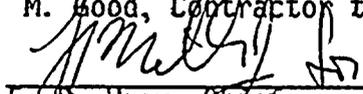


U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos. 50-275/90-29 and 50-323/90-29
Docket Nos. 50-275 and 50-323
License Nos. DPR-80 and DPR-82
Licensee: Pacific Gas and Electric Company
77 Beale Street
San Francisco, California 94106
Facility Name: Diablo Canyon Units 1 and 2
Inspection at: Diablo Canyon Site, San Luis Obispo County, California
Inspection Conducted: November 27-30, 1990
December 17-21, 1990
January 7-11, 1991

Inspectors: C. Myers, Resident Inspector
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Approved by: 
F.R. Huey, Chief,
Engineering Section

2-7-91
Date Signed

SUMMARY:

Inspection on November 27-30, 1990, December 17-21, 1990 and January 7-11, 1991 (Report Nos. 50-275/90-29 and 50-323/90-29)

AREAS INSPECTED

Announced inspection to follow-up on mechanical maintenance measuring and test equipment issues. Inspection module 35750 was used as guidance for the inspection.

Results:

One unresolved item was identified in the areas inspected. The unresolved item involved the apparent lack of timely issuance of a nonconformance report to effect corrective action for recurring deficiencies in the control of measuring and test equipment, and overall conformance with M&TE program controls. Individual discrepancies discussed throughout the report contributed to the situation and involved repetitive cases of problems with following M&TE procedures, improper dispositioning of Action Requests and Quality Evaluations, and failure to correct recurring deficiencies.



DETAILS

1. Scope

This inspection reviewed the programmatic controls and implementation of the Measuring and Test Equipment (M&TE) program with emphasis in the mechanical maintenance area. Inspectors reviewed individual M&TE deficiencies to evaluate their effects on safety. Inspectors performed reviews of PG&E surveillances and audits, performed field inspections of M&TE facilities, and interviewed management, Quality Assurance (QA), Quality Control (QC), and Maintenance Department personnel. Inspectors performed detailed reviews of licensee Action Requests (AR), Quality Evaluations (QEs), and M&TE documentation to determine the correction status of licensee identified deficiencies in M&TE.

2. Major Findings and Conclusions

This inspection resulted in the following findings and conclusions. The bases for each of these are developed in detail in the subsequent paragraphs of this report.

- a. Licensee audits and surveillances of the control of measuring and test equipment in the mechanical maintenance department have identified significant documentation deficiencies since 1985. The licensee response to this problem has been slow.
- b. Licensee personnel did not deal effectively with the overall findings of their own audits and surveillances. This lack of effective corrective action was recognized in another licensee audit in May, 1990. However, effective corrective actions were still not taken.

The licensee had inappropriately closed a 1987 nonconformance report which identified M&TE deficiencies without assuring that the root cause was identified and effective corrective actions were implemented to preclude recurrence.

- c. The licensee had not used the established nonconformance report system to address the recurrent nature of these deficiencies.
- d. The examination of M&TE controls conducted during this inspection confirmed the continuing nature of M&TE documentation deficiencies in mechanical maintenance. Some of the deficiencies identified were readily apparent, and should have been found prior to the inspection by the licensee.

3. Review of Surveillances and Audits

Inspectors reviewed the results of the following licensee surveillances and audits of the Measuring and Test Equipment program:



- Measuring and Test Equipment (NECS-C) & Maintenance Program (DCPP) Audit 89616P, report date May 5, 1989.
- Control of Measuring and Test Equipment Audit 89625P, report date June 23, 1989.
- Control of Measuring and Test Equipment (I & C), Control and Calibration of Performance Monitoring Equipment (I & C) and Control of Measuring and Test Equipment (ISI/NDE) Audit 89635P, report date November 9, 1989.
- Mechanical Maintenance Surveillance Report QCS 89-175, report date December 5, 1989.
- Calibration and Control of Mechanical M&TE surveillance QCS 90-030, report date April 12, 1990.
- Quality Performance and Assessment Maintenance Branch Surveillance Report (QP & A) 90-126, report date May 30, 1990.
- Mechanical Maintenance Control of Measuring and Test Equipment audit 90812T, report date June 6, 1990.

The inspectors found that licensee audit and surveillance reports had identified significant deficiencies in mechanical maintenance issuance and control of M&TE. Inspector findings as a result of field inspections, discussed in Paragraph 3, confirmed that some of the deficiencies, previously identified by the licensee, still existed and had not been corrected.

a. Quality Control Surveillance QCS 89-175

QCS 89-175 had identified significant deficiencies which resulted in nine action requests being issued to address individual discrepancies. Problems included several cases of failure to follow procedures, which resulted in lack of torque verification after M&TE use, not using the required logs to document M&TE issuance, incomplete log entries, and M&TE use not documented on work orders. The audit report indicated that a mechanical maintenance foreman stated there had been numerous discussions at all management levels to rectify the situation. It does not appear, however, that to the NRC inspectors whether any substantial action was taken to correct the situation as a result of those management discussions.

b. Quality Control Surveillance No. QCS 90-030

Surveillance QCS 90-030 had been performed by QC to evaluate mechanical maintenance M&TE and corrective action taken since the above surveillance. The assessment found that not all requirements of upper tier procedures had been implemented into mechanical calibration procedures. Mechanical calibration procedures (MP M-53 series) were "generic" rather than device specific, and the working



level mechanical calibration procedures were inadequate in instruction detail. The surveillance also identified a wide range of errors in a sampling of 80 quality records associated with the calibration of M&TE. Discrepancies included "as found" and "as left" data not recorded, standards not identified, accuracy ratios exceeded, "reviewed by" and "calibrated by" signatures missing, accuracy requirement discrepancies, and restrictions on usable range not documented.

The audit found inadequate follow-up on out-of-tolerance (OOT) M&TE usage. Of 39 action requests for OOT M&TE usage, ten had historical searches which exceeded the required time limits of 14 days. The audit report concluded that the discrepancies indicated serious programmatic weaknesses that could impact safe plant operation and reliability or could have significant regulatory impact and that, overall, the mechanical maintenance M&TE program was not effective in attaining the desired level of quality. Ten action requests were issued as a result of the surveillance. The summary of results of the surveillance stated that "many of the program administrator's corrective actions during the last year only corrected the symptoms of the problems and not their causes thus allowing problems to recur."

The inspectors found that, although the audit identified significant recurring deficiencies for which previous corrective action was inadequate, no Action Requests (ARs), Quality Evaluations (QEs), or Audit Finding Reports (AFRs) were written specific to the problem of inadequate corrective action for significant deficiencies. The inspector found that no written response was required to address the overall conclusions of the surveillance report. These conclusions were based on the auditor's evaluation of the significance of the individual observed deficiencies as indicators of the effectiveness of the program in achieving its quality objectives. Individual deficiencies were addressed under subsequent Action Requests. Apparently, the licensee did not recognize that the programmatic weaknesses, which allowed the individual deficiencies to occur, required correction. Therefore, the programmatic weaknesses were not adequately dealt with to preclude recurrence.

c. Quality Performance and Assessment Surveillance Report No. QP&A 90-126

The Quality Assurance organization had performed audit QP & A 90-126 because of the significant number of discrepancies identified by QC in mechanical maintenance M&TE controls.

Audit QP&A 90-126, performed in May, 1990, identified the following discrepancies.

- o A review of audit report 85230-P (1985) showed that several of the discrepancies identified in the QC surveillance QCS 90-030 had been previously identified by QA. Specific discrepancies were:



- lack of history searches/evaluations for out-of tolerance M&TE;
 - lack of program provisions for describing M&TE calibration;
 - calibration checkout and calibration logs not complete and contained errors;
 - use of torque wrench without proper reverification;
 - inadequate record keeping for on hold/out-of-tolerance M&TE;
 - 'Master List' not being properly maintained;
 - lack of evaluations for consistently out-of-tolerance M&TE;
 - as found data not being documented;
 - questionable personnel qualification and record requirements;
- ° Nine previous QEs identified similar types of problems. The QEs reviewed were: Q0007123, Q0007147, Q0005359, Q0006760, Q0006560, Q0006533, Q0006536, Q0006335, and Q0006138.
 - ° Five of the above QEs initiated in the 1988-1989 time frame were closed out prior to QC surveillance 90-30. Therefore, it is significant to note that QC observed a repetition of previously identified problems, (QC subsequently re-documented these discrepancies on AR). Examples of these recurring problems included:
 - QE-0005359/AR-A0182655: use of torque wrenches outside their useable range;
 - QE-Q0006742/AR-A0184939: out of tolerance evaluations exceeding time limitations;
 - QEs-Q0006533, QE-Q0006536/AR-A0184939/AFR-84-192: out-of-tolerance evaluations not being performed;
 - AFR-84-191/AR-A0181518: as found data not recorded prior to making M&TE adjustments;
 - ° Examples of other currently open problems identified in 1988-89, which were also found to be repetitive and re-documented on AR by QC, included:
 - QE-Q0006560/AR A-A0184106/AFR-85-389: calibration check-out logs not being maintained;
 - QE-Q0007123/AR-A0183542: problems related to M&TE issuance and record keeping.

QP&A 90-126 demonstrates that the auditor recognized that M&TE deficiencies had been identified frequently since 1985 and that effective corrective action to preclude recurrence had not been taken. However, it was not clear that the auditor's findings were recognized and dealt with effectively by management. Apparently, no nonconformance report was written.



d. Quality Assurance Audit 90812T

Audit 90812T was conducted during the period of June 20 - August 9, 1990 as a result of the deficiencies discussed above. The audit resulted in the issuance of six QE-AFRs and eight action requests - five with quality evaluations pending. The audit findings included the following deficiencies:

- The accuracy of two step block gages designed and fabricated by the licensee did not comply with the required 4:1 accuracy ratio.
- M&TE descriptions, identification and calibration due dates were not always recorded on work orders. Seven of 20 work orders reviewed did not contain required information.
- Dial indicators which were classified as "maintenance only" (uncalibrated) were being used by mechanical maintenance to establish compliance with quantitative specifications.
- The Justification For Use (JFU) for a Dillon Tension Dynamometer contained a math error.
- Methods and calibration standards for calibrating the vernier calipers, levels, and vernier height gages were not prescribed in approved plant procedures.
- Mechanical maintenance did not maintain vendor manuals for most of the equipment they were responsible for calibrating. Because of that, tool room personnel could not describe or refer to recognized practices and methods of calibration.

The inspectors concluded, based on documented audit and surveillance results, that significant deficiencies in mechanical maintenance M&TE program implementation, procedural compliance, root cause analysis and corrective action have existed for some time. Audit and surveillance results indicated that the recurring problems were, again, recognized and documented by both Quality Assurance and Quality Control Departments. The inspectors concluded that long standing and recurring deficiencies with Mechanical Maintenance M&TE existed. The licensee did not effectively provide for, nor address, the effectiveness of corrective actions needed to preclude recurrence.

The audit additionally identified and stated that "QC's slow response to continue to pursue and investigate known problems further to reach conclusions and correct deficiencies was considered weak." Again, no action request, nonconformance report, or finding was identified for weak action on the part of QC. In section 3.2, the audit identified that "several of the discrepancies were previously identified in past MM



calibration audits," yet no findings specific to inadequate corrective action for recurring deficiencies were issued. The inspectors concluded that audit findings did not address concerns that appeared to be contributory to the recurring deficiencies. This is an example of inadequate corrective action.

4. Ineffective Use of the Nonconformance Reporting System

Audit 90812T identified that a previous NCR on M&TE, NCR DCO-87-QA-N001, was closed. No new NCR was initiated as a result of the significant findings during that audit. The audit report stated in section 4.0 that "findings identified by the audit team showed that MM has not fully implemented the corrective actions required by NCR DCO-87-QA-N001." It further stated that "although a plan had been developed and instituted, as required by the NCR, several program weaknesses related to implementation were observed by the auditors." It stated that the 1987 NCR was closed based on the objective evidence that a corrective action plan had been implemented; however, implementation was not verified to be completed or effective at the time of NCR closure.

The inspectors found that Audit 90812T in Section 4.0, Effectiveness Evaluation, identified that implemented corrective actions required by NCR DCO-87-QA-N001 for Mechanical Maintenance M&TE were not implemented. Yet the NCR was closed and no action request was written to investigate the root cause of the failure to implement the NCR required action. NPAP C-12, Revision 19, Identification and Resolution of Problems and Nonconformances, section 5.2.1 requires in part that an action request be written for "any deviation of a procedure. Failure to implement NCR corrective action for significant conditions adverse to quality would constitute a deviation from a procedure (QAP-15-B). Furthermore, NPAP C-12, section 5.4.3.2, requires a nonconformance report to be initiated for a potential nonconformance. Quality Assurance Procedure QAP-15-B Paragraph 2.1 defines a nonconformance, in part, as a "quality problem which has occurred at a frequency which indicates that past action to prevent recurrence was ineffective and additional management attention is deemed necessary." However, the inspector found that no NCR had been initiated as a result of the audit findings. This issue regarding compliance with procedures for identifying significant conditions adverse to quality is considered an unresolved item. (50-275/90-29-01).

In response to the inspector's concerns, the licensee initiated NCR #DCO-90-MM-N089 to address the repetitive nature of the findings in this area and the lack of prior NCR initiation.

5. Inspection of M&TE Facilities

The inspectors performed field inspections of Mechanical, Electrical, and I&C Measuring and Test Equipment facilities.

The inspectors noted that the I&C facility was a strength. The facility was large, well organized, and well equipped. Foremen and Supervising Technicians interviewed were knowledgeable of the facility, procedures and requirements. Calibration procedures were detailed and well written.



The mechanical and electrical facilities, although adequate, were marginal in some areas. The Unit 1 mechanical facility was very small and allows little room for calibration and checkout of equipment. There was no space (due to size) for separate storage of out-of-service/out-of-tolerance and ready for use M&TE. Because the contents of cabinets and storage "Vidmars" were not well marked, the tool clerk had trouble locating some equipment. The Unit 1 tool crib was immediately adjacent to the M&TE room. During backshift the inspectors noted that the M&TE room was open and unattended while the tool clerk was in the tool crib.

Unit 1 M&TE Facility

The inspectors performed a review of the M&TE issue log in the Unit 1 M&TE facility for recently issued M&TE. The facility used a manual log in lieu of the PIMS computer module for issue and return of M&TE. The following deficiencies were identified and brought to the attention of department supervision for resolution.

- a. Micrometer #40, was checked out on 11/6/90 and was not logged as being checked back in. The tool was located in the room. The tool clerk stated that someone had apparently forgotten to check the tool in upon return. In the event that no clerk is available, the job foreman is to ensure that all applicable information is documented on hard copy forms for input into the M&TE Module at a later time.
- b. Torque wrench #133 was checked out on 6/18/90 and verified at 120 inch-lbs. The calibration reverification upon return on 6/28/90 was done at 30 inch-lbs. No explanation for the difference was provided in the log.

The inspector found inconsistencies regarding the required check data in the verification and reverification procedures. MP M53.1, "Calibration of Torque Wrenches and Torque Wrench Testers," Revision 10, section 7.3.2 a. requires verification be accomplished by "Setting the specified value, OR the midpoint of the range, on the torque wrench." Section 7.4.1 requires "The specific value OR range calibration shall be reverified when returned after use." Mechanical staff stated the "normal" practice was to verify and reverify at the specific value that the torque wrench was to be used for in the field. The procedural inconsistencies and work practices appear to need reevaluation.

- c. Torque wrench #133 was subsequently checked out on 8/3/90 to be used on work order R-39845. It was declared lost in the log on 11/19/90. No post-job torque reverification was done. Mechanical maintenance staff were not able to produce objective evidence that the lack of reverification had been known or acknowledged by supervisory personnel.



- d. The "precision yes/no" block was not filled out upon issue of torque wrench #137 for one job.
- e. The "precision yes/no" block and the "QA yes/no block" was not filled out for the 5 lb weight set #138 checked out on 2/7/90.
- f. Micrometer set #195 was missing from the M&TE room. Subsequent investigation revealed that the entire set was in the Unit 2 cold machine shop tool room but had not been properly checked out of the Unit 1 room. This was an example of inadequate control of M&TE.
- g. The "precision yes/no block" and the "QA yes/no block" were not filled out for pressure gage #237, checked out and returned on 12/12/90. Lacking documentation, it was indeterminate whether the first level review of whether the M&TE was appropriate for the job was conducted.
- h. The "precision yes/no block" and the "QA yes/no block" for pyrometer #241, checked out on 12/7/90, was not filled out.
- i. The "precision yes/no block" for torque wrench #290, checked out on 12/5/90, was not filled out.
- j. The "QA yes/no block" for micrometer #298, checked out on 11/02/90, was not filled out.
- k. There was no post-job torque reverification for torque wrench #417 checked out on 10/9/90.
- l. Torque wrench #4, issued on 3/8/90, for a quality precision job, was verified at a torque value of 96 inch-lbs. Upon return, on the same date, the reverification was done at 178 ft-lbs. The log sheet was annotated with a note that the torque was changed at the job site.
- m. Torque wrench #5, checked out on 3/7/90, was verified at 30 ft-lbs. The reverification upon return on 3/12/90 was done at 22 ft-lbs. No explanation was noted in the log. Additionally, the "precision yes/no block" and the "QA yes/no block" were not filled out. The specified instrument use range was 320 - 1000 inch-lbs and the verifications were in ft-lbs. The use of consistent units would reduce the potential for error.
- n. Torque wrench #7, issued and returned on 3/27/90, was verified at 81 ft-lbs. The reverification upon return was done at 122 ft-lbs. No explanation for the difference was noted in the log.



The inspectors concluded that adherence to program and procedure requirements for the control of M&TE continue to be a problem area and that the deficiencies had potential to affect safety. Although individual deficiencies may have been technically justifiable on a case by case basis, the safety affect of numerous recurring deficiencies was indeterminate. The deficiencies identified were similar to long standing deficiencies referred to in the audits and surveillances discussed above, and are additional manifestations of inadequate M&TE control and corrective action.

Unit 2 Cold Machine Shop Tool Room

Inspectors performed an inspection of the Unit 2 cold machine shop tool room with a QC Surveillance Supervisor.

The facility used a manual check out log in lieu of the PIMS computer module. The tool room and the M&TE area in the rear of the tool room were generally neat and clean. The following deficiencies were identified and discussed with department supervision:

- a. The person manning the facility for issue and checkout of tools and M&TE stated that he was just standing in for the qualified tool clerk and that he did not really know about the M&TE in the room. Facility attendants are responsible for issue, return, inspection, and verification and reverification. Verification and reverification requires the same knowledge as users. User qualification is addressed by AP D-752, "Calibration and Control of Measuring and Test Equipment (Electrical and Mechanical Maintenance)," Revision 10, section 4.1.4, however, the procedure is silent on qualification of attendants. The lack of program requirements for facility attendant training and the use of "unqualified" personnel in this facility is considered a weakness.
- b. A "Vidmar" storage unit in the M&TE room had numerous blank "calibration stickers" and "maintenance only" stickers. The inspector was told that no calibration was done at that particular facility. The inspector questioned why uncontrolled blank calibration stickers were in a facility which performs no calibration. The item was referred to the mechanical maintenance foreman for investigation and resolution. The poor control of calibration stickers is considered a weakness.
- c. An out of calibration Alnor Digicon II temperature indicator (serial #7916) was stored along side calibrated indicators. The practice has potential to result in inadvertent use of uncalibrated indicators.
- d. Alnor Digicon II indicator serial #8946 was calibrated for use with probe #205, however the padded carrying case for indicator serial #8946 had probe #202 stored in the case. The storage of probes should be evaluated. The conservative practice in use in the I & C department was to lead seal the probe to the indicator that it was calibrated with to prevent inadvertent mixing of probes and indicators.



Electrical Maintenance M&TE Storage Facility

A walkthrough inspection of the electrical M&TE storage facility was performed with a QC Surveillance Supervisor. The facility was well organized, neat, and clean. The facility attendant was knowledgeable of the facility and equipment. The following deficiency was identified and discussed.

One terminal crimping tool, TB WT-021, selected at random, in the presence of the QC inspector and Tool Maintenance Clerk was found broken. The crimping tool ratchet spring was loose and prevented the tool from ratcheting. The calibration requirement for the tool is addressed by MP E-54.8, "Calibration of Crimping Tools," Revision 1. A record search indicated that the tool was last used on safety-related work request C0070675, activity 1, on 3/28/90. Discussions with the tool clerk indicated that in some cases M&TE could have been used in the shop (to make extension cords, etc) without going through the required issue and return process. The inspectors questioned the adequacy of M&TE control with mechanical maintenance management and, based on these discussions, considered the control of M&TE in this facility a weakness. The licensee subsequently issued Action Request A0211834 to document the deficiency. The tool was tagged and removed from service. Quality Evaluation Q0008224 was issued to evaluate the deficiency and address the potential for inadequate control of M&TE within the facility. The licensee stated that they were recalling all keys to the facility and would rekey and reissue keys to insure adequate control. The inspector reviewed work request C0070675, activity 1, and determined that QC had hold points that enveloped all uses of the crimping tool for the safety-job. QC hold points were established and properly signed off for verifying the crimping tool was correct and in calibration, witnessing the crimping, and inspecting the crimped connection. The inspector considered that the licensee took appropriate action.

Based upon the results of the above inspections, it was clear to the inspectors that the licensee needs to pay more attention to the actual conditions and circumstances existing in the M&TE control and issue locations.

6. Review of M&TE Action Requests and Quality Evaluations

a. Action Request A0183542, Inadequate Calibration Records

This AR, initiated on March 18, 1990, documented multiple calibration record deficiencies. Quality Evaluation Q0007642 was initiated on May 25, 1990 to perform a root cause analysis and implement corrective actions. The action was assigned to the Mechanical Maintenance Planning Group with a due date of June 26, 1990. No progress or action was documented for the AR or QE as of December 1990.



Since the action was six (6) months overdue, the inspectors held discussions with mechanical maintenance supervision to determine what actions had been taken to: 1) correct the specific records that had identified deficiencies (the 80 records audited); 2) survey other M&TE quality records to identify the full scope of the deficiencies; and 3) implement corrective action to prevent recurrence. Maintenance supervisory personnel were unable to provide objective evidence of corrective action for this AR.

This is an additional example of problems in implementation of the nonconformance reporting and corrective action program.

b. Action Request A0119306, Torque Bar Wrench Used Beyond Calibration Due Date

This AR involved torque bars found out of calibration during the stud tensioning on steam generator 2-2 by Westinghouse. An out-of-calibration PG&E torque bar was being used for the pretension torquing. Four torque bars were at the job site. Two Westinghouse bars, one out-of-calibration, one with the calibration date unreadable; and two PG&E bars, one out-of-calibration and one in calibration. The action request deferred corrective action to Westinghouse NCR #PEG-88-00003 and was closed on that basis. The NCR technically justified the adequacy of tool accuracy based on its use as a preliminary in-process check. Stud elongation was measured by ultrasonic testing to satisfy design requirements. Inspectors noted that neither the AR nor the NCR addressed the following:

- The root cause and recurrence control for failure to follow safety related maintenance procedures.
- The failure of the M&TE control system that allowed uncalibrated M&TE to be issued to the job.
- The presence of three (3) tools with expired or indeterminate calibration dates on the job site.
- The performance of a historical search to insure the uncalibrated M&TE was not used for other safety-related jobs.

A failure to address programmatic controls and root cause analysis may be contributory to recurring deficiencies.

c. Action Requests A0170122, A0170117, A0169757, A0170386, A0170368, A0169776, A0168780.

The ARs involved failure to record issue of M&TE, failure to perform required torque verifications, and failure to record M&TE used on work orders. Quality Evaluation Q0007123 was written for corrective action and closed on July 11, 1990. The closure was based on Mechanical Maintenance personnel receiving training in



course MG 0140 and MG 0170 covering procedures AP D752, "Calibration and Control of Measuring and Test Equipment (Electrical and Mechanical Maintenance)," and MP M-53.1, "Calibration of Torque Wrenches and Torque Wrench Testers."

The inspector reviewed both master lesson plans provided by training. The courses were an overview which did not specifically relate to identified deficiencies. Because of the number of deficiencies (as discussed in section 2 of this report) identified since the training was conducted, the inspectors concluded that corrective action and recurrence control was inadequate.

- d. Action Request A0202680 - Overtorque of spent fuel pit pump 1-2 suction flange bolts.

The bolts were torqued to 308 ft-lbs rather than the correct 250 ft-lbs because vendor drawing requirements were not incorporated into the work order, as required by procedures. The AR stated that no quality evaluation was required and closed the AR on the technical basis that discussions with the vendor indicated that the overtorque would have no adverse affects on the pump casing and suction nozzle. The root cause of the deficiency "failure to incorporate vendor requirements into work orders" was not addressed or recognized as a quality concern requiring a quality evaluation.

NPAP C-12, "Identification and Resolution of Problems and Nonconformances," Revision 19, section 5.4.1 a.3, requires a Quality Evaluation when an activity is not performed in accordance with established requirement(s) or results are unsatisfactory. Examples include: test failures, violation of program requirements, unapproved deviations from procedures, and failure to meet Technical Specification requirements.

This is an additional example of inadequate corrective action and recurrence control. After identification by the inspector, the licensee concurred with the finding and subsequently issued Quality Evaluation Q0008220 to address the deficiency. The QE appeared appropriate to address the deficiency.

- e. Action Request A0184108 - Failure to perform a biennial review of Mechanical Maintenance M&TE for calibration frequency, device condition, and device accuracy.

The review was required by AP D-752, section 4.1.2.c. The AR identified that standards M-M-36S and M-M-120 had not been reviewed in four (4) years and that standard M-M-36S was rusted and had scratches on surfaces that were critical to its use as a standard. The AR referenced Quality Evaluations Q0007873, Q0007876, and Q0007882 and did not address corrective action for the rust problem with standard M-M-36S.



- f. Action Request A0187423 - Torque readings during calibration and testing which varied dependent on the type of adapters that were used.

Various type socket adapters gave different resulting torques vs applied torque depending on the adapter used. Tests by I&C calibration personnel indicated that the variations were applicable to Snap-on, Proto, and Williams adapters, but not with the "Nobar" adapters made by the manufacturer of the calibration laboratory standards. Action taken included requiring all calibration of torque wrenches to be done with "Nobar" adapters, segregating all adapters with anomalies, and referring the problem to the PG&E Technological and Ecological Services (TES) for analysis.

As a result of the review of this adapter issue and interviews with Mechanical Maintenance craft regarding the use of adapters, the inspectors identified a new concern regarding the guidance and use of "crows foot" adapters. Procedure MP M-54.1 Rev. 5, Bolt Torquing", Paragraph 7.3.1.a requires that if a torque multiplier, a crowfoot or other adaptors are to be used, the wrench shall be calibrated with and without the adaptor attached. However, the inspector found that no equivalent requirement was contained in Procedure AP D-4-50 "Calibration and Control of Measuring and Test Equipment" which controlled the issuing of torque wrenches from the tool room. MP M-53:1, "Calibration of Torque Wrenches and Torque Wrench Testers," Revision 5, provides no instructions regarding verification and re-verification when torque multipliers, special adapters, or "crows feet" are used. Conversion tables, restrictions, and limitations for the use of adapters did not appear to be documented in approved procedures for use by calibration and field personnel. Furthermore, in review of a sample of the tool room issue logs for 1990, the inspector found no documentation of the dual calibration required for issue of torque wrenches with adaptors. In discussions with licensee QC and maintenance personnel the inspector found that crowfoot adaptors were routinely used for torquing fasteners with difficult access. However, the control established over the required calibration was inconsistent.

The inspector expressed his concern regarding the apparent lack of control over the use of crowfoot adaptors to the mechanical maintenance manager. The manager committed to correct the weakness in their procedural controls and documentation, and indicated that additional training of maintenance personnel on the proper use of crowfoot adaptors would be implemented.

The inspector considered the weakness to be indicative of a lack of attention to detail in the effective implementation of M&TE controls.

Furthermore, the inspectors found that the mechanical maintenance foreman was unaware of the repeated observations by QC of improper



use of "crows foot" adapters. Despite repeated instances in which QC corrected the improper activity in-process, an AR was not initiated by QC. The inspector found this to be an example of a weakness on the part of QC to elevate their observations of individual deficiencies and pursue programmatic implications.

7. Additional Observations

a. Temperature Correction

The inspector found that the licensee had not determined the effect of temperature on the accuracy of torque wrenches. Procedure NPAP D-5 "Control of Measuring and Test Equipment," Paragraph 4.2.4, requires that when inaccuracy due to environmental effects cannot be avoided during use of the equipment, correction factors shall be determined and applied. The inspector found that, although calibrated at room temperatures, some torque wrenches had been used in environments of 130-140F. The licensee had not determined the effect of elevated temperature on the accuracy of the torque wrench in these applications.

In response to the inspector's concern, the licensee obtained informal test results which identified that the torque wrench did maintain its required accuracy at elevated temperatures. Further, the licensee committed to review the adequacy of their calibration controls for equipment used in high temperature environments.

The inspector found the licensee's initial actions to be adequate.

b. Preformatted Data Sheets

The inspector found that previous QC surveillances had found examples of data sheets for micrometer calibrations which had been preformatted with as-found data. Expected values of as-found data had been typed onto a master form and photocopied in lieu of actual data measured. In discussions with the mechanical maintenance technician who performed the calibration, the inspector found that the as-found data had been preformatted to expedite the calibration data recording by minimizing handwritten entries. The inspector found that this practice was not authorized by procedure and that it appeared to be isolated to two micrometer calibrations.

In response to the inspector's concern the licensee indicated that the improper documentation practice had been eliminated by requiring handwritten entry of actual measured values.

The inspector found the licensee action to be adequate.

c. Management Review of QC Findings

The inspector reviewed NCR DCO-90-QA-N004 which dealt with an apparent lack of ownership of certain event-related problems which delayed corrective actions. The inspector found that the licensee had recently implemented daily reporting to senior plant management



of QC identified problems to assure ownership of the problem was clearly assigned for timely resolution. The inspector observed that the senior management level review was informational only and was not part of the quality program established for elevating problems for increased management attention. The inspector acknowledged the benefit intended by the review but cautioned licensee management to ensure that the review did not exert undue influence over, or be assumed to be an equivalent to, the established processing of quality problems in accordance with program and procedure requirements.

d. Computer Access

In discussions with maintenance personnel, the inspector found that some of the personnel did not have ability to personally initiate an AR using the licensee's computer based system. The inspector subsequently found that due to current system limitations, only 50% of department personnel had computer access authorization codes. Without computer access, individuals were required to notify their foreman of deficiencies, who would subsequently initiate the AR. The inspector expressed his concern that the current practice did not encourage problem identification nor provide feedback to the initiator on the evaluation of the problem. The licensee acknowledged the current system limitations and committed to review the adequacy of their program for initiating ARs.

8. Unresolved Item

An unresolved item is a matter about which more information is required to ascertain whether it is an acceptable item, a deviation, or a violation. An unresolved item is identified on page six (6), paragraph (4) of this inspection report.

9. Exit Interview

The inspectors met with licensee management denoted in Paragraph 1 on December 21, 1990 and January 11, 1991. The scope of the inspection and findings were discussed. The licensee acknowledged the findings and committed to complete their review of the identified deficiencies in the control of M&TE under NCR #DCO-90-MM-N089 by 2/28/91, with any corrective actions identified and initiated by 3/31/91.



ATTACHMENT A
PERSONNEL CONTACTED

Licensee Personnel:

- *J. Townsend, Vice President, NPG, Plant Manager
- *W. Barkhuff, Quality Control Manager
- *T. Bennett, Mechanical Maintenance Department Manager
- *C. Seward, Senior Power Production Engineer
- *M. O'Connell, Regulatory Compliance Engineer
- *R. Willis, Mechanical Maintenance General Foreman
- *M. McCann, I & C, General Foreman
- *D. Carver, I & C, Supervising Technician
 - R. Cramins, QC, Verification Section Supervisor
 - K. McDonald, QA, Auditor
 - J. Griffity, Senior Compliance Engineer
 - R. McVicker, QC Surveillance Supervisor
 - A. Celino, Machinist
 - J. Strahl, Mechanical Maintenance Foreman
 - R. Howard, Electrical Foreman
 - J. Guyette, Tool Maintenance Clerk
 - J. Bonner, QC specialist
- *B. Griffin, Asst. Plant Manager, Maintenance Services
- *A. Young, Sr. QA Supervisor

* Attended exit meeting

NRC Personnel:

- *P. Narbut
- *K. Johnston

The inspectors also held discussions with other licensee and contractor personnel during the course of the inspection.



ATTACHMENT B

DOCUMENTATION AND PROCEDURES REVIEWED

AP C-40S3, Revision 14, Use of PIMS Work Order Module

AP D-450, Revision 4, Calibration and Control of Measuring and Test Equipment

AP D-752, Revision 10, Calibration and Control of Measure and Test Equipment
(Electrical and Mechanical Maintenance)

NPAP A-802, Revision 5, Quality Control Department Stop Work Authority

NPAP D-5, Revision 6; Control of Mechanical, Electrical, and Instrument and
Control Measurement, Test and Performance Monitoring Equipment

NPAP C-12, Revision 19, Identification and Resolution of Problems and
Nonconformances

QAP-12A, Revision 8/29/89, Control and Calibration of Measuring and Test
Equipment

QAP-12B, Revision 11/10/89, Control and Calibration of Performance Monitoring
Equipment

MP M-53.1, Revision 5, Calibration of Torque Wrenches and Torque Wrench
testers

MP M-53.2, Revision 3, Calibration of Outside and Depth Micrometers

MP M-53.3, Revision 2, Calibration of Bench Scale With Single Beam

MP M-53.4, Revision 0, Calibration of Hydraulic Torque Wrenches

FSAR Section 17.7, Revision 1, Control of Purchased Material, Equipment, and
Services

FSAR Section 17.12, Revision 1, Control of Measuring and Test Equipment

IEEE Std 498, 1980, Requirements for the Calibration and Control of Measuring
and Test Equipment Used in the Construction and Maintenance of Nuclear Power
Generation Stations

ANSI N45.2, 1971, Quality Assurance Program Requirements for Nuclear Power
Plants

ANSI N45.2.8, 1975, Supplementary Quality Assurance Requirements for
Installation, Inspection and Testing of Mechanical Equipment and Systems for
the Construction Phase of Nuclear Power Plants

ANSI N18.7, 1976, Administrative Controls and Quality Assurance for the
Operational Phase of Nuclear Power Plants

