

NUCLEAR REGULATORY COMMISSION

REGION IV

611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TEXAS 76011

MAY 18 1984

MEMORANDUM FOR: Darrell G. Eisenhut, Director, Division of Licensing, NRR
FROM: John T. Collins, Regional Administrator
SUBJECT: PROPOSED BOARD NOTIFICATION - COMANCHE PEAK PROTECTIVE
COATINGS ALLEGATIONS THAT HAVE BEEN IDENTIFIED AND
PREVIOUSLY FORWARDED TO TEXAS UTILITIES ELECTRIC COMPANY

A total of 60 allegations related to the Comanche Peak Steam Electric Station protective coatings program have been identified. These allegations have been forwarded to the licensee for their technical review, corrective actions, and preventative measures.

The licensee is in the process of completion of application of protective coatings on Unit 1. Three inspections have been performed at Comanche Peak Steam Electric Station during 1984 to date. These inspections have been performed by our contractor, Brookhaven National Laboratory (BNL). The interim findings from these inspections are under review and Region IV is currently planning to request that Texas Utilities Electric Company assess and report the safety significance of these concerns. No NRC inspection reports on protective coatings inspection results by Brookhaven National Laboratory have been written to date.

Because of the applicability of the protective coatings to the Comanche Peak Steam Electric Station ASLB Hearing as a licensing issue and items associated with safety significance, I am recommending that the Board be notified immediately of this potential area of concern.

We will continue to keep you advised as to the disposition of this matter.

If additional information is required, contact D. M. Hunnicutt (728-8137) or R. L. Bangart (728-8249).

Richard L. Bangart
John T. Collins
Regional Administrator

Attachment: Allegations

cc:

G. Edison, LB1
T. A. Ippolito, NRR
E. Case, NRR
R. DeYoung, OIE
S. Treby, ELD
S. Burwell, NRR

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ALLEGATIONS CONCERNING COMANCHE PEAK PROTECTIVE COATINGS

NOTE: Allegations 1 through 6 are concerned with the protective coating systems not being qualified, for example for environmental (irradiation) conditions and DBA conditions, under ANSI 101.2-1972. (See letter to Doyle Hunnicutt from V. Lettieri dated January 16, 1984.)

7. NCR No. C83-01986 discusses the cracking and flaking of concrete coatings systems (NUTEC 11, 11S, 1201). The disposition section of this NCR states "cracking of coatings is due to excessive stresses in the coating during drying and curing." The allegation is that repairing these cracks will not remedy the condition which caused the cracks.
8. Paragraph 4.1.3 of Procedure Number CCP-30, Rev. 11, states: "... shadows or tight residue of primer which may remain in the profile of the previously prepared substrate is acceptable." The allegation questions the integrity of an inorganic zinc primer which has been applied over a steel substrate with metallic zinc residue in the profile of the steel. The concern is that there will be coating adhesion problems, and that the zinc is isolated from the carbon steel substrate; thus the necessary galvanic action will fail to occur.
9. It is alleged that three coats of inorganic zinc primer have been applied at Comanche Peak to obtain the required dry film thickness. Paragraph 3.2.4 of Instruction Number Q1-QP-11.4.5, Rev. 27, states: "Only two (2) overcoats shall be applied." It is alleged that this system would lack chemical attraction or intercoat adhesion with itself. Is this three coat primer system qualified, for example for environmental (irradiation) conditions and DBA conditions, under ANSI N101.2-1972? This is another example of the coatings systems not being qualified.

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1. Paragraph 4.3.1.2 of Procedure Number CCP-40 states "Imperial coatings may be applied in the following sequential order: #11S/1201/11S/1201 or 11S/1201/11/1201." Imperial letter dated May 8, 1978, VBR-7697 to Mr. Kelly Williams, second paragraph, states: "Although the resultant systems #11S/1201/11S/1201 or #11S/1201/11/1201 have not been qualification tested, there is no reason to believe that they are not viable systems." Thus these two systems have not been DBA qualified.
2. Specific sequencing of coatings systems not required. For example, NRC No. C83-01752 dated 6/23/83, Disposition section, first paragraph, states: "Table A2 in Appendix A of AS 31 specifies acceptable coating systems, i.e., primer and final coat product identification and vendors." It then goes on to say that full sequencing is not identified. "This table does not identify full system sequencing or application parameters." Does a system's sequencing change for a repair? Why? Has the repair sequence been DBA qualified?
3. DCA, No. 17, 142, Rev. 2, allows Carboline 305 to be applied over another manufacturer's epoxy coating. Has this system been DBA qualified?
4. DCA, No. 12, 374, Rev. 1, allows inorganic zinc primer (Carboline CZ-11?) to be top coated by Imperial 1201. Has this system been DBA qualified?
5. Procedure No. CCP-30A, Rev. 2, page 2 of 13, paragraph 1.3.1 allows the application of Carboline 305 over the primer Dimetecote 6 by Ameron. Has this system been DBA qualified?
6. Procedure No. CCP-40, Rev. 5, page 5 of 13, paragraph 4.1.1.3 states: "Repair of embedded foreign objects such as nails, rebar chairs, bolts, wood, or plastic shall be repaired per the following guidelines before application of NUTECH 11S surfacer." Have these systems been DBA qualified?

10. Paragraph 3.2.2.3 of Instruction Number QI-QP-11.4-5, Rev. 27, page 8 of 27, states: "Surfaces that have been power tooled with '3M Clean-N-Strip,' 80 grit or coarser 'flapper wheels,' sanding discs, 'roto peans,' or equivalent to provide acceptable surface profile. It has been alleged that:
- a. The coating system applied to surfaces prepared using the above specified power tool methods are not qualified, for example for environmental (irradiation) conditions and DBA conditions under ANSI N101.2-1972.
 - b. The above mentioned methods provide a smoothing or polishing action, rather than a penetrating action as obtained with sandblasting or with a needle gun.
 - c. The profile that is obtained using the above-mentioned methods occurs in a sparse pattern and not a densely packed pattern.
11. It is alleged that DCA No. 18, 489, Rev. 1, allows a primer thickness of 0.5 mils. If this is so, is a coating system having a primer coat of 0.5 mil thickness qualified, for example for environmental (irradiation) conditions and DBA conditions, under ANSI 101.2-1972?
12. If maximum limits are used, paragraph 4.3.1.2 of Procedure Number CCP-40, Rev. 5., allows a 102 mil thick coating system for 11S/1201/11S/1201. Is this system thickness qualified, for example for environmental (irradiation) conditions and DBA conditions, under ANSI 101.2-1972?
13. It is alleged that the coatings applied to areas such as the reactor core cavity will not maintain their integrity due to neutron and gamma exposure. It is further alleged that water and flaked-off paint will flow out of the reactor core cavity in the case of a LOCA. Are the coating systems applied to these area qualified under ANSI 101.2-1972, especially for environmental and DBA conditions? Which areas are qualified and which areas are not? If coatings in the cavity will come off with irradiation, will this cause a problem post-LOCA?

14. a. It has been alleged that after a NCR is written, anyone can sign off on it.
- b. It has been alleged that NCRs cannot be written, and that IRs must be written with "unsats." It is alleged that NCRs must be dispositioned by an engineer, while IRs can be dispositioned by anyone. What prevents items identified on an IR from becoming lost, the problem not being resolved, or generic items not being identified?

15. a. It is alleged that Paragraph 4.4.3.0 of Procedure Number CCP-30, Rev. 11, allows CZ-11 or Carboline 191 to be applied over existing Phenoline 305 topcoat and left intact, without sanding back to a "mottled" transition.

- b. It is also alleged that this paragraph allows Phenoline 305 to be applied over Reactic 1201 and vice-versa.

Are these coating systems qualified, for example for environmental and DBA conditions, under ANSI 101.2-1972?

16. As a result of numerous allegations regarding improper pressure being applied to QC inspectors, NRC Office of Investigations has written violations in this area and proposed two civil penalties. Are there any coating material deficiencies in the plant resulting from the improper pressure applied to QC inspectors (e.g., pressure not to write unsat reports or NCRs, threats to lose job, use of verbal instructions to QC inspectors vs. written instructions, lack of support from QC management in technical disputes with construction, confusing instructions which do not support unsats, such as QI-QP-11, 4-5, Rev. 27, page 5 of 27, Note 4 and page 19 of 27 paragraph 3.7.5.b).

17. It is alleged that the "air acceptability test" results are invalid because cigarette butts are placed into the cheater valve of the spray gun prior to the test and removed after the test. Further, it is alleged that construction and QC management was aware of this practice.

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Note: For Allegations 1 through 17 see inspection report 50-445/84-03; 50-446/84-01, Attachment 1.

18. It is alleged that QC inspectors are not allowed to identify visual defects such as cracking or blistering during backfit inspections.
19. It is alleged that Instruction Number QI-QP-11.4-23 and QI-QP-11.4-24 are very vague regarding the way the backfit inspections are to be conducted.
20. It is alleged that adhesion testing of the protective coatings are not performed properly. The QC inspectors are instructed not to cut around the adhesion test dollies when conducting adhesion tests. The instructions that come with the machine tell you to do so (and Specification AS-31 references these instructions).
21. It is alleged that Brown & Root is doing the calibration on these adhesion testers, and they are not using a corrected value curve (which should have been supplied with each unit).
22. In the present backfit program, QC inspectors are required to take readings with adhesion testers without receiving formal training.
23. It is alleged that the Coatings QC Program at CPSES is inferior to the same programs at other nuclear power plant projects. One reason is that standard inspection practices, used at other sites, are not used at CPSES. For example, a sample adhesion test used by a QC inspector regularly at another site, was not allowed at CPSES by one of the QC lead men. The ASTM tape adhesion test.

24. It is alleged that Q coatings have been placed over rusty, scaly unprepared metal surfaces inside pipe supports made of tube steel without end-caps. In these cases, the protective coating gets on the rusty inside of the tube. This coating material could later crack, scale, come off the pipe, and then travel to the sumps.
25. It is alleged that a seal coat was accepted prior to the finished coat being applied, when in fact the seal coat should have been rejected. The area in question is just outside the Skimmer Pump Room, in Reactor Containment Building-Unit 1, on the steel liner plate. The stains on the liner plate in the opinion of the inspector were not acceptable per procedure and should have caused the seal coat to be rejected for finish coat application. The QC inspector brought the condition to management's attention and requested their opinion.; Management stated that the stains were in fact rust stains and acceptable, while the QC inspector felt it was obvious that the stains were not rust and unacceptable. The QC inspector stated: "The reason I accepted this was because I feared adverse action would be taken against me if I rejected it." The QC Inspector goes on to say that this area has the finish coat on it now and none of the stains are visible.
26. It is alleged that Design Change Authorization (DCA) documents are not controlled.
27. It is also alleged that DCAs at CPSES are originated and approved totally by engineering. QA/QC has no input in the review and disposition of DCAs.
28. It is alleged that DCAs are used frequently and conveniently to cover up a condition for which a Nonconformance Report (NCR) should be written. The allexer estimated that 40% of the DCAs are for NCR conditions.

29. It is further alleged that DCAs are written to overcome a problem area which will take considerable time for repairs. In other words, the DCAs are used to facilitate the completion of a job even though this means that accepted procedures will not be followed.
30. It is alleged that on numerous occasions DCAs have been issued to downgrade the surface preparation from an SP-10 to an SP-6 standard preparation. It is further alleged that DCAs are also written to downgrade Specification AS-31 requirements in containment to AS-30, which is the non-safety specification. The downgrading of an SP-10 to an SP-6 surface preparation is an example of DCAs being written to downgrade from an AS-31 to an AS-30 requirement.
31. It is further alleged that QC management interpreted an SP-6 on a DCA to mean "do the best you can". For example, when difficult access areas were involved, QC management allegedly stated to the QC inspectors, if you cannot get to an area, do not worry about it.
32. It is alleged that after a reading list was signed by QC inspectors, the document that they read was removed and replaced by a different document, yet the reading list coversheet remained the same.
33. It is alleged that many problems at CPSES with coatings are due to a QC Coatings Lead Inspector's (Individual K) lack of experience in QC. An example of this was when he identified the rust on an A-frame in the core area as being D-6 residue.

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(NOTE: For allegations 1 through 33, see letters dated January 16 and 24, 1984, and February 16, 1984, Vincent Lattieri to Doyle M. Hunnicut)

34. It is alleged that the requirements of ANSI/ASME N45.2.2-1978 were not met for material storage.
35. It is alleged that Comanche Peak has problems in the area of workmanship, quality of work, painter qualification, and indoctrination. It is also alleged that documentation requirements were not being met, for example documentation of painter qualifications and in-process work.
36. It is alleged that the traceability of coatings materials was not always maintained.
37. It is alleged that for the backfit program, areas that were stated to have satisfactory primer documentation ended up having 10 mils of primer on them, which exceeded the allowed maximum.

It is also alleged that none of the maps showing areas of adequate primer documentation were correct, for the backfit program. Additionally, it is alleged that the documentation for the backfit program was forged and falsified. Furthermore, it is alleged that a QC inspector for the night shift wrote up acceptable inspection reports for the dome area without ever performing the inspections.

38. It is alleged that high dry film thicknesses (DFT's) of CZ-11 are power ground to an acceptable DFT. It is further alleged that this would burnish or polish the zinc, and possibly result in poor adhesion of the top coat.
39. It is alleged that old Phenoline 305 (between 1 and 2 years old) is being top coated with new Phenoline 305 with little or no surface preparation.

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40. Instruction Number QI-QA-11.4-5, paragraph 3.2.2.4, rev. 27, dated 11/6/83, page 7 of 27 states: "Verify that the blasted or power tooled surface has been brushed or vacuumed to the extent required for final surface inspection." It is alleged this has never been performed on power tool cleaned surfaces. It is further alleged that in lieu of following the procedure, the surfaces are being blown down with compressed air or wiped with a cloth rag. The concern with using compressed air is that the surface becomes contaminated with oil and/or water. The concern with a cloth rag is that the surface becomes contaminated with lint.
41. It is alleged that when wiping a surface immediately prior to repairing that surface, the paint is wiped with a foreign cleaning solution. This foreign cleaning solution is alleged to be a hospital disinfectant containing two (2) percent chlorides. The concern is that this hospital disinfectant is not allowed by procedure and could cause stress corrosion cracking of stainless steel.
42. It is alleged that duct tape has been placed over Richmond Inserts, leaving a hole behind the duct tape. Also, foam rubber was left inside the Richmond Insert. It is then alleged that 115 and 1201 are applied over the duct tape. The end result is what appears to be a solid wall, but in reality is a wall with holes in it covered with duct tape, 115 and 1201.
43. It is alleged that zinc primer was not sufficiently cured before a top coat was applied. It is also alleged that the procedures were not followed to determine if the zinc primer was properly cured.
44. It is alleged that the "nickel" test was not performed properly due to instructions received from QC supervisors. It is alleged that QC supervisors instructed QC inspectors to lay the nickel flat on the surface of the coating; then to lightly rub the nickel, as lightly as the inspector could, across the coating, to keep just enough pressure on the nickel so

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43. It is alleged that repairs of defects have been accomplished with no re-inspection of these defects. For example, a repair is made, someone comes along and walks in that repair, you have accepted that area as satisfactory with footprints, contamination, sand, etc., and it is never re-inspected. It is further alleged that this repair is not given a final inspection of the type that would have been performed had it been a regular production type job.
 44. It is alleged that during toke gauge tests, it was observed that rust was seen on steel substrate, and grease, grime, filth, and other contaminants on concrete substrate.
 45. It is alleged that for an installation hanger for the steam generators, in violation of a written instruction, QC inspectors were instructed to perform approximately 25 elcometer adhesion tests.
 46. It is alleged that coatings have been applied over seismic joints. These joints are filled with foam and were not to be coated.
 47. It is alleged that overspray into areas that had previously been inspected has been allowed and is commonplace.
 48. It is alleged that coatings have been applied without the benefit of quality control inspection.
 49. It is alleged that Phenoline 305 was thinned to a 50/50 mix with thinner. This 50/50 mix, when dried, became as brittle as glass. The Phenoline 305 became so brittle that it was not possible to obtain a toke gauge reading. It lost its impact resistance and abrasion resistance.
 50. It is alleged that coatings have been placed over raw concrete that had no surface preparation.
 51. It is alleged that QC inspectors were not to write Requests for Informa-

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54. It is alleged that during the Backfit Program, only the first unsatisfactory reading was recorded, even if the following readings were either higher or lower, meaning further out of the acceptable range. It is further alleged that the trend analysis was adversely affected by not including the actual readings.
55. It is alleged that areas identified during the Backfit Program as being outside of the acceptable range for applied coatings were not removed as required.
56. It is alleged that original documentation related to the Backfit Program was destroyed by QC management.
57. It is alleged that in Unit 2, elevation 860, the room directly off the elevator had an area coated that was covered with filth, weld spatter, tobacco juice, and other unsuitable material.
58. QC Inspector procedures such as QI-QP-11.4-1 state: "Adequate lighting is defined as the minimum light produced by a (2) cell battery flashlight." It is alleged that the minimum is zero light. It is alleged that QC inspectors were to perform their inspections at arm's length, and if the light was bright, that wasn't the minimum. Rather, it was the maximum and they should obtain a weaker flashlight.
59. It is alleged that a QC Inspector accepted substandard coatings on the liner plate, below and above the polar crane rail at azimuth 270° to 0°.
60. It is alleged that QC Inspectors were selectively sent to various inspections so that the coatings would pass inspection. For example, production calls for QC Inspection. When the inspector arrives, he is told they are not ready. He returns to the QC office. On the way he meets a second inspector proceeding to the area he was just told was not