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PRIORITY ROUTING

First	Second	
RA	RC	Willfred Connell Vice President
DRA	EIC	U-602747
DRP	SGA	WC-220-97
DRS	hmo	May 30, 1997
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Mr. A. Bill Beach
Regional Administrator, Region III
U.S. Nuclear Regulatory Commission
801 Warrenville Road
Lisle, Illinois 60532-4351

Subject: Clinton Power Station, Docket No. 50-461
Improvement Actions and Progress Since September 1996

Dear Mr. Beach:

In September 1996, Clinton Power Station (CPS) was shutdown following an event involving the failure of the "B" reactor recirculation pump seal. This event illustrated several performance weaknesses, including weaknesses with procedure compliance and adequacy, conservative decision making and human performance, management oversight, and plant material conditions. As noted in my letters to you on September 17 and December 9, 1996, and as described in several meetings with the NRC Staff, Illinois Power Company (IP) developed and has been implementing a comprehensive set of improvement actions to address these weaknesses and others identified in the inspections, assessments, and root cause analyses that followed the September event. The purpose of this letter is to update you on the actions we have taken and the results that have been achieved in correcting those weaknesses.

Our initial improvement initiative was the Startup Readiness Action Plan (SRAP), which specifically addressed the September 5, 1996 event and associated NRC inspection findings and CPS assessments. During the course of implementing the SRAP, it became apparent that additional issues, beyond the scope of the SRAP, warranted attention. In response, IP established a Turn-Around Team (TAT) headed by a specially appointed Assistant to the Vice President to review these issues and develop a strategy to address them.

The TAT developed a Strategic Recovery Plan (SRP) which incorporated the SRAP actions and addressed additional issues associated with plant systems and hardware, programs and procedures, and organizations. The SRP also includes reviews to ensure that CPS is ready for restart and incorporates performance measures to be used in determining progress in achieving performance improvement. Implementation of the pre-startup activities in the SRP is nearing completion.

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We intend to restart CPS in mid-June 1997, utilizing the results of a series of intensive SRP reviews to ensure our readiness. Prior to restart, we will have completed those reviews and will make the results available to you. The restart will be an important test of the effectiveness of our corrective actions. But in the interim, we have completed actions which address the weaknesses identified since the September event, and have arrested the decline in performance indicated by those weaknesses. Key actions and results are summarized below.

As part of our effort to return CPS to strong performance, we have made several management and organizational changes since the September 1996 event. These changes include the creation of Assistant Vice President for CPS and Assistant to the Vice President positions and appointments of a new Power Plant Manager and Assistant Plant Manager-Operations.

Procedure Compliance and Adequacy and Conservative Decision Making

We have engaged in a broad effort to set and enforce clear standards for procedure compliance, and to ensure that our procedures are of high quality.

- The CPS procedures and policy statements governing conduct of operation and procedure adherence have been revised to provide clear direction on procedure compliance and conservative decision making. This included guidance on the use of action plans and the fact that those plans are not stand-alone procedures and do not direct work.
- Seminars on procedure compliance and conservative decision making have been conducted for CPS Managers, Operations personnel, System Engineers, Shift Technical Advisors, and selected additional personnel.
- Operating and surveillance procedures have been reviewed for adequacy and enhancements, including walkdowns of approximately 160 system operating procedures. Revisions to these procedures based upon the results of these reviews have been completed.
- The Maintenance and Radiation Protection departments have conducted reviews of their procedures to ensure adequacy and ease of use.
- Training programs have been revised to require that site employees and contractors receive training on procedure use and adherence. Training on conservative decision making has been provided for appropriate personnel and incorporated into their continuing training programs.
- Procedural and administrative limits on system and equipment operation have been established for several key systems and pieces of equipment to ensure conservatism in their operation.

As a result of these actions, our management observations and peer reviewers show improvement in the areas of operational decision-making and procedure compliance and adherence.

Management Oversight

We have taken several steps to strengthen management oversight and ensure that management sets and reinforces expectations.

- The Vice President - CPS met with each first line supervisor to obtain agreement on a "contract" regarding responsibilities shared by CPS management to ensure safe, reliable CPS operation.
- The CPS Plant Manager is meeting with each Operations crew member to ensure understanding of expectations regarding safe and conservative operation, procedural compliance, responsibility for ensuring safe plant configurations, and other operator responsibilities.
- Work stand-downs have been held on several occasions to enforce management expectations on procedure compliance and a safe, conservative approach to the performance of work activities.
- In-Plant Crew Monitoring and Observation checklists have been developed and are being used by management monitors to provide crew members with timely performance feedback and give management a real-time indicator of performance.
- The IP Chief Executive Officer met with CPS employees to reinforce the company's commitment to operate CPS in a safe and conservative manner.

Recent surveys and inspections have confirmed stronger understanding of management expectations regarding compliance with procedures and conservative decision-making.

Plant Material Conditions

We have used our outage to review and improve the material condition of CPS. We have acted both to correct known problems and to identify and correct previously unidentified material condition issues.

- System Readiness Reviews have been conducted as a part of our comprehensive strategic recovery effort to identify and resolve conditions having any significant potential to affect safe and reliable operation of CPS.
- Quarterly Material Condition Reviews are being performed by senior CPS management to ensure that material condition problems are appropriately focused on and resolved.

- Several important material condition enhancements to further ensure safe, reliable operation of CPS have been implemented. These relate to feedwater check valves, drywell floor and equipment drain leak detection, electrical breakers, and reactor recirculation pump seals.
- Significant improvements have been made to the material condition of the CPS Main Control Room. These improvements enhance the operator's ability to respond to plant operational requirements.

Broader results of material condition improvement actions include a greater than fifty percent decrease in temporary modifications since November 1996 and an increased focus on identifying and improving the material condition of CPS.

Engineering and Evaluations

We have made several changes in station engineering support to further ensure safe, reliable operation of CPS.

- The Nuclear Station Engineering Department has been reorganized to establish clearer lines of responsibility for engineering activities, and the size of the Engineering staff has been increased to provide better response to engineering issues.
- The Operability Evaluation Process has been revised using Generic Letter 91-18 and CPS lessons learned as guidance to create a formal proceduralized program.
- We implemented a comprehensive 50.59 improvement plan which includes a review of engineering changes made during RF-6, creation of specially trained core reviewers, and awareness training on the 50.59 process for key site personnel.
- We reestablished the Engineering Assurance Group in the Engineering Department to provide greater self-assessment capability.
- We created a new position of Director-Independent Analysis to better coordinate root cause and trend analysis activities.

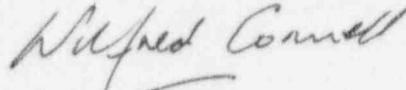
A more comprehensive description of actions taken to improve plant management and organization, programs and procedures, and systems and hardware is presented in the Attachment to this letter.

In sum, action has been completed to address each of the main areas of weakness identified in the Fall of 1996, and our performance results show that these actions are having an effect. We are also very aware that weaknesses remain and that further improvement is necessary. Our Strategic Recovery Plan includes not only the pre-startup actions, which are now largely complete, but also longer term actions to ensure that performance improvement continues once startup is achieved. We intend to share our Long-Term Improvement Plan with the NRC when it is completed. As our actions have

shown, we are willing to take the steps necessary to continue improvement. We remain committed to this course.

Please call me should you have any questions or require any further information.

Very Truly Yours,



Wilfred Connell
Vice President

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cc: Mr. L. J. Callan, Executive Director for Operations
Mr. S. J. Collins, Director of Nuclear Reactor Regulation

Attachment

Summary of Clinton Power Station Improvement Actions and Results Since September 1996

Background

During recent SALP periods, Clinton Power Station (CPS) received ratings of "1" or "2" in all areas, and performance measures have generally indicated performance at or above industry norms.

However, in 1996 Illinois Power confronted some significant performance problems and is striving to return CPS to a strong level of performance. Following a September 5, 1996, event in which a reactor recirculation pump seal failed, forcing shutdown of the unit, CPS management elected to keep the unit down and commence a scheduled refueling outage. During this outage, refueling of the reactor and many other maintenance activities were completed. IP has also taken action to address the causes of the September 5, 1996, event and other performance weaknesses identified by both IP and the NRC.

Since the September 5, 1996 forced shutdown, several inspections, assessments, and root cause evaluations have been performed and reviewed to establish a group of issues for improvement. The root cause evaluation was performed by a select team of individuals specially trained in root cause investigation and evaluation. In September and October 1996, IP developed and began to implement a Startup Readiness Action Plan (SRAP), which specifically addressed the September 5, 1996, forced shutdown and associated inspection findings. The development of the SRAP, and implementation of several of the specific SRAP items, were the subject of NRC Confirmatory Action Letters on September 11, 1996, and January 9, 1997. Closure and validation of action items covered by the SRAP are nearing completion.

During the course of implementation of the SRAP, and as a result of evaluations, assessments, and events in late 1996 and January 1997, it became apparent that additional issues, beyond the scope of the initial SRAP, warranted attention. Some issues required attention prior to CPS restart, while others represented longer-term challenges. Accordingly, IP established a Turn-Around Team (TAT) to review these issues and develop a strategy to address them. The TAT is headed by a specially appointed Assistant to the CPS Vice President and includes representatives with expertise in Operations, Maintenance, Engineering, Radiation Protection, Licensing, and Human Performance Improvement.

During February and March 1997, the TAT evaluated the SRAP, previous inspection and assessment findings, and recent events to identify pre-startup and longer-term issues that needed to be addressed. The TAT then developed a Strategic Recovery Plan (SRP) describing improvements to address these issues. The SRP contains two major areas of focus, human performance and material condition. It includes reviews of: (1) plant systems and hardware; (2) programs and procedures; and (3) organizations. It incorporates all of the previously-identified SRAP actions, and includes performance measures to be used in determining progress in achieving performance improvement. The SRP also describes the reviews and assessments being performed to ensure that CPS is ready for restart. Finally, the SRP defines the development of a Long-Term Improvement Plan to guide CPS improvement efforts following restart.

Implementation of the SRP is ongoing. However, many of the key improvement actions included in it have already been completed. These include some 45 of the 55 SRAP actions and many other steps to address causes of performance problems that became apparent in the fall of 1996 and early 1997. IP currently intends to restart CPS in June 1997 following completion of its startup readiness reviews. The Long-Term Improvement Plan is also under development and is scheduled to be issued prior to plant startup.

The remainder of this Attachment describes the actions and results that have been achieved to date in each of the areas covered by the SRP, including:

- Management and Organization
- Programs and Procedures
- Systems and Hardware

The attachment also describes performance indicators that are being used to measure progress, and results shown by those indicators to date.

Management and Organizational Enhancements

Actions taken in the area of management and organization include several significant management changes, efforts to upgrade management oversight, and improvements to the clarity and understanding of management expectations, particularly with respect to procedure adherence and conservative decision making. Several of the more important actions completed are described below.

Management Changes

As part of the effort to return CPS to strong performance, Illinois Power has made several management and organizational changes since September 1996. These include:

- Mr. Wayne Romberg, formerly a Vice President responsible for nuclear activities at two other nuclear utilities, has been named Assistant Vice President for CPS, responsible for accomplishing strategic objectives related to safety, reliability, operation and maintenance of CPS. Mr. Romberg also has held a nuclear plant operator's license, served in the U.S. Navy as a nuclear submarine officer, and holds a bachelor's degree in Industrial Engineering and a Master's in Nuclear Engineering.
- A new Assistant to the Vice President position has been created to lead turn-around efforts and ensure strong management focus on completion and effectiveness of improvement actions. Mr. Richard Phares, formerly Manager of Nuclear Assessment and Director of Licensing, has been appointed to this position and serves as leader of the Turn-Around Team responsible for coordination, monitoring, and oversight of implementation of the Strategic Recovery Plan. Mr. Phares served in the U.S. Nuclear Navy and has a bachelor's degree in Applied Science-Industrial Safety with high honors.
- Mr. Pat Yocum was named Power Plant Manager. Mr. Yocum was previously the Director of Nuclear Assessment, Director of Operations, Director of Maintenance and Technical Training, Plant Operations Supervisor, and Shift Supervisor. He has held an operators license at CPS and served as Engineering Watch Supervisor and Engineering Officer of the Watch on nuclear submarines in the U.S. Navy. Mr. Yocum has a Masters in Business Administration degree.
- Mr. Michael Lyon was appointed Assistant Plant Manager - Operations. Mr. Lyon previously served as Director of Licensing, Director of Operations Training, and Director of Emergency Response. He has held a senior reactor operator license at CPS. Mr. Lyon holds a bachelor's degree in psychology and a Masters in Business Administration.
- Mr. Russ Bedford assumed the position of Assistant Director - Operations. Mr. Bedford holds a senior reactor operator's license, obtained a degree in Nuclear Engineering, and has previously been a supervisor in plant engineering and a senior engineer in NSED.
- Mr. Joseph Sipek assumed the position of Director - Licensing. His experience includes supervisory positions at CPS in Maintenance, Fire Protection and Licensing. Mr. Sipek also holds a degree in Thermo-Mechanical and Energy Transfer Engineering.

- Mr. Gary Baker assumed the position of Director - Nuclear Assessment. He was perviously Managing Director of Information Systems and Director-Plant Support Services. His experience also includes supervisory positions at CPS in Nuclear Training & Support, Outage Planning, Quality Assurance and Radiation Protection. Mr. Baker has over twenty years experience in nuclear quality assurance and holds a degree in Industrial Technology.
- A new position of Director-Independent Analysis was created to coordinate independent assessment, root cause, and trend analysis activities. Mr. Don Waddell has been appointed to this position. Mr. Waddell previously held supervisory positions in plant safety, NSED, fire protection, and emergency response training. Mr. Waddell holds a degree in Physics and a Masters in Business Administration.
- Mr. James Hale recently became Director of Planning and Scheduling. Mr. Hale held a senior reactor operator license and has a degree in Industrial Technology. Prior to his current position, Mr. Hale served in supervisory positions in Operations, Work Control, and Outage Planning.
- Mr. Wayne Bousquet was recently appointed to the position of Director of Plant Support Services which has site responsibility for the Corrective Action Program. Mr. Bousquet has previous supervisory experience in Quality Engineering, Maintenance and Technical Training, and Plant Support Services.

In addition, outside management assistance has been brought in to assist station management. These include:

- A direct assistant to the Vice President, an assistant to the Manager, Nuclear Station Engineering, and additional assistants to the Assistant Plant Manager - Operations provided through INPO.
- A reconstituted offsite safety review group (Nuclear Review and Audit Group [NRAG]) which is now chaired by a former NRC Deputy Executive Director for Operations and includes senior nuclear executives with extensive commercial nuclear operating experience and independent consultants.
- An independent assessment of actions taken to improve human performance, procedure compliance, and conservative decision-making headed by a senior nuclear executive from South Texas Project and a senior consultant with over thirty years experience in nuclear technology.
- In-plant operations crew monitoring by Operations personnel from INPO, WNP2, Wolf Creek, and Duane Arnold.

- An assessment of CPS safety culture and training of human error reduction technicians conducted by Performance Improvement International (PII, formerly FPI).
- An engineer from Duke Power with extensive experience in electrical circuit breaker to assist in assessment of CPS circuit breaker conditions and the formation of a corrective action plan.

Reinforcement of Corporate Commitment to Safety

To ensure CPS employees understand IP's commitment to safety, Mr. Larry Haab, IP's Chief Executive Officer (CEO), addressed a letter to all CPS plant employees that reinforced IP's corporate policy of operating Clinton Power Station in a safe and conservative manner. As a follow-up to this letter, on December 16, 1996, Mr. Haab visited with approximately 250 CPS personnel to share his convictions regarding safe plant operation. These sessions were video taped for other CPS personnel to view.

In-Plant Crew Monitoring and Observation

A detailed CPS Operations Department In-Plant Crew Monitoring and Observation checklist was developed and is being used by management monitors. The purpose of the monitoring program is to ensure management awareness of crew values, practices, and behaviors, and to provide feedback to the operating crew regarding management expectations. This monitoring provides operating crew members with timely performance feedback and gives management a real-time indication of performance. This feedback ensures that (1) the plant is being operated safely and in accordance with license and regulatory requirements, (2) conservative decisions are made in the daily operation of the plant, (3) procedure compliance and adherence is being maintained, (4) oversight roles and responsibilities are being properly maintained, and (5) three-part communication is utilized in directions for operating plant equipment and components. Additionally, IP has developed a power ascension plan with hold points to provide for management assessment of personnel performance during restart.

Management Oversight, Direction, and Expectations

There has been a significant increase in management oversight and direction at CPS. Management expectations for safety, conservative decision making, and adherence to procedures have been clearly formulated, communicated, and reinforced through:

- The Vice President, CPS, met with each supervisor to obtain a written agreement on a "contract" of responsibilities shared by CPS management team members to ensure safe, reliable CPS operation.
- Policy Statements on conduct of operations, procedure compliance, and conservative decision-making were updated and revised.
- Seminars on procedure compliance and conservative decision-making were conducted for CPS Managers, Operations personnel, System Engineers, Shift Technical Advisors, and selected additional personnel.
- The Power Plant Manager is meeting with each Operations crew member to ensure understanding of expectations regarding safe and conservative operation, procedural compliance, responsibility for ensuring safe plant configurations, and other operator responsibilities.
- The Operations and Maintenance departments each issued written departmental management expectations on the conduct of safe operations.
- CPS management developed and committed to a written charter that reaffirms that nuclear safety is the management team's highest duty.
- Plant or equipment condition limits have been established to ensure conservatism in the operation of selected key systems.
- Conservative decision making training, emphasizing safety of operation and procedure compliance, has been incorporated into accredited continuing training programs.
- In October 1996, all site employees and contractors working at CPS were required to attend training seminars on procedure adherence, which included (1) a review of the September 5 event and resulting lessons learned; (2) procedural compliance and adherence training on Appendix B, Criteria V; (3) conservative decision-making; (4) a presentation of management oversight and roles; and (5) specific training on when procedure changes should be made and how to accomplish them.
- CPS Procedure No. 1005.01, "CPS Procedures and Documents," was revised to provide clearer guidance on procedure use and adherence. A new procedure, CPS Procedure No. 1005.15, "Procedure Use and Adherence," has also been issued which makes clear how procedures are to be performed.

Various forms of employee communications used on site, including billboards, newsletters, and video monitors, also were and are being used to reinforce

management's expectations for safe, conservative plant operations and procedure compliance.

Use of Stand-Downs to Enforce Management Expectations

To further enforce its expectations, management declared two work stoppage stand-downs during the months of January and February after events occurred which indicated that safety focus and procedural compliance did not meet CPS standards. During the stand-downs, employees attended briefings presented by supervision during which the recent errors and the significance of the errors were discussed. Employees were coached in error-reduction techniques and methods to apply these techniques to help reduce errors. During these meetings, employees also had the opportunity to discuss frustrations, concerns, and problems they were experiencing. Prior to resuming work activities, each site department head submitted written confirmation to the Plant Manager indicating how his organization would satisfactorily implement self-checking techniques.

Improvements in Quality Assurance

The Quality Assurance (QA) Department has developed and is implementing an action plan that provides senior management a periodic verbal report summarizing QA observations. The Employee Concerns Program has been enhanced by increasing resources, and QA personnel have been provided with increased training in Quality Assurance Fundamentals and refresher training in regulatory requirements. In addition, where appropriate, QA is enhancing its audit function by incorporating performance-based assessments.

The Engineering Assurance Group has been reestablished in Engineering, providing greater self-assessment capability. This is part of an Engineering Department restructuring aimed at increasing accountability.

Programs

Since September 1996, IP has taken measures to improve the quality of a number of specific programs and procedures. Broader assessments and reviews have also been performed to identify weaknesses in site-wide programs and categories of procedures, and action has been taken to address identified weaknesses.

Procedure Review

IP formed a special team to review procedures governing procedure adherence, conservative decision making, and management oversight. Provisions that

could be misinterpreted and lead to procedure noncompliance were deleted, and management's expectations on procedure adherence and when procedure questions are to be brought to the attention of supervision were clarified. Steps to be taken when problems or errors in procedure are encountered were changed to clearly reflect the expectation to stop work and have the procedure properly changed before proceeding.

IP also conducted reviews of several important categories of procedures, with an emphasis on procedure compliance and adherence, and a recognition of the need to have appropriate guidance in station procedures and less reliance on tool box skills. These reviews included:

- Operating and surveillance procedures were reviewed for adequacy and enhancements. Revisions to surveillance procedures resulting from this review have been completed.
- Operations Department personnel performed reviews and walkdowns of approximately 160 system operating procedures to identify and correct any procedure inadequacies that might prohibit successful completion of an operational evolution. Procedure revisions resulting from this review have been completed.
- Operating crew personnel have reviewed procedures for scheduled surveillances for RF-6 and startup prior to implementation to identify and correct inadequacies that could have prevented successful completion of surveillance activities. Revisions to surveillance procedures resulting from this review have been completed.
- The procedures for Conduct of Operations and Authorities and Responsibilities for Reactor Operators For Safe Operation and Shutdown were revised to give clear direction on conservative decision making. Procedure steps that could be construed as nonconservative were deleted or modified.
- The Operations procedures associated with various normal and startup activities were exercised in the simulator by the operating crews to ensure clarity, consistency, and ease of use. These included procedures for activities such as plant startup, single loop operation, leak detection, reactor coolant leakage, long cycle lineup, operations, and others. Seventeen operating procedures and documents were revised as a result of this review.
- An independent, site-wide assessment of procedure use and adherence was performed by the Quality Assurance Department. Although the findings were generally acceptable, specific areas were identified for additional attention. Corrective actions have been identified and taken to eliminate weaknesses in those areas.

Electrical, Controls, and Instrumentation Surveillance Procedure Assessment

The Electrical, Controls & Instrumentation (E,C&I) Maintenance department conducted a self-assessment of its surveillance procedure program. Over 200 surveillance procedures were included in the scope of the evaluation. The self-assessment evaluated how well technicians were meeting procedure compliance expectations, evaluated the quality of thirty completed surveillance tests, reviewed thirty-five open requests for procedure changes, assessed personnel qualifications, reviewed the forty-eight most recent changes to procedures for impact upon training and the surveillance program, and performed observations of surveillance tests performed in the field. Although some problems were noted, this review confirmed that no significant deficiencies existed and that site-wide expectations for procedure compliance were being reflected in work activities.

Radiation Protection (RP) Procedure Review

IP assembled a dedicated enhancement team to review RP procedures for accuracy, usability, and compliance with regulations. This team is initially focusing on approximately fifty procedures deemed critical for safe, reliable operation of CPS. The product of this review is analyzed independently by the CPS Procedures Group in Plant Support Services. To date, several enhancements to RP procedures have been made to improve RP performance and efficiency.

Assessments and Corrective Actions

A number of actions have been taken to improve the quality and timeliness of assessments and corrective actions. These include:

1. Lower Thresholds for Initiating Condition Reports

CPS has taken actions to establish a work environment that encourages timely reporting of safety concerns and to strengthen human error reduction measures at CPS. These actions include reinforcing management's expectation that questions involving conditions adverse to quality are documented in the CPS Condition Report (CR) program. As a result, our threshold for writing condition reports has been lowered dramatically, resulting in a several-fold increase in the rate of initiation of CRs. This has resulted in CPS better identifying and addressing issues at an early stage and improving trending of performance problems for comprehensive corrective action.

2. Enhancements to the CPS Event Critique Process

The site procedure for conducting critiques and fact findings of events was reviewed and revised to (1) require appropriate personnel chair and attend critiques, (2) require appropriate independent and objective inputs from other departments at the critiques, (3) require in-depth fact finding during the critique, (4) establish clear expectations for timeliness of critique evaluations and documentation, (5) require specific determinations on whether procedure noncompliances or non-conservative operations occurred during the event being critiqued, and (6) require a timely review and concurrence of the facts by appropriate senior management.

3. Safety Performance Improvement Initiative

A human performance improvement initiative is underway at CPS through a partnership arrangement with Performance Improvement International. The human performance improvement program focuses on prevention, detection, and correction of human errors and equipment failures. The results of a site-wide survey of employees taken in September, combined with organizational and programmatic improvements and human error reduction, are being used to address weaknesses and develop departmental improvement plans. This major safety improvement initiative will continue into 1997.

4. Independent Analysis

Because the corrective action program is critical to future performance, IP has created an independent group of root cause analysts, whose full-time responsibilities are investigating and solving problems. IP has created a new position, Director - Independent Analysis, reporting to the Vice President to head this group.

The mission of the group is to prevent events and improve station performance by performing rigorous root cause analyses; developing effective, technology-based corrective actions; developing and maintaining a mature performance monitoring program; and ensuring proper execution of performance improvement actions. Corrective action trending responsibilities will move from the Quality Assurance department to the new group, and nine root cause investigator positions have been filled.

50.59 Improvement Plan

CPS reviewed the engineering changes implemented during RF-6, including the 209 safety evaluations/screenings prepared for engineering changes and modifications for RF-6. These safety evaluations/screenings were evaluated to determine whether they provided sufficient justification for determining whether the change involved an unreviewed safety questions (USQ). Of the 209 safety evaluations/screenings reviewed, fifteen safety evaluation screenings were identified as not adequately providing justification why the change did not constitute a unreviewed safety question (USQ). Full safety evaluations have been completed for these fifteen changes. None have been found to identify an unreviewed safety question.

To ensure the adequacy of future safety evaluations/screenings, awareness training was provided to approximately 300 people on site at all levels, but it was primarily directed to those people involved in the work processes. Attendees included the site Vice President, supervisors, shift supervisors, assistant shift supervisors, group leaders, and maintenance planners. The seminar provided an overview of 10CFR50.59 requirements and included discussion of identified weaknesses in the implementation of the safety evaluation process at CPS. The objective was to make people aware of when a safety evaluation was needed.

In addition, IP developed and implemented a Safety Evaluation Improvement Plan that addressed short term and long term actions to improve the effectiveness of our program. The improvement plan included the following:

- Specialized training for core reviewers on the legal requirements for the safety evaluation program, the lessons learned from past mistakes identified from the NRC inspections and CPS assessments, guidance for filling out the safety screening and evaluation forms, and management expectations for determining if an unreviewed safety question exists.
- Revision of the CPS safety evaluation procedure to require that all safety evaluations and screenings be reviewed by a specially trained core reviewer.

Other Program Improvements

1. Revised Operability Evaluation Program

The Nuclear Station Engineering Department (NSED) assembled a team of senior individuals to conduct a review of documents related to equipment operability evaluations. Using Generic Letter 91-18 as guidance, the team worked to identify conditions or equipment which may have been incorrectly considered operable. Although no incorrect operability determinations were found, some evaluations were found to be lacking in detail or complete analysis. These operability evaluations were corrected.

The team also performed a thorough investigation of past operability evaluations and determinations which had the potential to affect safety component and system operability. In addition to 140 Condition Reports in the team's original scope, additional scope was added to the team's review to provide plant management the confidence that all equipment is operable. The team uncovered no situations where inoperability exists. The team also assessed the existing operability evaluation practices and identified program deficiencies, both internal and external to NSED, which were documented on a Condition Report.

The Operability Evaluation Process used at CPS has been overhauled. The new procedure, prepared by a cross-departmental team, provides guidance for a formal program incorporating the requirements of Generic Letter 91-18 and CPS lessons learned.

The operability evaluation improvement effort received independent oversight from an experienced industry consultant. The past operability review effort received a detailed independent review by an experienced external reviewer. The new operability determination program was tested prior to approval. Substantial training was provided to Operations and Engineering on the requirements of the new program. The program has been fully implemented and is in place to support plant startup.

2. Surveillance Conformance With USAR and Technical Specifications

Licensing has performed a review of a sample of surveillance procedures to ensure fidelity and accuracy between that surveillance acceptance criteria and the USAR and Technical Specifications. Discrepancies found were minor and appropriate corrective action was initiated. Additional reviews will be performed after restart.

3. Work Control

Based on self-assessment results, IP has developed and implemented a new work control program. This program is now staffed and will result in improved work value ranking for routine work. The program expands the use of performance indicators to ensure the proper focus on material condition for important categories such as MCR deficiencies, and improves coordination between departments to increase efficiency and reduce backlogs.

Enhancements in Hardware

During the current outage, IP has taken a number of actions to improve the material condition of CPS and ensure that it will support safe, reliable operation.

System Readiness Reviews

As part of the SRP, IP conducted system readiness reviews for vital and non-vital systems to identify conditions having any significant potential to affect safe and reliable operation of CPS. The system readiness reviews included plant configuration verification, reviews of main control room deficiencies, preventive maintenance, and open Condition Reports.

Quarterly Material Condition Reviews

To ensure that material deficiencies are resolved promptly and efficiently, IP has established a senior management quarterly review team. The Vice President, Power Plant Manager, Manager-NSED, and other senior management team members began meeting periodically to specifically review and discuss long term material deficiencies, including operator work-arounds, maintenance rule category A.1 systems, and main control room deficiencies. The intent of these periodic meetings is to maintain visibility and establish a high level of management involvement in resolving material deficiencies. The first of these meetings occurred on December 9, 1996 and resulted in a prioritizing of existing material issues and identifying goals and expectations for the team.

Material Condition Enhancements

During the current outage, numerous material condition enhancements have been completed. Key items include:

1. Main Control Room (MCR) Deficiencies

Coming into the current outage, CPS had approximately 147 Main Control Room (MCR) Deficiencies, 102 outage and 45 non-outage deficiencies. Because MCR deficiencies can affect an operators ability to monitor the plant, IP made the reduction of MCR deficiencies a priority during the current outage. As a result, nearly all outage deficiencies were included in the outage scope. IP has established a goal of less than 20 outage and 25 non-outage MCR deficiencies prior to startup and to date. The remaining MCR deficiencies will not significantly affect an operator's ability to safely operate the plant. This has been confirmed by shift supervisory assessments, Licensing review for 50.59 applicability, and TAT system readiness reviews.

2. Operator Work-Arounds

CPS had twelve operator work-arounds entering the current outage. Because operator work-arounds can inhibit an operator from responding to plant transients, IP undertook a comprehensive review of existing work-arounds to ensure that they have been identified and appropriately evaluated to permit restart of the plant. This review concluded that CPS had identified and properly evaluated existing work-arounds to permit restart of the plant. The program review did identify an inconsistency in the counting and tracking of the identified items. This has been corrected. IP also established both startup and long-term goals for reduction of operator work-arounds and has reduced the number of work-arounds to eight. The remaining work-arounds will not significantly effect an operator's ability to safely operate the plant. This has been confirmed by shift supervisory assessments, Licensing review for 50.59 applicability, and TAT system readiness reviews.

3. Feedwater Check Valves

During the current outage, CPS has extensively redesigned and reworked these check valves. The valves were modified from their original split hinge pin design to a solid hinge pin design to ensure maximum closing force of the actuator is translated to the valve discs. In addition, dual actuators were installed to provide a more balanced and increased closing force on the valve discs. Results of local leak rate tests for these valves range from 0 to 470 sccm. The acceptance criterion for this test is 20,000 sccm.

4. Drywell Floor and Equipment Drain Leak Detection

Several improvements and repairs have been made to drywell floor and equipment leak drain detection systems. These include:

- Drywell Floor Drain (RF) leak detection and flow measurement instrumentation was made operable and tested.
- Drywell Equipment Drain (RE) leak detection and flow measurement instrumentation was made operable and tested.
- The leak detection calculation method (based on RF sump fill times) was incorporated into the process computer.
- The float setpoints change for improved time response for the alternate (LD-27) leak detection system was implemented.
- The leak detection calculation method (based on RE sump fill times) was incorporated into the process computer.
- Permanent piping has been thoroughly cleaned by hydro-lasing and application of a chemical biocide. This was followed by boroscopic inspection to assess results.

5. Electrical Breakers

Circuit breakers have a history of problems in the industry. Recognizing the importance of circuit breakers to assure safe, reliable operation of CPS, IP has embarked on an aggressive inspection, testing, and refurbishment program for its safety-related circuit breakers. CPS employs ABB (480V), GE (4160V), and Westinghouse (4160/6900V) breakers in its safety-related systems. Prior to restarting CPS, IP will evaluate the test results to ensure that each class of breakers will be able to perform its function during the upcoming operating cycle

6. Reactor Recirculation Pump Seals

Following the September 5 event, IP has taken measures to improve RR seal performance. These measures included:

- replaced both RR seal assemblies
- increased monitoring of seal performance
- placed administrative restrictions on system operation and modified the RR system to decrease challenges to the seal assembly.

7. Turbine Generator Torsional Vibration

During the last operating cycle, IP identified a susceptibility to torsional vibration induced failure of the low pressure turbine rotor blades. In response, IP performed an extensive modification of the turbine generator assembly, consisting of tie-wire brazing and coupling mass reduction, to eliminate the possibility of this event. This modification has been completed.

Performance Indicators

IP has established performance indicators which are being used to track and trend the effectiveness of CPS improvements. These indicators contain both quantitative and qualitative benchmarks against which IP is assessing and monitoring the effectiveness of the Startup Readiness Action Plan items, the Strategic Recovery Plan elements, and other CPS improvement initiatives. These performance indicators have both startup and long-term goals and fall into three categories: (1) lagging indicators, (2) real time indicators, and (3) leading indicators.

Collectively, these indicators illustrate that IP improvement effort is working and that overall performance at CPS is improving. For example:

- Event-free performance, a ninety-day rolling average of the number of days between human performance events. This indicator has more than doubled since early January 1997.
- Plant material condition has also improved since the beginning of this year as demonstrated by a decrease of greater than fifty percent in temporary modifications and continuing reduction in MCR deficiencies.
- IP has evaluated the trend in CR initiation to determine its implications for CPS performance. This trend shows a significant increase in the CR initiation rate in the fall of 1996, as expected, when IP lowered the threshold for initiation of CRs and reinforced with CPS personnel the need to prepare them. Following the significant increase, the rate of initiation has been more steady and has declined somewhat. This was expected since many of the previously undocumented conditions have now been added to the program. The current rate still above levels prior to the fall of 1996. This is consistent with both continuing improvement in performance and successful indoctrination of CPS personnel regarding the lower threshold for initiation of CRs.

- CRs associated with procedure violations, a central focus of IP's improvement initiative, have trended downward since October 1996. Indicators for individual CPS departments confirm site improvement in this area.

IP has also established performance measures for its management observations program and benchmarked its observations with those by several outside organizations, including INPO and representatives from several other nuclear utilities. Results of management observations of CPS Operations and Maintenance departments and radiation worker performance also show overall improvement. CPS Operations has already met its startup goal in fourteen of sixteen ratings categories of operations crew monitoring. Ratings were particularly strong in the areas of nuclear safety/conservative operational decision making and procedure compliance and adherence. CPS Maintenance performance observations have also trended positively, particularly with respect to procedure use and adherence category. Radiation worker performance, as measured by trending RP technician observations of field activities, has improved each of the last three quarters.

IP will continue to use performance indicators to gauge CPS performance and assess the effectiveness of both its near-term and long-term improvement efforts.

Conclusions

IP has identified the root causes of its performance problems and areas in which improvements can be made. IP has made and is making corresponding improvements in management, programs, and hardware. Performance indicators demonstrate that these improvements have been effective. IP clearly understands that further progress must be made and that improvement efforts must continue beyond startup. To this end, a detailed Long-Term Improvement Plan is under development and will be implemented.