(2)

SUPPORT

AUDIT NO. SA-W3-OA-83-01

SHEET 1 OF 4

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT REPORT

1. AUDIT SUBJECT: Environmental Monitoring Program

2. AUDIT DATES: January 19, 1983 THROUGH: March 4, 1983

3. AUDITED ORGANIZATION(S) AND LOCATION(S): NPSG

4. AUDIT TEAM:

A. R. Roberts, Lead Auditor

G. W. Forgala, Team Member

5. AUDIT SCOPE:

To verify through reviews and interviews that the program requirements as reflected in the Program Management Descriptions have been adequately implemented.

6. PERSONS CONTACTED DURING THIS AUDIT:

A. PRE-AUDIT:

R. Barkhurst
L. Maurin
J. Sleger
J. Woods
R. Burski
R. Kenning
W. Morgan
J. McGaha
Z. Sabri
P. Prasankumar
G. Peeler
G. Bailey
T. Armington

B. AUDIT:

K. Iyengar
R. Prados
C. Groome
M. Borter
D. Espenan
A. Jones
D. Lowe
W. Johnson
W. Hellums

C. POST-AUDIT:

C. Groome
M. Borter
A. Roberts

7. SUMMARY OF AUDIT RESULTS:

A. GENERAL (INCLUDING ALL ELEMENTS, COMMITMENTS AND PROCEDURES REVIEWED).

This audit was compared to the criteria 10CFR50, Appendix B, I, II, V, X

The following reference documents were reviewed in the conduct of this audit.

1. PMD-GO-020, Rev. 0
2. WSES-3 Environmental Report
3. WSES-3 Radiological Effluent Technical Specifications
4. USNRC Regulatory Guide 4.15
5. Branch Technical Position of the NRC Radiological Assessment Branch, November 1979
6. NUREG-0472 Radiological Effluent Technical Specifications for PWR's

In order to formulate a checklist the audit team utilized the WSES-3, PMD-GO-020, Rev. 0.

B. EVALUATION OF QA PROGRAM EFFECTIVENESS AND IMPLEMENTATION.

The NPSG's implementation of the QA/QC program elements, applicable to this audit could not be fully evaluated because this program has not been fully developed, however, it is noted that all personnel interviewed expressed a keen desire for an effective program.

C. DURING THE CONDUCT OF THE AUDIT THE FOLLOWING NAP PROCEDURES WERE REVIEWED:

NAP-221	Rev. 0	1/12/83
NAP-222	Rev. 0	1/05/83
NAP-223	Rev. 0	1/12/83
NAP-220	Rev. 0	1/05/83
NAP-230	Rev. 0	1/31/83
NAP-231	Rev. 0	1/31/83
NAP-232	Rev. 0	1/31/83
NAP-233	Rev. 0	1/25/83
NAP-234	Rev. 0	1/31/83
NAP-235	Draft	

7. SUMMARY OF AUDIT RESULTS: (Continued)

D. DURING THE CONDUCT OF THE AUDIT THE FOLLOWING DOCUMENTS RELATING TO TELEDYNE ISOTOPES WERE REVIEWED:

Uncontrolled copy of Teledyne Isotopes
Quality Control and Audits
Environmental Analysis Department
Copy #13, IWL-0032-365 October 1981 Revision

Uncontrolled copy of Teledyne Isotopes
Quality Assurance Manual Environmental
Analysis Department Compliance with
10CFR50 - Appendix B, Compliance with Regulatory Guide 4.15
IWL-0032-395 effective date
October 15, 1980 Revision 9.8.81, Addition
9/08/81 copy #46

E. DURING THE CONDUCT OF THE AUDIT THE FOLLOWING UNCONTROLLED COPIES OF TELEDYNE ISOTOPES ANALYTICAL PROCEDURES WERE REVIEWED:

PRO-032-1	Determination of Gross Alpha and/or Gross Beta in Water Samples 12/10/79
PRO-042-5	Determination of Gamma Emitting Radioisotopes 10/27/80
PRO-032-10	Determination of Gross Beta Activity in Air Particulate
PRO-032-11	Determination of Radioiodine in Milk and Water Samples 12/10/79
PRO-032-12	Determination of Radioiodine in Vegetation Samples 12/22/79
PRO-342-17	Environmental Thermoluminescent Dosimetry (TLD) 10/20/80
PRO-052-35	Determination of Tritium in water by Liquid Scintillation 10/27/80
PRO-042-5	Determination of Gamma Emitting Radioisotopes No date

The following revisions which had not been entered but were included with the package:

PRO-032-12	Revision #2	11/03/83
PRO-032-16	Revision #6	11/15/82
PRO-032-16	Revision #5	10/27/82

AUDIT NO. SA-W3-QA-83-01

FINDING NO. N/A

SHEET 4 OF 4

8. UNRESOLVED FINDINGS OPENED DURING THIS AUDIT.

A. Findings

1. The program for Radiological Environmental Monitoring has not been fully implemented.

2. Insufficient data to evaluate qualifications of personnel collecting and analyzing environmental samples. Qualifications of contract laboratory personnel has not been verified in accordance with QA Program requirements.

3. Insufficient data is available to fully evaluate the records and reporting systems of the contract laboratory.

4. Controlled copies of contract laboratory's operating procedures are not being maintained.

9. STATUS OF PREVIOUSLY IDENTIFIED UNRESOLVED FINDINGS.

There are no previously identified unresolved audit findings within the scope identified by previous Operations Quality Assurance audits.

The audit team wishes to express its appreciation for the excellent cooperation and assistance provided by the NPSG during the conduct of this audit.

10. SUBMITTED BY: G. R. Roberts (Team Leader) DATE: 24 MAR 83

APPROVED BY: W M Morgan (QA Manager or QA Engineer) DATE: 3/29/83

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT FINDING

AUDIT NO. SA-W3-QA-83-01

FINDING NO. 1

SHEET 1 OF 2

1. AUDITED ORGANIZATION: NPSG, Environmental Monitoring Program

   CONTACTS: K. R. Iyengar
   R. W. Prados
   C. D. Groome
   M. A. Borter

   AUDIT LOCATION: NPSG and Waterford 3 SES
   Killona, LA

2. REQUIREMENT:

   The Radiation Control Engineer ensures performance of radiological environmental monitoring as instructed by this program, applicable procedures, and regulatory permits. (PMD-GO-020, 4.3.1)

3. FINDING:

   The operational phase of this program was implemented in January 1983. This program is not expected to be fully operational for a number of months yet. Currently, only TLD environmental monitoring samples are being taken.

4. AUDITOR'S RECOMMENDED CORRECTIVE ACTION:

   Continue implementation of the Environmental Monitoring Program. Commence obtaining all environmental samples at earliest possible date.

AUDITOR'S SIGNATURE: G. R. Roberts DATE: 24 MAR 83

AUDIT NO. SA-W3-QA-83-01

FINDING NO. 1

SHEET 2 OF 2

5. ACKNOWLEDGEMENT: This finding was identified during the conduct of an audit. As a member of the audited organization's management, your signature signifies acknowledgement of this finding, not necessarily agreement.

SIGNATURE: Marcia A Porter TITLE: Eng Tech-Nucl DATE: 24 Nov 83

PLEASE COMPLETE ITEM 6 BELOW AND RETURN TO THE AUDITING ORGANIZATION WITHIN 30 DAYS OF YOUR ACKNOWLEDGEMENT.

6. CORRECTIVE ACTION TAKEN: In the event that corrective action cannot be completed within 30 days, your response shall include a scheduled date for the corrective action.

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT FINDING

AUDIT NO. SA-W3-QA-83-01

FINDING NO. 2

SHEET 1 OF 2

1. AUDITED ORGANIZATION: NPSG, Environmental Monitoring Program

   CONTACTS: K. R. Iyengar
   R. W. Prados
   C. D. Groome
   M. A. Borter

   AUDIT LOCATION: NPSG and Waterford 3 SES
   Killona, LA

2. REQUIREMENT:

   a. The contract laboratory personnel shall be properly qualified according to the LP&L approved Quality Assurance Program. (PMD-GO-020, 5.3.3)

   b. Personnel responsible for collecting, preparing, and analyzing environmental samples shall have relevant experience in these areas in accordance with U.S. Nuclear Regulatory Commission, Regulatory Guide 4.15. (PMD-GO-020, 5.3.1)

   c. The Radiation Control Engineer ensures proper qualification of personnel collecting, preparing, and analyzing environmental samples according to this program. (PMD-GO-020, 4.3.2)

3. FINDING:

   There is at present no personnel qualification data available on the contract laboratory personnel.

4. AUDITOR'S RECOMMENDED CORRECTIVE ACTION:

   Obtain sufficient data to evaluate the qualifications of personnel who will be responsible for collecting and analyzing the environmental samples for LP&L.

AUDITOR'S SIGNATURE: G R Roberts DATE: 24MAR83

AUDIT NO. SA-W3-QA-83-01

FINDING NO. 2

SHEET 2 OF 2

5. ACKNOWLEDGEMENT: This finding was identified during the conduct of an audit. As a member of the audited organization's management, your signature signifies acknowledgement of this finding, not necessarily agreement.

SIGNATURE: Marcia A. Carter TITLE: Eng. Tech-Nucl DATE: 24 Mar 83

PLEASE COMPLETE ITEM 6 BELOW AND RETURN TO THE AUDITING ORGANIZATION WITHIN 30 DAYS OF YOUR ACKNOWLEDGEMENT.

6. CORRECTIVE ACTION TAKEN: In the event that corrective action cannot be completed within 30 days, your response shall include a scheduled date for the corrective action.

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT FINDING

AUDIT NO. SA-W3-QA-83-01

FINDING NO. 3

SHEET 1 OF 2

1. AUDITED ORGANIZATION: NPSG, Environmental Monitoring Program

   CONTACTS: K. R. Iyengar
   R. W. Prados
   C. D. Groome
   M. A. Borter

   AUDIT LOCATION: NPSG and Waterford 3 SES
   Killona, LA

2. REQUIREMENT:

   a. The Radiation Control Engineer ensures maintenance of an adequate records system which provides complete sample traceability. (PMD-GO-020, 4.3.3)

   b. The Radiation Control Engineer ensures timely preparation of reports relating to radiological environmental events described in regulatory permits or requirements. (PMD-GO-020, 4.3.4)

3. FINDING:

   There is insufficient data available from the contract laboratory to fully evaluate the records and reporting systems in relation to sample traceability and reporting of radiological environmental events.

4. AUDITOR'S RECOMMENDED CORRECTIVE ACTION:

   Obtain from the contract laboratory the necessary data to fully evaluate the laboratory's records and reporting systems.

   AUDITOR'S SIGNATURE: G. R. Roberts DATE: 24 MAR 83

5. ACKNOWLEDGEMENT: This finding was identified during the conduct of an audit. As a member of the audited organization's management, your signature signifies acknowledgement of this finding, not necessarily agreement.

   SIGNATURE: Marcia A. Borter TITLE: Eng Tech - Nucl DATE: 24 Mar 83

   PLEASE COMPLETE ITEM 6 BELOW AND RETURN TO THE AUDITING ORGANIZATION WITHIN 30 DAYS OF YOUR ACKNOWLEDGEMENT.

AUDIT NO. SA-W3-QA-83-01

FINDING NO. 3

SHEET 2 OF 2

6. CORRECTIVE ACTION TAKEN: In the event that corrective action cannot be completed within 30 days, your response shall include a scheduled date for the corrective action.

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT FINDING

AUDIT NO. SA-W3-QA-83-01

FINDING NO. 4

SHEET 1 OF 2

1. AUDITED ORGANIZATION: NPSG, Environmental Monitoring Program

   CONTACTS: K. R. Iyengar
   R. W. Prados
   C. D. Groome
   M. A. Barter

   AUDIT LOCATION: NPSG and Waterford 3 SES
   Killona, LA

2. REQUIREMENT:

   Written procedures shall be used for performing activities involved in the environmental monitoring program in accordance with U.S. Nuclear Regulatory Commission, Regulatory Guide 4.15. (PMD-GO-020, 5.4.1)

3. FINDING:

   At present, LP&L does not have controlled copies of the contract laboratory's Operating Procedures, QA manual or QC manual. NPSG's NAP-235 was also awaiting final approval. Also, a number of LP&L's procedures dealing with collecting, handling, and shipment of environmental samples may have to be revised after copies of the contract laboratory's procedures are received.

4. AUDITOR'S RECOMMENDED CORRECTIVE ACTION:

   Obtain copies of contract laboratory's QA and QC manuals and procedures as soon as possible to allow for review and modification of any LP&L procedures that may be required.

AUDITOR'S SIGNATURE: G. R Roberts DATE: 24MAR83

AUDIT NO. SA-W3-QA-83-01

FINDING NO. 4

SHEET 2 OF 2

5. ACKNOWLEDGEMENT: This finding was identified during the conduct of an audit. As a member of the audited organization's management, your signature signifies acknowledgement of this finding, not necessarily agreement.

SIGNATURE: Marcia A. Bartee TITLE: Eng Tech - Nucl DATE: 24 Mar 83

PLEASE COMPLETE ITEM 6 BELOW AND RETURN TO THE AUDITING ORGANIZATION WITHIN 30 DAYS OF YOUR ACKNOWLEDGEMENT.

6. CORRECTIVE ACTION TAKEN: In the event that corrective action cannot be completed within 30 days, your response shall include a scheduled date for the corrective action.

(1)

Audit

LOUISIANA POWER & LIGHT
MIDDLE SOUTH UTILITIES SYSTEM

AUDIT NO.: SA-W3-OA-83-18
SHEET 1 OF 1

AUDIT PLAN

1. **AUDIT SUBJECT:** Equipment, Instrument Operation and Calibration for Radwaste and Health Physics Departments

2. **AUDIT DATE(S):** June 13, 1983 through

3. **AUDITED ORGANIZATION(S):** Health Physics, Radwaste, Operations Maintenance, and I&C Departments, WSES-3, Killona, Louisiana

4. **AUDIT TEAM:** A. R. Roberts, Lead Auditor S. C. Petty, Team Member
J. W. Smith, Team Member

5. **AUDIT SCOPE:** This audit is to focus on a review of the activities and documentation associated with the implementation of the Waterford SES 3 equipment, instrument operation and calibration program for the Health Physics and Radwaste Departments, a review to examine management responsibilities and quality assurance program controls will be conducted as part of this audit.

6. **AUDIT ACTIVITIES:**
   A. **10CFR50 APPENDIX CRITERIA:** II, V, VII, X, XI, XII, XIII, XIV, XV, XVII, XVIII
   B. **OTHER:** NONE

7. **THIS AUDIT MAY INCLUDE BUT SHALL NOT BE LIMITED TO THE FOLLOWING REFERENCE DOCUMENTS:** FSAR, Chapter 12.5; PMD-HP-009; USNRC Regulatory Guide 8.15, October 1976; ANSI N323-1978; PMD-MD-005

8. **DURING THIS AUDIT THE FOLLOWING PREVIOUSLY IDENTIFIED AUDIT FINDINGS WILL BE REVIEWED FOR CORRECTIVE ACTION FOLLOWUP:** Corrective action taken as a result of findings 1 through 5 of OPS QA Audit SA-W3-QA-82-03 will be verified as part of this audit.

9. **SUBMITTED BY:** A R Roberts (Team Leader) **DATE:** 06/13/83

APPROVED BY: J M Moore (QA Manager or QA Engineer) **DATE:** 6/29/83

FOIA-84-206
A-1

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 1 OF 73

REFERENCE: Equipment, Instrument Operation and Calibration for Radwaste and H.P. Dept.

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

I. Health Physics Program, FSAR 12.5 Amendment 31

A. Health Physics Facilities

1. A portal monitor and personnel contamination friskers are located at the main access control point. (12.5.2.1)

2. Respiratory protection equipment is maintained and stored at the main control point. (12.5.2.1)

3. A portal monitor is also located at the plant exit in the administration/access control facility. (12.5.2.1)

B. Laboratory Instrumentation

1. Laboratory instrumentation located in the radiochemistry counting room allows plant personnel to ascertain the radioactive material present in survey samples. (12.5.2.2.1)

2. Typical samples would be contamination survey smears, airborne survey filter, and charcoal cartridges; but tritium survey and other samples may be processed also. (12.5.2.2.1)

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 2 OF 73

REFERENCE: Equipment, Instrument Operation and Calibration for Radwaste and H.P. Dept.

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

1. Health Physics Program, FSAR 12.5 Amendment 31

B. 3. The counting room instrumentation is as follows:

Instrument	Sensitivity	Range	Quantity	Remarks
Gas Flow proportional Counter	a: 0.4 pci B: 10 pci	$0-10^7$ c/m	2	For contamination levels on survey samples.
CM Counter	200 pci	$0-10^5$ c/m	2	May be portable and used at in-plant control points.

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 3 OF 73

REFERENCE: Equipment, Instrument Operation and Calibration for Radwaste and H.P. Dept.

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

1. Health Physics Program, FSAR 12.5 Amendment 31

B. 3. The counting room instrumentation is as follows:

Instrument	Sensitivity	Range	Quantity	Remarks
Liquid Scin-	$1x10^{-6}$ uC 1/ml	$0-10^{6}$ c/m	1	For low energy B counting. Maintenance by Chemistry Department

A = Acceptable U = Unacceptable N/A = Not Applicable

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 4 OF 13

REFERENCE: Equipment, Instrument Operation and Calibration for Radwaste and H.P. Dept.

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

1. Health Physics Program, FSAR 12.5 Amendment 31

B. 3. The counting room instrumentation is as follows:

Instrument	Sensitivity	Range	Quantity	Remarks
Ge (Li) Detector	Particulate $1x10^{-11}$ uCi/ml liquid $1x10^{-7}$ uCi/ml	-	1	With associated electronics and spectrum - stripping computer for isotopic analysis

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 5 OF 73

REFERENCE: Equipment, Instrument Operation and Calibration for Radwaste and H.P. Dept.

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

1. Health Physics Program, FSAR 12.5 Amendment 31

B. 3. The counting room instrumentation is as follows:

Instrument	Sensitivity	Range	Quantity	Remarks
NaI Dual SCA	$1x10^{-10}$ uCi/ml	$0-10^{6}$ c/m	2	For use by off-site monitoring teams.

12.5.2.2.1

4. Each laboratory counting system is checked and calibrated at regular intervals with standard radioactive sources traceable to a National Bureau of Standards (NBS) source. 12.5.2.2.1

5. Counting efficiency, background count rates, and high voltage settings are checked by plant personnel in accordance with plant procedures. 12.5.2.2.1

A = Acceptable U = Unacceptable N/A = Not Applicable

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 6 OF 73

REFERENCE: Equipment, Instrument Operation and Calibration for Radwaste and H.P. Dept.

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

1. Health Physics Program, FSAR 12.5 Amendment 31

C. Portable Survey Instrumentation

1. Portable survey instrumentation is located at the access control point and in plant control points. 12.5.2.2.2

2. This equipment will allow plant personnel to perform alpha, beta gamma, and neutron surveys for radiation, airborne, and surface contamination control. 12.5.2.2.2

3. Each portable survey instrument will be calibrated semiannually, when in use. 12.5.2.2.2

4. Calibrations are normally performed using the instrument calibrator by plant personnel. 12.5.2.2.2

5. Instruments will be source checked to verify proper operation in accordance with plant procedures. 12.5.2.2.2

6. Sufficient quantites of each type of instrument will be available to permit calibration, maintenance, and repair without causing a shortage in operational instrumentation. 12.5.2.2.2

A = Acceptable U = Unacceptable N/A = Not Applicable

REFERENCE: Equipment, Instrument Operation and Calibration for Radwaste and H.P. Dept.

REQUIREMENT/ITEM TO BE AUDITED | COMMENT

1. Health Physics Program, FSAR 12.5 Amendment 31

C. Portable Survey Instrumentation

7. The following is a listing of portable radiological survey instrumentation:

Instrument	Accuracy	Range	Qty	Remarks
Alpha Survey Meter	±10%	0-10^5 c/m	2	Scintillation
Neutron Survey Meter	±15%	0-5 Rem/hr	2	Gives dose rate over range of .025eV-10MeV.
GM Survey Meter	±10%	0-10^3 Rem/hr	10	Telescoping probe.
GM Survey Meter	±10%	0-2000 mRem/hr	8	Energy Compensated hand probe.

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 8 OF 73

REFERENCE: Equipment, Instrument Operation and Calibration for Radwaste and H.P. Dept.

REQUIREMENT/ITEM TO BE AUDITED | COMMENT

1. Health Physics Program, FSAR 12.5 Amendment 31

C. Portable Survey Instrumentation

7. The following is a listing of portable radiological survey instrumentation:

Instrument	Accuracy	Range	Qty	Remarks
CM Survey Meter	±10%	0-10^4 c/m	4	End window and pancake probes.
Ion Chamber Survey Meter	±10%	0-10^3 Rem/hr	10	y dose rate gas filled tube.
Ion Chamber Survey Meter	±10%	0-5000 mRem/hr	15	y dose rate air filled tube.
Ion Chamber Survey Meter	±10%	0-50,000 mRem/hr	15	y dose rate tube.

A = Acceptable U = Unacceptable N/A = Not Applicable

AUDIT CHECKLIST

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT NO. SA-W3-QA-83-18

SHEET 9 OF 73

REFERENCE: Equipment, Instrument Operation and Calibration for Radwaste and H.P. Dept.

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

1. Health Physics Program, FSAR 12.5 Amendment 31

C. Portable Survey Instrumentation

7. The following is a listing of portable radiological survey instrumentation:

Instrument	Accuracy	Range	Qty	Remarks
GM Survey Meter	±20%	0-10^4 R/hr	1	High range, extendable probe. Energy compensated. 12.5.2.2.2

D. Personnel Monitoring Instruments

1. Personnel monitoring will be provide by use of thermoluminescent dosimeters (TLDs), direct-reading pocket dosimeters, neutron badges, and survey instrumentation. 12.5.2.2.3

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 10 OF 13

REFERENCE: Equipment, Instrument Operation and Calibration for Radwaste and H.P. Dept.

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

1. Health Physics Program, FSAR 12.5 Amendment 31

   D. Personnel Monitoring Instruments

      2. TLDs will, under normal conditions, be analyzed on a quarterly basis by plant personnel and at other times when circumstances warrant. 12.5.2.2.3

      3. Direct reading dosimeters will be worn by personnel in the radiologically controlled area. 12.5.2.2.3

      4. If a significant potential for neutron exposure exists, personnel will be issued albedo neutron dosimeters. 12.5.2.2.3

      5. A day-to-day estimate of neutron exposure will be provided by a calculated neutron dose equivalent based upon measurements obtained with a "rem-meter" type neutron survey meter during the period of exposure. 12.5.2.2.3

      6. The TLD reader is calibrated quarterly and checked prior to use for proper response. 12.5.2.2.3

      7. The direct-reading dosimeters will be calibrated semiannually or if damage is suspected. 12.5.2.2.3

      8. TLD Chips will be checked for matched response periodically. 12.5.2.2.3

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 11 OF 73

REFERENCE: Equipment, Instrument Operation and Calibration for Radwaste and H.P. Dept.

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

1. Health Physics Program, FSAR 12.5 Amendment 31

   D. Personnel Monitoring Instruments

      9. Quality Control audit of TLD performance is proceduralized. 12.5.2.2.3

      10. Personnel survey instrumentation will consist of G-M countrate meters (contamination friskers), portal monitors, and whole body counting capability. 12.5.2.2.3

      11. These instruments will be calibrated quarterly as applicable when in use. 12.5.2.2.3

      12. Source checks will be performed weekly when in use. 12.5.2.2.3

      13. Personnel monitoring instrumentation is as follows:

Instrument	Sensitivity	Range	Qty	Remarks
GM Personnel Survey (Friskers)	50 c/m	$0-10^5$ c/m	8	Placed at control points and change areas.

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 12 OF 73

REFERENCE: Equipment, Instrument Operation and Calibration for Radwaste and H.P. Dept.

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

1. Health Physics Program, FSAR 12.5 Amendment 31

D. 13. (Continued)

Instrument	Sensitivity	Range	Qty	Remarks
Portal Monitors	1.0 uci Cs-137	NA	2	Liquid scintillation type
Whole Body Counter	1% of most nuclide body burdens.	0-several organ burdens.	1	3 NaI Detector system
Direct Reading Dosimeters	20 mr	0-1000 mr	50	
Direct Reading Dosimeters	50 mr	0-5000 mr	10	
Direct Reading Dosimeters	10 mr	0-200 mr	750	
Dosimeter Chargers	---	---	4	

12.5.2.2.3

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 13 OF 73

REFERENCE: Equipment, Instrument Operation and Calibration for Radwaste and H.P. Dept.

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

I. Health Physics Program, FSAR 12.5 Amendment 31

E. Health Physics Equipment

1. Portable air samples are used to survey airborne radioactive material concentrations. 12.5.2.2.4

2. Air samples are calibrated for flow quarterly. 12.5.2.2.4

3. Portable continuous air monitors will be used to monitor airborne concentrations at specific work locations. 12.5.2.2.4

4. Local indication will be provided as well as trend information. 12.5.2.2.4

5. Alarm setpoints are variable and visual and audible alarms are provided. 12.5.2.2.4

6. Respiratory protection equipment is available at the access control point. 12.5.2.2.4

7. Emergency use self-contained breathing apparatus is available at the access control point and all emergency equipment storage lockers. 12.5.2.2.4

8. Equipment will be maintained in accordance with Regulatory Guide 8.15, October 1976. 12.5.2.2.4

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 14 OF 73

REFERENCE: Equipment, Instrument Operation and Calibration for Radwaste and H.P. Dept.

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

1. Health Physics Program, FSAR 12.5 Amendment 31

   E. Health Physics Equipment

      9. An instrument calibrate will be used for calibrating gamma dose rate instrumentation. 12.5.2.2.4

      10. Neutron, beta, and alpha radiation sources will also be available for instrument calibration. 12.5.2.2.4

      11. Sources are traceable to an NBS source. 12.5.2.2.4

      12. The following is a listing of Health Physics Equipment:

Equipment	Qty	Range	Remarks
High Volume Air Sampler	4	$\frac{1}{3}$ to 8 ft^3/min	Used for rapid assessment of airborne levels.
Low Volume Air Sampler	4	10 to 1[illegible] L/min	Used for long duration sampling and trending.

A = Acceptable U = Unacceptable N/A = Not Applicable

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 15 OF 73

MIDDLE SOUTH UTILITIES SYSTEM

REFERENCE: Equipment, Instrument Operation and Calibration for Radwaste and H.P. Dept.

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

1. Health Physics Program, FSAR 12.5 Amendment 31

E. 12. (Continued)

Equipment	Qty	Range	Remarks
Air-Purifying Respirators	100	---	Full face, negative pressure.
Atmosphere Supplying Respirators	25	---	Full face, pressure demand.
Self-Contained Breathing Apparatus	15	---	Full face, pressure demand; supplements emergency equipment.
Portable Continuous Air Monitors	5	Particulate 1×10^{-10} - 1×10^{-7} $\frac{uCi}{ml}$ gaseous 1×10^{-7} - 1×10^{-4} $\frac{uCi}{ml}$	Monitoring of work areas.

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 16 OF 73

REFERENCE: Equipment, Instrument Operation and Calibration for Radwaste and H.P. Dept.

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

1. Health Physics Program, FSAR 12.5 Amendment 31

E. 12. (Continued)

Equipment	Qty	Range	Remarks
Instrument Calibrator	1	.002-500 R/Hr	Multiple source shielded self-contained calibrator. 12.5.2.2.4

F. Other Health Physics Instrumentation

1. Area Radiation Monitoring System will be installed in areas where it is desirable to have constant dose rate information. 12.5.2.2.5

2. Monitors will indicate dose rate locally and/or in the main control room. 12.5.2.2.5

3. Fixed continuous airborne radioactivity monitors are also provided at strategic locations where personnel exposure to airborne radionuclides is likely. 12.5.2.2.5

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 17 OF 73

REFERENCE: Facilities and Equipment. POM-HP-009, Rev.0

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
1. As necessary, the Health Physics Superintendent will make recommendations to the Plant Manager concerning the need for updating, replacement, or modifications to equipment and facilities for the Health Physics Group. 4.2	
2. The Health Physics Supervisors are responsible for equipment and facilities related to the Plant Health Physics operations; including portable survey equipment, laboratory counting, and respiratory protection equipment. 4.3	
3. The ALARA Coordinator is responsible for facilities and equipment related to implementation of the ALARA program. 4.4	
4. The Dosimetry Supervisor is responsible for equipment and facilities associated with internal and external dosimetry. 4.5	
5. The Health Physics Training Coordinator is responsible for equipment, training aids, and any special facilities associated with Health Physics training. 4.6	
6. The Maintenance Group is responsible for maintaining Health Physics facilities and equipment and assisting in the movement or placement of heavier items and equipment. 4.7	
7. The I&C Maintenance Department is responsible for the timely repair of Health Physics equipment and instruments and, as required, calibration of Health Physics instruments. 4.9	

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 18 OF 73

REFERENCE: Facilities and Equipment. POM-HP-009, Rev.0

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

8. The Plant Engineering Department has responsibilities defined in the ALARA Program for modifications to facilities or equipment that may affect radiation exposure personnel. 4.10

9. The Nuclear Training Group has responsibility for providing adequate training facilities for all phases of training. 4.11

10. Health Physics equipment includes both equipment used directly by the Health Physics Group to evaluate and document radiological conditions and personnel radiation exposures, and equipment provided by Health Physics in support of plant operations. 5.2

11. The general types of Health Physics equipment are as follows:

    A. Radiation Monitoring Equipment (Portable, semi-fixed and fixed equipment for collection of samples, detection of radiation fields and analysis of samples and data).

    B. Protective equipment:

    - Protective clothing
    - Respiratory protection equipment
    - Equipment for ALARA purposes, such as shielding materials, containments, remote handling tools and communication devices.

A = Acceptable U = Unacceptable N/A = Not Applicable

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 14 OF 73

REFERENCE: Facilities and Equipment. POM-HP-009, Rev.0

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

8. The Plant Engineering Department has responsibilities defined in the ALARA Program for modifications to facilities or equipment that may affect radiation exposure personnel. 4.10

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    B. Protective equipment:

    - Protective clothing
    - Respiratory protection equipment
    - Equipment for ALARA purposes, such as shielding materials, containments, remote handling tools and communication devices.

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 19 OF 73

REFERENCE: Facilities and Equipment. POM-HP-009, Rev.0

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

II. The general types of Health Physics equipment are as follows:

C. Technical Support Equipment:

- TLD System
- Records computer
- Testing equipment
- Calibration devices
- Whole body counter
- Environmental lab equipment

D. Decontamination Equipment:

- Vacuum cleaners
- Hydrolazer
- Ultrasonic Sinks
- Turbolator

E. Training Equipment:

- Models
- Mockups
- Audio - Visual Aids

5.2

A = Acceptable U = Unacceptable N/A = Not Applicable

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 20 OF 73

REFERENCE: Facilities and Equipment. POM-HP-009, Rev.0

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

12. Each Health Physics supervisor and coordinator will evaluate annually the facilities and equipment under their cognizance. Some criteria for evaluation are as follows:

    a. Are quantities of equipment sufficient for normal use and/or backup purposes?

    b. Is the type of equipment state-of-the-art and, if not, what are the advantages of more modern equipment?

    c. Should a change in vendor be considered due to lack of support, poor quality, cost, etc.?

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 21 OF 23

REFERENCE: Acceptable Programs for Respiratory Protection USNRC Reg. Guide 8.15, Oct 1976

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

1. Pursuant to 20.103 of 10CFR Part 20, a licensee may make allowance for the use of respiratory protective equipment in estimating exposures of individuals to airborne radioactive materials if the equipment is used according to the following guidance:

   a. A written policy statement on respirator usage is to be issued from a high management level.

   b. Respiratory protective equipment is to be selected to provide a protection factor greater than the multiple by which peak concentrations of radioactive materials are expected to exceed the values specified in Table I, Column 1 of Appendix B to 10CFR Part 20.

   c. The licensee is to advise each respirator user that be may leave the area at any time for relief from respirator use in the event of equipment malfunction, physical or psychological distress, procedural or communication failure, significant deterioration of operating conditions, or any other condition that might require such relief.

   d. The licensee is to maintain and implement a respiratory protection program that includes, as a minimum, the following items:

      1. Air sampling and other surveys sufficient to identify the hazard, to evaluate individual exposures, and to permit proper selection of respiratory protective equipment.

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 22 OF 73

REFERENCE: Acceptable Programs for Respiratory Protection USNRC Reg. Guide 8.15, Oct 1976

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
1. d. 2. Written procedures to ensure proper selection, supervision, and training of personnel using such protective equipment.	
3. Written procedures to ensure the adequate individual fitting of respirators, as well as such procedures to ensure the testing of respiratory protective equipment for operability immediately prior to each use.	
4. Written procedures for maintenance to ensure full effectiveness of respiratory protective equipment, including procedures for cleaning and disinfection, decontamination, inspection, repair, and storage.	
5. Written operational and administrative procedures for control, issuance, proper use, and return of respiratory protective equipment, including provisions for planned limitations on duration of respirator use for any individual as necessitated by operational conditions.	
6. Bioassays and other surveys, as appropriate, to evaluate individual exposures and to assess protection actually provided.	
7. Records sufficient to permit periodic evaluation of the adequacy of the respiratory protection program.	

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 23 OF 23

REFERENCE: Acceptable Programs for Respiratory Protection USNRC Reg. Guide 8.15, Oct 1976

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
1. d. 8. Determination prior to assignment of any individual to tasks requiring the use of respirators that such an individual is physically able to perform the work and use the respiratory protective equipment. A physician is to determine what health and physical conditions are pertinent. The medical status of each respirator user is to be reviewed at least annually.	
e. The licensee is to use equipment approved under appropriate Approval Schedules in 30CFR Part 2 of the U.S. Bureau of Mines/National Institute for Occupational Safety and Health and as set forth in Table 1 of Regulatory Guide 8.15.	
f. Where no equipment of a particular type has been approved under the schedules in 30CFR Part 2 or where there is no existing schedule for approval of certain equipment, such equipment is not to be used without specific authorization by the Commission.	
g. Unless otherwise authorized by the Commission, the licensee is not to assign protection factors in excess of those specified in Table 1 of Regulatory Guide 8.15 in selecting and using respiratory protective equipment.	

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 23 OF 73

REFERENCE: Acceptable Programs for Respiratory Protection USNRC Reg. Guide 8.15, Oct 1976

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
1. d. 8. Determination prior to assignment of any individual to tasks requiring the use of respirators that such an individual is physically able to perform the work and use the respiratory protective equipment. A physician is to determine what health and physical conditions are pertinent. The medical status of each respirator user is to be reviewed at least annually.	
e. The licensee is to use equipment approved under appropriate Approval Schedules in 30CFR Part 2 of the U.S. Bureau of Mines/National Institute for Occupational Safety and Health and as set forth in Table 1 of Regulatory Guide 8.15.	
f. Where no equipment of a particular type has been approved under the schedules in 30CFR Part 2 or where there is no existing schedule for approval of certain equipment, such equipment is not to be used without specific authorization by the Commission.	
g. Unless otherwise authorized by the Commission, the licensee is not to assign protection factors in excess of those specified in Table 1 of Regulatory Guide 8.15 in selecting and using respiratory protective equipment.	

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 24 OF 73

REFERENCE: Acceptable Programs for Respiratory Protection USNRC Reg. Guide 8.15, Oct 1976

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

1. h. As a minimum, the following additional technical items are to be observed:

   1. Respirable air of approved quality and quantity is to be provided and oxygen deficiency is to be avoided.

   2. There is to be a standby rescue person equipped with self-contained breathing apparatus and communications equipment when supplied-air suits are used.

   3. No credit is to be taken for use of sorbents against radioactive materials.

   4. Filter media in air-purifying respirators are to be of the high-efficiency type.

   5. Air-purifying respirators are not to be used in oxygen-deficient atmospheres.

   6. Adequate skin protection is to be provided.

   7. Air-purfying respirators are not to be used in atmospheres immediately hazardous to life or health.

   8. Canisters and cartridges are not to be used beyond service-life limitations.

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 25 OF 73

REFERENCE: Acceptable Programs for Respiratory Protection USNRC Reg. Guide 8.15, Oct 1976

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
1. h. 9. Facelets are not to be used.	
10. Oxygen and breathing air are not to be used in the same apparatus.	
11. Proper fittings are to be used with supplied-air equipment.	
12. Equipment is to be used within limitations for type and mode of use.	
13. Only specified equipment is to be used as emergency devices.	
14. Appropriate equipment with proper visual, communication, and other special capabilities is to be provided. Regulatory Guide 8.15	

A = Acceptable U = Unacceptable N/A = Not Applicable

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 26 OF 73

REFERENCE: Radiation Protection Instrumentation Test and Calibration, ANSI N323-1978

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

1. Inspection, Calibration, and Performance Test Requirements

   A. Precalibration - The following conditions shall be established prior to exposing the instrument to a source for adjustment and calibration:

      1. The instrument should be free of significant radioactive contamination.

      2. The meter shall be adjusted to zero or the point specified by the manufacturer using the adjustment or adjustments provided.

      3. The batteries or power supply shall comply with the instrument manufactures' specification.

      4. The instrument shall be turned on and allowed to warm up for the time period specified by the manufacturer.

      5. Electronic adjustments such as high voltage shall be set, as applicable, to be manufacturers' specifications.

      6. Geotropism shall be know for orientation of the instrument in the three mutually perpendicular planes, and this effect shall be taken into account during calibration and performance testing.

A = Acceptable U = Unacceptable N/A = Not Applicable

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 27 OF 73

REFERENCE: Radiation Protection Instrumentation Test and Calibration, ANSI N323-1978

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

1. Inspection, Calibration, and Performance Test Requirements

A. 7. The performance of any internal sampling time base in digital readout instruments should be verified as being within the manufacturer's specifications.

4.1

B. Primary Calibration

1. The reproducibility (precision) of the instrument should be known prior to making calibration adjustments. This is particularly important if the instrument failed to pass the source check or if repairs have been made.

2. To check reproducibility, the instrument should be exposed to a radiation field three or more times under identical conditions.

3. The readings obtained should normally not deviate from the mean value by more than ± 10 percent.

4. The response of an instrument may vary as a function of such parameters as energy, temperature, pressure, humidity, and source/detector geometry. The primary calibration should be accomplished with known values of these parameters.

A = Acceptable U = Unacceptable N/A = Not Applicable

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 28 OF 73

REFERENCE: Radiation Protection Instrumentation Test and Calibration, ANSI N323-1978

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

1. Inspection, Calibration, and Performance Test Requirements

A. 5. The calibration should be performed under the conditions specified by the manufacturer.

6. Alternatively, any of these parameters may be fixed to the condition in which the instrument is to be used routinely, and notation made of these values.

4.2.1

C. Linear Readout Instruments

1. Linear instruments usually have a scale selection switch. If controls are provided for each scale, adjustment of each shall be made according to the manufacturers' specifications or at the midpoint of each scale.

2. If only one control is provided, adjustment shall be made either (a) at the point specified by the manufacturer, (b) near the midpoint of the middle of a scale, or (c) near the midpoint of a scale that is particularly important to the users' requirements.

3. After adjustment, calibration shall be checked near the ends of each scale (approximately 20 percent and 80 percent of full scale).

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 29 OF 13

REFERENCE: Radiation Protection Instrumentation Test and Calibration, ANSI N323-1978

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

I. Inspection, Calibration, and Performance Test Requirements

C. 4. After an adjustment or adjustments have been completed, instrument readings shall be within 10 percent of known radiation values at these two points.

5. However, readings within ± 20 percent shall be acceptable if a calibration chart or graph has been prepared and made available with the instrument.

4.2.2.1

D. Logarithmic Readout Instruments

1. Logarithmic readout instruments commonly have a single readout scale spanning several decades with two or more adjustments.

2. The instrument should be adjusted for each scale according to the manufacturer's specifications or, alternatively, at points of particular importance to the user.

3. After adjustment, calibration shall be performed at a minimum of one point near the midpoint of each decade.

4. After adjustments have been complete instrument readings shall be within ± 10 percent of the known radiation values at these points.

A = Acceptable U = Unacceptable N/A = Not Applicable

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 30 OF 73

REFERENCE: Radiation Protection Instrumentation Test and Calibration, ANSI N323-1978

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

1. Inspection, Calibration, and Performance Test Requirements

D. 5. However, readings within ± 20 percent is acceptable if a calibration chart or graph is prepared and made available with the instrument.

4.2.2.2

E. Digital Readout Instruments

1. Digital instruments may have manual scale switching, automatic scale switching (auto ranging) or no scale switching.

2. For instruments with either manual or automatic scale switching, the calibration shall be performed as in item C above. For instruments without scale switching the calibration shall be performed as in item D above.

4.2.2.3

F. Calibration for Special Conditions

1. If the instrument is to be used under conditions (that is, radiation energy, temperature and pressure, or source/detector geometry) which very significantly from those for which the instrument is designed, the instrument should be adjusted, calibrated, and used only for the special conditions.

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 31 OF 73

REFERENCE: Radiation Protection Instrumentation Test and Calibration, ANSI N323-1978

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

I. Inspection, Calibration, and Performance Test Requirements

F. 2. When an instrument is calibrated for special conditions, a special condition identification label shall be attached (in addition to any required calibration labels) to indicate its applicability for this special use only.

3. However, if the instrument is also to be used within its design limits, the adjustments made during primary calibration shall remain the same, and instrument readings for the special conditions shall be corrected using correction factors obtained from appropriate tables or graphs.

4. Only one parameter should be varied at a time during calibration for the special conditions, but the interrelationships of the variables should be known.

4.3.1

G. Radiation Energy

1. Calibration shall be performed with a standard source or sources providing radiation fields similar to those in which the instrument will be used.

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 32 OF 73

REFERENCE: Radiation Protection Instrumentation Test and Calibration, ANSI N323-1978

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

I. Inspection, Calibration, and Performance Test Requirements

G. 2. Where instruments will be used in radiation fields of widely differing energies, the response of the instrument at several energies over the energy range shall be determined.

3. The response of the instrument to various energies of radiation shall be (a) plotted as a function of energy, or otherwise called out, (b) normalized to the response to a specific energy obtained during primarily calibration, and (c) provided with the instrument. This type of graph is commonly called an energy dependence or spectral sensitivity curve. 4.3.2

H. Temperature, Pressure, and Humidity

1. Instruments to be used outside the manufacturers' recommended temperature range or at temperatures which differ by more than 30°C from the calibration temperature shall be calibrated over the temperature range at which they will be used.

2. If the manufacturer has not stated operating limits for humidity or atmospheric pressures, the instruments shall be calibrated at the approximately humidity or pressure expected to be encountered in use.

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 33 OF 73

REFERENCE: Radiation Protection Instrumentation Test and Calibration, ANSI N323-1978

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

I. Inspection, Calibration, and Performance Test Requirements

H. Temperature, Pressure, and Humidity

3. Care should be taken to ensure that an instrument is not damaged by exceeding its pressure or humidity limits. 4.3.3

I. Detector Directional Dependence

1. If an instrument is to be used in a detector orientation relative to the source which is different from that used during primary calibration, correction factors should be developed. 4.3.4

J. Discrimination Against Unwanted Radiation

1. If adjustments or changes are made which might alter the instrument response to unwanted ionizing and nonionizing radiations, the discrimination against unwanted radiation should be determined for all unwanted radiations that may be encountered. 4.4

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 34 OF 73

REFERENCE: Radiation Protection Instrumentation Test and Calibration, ANSI N323-1978

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

1. Inspection, Calibration, and Performance Test Requirements

K. Calibration Records

1. A record shall be maintained of all calibration, maintenance, repair, and modification data for each instrument.

2. The record shall be dated and shall identify the individual performing the work.

3. The record shall be filed with previous records on the same instrument in accordance with American National Standard Practice for Occupational Radiation Exposure Records Systems, N13.6-1976 (R 1972) (6).

4. Each instrument shall be labeled with the following information:

   a. Date of most recent calibration

   b. Initials or other specific identifying mark of calibrator.

   c. Energy correction factors, where required.

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 35 OF 73

REFERENCE: Radiation Protection Instrumentation Test and Calibration, ANSI N323-1978

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

1. Inspection, Calibration, and Performance Test Requirements

K. 4. d. Graph or table of calibration factors, where necessary, for each type of radiation for which the instrument may be used; this should relate the scale reading to the units required if units are not provided on the scale.

e. Instrument response to an identified check source (to be provided either by calibrator or user).

f. Unusual or special use conditions or limitations.

g. Date that primary calibration is again required.

h. Special condition identification label (if applicable).

4.5

L. Periodic Performance Test

1. To assure proper operation of the instrument between calibrations, the instrument shall be tested with the check source during operation and prior to each intermittent use.

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 36 OF 73

REFERENCE: Radiation Protection Instrumentation Test and Calibration, ANSI N323-1978

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

I. Inspection, Calibration, and Performance Test Requirements

L. 2. Reference readings shall be obtained on each instrument when exposed to a check source in a constant and reproducible manner at the time of, or promptly after, primary calibration.

3. If at any time the instrument response to the check source differs from the reference reading by more than ±20 percent, the instrument shall be returned to the calibration facility for calibration or for maintenance repair, and recalibration, as required.

4. Reference readings should be obtained for one point on each scale or decade normally used.

5. The check source should accompany the instrument if it is specific to that instrument. 4.6

M. Primary Calibration Frequency

1. All instruments shall receive the precalibration inspection described in item A above and the primary calibration described in item B above prior to first use.

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 31 OF 73

REFERENCE: Radiation Protection Instrumentation Test and Calibration, ANSI N323-1978

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

I. Inspection, Calibration, and Performance Test Requirements

M. 2. Primary calibration will be required at least annually even when the performance test requirements outlined in item L above are met.

3. Where instruments are subjected to extreme operational conditions, hard usage, or corrosive environments, more frequent primary calibration should be scheduled.

4. Recalibration shall be scheduled after any maintenance or adjustment of any kind has been performed on the instrument. For this requirement, battery change is not normally considered maintenance.

N. Calibration Frequency for Special Conditions

1. Calibration for special conditions need be performed only once unless (a) the instrument is modified or physically altered, (b) the special conditions are changed, or (c) the primary calibration is altered, providing that the conditions in item M above are met. 4.7.2

O. Performance Test Frequency

1. A performance check shall be made prior to each use, during intermittent use conditions and several times a day during continuous use. 4.7.3

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 38 OF 73

REFERENCE: Radiation Protection Instrumentation Test and Calibration, ANSI N323-1978

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

II. Calibration Equipment Required

A. Calibration Standards - Instruments should be calibrated either against National Standards or with Derived Standards. If National or Derived Standards are not available, Laboratory Standards, obtained in one of the following ways, should be used:

1. Comparison of the radiation field from a users' source with the radiation field from a National or Derived Standard source in the same geometry, using a "transfer instrument" with a reproducibility of ± 2 percent. The calibration curve for the transfer instrument taken with the National or Derived source over a range that covers both the National or Derived source measurement and the user source measurement. (Such a curve reduces to a single point if the transfer calibration procedure is such that the transfer instrument readings are identical for both measurements.)

2. Calibration of a users' transfer instrument with a National or Derived Standard source, followed by evaluation of a users' source with the same transfer instrument. The transfer instrument shall have a reproducibility of ± 2 percent and the procedure shall utilize a calibration curve as in item (1) above.

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 39 OF 73

REFERENCE: Radiation Protection Instrumentation Test and Calibration, ANSI N323-1978

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

II. Calibration Equipment Required

A. 3. Where no National or Derived Standard exists, as in the case of specific energies or unusual sources, by establishment of a standard source or instrument with documented empirical and theoretical output or response characteristics.

4. A calibration source or sources preferably should be of a radiation energy similar to that with which the exposure rate sufficient to reach full scale of any instrument to be calibrated.

5. If the source is a radionuclide, the half-life should be long, preferably greater than several years to minimize corrections and errors.

6. The uncertainty of source calibration shall be no greater than ± 2 percent with respect to U.S. National Standards.

5.1

B. Calibration Assemblies

1. Instrument calibration assemblies shall be mechanically precise to ensure that positioning errors of either instruments or radiation sources do not affect the radiation field values by more than ± 2 percent.

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 40 OF 73

REFERENCE: Radiation Protection Instrumentation Test and Calibration, ANSI N323-1978

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

II. Calibration Equipment Required

B. 2. The working conditions in the calibration facility shall not cause excessive radiation exposure of personnel. Personnel exposure shall be kept as low as practicable and in no case under normal operating conditions exceed permissible levels permitted by agreement or law (whichever is lower).

3. To meet this condition, personnel shielding, remote instrument reading and positioning facilities, automatic, source handling mechanisms, and other mechanical or remote operations are recommended.

4. A sufficient range of radiation fields shall be available to satisfy calibration requirements. 5.2

C. Standard Instruments

1. An instrument used as a Derived Standard shall have an uncertainty no greater than ± 10 percent.

2. Calibration shall be reestablished after maintenance or repair or at intervals specified by the manufacturer but in no case at intervals greater than three years.

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 40 OF 73

REFERENCE: Radiation Protection Instrumentation Test and Calibration, ANSI N323-1978

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

11. Calibration Equipment Required

B. 2. The working conditions in the calibration facility shall not cause excessive radiation exposure of personnel. Personnel exposure shall be kept as low as practicable and in no case under normal operating conditions exceed permissible levels permitted by agreement or law (whichever is lower).

3. To meet this condition, personnel shielding, remote instrument reading and positioning facilities, automatic, source handling mechanisms, and other mechanical or remote operations are recommended.

4. A sufficient range of radiation fields shall be available to satisfy calibration requirements. 5.2

C. Standard Instruments

1. An instrument used as a Derived Standard shall have an uncertainty no greater than ± 10 percent.

2. Calibration shall be reestablished after maintenance or repair or at intervals specified by the manufacturer but in no case at intervals greater than three years.

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 40 OF 73

REFERENCE: Radiation Protection Instrumentation Test and Calibration, ANSI N323-1978

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

11. Calibration Equipment Required

B. 2. The working conditions in the calibration facility shall not cause excessive radiation exposure of personnel. Personnel exposure shall be kept as low as practicable and in no case under normal operating conditions exceed permissible levels permitted by agreement or law (whichever is lower).

3. To meet this condition, personnel shielding, remote instrument reading and positioning facilities, automatic, source handling mechanisms, and other mechanical or remote operations are recommended.

4. A sufficient range of radiation fields shall be available to satisfy calibration requirements. 5.2

C. Standard Instruments

1. An instrument used as a Derived Standard shall have an uncertainty no greater than ± 10 percent.

2. Calibration shall be reestablished after maintenance or repair or at intervals specified by the manufacturer but in no case at intervals greater than three years.

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 41 OF 73

REFERENCE: Radiation Protection Instrumentation Test and Calibration, ANSI N323-1978

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

11. Calibration Equipment Required

C. 3. A periodic instrument check procedure shall be established by the user to assure continued proper operation.
5.3

D. Check Sources - Check sources should provide radiation of the same type or types as provided by those sources used in instrument calibration. However, check sources may provide radiation different than that used for calibration if:

1. The source instrument geometry is well understood and easily reproduced, or

2. The instrument response to this radiation is well understood and is not critically dependent on instrument adjustment. (For example, the use of a photon source to check instruments sensitive to beta of a photon source to check a detector utilizing a BF_3 response to neutrons is not acceptable.)

3. A reproducible source detector geometry shall be established and used for all performance test measurements.
5.4

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 42 OF 73

REFERENCE: Radiation Protection Instrumentation Test and Calibration, ANSI N323-1978

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

III. Maintenance of Quality of Calibration

A. Radiation Field

1. Either narrow or broad beam geometry may be used to compare the response of similar instruments with that of a standardized instruments.

2. Alpha radiation sources shall be standardized in terms of activity or activity per unit area of the source or both. The reference geometry, 2 or 4 , shall be stated.

3. Beta radiation sources shall be standardized in terms of air or soft tissue absorbed dose rate at the surface or at a specified distance from the source, or in terms of activity.

4. Photon-emitting radionuclide sources shall be standardized in terms of exposure rate (in roentgens per hour) at a specified distance from the source.

5. Neutron sources shall be standardized in terms of (a) the number of neutrons emitted per unit time and (b) the effective or average neutron energy. Concomitant photon exposure rate should be known and stated.

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 43 OF 73

REFERENCE: Radiation Protection Instrumentation Test and Calibration, ANSI N323-1978

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

III. Maintenance of Quality of Calibration

A. Radiation Field

6. For photon and neutron monitoring instrument calibrations, the source-to-detector distance shall be the distance measured between the effective center of the radioactive source and the effective center of the radiation detector. Either this distance shall be greater than seven times the maximum dimension of the source or detector, whichever is larger, or suitable corrections shall be used.

7. The exposure rate or the flux density of the radiation field shall be known with an estimated uncertainty no greater than ± 10 percent. A continuous monitor or other device should be used to determine whether the radiation field has changed.

6.1

B. Calibration Facility

1. Free-space geometry should be achieved for photon and neutron instrument calibration.

2. The distance to scattering objects from the source and from the detector should be at least twice the distance between the detector and the source.

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 44 OF 73

REFERENCE: Radiation Protection Instrumentation Test and Calibration, ANSI N323-1978

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

III. Maintenance of Quality of Calibration

B. 3. Where scattering contributions to instrument readings are significant they shall be included in stating the value detector positions used for calibration purposes.

4. The radiation background at the calibration facility shall be low known, and stable and shall be accounted for during calibration.

5. Temperature, relative humidity, and atmospheric pressure shall be noted at the time of instrument calibrations.

6. Calibrations should be performed within the temperature range 25 ± 10°C, except when the instrument is to be used outside this temperature range.

6.2

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 45 OF 73

REFERENCE: Health Physics and Radwaste Audit

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

Measuring and Test Equipment Control PMD-MD-005, Rev. 1

1. Plant Manager Nuclear

   Is responsible for reviewing the program annual evaluation report and delegating responsibility for appropriate program implementation. 4.1

2. Quality Assurance Manager

   Is responsible for auditing offsite vendors of calibration and certification services. 4.2

3. Department Heads

   Are responsible for department procedures which address procurement, indexing, issuing, recall, storage, use repair, inventory, evaluation of out of tolerance M&TE, and removal from service of all M&TE, instruments, and reference standards in their cognizance. 4.3

4. Meteorology Supervisor - Nuclear

   Is responsible for providing calibration services which are within the capability of the Meteorology Laboratory. 4.4

A = Acceptable U = Unacceptable N/A = Not Applicable

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 46 OF 73

MIDDLE SOUTH UTILITIES SYSTEM

REFERENCE: Health Physics and Radwaste Audit

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

Measuring and Test Equipment Control PMD-MD-005, Rev. 1

5. M&TE Users

Are responsible for exercising reasonable care when using instrument in their custody, and for insuring that instruments are not used after their calibration or certification has expired, and for immediate return of damaged M&TE to the issuing facility. 4.5

6. Procedure

Each group or department shall generate a specific procedure(s) which details the control of their M&TE, instruments, analytical equipment, and Reference Standards. This procedure(s) shall provide the specific implementing instructions necessary to implement the controls required by this program. 5.1

7. Procurement

M&TE,,instruments and reference standards shall be procured from vendors listed on the Qualified Suppliers' List when Certification of calibration is required. M&TE may be purchased commercial grade and calibrated onsite by approved procedures or offsite by approved vendor. 5.2

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 47 OF 73

REFERENCE: Health Physics and Radwaste Audit

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

Measuring and Test Equipment Control PMD-MD-005, Rev. 1

8. Calibration

a. The calibration or verification of all controlled measuring and test equipment or reference standards is performed by qualified technicians using approved procedures, to tolerance specifications and frequencies listed in the departmental index. 5.3

b. The purpose of these periodic calibrations is to provide traceability to the NBS or other nationally recognized standard, and to establish the base accuracy of the site measurements. 5.3

c. The maximum allowable uncertainty of M&TE used to calibrate permanently installed or portable process instrumentation should not exceed ¼ the allowable uncertainty of the equipment being calibrated unless limited by current state-of-the-art.

d. A written evaluation documenting the acceptability of the use of M&TE with uncertainties greater than ¼ the process instrumentation it is being used to calibrate shall be prepared and retained. 5.3

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 48 OF 73

REFERENCE: Health Physics and Radwaste Audit

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

Measuring and Test Equipment Control PMD-MD-005, Rev. 1

9. Issuance/Use

a. Maintenance group M&TE and tools are issued and controlled by the Tool Control Program. 5.4

b. Issuance of other controlled M&TE shall be governed by individual group or department procedures. 5.4

c. Adequate controls shall be applied to ensure that whenever a piece of controlled M&TE is issued for use the intended use of the equipment and the name of the responsible individual is recorded. 5.4

d. Procedures for issuing M&TE shall ensure that all controlled M&TE has been calibrated within its specified interval prior to use. 5.4

e. Controlled M&TE which is permanently located and which is not subject to issuance shall have adequate controls applied through implementing procedures to all determination of all past results obtained. 5.4

f. Controls shall also be established through appropriate implementing procedures to require verification of the calibration of all permanently mounted controlled M&TE prior to use by potential users. 5.4

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 49 OF 73

REFERENCE: Health Physics and Radwaste Audit

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

Measuring and Test Equipment Control PMD-MD-005, Rev. 1

10. Recall

M&TE, Instruments, and Reference standard which require periodic re-calibration or recertification are recalled according to the guidelines of each department procedure. 5.5

11. Equipment found out of Tolerance

a. M&TE, instruments or reference standards found out of tolerance during periodic recalibration are adjusted and repaired to return them to a satisfactory condition. 5.6

b. A record search of M&TE use histories is performed in accordance with department procedures to identify any plant equipment or procedures on which the out of tolerance instrument was used since its last calibration/certification was performed. 5.6

c. An evaluation is performed to determine if any plant equipment requires recalibration or re-testing as a result of the out-of-tolerance condition. 5.6

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 50 OF 73

REFERENCE: Health Physics and Radwaste Audit

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

Measuring and Test Equipment Control PMD-MD-005, Rev. 1

12. Inventory

a. A semi Annual Inventory of all controlled M&TE and reference standards is conducted. 5.7

b. Out-of-tolerance histories are evaluated in order to determine generic trends which may identify periods and tolerances. 5.7

13. Reference and Transfer Standard Uncertainties

Reference standards are controlled M&TE which is used as a transfer standard to calibrate other M&TE should have an uncertainty no greater than the maximum allowable uncertainty of the device being calibrated. 5.8

14. Physical Identification of Controlled M&TE

a. Each piece of controlled measuring and test equipment shall be clearly identified utilizing a unique identification number and shall also have the current calibration status of the equipment identified. 5.9

b. The calibration status shall indicate the last calibration date and the due date for the next scheduled calibration. 5.9

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 51 OF 73

REFERENCE: Health Physics and Radwaste Audit

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

Measuring and Test Equipment Control PMD-MD-005, Rev. 1

14. Physical Identification of Controlled M&TE (Continued)

c. The unique identification number should correspond to the equipment number used in the group or department index. 5.9

d. This unique identification number may be the equipment serial number. 5.9

e. For equipment which is used in a designated permanent location such as controlled chemistry test stands and other laboratory equipment the current calibration status is not required to be displayed on the equipment provided:

1. Documentation of current calibration status is easily accessible to any potential user.

2. Appropriate procedural controls are established to require verification of calibration status prior to each use. 5.9

15. Nonconforming Test Equipment

a. Any controlled measuring and test equipment which is found to be out of calibration or otherwise defective shall be physically identified as nonconforming, removed from service, and stored in a physically separate area. 5.10

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 52 OF 73

REFERENCE: Health Physics and Radwaste Audit

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

Measuring and Test Equipment Control PMD-MD-005, Rev. 1

15. Nonconforming Test Equipment (Continued)

b. For equipment used only in designate permanent locations where removal to separate physical storage may be impractical, tagging and identification of the equipments' nonconforming status is adequate. 5.10

c. Out of calibration or nonconforming test equipment should be turned in to the appropriate calibration facility as soon as possible. 5.10

16. Environmental Conditions

The responsible groups or departments shall ensure that their controlled measuring and test equipment and reference standards are stored and used under environmental conditions which will not adversely affect its calibration or accuracy. 5.11

17. Qualification/Training of Personnel

The responsible groups and departments shall ensure that calibrations of controlled measuring and test equipment are performed by qualified personnel, per ANS 3.1-1978, "Selection and Training of Nuclear Power Plant Personnel." 5.12

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 52 OF 73

REFERENCE: Health Physics and Radwaste Audit

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

Measuring and Test Equipment Control PMD-MD-005, Rev. 1

15. Nonconforming Test Equipment (Continued)

b. For equipment used only in designate permanent locations where removal to separate physical storage may be impractical, tagging and identification of the equipments' nonconforming status is adequate. 5.10

c. Out of calibration or nonconforming test equipment should be turned in to the appropriate calibration facility as soon as possible. 5.10

16. Environmental Conditions

The responsible groups or departments shall ensure that their controlled measuring and test equipment and reference standards are stored and used under environmental conditions which will not adversely affect its calibration or accuracy. 5.11

17. Qualification/Training of Personnel

The responsible groups and departments shall ensure that calibrations of controlled measuring and test equipment are performed by qualified personnel, per ANS 3.1-1978, "Selection and Training of Nuclear Power Plant Personnel." 5.12

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 53 OF 73

REFERENCE: Health Physics and Radwaste Audit

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

Measuring and Test Equipment Control PMD-MD-005, Rev. 1

18. Calibration Schedules

a. Each group or department is responsible for ensuring that a calibration schedule is established for each piece of controlled measuring and test equipment subject to calibration. 5.13

b. Calibration intervals and acceptable calibration tolerances shall be specified by each group or department. 5.13

c. If current calibration status is not clearly identified on each piece of measuring and test equipment per item 14, controls shall be established to ensure that verification of calibration is performed by each user prior to use. 5.13

19. Noncontrolled Measuring and Test Equipment

a. Measuring and test equipment which is not used to obtain results which affect nuclear safety and which is not used to verify Technical Specification requirements may be treated as noncontrolled measuring and test equipment. 5.14

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 54 OF 73

REFERENCE: Health Physics and Radwaste Audit

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

Measuring and Test Equipment Control PMD-MD-005, Rev. 1

19. Noncontrolled Measuring and Test Equipment (Continued)

b. Noncontrolled measuring and test equipment should be stored in a physically separate location from controlled measuring and test equipment unless such noncontrolled equipment is designated for use only in a single permanent location. 5.14

c. Individual groups or departments may, at their option, treat all M&TE under their control as controlled M&TE. 5.14

20. Program Evaluation

a. An annual evaluation report of this programs' effectiveness is made by the Maintenance Superintendent to determine the proper control of M&TE, Instruments, and Reference Standards used in the construction and operation of Waterford-3. 7.0

b. This evaluation is based on the results of audits and surveillances performed by QA and QC as well as an evaluation of the number of instances where procedural or test results have been invalidated or questioned due to improper use and control of M&TE. 7.0

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SU-W3-QA-83-18

SHEET 55 OF 73

REFERENCE: WSES-FSAR-Unit 3, 12.3.4
Amendment #28

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

1. Area Radiation and Airborne Radioactivity Monitoring Instrumentation

   1. The radiation monitoring system provided for Waterford 3 consists of the following:

      a. Area Radiation Monitoring System.

      b. Airborne Radiation Monitoring System.

      c. Process and Effluent Radiological Monitoring and Sampling System.

   2. The Area Radiation Monitoring System informs Operations personnel, both locally and in the main control room, of radiation levels in areas where area Radiation Monitoring System detectors are located, provides warning when abnormal radiation levels occur in specific plant areas, and warns of possible equipment malfunctions.

   3. Some channels of the Area Radiation Monitoring System are designed to class IE requirements and can withstand loss-of-coolant accident environmental conditions.

      a. These channels provide a containment purge isolation signal in the event of abnormally high radiation inside the containment and enable main control room operators to monitor radioactivity levels inside the containment.

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 56 OF 73

REFERENCE: WSES-FSAR-Unit 3, 12.3.4
Amendment #28

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

b. The past-LOCA instrumentation provides information on the general direction of the accident.

c. In the event of a fuel handling accident, the Area Radiation Monitoring System provides a signal to isolate the Fuel Handling Building and start the emergency ventilation system.

4. The Airborne Radiation Monitoring System provides information, both locally and in the main control room, for the purpose of maintaining low in-plant personnel radiation exposure in accordance with 10CFR20 and Regulatory Guide 8.8 (March 1977).

5. It provides information on the airborne activity levels inside the control room outside air intakes and in the event of detection of high airborne activity generates a signal to isolate the normal outside air intakes and start the emergency ventilation system.

6. Detectors also exist in the emergency outside air intakes to assist operators in picking the one of two emergency intakes to assist intakes with the lowest airborne activity levels, thereby minimizing the amount of noble gases entering the control room environment and also minimizing the amount of emergency ventilation system filter loading.

(FSAR 12.3.4)

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 51 OF 73

REFERENCE: WSES-FSAR-Unit 3, 12.3.4
Amendment #28

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

7. Area Radiation Monitoring System

a. Design objectives - The objectives of the Area Radiation Monitoring System during normal operating plant conditions and anticipated operational occurrences are:

1. To measure ambient gamma radiation and to indicate to operations personnel the ambient gamma radiation in specific areas of the plant.

2. To annunciate and warn of abnormal radiation levels in specific areas of the plant.

3. To furnish records of radiation levels in specific areas of the plant.

4. To provide base data in controlling access of personnel to radiation areas.

5. To warn of uncontrolled or inadvertent movement of radioactive material in the plant.

6. To provide local indication and alarms at key points where a substantial change in radiation levels might be of immediate importance to personnel frequenting the area.

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 51 OF 73

REFERENCE: WSES-FSAR-Unit 3, 12.3.4
Amendment #28

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

7. Area Radiation Monitoring System

a. Design objectives - The objectives of the Area Radiation Monitoring System during normal operating plant conditions and anticipated operational occurrences are:

1. To measure ambient gamma radiation and to indicate to operations personnel the ambient gamma radiation in specific areas of the plant.

2. To annunciate and warn of abnormal radiation levels in specific areas of the plant.

3. To furnish records of radiation levels in specific areas of the plant.

4. To provide base data in controlling access of personnel to radiation areas.

5. To warn of uncontrolled or inadvertent movement of radioactive material in the plant.

6. To provide local indication and alarms at key points where a substantial change in radiation levels might be of immediate importance to personnel frequenting the area.

A = Acceptable U = Unacceptable N/A = Not Applicable

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

7. To assist Operations personnel in decisions on deployment of personnel in the event of an accident or equipment malfunction resulting in a release of radioactive material in the plant.

8. To annunciate and warn of possible equipment malfunctions in specific areas of the plant.

9. To furnish information for making radiation surveys.

10. To assist the supervisors in planning work schedules based on employees historical radiation exposure data.

(FSAR 12.3.4.1.1)

b. The objectives of the Area Radiation Monitoring System during postulated accidents are:

1. Provide the capability to alarm and initiate a containment purge isolation signal in the unlikely event of a loss-of-coolant accident or abnormally high radiation inside the containment.

2. Provide long term post-accident monitoring of conditions inside the containment.

3. Provide a signal to isolate the Fuel Handling Building and start the emergency ventilation system in the event of a fuel handling accident.

(FSAR 12.3.4.1.1)

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3 QA-83-18

SHEET 59 OF 73

REFERENCE: WSES-FSAR-Unit 3, 12.3.4
Amendment #28

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

8. Criteria for Location of Monitors - Consideration for an area monitor locations are based on the following:

   a. Frequency and length of personnel occupancy of a specific area.

   b. Potential for personnel unknowingly to receive high radiation doses.

   c. Potential for equipment malfunction.

   d. Areas where during normal plant operation including refueling, radiation exposures could exceed the radiation limits due to system failure or personnel error.

   e. Areas where new and spent fuel is received and stored.

   f. Containment area for indicating the level of radioactivity and detecting the presence of fission products due to a reactor coolant pressure boundary lead.

   g. Normally or potentially radioactive release points.

(FSAR 12.3.4.1.2)

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 60 OF 73

REFERENCE: WSES-FSAR-Unit 3, 12.3.4
Amendment #28

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

9. System Description - I

   a. The Area Radiation Monitoring Channels are located at selected places inside the plant to detect and store information on the radiation levels and, if necessary, annunciate abnormal radiation conditions.

   b. Indication, annunciation, and storage is provided for all 33 channels in the main control room and other cathode ray tubes (CRTs) and computer magnetic storage tape.

   c. A typical channel consists of a gamma sensitive Geiger-Muller (GM) detector, a microprocessor, power supply, a local indicator, and audio-visual alarm and a check source.

   d. The system utilizes local microprocessors with inputs to the radiation monitoring computers for purposes of data logging, processing, editing, and displaying of information obtained from the radiation sensors.

   e. All channel information is processed through a dedicated microprocessor which is then interrogated by the radiation monitoring computer for processing, indications on CRTs, storage, alarming, and hard copy production if so desired.

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-103-QA-83-18

SHEET 61 OF 73

REFERENCE: WSES-FSAR-Unit 3, 12.3.4
Amendment #28

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
f. Those channels identified as safety related are first indicated and recorded on digital ratemeters and strip-chart recorders housed on the radiation monitoring panels in the main control room.	
g. Upon a seismic event where the plant computer and peripherals are presumed to fail, the safety related channels maintain their functionability.	
h. The detectors are wall-mounted gamma sensitive Geiger-Muller tubes.	
i. The detectors energy dependence is typically flat (within ± 20 percent) from 80KeV to 1.5 MeV and each detector is provided with an integral check source, operated from the local microprocessor or the CRT in the main control room.	
j. Each monitor channel is provided with three alarms.	
k. One alarm level is set high enough above the normal measured radiation levels in the area to prevent spurious alarms, yet low enough to indicate transient radiation level increases.	
l. A second alarm is set at a higher level.	
m. A third alarm act as a tube failure, circuit failure, or cable disconnect alarm.	

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 62 OF 73

REFERENCE: WSES-FSAR-Unit 3, 12.3.4
Amendment #28

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

n. Some monitors are expected to have different alarm points when the reactor is critical than they will have when the reactor is shutdown.

o. Plant Health Physics personnel will specify the alarm points consistent with radiological safety controls for the area.

p. The instruments are calibrated and maintained on a routine schedule, as discussed in the Technical Specifications, Chapter 16.

q. All alarms initiate continuous audible and visual alarms at the detector.

r. The tone and volume of the local audible alarm is of variable intensity to be easily heard in operating areas.

s. The main control room annunciator provides a single window which alarms for any channel detecting high radiation levels.

t. Visual verification of the channel that has alarmed is done at the CRT in the main control room and the Health Physics office.

(FSAR 12.3.4.1.3)

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 63 OF 73

REFERENCE: WSES-FSAR-Unit 3, 12.3.4
Amendment #28

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

10. System Description - II

a. Area radiation monitoring channels 24 through 27 (ion chambers) (containment purge isolation detectors) are designed to Class IE requirements and can withstand a LOCA environment for a period of at least 10 minutes after the accident.

b. Channels 24 through 27 are powered from two 120V AC nuclear instrumentation buses SA and SB and are arranged in two groups of two monitors in each group.

c. The output signals from these monitors make up the containment purge isolation signal.

d. Channels 28 through 31 are designed to Class IE requirements. These are powered by two 120V AC vital buses (SA and SB).

e. All other monitors have power supplies fed from an interruptible source and are inoperative during a loss of off-site power.

f. In addition to qualification to Class IE requirements, channels 24 through 31 are physically and electrically separated from each other in accordance with the criteria set forth in IEEE 279-1971 and IEEE 308-1971.

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 64 OF 73

REFERENCE: WSES-FSAR-Unit 3, 12.3.4
Amendment #28

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
g. A means of checking of the integrity of the Area Radiation Monitoring System is accomplished through the use of a retractible solenoid operated check source.	
h. The microprocessor and computer receives, processes and displays information on request.	
i. Three alarms are provided: one for high radiation, the second for high - high radiation, and a third for when a channel becomes inoperative.	
j. The microprocessor has the ability to activate the check source into position for calibration purposes.	
k. Four redundant fuel pool monitors are provided to detect radioactivity in the event of a fuel handling accident in the Fuel Handling Building.	
l. In the event of a refueling accident, four GM tubes positioned above the fuel pool area will sense the radioactivity released and will supply a signal for the startup of the Fuel Handling Building Ventilation System (only emergency portion), as well as the closure of isolation dampers in the normal ventilation system.	
m. These monitors are designed to Class IE requirements and in accordance with IEEE 279-1971 and IEEE 308-1971, and IEEE 344-1971.	

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 65 OF 73

REFERENCE: WSES-FSAR-Unit 3, 12.3.4
Amendment #28

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
n. The calibration performed is in accordance to Reactor Research and Development Standard C14-IT-1974, Ventilation Exhaust Radiation Monitoring System. (FSAR 12.3.4.1.3)	

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 46 OF 73

REFERENCE: WSES-FSAR-Unit 3, 12.3.4
Amendment #28

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

II. Airborne Radiation Monitoring System - Design Objectives

1. The objectives of the Airborne Radiation Monitoring System during normal operating plant conditions and anticipated operational occurrences are:

   a. To inform operations personnel of airborne particulate, gaseous, and iodine (B - ɣ, gross B, and ɣ, respectively) activity trends in the various building and structures of the plant.

   b. To alarm any abnormal increases in the airborne activity levels.

   c. To furnish records of gross airborne trends in the various plan areas and of the amount of radioactive releases to the environment through the plant buildings or structures during normal, or abnormal operational occurrences.

   d. To help detect identified or unidentified leaks inside the reactor coolant pressure boundary (as recommended in Regulatory Guide 1.45, May 1973) and other areas of the plant.

   e. To assist personnel in deciding whether or not breathing apparatus is necessary when entering a high activity area.

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 67 OF 73

REFERENCE: WSES-FSAR-Unit 3, 12.3.4
Amendment #28

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

f. To provide information for evaluation of the performance of all plant systems that function to minimize the release of radioactivity to accessible areas of the plant and to the environment.

2. The objective of the main control room airborne radiation monitoring system during postulated accidents is to provide the capability to alarm and initiate isolation of the main control room normal ventilation system and actuate the emergency ventilation system in the unlikely event that radioactivity is introduced into the main control room intake ductwork.
(FSAR 12.3.4.2.1)

3. Criteria for location of monitors

a. Considerations for locating the Airborne Radiation Monitoring System monitors are based on the following:

1. Paths that normally, or potentially, may release airborne radioactivity to the environment.

2. Areas where the airborne radioactivity can abruptly increase and where personnel normally have access to the areas.

3. In ventilation ducts where the monitors can survey, at large, the airborne radioactivity level.

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

4. Inside the containment for the purpose of monitoring unidentified leaks.

(FSAR 12.3.4.2.2)

4. System Descriptions

a. Airborne radioactivity detection devices are provided in the plant to monitor normal radiation levels and to detect and annunciate any abnormal radiation conditions.

b. The Airborne Radiation Monitoring System consists of monitors for the containment, the main control room, as well as certain areas in the Reactor Auxiliary Building.

c. Additional alarms are provided for malfunction of the particulate filters; high pressure and low pressure across the filters.

(FSAR 12.3.4.2.3)

5. Containment Atmosphere Radiation Monitor

a. The containment atmosphere radiation monitor is designed to provide an indication in the main control room of the particulate, iodine, and gaseous radioactivity levels inside the containment.

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 69 OF 73

REFERENCE: WSES-FSAR-Unit 3, 12.3.4
Amendment #28

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
b. The containment atmosphere sample is drawn into the monitoring assembly by a one inch stainless steel sampling line.	
c. The flow sample is distributed to the iodine and the particulate samplers by a V pipe connection.	
d. The iodine sample is obtained when the sample passes through a fixed charcoal filter bed.	
e. The fixed charcoal filter bed is then monitored by a gamma sensitive scintillation detector.	
f. The particulate sampler collects particles greater than or equal to 0.3 microns on a moving paper filter.	
g. A beta sensitive scintillation detector aimed at the moving paper filter monitors for particular radiation.	
h. After passing through the particulate and iodine filters, the sample will be monitored for radio-gas content in the gas sampler.	
i. The sample lines are kept as short as possible and horizontal runs are minimized to reduce plate-out and losses due to gravity deposition.	

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 69 OF 73

REFERENCE: WSES-FSAR-Unit 3, 12.3.4
Amendment #28

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
b. The containment atmosphere sample is drawn into the monitoring assembly by a one inch stainless steel sampling line.	
c. The flow sample is distributed to the iodine and the particulate samplers by a "T" pipe connection.	
d. The iodine sample is obtained when the sample passes through a fixed charcoal filter bed.	
e. The fixed charcoal filter bed is then monitored by a gamma sensitive scintillation detector.	
f. The particulate sampler collects particles greater than or equal to 0.3 microns on a moving paper filter.	
g. A beta sensitive scintillation detector aimed at the moving paper filter monitors for particular radiation.	
h. After passing through the particulate and iodine filters, the sample will be monitored for radio-gas content in the gas sampler.	
i. The sample lines are kept as short as possible and horizontal runs are minimized to reduce plate-out and losses due to gravity deposition.	

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 70 OF 73

REFERENCE: WSES-FSAR-Unit 3, 12.3.4
Amendment #28

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
j. The pumping system consists of two carbon vane pumps; one pump draws air through the iodine monitor and the other draws air through the particulate monitor.	
k. Flowmeters are placed downstream of each pump, to indicate flow rates and to alarm abnormal flow rates.	
l. Pressure drop sensors are placed on the particulate and iodine monitor to indicate and alarm abnormal filter function.	
m. The isolation of the noble gas monitor allows remote purging with clean air for background and maintenance.	
n. The air stream bypasses the noble gas monitor whenever it is isolated by its isolation valves.	
o. The iodine filter is periodically replaced and can be analyzed in the laboratory.	
p. Adequate shielding is arranged in a 4 π geometry around the detectors to prevent interference from background radiation and electromagnetic fields.	
q. A solenoid operated check source is provided for gross calibration purposes.	

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 21 OF 73

REFERENCE: WSES-FSAR-Unit 3, 12.3.4
Amendment #28

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

r. Each channel provides three alarm modes: FAIL, ALERT, and HIGH. ALERT and HIGH alarms are adjustable over the full span of the scale.

s. One alarm is set to alarm for detector signal failure, power failure, or from a failure due to a disconnected cable. The second is set to alert that a specified radiation level has been exceeded. The third is set at a higher level to alarm at higher radiation levels.

t. Power sources and indication devices are located on the main control room radiation monitoring panel.

u. All radiation channels are indicated, stored, as required, and annunciated on the main control room radiation monitoring panel.

v. Abnormal radiation levels are indicated both visually and audibly; locally and in the main control room.

w. Each detector is calibrated at the factory using two or more National Bureau of Standards calibrated isotopes prepared in the proper form to simulate the effluent for which the system will be used.

(FSAR 12.3.4.2.3.1)

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3 QA-83-18

SHEET 72 OF 73

REFERENCE: WSES-FSAR-Unit 3, 12.3.4
Amendment #28

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

6. Containment Atmosphere Radiation Monitor - II

   a. A recalibration of the detectors will be performed at periodic intervals. Calibration is performed in accordance with Reactor Research and Development Standard C14-1T-1974.

   b. The plant stack radiation monitors the plant stack for particulates, iodine, and noble gases at the point of release to the atmosphere.

   c. The sample flow is withdrawn from the stack through an isokinetic nozzle located at a minimum of eight stack diameters from the last point of radioactivity entry.

   d. The following items are applicable to the containment atmosphere radiation monitor; monitor cabinet, sampler check source, detectors assembly, recorders and power supplies.

(FSAR 12,3.4.2.3.1)

7. Main Control Room Radiation Monitors

   a. Two redundant pairs of radiation monitors are provided for monitoring radioactive airborne concentration levels inside the two outside air intake plenums.

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-18

SHEET 13 OF 73

REFERENCE: WSES-FSAR-Unit 3, 12.3.4
Amendment #28

REQUIREMENT/ITEM TO BE AUDITED	COMMENT

b. Each of the four monitors consists of two separate plastic scintillator detectors; one detector with a beta shield and one without.

c. This configuration provides operators with information on beta and gamma, and gamma only radiation field intensities.

d. Under normal operations, the control room ventilation system draws air from the north side intake plenums.

e. Upon detection of high radiation in two radiation detectors of the same group, a signal is developed to isolate the control room.

f. The operator shall examine the radiation monitor outputs of the Emergency Outside Air Intakes (EOAI) to determine which intake point has the lowest radiation level and choose the intake point with the lowest airborne contamination level to pressurize the control room.

(FSAR 12.3.4.2.4)

A = Acceptable U = Unacceptable N/A = Not Applicable

(3)

REFERENCE: WSES-FSAR-Unit 3 12.5 Health Physics Prog.

ITEM TO BE AUDITED	A	U	N/A	COMMENTS
I. Health Physics Program 1. The health physics program ensures that: (12.5.1.3) a. All radiation workers receive radiation protection training commensurate with their respective responsibilities. b. Respiratory protection equipment training is provided to workers who may use the equipment. c. Emergency plan training is provided as necessary for personnel who may be assigned to radiation emergency teams. d. Appropriate personnel dosimetry is available. e. Internal and external dose assessment is provided for workers. f. Workers' internal and external exposure history are known prior to allowing exposure at Waterford 3. g. Respiratory protection equipment is provided to keep internal exposure ALARA. h. Radiologically controlled areas are segregated to control exposure potential.				

A - ACCEPTABLE U - UNACCEPTABLE N/A - NOT APPLICABLE

MIDDLE SOUTH UTILITIES SYSTEM

LOUISIANA POWER & LIGHT

AUDIT CHECKLIST

AUDIT NO.: SA-W3-QA-82-03

SHEET 1 OF 10

FOIA-84-20
R/3

REFERENCE: WSES-FSAR-Unit 3 12.5 Health Physics Prog.

ITEM TO BE AUDITED	A	U	N/A	COMMENTS
I. Health Physics Program				
i. Access to radiologically controlled areas is proceduralized to control exposure potential.				
j. Radiological instrumentation is provided and maintained to assess exposure potential.				
k. Incoming shipments of radiocative material are received and surveyed properly.				
l. Outgoing shipments of radioactive material are packaged, surveyed, and labeled properly.				
m. Necessary measures are taken and guidelines followed to keep exposures and effluents ALARA while safely supplying a reliable source of power to the public.				
II. Health Physics Instrumentation				
2. Each portable survey instrument will be calibrated semiannually, when in use. (12.5.2.2.2)				
3. Sufficient quantities of each type of instrument will be available to permit calibration, maintenance, and repair without causing a shortage in operational instrumentation. (12.5.2.2.2)				

A - ACCEPTABLE U - UNACCEPTABLE N/A - NOT APPLICABLE

MIDDLE SOUTH UTILITIES SYSTEM

LOUISIANA POWER & LIGHT

AUDIT CHECKLIST

AUDIT NO.: SA-W3-QA-82-03

SHEET 2 OF 10

REFERENCE: WSES-FSAR-Unit 3 12.5 Health Physics Prog.

ITEM TO BE AUDITED	A	U	N/A	COMMENTS
II. Health Physics Instrumentation				
4. TLD's will, under normal conditions, be analyzed on a quarterly basis by plant personnel and at other times when circumstances warrant. (12.5.2.2.3)				
5. Direct reading dosimeters will be worn by personnel in the radiologically controlled area. (12.5.2.2.3)				
6. Neutron dosimeters will be analyzed on a monthly basis. (12.5.2.2.3)				
7. A day-to-day estimate of neutron exposure will be provided by a calculated neutron dose equivalent based upon measurements obtained with a "remmeter" type neutron survey meter during the period of exposure. (12.5.2.2.3)				
8. The TLD reader is calibrated quarterly and checked prior to use for proper response. (12.5.2.2.3)				
9. The direct-reading dosimeters will be calibrated semiannually or if damage is suspected. (12.5.2.2.3)				
10. TLD chips will be checked for matched response periodically. (12.5.2.2.3)				
11. Quality control audit of TLD performance is personalized. (12.5.2.2.3)				
12. Air samplers are calibrated for flow quarterly. (12.5.2.2.4)				

A - ACCEPTABLE U - UNACCEPTABLE N/A - NOT APPLICABLE

MIDDLE SOUTH UTILITIES SYSTEM

LOUISIANA POWER & LIGHT

AUDIT CHECKLIST

AUDIT NO.: SA-W3-QA-82-03

SHEET 3 OF 10

REFERENCE: WSES-FSAR-Unit 3 12.5 Health Physics Prog.

ITEM TO BE AUDITED	A	U	N/A	COMMENTS
II. Health Physics Instrumentation				
13. Respiratory protection equipment is available at the access control point. (12.5.2.2.4)				
14. Emergency use self-contained breathing apparatus is available at the access control point and all emergency equipment storage lockers. (12.5.2.2.4)				
15. An instrument calibrator will be used for calibrating gamma dose rate instrumentation. (12.5.2.2.4)				
16. Neutron, beta and alpha radiation sources will also be available for instrument calibration. (12.5.2.2.4)				
17. The clothing required for a particular instance will be prescribed by health physics personnel on a radiation work permit based on actual or potential radiological conditions. (12.5.2.2.4)				
18. The inventory of protective clothing will include, overalls, hoods, caps, plastic oversuits, gloves (plastic, rubber, cloth), shoe covers, boots, and rubbers. Tape will be provided for sealing. (12.5.2.2.4)				
19. Additional contamination control supplies will be available. These include vacuum cleaners, absorbent paper, plastic sheets and bags, barricade ropes, signs, and labels. (12.5.2.2.4)				

A - ACCEPTABLE U - UNACCEPTABLE N/A - NOT APPLICABLE

MIDDLE SOUTH UTILITIES SYSTEM

LOUISIANA POWER & LIGHT

AUDIT CHECKLIST

AUDIT NO.: SA-W3-OA-82-03

SHEET 4 OF 10

REFERENCE: WSES-FSAR-Unit 3 12.5 Health Physics Prog.

ITEM TO BE AUDITED	A	U	N/A	COMMENTS
III. Radiation Surveys				
20. Survey information is factored into exposure stay time determination and radiation work permit specifications. (12.5.3.1)				
IV. Access Control				
21. Only personnel with current authorization, such as a radiation work permit may pass control points. (12.5.3.3)				
22. Key control for high radiation areas is delineated in administrative procedures. (12.5.3.3)				
V. Radiation Work Permit				
23. The operating and maintenance supervisor will be made cognizant of all radiation work permits. (12.5.3.4)				
24. Radiation work permits define allowable exposures, necessary training and staging, stay times, anticontamination clothing, respiratory protection, survey requirements, and special precautions or instructions for the work to be performed safely, efficiently, and within the ALARA commitment. (12.5.3.4)				
25. Violations of radiation work permit instructions will be reported and documented in accordance with administrative procedures. (12.5.3.4)				

A - ACCEPTABLE U - UNACCEPTABLE N/A - NOT APPLICABLE

MIDDLE SOUTH UTILITIES SYSTEM

LOUISIANA POWER & LIGHT

AUDIT CHECKLIST

AUDIT NO.: SA-W3-QA-82-03

SHEET 5 OF 10

REFERENCE: WSES-FSAR-Unit 3 12.5 Health Physics Prog.

ITEM TO BE AUDITED	A	U	N/A	COMMENTS
VI. Contamination Control 26. Contaminated personnel are decontaminated at the decontamination facility under the supervision of health physics personnel. (12.5.3.5) VII. Radiation Protection Training 27. Plant personnel, both permanent and temporary, whose duties require such training, will be instructed in the fundamentals of radiation protection. (12.5.3.6) 28. Radiation protection training will be given annually as part of general employee retraining. (12.5.3.6) 29. Training is commensurate with the degree of hazard associated with personnel work assignments. (12.5.3.6) 30. Training topics will include: (12.5.3.6) a. Instruction in applicable station and NRC exposure limits. b. Station procedures. c. Instructions to women concerning prenatal exposure. d. Properties of radiation and radioactivity.				

A - ACCEPTABLE U - UNACCEPTABLE N/A - NOT APPLICABLE

MIDDLE SOUTH UTILITIES SYSTEM

LOUISIANA POWER & LIGHT

AUDIT CHECKLIST

AUDIT NO.: SA-W3-QA-82-03

SHEET 6 OF 10

REFERENCE: WSES-FSAR-Unit 3 12.5 Health Physics Prog.

ITEM TO BE AUDITED	A	U	N/A	COMMENTS
VII. Radiation Protection Training				
30. e. Biological effects of exposure.				
f. Techniques of radiation protection.				
g. ALARA				
h. Emergency and fire alarm response.				
i. Other topics as pertinent.				
VIII. Personnel Monitoring				
31. Radiation work permits will specify the need for neutron dosimetry. (12.5.3.7.1)				
32. Use of the TLD reader and the quality control associated with it is proceduralized. (12.5.3.7.1)				
33. A permanent exposure record is kept for all badged personnel, in accordance with Regulatory Guide 8.7, May 1973, and 10CFR20.401. (12.5.3.7.1)				
34. A bioassay program will be performed in accordance with Regulatory Guide 8.9, September 1973 and the ANSI STandard for Internal Dosimetry for Mixed Fission and Activation Products, N343-1978. (12.5.3.7.2)				

A - ACCEPTABLE U - UNACCEPTABLE N/A - NOT APPLICABLE

MIDDLE SOUTH UTILITIES SYSTEM

LOUISIANA POWER & LIGHT

AUDIT CHECKLIST

AUDIT NO.: SA-W3-OA-82-03

SHEET 7 OF 10

REFERENCE: WSES-FSAR-Unit 3 12.5 Health Physics Prog.

ITEM TO BE AUDITED	A	U	N/A	COMMENTS
VIII. Personnel Monitoring 35. All personnel who may regularly enter an airborne radioactivity area and any other area where unencapsulated radioactive material is present in a form and quantity such that the area has a significant potential for becoming an airborne radioactivity area will be included in the bioassay program. (12.5.3.7.2) 36. The minimum frequency will be at least one in vivo measurement per year for those persons in the program. (12.5.3.7.2) 37. In the event that results of in vivo measurements indicate a radionuclide present at greater than 10 percent of the maximum Permissible Organ Burden an excreta bioassay will be performed. (12.5.3.7.2) IX. Airborne Radionuclide Control, Assessment, and Personnel 38. To assure an adequate program for respiratory protection, the following controls are incorporated into the program: (12.5.3.8) a. Each respirator user is advised that he may leave an airborne radioactivity area for psychological or physical relief from respirator use.				

A - ACCEPTABLE U - UNACCEPTABLE N/A - NOT APPLICABLE

MIDDLE SOUTH UTILITIES SYSTEM

LOUISIANA POWER & LIGHT

AUDIT CHECKLIST

AUDIT NO.: SA-W3-QA-82-03

SHEET 8 OF 10

REFERENCE: WSES-FSAR-Unit 3 12.5 Health Physics Prog.

ITEM TO BE AUDITED	A	U	N/A	COMMENTS
IX. Airborne Radionuclide Control, Assessment, and Personnel				
38. b. Sufficient air samples and surveys are made to identify the various radionuclides present and to estimate the individual exposures so that selection of appropriate respiratory equipment can be made in accordance with 10CFR20.103. (12.5.3.8)				
c. Training procedures are established to assure correct fitting, use, maintenance, and cleaning of the various types of respiratory equipment.				
d. Each employee will be individually fitted prior to use.				
e. Bioassays will be performed in accordance with plant procedures and, as required, to evaluate individual body burdens of radionuclides and to assess the overall effectiveness of the respiratory protection program. (12.5.3.8)				
X. Radioactive Material Safety Program				
39. Procedures specify handling techniques, storage, and other safety considerations for radioactive material as listed below: (12.5.3.9)				
a. Proper labeling of all radioactive material (per 10CFR20).				

A - ACCEPTABLE U - UNACCEPTABLE N/A - NOT APPLICABLE

MIDDLE SOUTH UTILITIES SYSTEM

LOUISIANA POWER & LIGHT

AUDIT CHECKLIST

AUDIT NO.: SA-W3-OA-82-03

SHEET 9 OF 10

REFERENCE: WSES-FSAR-Unit 3 12.5 Health Physics Prog.

ITEM TO BE AUDITED	A	U	N/A	COMMENTS
X. Radioactive Material Safety Program 39. b. Inventorying of licensed sealed radioactive sources in accordance with plant procedures. c. Leak testing of sealed sources at six month intervals in accordance with license conditions. d. Monitoring of all packages received containing radioactive material in accordance with 10CFR20.205. (12.5.3.9)				

A - ACCEPTABLE U - UNACCEPTABLE N/A - NOT APPLICABLE

MIDDLE SOUTH UTILITIES SYSTEM

LOUISIANA POWER & LIGHT

AUDIT CHECKLIST

AUDIT NO.: SA-W3-QA-82-03

SHEET 10 OF 10

DRAFT QA of Training (4)

4.0 INTRODUCTION

4.1 The Waterford-3 Nuclear Power Plant is in the final stages of construction and startup. The present schedule calls for the start of hot functional testing in January 1983 with initial fuel loading anticipated for May 1983.

4.2 The Waterford-3 Final Safety Analysis Report requires that prior to fuel loading a training program be implemented to ensure that all personnel possess the fundamental skills, technical knowledge, and plant specific qualifications necessary to work safely and efficiently and to understand the effect of their actions on plant safety and operations.

4.3 The Waterford-3 Operational Quality Assurance Organization has requested that MAC evaluate the training program. The evaluation was covered in two specific phases. The first phase was performed in an LP&L Audit Report (re: SA-W3-TS-82-03) with MAC personnel acting as audit team members. The Lead Auditor was an LP&L employee. The audit was conducted to determine if the provisions of the FSAR, Program Management Descriptions (PMD's) and procedures were consistent with each other and if they provided adequate criteria to implement the program. The audit identified several areas of concern which includes document inconsistencies, lack of a document hierarchy and confusion regarding applicable FSAR and ANSI requirements.

4.4 During the second phase MAC was requested to perform a separate evaluation to ensure that the initial training program is adequate to assure NRC acceptance prior to fuel loading. The scope of the evaluation included a review of the Waterford-3 initial operations training program including the following training sub-units defined in the FSAR Section 13.2:

- Cold License Operator Training
- Non-Licensed Operator Training
- Shift Technical Advisor Training
- Instrumentation and Control Training
- Mechanical Maintenance Training
- Electrical Maintenance Training
- Chemistry Technician Training
- Radwaste Training
- Training for Health Physics Technicians
- Engineering Personnel Training
- Training for Nuclear Engineering Personnel
- Fire Protection Training

FSAR Section 13.2 specifies the training program requirements for each training sub-unit noted above.

4.5 The following guidelines were agreed upon with LP&L for performance of the evaluation:

- determine the baseline requirements
- determine if baseline meets FSAR and ANSI 3.1 - 1978

requirements
- have adequate procedures been developed and implemented
- has adequate documentation been generated to support the training program
- has training schedules been developed to ensure that required plant personnel will be trained prior to fuel loading

4.6 The main body of this report includes an evaluation of each training sub-unit as noted in 4.4 above. The report defines problem and potential problem areas as "Findings", "Concerns" and "Comments". "Findings" have been defined as direct violations of requirements which are considered serious in nature and (in MAC's opinion) will effect acceptance of the training. "Concerns" are less serious violations which if not corrected (in MAC's opinion) could have a direct effect in acceptance of the training. Finally, "Comments" cover areas where although the program is not in violation of requirements, improvements could be made.

5.0 MAIN BODY

5.1 Cold License Operator Training

The Nuclear Training Manager (Implementation) and Operations Training Supervisor were interviewed regarding the Cold License Operator Training Program. As a result of these interviews and evaluation of supporting data the following problems were noted.

5.1.1 Finding - Procedures are not available for the initial training of Cold License Operators. Discussions with the Training Manager and Operations Training Supervisor noted that in their opinion the FSAR Section 13.2 adequately defines and controls the training program. This position is contrary to the requirements of the FSAR Chapter 17.2, 10CFR50 Appendix B Criterion 5 and the Waterford-3 QA Manual Section QR-5.0 which require that all safety related activities be described in procedures or instructions. It was further noted that this position was not consistent with the balance of the Training Program which has been documented in PMD's and procedures.

5.1.1.1 Recommendation - It is recommended that the initial Cold License Operator Training Program be described in Program Management Descriptions (PMD's) and procedures as appropriate.

5.1.2 Finding - Program Management Description PMD-TR-010 Rev.0 entitled "Nuclear Operations Department Training Program" paragraph 4.2.4 states that the Training Manager (Implementation) ...."Evaluates candidates for waiver of training and recommends certification of individuals who meet training objectives of waived topics." Paragraph 4.1.6 states that the Training Director approves the waiver of training for appropriate qualified individuals.

No records are available which indicate that an evaluation or approval has been accomplished for waivers of training

requirements. Review of figure 2.1 indicates that numerous candidates have had training requirements waived. Subsequent discussions were held with the Training Manager (Implementation) who noted that he was not involved in the day to day dealings in this area and referred the evaluator to the Operations Training Supervisor. He did note however, that he thought any such waivers would certainly be based upon some type of examination.

The Operations Training Supervisor was not aware of the procedural requirements regarding waivers nor that the Training Manager has assigned him this responsibility. He noted that waivers were not formally documented except on an informal list of candidates and training requirements (see figure 2.1). It could not be determined who had in fact assigned these waivers. Further investigation with the Training Administrator and the Office of the Training Director confirmed that no information is available as to who was responsible for waiving training requirements.

5.1.2.1 Recommendation - Training Department should comply with the requirements of PMD-TR-010. All waivers should be documented including the basis of the waiver.

5.1.3 Finding - Program Management Description PMD-TR-010, Rev.0 paragraph 7.2.3 requires that the Operations Training Supervisor propose training updates based on review and evaluation of industry events, regulatory actions, plant modifications and input from Nuclear Operations. The requirement was discussed with the Training Manager's for implementation and development. At present there is no systematic review of such data for incorporation into the Training Program. The Managers noted that the PMD implementing procedures defining department responsibilities and interfaces have not been developed to date. The Training Manager (Development) noted that some LER's are passed to him by the Operations Assessment and Information Dissemination Group for consideration, but it is not, at present, an adequate system. The primary reason given for not developing and implementing procedures to date was attributed to a lack of manpower.

5.1.3.1 Recommendation - Procedures should be implemented defining the responsibilities and interfaces as soon as possible. The Training program should also be evaluated in terms of any recent changes in requirements.

5.1.4 Concern - The employment experience and education verification documentation for the following cold license operator candidates could not be verified:

Booher, R.	McCann, J.
Clark, D.	Olsen, D.
Crouch, D.	Peeler, G.

Davie, G. Perhala, G.
Maley, J.

Note: All candidates above have had several training requirements waived. It has been assumed that they were waived due to past experience and education.

The Training Department has no records or personnel recollection of verifying any experience or education requirements. The Training Manager (Implementation) noted that in the past, viewing a resume, college diploma or RO/SRO License was sufficient. The evaluator was referred to the personnel department.

An interview was performed with Yolanda M. Barkate, LP&L Personnel Representative regarding LP&L verification of employee experience and education. Ms. Barkate noted that it is not LP&L policy to require formal verification of experience and education claimed on resumes. It was noted that from time to time a person's experience may be questioned and a phone call made to a past employer. This contact is normally not documented.

5.1.4.1 Recommendation - A program for experience and education verification be implemented for all Waterford-3 employees. Documented evidence should be available in each personnel file. This requirement is critical since entry level qualification, certifications and training requirement waivers may be based upon past experience.

It has been MAC's experience that when problems have been identified at other plants by the NRC, experience and education, including verification, have come under close scrutiny of the NRC.

→ 5.1.5 Concern - The cold license operator training curriculum was reviewed in accordance with the training requirements of FSAR Sections 13.2.1.1 and 13.2.1.1.1. The following list of training course descriptions was supplied by the Operations Training Supervisor.

Academic Refresher
Power Plant Fundamentals
* Research Reactor Training
NSSS Lectures (old course)
* Observation Training
* Simulator Training * Recertification if needed
* Advanced Theory I
* Advanced Theory II
Behavioral Science
Health Physics (old course)
Tech Spec's (old course)
* DEH Course

- BOP Systems (old course)
* NSSS Lectures
* BOP Systems
Emergency Planning
* Health Physics
* Procedures
* Tech Spec's
* Fuel Handling
* Reactor Theory
* Transient Analysis
Intensive Review
* Final Audit Exam

Those requirements with an asterisk denote those requirements which the Training Supervisor is requiring to be completed prior to cold licensing. Based upon the evaluator's review of the above requirements it appears that the Training Supervisor is requiring that candidates only meet the requirements of the Cold License Training Program identified in 13.2.1.1.1 of the FSAR along with select requirements from the original requirements identified in FSAR Section 13.2.1.1. It appears that the original and revised programs have some duplication, however, the FSAR is not clear in differentiating between them, nor applicability of the various requirements.

⇒ 5.1.5.1 Recommendation - It is recommended that the program applicability be officially clarified in terms of all license candidates. The present informal requirements selection by the Training Supervisor could lead to problems with regulatory personnel at time of cold licensing. It should be noted that the FSAR is misleading in that it appears that all cold license candidates did attend the original training prior to implementation of the revised program, when in fact many of the later candidates did not attend them.

5.1.6 Concern - A random sample of cold license candidate training record files and backup data was reviewed to ensure that their training meets FSAR commitments and is adequately documented.

Training files for the following candidates were reviewed:

Edwards, J.	Mitchell, D.
Jones, M.	Tillman, M.
Olsen, D.	Booher, R.

All training records including course descriptions, attendance sheets, performance records and exam papers are on file with the Training Department. The training files for the above applicants were found to include the following enclosures as applicable (per UNT-3-002).

- Section 1 - G-1 Form-Previous training and experience record.

- Section 2 - G-2 Form-Employee check in and orientation summary.
- Section 3 - GET-1 Form-General Employee Checklist.
- Section 4 - G-3 Form-Training Summary.
- Section 5 - OI Licensed Operator Requal. Summary.
- Section 6 - G-4 Form-Summary of Qualifications.
- Section 7 - Certifications.

The G-3 "Training Summary" was checked against an informal candidate status document (fig. 2.1) supplied by the Training Department. This informal document was the only document available at the time of the evaluation indicating course completion status. The following training record errors were noted during the review:

Jones, M.

The G-3 Form indicates that the applicant attended the "Research Reactor Course" in July 1980. The course attendance sheets and exams were available however, the instructor's performance record was not available in the file.

Mitchell, D.

The G-3 Form indicates attendance of Reactor Theory Course from 10/18/82 through 12/5/82. Review of actual course data, attendance sheets, etc. indicate attendance between 10/18/82 and 11/5/82.

The instructor's performance record for the Research Reactor Course was not available in the training files. Support information that the candidate did attend the course (i.e., attendance sheet & exams) are available.

Tillman, M.

The G-3 Form indicates attendance of Research Reactor course in June/July 1980. Training records, attendance sheets, etc. indicate that actual attendance was June/July 1978.

The G-3 Form indicates observation training performed at San Onofre on 1/22-2/5/81, however, no backup data is available in file. It should be noted that the candidate also attended Observation Training at St. Lucie which does have backup data in the file.

Based upon the small sample taken and level of training record completion it appears that the records may have a considerable number of administrative deficiencies. It appears that approximately 40% of the cold licensed candidate training records are presently available in the file due to in-process courses; future courses; and awaiting student grades from contractors who performed outside training.

5.1.6.1 Recommendations - It is recommended that both Training Department and QA place a greater involvement in

- reviewing training record files and as the training is completed. It was further suggested to the Training Manager (Implementation) that remedial action be taken to attain a higher degree of accuracy by the Training Dept. Administrative staff. The bottom line remains however, that based upon this sample of records, adequate training records and support data will be available for licensing application.

5.1.7 Comment - ANSI 3.1, 1978 paragraph 5.0 "....requires that a training schedule be established for each Nuclear Power Plant to initially develop and maintain an organization fully qualified to be responsible for operation". It further states that the program shall ensure that fully trained Operating,....personnel are available in the necessary numbers when fuel loading commences.

Discussions with the Training Supervisor noted that no formal schedule of training exists. An informal bar chart (fig. 2.2) was presented to the evaluator which represented courses completed and a rough estimate of future courses during 1982 and 1983. The Training Supervisor noted that it was not actually a schedule, but a reference document for himself. He noted that any schedule would have to be based on each individual due to different starting times and course completions by the Cold License Operator Candidates. He finally noted that schedules should be available to better coordinate training sequences and completions, however a lack of manpower has restricted any effort in this direction.

5.1.7.1 Recommendation - It is recommended that schedules be developed and implemented for cold license candidates training for the reasons noted above.

5.2 Non Licensed Operator Training (NLOT)

The Training Manager (Implementation), Operation Training Supervisor and Non Licensed Training Coordinator were interviewed regarding the nonlicensed operator training program. The evaluation was performed against the requirements of the FSAR Section 13.2.1.3.1 and PMD-TR-006. As a result of these interviews and evaluation of supporting data, the following problem areas were identified.

5.2.1 Finding - The non-licensed training program has not been developed or implemented in accordance with the requirement of the FSAR Section 13.2.1.3.1 or PMD-TR-006. In lieu of a program defined in the requirements, a separate program has been implemented based upon an internal memo. Louisiana Power & Light memo W3T82-0245 dated May 20, 1982 from C.J. Toth to C.J. Sabri deals with Nuclear Auxiliary Operator Training. The letter states that the non-licensed operator trainig program described in PMD-TR-006 cannot be accomplished prior to fuel load due to:

- Excessive Operations Workload

- Manpower presently assigned to non-licensed training cannot develop and instruct the program within the time allotted.

- It further states that in order to accommodate the need for qualified personnel 30 days prior to fuel load, it is necessary to delay the instruction of certain topics of the NLOT Program and provide only those necessary for watch standing qualifications. Therefore, the Nuclear Auxiliary Qualification Program has been developed to temporarily replace PMD-TR-006.

The Nuclear Auxiliary Qualification program is not documented in a procedure or the FSAR. The program is identified in a series of numbered internal memorandums. As a result of review of the memos and assorted program documents, (i.e., checklists) it appears that the program is extensive in scope and requires a great deal of self-study on the part of the student. Documentation for completion of each self-study assignment and verification of practical factors is required on the forms checked. However, no procedure is available defining responsibilities, documentation and interfaces.

5.2.1.1 Recommendation - It is recommended that all deviations from FSAR commitments be identified. A decision should then be made as to whether it is necessary to revise the FSAR to fall in line with what is actually being done. Upon approval of the revised FSAR, PMD-TR-006 should be revised to include the Nuclear Auxiliary Qualification Program for training/qualification prior to fuel loading.

5.3 Shift Technical Advisor (STA)

The Training Manager (Implementation) and Engineering Training Supervisor were interviewed regarding the STA Training Program. The STA Training Program has been developed and is in the final stages of implementation. The scheduled completion and certification of Shift Technical Advisors is planned for April 1, 1983.

The STA Training Program described in PMD-TR-005 Rev.0 "Program Description For Shift Technical Advisor's Training" appears to have been implemented in accordance with FSAR requirements. Lesson plans governing the various elements of training program were on file in the training files. Backup data including course attendance records and grades were also available for students. The personnel training files were not reviewed due to their present status of being upgraded. However, it was noted that engineering had done a good job in developing and cataloging their files.

The Engineering Training Supervisor noted that all plant and nuclear engineering personnel had completed or were near completion of the STA Training Program.

PMD-TR-014 Rev.0, paragraph 5.2 entitled "Training Objectives" requires that the training program be formulated to take into account each

individuals training based on experience, the intended position and a position task analysis. The follcwing finding was noted.

5.3.1 Finding - The requirements of PMD-TR-014 paragraph 5.2 has not been implemented for Shift Technical Advisors, Plant Engineering or Nuclear Engineering personnel training. A "Position Description Form", form number DL-81-164-101 Rev.0 has been developed. This form defines the position responsibilities, education and experience requirements for Associate Engineers I/II, Nuclear Engineers and Nuclear Utility Engineers. The forms have not been completed to date, nor has a position task analysis been performed.

5.3.1.1 Recommendation - It is recommended that the requirements of PMD-TR-014 paragraph 5.2 be met.

5.4 Mechanical Maintenance Technician Training - Several discussions were held with the Training Coordinator for Mechanical Maintenance Technicnians. The following summarizes that discussion.

The Training Coordinator is new to the job and was not familiar with much the background for the training program nor the procedures for filing training records. He is trying to get a handle on the program and had a very positive attitude about his job.

One of the major elements of the MM training program is a series of self-study manuals put out by Technical Publishing Company (TPC). The manuals are generic rather than plant specific. The TPC manuals do have tests that give some measure of the amount of comprehension.

A training schedule for systems training has been set up (See Figure 2.6). The Training Coordinator expects to have a sufficient number of technicians qualified for each system to be able to support fuel loading. He does not expect that all technicians will be qualified for all systems, however.

5.4.1 Finding - The MM training course material has not been reviewed and approved by the Training Department as required by PMD-TR-010, paragraph 5.2.9.

5.4.1.1 Recommendation - The MM training material be submitted to Training Department for their review and approval.

5.4.2 Concern - The MM training program provides specific training and qualification requirements for level A, B and C mechanics. However, the lead A, B and C classifications are basically pay categories in LP&L based on experience rather than the criteria established at Waterford-3. This can create problems when MM personnel are transferred in or temporarily assigned during outages and modifications.

5.4.2.1 Recommendation - The training and qualification classification for MM personnel at Waterford-3 should be distinguished from the LP&L level A, B, & C classification for pay purposes. The training and

- qualification should reflect what kinds of work and on what system the technician can work.

5.4.3 Comment - ANSI Standard 3.1-1978 discusses the training for operators, technicians and maintenance personnel. The requirements for maintenance personnel are "a high degree of manual dexterity and ability and should be capable of learning and applying basic skills". The Waterford-3 program classifies maintenance personnel as technicians and has an extensive set of training requirements. This extension of requirements will make it difficult to qualify the maintenance force and create problems during outages and modifications when temporary forces are brought aboard who have not met the Waterford-3 criteria.

5.4.3.1 Recommendation - The practice of classifying maintenance personnel as technicians should be reevaluated. The training requirements should be brought more in line with standard requirements and general industry practice, at least in so far as commitments to the NRC are concerned.

5.4.4 Comment - The training of MM personnel was reported to be subject to being pre-empted at any time the work load increased. This could jeopardize the chances of having a maintenance force which meets training commitments.

5.4.4.1 Recommendation - Every effort should be made to adhere to the training schedule This may require the temporary addition of more maintenance personnel.

5.5 Electrical Maintenance Technician - The Electrical Maintenance Technician Training Coordinator was interviewed to determine the status of training. The following summarizes the results of that discussion.

The training program is underway and lesson plans have been approved by the Training Department or are in the process of being approved. A detailed schedule has been developed for training through April 29, 1983 at which time all of the present group of EM Technicians should have completed all of their required training. (See Figure 2.7). There were some areas of concern or comment as described below.

5.5.1 Concern - The EM Technicians Training catalog was revised and the order or title of same courses was changed. However, they used the same series of course designators (i.e., E-1, E-2, etc.) in the new catalog as in the old. As a result, the course designations cannot be used to record training without a course title, catalog reference date or both. This has caused problems for the records personnel.

5.5.1.1 Recommendation - Consideration should be given to backfitting records to assure that a course designation has a consistent meaning. Any further revisions to the course catalog should not use designations differently than previously.

5.5.2 Concern - See Concern 5.4.2 for Mechanical Maintenance Technician Training. The same situation exists for EM Technicians.

5.5.3 Comment - See Comment 5.4.3 for Mechanical Maintenance Technician training. The same situation exists for EM Technicians.

5.6 Fire Protection Training - The Fire Protection training program is proceeding in a manner which will enable it to meet its scheduled commitments. The staff is motivated and resourceful in using Delgado Community College and other available training resources. The fire protection responsibility for Waterford-3 is in transition beginning January 3, 1983 for thirty days, transferring from Ebasco to LP&L.

Fire protection lesson plans have been prepared and are ready for use, with the exception of approval by Training Manager.

5.6.1 Comment - The records for fire protection training in the official training files were minimal and obviously inadequate for the amount of training required and the number of people involved. Due to a shortage of time and unavailability of the Fire Protection Training Coordinator when some time was available, the reasons for the record situation is not known. It is believed, however, that transfer of records to the files is at least part of the problem.

5.6.1.1 Recommendation - Records should be brought up to date in the official files as soon as possible. This is particularly significant in view of the impending transfer of fire protection responsibility from Ebasco to LP&L.

5.7 Chemistry Technician Training

The Chemistry Technician Training Coordinator and the Supervisor, HD/Chemistry Training were interviewed regarding the Chemistry Technician training program. The following summarizes the results of those interviews.

The training program for Chemistry Technicians has not yet been developed. LP&L is in the process of contracting with an outside contractor to develop and present a training program. The program will be in modular form and can be later presented by LP&L if desired. The baseline for the training program is to be ANSI 3.1-1978. The INPO Guideline for Chemical Technician Training was considered but added little other than course titles and times.

LP&L did some Chem Tech training of its own and with what was considered to be good results. Unfortunately, most of the employees who received the training left shortly thereafter to go with other companies. To try to reduce losses in the future, candidates for the Chem Tech positions are being recruited from the local population. The results of this recruiting effort have been satisfactory in that all present candidates have either two years of college chemistry or work experience judged to

be equivalent.

According to the training coordinator, the Chem Tech candidates have been divided into two groups. One group will concentrate on qualifying for the primary systems while the other concentrates on the secondary systems. Once they complete this training they will switch and concentrate in the other area. They expect to have one group fully qualified for primary and one fully qualified for secondary even though neither group may have completed the full program.

5.7.1 Finding - Qualification Card records for training already accomplished are not current.

5.7.1.1 Recommendation - Training records be brought up to date and transferred to the records file in the Training Department.

5.7.2 Concern - Considering the amount of time remaining until the anticipated fuel load date, the program outlined for Chem Tech training is optimistic. There is little or no margin for error and any delay could impart the fuel load date. In addition, such intense schedule pressure could lead to short cuts which would degrade the quality of the training from the level desired.

5.7.2.1 Recommendation - The Chemical Technician training program should be initiated immediately and monitored very closely. Any development which could threated either the training schedule or the quality of training should be brought to management's attention immediately.

5.7.3 Concern - The Training Coordinator for Chemical Technicians had no prior nuclear experience before coming to Waterford-3 in early 1982. In addition, the coordinator is working as a Chem Tech and will be taking training with others.

5.7.3.1 Recommendation - The Training Coordinator should be given as much support as possible and relieved of an many duties as possible which do not relate to her job as coordinator or to her qualification upgrading.

5.8 Radwaste Training

The Training Coordinator for Radwaste Training was interviewed. The status of the Radwaste Training Program is as follows.

There is little industry guidance available on Radwaste Training. The LP&L program is based on the knowledge of the people responsible for its development. (The Training Coordinator taught in the Nuclear Engineering Department at Mississippi State University as well as having extensive industry experience).

The lesson plans for the courses have been developed but have not yet been approved by the Training Department. They are scheduled to begin the Radwaste specific training of February 24, 1983 and complete it by

March 9, 1983. (See Figure 2.3-Radwaste Department Training).

5.8.1 Concern - The amount of time remaining before anticipated fuel load is short. Any significant slippage in the schedule of Radwaste training could adversely affect the licensing process.

5.8.1.1 Recommendation - The Radwaste training program should be monitored closely. Any development which could threated the training schedule or quality of training should be brought to management attention immediately.

5.9 Health Physics Technician Training

The program for training Health Physics Technicians was discussed with a candidate for Junior Health Physics (HP) Technician in the absence of the Training Coordinator for HP. A brief conversation was later held with the Training Coordinator. The Junior Tech candidate has been assisting the coordinator in developing and implementing the HP training program.

The lesson plans for HP training are in various stages of completion. The Junior Tech I plans are developed and approved. The Junior Tech II plans are developed but have not yet been approved by the Training Department. The Junior Tech III plans are currently being developed. All training is supposed to "satisfy the intent of INPO guidelines".

There are 18 candidates working toward Senior Technician. In order to be ready for fuel load, 10 Senior Techs must be certified. The necessary training programs are scheduled to provide enough Senior Techs to support the anticipated fuel load schedule. (See Figure 2.4, HP Training).

5.9.1 Concern - In examining training records, the summary of experience form was missing from the training folder of the Training Coordinator and the Junior HP Tech candidate who is assisting him. Since there is not presently a PMD for training records, there is no specific requirement that could be identified. However, experience records were found in other folders.

5.9.1.1 Recommendation - The personnel training records for persons involved in the HP program should be examined and updated as necessary.

5.9.2 Concern - The short time remaining to anticipated fuel load will require strict adherence to proposed schedules in order to have an adequate number of Senior Techs.

5.9.2.1 Recommendation - The HP training program should be monitored regularly. Any development which could threated the schedule or the quality of the training should be reported to management immediately.

5.10 Plant/Nuclear Engineering

The Nuclear Training Manager (Implementation) and Engineering Training Supervisor were interviewed. The interviews were conducted to determine if engineering training is being performed in accordance with the FSAR Sections 13.2.1.3.10, 13.2.1.3.11 and PMD-TR-014 entitled "Engineering Training". Review of the "Engineering Training Matrix", which defined what engineering training is planned prior to fuel load, lists the following required courses:

- GET I, II and III
- First Aid
- Emergency Plan
- Radiation Assessment
- Plant Operating Manual (Qualification Card)
- System Training
- Qualification Card (Position Specific Training)

The Engineering Department plans on developing a qualification card program in lieu of training as defined in the FSAR and PMD-TR-014. The qualification card program will include the plant operations manual and position specific training. The qualification card program will be similar to the non-licensed training program. The program will rely on a self-study program in lieu of contact training. The following finding was noted.

5.10.1 Finding - The engineering training program does not meet the requirements of the FSAR. The Engineering Training Supervisor noted that the following engineering personnel training courses required by the FSAR Section 13.2.1.3.10 have not been developed or implemented to date:

- Job Specific QA/QC Course
- Codes and Standards Course
- Discipline Cross Training Course
- Position Specific Training Course

It was noted however, that engineering personnel have attended numerous training courses from other plant organizations and outside contractors which could be equal to or above an engineering training requirement. The Engineering Training Supervisor has not evaluated these courses for possible substitution in place of specific engineering training course requirement. (i.e., all engineers have attended STA training).

The Engineering Training Supervisor stated that he was of the opinion that completion of the FSAR training requirements were not mandatory for engineers prior to fuel loading. He indicated that he only considered those courses identified in the "Engineering Training Matrix" as being mandatory prior to fuel loading.

5.10.1.1 Recommendation - It is recommended that the engineering training group review the program being implemented against those required by the FSAR. A decision should then be made to either

update the program to meet FSAR commitments or amend the FSAR accordingly. If there are matters of FSAR interpretation, official responses should be obtained from the LP&L Licensing Department.

It is equally important to amend and/or develop PMD's and procedures to precisely reflect what is actually being done.

5.11 Instrumentation and Control Technician Training

The Training Coordinator for I&C Training was interviewed. The results of that interview are discussed below.

The training program for I&C technicians is well underway and appears able to meet the schedule goals. (See Figure 2.5 - I&C Training Schedule). The program is based on INPO Guidelines and is designed to bring a high school graduate through a series of steps to I&C Technician status. The requirements for training level I and II were well defined.

Instructor guides were in place and approved by the appropriate levels of management in the Training Department.

The I&C Training Coordinator is doing an excellent job in evaluating I&C Technician candidates to determine their training needs. There is a problem in the documentation of this evaluation which is discussed below.

5.11.1 Finding - I&C Technician candidates are evaluated to determine training needs against a predetermined checklist of requirements. This evaluation is, in effect, a waiver of requirements which requires approval by the Training Director per paragraph 4.2.4 of PMD-TR-010. This approval has not been accomplished.

5.11..1 Recommendation - The summary of training needs for I&C Technician candidates should be submitted to the Training Manager, along with the checklist which records the justification for waiver of requirements. Upon acceptance by the Training Manager, the material can then be forwarded to the Training Director for approval.

5.11..2 Comment - PMD-TR-027 states that a Level 1 I&C Technician can work on systems not adversely affecting plant operations. FSAR 13.2.1.3.3 states Level 1 can work on components or systems that are not safety related.

5.12 General Employee Training - The General Employee Training Program appears to be functioning very well. Instructor guides have been approved and are being used. In the GET 2 course Radiation Protection, a screening examination is used to justify a waiver for an experienced individual to attend a short course designated GET 2A. The same examination is used for GET 2 and 2A.

REFERENCE: PMD-GO-020, Rev. 0

ITEM TO BE AUDITED	A	U	N/A	COMMENTS
References for this audit checklist were: a. PMD-GO-020, Rev. 0 b. Waterford 3 SES Environmental Report c. Waterford 3 SES Radiological Effluent Technical Specifications d. U.S. Nuclear Regulatory Commission, Regulatory Guide 4.15 e. Branch Technical Position of the NRC Radiological Assessment Branch f. NUCREG 0472, Radiological Effluent Technical Specifications for PWR's				
1. Project Support Manager - Nuclear				
a. Has ultimate responsibility for activities governed by this program. (4.1.1)	✓			
2. Quality Assurance Manager				
a. Ensures the adequacy of implementation of the requirements of this program and requirements of applicable regulatory documents. (4.2.1)	✓			See auditors Note #1
b. Ensures a periodic audit of this program. (4.2.2)	✓			

A - ACCEPTABLE U - UNACCEPTABLE N/A - NOT APPLICABLE

LOUISIANA POWER & LIGHT
MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO.: SQA-GO-83-01
SHEET 1 OF 13

FOIA-84-206
A/5

5

REFERENCE: PMD-GO-020, Rev. 0

ITEM TO BE AUDITED	A	U	N/A	COMMENTS
3. Radiation Control Engineer				
a. Ensures performance of radiological environmental monitoring as instructed by this program, applicable procedures, and regulatory permits. (4.3.1)		✓		See auditors note #2
b. Ensures proper qualification of personnel collecting, preparing, and analyzing environmental samples according to this program. (4.3.2)		✓		See auditors note #3
c. Ensures maintenance of an adequate records system which provides complete sample traceability. (4.3.3)		✓		See auditors Note #3
d. Ensures timely preparation of reports relating to radiological environmental events described in regulatory permits or requirements. (4.3.4)		✓		See auditors Note #3
e. Provide annual review of the program and applies corrective actions as appropriate. (4.3.5)			✓	See auditors note #4
4. Licensing Engineering Supervisor - Nuclear				
a. Provides for final review and submittal of all reports to regulatory agencies. (4.4.1)			✓	See auditors note #5

A - ACCEPTABLE U - UNACCEPTABLE N/A - NOT APPLICABLE

MIDDLE SOUTH UTILITIES SYSTEM

LOUISIANA POWER & LIGHT

AUDIT CHECKLIST

AUDIT NO.: SP-W3-QP-83-01

SHEET 2 OF 13

REFERENCE: PMD-GO-020, Rev. 0

ITEM TO BE AUDITED	A	U	N/A	COMMENTS
5. Program Administration				
a. The Radiation Control Engineer administers the radiological environmental monitoring program with the aid of the plant and corporate Health Physics staff. (5.1.1)	✓			
b. Procedures shall be developed which specify the operational and quality control requirements of the program. (5.1.2)	✓			
6. Sampling Location and Analysis Criteria				
a. The environmental monitoring program shall be conducted by LP&L personnel and contract laboratory responsible to LP&L for quality and reliability for results of analysis. (5.2.1)	✓			See auditors Note #6
b. Are the requirements and sampling locations for the program as provided in references (b) through (f) being met? (5.2.1)	✓			
7. Personnel Qualifications				
a. Personnel responsible for collecting, preparing, and analyzing environmental samples shall have relevant experience in these areas in accordance with reference (d), the acceptability will be decided by the Radiation Control Engineer. (5.3.1)		✓		See auditors Note #1

A - ACCEPTABLE U - UNACCEPTABLE N/A - NOT APPLICABLE

LOUISIANA POWER & LIGHT
A MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO.: SP-W5-GO-020

SHEET 2 OF 13

REFERENCE: PMD-GO-020, Rev. 0

ITEM TO BE AUDITED	A	U	N/A	COMMENTS
8. Those personnel with no previous experience shall be qualified by the following as a minimum:				
a. On-the-job instruction and performance shall be verified by a qualified individual in accordance with item 7. (5.3.2.1)			✓	See auditor's Note # 7
b. For each activity that is completed during the qualification; the activity, associated procedure, date, time, satisfactory or unsatisfactory completion and signature of the observer shall be entered on the appropriate qualification form. (5.3.2.1)			✓	
c. A copy of this form shall be maintained in the individual's file. (5.3.2.1)			✓	
d. Successful completion of a written examination, to be administered by a qualified individual in accordance with item 7, covering the procedures and instructions associated with this program is required for qualification. (5.3.2.2)			✓	
e. A copy of this examination shall be maintained in the individual's file. (5.3.2.2)			✓	
f. The written approval of the Radiation Control Engineer is required to complete qualification. (5.3.2.3)			✓	

A - ACCEPTABLE U - UNACCEPTABLE N/A - NOT APPLICABLE

LOUISIANA POWER & LIGHT
MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO.: [illegible]
SHEET 4 OF 13

REFERENCE: PMD-GO-020, Rev. 0

ITEM TO BE AUDITED	A	U	N/A	COMMENTS
9. The contract laboratory personnel shall be properly qualified according to the LP&L approved Quality Assurance Program. (5.3.3)		✓		See Audit's Note #7
10. Operating Procedures				
a. Written procedures shall be used for performing activities involved in the environmental monitoring program in accordance with reference (d). (5.4.1)		✓		See Audit's Note #8
11. Records				
a. The records to provide the ability to track and control a sample through the sequence of monitoring process shall cover the following: field collection of samples for subsequent analysis, including sample description; laboratory receipt and identification; preparation and analysis; radioactivity measurements of samples, instrument backgrounds and analytical blanks; and data reduction and verification. (5.5.1)			✓	See Audit's Note #9
b. Quality control records for laboratory counting systems shall include the results of measurements of radioactive check sources, calibration sources, backgrounds, and blanks. (5.5.2)			✓	
c. Records relating to overall laboratory performance shall include the results of analyses of quality control samples such as analytical blanks, duplicates, interlaboratory cross-check samples; standards and instrument calibrations. (5.5.3)			✓	

A - ACCEPTABLE U - UNACCEPTABLE N/A - NOT APPLICABLE

LOUISIANA POWER & LIGHT
MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO.: SA-415-GO-83-01
SHEET 5 OF 13

REFERENCE: PMD-GO-020, Rev. 0

ITEM TO BE AUDITED	A	U	N/A	COMMENTS
11. Records (continued)				
d. Records shall be maintained of air samples and TLD system calibrations, verification and documentation of computer programs, qualifications of personnel and results of audits. (5.5.4)			✓	See auditor's note #9
12. Quality Control in Sampling				
a. Instrumentation used to continuously sample liquids and gases shall be periodically tested to determine accuracy within specified limits. (5.6.1.1)			✓	
b. The results of these calibrations shall be recorded. (5.6.1.1)			✓	
c. The frequency of the calibrations will be specified based on the required accuracy, purpose, degree of usage, stability characteristics, and other conditions affecting the measurements. (5.6.1.1)			✓	See auditor's note #10
d. Replicate samples will be taken periodically to demonstrate reproducibility for continuous samples. (5.6.1.1)			✓	
e. Grab samples will be demonstrably representative of the material sampled and replicate samples will be taken periodically to demonstrate sampling reproducibility. (5.6.1.2)			✓	

A - ACCEPTABLE U - UNACCEPTABLE N/A - NOT APPLICABLE

LOUISIANA POWER & LIGHT
MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO.: SA-W3-GO-83-01
SHEET 6 OF 13

REFERENCE: PMD-GO-020, Rev. 0

ITEM TO BE AUDITED	A	U	N/A	COMMENTS
12. Quality Control in Sampling (continued)				
f. Procedures for sampling, packaging, shipping and storage of samples shall be designed to maintain the integrity of the sample from time of collection to time of analysis. (5.6.1.3)			✓	See Auditors note # 10
13. Radionuclide Reference Standards				
a. Radionuclide standards that have been certified by NBS or standards that are traceable to NBS shall be used when such standards are available. (5.6.2.1.1)	✓			
b. The details of the preparation of working standards from certified standards solutions shall be recorded. (5.6.2.1.2)	✓			
c. The working standard shall have the same physical form as the environmental samples, or be a close approximation thereto. (5.6.2.1.2)	✓			
d. Efficiency calibrations shall be performed periodically with standard sources. (5.6.2.1.3)	✓			
e. In addition, these calibrations shall be made whenever the need is indicated, such as when a significant change in the measurement system is detected by routine measurements with a check source. (5.6.2.1.3)	✓			See Auditors note # 11

A - ACCEPTABLE U - UNACCEPTABLE N/A - NOT APPLICABLE

LOUISIANA POWER & LIGHT
MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO.: SP-W-5-QA-83-01
SHEET 7 OF 13

REFERENCE: PMD-GO-020, Rev. 0

ITEM TO BE AUDITED	A	U	N/A	COMMENTS
14. Performance Checks of Radiation Measurement Systems				
a. Determination of the background counting rate and the response of each radiation detection system to appropriate check sources shall be performed on a scheduled basis for systems in routine use. (5.6.2.2.1)			✓	See auditors note #12
b. Appropriate investigative and corrective action shall be taken when the measured value falls outside the predetermined control value in accordance with LP&L approved laboratory procedures. (5.6.2.2.1)			✓	
c. For systems in which samples are changed manually, check sources shall be measured daily when the system is in use. (5.6.2.2.2)			✓	
d. For systems with automatic sample changes, the check source shall be included in each batch of samples to obtain a measurement of the source within each counting cycle. (5.6.2.2.2)			✓	
e. Background measurements shall be made frequently to ensure that levels are within the expected range. (5.6.2.2.2)			✓	
f. For systems with automatic sample changers, background measurements should be included within each measurement cycle. (5.6.2.2.2)			✓	

A - ACCEPTABLE U - UNACCEPTABLE N/A - NOT APPLICABLE

MIDDLE SOUTH UTILITIES SYSTEM

LOUISIANA POWER & LIGHT

AUDIT CHECKLIST

AUDIT NO.: SM-W3-GP-85-01

SHEET 8 OF 13

REFERENCE: PMD-GO-020, Rev. 0

ITEM TO BE AUDITED	A	U	N/A	COMMENTS
14. Performance Checks of Radiation Measurement Systems (Continued)				
g. Daily energy calibration checks shall be performed on spectrometry systems while in use. (5.6.2.2.2)			✓	See Auditor's Note #12
h. The results shall be recorded and compared to predetermined limits in order to determine the need for adjustment. (5.6.2.2.3)			✓	
i. Necessary adjustments will be performed by laboratory personnel in accordance with LP&L approved procedures. (5.6.2.2.3)			✓	
j. Checks for spectrometry systems include weekly energy resolution checks, daily count rate checks and checks after system changes (such as power failures or repairs) to determine if there has been any significant change in the system. (5.6.2.2.4)			✓	
k. The results of these measurements shall be recorded. (5.6.2.2.4)			✓	
15. Analysis of Quality Control Samples				
a. The analysis of quality control samples provides a means to determine the precision and accuracy of the monitoring processes and includes both intra-laboratory (in-house) and interlaboratory (EPA, DOE, labs, etc.) measurements. (5.6.2.3.1)			✓	See Auditor's Note #12

A - ACCEPTABLE U - UNACCEPTABLE N/A - NOT APPLICABLE

LOUISIANA POWER & LIGHT
MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO.: SAP-W/S-GO-83-01
SHEET 9 OF 13

REFERENCE: PMD-GO-020, Rev. 0

ITEM TO BE AUDITED	A	U	N/A	COMMENTS
15. Analysis of Quality Control Samples (continued)				
b. Analysis of laboratory blanks provides a means to detect and measure contamination of analytical samples and provides information on the adequacy of background subtraction. (5.6.2.3.2)			✓	See Auditor's note #12
16. Intralaboratory (In-house) Analysis				
a. Replicate samples, usually duplicates, shall be analyzed routinely. (5.6.2.4.1)			✓	
b. Replicates shall be prepared from samples that are as homogenous as possible. (5.6.2.4.1)			✓	
c. The size and other physical and chemical characteristics of the replicates shall be similar to those analyzed routinely. (5.6.2.4.1)			✓	
d. When true replicates cannot periodically be obtained, e.g., airborne materials, simulated samples may be prepared in replicate and analyzed. (5.6.2.4.2)			✓	See Auditor's note #12
e. Known analytical blanks shall be included frequently in groups of unknown samples that are analyzed radiochemically. (5.6.2.4.3)			✓	
f. Accuracy of the analytical results shall be checked by analyzing spiked and blank samples submitted as unknowns. (5.6.2.4.3)			✓	

A - ACCEPTABLE U - UNACCEPTABLE N/A - NOT APPLICABLE

MIDDLE SOUTH UTILITIES SYSTEM

LOUISIANA POWER & LIGHT

AUDIT CHECKLIST

AUDIT NO.: SA-113-GO-83-01

SHEET 12 OF 13

REFERENCE: PMD-GO-020, Rev. 0

ITEM TO BE AUDITED	A	U	N/A	COMMENTS
17. Intralaboratory (Independent Outside Laboratories) Analyses				
a. Analysis of environmental samples split with one or more independent laboratories will provide a means to detect errors that might not be detected by intralaboratory measurements described above. (5.6.2.5.1)			✓	See Auditor's Note #12
b. When possible, these independent laboratories should be those whose measurements (sources) are traceable to NBS. (5.6.2.5.1)			✓	
c. The contract laboratory shall participate in the EPA's cross-check program or an equivalent program to provide an objective measure of analytical accuracy. (5.6.2.5.2)	✓			
d. If the mean result of the cross-check analysis exceed the control limit as defined by the EPA, an investigation shall be made to determine the reason for the deviation and corrective action taken, and the Radiation Control Engineer notified. (5.6.2.5.2)			✓	See Auditor's Note #12
18. Computational Checks				
a. A substantial fraction of calculated results shall be verified independently by a knowledgeable individual other than the one performing the original calculation. (5.6.2.6.1)			✓	See Auditor's Note #12

A - ACCEPTABLE U - UNACCEPTABLE N/A - NOT APPLICABLE

LOUISIANA POWER & LIGHT
MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO.: SA-W3-GO-82-01
SHEET 11 OF 13

REFERENCE: PMD-GO-020, Rev. 0

ITEM TO BE AUDITED	A	U	N/A	COMMENTS
18. Computational Checks (continued)				
b. For computer calculations, the input data should be verified by a knowledgeable individual. (5.6.2.6.1)			✓	See auditor's Note #12
c. All computer programs shall be documented and verified before initial routine use and after each modification of the program. (5.6.2.6.1)			✓	
19. Review and Analysis of Data				
a. Data from all samples shall be reviewed and analyzed by personnel designated by the Radiation Control Engineer. (5.7.1)	✓			See auditor's Note #13
b. These reviews shall be performed on a timely basis. (5.7.1)	✓			
c. Investigative and corrective actions shall be taken for recognized deficiencies. (5.7.1)	✓			
d. These actions shall be recorded and approved in writing by the Radiation Control Engineer. (5.7.1)	✓			
20. Audits				
a. Planned and periodic audits shall be made by qualified individuals who do not have direct responsibilities in the area being audited. (5.8.1)	✓			See auditor's Note #13

A - ACCEPTABLE U - UNACCEPTABLE N/A - NOT APPLICABLE

LOUISIANA POWER & LIGHT
MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO.: ____ SHEET 12 OF 13

REFERENCE: PMD-GO-020, Rev. 0

LOUISIANA POWER & LIGHT
MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO.: SAP-GO-82-11
SHEET 13 OF 13

ITEM TO BE AUDITED	A	U	N/A	COMMENTS
20. Audits (continued)				
b. Audits shall be documented and reviewed by the LP&L Quality Assurance Manager. (5.8.1)	✓			See auditor's note #13
c. Findings and deficiencies shall be addressed by cognizant individuals and feedback provided to the auditing organization. (5.8.1)	✓			
d. Deficient areas shall be re-audited. (5.8.1)	✓			
21. Feedback				
a. Feedback on sample collection and preparation will be ensured by procedure review and personnel qualification. (5.9.1)	✓			See auditor's note #13
b. Feedback on analyses is obtained through the intra- and inter-laboratory checks. (5.9.2)	✓			
c. Quality Assurance audits will also provide information in identifying deficiencies. (5.9.2)	✓			
22. Program Evaluation				
a. An annual review of the program will be performed by the Radiation Control Engineer. (7.1)	✓			See auditor's note #13
b. This evaluation will be submitted to management within 30 days after the review. (7.1)	✓			

A - ACCEPTABLE U - UNACCEPTABLE N/A - NOT APPLICABLE

Master

LOUISIANA POWER & LIGHT / INTER-OFFICE CORRESPONDENCE

MIDDLE SOUTH UTILITIES SYSTEM

August 29, 1983

W3K83-1236
Q-3-A35.02.29

TO: Distribution

FROM: W. M. Morgan
Operations Quality Assurance Group Supervisor

SUBJECT: LP&L Quality Assurance Audit Report SA-W3-QA-83-19
"Environmental Monitoring Program (Non-Radiological)"

The subject audit report is forwarded for your information and/or action.

WMM:JBP:SSTG

Distribution: R. S. Leddick, R. P. Barkhurst, F. J. Drummond, T. F. Gerrets, W. A. Cross, C. Groome, J. Woods

cc: Central Records, Nuclear Records

FOIA-84-206
A/6

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT NO. SA-W3-QA-83-19

SHEET 1 OF 4

AUDIT REPORT

1. AUDIT SUBJECT: Environmental Monitoring Program (Non-Radiological)

2. AUDIT DATES: July 18, 1983 THROUGH: August 9, 1983

3. AUDITED ORGANIZATION(S) AND LOCATION(S):

   Nuclear Project Support Group
   Chemistry Department
   Waterford 3
   Killona, Louisiana

4. AUDIT TEAM:

   A. R. Roberts, Lead Auditor
   J. Smith, Team Member
   S. C. Petty, Team Member

5. AUDIT SCOPE:

   This audit focused on a review of the activities and documentation associated with the implementation of NPSG's, WSES-3 Non-Radiological Environmental Monitoring Program. A review of management responsibilities and QA Program controls was conducted as part of this audit.

6. PERSONS CONTACTED DURING THIS AUDIT:

   A. PRE-AUDIT:
      C. Groome
      C. R. Booth
      J. B. Perez
      J. Smith
      S. C. Petty
      A. R. Roberts
      W. M. Morgan

   B. AUDIT:
      C. Groome
      C. R. Booth
      B. P. Falgoust
      J. Smith
      S. C. Petty
      A. R. Roberts
      A. D. Jones
      M. S. Green

6. PERSONS CONTACTED DURING THIS AUDIT: (Continued)

C. POST-AUDIT: C. Groome
A. Roberts
J. B. Perez
W. M. Morgan

7. SUMMARY OF AUDIT RESULTS:

A. GENERAL (INCLUDING ALL ELEMENTS, COMMITMENTS AND PROCEDURES REVIEWED).

This audit was compared to the criteria 10 CFR 50, Appendix B I, II, V, X

The following Reference Documents were reviewed in the conduct of this audit:

1. Waterford 3 Environmental Report
2. POM, CE-3-105 Rev. 1
3. NPDES, Permit No. LA0007374

In order to formulate a checklist the audit team utilized the NPDES, Permit Number LA0007374.

The following pertinent procedures were reviewed during the conduct of this audit.

CE-3-128, Rev. 0, Chemical and Environmental Determination of Suspended, Nonfilterable Solids.

CE-3-133, Rev. 0, Chemical and Environmental Determination of Copper (Cuprithol Method).

CE-3-134, Rev. 0, Determination of Copper (Neocuproine).

CE-3-135, Rev. 0, Chemical and Environmental Procedure, Determination of Sulfide (15 pp6-5006).

CE-3-136, Rev. 0, Chemical and Environmental Determination of Sulfates 200ppm Spectrophotometric Method.

CE-3-137, Rev. 0, Chemical and Environmental Procedure, Determination of Sulfite.

CE-3-142, Rev. 0, Chemical and Environmental Procedure, Determination of Iron (0-100ppb).

CE-3-505, Rev. 1, Determination of Biological Oxygen Demand (BOD).

7. SUMMARY OF AUDIT RESULTS: (Continued)

B. EVALUATION OF QA PROGRAM EFFECTIVENESS AND IMPLEMENTATION.

The departmental QA Program appears satisfactory. However, it should be noted that the QA/QC Program of the contract laboratory responsible for performing the tests has not been evaluated.

8. UNRESOLVED FINDINGS OPENED DURING THIS AUDIT.

A. FINDINGS

1. Contract Laboratory responsible for performing samples for the program has not been audited nor approved for LP&L's vendor list.

2. Flow meters are unreliable.

3. Drainage pipe at discharge outlet 004 is broken.

B. OBSERVATIONS

The following observations were noted and require no written response.

1. Requirement:

The permittee shall at all times maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems installed or used by the permitter to achieve compliance with the terms and conditions of this permit. (NPDES 13/18)

Observation:

a. At discharge outlet 005B a protective grating cover is missing.

b. Ebasco Pit #3 is not draining properly. It has old stagnant discharge, and the area is very dirty and has a very bad odor.

c. At discharge outlet 002 (yard oil/water separator) the manhole cover is off (and appears to have been off for an extended period of time) and the barrels used for collecting the oil are not labeled properly.

AUDIT NO. SA-W3-QA-83-19

FINDING NO. N/A

SHEET 4 OF 4

8. UNRESOLVED FINDINGS OPENED DURING THIS AUDIT. (Continued)

B. 1, d. There are no safety chains installed at the discharge outlets. (NOTE: some discharge outlet stations have temporary barricades installed).

9. STATUS OF PREVIOUSLY IDENTIFIED UNRESOLVED FINDINGS.

Corrective action taken for findings 1 through 4 of QA Audit Report SA-W3-QA-83-01 were verified as being satisfactory.

The audit team wishes to express its appreciation for the excellent cooperation and assistance provided by NPSG and the Chemistry Department during the conduct of this audit.

10. SUBMITTED BY: A. Roberts (Team Leader) DATE: 8/29/83

APPROVED BY: W M Morgan (QA Manager or QA Engineer) DATE: 8/29/83

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT FINDING

AUDIT NO. SA-W3-QA-83-19

FINDING NO. 1

SHEET 1 OF 2

1. AUDITED ORGANIZATION: Environmental Monitoring Program(Non-Radiological)

   CONTACTS: Chati Groome

   AUDIT LOCATION: Waterford 3 SES
   Killona, Louisiana

2. REQUIREMENT:

   Monitoring and Reporting:

   3. For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information.

   A. The person(s) who performed the analysis.

   B. The analytical techniques or methods used. (NPDES 11/18)

3. FINDING:

   All samples except the Ph samples are performed by Enviro-Med Laboratories, Inc. Information concerning the contract laboratory's methods, procedures and analytical techniques are not available at present to the audit team.

4. AUDITOR'S RECOMMENDED CORRECTIVE ACTION:

   The audit team feels an audit should be performed by GO QA to insure that the laboratory is following approved procedures and utilizing proper analytical/techniques or methods in the performance of the laboratory tests.

   AUDITOR'S SIGNATURE: A Roberts DATE: 8/26/83

5. ACKNOWLEDGEMENT: This finding was identified during the conduct of an audit. As a member of the audited organization's management, your signature signifies acknowledgement of this finding, not necessarily agreement.

   SIGNATURE: [illegible] TITLE: Assist Env. Eng. DATE: 26 Aug 1983

   PLEASE COMPLETE ITEM 6 BELOW AND RETURN TO THE AUDITING ORGANIZATION WITHIN 30 DAYS OF YOUR ACKNOWLEDGEMENT.

AUDIT NO. SA-W3-OA-83-19

FINDING NO. 1

SHEET 2 OF 2

6. CORRECTIVE ACTION TAKEN: In the event that corrective action cannot be completed within 30 days, your response shall include a scheduled date for the corrective action.

7. CORRECTIVE ACTION VERIFICATION: The corrective action stated in item 6 above has been verified as complete and is acceptable. This finding is closed.

AUDITOR'S SIGNATURE: _____ DATE: _____

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT FINDING

AUDIT NO. SA-W3-OA-83-19

FINDING NO. 2

SHEET 1 OF 2

1. AUDITED ORGANIZATION: Environmental Monitoring Program - (Non-Radiological)

   CONTACTS: Chati Groome

   AUDIT LOCATION: Waterford 3 SES
   Killona, Louisiana

2. REQUIREMENT:

   The permittee shall at all times maintain good working order and operate as efficiently as possible all treatment or control facilities or systems. (NPDES 13/18)

3. FINDING:

   The flow meters in use at present are considered unreliable. At two discharge outlets, the flow meters were out of commission for more than 50% of the time during the month of June.

4. AUDITOR'S RECOMMENDED CORRECTIVE ACTION:

   Replace the present flow meters that are in use with a more reliable meter. A flow meter that is more suitable for the local elements is desirable. The flow meter in use at this time is extremely sensitive to high temperature.

AUDITOR'S SIGNATURE: A. Roberts DATE: 8/26/83

5. ACKNOWLEDGEMENT: This finding was identified during the conduct of an audit. As a member of the audited organization's management, your signature signifies acknowledgement of this finding, not necessarily agreement.

SIGNATURE: C. Groome TITLE: Associate Engineer DATE: August 1983

PLEASE COMPLETE ITEM 6 BELOW AND RETURN TO THE AUDITING ORGANIZATION WITHIN 30 DAYS OF YOUR ACKNOWLEDGEMENT.

AUDIT NO. SA-W3-OA-83-19

FINDING NO. 2

SHEET 2 OF 2

6. CORRECTIVE ACTION TAKEN: In the event that corrective action cannot be completed within 30 days, your response shall include a scheduled date for the corrective action.

7. CORRECTIVE ACTION VERIFICATION: The corrective action stated in item 6 above has been verified as complete and is acceptable. This finding is closed.

AUDITOR'S SIGNATURE: _____ DATE: _____

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT FINDING

AUDIT NO. SA-W3-QA-83-19

FINDING NO. 2

SHEET 1 OF 2

1. AUDITED ORGANIZATION: Environmental Monitoring Program (Non-Radiological)

   CONTACTS: Chati Groome

   AUDIT LOCATION: Waterford 3 SES
   Killona, Louisiana

2. REQUIREMENT:

   The permittee shall at all times maintain good working order and operate as efficiently as possible all treatment or control facilities or systems. (NPDES 13/18)

3. FINDING:

   Drainage pipe at discharge outlet 004 is broken. This situation could result in the discharge flow being slowed down or preventing the flow completely.

4. AUDITOR'S RECOMMENDED CORRECTIVE ACTION:

   Replace end section of Drainage pipe.

   AUDITOR'S SIGNATURE: A. Roberts DATE: 8/26/83

5. ACKNOWLEDGEMENT: This finding was identified during the conduct of an audit. As a member of the audited organization's management, your signature signifies acknowledgement of this finding, not necessarily agreement.

   SIGNATURE: C. Groome TITLE: Envr. Engr. I - Nbr DATE: 26 Aug 1983

   PLEASE COMPLETE ITEM 6 BELOW AND RETURN TO THE AUDITING ORGANIZATION WITHIN 30 DAYS OF YOUR ACKNOWLEDGEMENT.

6. CORRECTIVE ACTION TAKEN: In the event that corrective action cannot be completed within 30 days, your response shall include a scheduled date for the corrective action.

AUDIT NO. SA-W3-0A-83-19

FINDING NO. 3

SHEET 2 OF 2

7. CORRECTIVE ACTION VERIFICATION: The corrective action stated in item 6 above has been verified as complete and is acceptable. This finding is closed.

AUDITOR'S SIGNATURE:_____ DATE:_____

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-19

SHEET 1 OF 23

MIDDLE SOUTH UTILITIES SYSTEM

REFERENCE: National Pollutant Discharge Elimination System (NPDES) Permit No. LA0007374

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
I. Effluent Limitations and Monitoring Requirements (discharge outlet 001)	
1. Maximum flow per day (MGD) shall not exceed 1445 and shall be monitored continuously. (A1)	Note: this discharge outlet not currently being used because of stage of construction.
2. Maximum temperature shall not exceed 43.3°C (100°F) and shall be monitored continuously. (A1)	
3. Heat shall not exceed 8.5 X 10^9 BTU/hour and shall be monitored continuously. (A1)	
4. Free available chlorine shall not exceed a daily average of 91.3 (201) or daily maximum of 228.2 (502) - Kg/day (lbs./day). (A1)	
5. Free available chlorine shall not exceed a daily average of 0.2 mg/1 or daily maximum of 0.5 mg/1. (A1)	

(7)

FOIA-84-20 A/7

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-19

SHEET 2 OF 2-3

REFERENCE: National Pollutant Discharge Elimination System (NPDES) Permit No. LA0007374

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
I. Effluent Limitations and Monitoring Requirements (discharge outlet 001)	
6. Monitoring for free available chlorine shall be performed once per week and shall be representative of periods of chlorination. (A1)	Note: this discharge outlet not currently being used because of stage of construction.
7. There shall be no discharge of floating solids or visible foam in other than trace amounts. (A1)	
8. Samples taken in compliance with the monitoring requirements shall be taken prior to discharge to the Mississippi River. (A1)	

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-19

SHEET 3 OF 23

REFERENCE: National Pollutant Discharge Elimination System (NPDES) Permit No. LA0007374

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
II. Effluent Limitations and Monitoring Requirements (Control Point) (discharge outlet 01A)	
1. Maximum flow per day (MGD) shall be reported and the daily average shall not exceed .0093. (A3)	A/4 see note # 2
2. The discharge flow shall be measured daily and totalized. (A3)	A/4 see note # 2
3. Surfactants shall not exceed a daily average of 30 mg/l for daily maximum of 30 mg/l. (A3)	A
4. A grab type sample shall be taken from each batch of surfactants. (A3)	A
5. Oil and grease shall not exceed a daily average of 15 mg/l nor a maximum of 10 mg/l.	A

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-19

SHEET 4 OF 23

REFERENCE: National Pollutant Discharge Elimination System (NPDES) Permit No. LA0007374

REQUIREMENT/ITEM TO BE AUDITED		COMMENT
II. Effluent Limitations and Monitoring Requirements (Control Point) (discharge outlet 01A)		
6. A grab type sample shall be taken from each batch of oil and grease. (A3)	A	
7. Total suspended solids shall not exceed 30 mg/l daily average nor 100 mg/l daily maximum. (A3)	A	
8. A grab type sample shall be taken from each batch of total suspended solids. (A3)	A	
9. The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored by one grab sample per batch. (A3)	A	See note # 8
10. There shall be no discharge of floating solids or visible foam in other than trace amounts. (A3)	A	

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-19

SHEET 5 OF 23

REFERENCE: National Pollutant Discharge Elimination System (NPDES) Permit No. LA0007374

REQUIREMENT/ITEM TO BE AUDITED		COMMENT
II. Effluent Limitations and Monitoring Requirements (Control Point) (discharge outlet 01A)		
11. Samples taken in compliance with the monitoring requirements shall be taken prior to mixing with the circulating cooling water. (A3)	A	
III. Effluent Limitations and Monitoring Requirements (discharge outlet 01B - Control Point)		
1. The daily average flow (MGD) shall not exceed .0144. (A4)	A	see note # 2
2. The discharge shall be measured daily and totalized. (A4)	A	see note #2
3. The daily average boron shall not exceed 10 mg/1 nor shall the daily maximum exceed 10 mg/1. (A4)	A	

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-19

SHEET 6 OF 23

REFERENCE: National Pollutant Discharge Elimination System (NPDES) Permit No. LA0007374

REQUIREMENT/ITEM TO BE AUDITED		COMMENT
III. Effluent Limitations and Monitoring Requirements (discharge outlet 01B - Control Point)		
4. A grab type sample shall be taken from each batch. (A4)	A	
5. Oil and grease shall not exceed a daily average of 15 mg/l nor a daily maximum of 20 mg/l. (A4)	A	
6. A grab type sample shall be taken from each batch. (A4)	A	
7. Total suspended solids shall not exceed a daily average of 30 mg/l nor daily maximum of 100 mg/l. (A4)	A	
8. A grab type sample shall be taken from each batch. (A4)	A	
9. The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored by one grab sample per batch. (A4)	A	see note #8

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-19

SHEET 7 OF 23

REFERENCE: National Pollutant Discharge Elimination System (NPDES) Permit No. LA0007374

REQUIREMENT/ITEM TO BE AUDITED		COMMENT
III. Effluent Limitations and Monitoring Requirements (discharge outlet 01B - Control Point)		
10. There shall be no discharge of floating solids or visible foam in other than trace amounts. (A4)	A	
11. Samples taken in compliance with monitoring requirements shall be taken prior to mixing with the circulating cooling water. (A4)	A	
IV. Effluent Limitations and Monitoring Requirements (discharge outlet 01C - Control Point)		
1. Average daily flow (MGD) shall not exceed 0.720 and the daily maximum flow shall not exceed 0.960. (A5)	A	See note #2
2. The flow shall be measured daily and totalized. (A5)	A	See note #3

A = Acceptable U = Unacceptable N/A = Not Applicable

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-19

SHEET 8 OF 23

REFERENCE: National Pollutant Discharge Elimination System (NPDES) Permit No. LA0007374

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
IV. Effluent Limitations and Monitoring Requirements (discharge outlet 01C - Control Point)	
3. The daily average and daily maximum for total suspended solids shall be reported. (A5)	A
4. The total suspended solids shall be measured weekly by grab sample. (A5)	A
5. The daily average and daily maximum for total organic carbon shall be reported. (A5)	A
6. The total organic carbon shall be measured weekly by grab sample. (A5)	A
7. The daily average and daily maximum for alkalinity, Phenolphthalein method shall be reported. (A5)	A

A = Acceptable U = Unacceptable N/A = Not Applicable

MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-19

SHEET 9 OF 23

REFERENCE: National Pollutant Discharge Elimination System (NPDES) Permit No. LA0007374

REQUIREMENT/ITEM TO BE AUDITED		COMMENT
IV. Effluent Limitations and Monitoring Requirements (discharge outlet 01C - Control Point)		
8. Alkalinity, Phenolphthalein method shall be measured weekly by grab sample. (A5)	A	
9. The daily average for clarifying agents used shall be reported. (A5)	A	
10. A monthly record shall be kept for clarifying agents used. (A5)	A	
11. The pH shall be monitored weekly by grab sample. (A5)	A	see note #8
12. There shall be no discharge of floating solids or visible foam in other than trace amounts. (A5)	A	

A = Acceptable U = Unacceptable N/A = Not Applicable

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-19

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MIDDLE SOUTH UTILITIES SYSTEM

REFERENCE: National Pollutant Discharge Elimination System (NPDES) Permit No. LA0007374

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
IV. Effluent Limitations and Monitoring Requirements (discharge outlet 01C - Control Point)	
13. Samples taken in compliance with the monitoring requirements shall be taken prior to mixing with the circulating cooling water. (A5)	A
V. Effluent Limitations and Monitoring Requirements (discharge outlet 002, floor drainage - yard oil/water separator)	
1. The daily average flow (MGD) shall not exceed .147 nor the daily maximum flow shall not exceed .232. (A6)	A/4 see note #2
2. The daily average flow shall be measured daily and totalized. (A6)	A/4 See note #2.
3. The daily average for total suspended solids shall not exceed 30 mg/1 nor the daily maximum of 100 mg/1. (A6)	A

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MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-19

SHEET 11 OF 23

REFERENCE: National Pollutant Discharge Elimination System (NPDES) Permit No. LA0007374

REQUIREMENT/ITEM TO BE AUDITED		COMMENT
V.	Effluent Limitations and Monitoring Requirements (discharge outlet 002, floor drainage - yard oil/water separator)	
4.	The total suspended solids shall be measured weekly by grab sample. (A6)	A
5.	The daily average for oil and grease shall not exceed 15 mg/1 nor the daily maximum shall not exceed 20 mg/1. (A6)	A
6.	The oil and grease shall be measured weekly by grab sample. (A6)	A
7.	The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored weekly by grab sample. (A6)	A see note #8
8.	There shall be no discharge of floating solids or visible foam in other than trace amounts. (A6)	A

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MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-19

SHEET 12 OF 23

REFERENCE: National Pollutant Discharge Elimination System (NPDES) Permit No. LA0007374

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
V. Effluent Limitations and Monitoring Requirements (discharge outlet 002, floor drainage - yard oil/water separator)	
9. Samples taken in compliance with the monitoring requirements shall be taken prior to discharge to 40 arpent canal. (A6)	A see note #1
VI. Effluent Limitations and Monitoring Requirements (discharge outlet 003 service building floor drainage)	
1. The daily average flow (MGD) shall not exceed .05 nor the daily maximum of .05. (A7)	A/4 see note #2
2. The average flow shall be measured daily and totalized. (A7)	A/4 see note #2
3. The daily average for total suspended solids shall not exceed 30 mg/1 nor daily maximum of 100 mg/1. (A7)	A

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AUDIT NO. SA-W3-QA-83-19

SHEET 13 OF 23

MIDDLE SOUTH UTILITIES SYSTEM

REFERENCE: National Pollutant Discharge Elimination System (NPDES) Permit No. LA0007374

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
VI. Effluent Limitations and Monitoring Requirements (discharge outlet 003 service building floor drainage)	
4. The total suspended solids shall be measured weekly by grab sample. (A7)	A
5. The daily average for oil and grease shall not exceed 15 mg/l nor daily maximum of 20 mg/l. (A7)	A
6. Oil and grease shall be measured weekly by grab sample. (A7)	A
7. The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored weekly by grab sample. (A7)	A see note # 8
8. There shall be no discharge of floating solids or visible foam in other than trace amounts. (A7)	A

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MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-19

SHEET 14 OF 23

REFERENCE: National Pollutant Discharge Elimination System (NPDES) Permit No. LA0007374

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
VI. Effluent Limitations and Monitoring Requirements (discharge outlet 003 service building floor drainage)	
9. Samples taken in compliance with the monitoring requirements shall be taken prior to discharge to 40 arpent canal. (A7)	A
VII. Effluent Limitations and Monitoring Requirements (discharge outlet 004, administration building sanitary discharge and 005 onsite offices discharge).	
1. The daily average and daily maximum for flow (MGD) shall be reported. (A8)	A/U see note #2
2. The flow shall be measured daily and totalized. (A8)	A/U see note #2
3. The daily average and daily maximum for biochemical oxygen demand (5 day) (Kg/day - lbs./day) shall not exceed 0.5 (1.0) average nor 0.95 (2.1) maximum. (A8)	A

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MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-19

SHEET 15 OF 23

REFERENCE: National Pollutant Discharge Elimination System (NPDES) Permit No. LA0007374

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
VII. Effluent Limitations and Monitoring Requirements (discharge outlet 004, administration building sanitary discharge and 005 onsite offices discharge).	
4. The biochemical oxygen demand (5 day) daily average shall not exceed 30 mg/1 nor 45 mg/1 maximum. (A8)	A
5. The biochemical oxygen shall be measured weekly by grab sample. (A8)	A
6. Total suspended solids (Kg/day - lbs/day) shall not exceed daily average of 0.5 (1.0) nor daily maximum of 0.95 (2.1). (A8)	A
7. Total suspended solids shall not exceed a daily average of 30 mg/1 nor daily maximum of 45 mg/1. (A8)	A
8. The total suspended solids shall be measured weekly by grab sample. (A8)	A

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SHEET 16 OF 23

MIDDLE SOUTH UTILITIES SYSTEM

REFERENCE: National Pollutant Discharge Elimination System (NPDES) Permit No. LA0007374

REQUIREMENT/ITEM TO BE AUDITED		COMMENT
VII. Effluent Limitations and Monitoring Requirements (discharge outlet 004, administration building sanitary discharge and 005 onsite offices discharge).		
9. The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored weekly by grab sample. (A8)	A	see note #8
10. There shall be no discharge of floating solids or visible foam in other than trace amounts. (A8)	A	
11. Samples taken in compliance with the monitoring requirements shall be taken prior to discharge to 40 arpent canal. (A8)	A	

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AUDIT NO. SA-W3-QA-83-19

SHEET 17 OF 23

REFERENCE: National Pollutant Discharge Elimination System (NPDES) Permit No. LA0007374

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
VIII. Schedule of Compliance	
1. The permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedule: Progress Report 06-30-82 Progress Report 12-31-82 Progress Report 06-30-83 Progress Report 12-31-83 Progress Report 03-31-84 Achieve Compliance 07-01-84 (10/18)	A
2. No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirements. (10/18)	A

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AUDIT NO. SA-W3-QA-83-19

SHEET 18 OF 23

MIDDLE SOUTH UTILITIES SYSTEM

REFERENCE: National Pollutant Discharge Elimination System (NPDES) Permit No. LA0007374

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
IX. Monitoring and Reporting	
1. Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. (10/18)	A
2. Monitoring results obtained during the previous 3 months shall be summarized for each month and reported on a Discharge Monitoring Report Form (EPA No. 3320-1), postmarked no later than the 28th day of the month following the completed reporting period. The first report is due on July 28, 1981. (10/18)	A
3. For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:	
A. The exact place, date, and time of sampling.	A
B. The dates the analyses were performed.	A

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SHEET 19 OF 23

MIDDLE SOUTH UTILITIES SYSTEM

REFERENCE: National Pollutant Discharge Elimination System (NPDES) Permit No. LA0007374

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
IX. Monitoring and Reporting	
3. C. The person(s) who performed the analyses.	4 } see note #3
D. The analytical techniques or methods used.	4 } see note #3
E. The results of all required analyses. (11/18)	A
4. All records and information resulting from the monitoring activities required by this permit including all records of analyses performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation shall be retained for a minimum of three (3) years, or longer if requested by the Regional Administrator or the state water pollution control agency. (12/18)	A

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SHEET 20 OF 23

MIDDLE SOUTH UTILITIES SYSTEM

REFERENCE: National Pollutant Discharge Elimination System (NPDES) Permit No. LA0007374

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
X. Management Requirements	
1. If, for any reason, the permittee does not comply with or will be unable to comply with any daily maximum effluent limitation specified in this permit, the permittee shall provide the Regional Administrator and the State with the following information, in writing, within five (5) days of becoming aware of such condition:	
A. A description of the discharge and cause of noncompliance.	A
B. The period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncomplying discharge. (13/18)	A
2. The permittee shall at all times maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit. (13/18)	A See notes # 4, 5, 6, 7, 8

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AUDIT NO. SA-W3-QA-83-19

SHEET 21 OF 23

REFERENCE: National Pollutant Discharge Elimination System (NPDES) Permit No. LA0007374

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
X. Management Requirements	
3. Any diversion from or bypass of facilities necessary to maintain compliance with the terms and conditions of this permit is prohibited, except (i) where unavoidable to prevent loss of life or severe property damage, or (ii) where excessive storm drainage or runoff would damage any facilities necessary for compliance with the effluent limitations and prohibitions of this permit. The permittee shall promptly notify the Regional Administrator and the State in writing of each such diversion or bypass. (13/18)	A
4. In order to maintain compliance with the effluent limitations and prohibitions of this permit, the permittee shall either:	
A. In accordance with the Schedule of Compliance contained in Part I, provide an alternative power source sufficient to operate the wastewater control facilities, or, if such alternative power source is not in existence, and no date for its implementation appears in Part I.	A

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MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-19

SHEET 22 OF 23

REFERENCE: National Pollutant Discharge Elimination System (NPDES) Permit No. LA0007374

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
X. Management Requirements	
4. B. Halt, reduce or otherwise control production and/or all discharges upon the reduction, loss, or failure of the primary source of power to the wastewater control facilities. (14/18)	A
5. There shall be no discharge of polychlorinated biphenyl transformer fluid. (16/18)	A
6. Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day. (17/18)	A
7. Water treatment clarifies sludge water may be returned to the stream without treatment if not previously combined with any other untreated waste source, including demineralizer and softener water. (17/18)	A

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MIDDLE SOUTH UTILITIES SYSTEM

AUDIT CHECKLIST

AUDIT NO. SA-W3-QA-83-19

SHEET 23 OF 23

REFERENCE: National Pollutant Discharge Elimination System (NPDES) Permit No. LA0007374

REQUIREMENT/ITEM TO BE AUDITED	COMMENT
X. Management Requirements	
8. Noncompliance reporting for upsets and bypasses shall be made within 24 hours to EPA Region 6 followed by a written report in five days. (17/18)	A See note #8
9. Violations of daily maximum limitations for pollutants listed below will also be reported in 24 hours followed by a written report in five days. (17/18)	A
10. Violations of daily maximum limitations for all other pollutants identified elsewhere in this permit shall be reported in writing within five days. (17/18)	A

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Auditors' Notes

1. The following observations were made at discharge outlet 002 - yard oil/water separator:

   a. Oil drums used for collecting the used oil are not labeled properly. Note: one drum is labeled waste oil.

   b. The man hole cover is off - this cover appears to have been off for some time. The cover is partially buried in shells.

   c. There are no safety chains in place. There is a temporary barricade.

2. The flow meters currently being used are unreliable. The contacts informed the auditors that the flow meters are partially constructed of plastic and the high temperatures cause warping of the gears. A sun shield has been constructed but has not provided any appreciable difference. The flow meters remain OOC for more than 50% of the

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time. The pump flow capacity can be utilized to determine the MGD but it is desirable to have flow meters that operate properly.

3. With the exception of the ph samples all samples are performed by a contract laboratory ___ Enviro-Med Laboratories, Inc. No audit has been performed on this laboratory and no information is retained by the audited department concerning the analytical techniques or methods used by the laboratory.

4. The following general observations were noted:

a. Discharge outlet 005B is missing a protective grating cover.

b. EBASCO pit #3 has stagnant water with dirty rags, towels, etc stuffed around the pit. There are many flies in the area and there is a bad sanitary odor coming from the pit.