ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket Nos.:	50-528 50-529 50-530
License Nos.:	NPF-41 NPF-51 NPF-74
Report No.:	50-528/97-12 50-529/97-12 50-530/97-12
Licensee:	Arizona Public Service Company
Facility:	Palo Verde Nuclear Generating Station, Units 1, 2, and 3
Location:	5951 S. Wintersburg Road Tonopah, Arizona
Dates:	May 5-9, 1997
Inspector:	J. Blair Nicholas, Ph.D. Senior Radiation Specialist
Approved By:	Blaine Murray, Chief Plant Support Branch
ATTACHMENT:	Supplemental Information

EXECUTIVE SUMMARY

Palo Verde Nuclear Generating Station, Units 1, 2, and 3
NRC Inspection Report 50-528/97-12; 50-529/97-12; 50-530/97-12

Plant Support

- An improved secondary water chemistry program was implemented. The licensee's secondary chemistry performance index values compared well with the industry's index median value (Section R1.1).
- The primary chemistry and radiochemistry programs were properly implemented and maintained (Section R1.2).
- Secondary chemistry on-line monitoring instrumentation and secondary chemistry laboratory instruments were operable and properly maintained and calibrated (Section R2.1).
- Primary chemistry laboratory and counting room instrumentation was operable and properly maintained and calibrated (Section R2.2).
- The post-accident sampling systems were operational and properly maintained (Section R2.3).
- Effective chemistry procedures were revised and properly maintained (Section R3).
- Chemistry personnel had an excellent understanding of the chemistry programmatic procedures and monitoring requirements (Section R4).
- The chemistry department's analytical performance cross check program was properly implemented (Section R4).
- The chemistry training and qualification programs were properly implemented (Section R5).
- Effective, thorough audits, evaluation reports, and chemistry department self-assessments were performed. An effective corrective action program was in place to ensure that audit and self-assessment findings were addressed in a timely manner (Section R7).

Report Details

Summary of Plant Status

Units 1, 2, and 3 were at power operations during the inspection. There were no operational occurrences that impacted the results of the inspection.

IV. Plant Support

R1 Chemistry Controls

R1.1 Secondary Chemistry Program

a. Inspection Scope (84750)

Implementation of the secondary chemistry program and secondary system control parameters for 1995 and 1996 were reviewed to determine effectiveness. This review included the control, monitoring, and trends of secondary chemistry parameters (sodium, sulfate, molar ratio, and feedwater iron) in the secondary water systems. This data were compared to the licensee's goals and the industry's chemistry performance index criteria to determine the licensee's performance.

b. Observations and Findings

The licensee's secondary chemistry control limits and action levels were established in accordance with the Electric Power Research Institute Pressurized Water Reactor Secondary Water Chemistry Guidelines, Revision 3. The steam generator chemistry was controlled by limiting contaminate additions and maintaining chemical additions (molar ratio control) within specified limits. The intrusion of contaminates into the steam generators was maintained to a minimum by continuous blowdown for removal of concentrated contaminates resulting from system operation. Molar ratio control was maintained by the controlled addition of ammonium chloride.

Since 1994, site chemistry instituted many initiatives to improve secondary chemistry performance. The addition of ammonium chloride into the steam generator secondary system to enhance molar ratio control, steam generator cleaning, electrochemical potential testing, blowdown flow optimization, hideout return data evaluation, and downpower recommendations to enhance hideout return cleanup were changes instituted to improve secondary chemistry. To ensure that the data were trended and an action plan developed for continuous improvement, site chemistry instituted the chemistry program plan.

Although the same performance goals applied to all units, each unit was somewhat unique in its secondary chemistry performance. This was partly due to unit specific conditions and partly due to differing secondary control schemes tailored to optimize conditions for each unit.

During the time period between January 1995 and December 1996, Unit-1 secondary chemistry data showed secondary chemistry parameters were generally within specification and approaching or achieving chemistry program plan goals with the exception of sulfate and iron. Excessive iron transport remained an issue while a low pH was maintained to support condensate polisher operation. Unit-1 was also plagued with condenser inleakage and condensate polisher problems.

During the time period between January 1995 and December 1996, Unit-2 secondary chemistry data showed that all secondary chemistry parameters were within specification and generally achieved chemistry program plan goals and showed an improving trend during the time period. Exceptions were sulfate, condensate dissolved oxygen, and feedwater iron. During the shutdown and coast down prior to the outage in January 1996 chemistry program plan goals were not achieved.

During the time period between January 1995 and December 1996, Unit-3 secondary chemistry data showed that with exception of sulfate, sodium, and iron, secondary chemistry parameters were within specification and approaching or achieving chemistry program plan goals. During the outage recovery period in December 1995, the sodium, sulfate and iron chemistry parameters were excessively above the target values, and the unit experienced a deviation from the target molar ratio operating range. Upon initiation of condensate polisher operation, with reduced pH after February 1996, the secondary chemistry parameter performance degraded severely.

On May 6, the inspector observed a Unit-1 senior chemistry technician monitor the daily readings from the secondary chemistry on-line instruments and data recorders in the secondary laboratory and turbine building laboratory. Data from the on-line ion chromatographs, sodium analyzers, pH meters, and cation conductivity meters were recorded on continuous chart recorders and transmitted directly to a chemistry data management computer (data view) in the secondary chemistry laboratory for continuous monitoring and trending. The inspector determined that the secondary chemistry control was highly dependent on the continuous on-line instrument monitoring of the secondary chemistry parameters to maintain steam generator molar ratio chemistry within established limits. The licensee verified the on-line instrument data by comparison to weekly grab sample analytical results.

In 1997 the licensee established a new chemistry performance index for secondary chemistry. The licensee's chemistry index was more conservative than the Institute of Nuclear Power Operations (INPO) chemistry performance index because the individual secondary chemistry impurity divisors in the numerical equation were the licensee's secondary chemistry concentration goals rather than the 1995 INPO

median concentration values for the secondary chemistry parameters. The inspector determined that the licensee's current secondary chemistry performance index values (calculated using the INPO chemistry index divisor values) were 1.03 for Unit-1, 1.00 for Unit-2, and 1.13 for Unit-3. The INPO chemistry performance index median value was 1.07.

c. Conclusions

An improved secondary water chemistry program was implemented. The licensee's secondary chemistry performance index values compared well with the industry's secondary chemistry performance median value.

R1.2 Primary Chemistry Program

a. Inspection Scope (84750)

Implementation of the primary chemistry, and radiochemistry programs, as described in the Technical Specifications, were reviewed. This review included the control and monitoring of primary chemistry parameters in the reactor coolant system; trends of primary chemistry parameters and radiochemistry parameters; sampling and analyses; and performance of required surveillance tests.

b. Observations and Findings

The licensee's primary chemistry control limits and action levels were established in accordance with the Electric Power Research Institute Pressurized Water Reactor Primary Water Chemistry Guidelines, Revision 3. The reactor coolant chemistry program specifications were established to minimize corrosive species such as oxygen, chloride, fluoride, and controlling pH.

Primary system chemistry control performance for the time period January 1995 through April 1997 resulted in excellent operational primary chemistry control as shown by the pH and dissolved hydrogen analytical results. The reactor coolant system pH was maintained in the desired operating range (6.9 - 7.15) by coordinating the boron and lithium concentrations to maintain an alkaline pH to minimize crud transport. Dissolved hydrogen control in the three units' reactor coolant systems was good and met chemistry program objectives in the operating range of 25-50 cc/Kg of reactor coolant. Eight dissolved hydrogen out-of-specification conditions occurred at the three units, and there were only two occurrences when the pH control was greater than 0.05 pH units from optimum values between January 1995 and April 1997. All dissolved hydrogen deviations were corrected within 24 hours.

Reactor coolant system pH and boron, lithium, and dissolved hydrogen concentrations were consistently maintained within the optimum operating ranges per Electric Power Research Institute guidelines and met primary chemistry program goals. The reactor coolant system fluoride, chloride, and dissolved oxygen concentrations were maintained within the optimum operating concentrations with minimal occurrences of out-of-specification conditions.

The inspector observed a senior chemistry technician collect a depressurized liquid sample, gas stripped pressurized liquid sample, and gas sample from the Unit-2 reactor coolant system on May 6, 1997, and perform a dissolved oxygen analysis and dissolved hydrogen analysis. The technician followed the sampling and analytical procedures methodically and used good self-checking and radiological work practices while sampling and analyzing the samples. All aspects of the reactor coolant system sampling and analyses were performed in accordance with approved procedures.

The inspector determined that the sampling and analyses of each unit's primary system chemistry and radiochemistry parameters met Technical Specification requirements.

c. Conclusion

The primary chemistry and radiochemistry programs were properly implemented and maintained.

R2 Status of Chemistry Facilities and Equipment

R2.1 Secondary On-line Chemistry Instrumentation

a. Inspection Scope (84750)

The on-line cation and anion chromatographs, pH, sodium, cation conductivity, dissolved oxygen, and hydrazine analyzers were inspected for proper operation, calibration, quality control, and reliability. Selected secondary chemistry laboratory instrument quality control charts were reviewed.

b. Observations and Findings

All secondary chemistry on-line monitoring instrumentation in each unit were operational. All records reviewed indicated that the secondary chemistry on-line monitoring instrumentation were properly maintained and calibrated. During the period January 1996 through April 1997, the overall operational reliability of the secondary chemistry on-line and laboratory instrumentation in all three units was greater than the 95 percent established instrument operability goal. This high instrument operational reliability was directly the result of the focused attention and performance of the chemistry instrument group.

During the period between 1994 and 1997, the on-line ion chromatographs used to continuously monitor steam generator chemistry, the ion chromatographs used to monitor condensate demineralizer effluent, and the on-line sodium analyzers were upgraded with state-of-the-art instrumentation. The secondary chemistry data management computer system was upgraded in 1996 so that secondary chemistry parameters were readily available for monitoring and trending.

c. Conclusion

Secondary chemistry on-line monitoring instrumentation and secondary chemistry laboratory instruments were operable and properly maintained, calibrated, quality control tested.

R2.2 Primary Chemistry Laboratory and Counting Room Instrumentation

a. Inspection Scope (84750)

The boron autotitrator, ion chromatographs, ultraviolet/visible spectrophotometers, atomic absorption spectrometer, gas chromatography, and counting room instrumentation in each unit were inspected for proper operation, calibration, and reliability. Selected quality control data and control charts for the primary chemistry laboratory instruments and radiochemistry counting room instruments were reviewed.

b. Observations and Findings

All primary chemistry laboratory and counting room instrumentation in each unit were operational. Records reviewed indicated that the laboratory and counting room instrumentation were properly maintained, calibrated, and quality control tested. During the period January 1996 through April 1997, the overall operational reliability of the primary chemistry instrumentation and counting room instrumentation in all three units was greater than the 95 percent established instrument operability goal.

The radiochemistry counting rooms in each unit were equipped with state-of-the-art analytical instrumentation to perform the required analyses. The instruments were properly maintained, calibrated, and quality control tested.

On May 6, 1997, the inspector observed a radiation monitoring section senior technician perform the quality control tests on the Unit-2 counting room instrumentation. The quality control tests were performed in accordance with approved procedures, and the quality control data was documented and entered on control charts for each multichannel analyzer detector, liquid scintillation spectrometer, and the gross beta and gross alpha counters. The laboratory analytical control program acceptance criteria was verified to have been met.

c. Conclusion

Primary chemistry laboratory and counting room instrumentation was operable and properly maintained, calibrated, and quality control tested.

R2.3 Post-Accident Sampling System

a. Inspection Scope (84750)

The post-accident sampling system and sampling equipment were inspected to verify if adequate operation and surveillance programs were established, and the systems and equipment were maintained in a state of operational readiness. Post-accident sampling system operational surveillance function test records were reviewed.

b. Observations and Findings

The post-accident sampling systems provided sample collection capability from the reactor coolant system, safety injection system, and containment atmosphere. No on-line instrumentation was installed in the post-accident sampling systems. Analyses of the samples were performed in the units' primary chemistry laboratory and radiochemistry counting room.

On May 7, 1997, the inspector observed the operation of the Unit-3 post-accident sampling system to verify the operation of the system and the correct performance of a sample collection. A senior chemistry technician operated the post-accident sampling system and collected a depressurized reactor coolant sample for analysis. The senior chemistry technician performed the sampling of the depressurized reactor coolant sample in accordance with an approved procedure using appropriate self-checking and safe radiological work practices. The inspector observed the use of the specially designed sample handling equipment for sample collection and preparation of potentially highly radioactive samples for analyses. The post-accident sample handling equipment was designed to maintain radiation exposure ALARA for the chemistry technician while collecting and preparing the highly radioactive post-accident samples for analyses.

A monthly operational surveillance functional testing program was established to verify the sampling capabilities of the post-accident sampling system. The surveillance test required the collection and analysis of reactor coolant liquid samples and safety injection liquid samples for boron, isotopic content, and dissolved hydrogen, and the collection and analysis of a containment atmosphere gas sample for oxygen and isotopic content. The post-accident sampling systems in all three units were available to sample the reactor coolant system, safety injection system, and containment atmosphere.

c. Conclusion

The post-accident sampling systems were operational, properly maintained, and tested monthly in each unit.

R3 Chemistry Procedures and Documentation

a. Inspection Scope (84750)

Revisions to selected chemistry procedures made since January 1995 were reviewed.

b. Observations and Findings

The site chemistry program's implementing procedures described the various secondary and primary systems chemistry specifications and the responsibilities for controlling and ensuring that the chemistry parameters were maintained within specification or that the appropriate corrective actions were taken and that all chemistry samples were collected and analyzed as required. The chemistry department's procedures were written with sufficient detail to effectively conduct the required secondary chemistry and radiochemistry programs.

c. Conclusion

Effective chemistry procedures were revised and properly maintained.

R4 Chemistry Staff Knowledge and Performance

a. Inspection Scope (84750)

Personnel in the chemistry department were interviewed with regard to chemistry Technical Specification requirements, Electric Power Research Institute guidelines for chemistry system control, and the implementation of the water chemistry and radiochemistry programs. The program to evaluate chemistry technician analytical performance was reviewed.

b. Observations and Findings

Chemistry personnel, including chemistry operations section leaders and chemistry technicians, were knowledgeable of the site's systems chemistry control specifications, analytical procedures, and Technical Specification requirements. The chemistry staff maintained a high level of performance.

The chemistry technician analytical performance program included inter-laboratory and intra-laboratory sample sets, provided by a contractor laboratory, for secondary chemistry and primary chemistry analyses. The licensee demonstrated excellent performance regarding the analyses of the sample sets.

The radiochemistry analytical performance cross check program included gamma isotopic, tritium, strontium, and gross alpha analyses. The samples were provided by a contractor laboratory and split amongst the three units. Each unit's radiochemistry counting room participated in the cross check program. The 1995 and 1996 data showed a 100 percent agreement for all isotopes identified by all three units for the radiochemistry sample analyses.

c. Conclusions

Chemistry personnel had an excellent understanding of the chemistry programmatic procedures and monitoring requirements. The chemistry department's analytical performance cross check program included appropriate secondary chemistry and radiochemistry analyses requirements.

R5 Chemistry Staff Training and Qualification

a. Inspection Scope (84750)

Training and qualification programs for chemistry technicians were reviewed including:

- Site chemistry training program description
- Chemistry technician qualification reports
- Selected job qualification cards
- Chemistry continuing training schedule for 1995 through 1997
- Selected topics presented during the chemistry continuing training conducted during 1995, 1996, and 1997
- Chemistry technician training/attendance records for the continuing training program

b. Observations and Findings

The inspector verified that all of the chemistry technicians, except for the three most recently hired chemistry technicians, had completed the chemistry initial mandatory training and qualifications. The three most recently hired chemistry technicians had nearly completed their initial mandatory training and qualifications.

The continuing training program for the chemistry technicians contained a review of industry events, emergency plan overview and responsibilities, and post-accident sampling system retraining on an annual frequency. Analytical instrumentation retraining, counting room retraining, and chemistry design basis retraining was conducted on a 36-month frequency. The industry event topics provided timely information concerning problems experienced at other nuclear power facilities.

Training records showed that all senior chemistry technicians had completed the annual post-accident sampling system mandatory training.

c. Conclusions

The experience, training, and working knowledge of the chemistry staff met the training and qualification requirements. The chemistry training and qualification programs were properly implemented.

R6 Chemistry Organization and Administration

a. Inspection Scope (84750)

The site chemistry department's organization, staffing, and lines of authority were reviewed.

b. Observations and Findings

The staffing of the site chemistry organization was adequate to conduct required chemistry duties. Since the re-engineering in 1995, the chemistry department had experienced a staff reduction from 85 positions to the current 77 positions. The licensee compensated by adjusting work schedules and technician responsibilities which included assigning the chemistry instrument maintenance and calibration to the dedicated chemistry instrument group. The reassignment of chemistry technician duties and responsibilities had compensated for the reduction in staff, and no negative impact on chemistry staff performance was identified.

c. Conclusions

The site chemistry organization and staffing met Technical Specification requirements. The chemistry technical staff had experienced approximately a 10 percent reduction in staff during the past 2 1/2 years.

R7 Quality Assurance of Chemistry Activities

a. Inspection Scope (84750)

The nuclear assurance audit and evaluation programs regarding the site chemistry program activities were reviewed for scope, thoroughness of program evaluations, and timely followup of identified deficiencies. The review included the biennial audits performed in 1994 and 1996, selected evaluation reports performed since January 1, 1994, and chemistry department integrated self-assessments performed between January 1996 and March 1997. The qualifications of the nuclear assurance auditors and the technical specialists used to perform the chemistry program audits and evaluations were reviewed. Selected condition reports/disposition requests generated during audits and evaluations were reviewed.

b. Observations and Findings

The audit schedules for 1992 through 1997, indicated that the audits of the site chemistry program were performed biennially. The audit schedule for chemistry program activities was in compliance with the Technical Specification audit frequency requirements. Numerous chemistry program evaluation reports were completed and issued by the nuclear assurance department between January 1994 and April 1997.

Audit reports and evaluation reports were of excellent quality, technically comprehensive, and provided excellent oversight and evaluation of the licensee's performance in implementing the water chemistry and radiochemistry programs and met the Technical Specification requirements. The audits were performed by experienced and qualified auditors and supported with chemistry technical specialists from other nuclear power facilities. Concerns and deficiencies identified during the audits and chemistry program evaluations were documented on condition report/disposition requests. The condition report/disposition requests were promptly addressed and corrective actions were completed in a timely manner.

The chemistry department had developed several integrated self-assessment modules which were being performed by the chemistry staff with assistance from nuclear assurance auditors. These integrated self-assessment modules provided a detailed scope for evaluations in specific chemistry program areas. The integrated self-assessment program was initiated in March 1996, and is an enhancement to the quality assurance assessment of the site chemistry program.

c. Conclusions

Effective, thorough audits, evaluation reports, and chemistry department self-assessments were performed. An effective corrective action program was in place to address audit and self-assessment findings.

V. Management Meetings

X1 Exit Meeting Summary

The inspector presented the results of the inspection to members of licensee management at the conclusion of the inspection on May 9, 1997. The licensee acknowledged the findings presented. No proprietary information was identified.

ATTACHMENT

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. Levine, Senior Vice President
G. Overback, Vice President, Nuclear Production
R. Bouquot, Section Leader, Nuclear Assurance
C. Connell, Evaluator, Nuclear Assurance
D. Frey, Senior Chemistry Technician, Unit 3 Chemistry Operations
D. Fuller, Section Leader, Unit 3 Chemistry Operations
R. Fullner, Director, Nuclear Assurance
D. Goodwin, Section Leader, Unit 2 Chemistry Operations
T. Green, Senior Chemistry Advisor, Chemistry Support
P. Guay, Department Leader, Chemistry Operations
H. Hurley, Section Leader, Chemistry Instrument Group
L. Johnson, Department Leader, Chemistry Support
K. Korst, Site Chemistry, Training Coordinator
A. Krainik, Department Leader, Nuclear Regulatory Affairs
D. Larkin, Senior Engineer, Nuclear Regulatory Affairs - Compliance
D. Leech, Department Leader, Nuclear Assurance
D. Marks, Section Leader, Nuclear Regulatory Affairs - Compliance
D. Nelson, Instructor, Technical Training - Chemistry
B. Pierson, Section Leader, Unit 1 Chemistry Operations
J. Santi, Senior Chemistry Advisor, Chemistry Support
J. Scott, Director, Site Chemistry
R. Uniatowski, Senior Chemistry Technician, Unit 2 Chemistry Operations
J. Velotta, Director, Training
D. Wolter, Senior Chemistry Technician, Unit 1 Chemistry Operations

NRC

K. Johnson, Senior Resident Inspector

LIST OF INSPECTION PROCEDURES USED

IP 84750 Radioactive Waste Treatment, and Effluent and Environmental Monitoring

LIST OF DOCUMENTS REVIEWED

Organization Charts

Site Chemistry Department - February 1, 1997

Autits, Evaluation Reports, and Integrated Self-Assessments

Nuclear Assurance Audit Schedules for 1992-1997

Quality Assurance Audits

94-005, "Plant Chemistry," May 27 through June 14, 1994

96-012, "Plant Chemistry," May 21-31, 1996

Evaluation Reports

ER-94-0002 Steam Generator Chemical Cleaning, January 5, 1994

ER-94-0020 Secondary Chemistry, January 19, 1994

ER-94-0087 Unit-3 Primary and Secondary Chemistry, February 25, 1994

ER-94-0143 Post-Accident Sampling System, March 31, 1994

ER-94-0147 Unit-2 Steam Generator Chemical Cleaning, April 6, 1994

ER-94-0196 Unit-3 Spray Pond Chemistry Control, April 29, 1994

ER-94-0139 Unit-3 Steam Generator Chemistry, December 30, 1994

ER-95-0032 Site Steam Generator Chemistry, January 13, 1995

ER-95-0099 Site Chemistry Operations, February 7, 1995

ER-95-0410 Unit-1 Feedwater System Chemistry Controls, April 30, 1995

ER-95-0466 Site Secondary Chemistry Control, May 12, 1995

ER-95-0793 Chemistry Control Instruction, September 14, 1995

ER-95-0835 Steam Generator, Condensate, and Feedwater Project Effectiveness, September 29, 1995

ER-95-0888 Unit-3 Shutdown Secondary Chemistry U3R5, October 18, 1995

ER-95-1038 Acceptance Criteria Laboratory QC LAC Control Charts, December 20, 1995

ER-95-1046 Unit-3 Steam Generator and Secondary Outage Layup, December 21, 1995

ER-95-1054 Unit-1 Post Accident Containment Air and Pressurized Reactor Coolant Liquid, December 27, 1995

ER-96-0063 Post Accident Sampling System Reliability, January 30, 1996

ER-96-0154 Chemistry Training - Laboratory Analytical Control, March 19, 1996

ER-96-0262 Primary Chemistry/Autotitrator/Boron Analysis, April 30, 1996

ER-96-0450 Condensate and Blowdown Polisher Assessment, July 26, 1996

ER-96-0701 Iron Transport Monitoring/ICP Quality Control, October 30, 1996

Integrated Self-Assessments

CH-1 "Primary Systems Chemistry," April 24, 1996

CH-3 "Auxiliary Systems Chemistry," September 25, 1996

CH-4 "Secondary Systems Lay-up," November 26, 1996

CH-7 "Laboratory Analytical Control Module," December 6, 1996

CH-8 "Unit Count Room Operations," February 19, 1997

CH-11 "Condensate and Blowdown Polisher Operations," December 13, 1996

Procedures

Chemistry Procedures

74AC-9CY05 Inline Instrument Control, Revision 3, November 8, 1995

74CH-9ZZ06 Boron Autotitrator Operation and Calibration, Revision 16, March 12, 1996

74CH-9ZZ11 Chemistry Mode Change Checklists, Revision 1, October 30, 1996

74CH-9ZZ87 Iodine-131 Dose Equivalent Determination, Revision 5, October 25, 1996

74DP-0CH01 Laboratory Analytical Control Manual, Revision 0, April 1, 1996

74DP-9CY04 Systems Chemistry Specifications, Revision 0, December 18, 1996

74DP-9ZZ05	Abnormal Occurrence Checklist, Revision 11, March 26, 1996
74OP-9SC02	Secondary Sampling Instructions, Revision 13, January 22, 1997
74OP-9SS01	Primary Sampling Instructions, Revision 11, April 29, 1997

Post Accident Sampling System Procedures

74OP-1SS02	Operation of the Post Accident Sampling System, Revision 23, January 31, 1997
74PR-9CY02	Post Accident Sampling System Program, Revision 0, December 18, 1996
74ST-9SS03	Post Accident Sampling System Surveillance, Revision 6, April 30, 1997
74ST-9SS04	PASS Functional Test, Revision 6, April 30, 1997

Miscellaneous Documents

Chemistry Systems Status, Third Quarter 1995

Chemistry Systems Status, Fourth Quarter 1995

Chemistry Systems Status, First Quarter 1996

Chemistry Systems Status, Second Quarter 1996

Chemistry Systems Status, Third Quarter 1996

Chemistry Systems Status, Fourth Quarter 1996

Chemistry Program Plan Update, December 31, 1996

Unit Chemistry Data Trends