. The isotope of Co-60 was used since it was present, in high relative abundance, in every air sample and contamination surveys at the facility, and because a portion of its gamma component would penetrate the body compartments and interact with the detector. The source size for testing was determined by normalizing the percent abundance of isotopes in 10 CFR Part 61 samples, based on ALI, and by using NUREG 4884 to determine the fraction remaining in various body regions after an intake. When testing the PCM-1Bs, the phantom was placed into position, and a count cycle was started. The monitor was deemed to have detected the intake if at least one alarm was received during the cycle (alarm setpoint was 5000 disintegrations per minute). When testing the Gamma-10 Portal Monitor, the phantom was held at arms length and "walked through" the monitor. The alarm setpoint was at any value in excess of the minimum detectable activity, which during the test was 32 nanocuries.

c. Conclusions

The inspector noted that the licensee had effectively implemented the internal dosimetry program. Radiation workers were adequately protected from airborne radioactive contaminants as indicated by DAC-hour evaluations and the radiological survey program such that formal internal monitoring was not required. Radiation workers were effectively monitored for internal deposition via the passive whole body counting program with the PCM-1B alarm setpoints set to indicate intakes of 1 to 2 percent of an ALI. Administrative procedures were established to classify and take appropriate action on potential intakes of radioactive material at levels below 10 percent of an ALI. Once detected, workers who had an indication of an intake were evaluated via formal whole body counting techniques to determine the extent of the intake, and when necessary, were assigned a committed effective dose equivalent.

R1.2 Calibration and Maintenance of Internal Dosimetry Equipment and Internal Dose Assessments

a. Inspection Scope (IP 83750)

The inspector reviewed the licensee's calibration and maintenance programs for the PCM-1Bs located at the controlled area exit, the Gamma-10 monitors located at the controlled area exit and at the security area exit, and the Canberra whole body counters. The inspector also reviewed select evaluations which determined the assigned committed effective dose equivalent for individuals who had received intakes of radioactive material.

b. Observations and Findings

The inspector reviewed select calibration records for the PCM-1Bs, Gamma-10s, and Canberra whole body counters and determined that the calibrations were conducted within the procedurally required frequency. Additionally, the inspector noted that source checks of the monitors were completed on a daily basis. The inspector also reviewed several dose assessments based on intakes in 1996. To determine the retention mode (inhalation versus ingestion) the licensee conducted a series of whole body counts with a Canberra Fastscan Whole Body Counter. The licensee then projected the intake using a vendor supplied software package (ABACOS PLUS) and performed dose assessments using ICRP 30 calculation methodology. The whole body count activity results were separated into a Summed Geometry, Upper Detector, and Lower Detector retention data for each nuclide identified and compared to the theoretical retention values in NUREG 4884. The retention modes and the assigned internal doses were reasonable.

c. Conclusions

The inspector noted that the licensee effectively maintained internal dosimetry equipment, and that individuals who had received intakes of radioactive material were accurately assigned a committed effective dose equivalent.

R1.3 Minimization of Whole Body Counting Alarms Due to Radon Decay Products

a. Inspection Scope (IP 83750)

The inspector interviewed numerous personnel, and reviewed the following document regarding the elimination of spurious alarms on the PCM-1B portal monitor:

- "Establishment of the PCM-1B Sum Channel Sigma Factor to Eliminate Distributed Alarms Resulting from Radon Daughter [Decay] Product Contaminants," No. 96-011-H, dated October 14, 1996.

b. Observations and Findings

The licensee had been receiving numerous PCM-1B distributed contamination alarms caused by personal clothing which had been impregnated with radon decay products. The alarms primarily occurred during the spring and the fall during temperature inversions. The PCM-1Bs would alarm via the sum channel alarm function upon detection of the radon decay products, indicating that these decay products were low levels of distributed contamination. The contamination levels at which the sum channel would alarm were less than the detection capability of the individual or zoned detectors. The licensee's evaluation (number 96-011-H) determined a sum channel sigma factor which would be high enough to avoid the nuisance alarms due to radon decay products, but be low enough to detect distributed contamination. The establishment of the PCM-1B as a passive whole body counter was based on multiple and single alarms, not distributed alarms. Therefore, changing the sum channel sigma factor had no impact on using the PCM-1Bs as passive internal monitors. The licensee implemented this evaluation, and determined that the nuisance alarms had been decreased.

c. Conclusions

The inspector noted that the licensee had effectively reduced the number of spurious whole body counter alarms caused by radon decay products without reducing the ability of the monitors to indicate potential intakes of radioactive material.

R1.4 Radiation Protection Initiatives

a. Inspection Scope (IP 83750)

The inspector interviewed numerous personnel within the radiation protection department to review recent ALARA initiatives. The inspector performed inspections of the reactor building instrument and control's instrument racks, and reviewed selected radiation work permits and radiological survey maps.

b Observations and Findings

The inspector reviewed recent initiatives established in the radiation protection department. One of these initiatives involved the reduction of the number of contaminated areas located around instrument and control's instrument racks. These areas had been historically contaminated at the facility. Since the contaminated areas around the racks were physically small, work performed in these areas was often cumbersome. The health physics staff, with the assistance of decontamination personnel, systematically performed detailed surveys of these racks, and determined which valves were potentially seeping, thus causing the spread of contamination. After these valves were identified, instrument and control's personnel tightened the packing nuts on these valves, and the decontamination department personnel decontaminated the racks under the guidance of health physics. The licensee had successfully released three instrument racks including the 1C52 (second floor of the reactor building), 1C121A (reactor building north), and 1C121B (reactor building south). The licensee planned to

continue with decontamination efforts on the other instrument racks, and planned to maintain the cleaned racks through routine surveys and decontamination following any work performed on the racks.

The health physics department was also working on integrating occupational safety concerns into some radiation work permits. An example of this was Radiation Work Permit 61, job step 1 which provided guidance to maintenance workers who were performing activities around moving equipment. This procedure specified that gloves worn for contamination control purposes should not be taped to the worker's protective clothing (to ensure that if the glove was caught in moving equipment, the glove would be removed prior to the worker being injured). These additions to the radiation work permits were clear and ensured overall worker safety without reducing the radiological protection.

c. Conclusions

The health physics department was creating several ALARA initiatives which increased the overall radiation protection and safety of radiation workers.

R2 Status of RP&C Facilities and Equipment

R2.1 Instrumentation

a. Inspection Scope (IP 83750, IP 84750)

The inspector reviewed the RP&C instrumentation programs. This included a review of calibration and maintenance records for hand held radiation detection instruments and chemistry equipment. The inspector also reviewed the calibration methodologies used in the metrology lab for the calibration of the hand held radiation detection equipment.

b. Observations and Findings

The inspector reviewed calibration results of both radiation detection instruments and chemistry instrumentation. The instruments were calibrated within the scheduled calibration frequency. Additionally, for the radiation detection instruments, health physics technicians had established a computer data base which indicated instrument location and calibration due dates. Most radiation detection instruments were calibrated by the metrology laboratory at the facility. The inspector observed several instrument calibrations and noted that the metrologist was cognizant of procedural requirements, and was knowledgeable of the calibration process. The metrology laboratory maintained an instrument maintenance history folder which recorded any problems encountered with specific instruments. The inspector noted that the metrologists referred to this folder after performing the calibrations to ensure that previous problems were not recurring Neutron detection equipment was sent off-site for a vendor calibration. The inspector reviewed documents describing these calibrations, and noted no problems.

Source control for both chemistry and radiation protection equipment was maintained by the radiation protection department. The inspector reviewed the licensee's computer data base of all nonexempt sources stored at the facility, and reviewed this data against the original records of receipt. The inspector noted that there was good control over the sources.

Chemistry instrumentation was primarily maintained by the chemistry department, with most calibrations and maintenance completed by the technician staff. The equipment was maintained as required by procedures.

c. Conclusions

The inspector concluded that the licensee was adequately maintaining hand-held radiation detection equipment and chemistry instrumentation in accordance with procedures.

R2.2 Victoreen Model 530

a. Inspection Scope (IP 83750)

In April 1997, Victoreen (vendor) filed a 10 CFR Part 21 report on a problem with the Victoreen Model 530 Electrometer/Dosemeter. The problem identified with some of these electrometers involved the potential for a component failure which, under very specific circumstances, may have caused the electrometer to calculate radiation exposures or rates incorrectly. The inspector reviewed the licensee's action to determine if this component failure affected the instrument performance at the facility.

b. Observations and Findings

In response to the 10 CFR Part 21 notification, the radiation protection and metrology department personnel returned the electrometer to the vendor to have the machine analyzed. Upon receipt of the electrometer, the vendor replaced the potentially faulty component. However, the vendor did not perform an as found analysis to determine if the component had in fact been at fault. The sole use of the electrometer at the facility, during the calibration cycle in question, was the initial on-site certification of the J. L. Shepard calibrator. After the acceptable repair of the electrometer, the licensee used the unit to recertify and verify the J. L. Shepard calibrator. The recertification and verification of the J. L. Shepard calibrator (performed on August 6, 1997) substantiated and validated the acceptable integrity of the unit since its initial certification on April 15, 1996. The recertification and verification process found the calibrator to be within the published specifications with the largest magnitude of error at -3.32 percent at 20 millirem per hour. The inspector reviewed the licensee's documentation from the vendor (including calibration results), reviewed the J. L. Shepard recertification and verification results, and agreed with the licensee's determination that the initial calibration was adequate.

c. Conclusions

The licensee's response to a 10 CFR Part 21 notification on an electrometer with a potentially faulty component was good. No instrumentation at the facility was adversely affected by the potentially faulty electrometer.

R4 Staff Knowledge and Performance in RP&C

R4.1 Failure to Wear Electronic Dosimeters

a. Inspection Scope (IP 83750)

The inspector interviewed radiation protection personnel regarding the recent increase in the number of recorded personnel entering the controlled area (power block) without wearing the appropriate dosimetry. The inspector reviewed event descriptions, and the associated dose assessments for these occurrences. The inspector also reviewed the following procedure:

- Administrative Control Procedure (ACP) 1411.18, revision 7, "Personnel Dosimetry."

b. Observations and Findings

From March 6, 1997, through August 7, 1997, there were fifteen recorded incidents in which individuals entered the controlled area without wearing their electronic dosimeters (EDs). These events appeared isolated, and the inspector did not identify a person specific or department specific trend. The inspector reviewed the licensee's dose assessments for the individual's who failed to wear the EDs, and noted that each individual received no dose. The licensee identified several innovative corrective actions to this self-identified issue, including:

- Memorandums were issued stressing the importance of wearing EDs;
- Signs were posted at the controlled area to remind personnel to wear dosimetry;
- Motion activated recording was placed at the controlled area entrance which asked personnel if they had their ED; and
- Personnel actions were issued against individuals who failed to wear their ED which included the requirement to spend fours hours of the following shift at the entrance to the controlled area verbally reminding personnel to wear their EDs.

Since the frequency and number of these incidents had decreased since the corrective actions have been in place, it appeared that the corrective actions were effective. Additionally, since these events were examples of one problem, and no similar problems had been identified within at least the last two years, this problem was not considered repetitive. However, the failure to wear the ED prior to entering the power block is

contrary to ACP 1411.18. Failure to comply with this procedure is a violation of technical specification 6.9.1 which requires that procedures for personnel radiation protection be prepared consistent with 10 CFR Part 20 and shall be approved, maintained, and adhered to for all operations involving personnel radiation exposure. However, this licensee-identified, non-repetitive and corrected violation is being treated as a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Policy (NCV 50-331/97013-01).

c. Conclusions

The inspector noted that the licensee had effectively addressed and corrected an increasing trend in the number of personnel entering the controlled area without the appropriate dosimetry. One Non-Cited Violation of technical specification 6.9.1 was identified.

R5 Staff Training and Qualifications in RP&C

R5.1 Post Accident Sampling System Training

a. Inspection Scope (IP 84750)

The inspector interviewed chemistry and training personnel to determine if training on post accident sample acquisition was completed. The inspector also reviewed the following correspondences which discussed this type of training for personnel:

- Letter to Mr. Denton of the USNRC, from Mr. Root of the Iowa Electric Light and Power Company, dated November 5, 1982, LDR-82-285, "NUREG-0737, II.B.3.-Post Accident Sampling."

- Letter to Mr. Liu, Iowa Electric Light and Power Company, from Mr. Vassallo of the USNRC, dated November 30, 1983, "NUREG-0737 Item II.B.3 Post Accident Sampling System."

- Letter to Mr. Denton of the USNRC, from Mr. McGaughy of the Iowa Electric Light and Power Company, dated January 19, 1984, "NUREG-0737, II.B.3.-Post Accident Sampling."

- Letter to Mr. Denton of the USNRC from Mr. McGaughy of the Iowa Electric Light and Power Company, dated April 15, 1985, "Post Accident Sampling System Request for Additional Information (NUREG-0737, II.B.3.)."

- Letter to Mr. Liu, Iowa Electric Light and Power Company, from Mr. Vassallo of the USNRC, dated June 11, 1985, "Post Accident Sampling System [safety evaluation report]."

Additionally, the inspector observed a chemistry technician performing the following surveillance:

- "Post Accident Sampling System (PASS) Leakage Inspection," STP # 685003-Q,CY, completed on August 13, 1997.

b. Observations and Findings

Through routine interviews with chemistry personnel, the inspector discovered that chemistry personnel were not receiving continuing training on the operation of the PASS system. While the PASS system was routinely operated (annually, quarterly, and for emergency preparedness drills), there were no tracking mechanisms to ensure that each technician performed a sample acquisition. The licensee had routinely trained personnel through 1993, however, the licensee then made a decision to stop the training in this area.

Correspondence between the NRC and the licensee regarding the implementation of NUREG 0737, Item II.B.3, Post Accident Sampling indicated the following:

- In the letter dated April 15, 1985, the licensee stated that "DAEC PASS operators undergo formal retraining on PASS procedures every two years. Beginning the current refueling outage, the two-year operator training cycle will be staggered such that at least one operator is trained every six months. In addition to the DAEC formal training, some PASS operators demonstrate the ability to obtain PASS samples during the Tech. Spec. [technical specification] required PASS operability surveillance testing (performed once per operating cycle). Further, PASS operators demonstrate the ability to obtain and analyze PASS samples during the annual emergency drill."

- Subsequent to this letter, the NRC issued a safety evaluation report on June 11, 1985, which stated that the PASS system described in the licensee's submittals met the eleven criteria specified in Item II.B.3 of NUREG 0737, and that this item was resolved at the facility. The evaluation of Criterion Ten, which required that the "accuracy, range, and sensitivity shall be adequate to provide pertinent data to the operator in order to describe the radiological and chemical status of the reactor coolant system," discussed retraining of the system operators. Specifically, the evaluations stated that the "retraining of operators for post accident sampling is scheduled at a frequency of once every six months."

The licensee was unable to produce records which indicated that operators were receiving training for post accident sampling. This item will remain unresolved pending a review of the basis for the NRC evaluation, and a review of the licensee's determination to stop routine training (URI 50-331/97013-02(a)).

The inspector reviewed the licensee's technical specifications (TS 6.8.1.12) which required, in part, that written procedures be prepared covering the program to ensure the capability to accurately determine the airborne iodine concentration in vital areas under accident conditions including the training of personnel. These procedures were required to be reviewed by the operations committee and the Plant Superintendent Nuclear. Through interviews with training and chemistry personnel, the inspector noted

that they were unaware of any formally reviewed procedures governing training in this area. However, at the exit interview, the licensee indicated that these procedures may be located in the emergency preparedness area. This item will remain unresolved pending a review of any emergency preparedness procedures which cover the areas specified in this technical specification (URI 50-331/97013-02(b)).

The inspector observed a chemistry technician perform portions of the quarterly PASS surveillance (STP # 685003-Q,CY). The technician did not recall receiving formal training on the PASS system. However, the inspector noted that the technician was knowledgeable of the system and the surveillance test. Procedural compliance during this surveillance was good.

c. Conclusions

The inspector noted that PASS sample acquisition training did not appear to be conducted in accordance with the licensee's descriptions to the NRC or in accordance with technical specifications. This resulted in two unresolved items. The inspector also noted that a technician performing a routine surveillance on the PASS system appeared knowledgeable of the system's performance.

R6 RP&C Organization and Administration (IP 83750, IP 84750)

The inspector noted that the licensee had assigned an individual in the radiation protection department to provide oversight for all instrumentation activities within the radiation protection and chemistry area. The inspector noted that this change could provide more efficiency and continuity in the instrumentation program.

R8 Miscellaneous RP&C Issues (IP 92904)

R8.1 (Closed) VIO 50-331/97009-05: Failure to post VIO 50-331/97002 in accordance with 10 CFR 19.11. The inspector interviewed licensing department personnel, and reviewed documentation regarding this event. The corrective actions for this violation included posting the violation for the specified period of time, reviewing and training licensing personnel Procedure 114.6 for posting requirements, and changing the internal concurrence stamp as a reminder to post certain violations. These corrective actions appear adequate, and this violation is closed.

R8.2 (Closed) VIO 50-331/97002-01: Failure to comply with health physics instruction for the February 10, 1997, condensate demineralizer work. The inspector noted that corrective actions for this event had effectively prevented recurrence. These corrective actions included the following:

- The continuation of weekly working level meetings between health physics and mechanical maintenance personnel to discuss upcoming work activities;
- Health physics department participation in mechanical maintenance pre-job briefings;

- The continued use of the maintenance health physics team to prepare, plan, coordinate, and cover specific maintenance activities when the schedule allows; and

- Health physics foreman observations and performance evaluations of various maintenance work activities which require health physics coverage.

The inspector noted that these corrective actions effectively addressed the root causes of the February 10, 1997, event. This violation is closed.

R8.3 (Closed) IFI 50-331/97008-03: Determination of appropriate PASS sampling requirements. During the licensee's noble metal chemical addition safety evaluation, the licensee became aware of a potential discrepancy between the Updated Final Safety Analysis Report (UFSAR) and the actual PASS system operation. Section 12.3.4.2.3 of the UFSAR stated that heat tracing of the gaseous sample lines would be sized to maintain the line at 250 degrees Fahrenheit and that these lines would be insulated. This line was actually maintained at 95 degrees Fahrenheit and the entire line was not insulated. The licensee contacted General Electric (manufacturer of the skid) to determine the actual system requirements.

The vendor's evaluation determined that the licensee could not obtain a representative gaseous iodine sample using the PASS skid if the gaseous sample lines were maintained at the current temperature. However, through further evaluation, the licensee and vendor determined that gaseous iodine samples were not procedurally required or used to determine core damage following an accident. The licensee also determined that the above-mentioned temperature discrepancy was actually with the continuous air monitor (CAM) sample lines which were shared with the PASS system. Specifically, portions of the piping to the hydrogen/oxygen monitors and the containment radiation monitors were not properly insulated or heat traced.

The inspector noted that, as installed, the PASS portion of the system was capable of performing all of its design functions as they would be relied upon in current plant conditions. Therefore, this item (50-331/97008-03) is closed.

However, technical specification 6.8.1.12 requires that written procedures shall be prepared covering the program to ensure the capability to accurately determine the airborne iodine concentration in vital areas under accident conditions. Since the licensee was unable to obtain a representative sample via the PASS system, the inspector reviewed various post accident procedures to determine if the methodology existed to obtain the technical specification required procedures. While none were identified at the time of the inspection, this item will remain unresolved pending a review of licensing documents to determine if this capability exists at the facility (URI 50-331/97013-03).

The licensee's review of this issue also determined a potentially adverse effect on the CAM system, specifically with the ability to analyze for hydrogen and oxygen in post accident conditions. The initial heat trace design was to maintain the lines at 280

degrees Fahrenheit, however, sample piping was maintained at 95 degrees Fahrenheit. The licensee considered the current temperature to be acceptable since the lower the temperature line, the more conservative the hydrogen and oxygen readings. However, this item will remain open pending a review of the representativeness of sample results at the current temperature rating (IFI 50-331/97013-04).

V. Management Meetings

X1 Exit Meeting Summary

On August 15, 1997, the inspector presented the inspection results to licensee management. The licensee acknowledged the findings presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified which related to inspection findings.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. Atkinson	Budget Coordinator
M. Atkinson	Chemistry Trainer
J. Bjorseth	Maintenance Manager
R. Brown	Quality Assurance Specialist
D. Curtland	Operations Manager
D. Eilers	Materials Handling Supervisor
J. Franz	Vice President-Nuclear
R. Hite	Radiation Protection Manager
K. Jewett	Radiation Protection Specialist/Engineer
J. Karrick	Licensing
L. Kriege	Chemistry Supervisor
B. Lacey	Manager Nuclear Business Unit
R. Lewis	Chemistry Foreman
M. McDermott	Engineering Manger
R. McGee	Outage Project Manger
B. McVicker	Chemistry Foreman
J. Oldham	Metrology Team Leader
R. Perry	Health Physics Supervisor
K. Peveler	Manager Regulatory Performance
K. Putnam	Licensing Supervisor
D. Schebler	Quality Assurance
R. Schlueter	Health Physics Foreman
E. Sorenson	System Engineer
B. Stout	Metrologist
J. Wiench	Helper Foreman
R. Zook	Outage Manger

NRC

Christine Lipa	Senior Resident Inspector

INSPECTION PROCEDURES USED

IP 83750:	Occupational Radiation Exposure
IP 84750:	Radioactive Waste Treatment and Effluent and Environmental Monitoring
IP 92904:	Follow-up Plant Support

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-331/97013-02(a)	URI	Post accident sampling system training as described in licensee correspondence.
50-331/97013-02(b)	URI	Post accident sampling system training as described in licensee requirements.
50-331/97013-03	URI	Capability to determine airborne iodine concentration in vital areas under accident conditions.
50-331/97013-04	IFI	Hydrogen/Oxygen monitoring in post accident conditions.

Closed

50-331/97013-01	NCV	Failure to wear dosimetry as required by procedure.
50-331/97009-05	VIO	Failure to post NOV 50-331/97002 in accordance with 10 CFR 19.11.
50-331/97002-01	VIO	Failure to comply with HP instruction for the 2/10/97 condensate demineraliser work.
50-331/97008-03	IFI	Determination of appropriate PASS sampling requirements.

LIST OF ACRONYMS USED

ALARA	As Low As Reasonably Achievable
ACP	Administrative Control Procedure
ALI	Annual Limit on Intake
CAM	Continuous Air Monitor
CFR	Code of Federal Regulations
Co-60	Cobalt-60
DAC	Derived Air Concentration
dpm	disintegrations per minute
DRS	Division of Reactor Safety
ED	Electronic Dosimeter
GE	General Electric
HPP	Health Physics Procedure
I&C	Instrument and Control
ICRP	international Council on Radiation Protection
IFI	Inspection Follow-up Item
IP	Inspection Procedure
IR	Inspection Report
NCV	Non-cited Violation
NRC	Nuclear Regulatory Commission
PASAP	Post Accident Sampling and Analysis Procedure
PASS	Post Accident Sampling System
PCM	Personal Contamination Monitor
PDR	Public Document Room
RP&C	Radiological Protection and Chemistry
RWP	Radiation Work Permit
STP	Surveillance Test Procedure
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
USNRC	United States Nuclear Regulatory Commission
VIO	Violation

DOCUMENTS REVIEWED

Action Requests: 970654, 970658, 970663, 970927, 971212, 971215, 971220, 971248, 971272, 971464, 971468, 971471, 971472, 971528, 971635, 971806, 971876, 971877, 972028.

Administrative Control Procedure (ACP) 1411.18, revision 7, "Personnel Dosimetry."

Certificate of Calibration/Response Test Data for Victoreen #REP39790, Model 530, serial number 244 (March 5, 1996 and June 28, 1997.

Correspondence Documents:

Letter to Mr. Denton of the USNRC, from Mr. Root of the Iowa Electric Light and Power Company, dated November 5, 1982, LDR-82-285, "NUREG-0737, II.B.3.-Post Accident Sampling;"

Letter to Mr. Liu, Iowa Electric Light and Power Company, from Mr. Vassallo of the USNRC, dated November 30, 1983, "NUREG-0737 Item II.B.3 Post Accident Sampling System;"

Letter to Mr. Denton of the USNRC, from Mr. McGaughy of the Iowa Electric Light and Power Company, dated January 19, 1984, "NUREG-0737, II.B.3.-Post Accident Sampling;"

Letter to Mr. Denton of the USNRC from Mr. McGaughy of the Iowa Electric Light and Power Company, dated April 15, 1985, "Post Accident Sampling System Request for Additional Information (NUREG-0737, II B.3.);"

Letter to Mr. Liu, Iowa Electric Light and Power Company, from Mr. Vassallo of the USNRC, dated June 11, 1985, "Post Accident Sampling System [safety evaluation report];" and

Letter to GE P DAEC Memorandum NG-97-099, dated May 29, 1997, "Policies for Use of the Annex Door." ASS Users from Mr. Green of the General Electric Company, dated June 29, 1987, "PASS UPGRADES- MAINTENANCE/SURVEILLANCE OF GAS TRAY."

DAEC Memorandum NG-97-1123, dated June 19, 1997, "Health Physics Support on Backshifts."

Defective Dosimetry Report: 97-1272, 97-1220, 97-0927, 97-0654, 97-1471, 97-1472.

Dosimetry File records: 498422287; 505607616; 488646555.

Health Physics Procedures (HPPs): Series 3109 and 3110.

Memorandum to Mr. Perry from Mr. Louis, dated February 28, 1997, "Monthly Foreman Tour with I&C Maintenance."

Memorandum to Mr. Perry from Mr. Louis, dated May 29, 1997. "Monthly Foreman Tour with Mechanical Maintenance."

Memorandum to Mr. Perry from Mr. Schlueter, dated July 30, 1997, "July 1997 Observation of Maintenance Activity-Matching on PSV4407."

Memorandum to Mr. Hanrien from PASS Task Force, dated September 11, 1987, "Recommendation of the PASS Task Force Disagreeing With the Removal of the Gaseous Iodine and Particulate Sampling Capability."

M&TE Calibration Data Sheets: (Serial numbers/date): 8149, 08/06/97.

Nuclear Generating Division Procedure 114.6, revision 0, "10 CFR 19.11 &21.6 Posting Requirements."

Post Accident Sampling and Analysis Procedures (PASAP):

PASAP 7.0, revision 4, "Manual Reactor Building Effluent Grab Sample Procedure;"

PASAP 7.2, revision 3, "Interpretation of Post Accident Sampling System Results;"

PASAP 7.2, revision 5, "Fuel Damage Assessment;"

PASAP 7.3, revision 4, "Interpretation of Containment Atmosphere Samples;"

PASAP 7.4, revision 1, "Containment High Range Radiation Monitors;" and

PASAP 7.4, revision 2, "Estimation of Potential Release Rate."

Radiological Engineering Calculations:

"Establishment of PCM1B Sum Channel Sigma Factor to Eliminate Distributed Alarms resulting from Radon Daughter Product Contamination," No. 96-011-H, dated October 14, 1996;

"Passive Internal Monitoring Program at the DAEC Revised," NG-93-1691, dated April 21, 1993;

"Prospective Evaluation of the Need for Internal Monitoring at the DAEC Revised," NG-93-1692, dated April 21, 1993; and

"Periodic Evaluation on the Need for Internal Monitoring at the Duane Arnold Energy Center," Calculation No. 96-005A, NG-96-1358, dated June 18, 1996.

Radiation Work Permits.

Surveillance Test Procedure, STP # 685003-Q,CY, completed on August 13, 1997, "Post Accident Sampling System (PASS) Leakage Inspection."