Douglas R. Gipson

Detroit

Fermi 2 6400 North Dixle Highway Newport, Michigan 48166

> August 2, 1993 NRC-93-0083

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

References: 1) Fermi 2 NRC Docket No. 50-341 NRC License No. NPF-43

PEACOS

PDR

9308090212 930802 PDR ADOCK 05000341

2) NRC Inspection Report No. 50-341/93011, dated July 2, 1993

Reply to a Notice of Violation Subject:

Enclosed is Detroit Edison's response to the Notice of Violation contained in Reference 2. This response describes our corrective actions and several initiatives which will correct the weakness noted in your report. One of the corrective actions described in this response is our new administrative procedure on Independent Verification, which consolidates requirements from a number of other administrative procedures. The implementation of this procedure is expected to provide for a more uniform understanding of requirements and methodology for Independent Verification.

Also enclosed is a discussion of the Independent Safety Engineering Group's (ISEG) role in maintaining surveillance of plant activities to provide independent verification that these activities are performed correctly and that human errors are reduced as much as practical. Past efforts to reduce the rate of personnel errors are discussed, as well as new initiatives aimed at identifying and correcting their common causes to achieve further improvement.

In addition to the ISEG activities, a number of other site programs and activities have been directed at improving human performance. A description of some of these is enclosed. Because Senior Management has recognized the need for additional efforts to improve human performance, a Personnel Error Reduction Program has recently been developed. This program, which draws on experience of successful nuclear and non-nuclear organizations, is also briefly discussed.

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Should you have any questions regarding this response, please contact Mr. Joseph E. Conen, Senior Compliance Engineer at (313) 586-1960.

Sincerely,

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cc: T. G. Colburn W. J. Kropp J. B. Martin M. P. Phillips Region III USNRC August 2, 1993 NRC-93-0083 Page 3

I, DOUGLAS R. GIPSON, do hereby affirm that the foregoing statements are based on facts and circumstances which are true and accurate to the best of my knowledge and belief.

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INUGLAS R. GIPSON Senior Vice President

On this 2rd day of <u>August</u>, 1993, before me personally appeared Douglas R. Gipson, being first duly sworn and says that he executed the foregoing a his free act and deed.

Notary Public a. annelle

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10 CFR Part 50, Appendix B, Criterion V, requires, in part, that activities affecting quality be prescribed by documented instructions, procedures, or drawings of a type appropriate to the circumstances, and be accomplished in accordance with these instructions, procedures, or drawings. It further requires that instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.

Statement of Violation 93011-01A

Section 5.2.6 of NPP-OP-12, "Tagging and Protective Barrier System," specified that independent verifications shall be required when isolating components and upon restoration of components to service. Independent verification of component position shall be performed in accordance with NPP-OP1-08, "Control of Equipment." Section 5.3 of NPP-OP1-08 stated that independent verification should be done in a timely manner.

Contrary to the above, these procedures were not appropriate to the circumstances to ensure that an independent verification for an abnormal valve lineup required for a plant evolution was accomplished prior to the evolution. An Abnormal Lineup Sheet was performed on February 10, 1993, to isolate three control rod hydraulic control units prior to a planned reactor trip. The independent verification was performed approximately four hours after the reactor trip.

Reason for the Violation

Fermi administrative procedures require timely independent verification when restoring or removing safety related equipment from service. This assures protection of personnel, and equipment and compliance with license requirements. For the abnormal lineup (ALS) of the hydraulic control units (HCU), even though the HCU's were lined up in accordance with the ALS, independent verification should have been completed before manually tripping the reactor. However, the procedural requirements for timely independent verification were vague, and the operating crew failed to ensure that the verification was completed prior to the planned scram.

Corrective Action Taken and Results Achieved

On April 1, 1993, an accountability meeting was held with the operating crew involved, the Operations Superintendent, and the Plant

Manager. The Plant Manager emphasized that Independent Verification needs to be performed as soon as practical and explained his view that the isclation of the three HCU's should have been verified prior to manually scramming the reactor. A Deviation Event Report documenting this event was included in Operations Required Reading to ensure Operations Personnel are aware of management requirements and expectations regarding timely completion of independent verification.

Corrective Action to Avoid Further Violations

Administrative Procedure FIP-OP1-07 has been developed to consolidate and standardize the requirements for independent verification at Fermi 2. This procedure also provides clear guidance on the timely completion of independent verification. This procedure will be implemented, including training of operations department personnel, by August 31, 1993.

Date When Full Compliance will be Achieved

Implementation and training of operations personnel on the provisions of the new independent verification procedure will be completed by August 31, 1993.

Statement of Violation 93011-01B

Section 4.5.5.17 of Fermi Management Directive (FMD) CT-1, "Calibration, Testing, and Surveillance," requires, in part, that appropriate procedures, checklists, data sheets, and operator rounds sheets used to perform calibrations, checks, tests, and surveillances shall require independent verification of the installation and removal of jumpers and lifted leads and for systems important to safety, the return of the system to normal configuration following the calibration or test.

Contrary to the above, as of February 1, 1993, Instrumentation & Control Surveillance Procedures 44.020.212 (HPCI Steam Line Pressure Calibration), 44.020.203 (HPCI Steam Line Flow Calibration), 44.220.403 (MSIV Leakage Control System Control Air Pressure Calibration), 44.020.262 (HPCI Steam Line Flow Response Time Test), 44.030.257 (Reactor Vessel Water Level Calibration), and 44.030.218 (RHR Pump B Discharge Pressure (ADS Permissive) Calibration) all failed to contain independent verification requirements as required by FMD-CT1.

Reason for the Violation

In 1989 a global format change for I&C Surveillance procedures was initiated to remove Independent Verification (I.V.) requirements from section 7.0 of the procedures, and placed them in the body of the procedures as verifications. The bases for this change were as follows:

- Concurrent verification for removing and returning equipment and components to service, lifting and landing field leads, and installing and removing jumpers would reduce the possibility of personnel error during these evolutions.
- 2. It was erroneously assumed that the requirements of FMD's for Independent Verification were effectively implemented by the other methods for Independent Verification allowed by FMD-OP1 step 4.10.3, (observing and documenting the existence or absence of alarms or other indications that prove conclusively that all components are in the correct position or performance of a functional test that proves conclusively that all components are in the correct position).

Corrective Action Taken and Results Achieved

During investigation of this issue, a review of selected I&C surveillance procedures was performed at the request of the Human Performance Evaluation System (HPES) Coordinator. This review determined that the procedures did not fully implement I.V. as required, and it was ultimately decided that all I&C surveillance procedures would be reviewed to ensure that Independent Verification is correctly specified.

To date, 33 1&C surveillance procedures have been reviewed and revised as necessary to address I.V. Another 65 have been reviewed and are in various stages of the revision process. The remaining I&C surveillance procedures will be revised as necessary to ensure Independent Verification is correctly specified after implementation of FIP-OP1-07, the new administrative procedure which consolidates I.V. requirements.

Corrective Action to Avoid Further Violations

FIP-OP1-07, "Independent Verification", has been developed to consolidate and standardize the definitions and requirements for Independent Verification and Verification for plant administrative and

technical procedures. Consolidating these requirements into one document simplifies the process of determining how Verification/ Independent Verification requirements should be addressed in a given situation. This procedure supersedes parts of the following documents which contain independent verification requirements.

- FMD CT1, "Calibration, Testing, and Surveillance" 0
- FMD MA1, "Maintenance and Modifications" 0
- 0
- FMD OP1, "Operations"
 FMD PR1, "Procedures, Manuals, and Orders" 0
- FIP-OP1-02, "Temporary Modifications 0
- NPP-MA1-03, "Interim Alteration of Electrical Circuits" 0
- o NPP-OP1-12, "Tagging and Protective Barrier Systems"
- 0 NPM-OP1-04, Conduct of Operations Manual, Chapter 4, "Control of Equipment"

FIP-OP1-07 also includes a standard attachment for performing Independent Verification. The attachment will be included with every 1&C surveillance procedure which stipulates "none" for section 7.0. Independent Verification, each time the surveillance is performed. This form will list the steps required to complete the Independent Verification.

This procedure, including the supplemental Independent Verification process, will be implemented and training for personnel qualified for independent verification will be completed by August 31, 1993. Following this, Nuclear Quality Assurance (NQA) will perform a surveillance of other technical procedures to verify compliance with the revised requirements.

Date When Full Compliance Will be Achieved

Implementation of the revised independent Verification requirements will be completed by August 31, 1993. The NA surveillance will be completed by December 31, 1993.

Statement of Violation 93011-01C

Fermi Surveillance Procedure 44.120.001, "Accident Monitoring, Reactor Vessel Pressure, Division 1, Channel Calibration," was used to ensure equipment operability.

Contrary to the above, on April 29, 1993, Procedure 44.120.001 was not appropriate to the circumstances in that its provisions failed to

ensure equipment operability of Division 1, Post-Accident Monitoring Pressure recorder B21-R623A.

Reason for the Violation

Two I&C technicians were assigned to perform maintenance event AD10, which required performing attachment 4 of Surveillance 44.030.257 and attachment 2 of 44.120.001. Attachment 2 of 44.120.001 requires the lifting of the input leads for pressure to recorder B21R623A. The leads were lifted and landed in accordance with the procedure. While landing the leads, the power supply fuse for the pressure loop was blown, causing the recorder pen for reactor pressure to read downscale. Upon completion of the maintenance task, the recorder chart speed was reset and the downscale indication (blown fuse) went undetected by the technicians and the control room staff. Had the procedure been completed in its entirety, the blown fuse would have been detected during the collection of as-left data. The cause of this event was incomplete work directions contained in maintenance event AD10.

Corrective Action Taken and Results Achieved

Event AD10 (and AD11 for division 2) was created to periodically gather data on the fast speed operation of recorders (B21R623A and B). A review of data from the last few years revealed that the recorders consistently shift to fast speed as required. With the System Engineer's concurrence, it was determined that these events were no longer needed. Events AD10 and AD11 were cancelled on July 7, 1993. These two events were the only two I&C maintenance events that used only attachments of their respective procedures.

The two technicians that were performing this task focused onto performing only the attachments and did not consider looking beyond the requirements specified in the attachments. All technicians have been instructed to pay close attention to process parameters before removing and after returning a system to service.

Corrective Action to Avoid Further Violations

Events AD10 and AD11 have been cancelled. This event has been informally discussed with I&C technicians to inform them of the lessons learned. In addition, this event will be covered in continuing training for I&C supervisors, planners, and technicians during the third quarter of 1993.

Date When Full Compliance Will be Achieved

Based on the actions taken, Detroit Edison has achieved full compliance. Training on this event will be completed by September 30, 1993.

Statement of Violation 93011-03

Fermi Technical Specification 6.8.1.a requires that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. Section 1.g of Appendix A to this regulatory guide revision requires, in part, that shift and relief turnover be covered by written procedures. Fermi Administrative Procedure NPP-OP1-05, "Shift Turnover," requires the control room operators to perform shift turnovers, walkdown the control boards, and be aware of the status of any off-normal conditions.

Contrary to the above, on April 29, 1993, during two consecutive shift turnovers, the control room operators failed to be aware of the abnormal status of the Division 1, Post-Accident Monitoring Pressure recorder (B21-R623A), namely that it was inoperable and reading zero instead of approximately 1,000 psi. The recorder strip chart was stamped by an operator at each shift turnover.

Reason for the Violation

Two shift turnovers were not properly conducted in that the abnormal status (reading zero) of the Division I Post-Accident Monitoring Pressure recorder B21-R623A was not identified due to insufficient attention to detail.

Corrective Action Taken and Results Achieved

The facts of this event were discussed between the Superintendent -Operations and the midnight, day and evening shift NSSs on an individual basis of April 30, 1993. The expectations for accepting equipment from a work group in an operable condition and conducting proper panel walkdowns as part of shift turnover were discussed. Formal discipline was administered in accordance with company policy and documentation is a matter of record. In turn, each NSS reviewed the facts of his shift's performance with involved shift team members

and formal discipline was administered. After each shift concluded this activity, each shift team member met with the Superintendent -Operations individually to discuss the significance of individual and shift team performance as well as significance of unavailability of this instrument function. In addition, the Superintendent -Operations met with the Superintendent - Maintenance and General Supervisor - I&C on the morning of April 30, 1993 to discuss and state expectations for I&C personnel to properly complete the assigned tasks related to this recorder instrument loop. In addition, Inspection Report 93011 has been forwarded to each NSS and NASS for review and dissemination among their shift.

Corrective Action to Avoid Further Violations

Fermi recognizes that errors, such as in this case, are preventable. The focus on self-checking practices and attention to detail has been re-emphasized through the site-wide Personnel Error Reduction Program. As of July 16, 1993, the last group of operators assigned to shift completed this training.

Date When Full Compliance Will be Achieved

Corrective actions for this incident have been completed.

ISEG RESPONSE FOR NRC UNRESOLVED ITEM 93011-04

In carrying out the function described in Technical Specification 6.2.3, ISEG has maintained surveillance of unit activities to provide independent verification that these activities are correctly performed and that human errors are reduced as much as practical through tasks such as the following:

- ISEG participated on a task force formed to address the issues resulting from the Vogtle loss of power incident.
 ISEG participation included a detailed review of NUREG 1410 to identify concerns potentially applicable to Fermi 2.
 Identified concerns were either resolved or actions were taken to implement recommendations to address the concerns.
 Detroit Edison believes the potential for inappropriate human action contributing to such events has been effectively minimized at Fermi 2.
- O ISEC assures compliance with shutdown risk objectives during forced and planned outages. Following the development of outage schedules and before final approval, ISEC performs an independent proactive review of the plan from a nuclear safety perspective, thus providing added assurance that the outage will be conducted in a safe manner. These reviews typically include detailed examination of the outage plan, including system interactions, support system availability; and compliance with technical specification requirements. During the outages, ISEC conducts surveillances of selected activities to assure that risk and potential for human error are minimized. These activities typically occur during pre-outage, shutdown, and restart phases of outages when potential for human performance problems is greatest.

Following are examples of results of this effort:

- a) During the Second Refueling Outage (RFO2) potential conflicts in the outage plan were identified and recommendations were made to ensure tasks were correctly performed and to reduce the potential for human error. Results of these activities included:
 - Assured that the conditions associated with the Vogtle event were adequately addressed.
 - Identified that Neutron Intermediate Hange Monitors were scheduled for limit switch checks when they were required to be operable for core off-loading

per Technical Specifications. This error was corrected.

The General Service Water (GSW) system was scheduled for a shutdown on April 18-19, to work on valve P4100F143. During this period the GSW is required to support the FPCCU system. This conflict was resolved.

- Recommended that procedure NPP 82.000 ... "Control Rod Blade Installation and Removal" t "re .sed to address the use of the temporary fuel poor side wall control rod blade hangers. This was done.
- Identified the need for a safety evaluation for the use of the temporary fuel pool side wall control rod blade hangers. A safety evaluation was prepared.
 - Conducted surveillances of day-to-day outage activities to assure that nuclear safety margins were maintained and adequate shutdown cooling means (including primary, backup and alternate means) were always available and that off-site and on-site divisional electrical system capability was maintained.
 - Planned and unplanned changes to the rolling three day Plan of the Day (POD) were also reviewed to ensure they correctly maintained shutdown risk objectives.
- Selected refueling outage activities were monitored to assure that nuclear safety was not compromised and that plant activities were being performed correctly in accordance with approved plans and procedures, both of which are barriers to inappropriate human actions.
- b) Third Refueling Outage (RF03). The activities addressed were the same as for the previous outage. Examples of results achieved through the ISEG surveillance of RF03 activities include:
 - Recommended that the procedure for the installation, use and removal of main steam line plugs be revised to reflect the use of a new style of plug.

> Identified the need for an Engineering Functional Analysis to justify operability of the Standby Gas Treatment (SGTS) during Emergency Equipment Cooling Water (EECW) outages.

Identified conflicts within the divisional EECW outages and provided recommendations to resolve them.

Identified the need for procedure revisions associated with transfer of the steam dryer and separator from the reactor vessel to the equipment storage pool under water.

Conducted a Human Performance Enhancement System (HPES) evaluation of a Reactor Water Cleanup System phase separator overflow event. It was determined that human intervention could have prevented the overflow when a valve malfunctioned. From this evaluation, corrective actions to prevent recurrence of the conditions contributing to the human error associated with the event were implemented.

o Participated as a Technical Specialist in a Quality Assurance Audit of Nuclear Fuel Management and Special Nuclear Accountability Program. The ISEG review determined that certain activities related to the fuel design and licensing areas of Nuclear Fuel Management had not been proceduralized to provide confidence that the program requirements would be consistently implemented and, thereby, minimize the likelihood for human error.

o ISEG performed an evaluation and surveillance of Power Uprate Project activities from the initiation of the Power Uprate Implementation Plan (March 1992) thru the completion of the Power Uprate Startup Testing (February 1993). The primary areas evaluated were the adequacy of the design change acceptance testing, implementation of setpoint changes and instrument recalibrations required by the Power Uprate Program. The post-RF03 startup plan was reviewed for potential conflicts and continuous surveillance was performed during major portions of the startup. The majority of these activities were performed in the control room to verify that the sequence of the schedule was followed and any deviations received proper review and approval.

The Power Uprate surveillance and evaluation provided an independent verification that power uprate program activities were correctly performed and potential for human errors was minimized.

An implementation review of the Fermi 2 Amendment No. 80 to the facility operating license was performed in May 1992. The amendment reconciled the Technical Specifications (TS) actions for the Emergency Equipment Cooling Water (EECW) and Emergency Equipment Service Water (EESW) systems and the TS required actions for certain systems which are cooled by the EECW and EESW systems. This activity concluded that pre and post implementation training and procedures were adequate, except that four maintenance procedures required revision to be consistent with the amended Technical Specifications. The affected procedures were revised, and actions were taken to ensure that all appropriate organizations participate in implementation plans for Technical Specification changes, thus reducing the potential for human error.

Independent reviews are performed to ensure that selected regulatory issues and industry experiences, including events involving human performance problems, are properly addressed by Fermi 2. The objective of these reviews is to assure that the industry experience has been properly considered and that actions taken or planned adequately address the described problems and recommended actions. When these reviews result in recommendations or additional corrective actions, they are resolved prior to acceptance by ISEG.

ISEG performs independent reviews of Safety Evaluations for unreviewed safety questions and provides an assessment of the quality of the bases for conclusions reached. Results of the ISEG reviews are fed back to the individual preparers of the Safety Evaluations and Nuclear Training for incorporation of lessons learned into Safety Evaluation training.

In addition to reviewing Safety Evaluations, ISEG conducts independent reviews of Preliminary Evaluations to verify accuracy of conclusions that Safety Evaluations are not required. More than 100 Preliminary Evaluations have been reviewed in the past 2 1/2 years. In this period, one (1) instance was identified where Preliminary Evaluation conclusions were incorrect. Based on this review, the required Safety Evaluation was prepared.

While Detroit Edison believes that these activities were effective in preventing inappropriate human actions which could have resulted in undesirable events, several more recent actions have occurred, or are in progress, which are directed at further improving human performance at Fermi 2 and are related to the ISEG function.

Organizational changes in March and April 1993 combined the Independent Safety Engineering Group (ISEG) and Plant Safety

organization into a new organization - Safety Engineering. The Supervisor - Safety Engineering is responsible for (i) functions of the ISEG as described in UFSAR 13.4.3.3 and Technical Specification 6.2.3; (ii) administration, evaluation and review of the Corrective Action Program (as described in UFSAR 17.2.16) and the Operating Experience Review Program (as described in UFSAR 13.4.3.4). In addition, the knowledge and experience level of the new Safety Engineering organization has been enhanced by this reorganization. One of the strengths of the new organization is a concentration of personnel that are qualified to perform INPO Human Performance Enhancement System (HPES) evaluations. Also, the Fermi 2 HPES Coordinator now reports directly to the Supervisor - Safety Engineering.

In the past, problems involving human performance have been principally addressed on an individual basis. Detroit Edison recognizes the need to take a broader perspective look at human performance problems. Actions in progress to implement this approach are described in the paragraphs that follow.

- Safety Engineering is conducting an independent review of significant human error related DERs (including LERs) occurring since June 1992 to determine if dominant, common cause or contributing causes exist which may not have been previously identified or understood. An objective of this review is to attempt to understand why corrective action measures may not have been effective and to determine whether or not different or additional corrective action is warranted. It should be noted that this initiative is the "investigation" task mentioned in the first par_graph on page 14 of the Inspection Report.
- Improving site trending programs, which include precursors to human performance problems, to help recognize trends indicative of emerging problems and to determine cause and corrective action <u>before</u> they become significant events. This initiative includes benchmarking "Best-in-Class" utilities with acknowledged capability in the human performance area.
- Strengthening root cause analytical capability. Arrangements are being made for supplemental training in root cause analysis for selected site personnel, including Safety Engineering personnel, in September 1993. This training will be provided by Failure Prevention International and will complement the training provided by the Fermi 2 Training Department.
- Participation in the development of training materials associated with reduction of human error. This effort was in

> support of the current "Personnel Error Reduction" training which is being presented to all site personnel. Initial classroom training began on 5/11/93. Plans are to incorporate the subject into the General Employe Initial and Regualification training, later this year.

 Preparation and issuance of site communications associated with reduction of human error. Site wide communications included print and electronic media. Communications and self-checking are current topics being emphasized.

These initiatives are expected to be completed by December 17, 1993.

The Safety Engineering organization is committed to self assessment to help identify opportunities for improvement in performance. Because human error is recognized as the leading contributor to operating events at nuclear power stations, improvement opportunities for timely recognition of and effective corrective action for conditions associated with human error reduction will continue to be emphasized.

PERSONNEL ERROR REDUCTION

Detroit Edison is firsly committed to numerous efforts to improve human performance by reducing personnel errors. Fermi 2 shares with the rest of the American nuclear industry the goal of continuously improving nuclear power plant operating performance. It is widely recognized that as the number of events caused by equipment failures decreases, human performance becomes increasingly important for further improvements in our operation. This importance is reflected in many Fermi programs and procedures (such as Corrective Action, Human Performance Enhancement System (HPES), Performance Based Quality Assurance Auditing, Nuclear Training Programs, application of human factors for plant procedures and design changes, Fitness for Duty, etc.) which attempt to identify and implement steps that can improve human performance.

New initiatives are always being explored to further enhance human performance. For example, in 1992 Operation Self Check was initiated to heighten individual and organizational awareness of the "THINK" step in accomplishing an action. Also beginning with the first quarter of 1992, the scope of the trending program was expanded to examine causes for a larger population of plant Deviation Event Reports (DER's).

Notwithstanding the above efforts, Senior Management recognized the need for additional efforts to improve human performance. This has resulted in the development of a new Personnel Error Reduction Program which is designed to reinforce the error reduction skills and techniques already available to Fermi employes. Information from successful nuclear and non-nuclear organizations was used for the development of this program, as were lessons learned from internal and third party reviews of performance problems which occurred during the last refueling outage. This program includes initial and continuing training for site personnel, and the initial training is presented in part by a Fermi management representative to reinforce management's expectations. Classroom training is complemented by a quarterly newsletter sent to all site personnel discussing causes of personnel errors at Fermi and other nuclear stations. This is intended to help maintain a high level of awareness of the causes and potential consequences of personnel errors. Also, Nuclear Training is represented at accountability meetings and is reviewing selected DER's and HPES Reports to identify any areas where training programs need to address performance problems.

In addition to these programmatic efforts, several other recent initiatives and events are expected to contribute to improved human performance. As a result of a recently completed reorganization, all of the site engineering and modifications groups have been brought together under one manager. This should improve communication and

teamwork within the technical organization and lead to more flexible use of these technical resources. The Independent Safety Engineering Group was expanded to now include the Corrective Action organization, providing them with a broader perspective on plant activities which can better enable them to identify ways to improve operations. Overall improved communication, a stated goal of the reorganization, will also be crucial for continued improvement in Fermi's performance.

Finally, although this issue is not specifically focused on personnel errors, Detroit Edison and its represented power plant workers have recently reached agreement on a new contract. The amicable resolution of this contract should improve communication between the company and its employes, allowing a resumption of joint efforts to improve teamwork and performance.