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Self-Evaluation of Diablo Canyon Power Plant

July 1993

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PACIFIC GAS AND ELECTRIC COMPANY

1993 DCPP Self-Evaluation Report
MAINTENANCE (MA)

PERFORMANCE OBJECTIVE:

Plant supervision to ensure effective implementation and control of plant activities. Managers and supervisors routinely observe maintenance activities to identify and correct problems and to ensure adherence to station policies and procedures. This includes administrative controls that are effectively implemented in the conduct of maintenance activities. Pre and post-job briefings are effectively used.

FINDING:

(MA.1-1) **Some supervisors are not performing to management expectations.** The following areas of responsibility were noted to be indications of deficient or ineffective supervision.

1. The volume of findings, during the observation period, of personnel safety violations is an indicator supervisors are not "in the field" involved in the maintenance. (Reference finding OA.5-1)

2. Supervisors are not looking at housekeeping, storage of materials, and general cleanliness of the plant. (Reference finding MA.2-1)

3. Contamination control practices are still not in compliance with station polices. Workers are not being held accountable in this area. (Reference finding RP.8-1)

4. During work on a pump the procedure and the vendor manual were in conflict. The foreman indicated that a vendor manual should take precedence over a procedure and the work continued.

5. Some supervisors are not getting out in the plant and looking to see how work is being conducted. During the three-week observation period the team noted very little supervisor presence in the field. Of the approximately fifty maintenance observations, over 75 % have no mention of foreman involvement in the field. In most cases the foreman was only seen at the job site if he was called by the workers. Almost no upper management personnel were noted "out in the field". Related items found during observations were procedure and/or station policy non-compliance in areas of work documentation, procedural adherence. (Reference finding MA.6-1)

6. When supervisors are in the field, they do not always lead by example, and they do not always correct safety violations when they see them.

   a. A foreman and two engineers did not take steps to keep a worker safe when it was brought to their attention the worker was in violation of station policy regarding safe working distances on or around energized 12kv equipment. This was during repair work on the cubicle bottle shutter mechanism.

b. During a hazardous material spill a supervisor that was directing the work, in the area of the spill, was working in his street clothes with no safety equipment with the fully equipped response team.

c. During flooring hammering in the hot shop, the area was posted as a hearing protection required area. Six workers and one foreman were in the area. Only two of the workers had hearing protection. The foreman did not take any steps to comply with or enforce the postings.

d. During work on the main feed pump a worker was not wearing his hard hat. One foreman and two engineers were present and did not correct the unsafe work practice.

e. It was noted that supervisors are sending their crews to quarterly seminars but are not regularly attending the classes themselves. This does not set a good example and is required training for all maintenance supervisor training (MST) graduates.

7. Most tailboards are not being conducted in a detailed manner. They are insufficient and inconsistent both within and between departments.

a. The maintenance crew foremen are not meeting the "WANO" commitment regarding review of safety items in tailboards.

b. During the observation period over thirty items were noted to be deficient with the crew morning tailboards. The tailboards were inconsistent in all departments. (Reference the finding on tailboards OA.3-1.)

c. Some maintenance tailboards are not covering work in enough detail to reduce confusion in the field, insure the safety of the workers, and give the foreman a good feeling that he knows what his people are about to do. This was especially evident while observing routine preventative maintenance. (Reference finding MA.3-1 for work delays and inefficiencies.)

d. Some supervisors are not communicating priorities of the work to be performed during tailboards. In a few cases it was noted that the foreman did not communicate the priority of tech. spec. action maintenance or the maintenance verification test run. In one case the foreman did not inform the crew they were working a job in a 72 hour tech. spec. action

RECOMMENDATIONS:

Enable supervisors to meet management's expectations of excellence.

1993 DCPP Self-Evaluation Report
MAINTENANCE (MA)

PERFORMANCE OBJECTIVE:
Facilities and equipment effectively support performance of maintenance activities. Work areas are maintained in a clean and orderly condition. The materiel condition of the plant supports safe and reliable operation.

FINDING:
(MA.2-1) **Deficient housekeeping practices and ineffective implementation of the housekeeping program have resulted in numerous observed conditions of degraded materiel condition and housekeeping discrepancies.**

1. During a walk down of the plant, the self-evaluation team identified 159 housekeeping and 210 material condition discrepancies. Examples of these discrepancies include;

   a. Tools, rags and cigarette butts on floors in both the Turbine and Auxiliary buildings.

   b. A cart with air monitoring equipment was left unsecured in the unit 1 safety injection pump room.

   c. Unlabeled and inadequately labeled containers in work areas and storage lockers in the plant.

   d. Unsecured and unattended ladders were found leaning against plant equipment and outside ladder storage areas. Many ladder storage areas were found without their posted inventory.

   e. There were 25 instances of insulation which was missing, damaged or removed.

   f. There were 20 missing pipe caps from piping vents and drains.

   g. There were 44 steam, water, or oil leaks in the turbine building, only 11 of which were identified by A/R's.

   h. There were 31 instances of rust and corrosion on plant structures and components identified, with only 7 A/R's written.

2. Programs for management of plant housekeeping (AD4.DC2, Plant Housekeeping Areas, and AP C-70, Routine Plant Inspections by NPG Management) have not been effective in maintaining plant cleanliness.

   a. Housekeeping logs are not being updated weekly IAW the AD4.DC2. In April only 25% of area owners turned in a copy of their housekeeping log to housekeeping supervisor. In May there were approximately 50% of the required logs turned in. Similar findings were documented in QE Q0008086.

   b. Random polling of approximately one third of area owners showed that for the most part they were delegating their responsibility of weekly area walk down to persons on their crews. AD4.DC2 makes no provision for delegating of responsibilities.

c. A review of the log of plant management inspection forms indicated that less than half of the plant managers and directors are documenting their monthly walk downs IAW AP C-70.

3. Quality control surveillance report 93-0019 for May concluded that plant material conditions remain low and minor housekeeping discrepancies remain high. Eight A/R's were generated as a result of the May surveillance report.

RECOMMENDATIONS:

Areas that, if improved, could strengthen the overall plant housekeeping program are:

1. Clarify duties, responsibilities, reporting, and accountability of housekeeping area owners and program supervisor.

2. Clearly defined areas for the owners.

3. People involved need to provide the plant with a workable program that works.

PERFORMANCE OBJECTIVE:
Control of maintenance work supports the completion of tasks in a safe, timely, and efficient manner. Control of work is accomplished through the effective use of a priority system, scheduling, interdepartmental coordination. Work is controlled by effective and efficient work instructions, procedures, and drawings.

FINDING:

(MA.3-1) **Some work control process delays and inefficiencies result from inadequate work control documents, poor department and interdepartmental coordination, and insufficient foreman preparation.**

1. Crews did not start work on time when foreman was absent. This was noted three times, once in each of the maintenance departments. Twice it was over 30 minutes before the crew or general foreman took action. In the third case the crew started without a foreman or tailboard. Action was not taken to replace the foreman or assign a reporting foreman.

2. It was noted that little preparation was done, based on the work schedule for upcoming jobs. Most parts are not verified to be properly staged prior to starting work, or clearing of plant equipment.

   a. Oil in lube oil storage room was not verified before clearing equipment and entering a 72 hour technical specification action for work on aux. feed pump.

   b. Some work orders are signed by foreman with little or no review. In one case the foreman completed a tailboard with the craftsmen on a work order and did not know the scope of the work. This was later questioned by the craft after he had read the work order.

   c. Most foreman are not prepared for the morning tailboard. Reference "finding" on tailboards (OA.3-1).

3. Interdepartmental coordination is poor.

   a. A maintenance engineer was unaware of an upcoming maintenance task that required direct support during work on a new 12kv vacuum breaker.

   b. Some department personnel are not showing up in a timely manner for cross discipline pre-job briefings prior to a containment entry.

   c. In some cases coordination of maintenance verification testing (MVT) between departments was noted to be difficult to orchestrate. One case was Fan E-107

PM. The MVT was pushed back due to departments starting work on the same equipment at different times during the shift. Testing was delayed ½ shift.

d. Rescheduling of training and vacations impacts a departments ability to support interdepartmentally scheduled work and testing. This was noted as one of the "key" problems with the work and schedule delays, during an interview with the maintenance schedulers and their direct supervisor.

e. During work on a temperature indicator the work order was passed between I&C and Electrical Maintenance via the work planning center (WPC). The WPC made a second trouble shooting work order, that was not needed, for the same problem. This job wound up back with I&C after one foreman decided to call the other and work together on the problem. The main generator temperature indicator was out of service for over six months while packages were being swapped.

f. A cardox test was scheduled and operations could not support the test. The system engineer asked that the test be rescheduled. The following week operations could support the system engineer and he called the maintenance foreman to support the test. He found that the supporting work order had been taken to complete the week before, even though no work was performed, to get credit for completion. The test had to be deferred a second time to allow work planning center time to create a new work order.

4. Inaccurate, confusing, or unavailable work controlling documents contribute to delays.

a. Reference findings for inaccurate or insufficient procedures and work packages (MA.6-1).

b. During work on a DCN the work had to stop when workers discovered that they might not have the latest field change against their DCN. The foreman was able to obtain the current FC and incorporate it into the work package.

c. Workers in the field with a DCN for the other unit during heat trace work.

d. Loop test referenced manufacturers manual. Manual was checked out of library and the person who checked it out could not find it. Craft had to go the Document Control and look up the master copy.

e. A spot check in the Electrical Maintenance Document Control room found persons not using out cards when removing drawing.

f. Maintenance craft were not able to read the controlled vendor drawings. Craft used uncontrolled version to verify information.

RECOMMENDATIONS:
Involve craft in the resolution of work delay problems.

PERFORMANCE OBJECTIVE:
Maintenance procedures and other work-related documents are clear, technically accurate, and consistently used to ensure that maintenance is performed safely and efficiently. When procedural problems are encountered, craftsmen and other maintenance personnel identify and provide timely feedback to correct the problems.

FINDING:
(MA.6-1) **Some Work Orders contain conflicting or inadequate directions and incorrect supporting hard copy information, which results in work not being performed correctly, contributes to procedural non-compliances, and could lead to unsafe actions.** Feedback is not always provided to the Work Planning to identify work order and procedural deficiencies.

1. While performing preventative maintenance (PM) on a supply fan the machinists were confused as to what method they were to use in checking the belt tension. The work order (W/O) directed the machinist to perform the belt tension inspection in accordance with procedure MP M-23.4 which involves the use of a belt tension gauge, but the W/O contained a NOTE after the W/O step which directed the machinist to use their hands to check the belt tension. The machinist checked the belt tension by as directed by the W/O. It appeared satisfactory. When questioned by the Observer, the belt was checked with a gauge and found out of tolerance. Additionally, an A/R tag was found indicating that the belts had been squealing. Had the belts not been rechecked, repeat maintenance would have been required.

2. A supply fan PM W/O contained a step directing the machinist to drain and clean the condenser, which the machinist signed off. When asked when he completed the step, since the condenser was filled and pressurized with water, he indicated that he misread the W/O and thought is was referring to the condenser pan to be drained. The machinist asked his foreman about the step in the W/O and the foreman indicated that the step should not have been in the Work Order.

3. The work plan to Lube and Inspect the Turbine Overspeed could not be performed as written. Work Order instructed that four parts be lubricated with Chevron AW Machine Oil 100. However, the split coupling, had a grease zerk fitting. Investigation indicated that this error in the W/O has existed since 1989 without correction. Additionally, the tappet and ball, could not be filled correctly until the trip mechanisms were activated which was not mentioned in the Work Order.

4. The Radiation Work Permit (RWP) assigned to a work order to perform an oil sample PM on the charging pump was an outage permit RWP which was no longer valid. The Senior RP tech signed the worker on the correct RWP for this work.

5. The work package for performing a Loop Test contained incorrect drawings. The foreman caught the error and rectified the problem. Also, the work package did not contain a copy of the work order, which delayed the start of the job while the planner generated them.

6. When performing a fan PM, the maintenance worker was going to skip a step in the work based on information from a fellow worker, who indicated that the fan could not be accessed. The Observer assisted the worker in obtaining access and the worker completed the PM. The work package did not have adequate instructions on how to access the fan, this coupled with the feedback from the fellow worker would have resulted in maintenance not being performed. The worker identified the weakness in the work order, however he did not use the "HOW DID WE DO" form to get the information to the WPC.

RECOMMENDATION:

1. Utilization of the "HOW DID WE DO" form can be an effective means to provide feedback to the WPC to correct Work Order problems.

2. Form an Employee Continuous Improvement group to address strengthening the implementation and feedback mechanism of the "HOW DID WE DO" form.

PERFORMANCE OBJECTIVE:
Maintenance procedures and other work-related documents are consistently used to ensure that maintenance is performed safely and efficiently. Vender manuals, information and drawings are properly controlled, reviewed, and approved.

FINDING:
MA.6-2 **Good procedure and work instruction adherence practices and adequate control of vender documents are not always practiced.** The following are observed examples:

1. While trouble shooting rad monitor the craft were using an uncontrolled vender instruction manual leftover from previous work. Technicians had trouble getting the expected readings. They were able to obtain a controlled copy of the vender manual. They discovered they were taking the readings from the wrong capacitor. The controlled copy of the manual was blurred and unreadable. The technicians then continued work with the uncontrolled copy of the manual.

2. During research for a controlled copy of a vender manual, a file was discovered that contained numerous telecons from system engineers to the vender regarding various changes to the equipment. The telecons contained instructions which had never been incorporated into the manuals or procedures.

3. An uncontrolled copy of a pump instruction manual was found to be out and available in the mechanical maintenance shop. A review of all the maintenance shops showed that uncontrolled vender information was available in all three shops.

4. Found uncontrolled maintenance information taped to the wall in the turbine building by the nash vacuum pump.

5. Craft by-passed a foreman hold point, which was to verify work scope in work order, during routine oil change.

6. Technicians did not sign off work package as they completed work during routine preventive maintenance on charging pump.

7. Craft did not sign off completed work order steps during work on radiation monitor trouble shoot and repair.

8. Worker signed off step for draining condenser when work was never attempted and could not be performed in accordance with the work order as written. This was during routine work on technical support center supply fan.

9. Steps to obtain specific tools and bottles in the work order were signed off and never performed during routine oil sample of a charging pump. The wrong bottles and equipment were used and resulted in a non-representative oil sample being taken.

10. A step, in the work order, to hang a red tag was signed off and no red tag was used during routine preventive maintenance of a motor.

11. Procedural step to review the equipment history is routinely bypassed. Several foreman stated that for routine tasks the prerequisites of the procedures are not required to be performed. One foreman stated he preferred to use the old history hard copy card files even though they are no longer being kept up.

12. During routine supply fan maintenance the work order step for bearing inspection and greasing was signed off and not performed.

13. Shop cranes require daily inspections and log entries of the inspection. It was found that this is not routinely being completed the first time the crane is used each day.

14. In at least three of the jobs observed the required "FME" postings for performing system breaches were not used. In one case the foreman in charge did not correct the error when it was brought to his attention.

15. During battery charger pm a journeyman was noted chewing gum in a Zone 4 housekeeping area.

16. Craft did not follow steps of the procedure during oil change on charging pump. This resulted in the oil sample not being complete in accordance with the procedure

17. Craft performed steps of the procedure out of sequence during routine refueling water purification filter change out. Foreman stated it was OK to perform steps out of sequence if radiation conditions permitted it.

18. During routine fan pm the procedure required the craft to use a fan belt "V" groove wear gauge. This step was not performed by the craft.

RECOMMENDATIONS:

Deviations from procedures and policies occur predominately during routine work tasks. The plant staff should bring the routine task performance up to standards of excellence now used for non-routine tasks.

PERFORMANCE OBJECTIVE:
Materials management ensures that necessary parts and materials meeting quality and/or design requirements are available when needed.

STRENGTH:
(MAS.9-1) Through the use of a comprehensive integrated information system, materials are ordered or stocked and are available to support maintenance when required.

1. Bill of Materials exist for approximately 85 % of the components scheduled to be developed. This provides work planners a readily available parts listing and inventory status of maintenance item.

2. Parts are reserved for Work Orders and are reordered when demand exceeds stocking levels. Reserved parts are flagged by the Foreman prior to the job start date and are delivered to the maintenance shops. Emergent material requirements can be called to the warehouse and will be issued and delivered as a priority.

3. Daily maintenance foreman meetings are attended by Material Coordinators in an effort to identify plant needs, that require priority processing and expediting. Additionally, during Plant refueling outages a Material Hit Team is formed to identify and status priority items. All priority items are processed in a "Red Package" and can be processed to an issued purchase order in as little as one hour.

4. The warehouse facility contains a material testing laboratory for commercial grade dedication/verification. This capability eliminates the need to send material off site for testing thus making the material available for use.

5. As a result of a recent organizational changes, all of the tool room personnel are part of Materials Services. Although this change is in it's infancy, benefits have been gained in the following areas:

   a. Inventory reduction for consumable/commodity items as a result of many items stocked in departmental inventories being returned to the warehouse, and the maximum stocking levels analyzed and reduced.

   b. Consistent supervision and policies between each of the discipline tool rooms.