

OFFICIAL COPY

DEC 21 1990

Docket Nos. 50-338, 50-339
License Nos. NPF-4, NPF-7

Virginia Electric and Power Company
ATTN: Mr. W. L. Stewart
Senior Vice President - Nuclear
5000 Dominion Boulevard
Glen Allen, VA 23060

Gentlemen:

SUBJECT: SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE
(INSPECTION REPORT NOS. 50-338/90-22 AND 50-339/90-22)

This refers to the NRC's Systematic Assessment of Licensee Performance (SALP) report for your North Anna facility which was sent to you on October 23, 1990; our meeting of November 7, 1990 at which we discussed the report; and your written comments dated December 3, 1990. I have enclosed a summary of our meeting presentation, a copy of your written comments, a copy of the slides which were used at the presentation, and the Final SALP report for the period June 1, 1989 through August 31, 1990.

We appreciate your efforts in evaluating the Initial SALP report and providing comments, corrections and clarifications. The following is our evaluation of your comments:

Radiological Controls

We have evaluated your response in this area and agree that a clearer evaluation of the collective dose during the assessment period is warranted and have adjusted the SALP Report to reflect this assessment. Based on our re-review of your dose history during the assessment period, we agree that your performance has improved. Based on our evaluation, we have modified our rating to reflect a Category 2 Improving.

Security

Your response identified two specific areas for possible modification. In both cases, we agree. The SALP Report has been adjusted to clarify the Fitness for Duty issue at the station and to reflect that Security performance did not decline from the last assessment period. Although we agree with the changes that you identified, we continue to believe that your failure to take prompt action on the Fitness for Duty issue and the two non-cited violations do not represent performance commensurate with a Category 1 rating.

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In accordance with Section 2.790, a copy of this letter and its enclosures will be placed in the NRC Public Document Room.

No reply to this letter is required; however, should you have any questions concerning these matters, I will be pleased to discuss them with you.

Sincerely,



Stewart D. Ebenter
Regional Administrator

Enclosures:

1. Meeting Summary
2. Licensee Comments on SALP
3. SALP Slides
4. Revision Sheet
5. Final SALP Report

cc w/encls:

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(cc w/encls continued - see page 3)

DEC 21 1990

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Commonwealth of Virginia

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CReyes
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~~RII:ORA~~
~~JML Hoan~~
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Dumigan
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Pao

NRR
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HBerkow
12/19/90
Per Tubery
w/ L. Engle
12/19/90

ENCLOSURE 1

MEETING SUMMARY

A. A meeting was held at 9:00 a.m., on November 7, 1990, at the Virginia Electric and Power Company's (Virginia Power) North Anna Nuclear Information Center near Mineral, Virginia to discuss the SALP Report for the North Anna facility.

B. Licensee Attendees

W. W. Berry, Chairman of the Board, Dominion Resources
T. E. Capps, Vice Chairman, Dominion Resources
J. T. Rhoads, President and CEO, Virginia Power
W. L. Stewart, Senior Vice President - Nuclear
E. W. Harrell, Vice President - Nuclear Operations
J. P. O'Hanlon, Vice President - Nuclear Services
P. K. Moore, Vice President - Nuclear Engineering Services
R. F. Sauders, Asst. Vice President - Nuclear Operations
G. E. Kane, Station Manager
M. L. Bowling, Asst. Station Manager - Nuclear Safety & Licensing
R. O. Enfinger, Asst. Station Manager - Operations & Maintenance
J. P. Maciejewski, Manager - Quality Assurance
J. Adams, Member, Board of Directors, Dominion Resources
A. Innskeep, Member, Board of Directors, Dominion Resources
W. Roos, Member, Board of Directors, Dominion Resources

The list of licensee attendees above does not include all the Virginia Power Company employees that were present at the SALP presentation. The attendees also included superintendents, supervisors and other Virginia Power employees. This large turnout was beneficial to the SALP process and is highly recommended for future presentations.

C. NRC Attendees

S. Ebnetter, Regional Administrator, Region II (RII)
E. Merschoff, Deputy Director, Division of Reactor Projects (DRP),
RII (Chairperson)
M. Sinkule, Chief, DRP Branch 2, RII
W. Holland, Senior Resident Inspector, Surry, DRP, RII
M. Lesser, Senior Resident Inspector, North Anna, DRP, RII
H. Berkow, Director, Project Directorate II-2, Office of
Nuclear Reactor Regulation (NRR)
L. Engle, Senior Project Manager, Project Directorate II-2, NRR
A. Ruff, Project Engineer, DRP, RII

ENCLOSURE 2

LICENSEE COMMENTS ON SALP

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

December 3, 1990

90 DEC 10 P3: 10

Mr. Stewart D. Ebner
Regional Administrator
U.S. Nuclear Regulatory Commission
Region II
101 Marietta Street, N.W.
Suite 2900
Atlanta, Georgia 30323

Serial No. 90-667
NL&P/JYR:R7
Docket Nos. 50-338
50-339
License Nos. NPF-4
NPF-7

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION UNITS 1 AND 2
RESPONSE TO INSPECTION REPORT 50-338&339/90-22
SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

Virginia Electric and Power Company has reviewed the initial report dated October 23, 1990 on the Systematic Assessment of Licensee Performance (SALP) for the period of June 1, 1989 through August 31, 1990 for North Anna Power Station. On November 7, 1990 we met with you and members of your staff to discuss the assessment.

The recognition of the strengths noted in the report was appreciated, and we are committed to building upon those strengths. Also, we will make every effort to strengthen our performance in those areas where weaknesses were identified. After reviewing the report, we have comments regarding the SALP board's assessment in the functional areas of Radiological Controls and Security.

In the functional area of Radiological Controls a Category 2 rating was assigned. The principle reason for the Category 2 rating cited by the SALP board was the high collective dose during the assessment period. Our assessment is that North Anna's collective exposure has continued to decline from previous years. The reduced exposure experienced during this SALP period reflects programs that have been implemented and are expected to reduce future dose. Lastly, it appears that some of the SALP board observations regarding the collective doses during planned refueling outages included events that occurred outside the assessment period. The attachment provides further information that we hope you will consider in the development of the final SALP report.

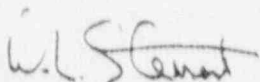
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In the functional area of Security, the report's Summary of Results might be interpreted such that a reader could draw the conclusion that a pervasive drug problem exists at North Anna. We request that the summary be reviewed and revised to reflect that the event of concern was an isolated instance and did not involve a drug issue on site. In addition, the Summary of Results described the performance of Security as "satisfactory during the assessment period, but declined from the last period." The attachment provides further information regarding the performance of Security during the assessment period that we hope you will consider in the development of the final SALP report.

Your consideration of our comments in determining the final assessment in these functional areas is appreciated. It is our position that both the radiological protection and security areas have performed in a superior manner during the SALP period and consideration of Category 1 rating is recommended.

Finally, one editorial comment is provided in the attachment. If you have any questions or require additional information regarding our comments, please contact us.

Very truly yours,



W. L. Stewart
Senior Vice President - Nuclear

Attachment

cc: U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Mr. M. S. Lesser
NRC Senior Resident Inspector
North Anna Power Station

Virginia Electric and Power Company
North Anna Power Station
Comments on the Initial SALP Report

Radiological Controls

Radiological Controls received a Category 2 rating in the initial SALP report. The report documented actions underway to improve our performance in this functional area, but also highlighted continuing NRC concerns. The SALP board stated that despite the dose reduction initiatives during the assessment period, overall collective dose remained high. The SALP board further commented that additional management emphasis on the pursuit and effective implementation of good ALARA practices was warranted.

In our view, Virginia Electric and Power Company has a very strong commitment to reducing radiation exposure. This is exemplified by both our ongoing programs which have reduced radiation exposure and our commitment to implement additional changes that will continue to result in dose reductions in the future. As acknowledged in the SALP report, you are aware of several effective dose reduction measures and practices currently implemented. Those include programs such as source term reduction, improved job planning, and increased management attention through reports and trending analyses.

The SALP board's assessment that our overall collective dose remained high is somewhat misleading. The SALP assessment period covered June 1, 1989 through August 31, 1990. During this evaluation period, North Anna's exposure normalized to one year was 201 man-rem per unit, and the total exposure during the SALP period was less than 252 man-rem per unit. As a comparison, the 1989 industry average based on AEOD data was 337 man-rem per unit. For 1990, which included a major refueling and ten years Inservice Inspection outage of 72 days, the North Anna exposure is currently 302 man-rem per unit.

These results directly reflect the aggressive management involvement in and the effectiveness of the ALARA and source term reduction programs during both outage and non-outage operations. Also, the collective dose incurred during the 1989 Unit 1 outage have already been considered by the SALP board and was documented in the previous SALP report (see page 15 of IR 89-16 dated August 15, 1989).

The major contributor to collective personnel exposure at North Anna is the extensive inspection of steam generators that occur each outage. The scope of the steam generator inspection and plugging activities routinely exceeds that required by the Technical Specifications and results in approximately one-third of collective radiation exposure received. However, we believe that this additional exposure has been and continues to be warranted to better assure a high state of operating nuclear safety.

Based on the above, we recommend that Radiological Controls be considered for a Category 1 rating in the final SALP report.

Security

Security received a Category 2 rating in the initial SALP report. Two NRC inspections in the functional area of security were conducted during the assessment period (April 23-27, 1990 and July 9-13, 1990) and documented in Inspection Reports 90-08 and 90-17, respectively. Those inspections were, from our perspective, a major input to the SALP board's deliberations and assessment of Security at North Anna. Based on these inspection reports, no programmatic or performance issues were identified. As a result, we have two comments on the SALP Summary of Results.

Our first comment involves the phrase "a problem with follow-up of a drug issue at the site" that was used in page 5 the Summary of Results. The use of the phrase "drug issue" is open to many, often detrimental, interpretations. NRC Inspection Report 90-17 documents NRC follow-up to an anonymous allegation regarding the discovery of a possible illegal substance outside of the Protected Area and a breakdown in communications that occurred between the site Security organization and the Louisa County Sheriff's Department. When identified, immediate corrective actions to enhance the notification process were implemented and policies were established to ensure proper follow-up in the future. We feel that those actions will preclude any future communications breakdown. To our knowledge, this was the first breakdown in communications experienced within the Security organization. NRC's evaluation of the circumstances of the event determined that a violation of regulatory requirements had not occurred.

Our second comment is the phrase "satisfactory during the assessment period, but declined from the last period" used in page 4 of the Summary of Results. NRC Inspection Report 90-08 identified two non-cited violations, one in the area of access control and one in the area of inadequate searches. Those concerns were immediately corrected and did not reflect programmatic breakdowns. Those corrective actions have been successful.

NRC Inspection Report 90-17 also stated: "Inspection findings confirm continued improvement in the effectiveness of the security program. Security personnel appear to be motivated and professional in their approach to duty performance." We feel that this statement better represents Security's performance during the SALP period, in contrast with the phrase used in the Summary of Results.

Based on the above, we recommend that Security be considered for a Category 1 rating in the final SALP report.

Editorial Comment

A sentence on page 5 under Plant Operations, second paragraph, seems to be missing a word. It appears to us that the sentence should read: "Significant progress was made in this area [that or which] was identified as needing improvement during the last assessment period."

ENCLOSURE 3

SALP SLIDES

UNITED STATES
NUCLEAR REGULATORY
COMMISSION



SYSTEMATIC ASSESSMENT
OF
LICENSEE PERFORMANCE
(SALP)

9011080029

VIRGINIA ELECTRIC
AND
POWER COMPANY

SALP CYCLE 9

JUNE 1, 1989

THROUGH

AUGUST 31, 1990

NORTH ANNA 1 AND 2

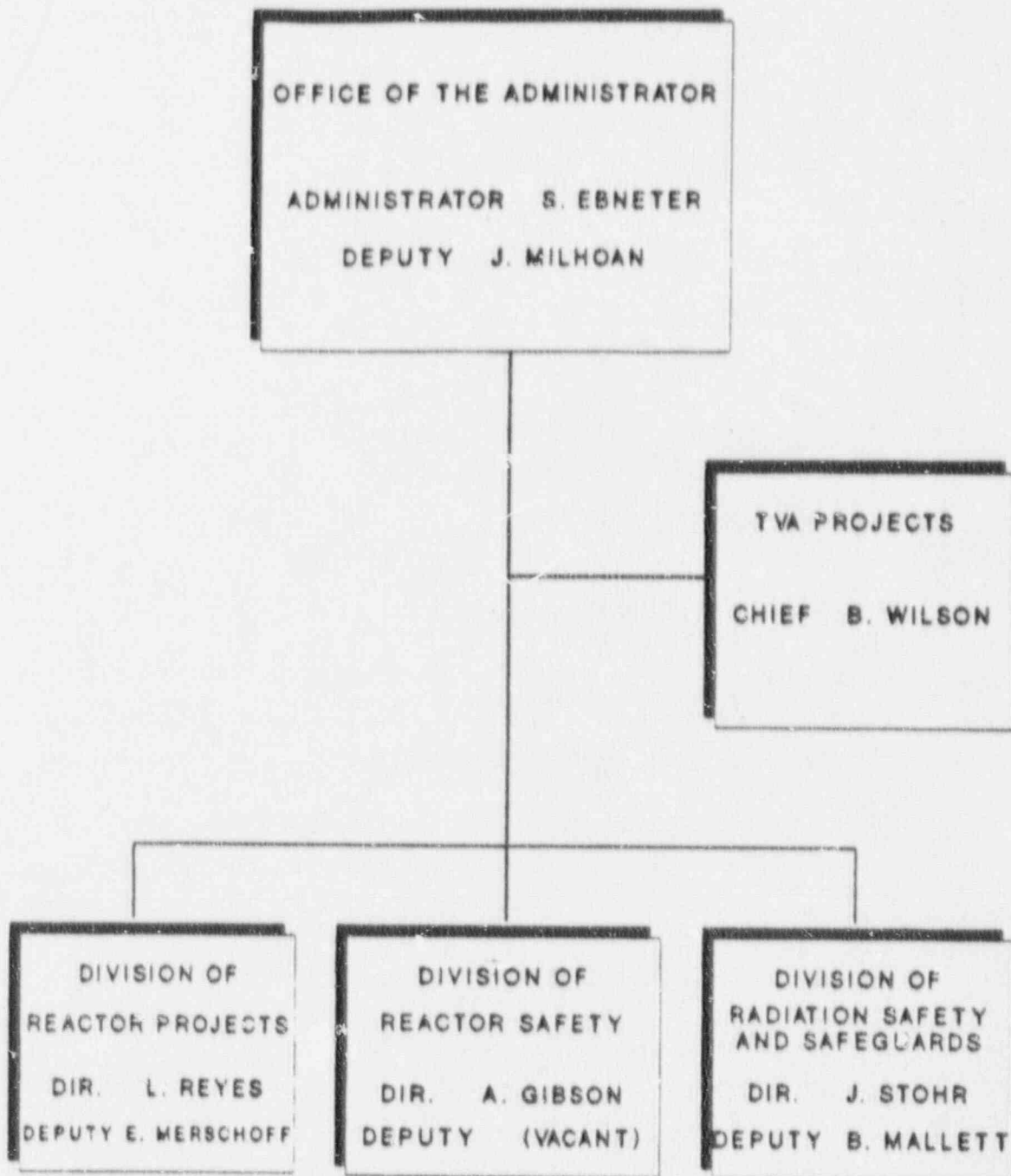
MINERAL, VIRGINIA

NOVEMBER 7, 1990

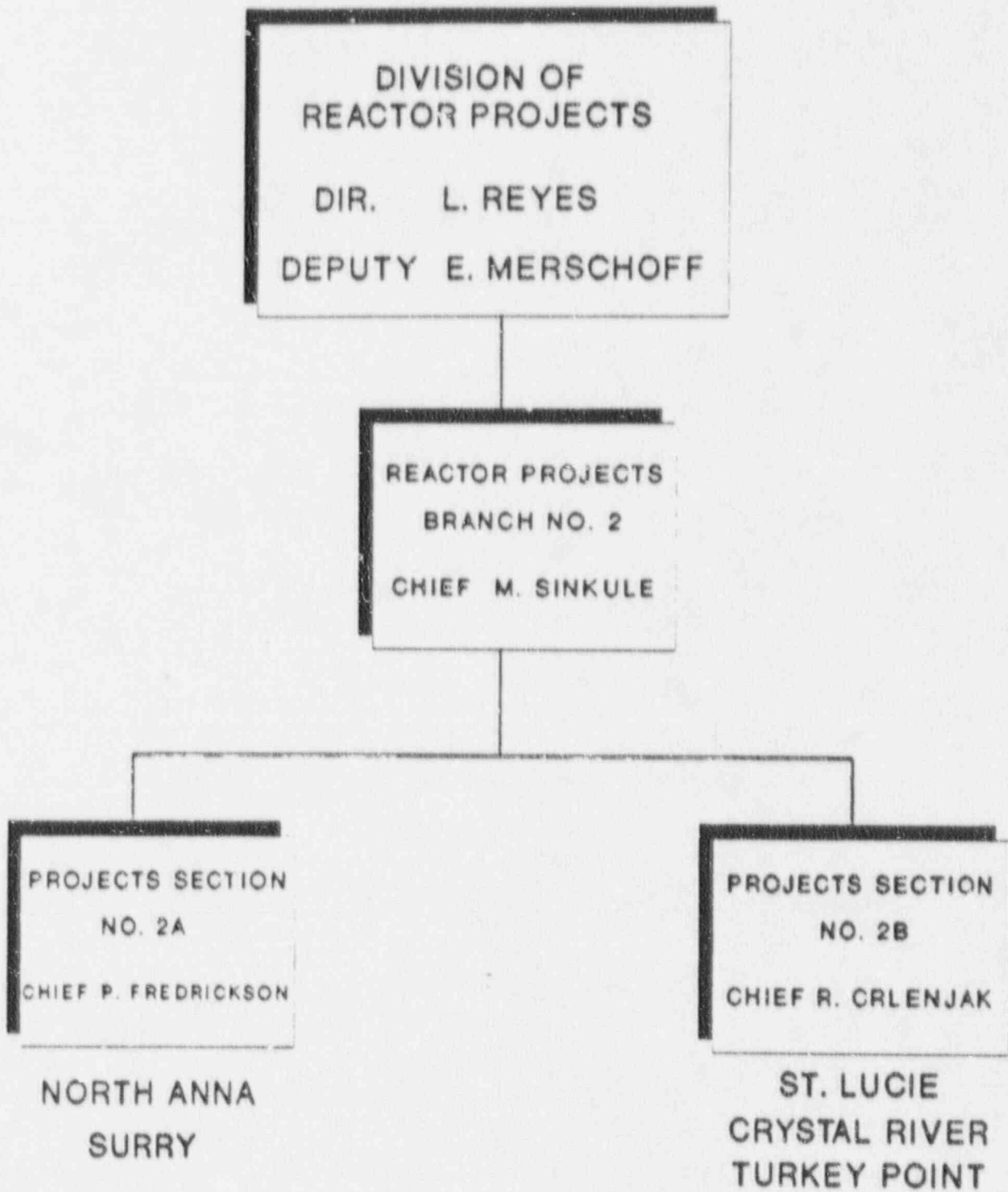
SALP PROGRAM OBJECTIVES

1. IDENTIFY TRENDS IN LICENSEE PERFORMANCE
2. PROVIDE A BASIS FOR ALLOCATION OF NRC RESOURCES
3. IMPROVE NRC REGULATORY PROGRAM

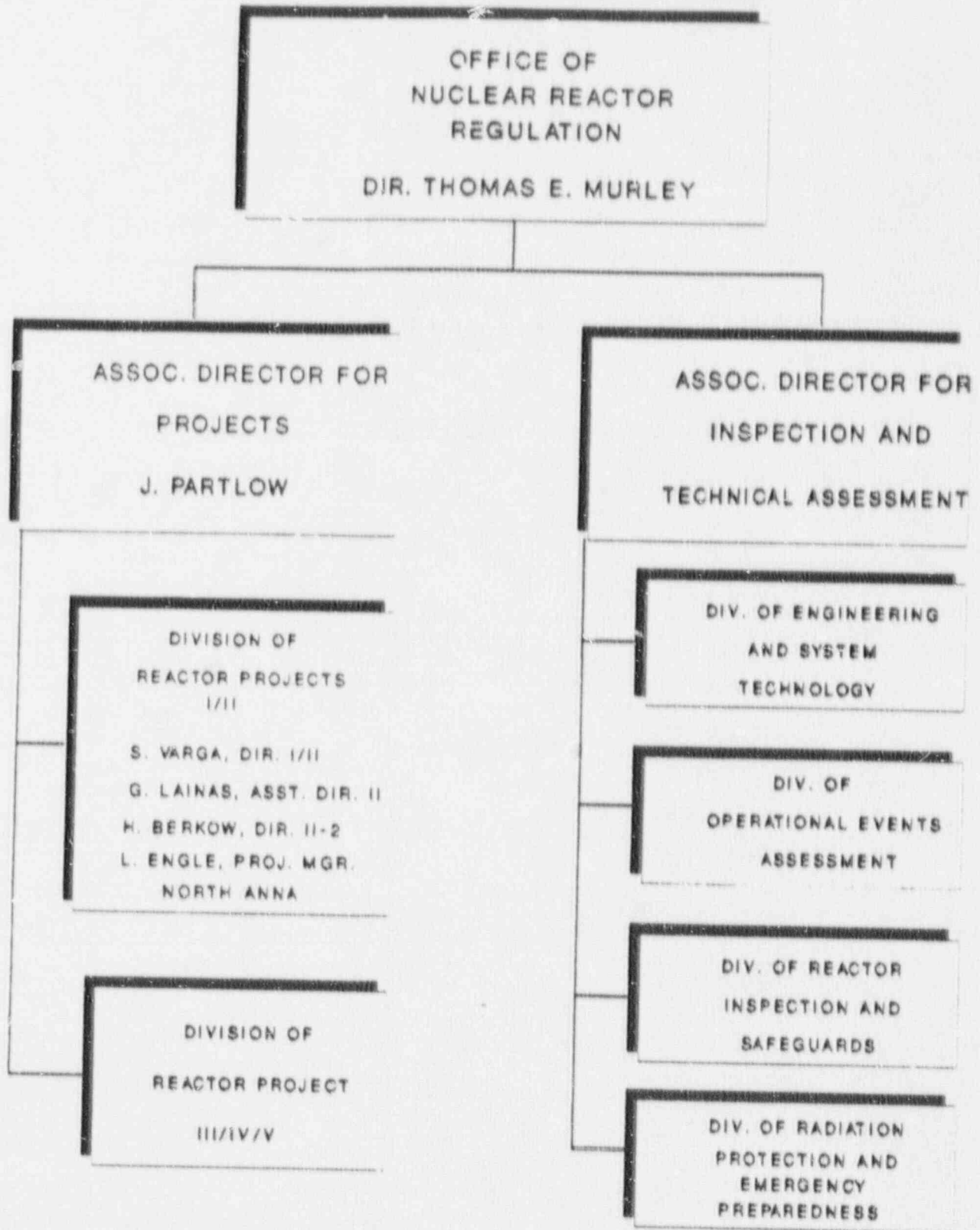
REGION II ORGANIZATION



DIVISION OF REACTOR PROJECTS ORGANIZATION



NRR ORGANIZATION



PERFORMANCE ANALYSIS AREAS
FOR OPERATING REACTORS

- A. PLANT OPERATIONS
- B. RADIOLOGICAL CONTROLS
- C. MAINTENANCE/SURVEILLANCE
- D. EMERGENCY PREPAREDNESS
- E. SECURITY/SAFEGUARDS
- F. ENGINEERING/TECHNICAL SUPPORT
- G. SAFETY ASSESSMENT/QUALITY VERIFICATION

AREA PERFORMANCE

CATEGORY 1

LICENSEE MANAGEMENT ATTENTION TO AND INVOLVEMENT IN NUCLEAR SAFETY OR SAFEGUARDS ACTIVITIES RESULTED IN A SUPERIOR LEVEL OF PERFORMANCE. NRC WILL CONSIDER REDUCED LEVELS OF INSPECTION EFFORT.

AREA PERFORMANCE

CATEGORY 2

LICENSEE MANAGEMENT ATTENTION TO AND INVOLVEMENT IN NUCLEAR SAFETY OR SAFEGUARDS ACTIVITIES RESULTED IN A GOOD LEVEL OF PERFORMANCE. NRC WILL CONSIDER MAINTAINING NORMAL LEVELS OF INSPECTION EFFORT.

AREA PERFORMANCE

CATEGORY 3

LICENSEE MANAGEMENT ATTENTION TO AND INVOLVEMENT IN NUCLEAR SAFETY OR SAFEGUARDS ACTIVITIES RESULTED IN AN ACCEPTABLE LEVEL OF PERFORMANCE; HOWEVER, BECAUSE OF THE NRC'S CONCERN THAT A DECREASE IN PERFORMANCE MAY APPROACH OR REACH AN UNACCEPTABLE LEVEL, NRC WILL CONSIDER INCREASED LEVELS OF INSPECTION EFFORT.

EVALUATION CRITERIA

1. MANAGEMENT INVOLVEMENT AND CONTROL
IN ASSURING QUALITY
2. APPROACH TO IDENTIFICATION AND
RESOLUTION OF TECHNICAL ISSUES
FROM A SAFETY STANDPOINT
3. ENFORCEMENT HISTORY
4. REPORTING, ANALYSIS AND CORRECTIVE
ACTION OF REPORTABLE EVENTS
5. STAFFING (INCLUDING MANAGEMENT)
6. TRAINING EFFECTIVENESS AND
QUALIFICATION

VIOLATION SUMMARY

(CYCLE 9)

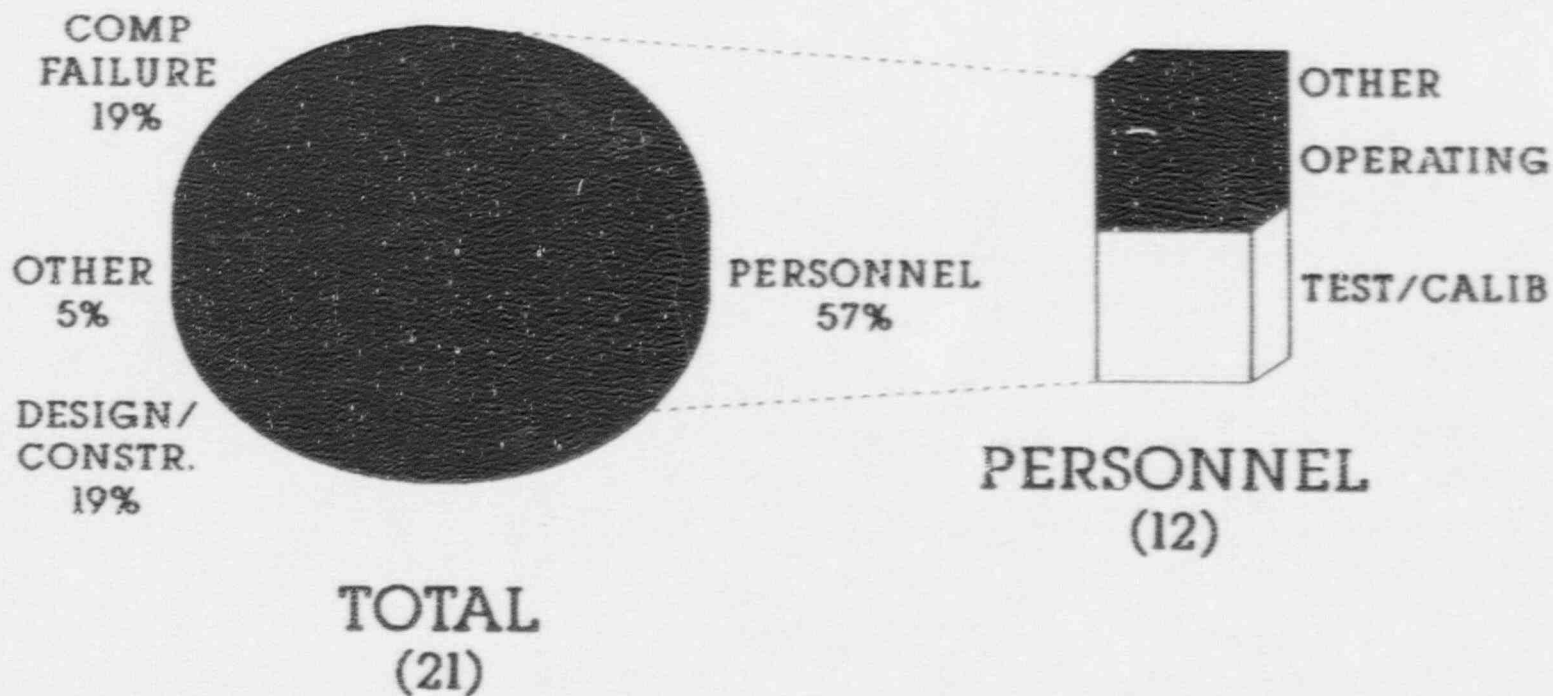
JUNE 1, 1989 THROUGH AUGUST 31, 1990

	I	II	III	IV	V
NORTH ANNA 1	0	0	1	8	1
NORTH ANNA 2	0	0	0	6	0
REGION II AVE.	0	0	1	13	1
PER OPERATING UNIT FOR ASSESSMENT PERIOD					

NORTH ANNA

JUNE 1, 1989 - AUGUST 31, 1990

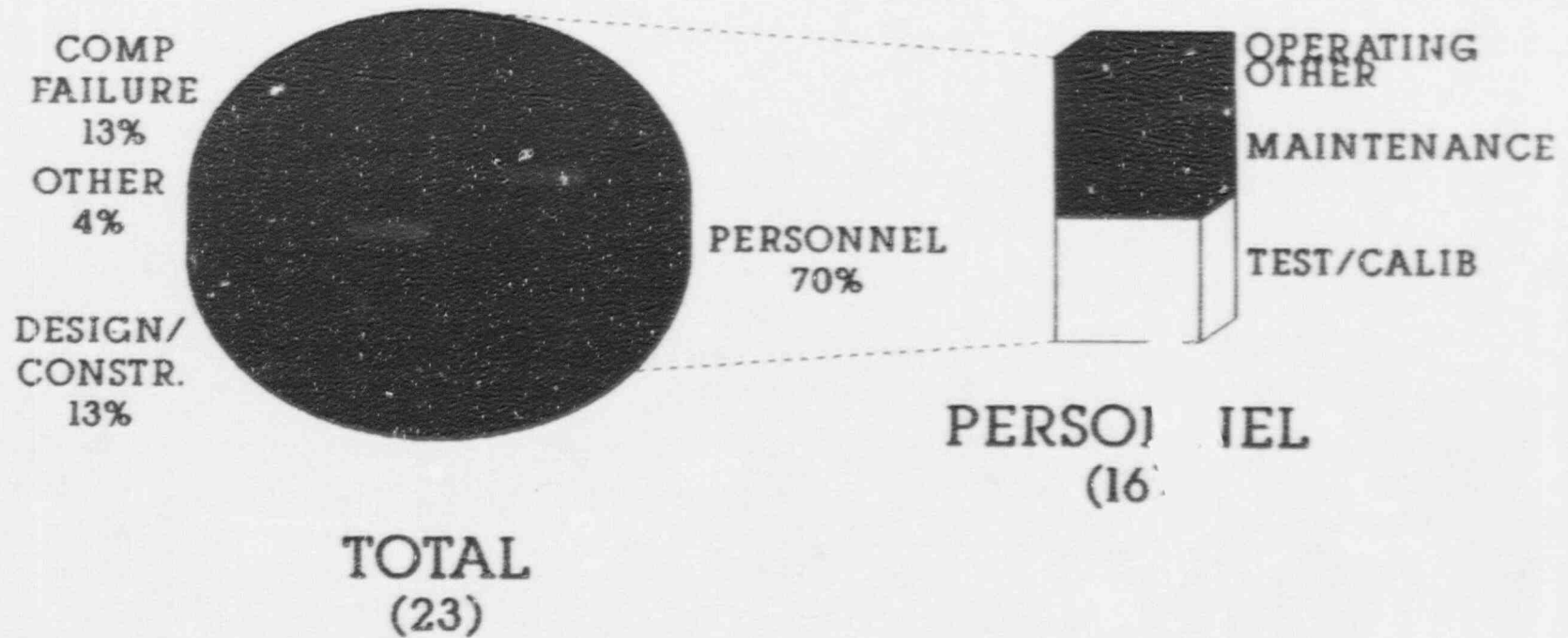
(CYCLE 9)



LERs

NORTH ANNA

MAY 1, 1988 - MAY 31, 1989
(CYCLE 8)



INCIDENTS

OPERATIONS

(CATEGORY 1)

OVERALL QUALITY OF OPERATIONS
REMAINED EXCELLENT

STRENGTHS

- MANAGEMENT
- PROFESSIONALISM
- TRAINING
- INNOVATION
- COMMUNICATIONS
- SELF ASSESSMENT

CHALLENGES

- MAINTAINING PERFORMANCE

RADIOLOGICAL CONTROL (CATEGORY 2)

OVERALL PERFORMANCE IN
RADIOLOGICAL CONTROLS REMAINED
GOOD

STRENGTHS

- MANAGEMENT
- STAFFING
- SOURCE TERM REDUCTION
- CHEMISTRY
- SELF ASSESSMENT

CHALLENGES

- COLLECTIVE DOSE

MAINTENANCE/SURVEILLANCE (CATEGORY 2)

OVERALL QUALITY OF MAINTENANCE
AND SURVEILLANCE REMAINED GOOD

STRENGTHS

- MANAGEMENT
- STAFFING
- SUPPORT TO OPERATIONS
- MATERIAL CONDITION
- PLANNING & SCHEDULING
- EROSION/CORROSION CONTROL
- SELF ASSESSMENT

CHALLENGES

- PROCEDURES & PRACTICES
- IST IMPLEMENTATION
- MISSED SURVEILLANCES
- CONTROL OF VENDOR INFORMATION

EMERGENCY PREPAREDNESS (CATEGORY 1)

OVERALL PERFORMANCE IN THIS
AREA IMPROVED TO EXCELLENT

STRENGTHS

- MANAGEMENT
- TRAINING
- STAFFING
- PERFORMANCE
- CORRECTIVE ACTIONS
- FACILITIES

CHALLENGES

- DRILL CONTROL

SECURITY AND SAFEGUARDS (CATEGORY 2)

OVERALL PERFORMANCE IN THIS AREA
REMAINED GOOD

STRENGTHS

- PERSONNEL
- HARDWARE
- SECURITY PLAN
- CONTROL OF SPECIAL NUCLEAR
MATERIAL

CHALLENGES

- ACCESS CONTROL
- AUDITS

ENGINEERING/TECHNICAL SUPPORT (CATEGORY 1)

OVERALL QUALITY OF ENGINEERING
AND TECHNICAL SUPPORT IMPROVED
TO EXCELLENT

STRENGTHS

- MANAGEMENT
- STAFFING
- TRAINING
- SUPPORT TO OPERATIONS
- INNOVATION
- SELF ASSESSMENT

CHALLENGES

- OCCASIONAL LAPSES IN RIGOR

SAFETY ASSESSMENT/QUALITY VERIFICATION
(CATEGORY 1)

OVERALL PERFORMANCE IN THIS
AREA IMPROVED TO EXCELLENT

STRENGTHS

- MANAGEMENT
- OVERSIGHT
- STARTUP ASSESSMENT
- TECH SPEC IMPROVEMENT
- SELF ASSESSMENT

CHALLENGES

- COMMITMENT MANAGEMENT

ENCLOSURE 4

REVISION SHEET

<u>PAGE</u>	<u>LINE</u>	<u>REASON FOR CHANGE</u>
4	8 and 49	Clarify performance in the Radiological Controls and Security functional areas
4	33-44	Modify summary of Radiological Controls performance to agree with clarification of functional area writeup
5	1	Clarify description of drug issue at the site
5	9 and 13	Add "Improving" trend to Radiological Controls area
5	42	Correct typographical error in Initial SALP Report
8	34	Clarify licensee's collective exposure for assessment period and also performance evaluation based on that exposure
11	4	Add "Improving" trend to Performance Rating
11	7	Change Board Recommendations, based on change in analysis and addition of "Improving" trend
16	4	Clarify issue as testing of suspected drugs and not drug testing of suspected individual

ENCLOSURE 5
FINAL SALP REPORT

ENCLOSURE
SALP BOARD REPORT

U. S. NUCLEAR REGULATORY COMMISSION
REGION II

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE
INSPECTION REPORT NUMBER
50-338, 339/90-22

VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA UNITS 1 AND 2
JUNE 1, 1989 THROUGH AUGUST 31, 1990

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I. INTRODUCTION

The Systematic Assessment of Licensee Performance (SALP) program is an integrated Nuclear Regulatory Commission (NRC) staff effort to collect available observations and data on a periodic basis and to evaluate licensee performance on the basis of this information. The SALP program is supplemental to normal regulatory processes used to ensure compliance with NRC rules and regulations. It is intended to be sufficiently diagnostic to provide a rational basis for allocation of NRC resources and to provide meaningful feedback to the licensee's management regarding the NRC assessment of their facility's performance in each functional area.

An NRC SALP Board, composed of the staff members listed below, met on October 4, 1990, to review the observations and data on performance and to assess licensee performance in accordance with Chapter NRC-0516, "Systematic Assessment of Licensee Performance." The guidance and evaluation criteria are summarized in Section III of this report. The Board's findings and recommendations were forwarded to the NRC Regional Administrator for approval and issuance.

This report is the NRC's assessment of the licensee's safety performance at North Anna for the period June 1, 1989 through August 31, 1990.

The SALP Board for North Anna Units 1 and 2 was composed of:

- E. Merschoff, Deputy Director, Division of Reactor Projects (DRP), Region II (RII) (Chairperson)
- A. Gibson, Director, Division of Reactor Safety, RII
- D. Collins, Chief, Emergency Preparedness and Radiological Protection Branch, Division of Radiation Safety and Safeguards RII
- M. Sinkule, Chief, Reactor Projects Branch 2, DRP, RII
- H. Berkow, Director, Project Directorate II-2, Office of Nuclear Reactor Regulation (NRR)
- M. Lesser, Senior Resident Inspector, North Anna, DRP, RII
- L. Engle, Senior Project Manager, Project Directorate II-2, NRR

Attendees at SALP Board meeting:

- P. Fredrickson, Chief, Projects Section 2A, DRP, RII
- A. Ruff, Project Engineer, Projects Section 2A, DRP, RII
- L. King, Resident Inspector, North Anna, DRP, RII
- G. Wiseman, Reactor Engineer, Technical Support Staff, DRP, RII

II. SUMMARY OF RESULTS

The overall performance of North Anna improved significantly during the assessment period. Plant Operations activities continued to be conducted in a superior manner and Emergency Preparedness, Engineering/Technical Support, and Safety Assessment/Quality Verification improved significantly from the last assessment period. The Radiological Controls and Maintenance/Surveillance areas did not exhibit significant improvement, and performance in the Security functional area decreased somewhat.

Site management awareness and involvement in daily activities and operator knowledge and sensitivity contributed heavily to the continued high performance level in the Plant Operations functional area. An innovative computer-based system to assist the operators and a record operating run for Unit 2 also strongly influenced performance in this area. The 1990 exercises demonstrated significant improvement in the Emergency Preparedness (EP) area. This exercise revealed not only that the emergency plan would function effectively, if needed, but also that the licensee's EP corrective action program was functioning in an effective and timely manner. Engineering/Technical Support performance demonstrated an overall improvement during the period. The Configuration Management/Design Basis Documentation (DBD) Program and improvements in system engineering (SE) were examples of good performance. Some engineering performance problems, though, revealed activities that would benefit from increased attention. Improvement was also made in the Safety Assessment/Quality Verification area. The licensee's sensitivity to nuclear safety, identification of deficiencies, and effective root cause evaluations contributed to improvement in this and the other functional areas which improved. The licensee's involvement in station licensing activities was also a strength.

Although significant effort was expended to improve performance in the area of Radiological Controls, the results were inconsistent. Contaminated areas continued to decrease, but clean area personnel contaminations continued to be a problem. Source term reduction continued to be pursued aggressively, but elimination of a primary dose source, the reactor coolant system (RCS) resistance temperature detector (RTD) bypass lines, was delayed. This problem and extensive outage activities contributed to a high collective dose. The Maintenance/Surveillance area improved, but not substantially, during the assessment period. The corrective maintenance backlog was maintained low and the preventive maintenance (PM) program was conducted without deferrals. Several instances of missed surveillances, continued problems with maintenance procedure adequacy, inadvertent equipment actuation from personnel inattention to detail, maintenance planning problems, and vendor manual usage problems, offset the improvements made in this area.

Performance in the Security area was satisfactory during the assessment period, but declined from the last period. Improvements in hardware and equipment from the last period were offset by several licensee-identified

II. SUMMARY OF RESULTS

The overall performance of North Anna improved significantly during the assessment period. Plant Operations activities continued to be conducted in a superior manner and Emergency Preparedness, Engineering/Technical Support, and Safety Assessment/Quality Verification improved significantly from the last assessment period. The Radiological Controls and functional area also exhibited some improvement during the assessment period. The Maintenance/Surveillance and Security functional areas continued to demonstrate good performance.

Site management awareness and involvement in daily activities and operator knowledge and sensitivity contributed heavily to the continued high performance level in the Plant Operations functional area. An innovative computer-based system to assist the operators and a record operating run for Unit 2 also strongly influenced performance in this area. The 1990 exercises demonstrated significant improvement in the Emergency Preparedness (EP) area. This exercise revealed not only that the emergency plan would function effectively, if needed, but also that the licensee's EP corrective action program was functioning in an effective and timely manner. Engineering/Technical Support performance demonstrated an overall improvement during the period. The Configuration Management/Design Basis Documentation (DBD) Program and improvements in system engineering (SE) were examples of good performance. Some engineering performance problems, though, revealed activities that would benefit from increased attention. Improvement was also made in the Safety Assessment/Quality Verification area. The licensee's sensitivity to nuclear safety, identification of deficiencies, and effective root cause evaluations contributed to improvement in this and the other functional areas which improved. The licensee's involvement in station licensing activities was also a strength.

Significant effort was expended to improve performance in the area of Radiological Controls. The results of these efforts were not fully demonstrated during the assessment period, when there was less radiological work than in past outages. Contaminated areas continued to decrease, but clean area personnel contaminations continued to be a problem. Source term reduction continued to be pursued aggressively, but elimination of a primary dose source, the reactor coolant system (RCS) resistance temperature detector (RTD) bypass lines, was delayed. This problem and outage activities contributed to the collective dose.

The Maintenance/Surveillance area improved, but not substantially, during the assessment period. The corrective maintenance backlog was maintained low and the preventive maintenance (PM) program was conducted without deferrals. Several instances of missed surveillances, continued problems with maintenance procedure adequacy, inadvertent equipment actuation from personnel inattention to detail, maintenance planning problems, and vendor manual usage problems, offset the improvements made in this area. Performance in the Security area was satisfactory during the assessment period. Improvements in hardware and equipment from the last period were offset by several licensee-identified

security violations and a problem with followup of a drug issue at the site.

Overview:

Performance ratings for the last assessment period and the current period are shown below:

<u>Functional Area</u>	<u>Rating Last Period</u>	<u>Rating This Period</u>
Plant Operations	1	1
Radiological Controls	2	2
Maintenance/Surveillance	2	2
Emergency Preparedness	2	1
Security	2	2
Engineering/Technical Support	2	1
Safety Assessment/ Quality Verification	2	1

III. CRITERIA

The evaluation criteria which were used, as applicable, to assess each functional area are described in detail in NRC Manual Chapter 0516. This Chapter is in the Public Document Room files. Therefore, these criteria are not repeated here, but will be discussed in detail at the public meeting held with the licensee management on November 7, 1990. However, the NRC is not limited to these criteria and others may have been used.

IV. PERFORMANCE ANALYSIS

A. Plant Operations

1. Analysis

This functional area addresses the control and performance of activities directly related to operating the units, as well as fire protection, as reviewed during routine inspections conducted during the assessment period.

Performance in this functional area was superior. Significant progress was made in this area identified during the last assessment period and needed improvement. Several programs and philosophies such as coaching, self-checking and check operator contributed to a reduction in personnel errors and attention to detail problems. Some of these programs were implemented in previous assessment periods but continued to contribute to effective operations.

The overall performance of the units was excellent, characterized by long runs and few reactor trips. Unit 1 started the assessment period in a refueling outage. During the period, Unit 1 experienced three reactor trips at power. All three trips were maintenance-related. Two of the

security violations and an isolated Fitness for Duty issue at the site which, upon discovery, was immediately corrected.

Overview:

Performance ratings for the last assessment period and the current period are shown below:

<u>Functional Area</u>	<u>Rating Last Period</u>	<u>Rating This Period</u>
Plant Operations	1	1
Radiological Controls	2	2 Improving
Maintenance/Surveillance	2	2
Emergency Preparedness	2	1
Security	2	2
Engineering/Technical Support	2	1
Safety Assessment/ Quality Verification	2	1

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A. Plant Operations

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Performance in this functional area was superior. Significant progress was made in those areas identified during the last assessment that needed improvement. Several programs and philosophies such as coaching, self-checking and check operator contributed to a reduction in personnel errors and attention to detail problems. Some of these programs were implemented in previous assessment periods but continued to contribute to effective operations.

The overall performance of the units was excellent, characterized by long runs and few reactor trips. Unit 1 started the assessment period in a refueling outage. During the period, Unit 1 experienced three reactor trips at power. All three trips were maintenance-related. Two of the

trips were a result of turbine electro-hydraulic control (EHC) maintenance problems and the third trip was caused by the failure of a driver card for the main feedwater regulating valve. This maintenance-related trip problem continued from the previous assessment period in that, of the three reactor trips on Unit 1 during the last assessment period, two were equipment problem related. At the end of the assessment period, Unit 1 had operated continuously for 219 days at power. Unit 2 continued to operate in an outstanding manner, starting the assessment period at 100% power. The unit set a Westinghouse continuous online run record of 469 days. Unit 2 also exceeded four years without an at-power reactor trip. Unit 2 completed the assessment period in a refueling outage, which was begun approximately two and a half weeks early due to primary-to-secondary steam generator (SG) tube leakage problems.

Station housekeeping and control room decorum continued to be strengths. Station management's high standards were reflected in the highly successful station painting program, which was extended during this period into the safeguards and quench spray buildings and the charging pump cubicles. This, along with significant reductions in auxiliary building contaminated areas, contributed to increased pride and professionalism on the part of station personnel.

The shift composition continued to exceed the Technical Specifications staffing requirements. In addition, the station manager and the two assistant manager positions, the majority of superintendent level positions and some of the supervisory level positions were filled with persons who either hold or held senior reactor operator licenses.

Station management maintained a high degree of awareness and involvement in daily activities at the station. Contributing factors included a detailed daily plant status report summarizing limiting conditions for operations, significant events, equipment problems and indicators, a recorded phone summary of plant status, and the use of modems to access plant operating parameters from offsite. An additional example of management's commitment to operations involved the development of a computer for use by the control room operators. The program allows the operator to immediately obtain annunciator response procedures, equipment status, emergency action levels, Technical Specifications or trend plant equipment operating parameters. In addition, this system can provide on-demand equipment out-of-specification data for the operators. Effective management controls were also noted with the licensee's startup assessment to support unit restart following an outage. Policies were clearly communicated and personnel were held accountable for actions.

Corporate management typically exercised good judgement and conservatism when dealing with nuclear safety. One example included a decision by management to reduce power and eventually shut down a unit when evidence indicated that a primary-to-secondary SG tube leak was increasing, even though the leak rate was significantly below that allowed by Technical Specifications. The decision was particularly noteworthy considering that the unit was only eight days from the world's record for a light water

reactor continuous online performance. A second example of good judgement and communication involved a response following a partial loss of offsite power and reliance on the emergency diesel generator to supply power for an extended time. Actions included dedicated operators and mechanics to monitor diesel performance and elimination of activities which could perturb the system. One decision, though, to continue operation with a degraded turbine EHC system, contributed to a subsequent automatic trip.

Operator performance during the assessment period continued to improve and generally demonstrated professionalism and sensitivity to events. Both units continued to achieve "black boards" (no annunciators lit) on a routine basis. Any annunciator which could not immediately be corrected, received prompt attention. The "black board" concept was considered effective because operators gave full attention to abnormal conditions and were not unnecessarily distracted by nuisance alarms. Daily duties were observed to be carried out in a professional manner. Operators demonstrated excellent knowledge of unit operations as indicated by very few problems during startups and shutdowns. Several examples of excellent response to events were noted. In one case, actions following a loss of power to the process control cabinet averted a potential reactor trip. A second example involved the quick detection and correction of a reactor coolant shift from the reactor vessel to the pressurizer, while shut down, due to air intrusion from Type C penetration testing. The operators were sensitive to RCS draindown and reduced inventory evolutions. Another example of operator sensitivity occurred when an operating shift identified during the prejob briefing that the planning phase of draindown was deficient in that previously identified procedural problems had not been corrected. Although attention-to-detail errors were reduced, failure to follow procedures resulted in two containment recirculation spray subsystems being inoperable simultaneously and resulted in a violation. A combination of operator error and a procedural inadequacy resulted in a failure to align the fuel building ventilation system through the charcoal filters during fuel movement.

The emergency operating procedures (EOPs) were adequate to cover the broad range of accidents and equipment failures necessary for safe shutdown of the plant, but contained numerous deficiencies. A significant number of these deficiencies, identified by an NRC EOP inspection, were similar to findings identified by the licensee shortly before the NRC inspection. Also, many of the licensee's abnormal operating procedures were weak. In some cases the procedures were incomplete, lacked guidance and conflicted with the EOPs. Although the procedures had problems, operators were aware of the proper action to take. Specifically, during two actual events involving loss of electrical power, operators correctly relied on electrical load lists to restore power to equipment in spite of inadequate procedural guidance. At the end of the assessment period, the licensee was addressing the problem and committed to periodic audits of the EOPs by Corporate Nuclear Safety (CNS).

Numerous problems with the instrument air system were identified during the last assessment period. While problems continued to occur early in this period, the installation and operation of a new instrument and service air system, late in the period, essentially resolved this issue.

One violation was identified for failure to maintain containment integrity when the equipment hatch escape door had been breached. This issue was an isolated event and not symptomatic of any programmatic weakness.

The licensee's fire protection program continued to be effective. Strengths identified included staffing in the fire protection group and the licensee's program for controlling movement of transient combustibles, which ensures fire safety in the plant.

Two violations were identified during the assessment period.

2. Performance Rating

Category: 1

3. Board Recommendations

None

B. Radiological Controls

1. Analysis

This functional area addresses those activities directly related to radiological controls and primary/secondary chemistry control, as reviewed during routine inspections conducted throughout the assessment period.

Staffing levels in these areas were appropriate and the groups experienced a low turnover rate. The licensee's three-year average for collective radiation dose per unit for 1987 through 1989 was 518 person-rem with a collective radiation dose of 736 person-rem per unit experienced in 1989. In 1989, the licensee experienced two planned refueling/maintenance outages and one unplanned forced outage for a total of 175 days. The first planned outage resulted in 678 person-rem. The second planned outage, entered earlier than scheduled due to a failed SG tube mechanical plug, resulted in the expenditure of 799 person-rem. The unplanned outage expended 34 person-rem. The high collective doses were attributable to the two planned outages, overruns in these outages and high radiation levels in the areas where a significant amount of the work was performed.

(SEE ERRATA SHEET)

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Two violations were identified during the assessment period.

2. Performance Rating

Category: 1

3. Board Recommendations

None

B. Radiological Controls

1. Analysis

This functional area addresses those activities directly related to radiological controls and primary/secondary chemistry control, as reviewed during routine inspections conducted throughout the assessment period.

Staffing levels in these areas were appropriate and the groups experienced a low turnover rate. The licensee's collective dose during this assessment period (15 months) was 239 person-rem/reactor. Given the work performed during this assessment (i.e., power operations and the end of one outage), this collective dose is indicative of a good ALARA program.

The licensee continued to reduce contaminated square footage of the radiologically controlled area (RCA) of the auxiliary building. The contaminated area of the 96,000 square feet RCA was reduced from 13,200 ft² in 1987 to 9,800 ft² in 1988. In 1989 the contaminated area was reduced to 6,700 ft² and further reduced to 5,300 ft² at the end of the assessment period. As the contaminated area of the plant has been reduced, personnel contamination events (PCE) have also declined. However, the licensee-performed assessments indicated that a significant number of PCEs continued to occur in designated clean areas of the RCA. Problems responsible for the high number of PCEs were identified and management attention given to assure PCEs were further reduced.

While several effective dose reduction measures and practices have been implemented, such as a reactor head shield, a valve packing extraction tool, digital alarming dosimeters to increase dose awareness, hot spot flushing, shielded SG manway doors, and an enhanced Cobalt Filtration Program; collective dose at North Anna was high. Use of the reactor head shield was postulated by the licensee to save 50-60 percent of the dose during reactor head operations, and a savings of 262 person-rem was postulated as a result of hot spot flushes. Use of the packing extractor tool reduced packing removal from valves from two to four hours to 20 minutes, depending on location. In addition, significant dose savings were realized from the use of temporary lead shielding. The licensee's ALARA group presented data which showed that from 1985 through 1989, dose from work in the vicinity of the RCS RTD bypass manifold area was responsible for 21 percent of total annual station dose; and that replacement could result in a savings of dose on the order of 50 percent in the vicinity of the loop rooms and pump cubicles. This is significant considering that in 1989, 40 percent of total outage dose was attributed to SG work. Other chronic contributors to station dose were: excessive dose to manually remove sludge from the reactor cavity because the transfer canal drainline is located four inches above the floor, health physics coverage of SG eddy current operations from the inside of the SG cubicles, high radiation levels on pressurizer spray lines, and entries to the sub-atmospheric containment while at power to perform maintenance and repair activities. In spite of the fact that removal of the RTD bypass manifold system is necessary to further reduce collective dose, the licensee indicated that removal of this system may be three to four years away.

The licensee's program for control of contaminated equipment was generally effective, but there was an instance when North Anna released radioactive material to an unrestricted area when a slightly contaminated Teledose unit was shipped offsite to another facility. This resulted in a violation. The licensee implemented more stringent controls for material to be released to unrestricted areas.

The liquid and gaseous effluent program was satisfactorily managed with liquid and gaseous effluents for calendar year 1989 within the dose limits specified by Technical Specifications and within the radioactivity concentrations specified in 10 CFR 20, Appendix B. The projected whole body dose to the maximum exposed member of the public due to liquid effluents was 3.08 mrem. The projected dose to the critical organ (infant's thyroid) due to gaseous effluents was 0.18 mrem. The doses for 1989 were greater than those for 1988, but consistent with 1987 doses. A Unit 1 SG tube leak contributed to an increase in liquid fission and activation products in 1989. Containment purges during outages (both units) in 1989 contributed to an increase in gaseous iodine. A review of the Semi-Annual Radioactive Effluent Release Report for January 1, 1990 through June 30, 1990, indicated a small reduction in the amounts of liquid and gaseous effluents released, although there were no outages during this period.

The Radiological Environmental Monitoring Program (REMP) was effectively managed. A review of the 1989 annual Radiological Environmental Operating Report indicated that there were no significant radiological consequences attributable to the operation of North Anna in 1989 due to airborne, waterborne, aquatic, ingestion, or direct exposure pathways. Tritium levels in Lake Anna have shown an increasing trend since 1977, although the reported levels were below the reporting level of 20,000 pCi/liter. The 1989 values for river water averaged 3,749 pCi/liter, as compared to 3,925 pCi/liter in 1988. The Updated Final Safety Analysis Report (UFSAR) postulated an equilibrium concentration of 3,671 pCi/liter. However, there was insufficient data to conclude that the tritium concentration has stabilized. No significant offsite dose can be projected as a result of these levels of tritium in the lake water.

The licensee performed an audit of the REMP, the Offsite Dose Calculation Manual, and the Process Control Manual. The findings and observations included: liquid and gaseous dose projections not being performed as required, inoperable monitors not being reported as required, problems with radiation monitor setpoints, and repair of inoperable radiation monitoring equipment. The corrective actions were adequate. Overall this audit was well planned, thorough and adequately documented.

The primary and secondary chemistry program was well managed. In November 1989 the chemistry organization was moved under the Radiation Protection Superintendent. Total chemistry staffing was increased from 23 to 26 persons, providing for increased attention to plant chemistry. Primary and secondary chemistry parameters were being effectively maintained within Technical Specifications and Electric Power Research Institute/Steam Generator Owner Group guidelines during steady state operations. The licensee had an aggressive program to measure, control, and reduce corrosion in various plant water systems.

One violation was identified during the assessment period.

2. Performance Rating

Category 2

3. Board Recommendations

The Board is concerned that despite the licensee's dose reduction initiatives during the assessment period, overall collective dose remained high. Additional management emphasis on the pursuit and effective implementation of good ALARA practices is warranted.

C. Maintenance/Surveillance

1. Analysis

This functional analysis assesses those activities related to equipment condition, maintenance, surveillance performance, and equipment testing as reviewed during routine inspections conducted during the assessment period.

The licensee's maintenance program improved during the assessment period, primarily as a result of corporate and station management's commitment to improve both resource allocation and programs. The maintenance department staffing levels were increased by the addition of maintenance engineers, maintenance support personnel, planners, and instrument technicians. The instrument support service group was reorganized to provide dedicated personnel for specialty areas such as security equipment, meteorology and computers.

Maintenance support of operations contributed to long operating runs, reduced forced outage rates, and "black boards." With the exception of a diesel engine connecting rod failure early in the assessment period, minimum equipment problems occurred. Three reactor trips, however, were caused by inadequate maintenance practices. Two trips involved the turbine EHC system and the third trip was due to a failed driver card for the main feedwater regulating valve. This maintenance-related trip problem continued from the previous assessment period. Also, superior material condition and equipment preservation was evident based on routine plant tours. Both units experienced isolated cases of high RCS unidentified leakage during the assessment period, although the Technical Specification limits were not exceeded. The leaks were located primarily on the RTD bypass manifold. Corrective action was effective and unidentified leakage remained low towards the end of the period.

The licensee effectively applied its resources to significantly reduce and maintain a small corrective maintenance backlog and to conduct PM without deferrals. The previous assessment identified the licensee's lack of a formal check valve PM program as a weakness. Corporate and station management assigned the necessary resources and developed a check valve program and, in addition, a relief valve program, a circuit breaker program, an motor-operated valve program and a component analysis program; each of which was assigned to a maintenance engineer. The licensee was also developing increased use of predictive maintenance techniques and

2. Performance Rating

Category 2

Trend: Improving

3. Board Recommendations

The Board recognizes that you face a challenge to dose reduction from the source term and steam generator work and we encourage you to continue pursuing these efforts to achieve the lowest collective dose that is reasonable for your facility.

C. Maintenance/Surveillance

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reliability-centered maintenance programs. However, the licensee's failure to implement a vendor-recommended Grinnell valve PM program in a timely manner contributed to a chronic problem of radiological gas in the auxiliary building which had been tolerated by the licensee and had continued from previous assessment periods. During this period, the licensee identified leaks from the gas stripper, VCT level instrumentation and low level waste tank to be significant sources of rubidium. By the end of the assessment period, the gas problems were under control. A violation for failure to establish an effective program to identify and reduce radioactive leakage in fluid systems outside containment involved both this issue and the Grinnell valve PM program.

The licensee experienced reliability problems with various recirculation heat exchangers and service water radiation monitors during the previous assessment period and early into this assessment period. Increased station management attention resulted in improved performance in the operability of radiation monitors, although some problems continued.

The licensee maintained an adequate program for ensuring that surveillances were properly scheduled and conducted. In some cases, however, the failure to properly revise test procedures and schedules resulted in missed surveillances. Examples of this included missed surveillances on the auxiliary feedwater system pumps, valves and flowrate instrumentation, pressurizer level time response testing and the failure to include 79 containment isolation valves in the monthly containment integrity certification. Surveillance procedures associated with the ten-year inservice inspection activities on the Unit 1 reactor vessel were technically adequate. The examination results were promptly and conservatively evaluated by the licensee.

Overall, the in-service testing (IST) program was implemented in a satisfactory manner. Several performance problems did occur, though, involving failure to increase testing frequency based on high vibration of a casing cooling pump, a procedure which did not ensure adequate running time prior to data collection and the implementation of a relief request prior to NRC approval.

In previous assessment periods, various problems with maintenance procedures were identified in that many were generic, lacked component-specific guidance and required "write-in" steps. The licensee embarked on a long-term program to upgrade and develop component-specific maintenance procedures. Although several procedures had been written, the overall program had not been implemented long enough during the assessment period to be evaluated. Current procedure inadequacies continued to cause problems. In one case the absence of detailed steps resulted in a low head safety injection pump discharge relief valve failing to reseal due to an incorrectly adjusted blowdown ring. Also a hydrogen analyzer calibration procedure required the acceptance criteria to be written in by the instrument technicians. Subsequent review determined that the written-in criteria was incorrect resulting in a violation. Surveillance procedural inadequacies accounted for a spurious diesel generator start

and a non-conservative calibration of all the refueling water storage tank (RWST) low level automatic setpoints.

Although personnel error corrective action effort from the previous assessment period continued to be effective, personnel problems contributed to several significant equipment issues. The failure to follow procedures during a RCS letdown filter replacement contaminated seven workers and resulted in a violation. Personnel errors also contributed to the previously mentioned diesel generator start and the RWST calibration error.

Although planning was generally satisfactory, problems continued to occur. In one case, when the low head safety injection pump was removed from service for corrective maintenance, the failure to identify procedural interference and needed repair parts by conducting walkdowns precluded timely completion of the job and resulted in the pump remaining out of service for an unnecessarily extended period. The lack of a planning walkdown and an effective procedure contributed to several problems observed during repair activities on a containment vacuum pump. Ineffective maintenance controls resulted in the removal of the service water pumphouse concrete blocks on one occasion and the charging pump cubicle blocks on another without adequate compensatory measures. The blocks serve structural support functions for the safety-related pumps. Several examples of successfully planned and executed work activities were observed. These included a reactor coolant pump motor replacement, a reserve station service transformer replacement and an outage to repair butterfly valves in the component cooling water system. These were the result of improvements in coordinating maintenance planning with operations, health physics and other groups.

In part, because problems occurred with control of vendor manual information, the licensee was comprehensively addressing vendor manual control by including upgrading programs as part of the overall configuration management program. Examples of vendor manual problems were the failure to incorporate casing leak repair procedures on a low head safety injection pump, torque values for Grinnell valve bonnet nuts not being incorporated into a maintenance procedure which contributed to an unplanned spill, and technicians observed using an uncontrolled vendor manual to perform calibrations.

Microbiological induced corrosion was being managed in the service water system with molybdate/phosphate corrosion inhibitors and biocides. This treatment scheme reduced uniform corrosion in this system to approximately 1 mil per year. The licensee installed a corrosion monitoring system for the service water system. The licensee was involved in several ongoing studies dealing with corrosion inhibition.

Five violations were identified during the assessment period.

2. Performance Rating

Category: 2

3. Board Recommendations

Maintenance and calibration procedures have continued to cause problems during this evaluation period. While the Board recognizes the long term efforts underway to correct this problem, continued management attention and support to this area is encouraged.

D. Emergency Preparedness

1. Analysis

This functional area addresses activities related to the implementation of the Emergency Plan and procedures, support and training of onsite and offsite emergency response organizations, as reviewed during licensee performance during emergency exercises and routine inspections conducted during the assessment period. This assessment period included both the 1989 and 1990 annual emergency exercise.

During this period the licensee provided good management support to the EP program and maintained a qualified on-call staff for responding to an emergency. Support to the EP program was evident and highly effective from both corporate and site management, as reflected by the 1990 annual exercise. The 1989 annual exercise resulted in licensee commitment to demonstrate objectives that were not adequately demonstrated in the exercise, primarily because of scenario/controller problems. The 1990 exercise scenario was challenging and technically accurate; the exercise controller organization was well-trained and well-coordinated; and the 1989 exercise commitments were fully demonstrated. Emergency planning staff at the site was increased during this assessment period with the addition of the Emergency Planning Station Coordinator position. Implementation of the Virginia Power Emergency Preparedness Enhancement Program resulted in additional upgrades in the EP program and initiatives to increase effectiveness. The more significant of these were the improved staff augmentation available from a significantly enhanced notification and callout methodology and the installation and demonstrated use of an upgraded dose assessment system.

EP coordination and support was very good, as indicated by the detailed exercise scenario and effective control observed during the 1990 annual exercise. EP training was effective, as demonstrated during exercise observations and a simulator exercise, with one exception. The exception was the training of the 1989 exercise controller staff which, because of excessive prompting of players, prevented the full evaluation of the licensee's capability to classify, assess, and respond to an accident. The 1989 emergency exercise also identified weaknesses in the area of personnel accountability and radiological monitoring activities; however, both of these were demonstrated as fully satisfactory during the 1990 exercise. The licensee also demonstrated an effective critique process and corrective action program in that all EP open items were closed by the

end of the assessment period. The licensee continued to maintain appropriate facilities and equipment to respond to an emergency, including the Technical Support Center, Local Emergency Operations Facility, and communications equipment, with one exception noted. The exception was a failure to maintain respirators in accordance with procedures such that respirator cartridges with an expired shelf-life were found in an emergency kit. The licensee immediately corrected the situation. In addition, the licensee's EP augmentation capability was improved from the last assessment period by putting all 30-minute responders on shift and extending the assignment of pagers to all personnel required for minimum staffing of the emergency response facilities.

The licensee had effective working relationships with the Virginia Commonwealth and local emergency response organizations. When emergency planning issues from the Virginia Commonwealth and local agencies were identified during drills and exercises, the licensee worked with these agencies to improve the programs and, when necessary, provided significant support.

The licensee submitted one revision to the North Anna Power Station Emergency Plan. The submittal was a complete plan change, which did not degrade the Emergency Plan's effectiveness.

No violations were identified during the assessment period.

2. Performance Rating

Category: 1

3. Board Recommendations

None

E. Security

1. Analysis

This functional area addresses those activities related to security protection of plant vital systems, equipment, and special nuclear material, as reviewed during inspections and observations conducted during the assessment period.

Security personnel performance was satisfactory during the assessment period, and the security program was, in general, effectively implemented. Perimeter detection zones were improved by installation of concrete foundations on which a new 4-wire Stellar E-field intrusion detection system was installed to replace the old 3-wire system. Testing of the new system demonstrated acceptable detection capability. The motivation and professionalism demonstrated by security personnel was noteworthy. The recent change in security shift scheduling to 12-hour shifts of 4-days on duty and 4-days off contributed to improved morale.

Access control was satisfactory during the period with the exception of two problems involving security requirements related to unsecured alarmed security doors and an inadequate materials search. An additional problem, related to inadequate management oversight resulted in an individual's station access continuing with positive drug test results. A review of the event revealed the occurrence of a communications breakdown between the security organization and the Louisa County Sheriff's Department. This lapse in communications resulted in a 14-month delay in the initiation of appropriate follow-up action by the licensee due to the licensee's failure to contact the sheriff's office for the results.

Review of the licensee's audits of the security program during this assessment period revealed a lack of documented conclusions relative to the adequacy of effectiveness of the security program early in the assessment period. However, more recent audits were thorough and also detailed the auditor's actions to determine the effectiveness of the security program.

The licensee made a concerted effort to ensure that plan changes were coordinated and properly documented prior to submittal. The lines of communication regarding plan changes improved during the assessment period. Three changes were made to the North Anna security plans under the provisions of 10 CFR 50.54(p). The changes were consistent with the applicable requirements. The licensee improved their communication with the NRC regarding the context and content of plan changes.

The licensee followed all applicable NRC guidelines and maintained an adequate program for controlling and accounting for special nuclear material.

No violations were identified during the assessment period.

2. Performance Rating

Category: 2

3. Board Recommendations

None

F. Engineering/Technical Support

1. Analysis

This functional area addresses those activities associated with the design of plant modifications, engineering and technical support for operations, outages, maintenance, testing and surveillance, and licensed operator training as reviewed during routine inspections conducted during the assessment period.

Access control was satisfactory during the period with the exception of two problems involving security requirements related to unsecured alarmed security doors and an inadequate materials search. An additional problem involved inadequate management oversight with respect to determining, what turned out to be, positive drug test results on confiscated substance. A review of the event revealed the occurrence of a communications breakdown between the security organization and the Louisa County Sheriff's Department. This lapse in communications resulted in a 14-month delay in the initiation of appropriate follow-up action by the licensee due to the licensee's failure to contact the sheriff's office for the results.

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The licensee followed all applicable NRC guidelines and maintained an adequate program for controlling and accounting for special nuclear material.

No violations were identified during the assessment period.

2. Performance Rating

Category: 2

3. Board Recommendations

None

F. Engineering/Technical Support

1. Analysis

This functional area addresses those activities associated with the design of plant modifications, engineering and technical support for operations, outages, maintenance, testing and surveillance, and licensed operator training as reviewed during routine inspections conducted during the assessment period.

Although examples of deficient performance were identified, the licensee generally demonstrated an improving trend in engineering and technical support performance. The licensee's commitment to improve performance was demonstrated by actions initiated to address previously identified weaknesses in this functional area. Corporate engineering management developed and implemented an Engineering Quality Plan which established goals and directions for improvement. Follow-up actions to address weaknesses identified by the safety system outage modifications inspection (SSOMI) were comprehensive and beyond NRC requirements. Actions to reduce the drawing update backlog were successful and provided improved program controls. The engineering work request backlog was reduced and improved controls were implemented for engineering calculations. Post-modification test controls were upgraded and resulted in improved performance in this area. Evaluation of modification field revisions demonstrated a design control self-assessment initiative. Temporary modifications were reduced and maintained at a minimal level.

Considerable licensee resources were allocated to the continuing Configuration Management DBD Program. The program was comprehensive and has been effective in upgrading plant design basis information. Completion of the system design basis documents was on schedule. This program was developing consistently with well-defined design basis information. The licensee's interface with the NRC on the DBD program status was very pro-active.

Engineering support contributed to achieving and routinely maintaining control room annunciator "black boards" and also evaluating and reducing a backlog of open justifications for continued operation. Modifications were implemented which resolved long standing control room habitability and instrument air system problems. Design Engineering (DE) identified and resolved calculation errors in both large break loss of coolant accident analysis and pipe support loading for recirculation spray heat exchanger service water lines. Additional examples included the identification of design deficiencies related to the incore flux mapping assembly and root cause for spurious actuation of pressurizer heater protective devices.

Although improved performance was evident, there were examples of less effective engineering performance. Station engineering was not pro-active in tracking and trending information to determine the impact of elevated environmental temperatures on equipment performance. Specific examples were elevated temperatures on the cable vaults, battery rooms, rod drive rooms and the extensive use of portable fans and blowers to cool safety-related equipment. Also, station engineering applicability evaluation of potential orifice installation deficiencies was not timely. DE evaluation and recommendations regarding the start-up channel check of steam and feed flow instrumentation was inadequate. Although the plant rejected this evaluation it demonstrated a deficient knowledge level of DE with respect to Technical Specification operability verification requirements. Also an inadequate engineering test procedure for solid state protection system slave relays resulted in inoperability of air ejector

discharge to containment valves. Problems related to equipment design and relief valve setpoints contributed to several piping system relief valve lifts during various safety-related pump testing. Test procedures and piping modifications appeared to have addressed the concerns with the pumps in the AFW and recirculation spray systems, however, relief valve lifting on the low head safety injection pumps had not been addressed at the end of the assessment period.

The onsite technical support organization developed into a more effective support resource. Contributors to this improvement were the realignment of onsite technical resources and the maturing SE organization. The onsite organization was well staffed with approximately 65 engineers. This included a small onsite contingent of DE and 26 system engineers. The technical support manager's strong operational and technical background provided additional strength for the technical support organization. The SE program was well developed including clearly defined performance goals and a comprehensive training and qualification process. A specific SE strength was the engineers' knowledge of systems and components. Also, station engineering demonstrated increased involvement in plant activities by participation in routine plant daily meetings.

Although deficiencies were identified in the IST program, which contributed to implementation problems, engineering's overall effort demonstrated an intention to meet all applicable industry and regulatory requirements in program development. The licensee's overall response to Generic Letter 89-04, Guidance on Developing Acceptable Inservice Testing Program, was satisfactory, prompt and demonstrated a good interface with the NRC. Additionally, the licensee demonstrated initiative in resolving IST program deficiencies. For example, prior to submittal of a relief request regarding test requirements for outside recirculation spray pumps, the licensee performed two pump tests and provided test results to substantiate the basis for relief. However, several sections of the program were incomplete. Specifically, station engineering failed to identify that the recirculation spray pump testing was not in accordance with ASME Section XI requirements. In addition, the licensee failed to incorporate numerous service water valves into the program and to properly full stroke charging pump lube oil cooler valves, resulting in a violation. During the latter part of the assessment period, the licensee demonstrated a strong interest in understanding Code requirements, NRC positions and generic issues in order to properly address and incorporate these matters in the IST program.

The licensed operator requalification training program was rated as satisfactory based on an 89 percent pass rate. Four crews were evaluated with no failures. No initial licensed operator examinations were administered. Effective use of the simulator was observed for proficiency training during major evolutions such as reactor startups and major tests.

Two violations were identified during the assessment period.

2. Performance Rating

Category: 1

3. Board Recommendations

None

G. Safety Assessment/Quality Verification1. Analysis

This functional area addresses those activities related to licensee implementation of safety policies; licensee amendments, exemptions and relief requests; responses to Generic Letters, Bulletins and Information Notices; resolution of safety issues (10 CFR 50.59 reviews); safety review committee activities, and use of feedback from self-assessment programs and activities, as reviewed during routine inspections conducted during the assessment period.

Licensee corporate and station management attention and involvement were readily evident and placed emphasis on superior performance of nuclear safety. The licensee implemented a series of overlapping programs for self-assessment and quality verification which were effective in identifying weak performance and improving programs. At the department level onsite, each group conducted quarterly self-assessments by compiling and reviewing performance indicators and other sources for strengths and weaknesses. The conclusions were presented for management review and the results visibly displayed to highlight personnel, programmatic or equipment problems.

Station management consistently demonstrated active involvement and exercised effective controls in station activities. This was evidenced by the continuation of management reactor startup assessments following refueling or reactor shutdowns. An evaluation was conducted by each department to ensure that within their area of responsibility, all equipment tests and supporting documentation necessary for unit startup were completed and evaluated. Each evaluation was presented to station management for their review, questions and approval.

Quality assurance (QA) organization performance during the assessment period was effective. QA conducted performance evaluations in various areas, often identifying issues which were outside the regulatory-based scope of QA audits. One example of an effective evaluation was a review of the Maintenance Department activities and program. The assessment was extensive and pointed out several strengths as well as weaknesses in the areas of planning, work activity documentation and post-maintenance testing. Exits were held with station management to ensure they were aware of the QA observations.

A significant problem was identified in the previous assessment period involving the offsite independent review group meeting its Technical Specification-required review responsibilities. Major improvements were

implemented during the assessment period with increased corporate involvement in the areas of oversight and independent review. A Management Safety Review Committee (MSRC) was formulated, consisting of senior corporate members and consultants, to independently review station activities such as significant events, violations, findings, and evaluations. A technical specification regarding MSRC activities was requested and issued demonstrating management's commitment to the establishment of an effective oversight program. To correct the specific problem from the previous assessment period, the CNS group was staffed with qualified reviewers and a dedicated supervisor to report to MSRC as a subcommittee. CNS conducted Technical Specification-required independent reviews and was also detailed by MSRC to review areas where management had concerns. Examples of reviews of CNS included an EOP inspection, commitment tracking assessment and an assessment of programs in place to minimize the chances of or to cope with a loss of decay heat removal capability.

With respect to onsite review activities, the Station Nuclear Safety and Operation Committee (SNSOC), which met frequently, was prudent and conservative in its duties to evaluate and approve station activities. Lessons learned from previous events were effectively applied, as indicated by programs established to control reactor water level during periods of reduced inventory. Station Nuclear Safety (SNS) increased staffing levels and continued to trend deviation reports, conduct human performance evaluations and root cause evaluations. Additionally, the shift technical advisors, who report to SNS, continued to be employed as independent reviewers of daily shift operations.

Management continued to stress a low threshold for identifying conditions adverse to quality and writing deviation reports. Management emphasized openness in making the NRC aware of potential problems. The licensee was typically sensitive to events requiring NRC notification. However, one violation involved the failure to make a timely notification of the discovery that the containment equipment door escape air lock was unable to fulfill its safety function.

The licensee's root cause evaluation program was fully implemented and effectively managed by SNS. One example involved the reactor trip due to a failed printed circuit driver card for a feedwater regulating valve. The evaluation identified a history of similar failures due to aging and recommended periodic replacement and a need to identify similar driver cards which could cause a reactor trip. An additional example involved followup to determine the failure mechanism of a diesel generator connecting rod. Improper preloading of connecting rod nuts was identified by a team of metallurgists and consultants. Corrective actions were determined and applied to the other engines as well.

The licensee's corrective action program was effective but sometimes not timely. The licensee addressed weaknesses identified by an NRC maintenance team inspection conducted during the previous assessment period. Station management involvement in formulating the corrective action was evident through assignment of priorities, prior planning and

well defined corrective actions. Responsiveness was timely, sound and thorough. In addition, the resolution of the long-term instrument air problem was an example of the licensee's effort to conduct extensive corrective action. In some cases, corrective actions to QA audit findings and long standing equipment problems were not timely. QA findings for which corrective action was not timely and received multiple extensions involved emergency preparedness training program development, corrections to the UFSAR, environmental qualification maintenance procedural controls, and the need for units on Technical Specification radiation monitor setpoints. In addition, station engineering identified several causes for a continuing pressurizer heater trip problem, but corporate and station management timeliness in implementing corrective action was slow.

A degradation in the licensee's management of NRC commitments continued during the assessment period. The licensee was unable to meet original commitments made to NRC concerning instrument and service air upgrades required for previous enforcement actions. The submittal on turbine governor valve tests during coastdown was late, based on the licensee's original commitment to address this matter. The licensee has a program under development to improve commitment management.

The human performance evaluation program was also used effectively and identified inadequate controls and policies governing structural concrete blocks following the failure to replace the service water pumphouse missile shield blocks after maintenance. Long-term corrective actions were recommended; however, interim actions were not effective in preventing recurrence, as a similar event occurred later on the charging pump cubicle blocks.

All licensee event reports were reviewed. The reports were timely and adequately described the major aspects of the event, including contributing factors.

The licensee continued to demonstrate a high level of corporate and station management involvement, control, and active participation in assuring quality in licensing activities. Particularly noteworthy during this assessment period was the licensee's response to implement the Commission's Interim Policy Statement on Technical Specifications Improvement. North Anna is the lead Westinghouse plant for the implementation of the new Standard Technical Specifications (STS). During the assessment period, the NRR staff began review of the proposed new North Anna Technical Specifications. The licensee's participation in the STS improvement program was exemplary. The licensee actively participated in the Westinghouse Owners Group efforts to develop the new STS. Also, as the lead Westinghouse plant, the North Anna formal proposal was submitted in a timely manner. The licensee brought strong resources and expertise to bear on this project, demonstrating excellent management attention. Throughout the review, the licensee demonstrated appropriate concern for plant safety. In addition, the licensee actively pursued an aggressive and continuous upgrade for Technical Specification continuity and similarity between the two North Anna units, as illustrated by the number

of Technical Specification changes submitted on a continuing basis. The licensee actively pursued an aggressive policy of quality control on proposed amendment changes to assure that the final submittal to NRR represented a quality product. The quality of the licensee's submittals continued to mitigate the amount of NRR staff effort required for review and resolution of licensing issues. Examples of excellent quality content were the new STS, engineered safety features slave relay, and limiting dose to control room operators submittals.

One violation was identified during the assessment period.

2. Performance Rating

Category: 1

3. Board Recommendations

None

V. Supporting Data and Summaries

A. Licensee Activities

Unit 1 began the assessment period in a refueling outage and restarted on July 15, 1989. On July 19 the unit automatically tripped from 90 percent power when turbine EHC pressure was lost. The unit operated at power until December 5 when power was reduced to 7 percent due to EHC pressure transients. At that time, it automatically tripped due to a turbine trip and the resultant steam SG level transient. After repairs, the unit restarted on December 21 and operated at power until January 23, 1990, when it again automatically tripped. The unit returned to 100 percent power on January 25 and continued at this level for the remainder of the assessment period.

Unit 2 started the assessment period operating at 100 percent power. The unit did not experience any reactor trips and set a continuous on-line operating record of 469 days for a Westinghouse pressurized water reactor. The unit experienced increasing primary-to-secondary leakage toward the end of the run and shut down on August 21, 1990, two and a half weeks prior to the scheduled refueling outage. The unit ended the assessment period in Mode 5.

The following organization changes and significant events occurred during the assessment period:

- October 1989, the licensee instituted their Nuclear Resource Allocation Plan
- December 1989, E. Harrell was assigned as the new Vice President for Nuclear Operations

- May 1990, J. Smith was assigned as the new Site QA Manager

B. Direct Inspection and Review Activities

From June 1, 1989, through August 31, 1990, 38 inspections were conducted by resident and regional based inspectors. This included two announced team inspections. One was an IST inspection conducted in January 1990, and the other was an EOP inspection conducted in June 1990. Also, a followup to the 1989 SSOMI was made in May 1990. Fourteen meetings were held with licensee management personnel during this assessment period. One of these meetings was an enforcement conference.

C. Escalated Enforcement Action

1. Violations

One Severity Level III violation with no Civil Penalty involving a loss of containment integrity event on December 28, 1989.

2. Orders

None

D. Management Conferences

June 12, 1989 - Management meeting at Rockville, Maryland, to discuss the Configuration Management Program for North Anna and Surry Power Stations.

June 19, 1989 - Management meeting at Atlanta, Georgia, to discuss the self-assessment for North Anna Power Station.

August 22, 1989 - Meeting at Atlanta, Georgia, to discuss the emergency preparedness plans and programs for North Anna and Surry Power Stations.

August 24, 1989 - Meeting at North Anna Nuclear Information Center, Mineral, Virginia, to present the SALP for North Anna.

September 26, 1989 - Management meeting at Atlanta, Georgia, to discuss the Configuration Management Program for North Anna and Surry Power Stations.

October 11, 1989 - Meeting at Atlanta, Georgia, to discuss the emergency preparedness plans and programs for North Anna and Surry Power Stations.

January 16, 1990 - Meeting at Atlanta, Georgia, to discuss a status report on the emergency preparedness upgrade program for North Anna and Surry Power Stations.

February 21, 1990 - Meeting at Atlanta, Georgia, to discuss the Commitment Management System.

February 27, 1990 - Enforcement conference at Atlanta, Georgia, for the containment escape hatch leakage event of December 1989.

May 23, 1990 - Meeting at Rockville, Maryland, to discuss the procurement and material program for North Anna and Surry Power Stations.

June 25, 1990 - Meeting at Atlanta, Georgia, to discuss the emergency preparedness program.

July 18, 1990 - Meeting at Atlanta, Georgia, to discuss the self-assessment for North Anna Power Station.

August 15, 1990 - Meeting at Atlanta, Georgia, to discuss Configuration Management Program.

E. Confirmation of Action Letters

None

F. Review of Licensee Event Reports (LERs)

During the assessment period, a total of 21 LERs were analyzed. The distribution of these events by cause, as determined by the NRC staff, is as follows:

Case	Unit 1 or Both	Unit 2
Component Failure	3	1
Design	3	0
Construction, Fabrication or Installation	1	0
Personnel Error		
-Operating Activity	4	0
-Maintenance Activity	0	0
-Testing/Calibration Activity	4	2
-Other	2	0
Other	1	0
<hr/> Total	<hr/> 18	<hr/> 3

Note 1: With regard to the area of "personnel error," the NRC considers lack of procedures, inadequate procedures, and erroneous procedures to be classified as personnel error.

Note 2: The "Other" category is comprised of LERs where there was a spurious signal or totally unknown cause.

G. Licensing Activities

A tabulation of licensing actions is as follows:

Active actions at beginning of period (06-01-89)	47
Actions added during period	32
Completed actions during the assessment period	37
Active actions at end of assessment period (08-31-90)	42

The 37 actions completed during this assessment period can be divided into two major categories. The number of actions which were completed for each category are:

Plant-specific	27
Multi-plant	10

H. Enforcement Activity

FUNCTIONAL AREA	NO. OF VIOLATIONS IN SEVERITY LEVEL				
	Dev.	V	IV	III	II I
		Unit 1/Unit 2			
Plant Operations		1/0	1/0		
Radiological Controls			1/1		
Maintenance/Surveillance		1/0	4/3		
Emergency Preparedness					
Security					
Engineering/Technical Support			1/2		
Safety Assessment/ Quality Verification			1/0		
TOTAL		1/0	8/6	1/0	

I. Reactor Trips

Unit 2:

There were no reactor trips on Unit 2 during the assessment period.

Unit 1:

07-19-89 - Reactor trip from 90 percent power due to turbine trip. A leaking O-ring in the EHC system caused the trip.

12-05-89 - Reactor trip from seven percent from low-low level in SG "B". The trip occurred approximately 21 minutes following a partial loss of EHC system pressure and resulting load reduction.

01-23-90 - Reactor trip from 100 percent power from a low level in SG "C" and steam flow/feed flow mismatch. The feedwater regulating valve closed when a driver card in the control circuit for the valve failed.