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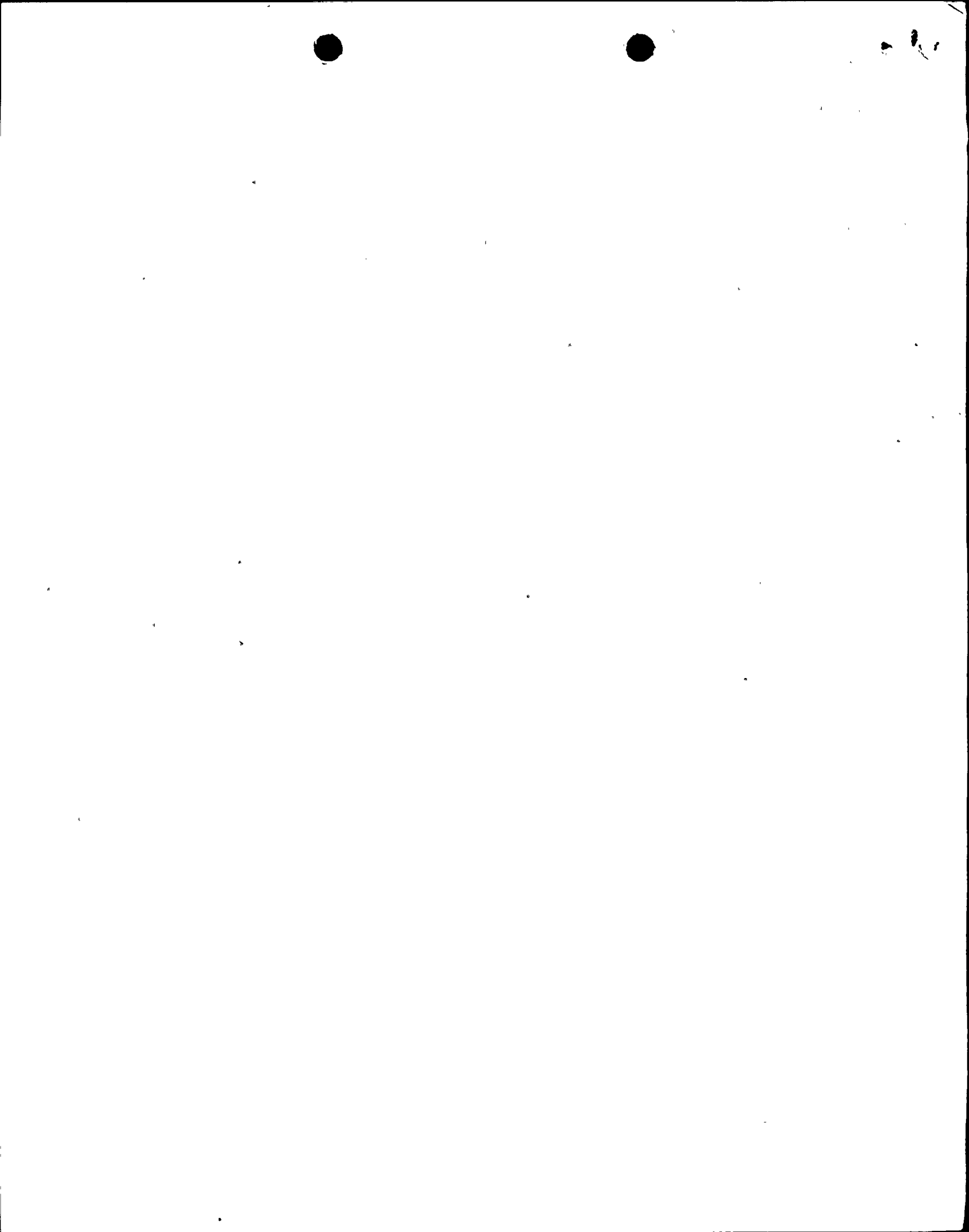
SUBJECT: Forwards results of interim assessment of licensee performance during initial phases of power ascension test program from 870604-0904. Major areas reviewed: operations, startup & surveillance testing & assurance of quality.

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 TITLE: Systematic Assessment of Licensee Performance (SALP) Report

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02 OCT 1987

Docket No. 50-410

Niagara Mohawk Power Corporation  
ATTN: Mr. C. V. Mangan  
Senior Vice President  
301 Plainfield Road  
Syracuse, New York 13212

Gentlemen:

Subject: Interim Assessment of Licensee Performance

This refers to an NRC, Region I assessment of your performance at Nine Mile Unit 2 during the initial phases of the Power Ascension Test Program from June 4, 1987 - September 4, 1987. Three major functional areas were reviewed and include Operations, Startup and Surveillance Testing, and Assurance of Quality. The results of this assessment are documented in the enclosed Interim Assessment Report.

We will continue our review of your activities and will include a final assessment of your performance during the Power Ascension Program, including implementation of corrective actions, in the next Systematic Assessment of Licensee Performance (SALP), presently planned to evaluate the period of February 1, 1987 - February 14, 1988.

Our assessment was independent of and in parallel with the Self-Assessment Program which you described in your June 4, 1987 letter and during the full power Commission Briefing on July 1, 1987. Your Self-Assessment Report was delivered to the NRC on September 13, 1987 and was reviewed during our meeting on site on September 21, 1987. At the meeting, we summarized our assessment and provided our comments on your findings and recommendations. You also stated your intention to continue this Self-Assessment process in modified form through Test Condition 6.

A copy of our Interim Assessment Report and your Self-Assessment Report will be provided to the Commission per their request during the full power license briefing. As is our policy during the SALP process, you are welcome to provide any written comment on our report.

We appreciate your cooperation.

Sincerely,

8710140049 871002  
PDR ADDCK 05000410  
G PDR

Original Signed By:

William F. Kane, Director  
Division of Reactor Projects

Enclosure: As Stated

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02 OCT 1987

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

INTERIM ASSESSMENT REPORT

NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT UNIT 2

ASSESSMENT PERIOD: JUNE 4, 1987 - SEPTEMBER 4, 1987





## 1. PURPOSE AND SCOPE

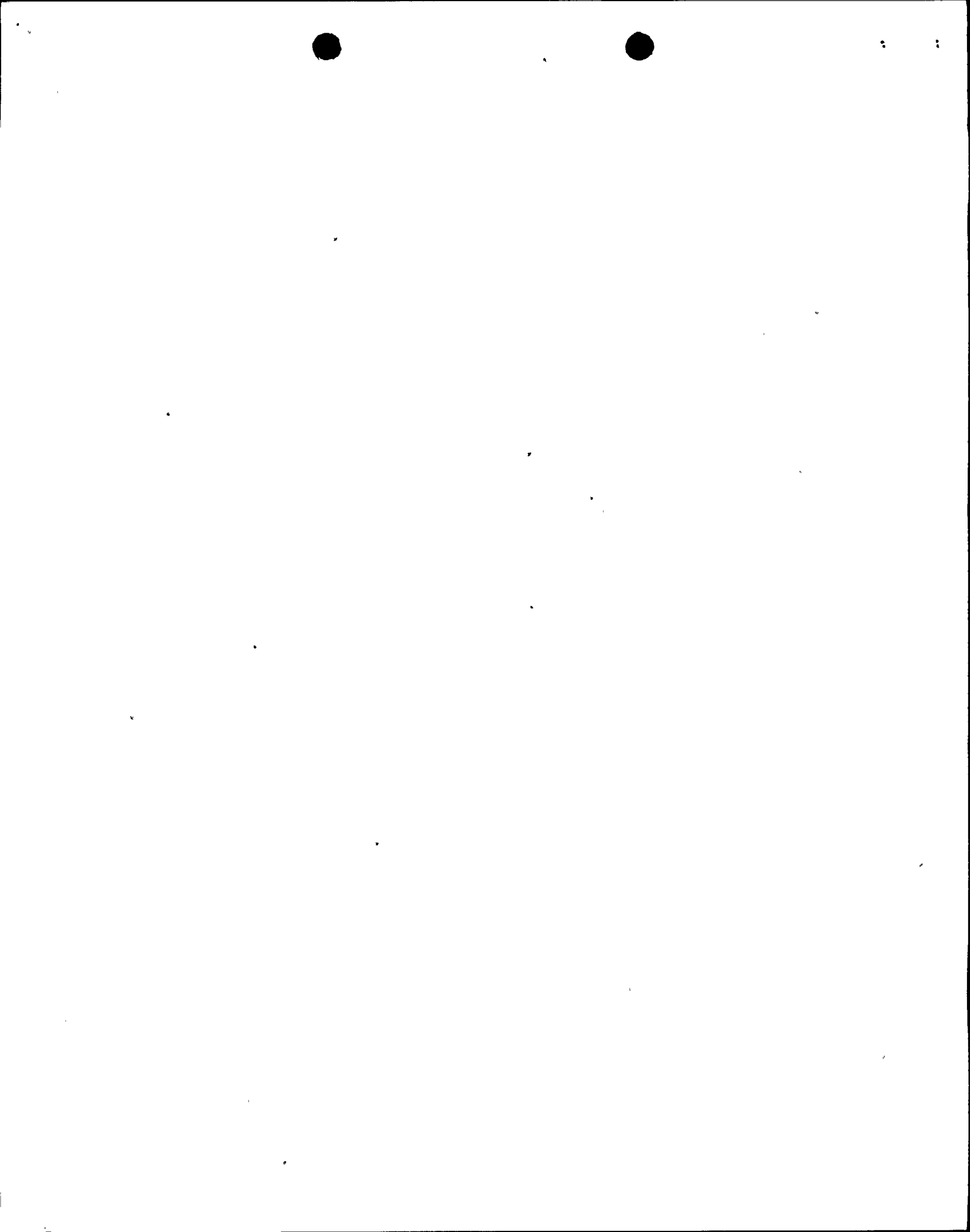
The Systematic Assessment of Licensee Performance (SALP) Report (No. 50-410/86-99) on Nine Mile Point Unit 2 (NMP-2) assessed the period from February 1, 1986 to January 31, 1987 and was issued on May 15, 1987. In it the NRC staff concluded that the Niagara Mohawk Power Corporation (NMPC) demonstrated a general inability to be self-critical. As a result, the Regional Administrator requested that NMPC conduct a self-assessment of their performance during the initial phases of the Power Ascension Test Program. NMPC agreed to perform the self-assessment and documented this in a June 4, 1987 letter to the Regional Administrator. At the full power license Commission briefing NMPC repeated their self-assessment commitment and the Regional Administrator committed to perform a concurrent Region I assessment. Also, this self-assessment was to be reviewed by the Region I staff at the conclusion of Test Condition 2, and a joint meeting to discuss the findings and assessments would be held prior to proceeding to Test Condition 3. ..

Because the reactor shut down on September 2, 1987 after reaching 42% power, September 4 was judged to be a convenient end date for the assessment. Accordingly, this Interim Assessment Report covers the three month period from June 4, 1987 to September 4, 1987. Although the assessment utilizes a SALP-type methodology, it is in addition to the SALP process, and the assessment period of the next NMP-2 SALP will not be adjusted for it. This assessment reviews Operations, Startup and Surveillance Testing, and Assurance of Quality and includes an Overall Evaluation.

## 2. OVERALL EVALUATION

Performance in the functional area of Operations has generally improved. The numerous and complex tests conducted by the Operations Department staff have generally been well planned and executed. The majority of the problems identified have been isolated and not untypical for a plant going through this phase of operations. The control room environment has improved. The handling of the Standby Gas Treatment (SBGT) System surveillance problem on September 1, 1987, and the feedwater thermal stratification problem demonstrated that previous NMPC management efforts had been ineffective in ensuring that identified problems get a high enough level of management involvement to properly resolve the problems.

Performance in the area of Startup and Surveillance Testing was generally good. Management oversight and control of the Power Ascension Testing Program has generally improved during this assessment. Weaknesses were identified in the areas of engineering support, communications, and management oversight of Technical Specification requirements. Strengths in this area were noted in the professionalism and competency of the licensed operators and a well coordinated and smooth functioning testing organization.



Problems in the area of Assurance of Quality have persisted during this assessment. Poor housekeeping and radiation protection practices reflected an apathetic worker attitude and insufficient management oversight. Only limited improvement in corporate and station management involvement in station activities was evident during this assessment period. Station management communications and coordination improved during this assessment; however, these improvements were not timely and were not entirely effective. Problem identification and resolution improved, but more senior management oversight is warranted. Resolution of plant problems at too low a level continued to hinder prudent station operations.

Overall, NMPC safely and competently operated the unit, conducted testing, and performed complex modifications and maintenance when those evolutions were preplanned and well-defined. In contrast, NMPC demonstrated difficulty in handling abnormal occurrences and unexpected problems. Corporate and station management need to respond more quickly to station problems and take effective action regarding the communication and coordination between station departments.

### 3. OPERATIONS

In the SALP Report this functional area was rated Category 2 and weaknesses were noted in the areas of operator familiarity with the Technical Specifications, control of activities in the control room, and Operations staff responsiveness to plant problems. In general, the transition of the Operations Department from construction support to power operations was not smooth and had required continued management oversight and involvement.

During this assessment, the inspectors noted a general improvement in the SALP identified weaknesses. Specifically, licensed operator familiarity with Technical Specifications improved. Shortly after fuel loading, NMPC management attributed the licensed operators' lack of familiarity with the Technical Specifications during the fuel load phase to a lack of coverage during the licensed operator training program. However, they stated that additional training on the Technical Specifications was already in progress. Experience during succeeding operational phases has shown this training to have been effective as the licensed operators have generally demonstrated a better understanding of Technical Specifications.

The SALP identified problems in the control of activities in the control room; the control room was frequently noisy and congested, Senior Reactor Operators (SROs) needed to provide more direct oversight of shift crews, and logs lacked detail and substance. In response to the continued NRC emphasis NMPC has improved the control room environment. Specifically, the "at the controls" area has been clearly defined with the use of boundary chains and placards. Licensed operators typically challenged station personnel entering



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those areas and generally limited access to the control room. The overall noise level in the control room has diminished, in part, due to moving the auxiliary operator break/eating and shift turnover area to a separate room across the hall. The establishment of the Operations Work Group Coordinator, a position filled by an Assistant Operations Superintendent, has lessened the administrative work load on the Station Shift Supervisors (SSSs), and they have taken a more active role in directly overseeing the shift crew's activities. The detail in the control room logs has improved, but the substance of the logs still needs improvement. In general, it appeared that the improvements made to the control room environment and activities over the last year have primarily resulted from the continued emphasis of the NRC inspectors. Accordingly, NMPC management must maintain sensitivity to the control room to ensure the improvements remain.

Some improvement was noted in Operations staff responsiveness to plant problems. When operators exhibited a casual response to control room annunciators, station management was informed by the inspectors of this observation and took prompt action to improve operator attentiveness. Also, Operations responsiveness to NRC questions and concerns has improved significantly.

During the period from May 23, 1987 to September 4, 1987, NMP-2 achieved initial criticality, completed Startup Test Condition One (TC-1) and was nearing the completion of TC-2 at 42% power. (Approximately seven days of testing remained.) Thirty-eight reportable events occurred during this three and a half month period. For comparison the statistics for Limerick 1 and Hope Creek from initial criticality to TC-2 completion are listed below:

|                   | <u>Reportable Events</u> | <u>Duration</u>                             |
|-------------------|--------------------------|---|
| Limerick 1        | 76                       | 8 months (included 4 month licensing delay) |
| Hope Creek        | 47                       | 3 1/2 months                                |
| Nine Mile Point 2 | 38                       | 4 months (projected)                        |

Attachment 1 lists the reportable events which occurred subsequent to initial criticality. Some of the more significant reported events which are germane to the Operations functional area are listed below:

- On July 11, 1987, a violation of Technical Specifications occurred when operators failed to measure service water temperature every two hours over a 24 hour period. This failure indicates a lack of attention to detail on the part of the operators of three successive shifts.

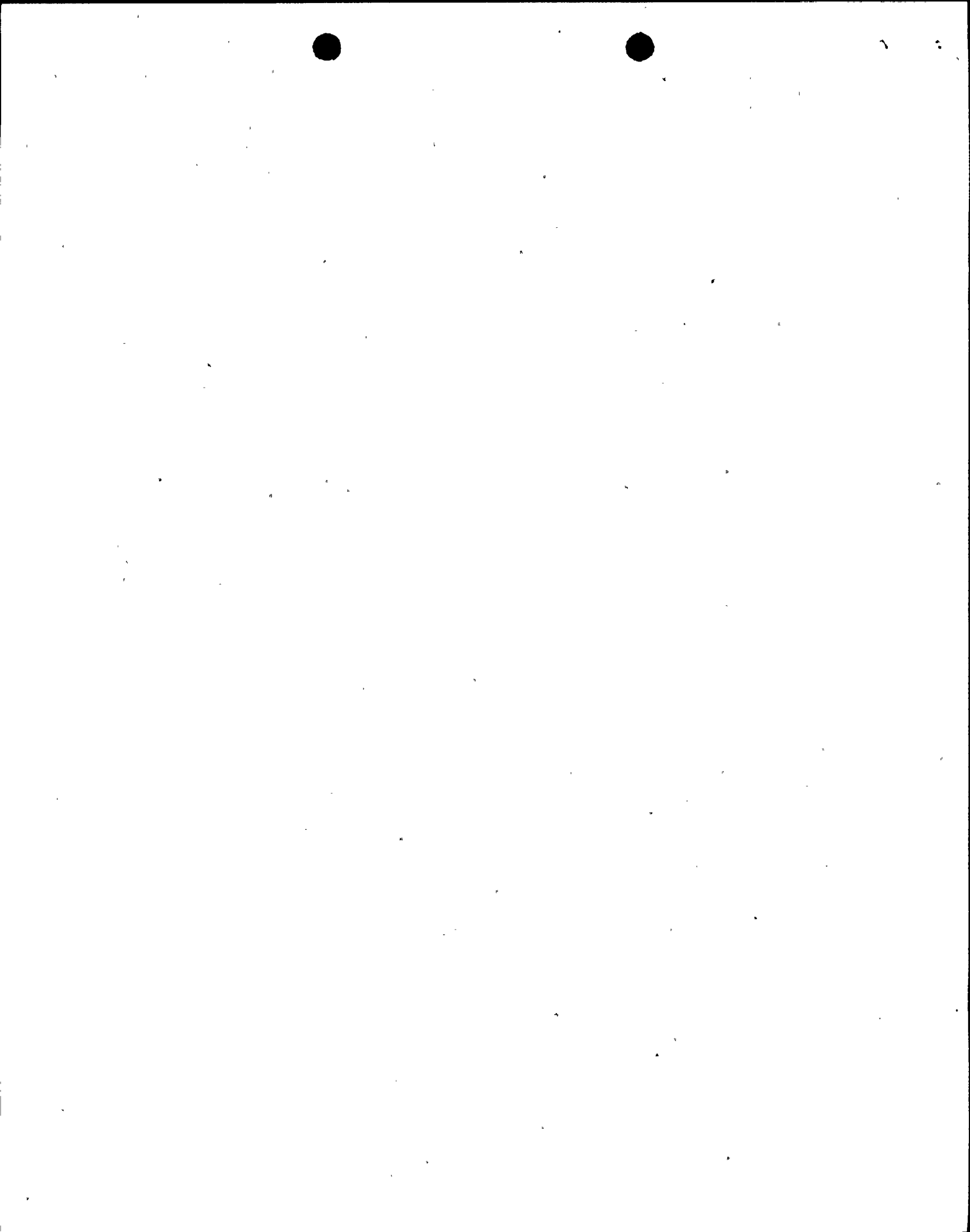


- On July 25 and August 25, 1987, Reactor Building Ventilation isolations occurred with concurrent Standby Gas Treatment (SBGT) system automatic initiations. On August 25 a second isolation occurred while operators were attempting to restore systems to the normal lineup. Similar SBGT initiations and secondary containment isolations occurred on November 28, 1986, November 29, 1986, and January 9, 1987. These repetitive events indicate inadequate root cause analysis and inadequate corrective action.
  
- On August 9, 1987, a Residual Heat Removal (RHR) pump trip and shutdown cooling isolation occurred when operators failed to reset the Nuclear Steam Supply Shutoff System (NSSSS) control room isolation signals prior to transferring control from the Remote Shutdown Panel back to the control room. This event resulted from a procedure error and lack of familiarity with the equipment.
  
- On August 13, 1987, a Technical Specification requirement was violated when an automatic isolation of the shutdown cooling mode of RHR occurred during Electrical Protection Assembly (EPA) testing. The isolation occurred due to an unanticipated effect of deenergizing the EPA logic, and the design interconnection between the EPAs and primary containment isolation is being reviewed for modification. Shutdown cooling was restored within two hours (an hour in excess of allowed). Operators did not take timely action to manually open the isolation and restore reactor coolant circulation when initial attempts to restore circulation were prevented by an electrical problem.

In general, the frequency of recurring problems and events caused by operator error has been reduced during this special assessment period when compared to previous operations.

Based on the number of reportable events and the time needed to proceed from initial criticality to 50% power, it appears that the operations and testing of NMP-2 have been comparable and somewhat better than the experiences at similar, recently licensed Region I boiling water reactors (BWRs). Also, based on a qualitative review of the NMP-2 reportable events and comparison to these other facilities, it appears that the safety significance of the events has been minor and typical for this phase of operation.

Overall, the problems encountered have not been untypical for this phase of operation. In view of the relatively few problems and their low safety significance, Operations performance has demonstrated no significant weaknesses and has generally improved since the last SALP Report. The control of activities in the control room has improved and is currently acceptable. NMPC management should continue to be sensitive to control room activities.





#### 4. Startup and Surveillance Testing

The SALP Report rated this functional area as Category 2 and identified problems regarding the poor quality of startup test procedures initially and a lack of Site Operations Review Committee (SORC) involvement in the resolution of major test exceptions. NMPC had initiated a review of startup test procedures to ensure technical adequacy and proper integration with other station procedures, including simulator validation of startup procedures. During this assessment period, these efforts continued and the NRC review of startup test procedures through Test Condition 3 has identified significant improvement in the quality of these procedures, including frequent direct references to Technical Specification requirements and better integration with station surveillance and operating procedures.

SORC involvement in the resolution of major test exceptions and related plant problems has also been significantly improved. The SORC has been particularly conscious of the safety significance of identified problems. The SORC members have consistently demonstrated a clear understanding of both the technical and safety aspects of issues, and SORC has routinely taken actions that are conservative with respect to safety. Particularly noteworthy were the actions taken to address the feedwater temperature stratification problem and the spurious actuations of the redundant reactivity control system.

Management oversight and control of the startup test program have been adequate and generally effective. Despite daily site management meetings to coordinate activities, problems were initially encountered in assembling accurate information on plant status and disseminating the information to the plant staff. With the exception of the Operations Department representatives, attendees were frequently ill-prepared. Various department representatives did not have an accurate status of their departmental activities during the backshifts. This lack of preparedness was typically exacerbated during Monday morning planning meetings. Improvements occurred when written reports of past activities, critical work items and the current short term schedule were distributed at these meetings. Also, the meetings were rescheduled to an hour later (9:30 a.m.) to permit better preparation. However, instances continued to be noted in which poor communications hampered effective management of daily activities. Continued management attention in this area is needed.

Overall, the Startup Test Program has been deliberately paced and well implemented. All testing was conducted in an organized and controlled manner. Prior to testing, the Shift Test Supervisors held briefings to discuss the procedure, note potential problems, and review actions required in the event of problems. During testing, test engineers and Operations personnel carefully monitored plant parameters and proceeded cautiously with testing after assuring proper plant response. Station



Shift Supervisor's (SSSs) effectively controlled the testing and maintained the proper control room atmosphere by limiting access of nonessential personnel.

Early in the startup testing, the inspectors identified that a test was performed without procedural controls or a written safety evaluation. On May 25, 1987, temperature stratification was identified in the feedwater lines. At the suggestion of engineering personnel, operators cycled feedwater isolation valves to attempt to disrupt the stratification. No procedure existed for operating or testing with one feedwater line isolated. On May 30, 1987, the problem recurred and the actions were repeated. It was only following the second event that station management became aware of the thermal stratification problem and of the actions previously taken. Once involved in the problem, station management was effective in properly resolving the problem.

The test results review process has functioned smoothly. Technical review of the results was thorough and the SORC review was adequate. Resolution of test exceptions has been aggressive.

Several equipment problems have been encountered with balance of plant systems (reactor water cleanup, offgas and electrohydraulic control among others). While management attention has been clearly focused on the safety implications of these problems and the plant staff has proven capable in addressing them, in many cases their efforts have been hampered by the lack of availability of spare parts and a lack of adequate Engineering Department support. The quality and timeliness of Engineering support has declined significantly during the current assessment period. For example, during the initial attempts to place the Offgas System in service, Operations personnel were tasked with lead responsibility. It soon became apparent that the problems included design and installation deficiencies. Engineering was aware of many of these problems, but did not become actively involved in their resolution for almost two weeks.

Several significant surveillance testing events occurred. On June 26, 1987, technicians discovered that the flow transmitters on the condensate storage tank (CST) suction lines for the High Pressure Core Spray (HPCS) and Reactor Core Isolation Cooling (RCIC) Systems had their low side vent lines plugged. It is believed that the plugs had been installed since the previous calibration in February 1987 and that technicians removed the plugs, performed the calibration and reinstalled the plugs. This is indicative of inadequate technical training and ineffective material control.



On July 2, 1987, during a HPCS surveillance test, NMPC discovered that a lead (for the HPCS high reactor water level seal-in reset relay) was lifted. NMPC concluded that the lead had been lifted during performance of the last surveillance test in March 1987. This is indicative of a lack of control of lifted leads during testing, including the lack of a specific sign-off.

On July 30, 1987, a missed surveillance of the flow-biased trips of all six Average Power Range Monitors resulted in a shutdown required by Technical Specifications. The portion of the procedure which required surveillance of the flow-biased trip had not been required for previous startups, since the mode switch had not been placed in Run. An additional shutdown required by Technical Specifications occurred on September 2, 1987, due to a missed surveillance of a Standby Gas Treatment (SBGT) system charcoal bed. Both events illustrate inadequate management oversight and review of Technical Specification requirements and poor communication between station personnel.

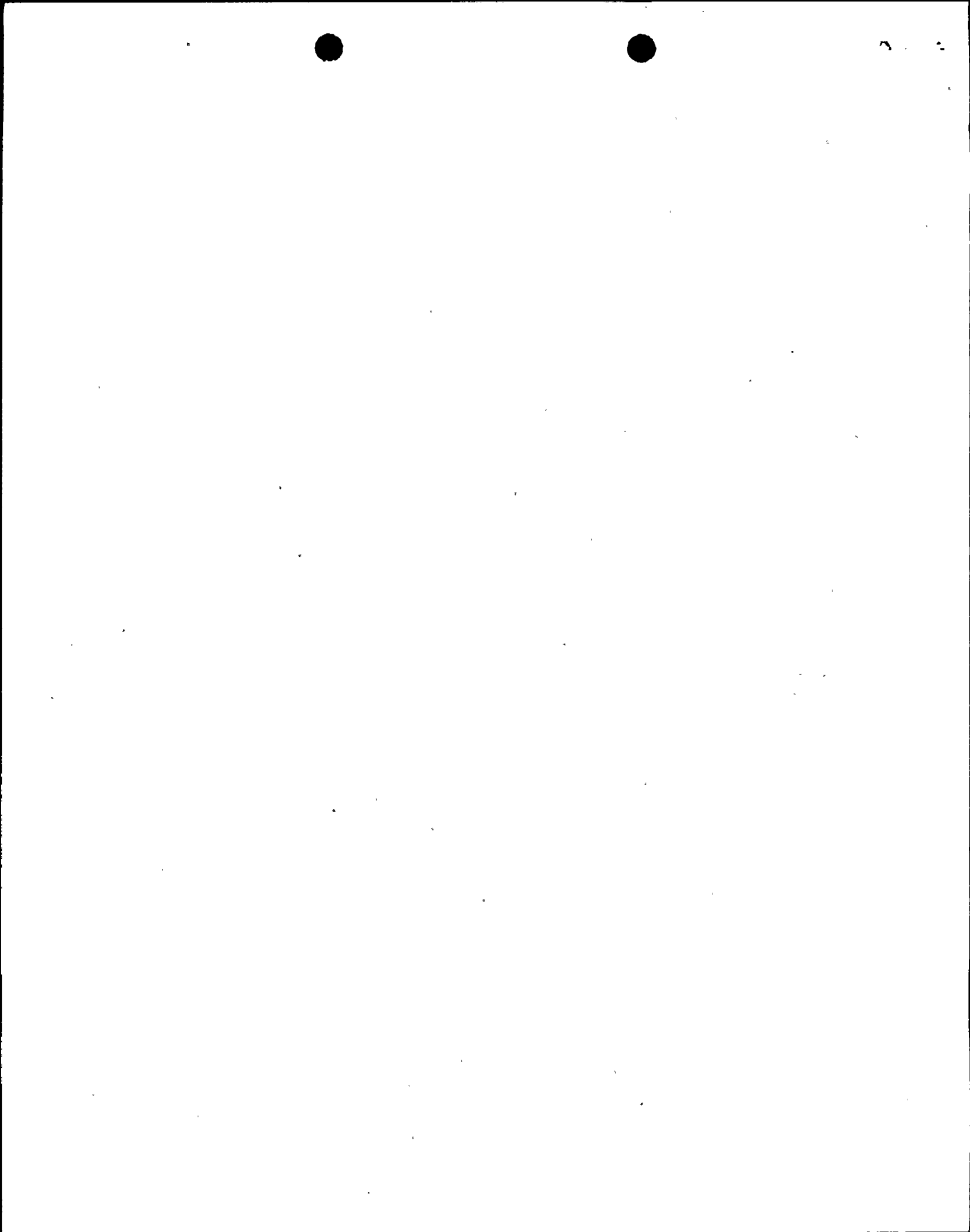
In summary, NMPC has conducted a deliberately paced startup testing program with a good perspective on nuclear safety. Management oversight and control of startup testing improved during this assessment period; however, management oversight of surveillance testing and the associated Technical Specifications has been a significant weakness. Strengths included professional and competent operators and a well coordinated and smoothly functioning test program organization. Shortcomings were apparent in the areas of engineering support, spare parts management, communications to management on plant status and problems, technical training of I&C technicians, material control, and control of lifted leads.

#### 5. Assurance of Quality

For this assessment, management involvement and control in assessing and assuring quality have been evaluated. This section is a synopsis of the assessments relating to the quality of work in all areas.

The last SALP Report rated this area as Category 2 and identified that NMPC had shortcomings in the following areas: problem identification and resolution; corporate management awareness and involvement in routine station activities; station management communications and coordination; and a poor approach to interpretation of Technical Specifications. Based on the activities during this assessment period, the inspectors have concluded that these weaknesses persist.

NMPC has improved their problem identification and resolution processes through the enhancement of their Licensee Event Report (LER) reviews and root cause analyses. However, examples persist where management has either not pursued or has not succeeded in identifying the underlying or programmatic causes of the problems. Examples of recurring problems include: reactor building ventilation isolations



and subsequent Standby Gas Treatment system automatic initiations; reactor water cleanup (RWCU) pump bearing failures; foreign material exclusion control problems (e.g., plugged RWCU flow transmitter sensing line and HPCS and RCIC pump suction line transmitter vent plugs); rod drive hydraulic control unit circuit card failures; repeat fire protection program violations involving personnel error; and persistent housekeeping problems. In contrast to the above, the corrective actions in response to unqualified Intermediate Range Monitor (IRM) circuit cards and an Electro-Hydraulic Control system pipe break were both prompt and comprehensive. In general, the identification and resolution of problems have improved, but further improvement is needed.

The September 2, 1987 event involved train A of SGBT being inoperable because of a missed surveillance (charcoal filter testing based on run times). This event demonstrated insufficient corporate and station management review of a Technical Specification interpretation. In addition, two months prior to the event the Operational Readiness Team Inspection had specifically identified to NMPC corporate and station management that tracking of SGBT run times was a potential problem. Yet, apparently no corrective action to this finding occurred. Based on this example, it appears that corporate and station management involvement have shown only limited improvement since the previous assessment.

Regarding station communication and coordination, the daily site management meetings were ineffective at the beginning of this assessment period, as discussed earlier in the testing section. Improvements in the attendees' preparation for the meetings have aided communication and problem resolution, such that the meetings have become generally effective. However, examples of poor communication onsite persisted through the end of the assessment.

As noted in the testing section, Engineering Department support of unit operations and power ascension testing has not been fully effective. It was not apparent that the site engineering and operations staffs were communicating problems to each other or receiving sufficient direction from management to get the appropriate attention and manpower to resolve identified problems. Inadequate materials support and spare parts inventory for Rosemount transmitters and RWCU pumps are further examples of poor station coordination. At times, the inspectors have observed an openly antagonistic relationship between various station departments. Such adversarial relationships must be resolved by station management to improve problem resolution efforts at the station.

The September 2 forced shutdown also exemplified a lack of communication within station management. Information (excessive SGBT run time hours) indicating the potential inoperability of the A train





of SBTG was made known to Operations personnel on September 1. This information was not provided to the SSS, Unit Superintendent, or other responsible station managers until September 2.

A recent issue concerning reactor building ambient and service water differential temperature, although a complex safety issue, demonstrated that NMPC was still reluctant to make decisions with respect to compliance with regulations. The responsibility to make this type of decision, rather than relinquish it to the NRC staff, has repeatedly been brought to NMPC's attention. In this instance, NMPC presented two different analyses to the NRC staff. Both analyses appeared to be accurate, but the more conservative analysis imposed a more restrictive operating limit on the plant. NMPC attempted to have the NRC staff make the decision as to which analysis to follow, rather than exercise their responsibility as the license holder by making their decision and then providing appropriate justification for their position.

Housekeeping and radiation protection practices at Unit 2 appeared to have slipped from previously acceptable levels. Housekeeping has been a repetitive problem in the past. Towards the end of this assessment, the station Quality Assurance organization took the lead to monitor adherence to proper housekeeping and radiation protection practices. While the QA efforts may have a positive impact on this area, NMPC management should continue to review this area. It appears that station management needs to instill pride and responsibility in all station personnel to address this concern.

In summary, NMPC has made some improvements in their ability to identify and resolve problems. However, senior management needs to be more active in their review process to ensure comprehensive corrective action. Station and corporate management communications, coordination, and involvement have demonstrated little overall improvement. However, station management involvement and control of the Power Ascension Testing Program have been generally good and represent an exception to the lack of improvement. The September 2 forced shutdown indicated that efforts to improve management assurance of quality have not been fully effective. NMPC's reluctance to make conservative regulatory and licensing interpretations and their inclination to resign that responsibility to the NRC staff continued.



## ATTACHMENT 1

### Cumulative Summary of Significant Events

- 10/31- License issued
- 3/11 - NMPC decision to replace the MSIVs
- 5/11 - MSIV replacement completed
- 5/23 - Initial criticality
- 5/25 - SBGT exhaust radiation monitor inoperable (TS violation)
- 5/25 - RWCU isolation while venting flow transmitters (ENS)
- 5/26 - Reactor shutdown initiated due to Air Lock Door (ENS)
- 5/27 - SBGT initiation while swapping RB ventilation fans (ENS)
- 5/28 - Cont. purge and vent isolation signals due to rad monitor (ENS)
- 5/28 - Non-Class 1E elect. components supplied as Class 1E (Part 21)
- 5/29 - Cont. purge and vent isolation signals due to rad monitor (ENS)
- 6/3 - SBGT initiation due to faulty flow switch (ENS)
- 6/12 - Reactor scram on high IRM power due to failed feed valve (ENS)
- 6/12 - RWCU isolation due to flow perturbations (ENS)
- 6/14 - RWCU isolation due to flow perturbations (ENS)
- 6/15 - Inadvertent alternate rod insertion during RRCS testing (ENS)
- 6/17 - Recirc pumps trip during RRCS surveillance testing (ENS)
- 6/18 - Inoperable and uncompensated fire detection (LCO violation)
- 6/19 - Non-Class 1E breakers in safety-related systems (ENS)
- 6/19 - Inoperable RWCU flow transmitters due to tape (ENS)
- 6/24 - Inoperable steam tunnel temperature transmitters (ENS)
- 6/26 - Inoperable RCIC and HPCS suction transfer (LCO violation)
- 6/27 - Two recirc pump trips due to RRCS (ENS)
- 7/2 - RWCU isolation capability inoperable, forced S/D (ENS)
- 7/2 - Full power license issued
- 7/2 - HPCS system declared inoperable due to lifted lead (ENS)
- 7/3 - RB and service water inlet delta temperature concern (ENS)
- 7/11 - Reactor scram on high press due to EHC line rupture (ENS)
- 7/11 - Failure to monitor service water temp (TS violation)
- 7/14 - Revised RB/service water delta temperature limit (ENS)
- 7/17 - IRM Channels A,D and H declared inoperable (ENS)
- 7/25 - RB vent. isolation and SBGT system auto start (ENS)
- 7/26 - Forced Shutdown due to service water temp > 77 F (ENS)
- 7/28 - Vital area boundary degraded (ENS)
- 7/29 - RB vent. isolation and SBGT system auto start (ENS)
- 7/30 - Shutdown required by Tech Specs. (TS surveillance violation)
- 8/5 - RWCU system auto isolation (ENS)
- 8/9 - Shutdown Cooling and RWCU system auto isolation (ENS)
- 8/9 - Main Stack flow estimate missed surv test (TS surv. vio)
- 8/13 - S/D cooling isol and loss of coolant circulation (TS vio)
- 8/25 - Automatic initiation of SBGT system (ENS)
- 9/2 - Forced shutdown due to inop SBGT and EDG (TS LCO violation)
- 9/3 - RWCU isolation due to reject flow oscillations (ENS)

