



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

JAN 7 1985

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What is next?

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MEMORANDUM FOR: B. D. Liaw, Chief
Materials Engineering Branch
Division of Engineering

THRU: *[Signature]* Warren Hazelton, Section Chief
Materials Application Section
Materials Engineering Branch

FROM: David E. Smith, Materials Engineer
Materials Application Section
Materials Engineering Branch

SUBJECT: REPORT ON A VISIT TO BECHTEL GAITHERSBURG IN SUPPORT
OF REGION IV CONCERNING STRUCTURAL STEEL WELDING AT
WOLF CREEK GENERATING STATION (50-482)

A request for technical assistance by Region IV was made by Memorandum from R. P. Denise to D. G. Eisenhower, dated November 2, 1984. Region IV requested a review of the following:

- (1) The selection methods for the connection joints to be inspected;
- (2) the evaluation methods and criteria used in determining whether rework of welds was necessary;
- (3) as the majority of the welds being re-inspected have previously applied coatings, concern was expressed as to the acceptability and the effectiveness of the reinspections; and
- (4) information on any ongoing or previous NRC positions associated with these types of corrective actions.

Mr. David E. Smith, Materials Engineering Branch, and Mr. Sang Bo Kim of the Structural and Geotechnical Engineering Branch, Division of Engineering, visited Bechtel's Gaithersburg offices on November 6, 1984 to acquire and to review information concerning the subjects requested by Region IV. We met with Mr. James A. Ivany, Civil Group Supervisor and some of his staff. This memorandum summarizes the information acquired during this visit and also provides the Materials Engineering Branch's views on the subjects under its cognizance.

The first item, the selection methods for the connection joints to be visually inspected, will be covered by Mr. Kim. As a general comment, the visual reinspection of all accessible and structurally significant connections would instill more confidence in the adequacy of structural integrity, relative to that by a sampling plan. "Accessible connections" are defined as all those joints which are not embedded in concrete or that do not require ripping out of equipment, cables, etc. The need for the

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removal of fireproofing or the construction of scaffolding does not constitute a basis for claiming the lack of accessibility. It was estimated that 80 to 90% of the joints will be accessible. Mr. Ivany indicated that they have decided not to remove concrete for these reinspections, even though Bechtel has not yet established a rationale for not reinspecting welds embedded in concrete. They are waiting for the complete results of the ongoing reinspections. At the time of our visit, the re-inspections were approximately 40% complete and few welds had been identified that required rework in order to meet the specified stress limits. Having no or little rework on accessible welds will probably be one of the reasons to be cited for not reinspecting welds embedded in concrete.

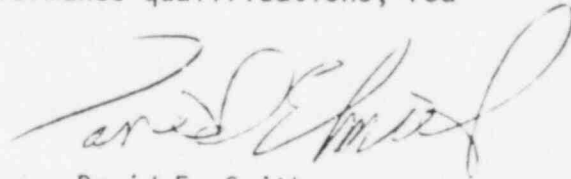
The second item is being addressed by: (1) calculating the stress levels in the individual welds which are undersized and/or underlength, or by assessing the structural adequacy of a connection joint in the case of a missing weld; and (2) determining if they meet the specified requirements. In these weldments, the applicant has required the constructor to install all missing welds, even when a joint connection meets the specified requirements without rework.

In other similar situations, a blanket "accept-as-is" rationale was often proposed (backed by calculations) to accept small deficiencies in the highest stressed welds of a given set of structures. For example, if a 1/16 inch undersize fillet in the most highly stressed weld in a given structure is acceptable, it would be acceptable for other welds which were not as highly stressed. For non-ASME Code class structures, this blanket approach may be acceptable. However, we do not believe that this is appropriate for ASME Code class structures or components. The approach by Bechtel for reinspecting a majority of the weldments and individually calculating stress levels to determine the structural adequacy is more conservative; in that it provides a better basis to assure the structural adequacy of the weldments.

For the third item, reinspection of welds through coatings, Mr. Ivany let us review Bechtel's rationale justifying the effectiveness of the reinspection of welds with coatings. The materials being used, A-36 steel and E7018 electrodes, are reliable and not prone to cracking, as evidenced by the fact that there has been little or no history of cracking of structural steel weldments at this site. Although small cracks could still be concealed by coatings, the likelihood of their occurrence is low and, accordingly, this type of defect can be disregarded for these structures. Other structurally insignificant concealed defects such as small porosity and light undercut do not pose a threat to the structural integrity and may also be disregarded. Lack of fusion, weld undersize, weld underlength, weld location, heavy undercut, and missing welds are the weld fabrication type of defects that can significantly affect structural integrity. Other than lack of fusion, these defects are detectable and measurable through coatings. Accordingly, we would accept reinspection of welds with coatings for these types of defects and would recommend that the applicant address the lack of fusion type defects.

For the last item, almost all sites have experienced some problems with weldments. These problems have been identified by the existing quality assurance process and NRC Regional inspections. When discrepancies are found, the applicant's approach, rationale, and results are reviewed to determine if the issue is satisfactorily resolved. Each case is resolved individually on its merits. In most instances, these problems are resolved at the Region level. For example, the reinspection through coatings occurred at Carolina Power & Light Co.'s Harris site. There was a history of cracking in welds by a particular vendor which were coated. A criterion was established for when coatings were to be stripped for more thorough inspections.

In summary, the writer believes that the applicant's approach is adequate to address most of the types of defects which have structural significance and should provide reasonable assurance as to the integrity of the weldments involved. The only type of defect not addressed is the lack of fusion defect. It is recommended that the applicant be required to make a matter of record the basis for selection of welds for reinspection, the results of the reinspections, the amount and type of rework performed, the rationale for acceptance of reinspection through coatings, and the results of the ancillary efforts the applicant is performing to address these non-conformances such as welders performance qualifications, rod control, etc.



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ALLEGATION REVIEW

Date: 01/08/85

CASE NUMBER	4-84-A-007
DATE OPENED	12/20/83
FACILITY NAME	Wolf Creek 50-482
SUBJECT	Intimidation of QC Inspector
SOURCE OF ALLEGATION	Confidential Source
NUMBER OF ALLEG. ASSIGNED TO CROSS REF. NO. ACTION SCHEDULED	OI See Detail Investigation
FIRST/LAST NAME DATE ASSIGNED REPORT NUMBER	R. K. Herr 12/20/83 1st: 2nd: Lst:
FTS NUMBER DUE DATE ALLEGATION SUBSTANT SORT CODE DATE CLOSED ACTION OFFICE MAN HOURS REPORT PREPARATION ASSIST	8-728-8100 0 RIV

DETAILS: Investigation Report 4-84-003 forwarded to Wolf Creek Task Force for action (review, inspection and/or enforcement). Cover sheet and summary sheet of 4-84-003 to be issued as Inspection Report. Need to coordinate with OI in contacting the alleged.

REFERENCES: 4-84-003/OIR4-84-A-004

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