TASK FORCE REVIEW OF OPERATIONAL HISTORY FOR

PALISADES

FINAL REPORT

May 1, 1986

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EXECUTIVE SUMMARY

Region III formed a special task force on January 10, 1986, to review the operating history of the Palisades Nuclear Plant. The purpose of this review was to determine if any problem areas existed which had not been previously addressed by the NRC and the licensee. A three-year time period (1983-1985) was reviewed. The task force determined that :

(1) The leaking valves in the Safety Injection Tanks (SITs) piping have been a repetitious problem requiring control room operator action to maintain the SITs within or to return them to Technical Specification (TS) requirements. This continual challenge to the operators' attention, time, and effort has the potential of contributing to the high incidence of personnel errors at Palisades.

(2) Procedural adherence has been poor. Forty percent of the licensees Event/Deviation Reports are written for procedure violations.

(3) The number of cited violations has increased over the study period.

(4) Corrective actions tend to be too narrow in scope and do not consider generic solutions.

(5) Problems are evident in the area of providing an adequate, in-depth review.

(6) Maintenance has been a problem area. It has been addressed by the NRC and the licensee, but has not been fully resolved.

I. INTRODUCTION

On January 10, 1986, Region III formed a special task force to perform an in-depth review of the operating history for the Palisades Nuclear Plant, with emphasis on identifying potential problem areas for any trends that might exist. The task force consisted of one senior resident inspector, one resident inspector, two regional inspectors, a consultant from Brookhaven National Laboratory (BNL), and the Chief of the Technical Support Staff (TSS).

The methodology to perform the review was two-part: (1) to review a variety of hard data concerning operational history and hardware problems (including assessment of root cause and other contributing factors) for potential trends, and (2) to assess NRC perceptions of the Palisades operation via interviews with regional personnel and to ascertain if potential problem areas existed that were not identified during the hard data review. It was decided prior to the review not to concentrate effort in the area of Maintenance since the NRC previously expended effort in this area. The task force subsequently completed its review on March 7, 1986, and this report is a compilation of the observations made and conclusions drawn by the team.

II. REVIEW METHODOLOGY

During the review process, the task force examined both NRC and licensee documents for any potential trends. The time frame these documents addressed was from January 1, 1983, to December 31, 1985, and included:

Licensee Event Reports (LERs)

Temporary Change Notices (procedures)

Radiological Incident Reports (RIRs)

Deviation Reports (DRs)

Event Reports (ERs)

NRC Inspection Reports

NRC Daily Reports

Licensee Audit Reports

The team also used NRC and licensee computer sorts.

In addition, the following NRC staff members were interviewed by team members for their perceptions of Palisades' performance:

R. A. Hasse, Reactor Inspector
P. R. Wohld, Reactor Inspector
A. L. Madison, Senior Resident Inspector (SRI) - Quad Cities, Leader of Special Maintenance Team Inspection
R. L. Greger, Chief, Facilities Radiation Protection Section
E. R. Swanson, Senior Resident Inspector - Palisades
C. D. Anderson, Resident Inspector (RI) - Palisades, Also Member of Task Force
B. L. Jorgensen, Senior Resident Inspector - D. C. Cook, Former SRI-Palisades
J. K. Heller, Resident Inspector - D. C. Cook, Former RI-Palisades

The team also had discussions with licensee personnel.

III. POTENTIAL PROBLEM AREAS REVIEWED FOR TREND ANALYSIS

A. Licensee Event Reports

1. Introduction

A review of Licensee Event Reports (LERs) for the Palisades plant was conducted for the years 1983 through 1985 in order to uncover any trends or repeated failures which would indicate deteriorating or unacceptable conditions in plant equipment, procedures, or personnel. The ability to determine trends from LER data was impaired because requirements for reporting and the contents of the LERs were changed as of January 1984. More LERs were issued in 1983; the LERs written in 1984 and 1985 are generally more complete and give better information.

Another fact that is important to note is the major outage during this period, which lasted approximately one year, from August 1983 to July 1984. This outage resulted in a change in both the type and number of LERs during this period. The present outage commenced at the end of November 1985. The LERs were categorized by system, component, event, and cause to assist in detecting trends. Causes such as personnel error could not readily be broken down into finer categories (i.e., operations, instrumentation, maintenance, etc.), because the LER details were not sufficient.

2. General Summary

There were a total of 137 LERs for Palisades distributed as follows for the three years reviewed:

1983 - 79
1984 - 27
1985 - 31

Table 1 is a listing of the number of LERs by system and components within the system, for those found more than once or twice. The only components which show up as repetitive problems are the Safety Injection Tanks (SITs). They appear 44 times and are discussed fully in Section 3. No other component appears more than two or three times, except the 1-1 Diesel Generator (DG), but a further analysis of these LERs reveals that the events are based on separate and unrelated failures.

Therefore, except for the SITs, there does not appear to be any recurrent component problems at the Palisades Plant. The Auxiliary Feedwater (AFW) System, which is always suspect in a Pressurized Water Reactor (PWR) because of its Probabilistic Risk Assessment (PRA) significance, accounted for only three LERs during this period at Palisades. These events were caused by unrelated failures and are summarized below:

84-003 loose pipe hanger due to vibration
84-018 missed surveillance on steam line snubber
84-019 turbine driven AFW speed governor bearing failure

TABLE 1
PALISADES LERs BY SYSTEM AND COMPONENT
1983, 1984, 1985

SYSTEM	NO. OF LERS	COMPONENT	NO. OF LERS
Safety Injection	50	SITs	44
		Test Circuit	1
		Working Relay -- Reactor Protection System (RPS)	1
		Flowmeter -- High Pressure Safety Injection (HPSI)	1
		Valves (test)	1
		Flow Control Valve -- Low Pressure Safety Injection (LPSI)	1
		Supports	1
Reactor Protection System (RPS)	17	Low Flow Trip Settings	2
		Others non-repetitive	
Containment	8	Non-repetitive	
Primary Coolant System (PCS)	10	Motor Operated Valve MOV 3015	2
		Power Operated Relief Valves (PORVs)	2
		Others non-repetitive	
Main Steam	3	Non-repetitive	
Auxiliary Feedwater	3	Non-repetitive	
Emergency Power Diesel Generators (DG)	6	DG 1-1	3
		Others non-repetitive	
Fire Protection	8	Missed surveillance	4
		Others non-repetitive	

Table 2 gives a summary of the number of LERs involving personnel error for the years 1983 through 1985 at Palisades. Although the distribution between activities is fairly even and does not indicate any predominant group, the absolute number (51) and the proportion (51 out of 137) is extremely high and warrants further study. The errors involved range from missed surveillance tests and fire watches to improper procedures and calibrations causing safety injection signals and reactor trips. Of the remaining 80-90 LERs involving component failures (half attributed to SITs - See Section 3.), approximately 40-50 involve random failures in random components. This is of the same order of magnitude as the personnel errors.

TABLE 2
PALISADES LERs INVOLVING PERSONNEL ERROR
ACTIVITY *

YEAR	DESIGN & ENGINEERING	TESTING & SURVEILLANCE	CALIBRATION	INSTRUMENT MAINTENANCE	OPERATIONS	MAINTENANCE
1983	9	6	1	1	3	3
1984	3	3	2	4	4	3
1985	3	4	4	5	5	8
Total**	15	13	7	10	12	14

*LERs do not give sufficient information to determine crew/type such as operations or maintenance, but general activity classification can be derived, although sometimes assigned to two categories.

**These totals equal 71, however, there were 51 LERs involving personnel error. The discrepancy occurs because some were assigned two "activities."

3. Safety Injection Tank Systems

The 44 LERs, which mention SITs as a "component failure," are actually a misnomer. In none of these cases has a tank ever failed. The normal cause is a leaking valve which causes the water level to rise or fall outside of the Technical Specification (TS) high or low level points, and/or the boron concentration to fall below the TS requirement of 1720 ppm.

Of the 44 LERs, 37 were generated in the first eight months of 1983 (prior to the 11 month refueling outage). During the outage, all loop check valves (check valves furthest from the tanks) were repaired, and repairs were also made as required on the fill and drain valves. If these repairs had been successful, they would have solved the problem which can be summarized as follows:

There are four Safety Injection Tanks, one each per cold leg. Each tank can be filled and drained without access to the main reactor coolant system and is maintained at 1720 ppm boron concentration per TS. The tank must be maintained within narrow limits of level in order to insure the correct amount of water, and maintained with nitrogen at the correct pressure and volume, so that during a Loss Of Coolant Accident (LOCA) all of the water at the proper boron concentration is injected into the reactor coolant system without any nitrogen gas. For this reason, the level, nitrogen pressure, and boron concentration must be kept within narrow limits at all times. The TS allow one of the tanks to go out of limits for up to one hour. If this is not corrected, or if two tanks go out of limits, a reactor shutdown must be started (orderly reduction of power).

The experience of Palisades during most of 1983 is that leakage past the loop check valves would find its way into the tanks. This raises level and reduces concentration. Usually a high level alarm alerts the operators to this situation. The operators must then attempt to readjust level (by draining), and concentration (by refilling with concentrated boron solution from the Safety Injection Refueling Water (SIRW) tank using the High Pressure Safety Injection (HPSI) system). If the operator is successful within an hour, no LER is written. If the operator is not successful within one hour, or if two tanks go out of limits at the same time, the plant must commence a shutdown and a LER is written. Thus, the 38 LERs written in 1983 really indicate that the tanks were continually in need of adjustment. Having made the repairs indicated in 1983, it would be expected that the problem would have been eliminated during this last operating cycle. This is not the case. At the beginning of the cycle (last half of 1984) there were only two SIT LERs written, but in 1985 there were five written against the SITs with two of the five in the last month of operation. A check of the Shift Supervisor's logs for that month showed that the SITs required adjustments (draining and filling) on the 8, 15, 18, 20, 22, 23 25, and 29th day of November. On a typical day requiring SIT adjustment, the plant is operated in and out of Limiting Conditions for Operations

(LCOs) about five or six times. This is excessive and indicates that the problem has not been solved.

Interviews with personnel at the plant indicated that during this present outage, one loop check valve had been repaired (Ck valve 3116).

The interviews indicated that among Combustion Engineering plants the Palisades plant has several unique features including relatively high tank elevation, and accordingly long (approximately 75 foot) length of piping between check valves. The exploration of these differences and their effect on the problem are beyond the scope of this review, but they should be explored by the plant and licensee engineering staff in order to achieve a permanent solution to this problem. While the operators are adjusting the SIT levels and concentrations, they are unavailable to concentrate on other issues. This continual challenge to the operators' attention, time, and effort has the potential of being a contributing factor to the high incidence of personnel error at this facility.

B. Event Reports and Deviation Reports (ER/DRs)

A review of ER/DRs was conducted for the period 1983 through 1985 for the purpose of trend analysis. Event reports are issued to initiate corrective action for conditions that may be reportable to the NRC or other regulatory agencies. Deviation reports document other conditions that are significantly adverse to quality of safety-related items or activities and which may require action to prevent recurrence. If an event first described as a DR is found to be more significant, it is upgraded to an ER. The number of DRs and ERs generated for the study period are as follows:

Year	ERs	DRs
1983	215	406
1984	117	373
1985	131	210
Total	463	989

The ER/DRs are internal documents as compared to LERs; however, a review of ER/DRs will serve to confirm trends that were identified in the LER review or will identify precursor trends that have not yet reached an extreme stage. The licensee has a tracking system that can be used to sort the ER/DRs in many different ways. Two of the more useful categories, generic cause (root cause) and activity (plant group that caused problem), were reviewed in detail.

The licensee generated 1452 ER/DRs during the period of study. The dominant root causes identified were as follows:

Procedure Violation	40%
Equipment Problems	21%
Procedure Inadequacies	15%

The licensee has recently published a trend analysis report for 1985 which shows reasonable agreement with our independent analysis, and also identifies these three root cause categories as the dominant ones. A further review was made of ER/DRs to evaluate them for personnel errors of commission and omission. This resulted in a total personnel error rate of 65% for all ER/DRs generated during the period 1983 through 1985. It should be noted that the first and third categories listed above, procedure violation and procedure inadequacies, provide the majority (55%) of the input. Due to the rather high number of procedure problems, a review of this area was conducted and is presented in the next section.

Another classification category was examined that identifies which plant group has been uncovering the problem. This review identified the fact that the Quality Groups were responsible for identifying 31% of the ERs and DRs issued for procedural violations.

A review of the activity category, those plant groups causing the problem, resulted in the totals listed below:

Maintenance	28%
Operations	25%
Administration	15%
Instrumentation and Control	10%

This distribution does not seem unusual based on the experience of the reviewer.

NOTE: The administration category is a combination of those items identified in Administration, Material Control, Procurement, and Documentation.

Those plant groups having extremely low numbers during the period were:

Measuring and Test Equipment (M&TE)/Calibration	2%
Security*	0%
Emergency Planning*	0%
Nondestructive Examination (NDE)	0%

*While the review showed 0% for Security and Emergency Planning, this may be caused by the lack of input from these groups to the ER/DR system. With the Civil Penalty in 1983 for failure to control access to the protected area, and the four Management Meetings held in 1985 to discuss problems in the Emergency Preparedness Program and Exercise it was felt that these percentages were low. Due to time constraints this item was not pursued further.

One other area of concern was the failure of the licensee to assign a generic cause for all ERs and DRs. A sort was done manually to determine the number of ER/DRs without a generic cause-code. It was noted that a few of these late 1985 ER/DRs are still in the system to be assigned codes but the numbers still appear high.

ER/DRS NOT ASSIGNED GENERIC CAUSE-CODES

	1983	1984	1985	Total
ERs	1	5	21	27
DRs	3	9	59	71
Totals	4	14	80	98

Some difficulty was encountered in accomplishing the type of trending that was desired because sorts by component or specific deviation in chronological order were not available. This type of sort was done manually for components or deviations which appeared to be repetitive in nature. The areas trended in this manner were: problems with the diesel generators, problems with auxiliary feedwater system, problems with containment personnel airlock, and failure to perform surveillance testing on time.

The number of ER/DRs for these areas broken down by year are as follows:

	1983	1984	1985	Total
Diesel Generators	6	11	12	29
Auxiliary Feedwater	1	14	2	17
Personnel Airlock	2	5	4	11
Surveillance	3	9	6	18

With the exception of diesel generator problems it appears that after a bad year in 1984 an improving trend is developing in the areas shown above as well as others reviewed but not shown. One possible problem noted when the diesel generator events were chronologized was that in at least two instances the same problem was repetitive over a short period of time which could indicate improper or inadequate maintenance. These two instances were diesel governor speed setting too high and diesel generator manifold pressure low.

C. Procedures

As a result of the high number of ER/DRs in the procedure violation area, it was decided to review the status of the licensee's procedures. There are approximately 1250 controlled procedures at Palisades. The following groups each have greater than 150 procedures assigned to them: operations, maintenance, technical specification surveillance, and radiation protection.

At present the average monthly number of temporary procedure changes and new/revised procedures is 150. According to one of the licensee's representatives, it takes three to six months to process a temporary change notice through their system. (Of course, a working copy can be obtained almost immediately.) This is probably due to the high volume of changes in their system. Procedure revisions take even longer to process than temporary changes, but a good time estimate was not available. Their administrative "Procedure on Procedures" is currently being modified to eliminate: (1) expiration dates for those changes which are proposed to eventually become permanent procedure revisions, and (2) some of the criteria upon which a procedure revision instead of a temporary change notice must be prepared. These modifications will be evaluated by the resident inspectors.

If six or more temporary change notices (TCNs) have been issued against a procedure, then it must be revised. However, beyond this revision criteria most temporary change notices have no expiration date. The licensee also has a requirement that all procedures be reviewed every two years. However, this does not necessarily mean that all outstanding change notices get incorporated via procedure revision, but that procedures that are technically inaccurate get revised and TCNs get evaluated to determine if incorporation is appropriate at that time. It should be noted that the licensee has been cited three times during the period for not performing this biennial review. Two of these citations were for failing to take adequate corrective actions.

D. Radiological Incident Reports

An attempt to trend radiological incident reports (RIRs) over the three year interval of 1983 through 1985 was hampered by a lack of consistency in what was reported in RIRs. This inconsistency occurred despite the fact that the procedure, HP 1.3, was developed in March of 1983 and the page identifying incidents to be reported remained unchanged through the two subsequent revisions. Evidence of more consistent use of the report occurs in late 1984 after an NRC inspection which pointed out a need for a significant improvement in the implementation of the reporting system. Consequently, in looking at the three year period, a false trend would be derived based on simply comparing numbers of RIRs (i.e., in 1983 there were four RIRs, in 1984 there were 16, and in 1985 (following the 1984 NRC inspection) there were 47).

After a detailed review of the RIRs, several areas stood out as significant. Four times in 1985 instrument and control (I&C) technicians were found working on contaminated equipment or in a controlled area without notifying health physics (HP) of their intent. The last three incidents occurred within a one month period and corrective action by the licensee included discussing the need to inform HP prior to starting work. This was accomplished in a safety meeting with all I&C technicians. This appears to have been adequate corrective action in that no other incidents of this type involving I&C technicians were reported. Conversely, during the period reviewed, 17 instances of failure to follow Radiation Work Permit (RWP) requirements were reported. In almost all instances documented

corrective action involved only counselling the individual involved and/or his supervisor. This did not appear to be adequate because there were several repeat instances within a given group and on one occasion involving the same individual. The last two revisions to procedure HP 1.3 (covering the time since March 1985) state that a copy of the RIR should be routed to the training department. Not until the sixteenth of the above noted 17 RWP violations did documented corrective action include sending a copy of the RIR to Training with recommendations.

The review of the RIRs also indicated that when health physics is cognizant of, and is following work activities, they maintain positive control and are not hesitant to stop work if changing conditions or lack of knowledge of the workers warrant it.

E. Regulatory Performance

As determined from a review of NRC inspection reports for 1983 through 1985, regulatory performance at Palisades has been on the decline over the period, as measured by numbers of violations. In 1983 there were 11 violations cited, in 1984 there were 26, and in 1985 there were 37. In categorizing the nature of the violations some trends were noted. In the category of "Failure to Report," either internally or to the NRC, nine instances were noted: three in 1983, five in 1984, and only one in 1985. This would indicate progress in preventing recurrence of this violation. In the category of "Failure to Perform an Adequate 10 CFR 50.59 Review" four instances were noted, all in 1985. Corrective action from the earlier cited violations had not been completed prior to the last instance. This corrective action was completed prior to September 15, 1985. By far the largest category noted was "Failure to Follow Procedures" with 22 citations, three with multiple examples. The trend shows two in 1983, eight in 1984, and 13, including the three multiple examples, in 1985. The licensee's corrective actions for these violations included: revising procedures, counselling individuals involved, or stating that the violation was an isolated incident and no further actions were necessary.

F. Operational Performance

1. Reactor Trips

From a review of Licensee Event Reports (LERs) and NRC Inspection Reports, the following was extracted concerning the number of reported reactor trips at Palisades.

Year	Manual	Automatic	Automatic During Shutdown
1983	0	2	0
1984	1	1	0
1985	0	2	4
Totals	1	5	4

Four of the trips were due to personnel error and the other six were attributed to equipment malfunctions.

2. Inadvertent Containment Isolations and Safety Injections

Due to the LER reporting requirements changing January 1, 1984, the inadvertent containment isolation (CI) and safety injection (SI) data was compiled for 1984 and 1985 only.

Year	CI	SI
1984	3	4
1985	3	2
Totals	6	6

All unplanned CIs and SIs reported were while the unit was shutdown. Four of the six CIs were due to personnel error while the other two were caused by inadequate procedures. Four of the six SIs were also the result of personnel error, one was caused by an inadequate procedure and one due to equipment malfunction.

3. Unit Operation

During the three year time period studied, the unit was on-line approximately 54%, based on the monthly operating reports submitted by the licensee to the NRC. With the exception of two trips (January 26, 1983, and May 19, 1983), the unit was on-line in 1983 until August 12, 1983, when the refueling outage commenced. The reactor was returned critical on July 24, 1984, and the unit was on-line July 30, 1984. During July, August, and September 1984, the reactor was critical for approximately 26% of the time with time on-line being even less.

The licensee experienced numerous problems following the 50-week refueling/maintenance outage. The turbine developed high bearing vibration on July 31, 1984, and the generator was separated from the grid. On August 4, 1984, a reactor and turbine trip occurred from 48% power on loss of electro-hydraulic control (EHC) fluid. The cause was a personnel error by the CPCo traveling maintenance crew in that a bracket was not replaced during the refueling outage: this failure allowed the system vibration to back off a fitting on the discharge line of the EHC pump. Therefore, the EHC fluid was pumped out of the open discharge piping.

On August 10, 1984, the unit was forced down, after being on-line for five days, due to an unisolable Primary Coolant System leak from a failed weld on an instrument line off the 1A Cold Leg. They returned on-line September 4, 1984, but were forced back down due to the 'B' auxiliary feedwater pump failing its Technical Specification (TS) surveillance test on September 8, 1984. September 14 to 16, 1984, the unit was operating. On September 16, 1984, the licensee shut down due to the failed seals on the 'C' primary coolant pump. The unit remained shutdown until November 21, 1984, and then continued operating throughout 1984.

1985 data shows nine outages for the turbine plus two reactor trips and one forced reactor shutdown in addition to the refueling and environmental qualification outage that began November 30, 1985. Of the nine turbine outages, eight were due to electro-hydraulic control (EHC) system leaks. Seven of the eight EHC related outages were in August and September 1985.

G. Modifications

From a review of the modification program there were fifty electrical and mechanical modifications in various stages of completion; this is considered to be a manageable number. There were 54 Event Reports and Deviation Reports written against modification activities. Using the cause codes identified by the Nuclear Assurance Department trend analysis program, sixteen of the cause codes were for procedure violations and fourteen were for inadequate procedures. A more in-depth study of the cause codes noted the underlying problem to be in the area of inadequate in-depth review, whether in procedure preparation, design considerations, or approval to accomplish work. Problems reviewed were in the area of installation of unauthorized equipment, facility change operability sign-offs not completed, control room equipment not installed in accordance with drawing details, and insufficient procedure information involving Q-list equipment. Examples of the type of problems are:

1. Since plant maintenance personnel were unable to support maintenance work (January, 1984) on the Reactor Primary Shield Cooling System, a Q-list system, part of the disassembly activity was turned over to a contractor. During the transfer of work, cleanliness controls covered in procedure MSM-M-20, Cleanliness Guides for Mechanical Maintenance, were dropped and a comparable contractor procedure was not implemented. This resulted in part of the Shield Cooling System not being protected or covered during contractor maintenance work. No damage to the Shield Cooling System was detected.

2. Removal of Control Room (CR) Heating Ventilation and Air Conditioning (HVAC) ductwork (July, 1985) around fan V-16 penetrated the barrier between the CR and the environment which violated Technical Specification 3.14.1d. The ductwork was being removed to allow inspection of spalling concrete in support of Safety Injection Refueling Water Tank (SIRWT) structural upgrade. The area of concrete to be inspected was accessible only through the vent shaft. This expanded the scope of the SIRWT project which was covered by issuing a Notice of Outside Construction (NOC). The NOC was listed as a Non-Q activity. It was not known that removal of the ductwork, which is a Q-item, would open a sealed boundary to the CR HVAC system creating an unanalyzed path to the atmosphere.

3. Three Facility Changes (FCs) were completed during a refueling outage (July, 1984). Operability authorization sign-offs were not completed for the FCs prior to the plant proceeding from cold shutdown to hot shutdown as required by procedure. Not all FCs were incorporated into the outage schedule for identification purposes, and the central tracking system for modifications did not provide the needed alert information.

4. During testing of a radiation monitor with a known radiation source, the radiation level detected did not agree with what was expected. The source used was verified to be the correct source for the instrument. A review of the electrical cables (June, 1984) servicing the instrument noted that one of the instrument cables was run in a high power cable tray in lieu of the instrument cable tray. The monitor signal cable was correctly placed in the instrument cable tray. Separation of the two cables caused a phase difference that resulted in incorrect radiation reading. The procedure for installation of the cables was inadequate. Lack of clear information provided by the monitor supplier also added to the problem.

H. Licensee Audits

Audits are performed by the corporate Quality Assurance (QA) staff out of Jackson, Michigan. In the three year time frame of 1983 through 1985, the Palisades "Audit Log" lists 50 licensee audits that were conducted. A spot check was made to determine whether there was adequate follow-up on the licensee's "findings" and "observations."

1. Maintenance Audits

A review of three maintenance audit reports (A-QT-83-07, 05/16/83; A-QT-84-09, 06/04/84; and A-QT-85-07, 05/85) noted that a majority of the findings and observations were closed in a timely manner. However, there were recurring problems in the area of Maintenance Order (MO) processing and completion. These problems were identified during the May 1983 audit and observed again during the 1984 and 1985 annual maintenance audits. Similar MO documentation deficiencies were also identified during a plant QA surveillance in 1983. The more significant findings were not recording the cause of problems and how they were observed, names of Repairman/Technician, and description of problems requiring maintenance. Other less significant problems covering attention to detail on completing an MO form were also reported. Even though the problems of processing MOs were documented on a Deviation Report with corrective action specified, it appears that the corrective action taken was ineffective in resolving the problems. Most of the audits were paper intensive with a minimum of auditing covering actual work activities.

2. Inservice Inspection and Environmental Protection Audits

A review of two Inservice Inspection (ISI) audit reports (A-QT-84-27, 12/17/84 and A-QT-85-23, 10/85) and an Environmental Protection (EP) Plan (nonradiological) audit (A-QT-85-27, 12/85) revealed that a problem may exist in the timely closeout of audit findings and observations. One observation from a 1983 audit (A-QT-83-17) was still open in the 1984 ISI audit and not addressed at all in the ISI 1985 audit. The 1984 ISI audit resulted in one finding and three observations. When the 1985 ISI audit was performed only one observation was resolved (i.e., two of the observations and one finding were still not resolved). The EP audit had one finding still open from a previous audit (AMS-84-50-01f).

3. Modification Audits

The audits reviewed on the subject of Plant Modifications included Audits A-QA-83-3, A-QA-83-11 (a "follow-up" audit), A-QA-84-5, and A-QA-85-2. This review resulted in the following two comments.

a. In the tracking of findings and observations from audit to audit, some of them disappear with no reference to acceptable closure. Specifically, audit A-QA-83-3, (02/07/83) had six findings. The follow-up audit A-QA-83-11 showed the six findings still open. The 1984 audit, A-QA-84-05 (2/20/84) also showed the six findings as still open. However, the 1985 audit, A-QA-85-02 (2/11/85) only looked back at the findings from the prior audit (1984) and not at the findings from 1983 that were still open when the 1984 audit was done.

   This failure to track findings from one audit through to the successive audits could result in some of the findings never being resolved. (In this case the six findings were not lost, see below.)

b. There has been a significant time lag between the documenting of a finding and the resolution thereof. For example, in the case reported above, audit A-QA-83-3 of February 1983 had six findings, with the earliest closure of a finding being June 7, 1984 and the latest closure being April 19, 1985.

   Even though the six findings were not, in fact, lost, the time lag between documenting the finding and closing it has varied from sixteen to twenty-six months.

   In addition to the two comments, above, note that the licensee has a protocol for tracking some "observations", also. Observations that actually call for a remedial action, rather than recommendations, are now tracked until completion.

I. Tracking of NRC Commitments

The Palisades system of management control for commitments made to the NRC was reviewed for adequacy. Every piece of correspondence sent/received and every commitment made to the NRC is followed by Consumers Power Company via the Correspondence Logging and Commitment Tracking System (CLCTS) on the main-frame computer at Jackson, Michigan. The corporate Nuclear Licensing Department at Jackson is responsible for the input to CLCTS, both to enter open items, unresolved items, and violations into the system based upon reports received from the NRC and also to close such items. The closing is done in two steps.

First, an item is closed "internally" when CPCo considers it closed. Secondly, the item is said to be closed "externally" when an NRC inspection report says that it is satisfactorily closed. When a "closure" is entered into CLCTS, the report number is usually entered, also. (Less frequently, the specific item number for the open item is entered into CLCTS.)

A spot check of the tracking of over one hundred open items, unresolved items, and violations (in total) from CLCTS was made and compared to Region III records, specifically to determine whether those classified as "externally" closed were in agreement with those listed as closed in the Region III records. With only one exception all of the remaining items checked were accurately recorded in CLCTS.

For its intended purpose of tracking commitments, the CLCTS works adequately.

J. NRC Daily Reports

From a review of Region III daily reports, a problem was noted in the area of adequate in-depth review which included procedure preparation, meeting Final Safety Analysis Report (FSAR) design requirements, use of non-conservative calculations, and incorrect analysis. This problem of lack of in-depth review is similar to that covered in the plant modification program of Section G, above. Some of the problems noted were:

1. Installed concrete beams under the SIRWT did not conform to the FSAR description and American Concrete Institute (ACI) code requirements.

2. On January 8, 1984, diesel generator 1-1 was started and loaded in parallel with bus 1-C in preparation for a planned removal of offsite power. However, the licensee did not recognize that the diesel was operating without service water cooling; it overheated and was manually tripped. On May 20, 1985, diesel generator 1-1 tripped during an operability test due to a water jacket cooling leak. It is believed that the leak was due to the engine overheating when it was run without cooling water on January 8, 1984.

3. On July 3, 1984, an inadvertent left-channel Safety Injection Signal (SIS) actuation resulted from using a new procedure for checking the design basis accident and normal shutdown sequences. The procedure did not recognize that the terminal from which a sequence lead was to be lifted also carried power for the left-channel SIS block.

4. The low flow trip setpoints for three reactor coolant pumps had been non-conservative by approximately 2.9% since 1974. The error was the result of the initial calculations not including backflow through the idle pump.

5. On December 4, 1985, the licensee determined by documentation review that a terminal block located inside the containment was not environmentally qualified as previously thought based on data received from a contractor by telephone.

IV. REGULATORY PERFORMANCE

A. Violations

Year	Severity Level III	IV	V	Total	Inspection Hours	Total Violations Per 1,000 Inspection Hours
1983	1	2	8	11	2680	4.1
1984	2	18	6	26	2551	10.2
1985	0	29	8	37	3213	11.5
Total	3	49	22	74	8444	

Currently there is one enforcement package being considered for escalated action concerning total containment leakage in excess of that allowed by Technical Specifications from May to November 1985.

Note: Inspection hours were obtained from the Inspection Report summaries.

B. Civil Penalties

Issued

Failure to control access to the protected area.

Inspection Report Number: 83014
Inspection Date: May 26, 1983
Amount of Penalty: $20,000

Pending

Failure to maintain containment integrity. Leakage exceeded Technical Specification allowable from May to November 1985.

Inspection Report Number: 86008
Inspection Dates: January 15 through February 19, 1986
Amount of Penalty: Not yet determined

C. Enforcement Conferences

June 23, 1983	Conference on Severity Level III Civil Penalty for failure to control access to the protected area.
March 5, 1984	Conference to discuss loss of all AC power event of January 8, 1984. Seven Severity Level IV violations.
April 27, 1984	Conference to discuss overexposure of diver in refueling cavity on March 18, 1984. Severity Level III violation.
October 2, 1985	Conference for failure to perform quarterly testing of five containment isolation valves in violation of Technical Specifications. Two Severity Level IV violations.

D. Management Meetings

November 9, 1983	Meeting to discuss licensee response to Security Inspection Report 83020.
May 3, 1985	Meeting to discuss repetitive weakness in Emergency Preparedness Program of timely classification of events and subsequent notifications.
September 5, 20 and 23, 1985	Meetings to discuss weaknesses identified in Emergency Preparedness Exercise of August 20, 1985.
October 24, 1985	Meeting to discuss maintenance problems and Confirmatory Action Letter to be issued October 30, 1985.

In addition, two Systematic Assessment of Licensee Performance (SALP) meetings and four informational/working level meetings were held.

E. Confirmatory Action Letters (CAL)

July 13, 1984	CAL issued following discovery of cables in containment that were degraded by high temperatures.
July 16, 1985	CAL issued for two Senior Reactor Operators and three Reactor Operators to be removed from licensed duties following failure of requalification exam.
October 30, 1985	CAL issued to reduce backlog of maintenance work orders including control room deficiencies, develop a trending program and machinery history and maintain additional personnel to reduce backlog to optimal level.

V. NRC PERCEPTION OF PALISADES

Certain perceptions of the Palisades plant appear to be common among regional/resident inspectors involved with the site. The review team interviewed Region III personnel who have had dealings with the plant concerning perceived problems. The following is a brief synopsis of areas where at least two or more of the people interviewed expressed their concerns.

A. The significant turnover in personnel during the period reviewed and the resulting loss of experience in key areas could affect overall plant operations.

B. The licensee's surveillance program is the minimum to meet the code.

C. The licensee's Quality programs minimally meet the requirements.

D. Corrective actions are often not effective in preventing recurrence.

E. It appears the work of support groups is important to management only if it does not interfere with plant availability.

F. Problems associated with the Midland site, both financial and personnel, have contributed to low worker morale at Palisades. It is too early to tell if this problem has been corrected.

VI. CONCLUSIONS

There are a number of conclusions that can be drawn from the data and interviews conducted during the review process as evaluated by the review team. They are as follows:

A. The licensee's personnel error rate is abnormally high: 33% of LERs, 65% ER/DRs. This is dominated by procedure problems.

B. The licensee has a problem in both the quality of their procedures and in adherence to their procedures. This is evidenced by the following:

Quality of Procedures

- 15% of ER/DRs are caused by procedure inadequacies.
- Approximately 150 new temporary change notices per month against 1250 total procedures. This implies that procedures are not being properly prepared and reviewed initially.

Adherence to Procedures

- 40% of ER/DRs are written for procedure violations.
- 31% of procedure violations are found by the quality/auditing groups. This implies that front line supervision is not reviewing work adequately.

C. The number of procedure changes and revisions is so large that the process is bogged down and the licensee is modifying the "Procedure on Procedures" to make it easier to issue a temporary change notice. The appropriateness of this change will be evaluated by the resident inspectors.

D. There are indications that corrective maintenance is not always effective in preventing recurring problems.

E. Corrective actions tend to be too narrow in scope and do not consider generic solutions. This was found in several of the areas reviewed.

F. The problems that the task force identified to be the result of inadequate in-depth review have shown a definite increase over the assessment period. This problem was identified during the review of modifications, but it was also seen in other areas.

G. The licensee's trending methodology could be improved. Some of the problems identified are described in Section III.B of this report.

H. The 1983 through 1985 Inspection Reports, with the exception of safeguards information, were reviewed to ascertain any potential trends at Palisades. The reports confirmed the conclusions noted above. One additional comment made in many Inspection Reports was that the needed documentation was not always readily retrievable. Also some documentation has been noted as incomplete and in some cases inaccurate. This indicates a lack of attention to detail.

I. Licensee performance appears to be improving during the last six months reviewed. This observation is based on NRC employee interviews and comments in the latest SALP report.

J. Audit followup is not always timely nor adequately documented. Some of the problems identified are described in Section III.H of this report.

K. While the number of cited violations has increased over the study period, the violations per inspection hour have leveled off.