APPENDIX

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-445/83-27

Docket: 50-445 Construction Permit: CPPR-126

Licensee: Texas Utilities Generating Company (TUGCO)
2001 Bryan Tower
Dallas, Texas 75201

Facility Name: Comanche Peak, Unit 1

Inspection At: Comanche Peak, Unit 1, Glen Rose, Texas

Inspection Conducted: May 10-July 1, and September 9-22, 1983

Inspector: _____ 9-28-83
R. C. Stewart, Reactor Inspector Date
Reactor Project Section A

Approved: D M Hunnicutt _____ 9/28/83
D. M. Hunnicutt, Chief Date
Reactor Project Section A

Inspection Summary

Inspection Conducted May 10-July 1, and September 9-22, 1983
(Report 50-445/83-27)

Areas Inspected: Special, unannounced inspection of alleged improper construction practices expressed by Robert L. Messerly in an affidavit dated February 3, 1983, prepared for Citizens Association for Sound Energy (CASE) and in an interview conducted on April 14, 1983, by members of the NRC Office of Investigations Field Office, Region IV. The inspection involved 120 inspector-hours onsite by one NRC inspector.

Additional information was received from an individual, who requested confidentiality, that a former B&R millwright had drilled holes through rebar without the required engineering approvals. This supplemental inspection involved 10 inspector-hours onsite by one NRC inspector.

Results: Of the seven allegations regarding improper construction practices expressed by Mr. Messerly, five were found to be unsubstantiated. One allegation regarding improper documentation was found to be substantiated, however, the error was properly corrected by the licensee and appears to lack technical merit; and one allegation regarding the posting of NRC Form 3, could neither be refuted nor substantiated, however, it too appears to lack technical merit. No violations or deviations were identified.

Results of Supplemental Inspection

The allegation that unauthorized cutting of rebar during installation of "trolley tracks" in the fuel handling building is considered to be unsubstantiated. No violations or deviations were identified.

Details

A. Persons Contacted

Texas Utilities Services Incorporated (TUSI) Employees
B. G. Scott, Quality Engineering Supervisor
G. Tanley, General Superintendent
C. R. Hooton, Lead Civil Engineer
R. M. Kissinger, Project Civil Engineer
C. Fleming, Field Engineer

Brown & Root (B&R) Employees

W. Wright, Project Welding Engineer
B. Hauser, Field Engineering Superintendent
C. Osborn, Tool Crib Foreman

The NRC inspector also contacted other licensee and contractor employees during the course of the inspection.

Note: Prior to this inspection, separate and independent investigative interviews were conducted by members of the Office of Investigation Field Office, Region IV (see attached Report A4-83-005, dated May 20, 1983).

B. Alleged Improper Construction Practices

The NRC inspector, through an interpretative review of Mr. R. L. Messerly's affidavit, dated February 3, 1983, and his statements during his interview, April 14, 1983, determined that there were seven specifically alleged matters that required a detailed inspection effort to assess their technical merit and/or their potential impact on safety-related systems, component, and structures.

The seven areas of NRC concern which Mr. Messerly alleged to have occurred are summarized as follows:

1. That B&R employees drilled undocumented and unauthorized holes that cut through reinforcing steel and that such drilling and cutting was done at the direction of supervisors. Mr. Messerly provided a copy of a personal diary which, he alleged, reflected undocumented and unauthorized drilling.

2. That one of the main steam lines in Unit 1 was moved using the polar crane, thereby placing the section of pipe line in an unsafe stressed condition.

3. That he had cut through concrete reinforcing steel as directed by work instructions that were not in accordance with the approved method of documentation.

4. That tubular hanger/support steel anchor bolt holes were enlarged with a burning torch which he said was unauthorized.

5. That (Richmond) anchor bolts were not perpendicular to concrete surface and, therefore, unacceptable.

6. That stainless steel pipe attachments were welded on piping without an inerting purge.

7. That NRC Form 3, "Notice to Employees" was not posted on three main bulletin boards.

C. Inspection Findings

Allegation 1

1. Discussion

Mr. Messerly stated that during his assignment as foreman over the first crew responsible for drilling through concrete and reinforcing steel (rebar) during installation of cable tray and pipe hanger supports, he was ordered by his supervisors to loan out drill bits and/or drill undocumented and unauthorized holes through rebar.

To further support his allegation, Mr. Messerly named B&R employees responsible for the alleged improprieties and those who could substantiate his allegations. 1/

In addition, Mr. Messerly provided the NRC staff a copy of his personal daily diary in which he logged drilling of holes for electric cable trays/hanger supports and rebar cutting details. He stated that this diary also identified holes he drilled, in or through, rebar and concrete without having documentation and authorization.

2. Chronological Findings 1978-1982

In order to determine the magnitude of implication and the resulting findings of Mr. Messerly's allegations.

1/ See attached "Assistance to Inspection Report," Report A4-83-005, dated May 20, 1983

The NRC inspector reconstructed, through the use of record archives and interviews with site personnel, the onsite construction activities and QA/QC program being implemented in the specific area of concern during the period 1978-1979.

3. Rebar Cutting Capabilities

The NRC inspector found from B&R purchases that during 1975 through 1982, the type of onsite equipment (drills) capable of cutting through rebar and available to craft personnel were restricted almost exclusively to the (water cooled) type diamond core drill bits (rebar eater) and associated drill motors, purchased from Drillco Equipment Company, Inc., (Drillco) Miami, Florida. The Drillco water cooled diamond core drill bits purchased are hollow, tubular in shape, varying in sizes from 1/2" to 16" in diameter and from 2" to 14" in length. The drilling end has a series of carbide rectangular shaped teeth impregnated with industrial diamond dust. When worn, or dull, the bits can be reconditioned and reused.

The NRC inspector found that the initial core drilling requirements (1975 to 1978) were under the control of the concrete department. Drilling was restricted to investigative type core drilling (identifing concrete honeycomb, voids or cold joints) in the base mats (NRC Inspection Report 445/446/76-04 dated April 20, 1976).

In late 1977, record archives contain copies of the original "Core Drilling Procedure," MCP-13, dated September 27, 1977, and issued for implementation April 21, 1978. The procedure was developed for core drilling through walls and slabs for the purpose of installing pipe sleeves, conduits, instrumentation sleeves, etc. Penetrations which were shown on drawings or included in design documents prior to concrete placement and inadvertently omitted, or penetrations which were added by the architect engineer (A/E) but for which the installation information was not available to the field prior to concrete placement were covered by this procedure. The procedure was applicable for all core drilling required in the plant. Core drilling was assigned to the millwright department.

The procedure and its controlling document, "Core Drill Request Form," requires delineation of exact location, size and rebar location, and contains review and approval signoffs. This procedure continues to be the principal core drilling procedure (Revision 3, dated December 2, 1981). However, current policy (as determined by the cognizant project civil engineer and reflected in documented records) is the assignment of core drilling of 2-1/2" diameter and larger to the millwright department and 1/2" to 2" diameter core drilling to the steel fabrication department drilling crew. The NRC inspector also noted that "Core Drilling Request Forms" do not imply rebar cutting; in fact, rebar cutting has for the most part, been avoided where possible as stated by the project civil engineer during discussions with engineering personnel. This fact was observed by the NRC

inspector during his review of randomly selected "Core Drilling Request Forms" (1978 through 1982).

Construction records indicate that electrical cable tray, conduit hangers, and pipe hanger support installations were initially started in late 1978. This coincides with the formation of the steel fabrication department pipe hanger crew(s), special drilling crew (headed up by Mr. Messerly), and the requisition of the water cooled diamond core drills and motors by the steel fabrication department (of which Mr. Messerly was a member) on September 6, 1978. A record search indicated a Design Change/Design Deviation Authorization 2470, dated September 5, 1978, authorizing rebar cutting for Cable Tray Support No. 597. This was an initial rebar cut made on September 9, 1978, and identified by Mr. Messerly in his personal handwritten diary (see paragraph 6).

The primary anchor and fasteners utilized at CPSES for the attachment of cable tray supports, conduit supports, pipe hanger supports, etc., to concrete surfaces are the "Hilti" drilled-in concrete expansion anchor and "Richmond" screw anchor. The Richmond screw anchor is positioned prior to concrete placement, whereas the Hilti requires concrete drilling and placement at the time of component installation (a licensee representative stated, that based on purchase orders, over one million Hilti bolts 1/2" to 1-1/4" in diameter, have been installed to date). Drilled-in expansion bolts are bolts having expansion wedges so arranged that, when placed in a drilled hole and the nut tightened, the wedges are expanded and the bolt is securely anchored.

The most predominant means of drilling holes into concrete for expansion bolts is the use of Hilti power drills, using Hilti carbide masonry bits of the same nominal size as the bolt. This form of drilling does not have the capability to drill through rebar.

In limited access areas where the Hilti power drills cannot be used, a flexible Drillco drive drill with drill press/vacuum base and Drillco water cooled carbide/diamond bits are used. This form of drilling has the capability of drilling through rebar and was restricted to the steel fabrication department special drilling crew (headed by Mr. Messerly from September 1978 through October 1979).

For these two methods of drilling, no authorization is required for Hilti bolt installations (other than an approved hanger support installation "traveler" with its accompanying location drawings). A design change authorization is only required if relocation is beyond the drawing tolerance limits, or if rebar is encountered and requires cutting. Construction quality programs of this nature rely heavily on each individuals personnal integrity to adhere to prescribed procedure requirements.

A research of purchase orders for 1978 through 1979 conducted by the NRC inspector, indicated that only seven (Drillco) power drives that facilitate water cooling capability were purchased during that time frame. Two were issued to the millwright department and five were issued to the steel fabrication department (under the control of Mr. Messerly). Mr. Messerly requisitioned (from the B&R warehouse) three drill machines, with water cooling splash guards, and one flex shaft unit on September 6, 1978. An additional flex shaft unit was requisitioned by Mr. Messerly on October 6, 1978.

In discussing the method of drilling with the Drillco water cooled diamond bits with cognizant site personnel, the NRC inspector was informed that when drilling with the diamond core bits, water cooling is mandatory. The water provides two primary functions: it removes drilling debris (concrete/steel) as drilling progresses, otherwise the drill bit would bind; secondly and most important, without water cooling, the drill bit will readily "burn up," particularly when attempting to cut through rebar steel. In addition, a drilling foreman stated that, drilling equipment is heavy and bulky and drilling set-up time (mounting to walls or ceiling) generally takes half an hour to one hour. When drilling, the water cooling creates a concrete/water mist deluge requiring crew members (normally two) to wear rain type outer protective clothing.

4. Diamond Core Drill Bit Control

In verifying the purchase and control of the diamond core drill bits, the NRC inspector reviewed 21 B&R purchase orders awarded to Drillco dating from January 13, 1978 through February 13, 1980.

The NRC inspector found that of the total 21 purchase orders, 10 requisitions were initiated by the steel fabrication department general superintendent, representing 293 core drill bit purchases, and 11 purchase orders were intiated by millwright supervisory personnel representing 122 core drill bit purchases.

In reviewing the accompanying warehouse requisitions contained in each of the purchase order files, the NRC inspector noted that in the case of the steel fabrication department orders, all requisitions bore the signatures of Mr. Messerly or his department personnel. Correspondingly all equipment ordered by the millwrights was issued to and signed for by a cognizant millwright foreman.

The NRC inspector conducted an inspection at each of the respective department tool crib areas (millwrights and steel fabrication). The millwrights maintain a tool crib area enclosed by heavy gauge wire screen and a locked counter door access. The tool crib attendant maintained a clip board type log specifically for the control of Drillco diamond core bits. The log identified the individual, along with checkout and return dates. Entries in this log date back to October 16, 1978.

The steel fabrication department maintains a small separate building where the hanger installation crew controls the drilling equipment and bits. The NRC inspector observed that the Drillco diamond core bits were separately stored in a large wooden cabinet with an accompanying combination lock. The method of control over drills and bits was discussed with the cognizant foreman. The foreman stated that he had been in charge of diamond core bits and the fabrication department drilling crew since April of 1982. He stated that he did not cut any rebar without an approved "request for rebar cutting" form, which he further demonstrated by utilizing an inprocess form dated June 14, 1983, No. 135. The NRC inspector determined that this was in accordance with the prescribed procedure, CC-P-47, "Request for Rebar Cutting," dated June 17, 1981.

In interviewing former supervisors, foremen, and members of diamond core drilling crews 1/, all interviewees stated that the present method of controlling diamond bits has been in effect since the initial purchase of Drillco bits; i.e., only cognizant supervisors, foremen, or drill crew members have access to the diamond bits (those interviewed included five former members of Mr. Messerly's drill crew).

5. Procedure Reviews and Procedure Implementation

During the inspection, the NRC inspector reviewed B&R procedures and procedural implementation applicable to concrete core drilling and drilling requirements for Hilti bolt installations.

Included in the review were the original versions of issued procedures from archive files that were applicable during 1978 and 1979.

Applicable procedures reviewed included the following:

- B&R Procedure 35-1195-CEI-20, "Installation of 'Hilti' Drilled-In Bolts," dated May 31, 1978;

- B&R Procedure 35-1195-CEI-20, "Installation of 'Hilti' Drilled-in Bolts," Revision 8, dated January 26, 1983;

- TUSI Procedure QI-QP-11.3-2, "Cable Tray and Conduit Hanger Inspection," dated June 3, 1978;

- B&R Procedure 35-1195-MCP-13, "Core Drilling," dated September 27, 1977;

- B&R Procedure 35-1195-MCP-13, "Core Drilling," Revision 1, dated April 21, 1978;

- TUSI Procedure CP-QP-11.2, "Surveillance and Inspection of Concrete Anchor Bolt Installation," dated December 13, 1979;

- B&R Procedure 35-1195-CCP-47, "Request for Rebar Cutting," dated June 17, 1981;

- TUSI Procedure QI-QP-11.2-1, "Concrete Anchor Bolt Installation," dated December 13, 1979; and

- G&H Specification 2323-SS-30, "Structural Embedments."

The principal construction procedure applicable for Hilti bolt installation was B&R Procedure 35-1195-CEI-20, originally issued May 31, 1978. Section 3.2.1 states, "Expansion bolt holes shall not be drilled into concrete reinforcing steel unless approved by the Gibbs & Hill, resident engineer or his representative." This requirement has been retained in all subsequent (eight) revisions to the procedure. The statement is currently found in Section 3.1.2.1 of Revision 8, dated January 26, 1983.

In discussing the method of "engineering approval" established in the period 1978-1979 with the cognizant project civil engineer, the NRC inspector was informed that an "Interference Task Force" was established in September of 1978, composed of three TUSI project civil engineers who coordinated any design changes or rebar cutting with the cognizant onsite, A/E Civil Design Engineer. Where interference between the expansion bolt and reinforcment was encountered, the bolt location was generally adjusted within the tolerances allowed by the design drawings, otherwise a design change/design deviation authorization (DC/DDA), design change authorization (DCA), or a component modification change (CMC) was initiated and issued. The various forms of design change documents have subsequently been reduced to the DCA and CMC forms of design change approval. Where interference with reinforcing steel cannot be avoided and the cutting of rebar is required, the approval authorization is initiated by the A/E site project civil engineer who evaluates all requests for cutting rebar. The criteria for such evaluation is based on design parameters determined by the A/E. Final design approval for any rebar cutting remains the responsibility of the A/E's New York office.

The A/E site project civil engineer maintains a CMC DCA issuing log, for rebar cutting. The earliest entry noted by the NRC inspector is CMC 0188, dated October 3, 1978. The information on the DCA or CMC; i.e., number of rebar cut, size and location is transferred to a separate set of building structural drawings especially established for showing "as-built" rebar cutting entitled "rebar drawings cutting criteria." In interviews with the cognizant A/E site project civil engineer assigned during 1978-1979 1/, the NRC investigators were informed that although requests to cut rebar came from a number of different B&R craft personnel, he, almost always, gave the approving CMC to Mr. Messerly, since his crew did the rebar cutting. He further stated that he had no knowledge of rebar cutting without

engineering approval. The NRC inspector subsequently conducted a detailed review and documentation verification of the above procedures.

6. Messerly's Diary (Log)

During the interview on April 14, 1983, Mr. Messerly provided the NRC investigators with a copy of his personal diary log entitled, "Start of New Crew and New Operation Rebar Cutting Detail." The diary consists of 24 handwritten pages of columniation entries on standard 8-1/2" x 11" paper dating from September 7, 1978, through October 17, 1979. Five columns delineating print numbers (cable tray/hanger support numbers); building location; rebar cut; day and date; and position (floor, wall, flex, DC/DDA, DCA, or CMC number) were recorded by Mr. Messerly. In addition, various notes regarding work activities are interspersed thoughout the 24 pages.

During a detailed review of the diary, the NRC inspector observed that (barring errors due to legibility) Mr. Messerly recorded drilling a total of 2976 holes associated with 415 hanger/supports. Of the 2976 holes drilled, 280 rebars were cut. This means that rebar requiring cutting was encountered in less than 10% of the holes drilled. All rebar cuts, as noted by Mr. Messerly, were identified by either a DC/DDA, DCA, or a CMC. A total of 84 such authorizations were identified.

Twenty-one of these rebar cuts were related to nonsafety-related buildings; therefore, the NRC inspector did not review these particular authorizations. In addition, of the 2976 holes drilled, 247 were identified by Mr. Messerly as being in the turbine building.

Of the remaining 63 documents authorizing rebar cutting, the NRC inspector made a random selection of 32 authorizations for a comparative verification against Mr. Messerly's diary. The NRC inspector verified 132 rebar cuts identified in the 32 authorizations. In all cases, the location, size, and number of rebar were identified on the DCA or CMC. In addition, all 132 cut rebars were traced to, and identified on, the specific building structural drawings, "rebar drawings cutting criteria," with the corresponding authorizing document number.

There was no rebar cutting, as identified by Mr. Messerly in his diary, that does not have a corresponding authorization number. It was also observed by the NRC inspector, that a handwritten note in the diary (assumed to be written by Mr. Messerly) states "Ordered to drill by (name withheld) - floor S.W.I." Adjacent to the date July 23, 1979, and Hanger/Support Number SW-2-035-004-J03R. Under the rebar cutting column Mr. Messerly noted, "None ?". Mr. Messerly also noted that eight holes were drilled. During

an investigation of this particular support (SW-2-035-004-J03R) in the service water intake structure (S.W.I.), the NRC inspector found that the support was deleted on July 30, 1980.

The original bolt holes were subsequently grouted and concrete surfaces painted. It is assumed that, by indicating a question mark after his notation, Mr. Messerly was not a witness to the actual drilling of the specific holes drilled by his crew members, and since seven persons formerly associated with drilling operations have stated 1/ that they have no knowledge of unauthorized rebar cutting. The NRC inspector did not pursue this matter further.

It was also observed by the NRC inspector that, during a verification review of the 32 DCA's and CMC's identified by the Mr. Messerly's diary, CMC 3307 identified 48 rebar cuts in the service water tunnel alone. This was also mentioned by Mr. Messerly during his interview. All 48 rebar cuts were traced to the design change authorization documents.

Although Mr. Messerly's diary consistently identified the percentage of rebar cut, the established G&H design criteria considers any reduction in individual bars a 100% loss of the bar.

The NRC inspector found no unauthorized rebar cutting identified by Mr. Messerly in his handwritten diary.

7. Conculsion - Allegation 1

Mr. Messerly's allegation that B&R employees drilled undocumented and unauthorized holes that cut through reinforcing steel could not be substantiated for the following reasons:

a. Mr. Messerly's statements lack sufficient specificity as to who he "loaned" the water cooled diamond drill bits to cut rebar, or who specifically ordered him to cut rebar when and where.

   Former supervisors deny ordering Mr. Messerly to "loan" out drills or cut unauthorized rebar, nor did any of the five former crew members support this contention.

b. In the event an unauthorized person did use a water cooled diamond bit, it is highly unlikely that cutting of rebar would be accomplished without the accompanying water cooling drive equipment, or if a drill bit was "loaned" for drilling concrete only, it is conceivable that drilling would be successful without water cooling, but not necessarilly resulting in defective workmanship.

c. Although Mr. Messerly implied that his personal diary contained identification of unauthorized and undocument rebar cutting, unless shrouded by omission or misinformation, the NRC inspector could not identify a rebar cut that was not authorized by DC/DDA, DCA, or CMC.

d. Although the method of diamond bit accountability/control exhibits a weakness, the need for relying on individual personal integrity would not be diminished. The inspection findings did not, nor do not, suggest indiscriminate cutting of rebar was done. Documented records exhibit a purposeful avoidance of rebar interference. Furthermore, the Messerly diary demonstrates that less than 10% of the recorded total holes drilled by his crew encounted rebar that required cutting.

There were no violations or deviations identified in this area of the inspection.

Allegation 2

1. Discussion

Mr. Messerly stated in his affidavit of February 3, 1983, and in his interview on April 14, 1983, that he had witnessed the use of the Unit 1 reactor containment building polar crane by a pipefitter supervisor in relocating a main steam line in a manner that put undue tension on the pipe. In addition, Mr. Messerly provided the names of persons involved with the movement of the steam line 1/.

2. Conclusion - Allegation 2

Although B&R personnel named by Mr. Messerly contradicted his allegation 1/, the NRC inspector conducted an independent review of the onsite documented records regarding this matter.

It was observed by the NRC inspector that the specific 32-inch steam line mentioned by Mr. Messerly is, Loop 1, Line number MS-1-RB-001-1302-2, and the reactor building polar crane was utilized in a vertical lift to assist repositioning a section of this permanent piping. The licensee has maintained a documented engineering record of the specific line movement. The NRC inspector noted that the movement of the line was necessary in order that a large section of temporary piping (attached to the steam generator feedwater nozzle and previously used for water flushing) be removed and to relocate the permanent section of the main steam line that had "sagged" due to the weight of the temporarly installed flushing pipe. The record folder contains meeting notes (memorandum) which reflect discussions with Westinghouse (NSS Supplier) and the cognizant A/E representatives prior to the work activity, in addition to establishing engineering limitations and acceptability. The line was moved on January 16, 1982 under the

supervision of the field mechanical engineering group, and was witnessed by an engineering representative who observed the installation and use of the dynamometer (to register crane lifting loads) throughout the operation. The lift connections and applied forces were recorded and retained in the file. The lifting points were consistent with the hanger locations to simulate the permanent support system. The as-built configuration was analyzed for stress and the acceptability of the line confirmed. In addition, the recent completion of the "Reactor Hot Functional Test" did not reveal any undue stress conditions. This allegation cannot be substantiated.

No violations or deviations were identified in this area of the inspection.

Allegation 3

1. Discussion

During Mr. Messerly's interview on April 14, 1983, Mr. Messerly (in referencing his personal diary) stated that he initially started drilling rebar based on the instructions of three-part memos, DC/DDAS, and subsequently the CMC. Although Mr. Messerly did not allege that the CMC was an improper document, he did imply that the DC/DDA and the three-part memo were not the right documentation.

2. Conclusion - Allegation 3

During the NRC inspector's review of Mr. Messerly's personal diary (paragraph 6), it was observed by the inspector that the first four holes (rebar cuts) he drilled on September 7 and 8, 1978, for cable tray hangers 596, 642, and 643, Mr. Messerly made the notation "RFIC". In researching the archive files, the NRC inspector found the original Request for Information or Clarification (RFIC) documents, Request Nos. EH-14 and EH-15, dated August 29, 1978. Although the instructions authorizing rebar cutting contained in the RFIC were correct and authorized by the cognizant A/E design engineer, the RFIC document was not the "approved" method of authorizing a design change. The NRC inspector noted that this documentation error was corrected by CMC No. 00766 issued on October 16, 1978. The original document, the RFIC contained a note to this effect. On September 9, 1978, Mr. Messerly's diary contains a reference to DC/DDA No. 2489 for two rebar cuts for hanger No. 597. In researching this particular DC/DDA, the inspector found that DC/DDA No. 2489 was not related to hanger No. 597. The NRC inspector found that DC/DDA No. 2470 correctly identified the rebar cutting authorization. The location and number of rebar cut was also traced to CMC No. 01146, dated September 20, 1978, and to the as-built building structrual drawings, "Rebar Drawings Cutting Criteria." This allegation by Mr. Messerly was substantiated; however, the original documentation error was identified a short time after its occurrence and immediately corrected and did not impact on plant safety.

No violations or deviations were identified in this area of the inspection.

Allegation 4

1. Discussion

During Mr. Messerly's interview on April 14, 1983, and as stated in his February 3, 1983 affidavit, Mr. Messerly indicated that anchor bolt holes in tubular steel hanger supports were enlarged with a burning torch in order to compensate for the angularity of the previously installed (Richmond) anchor bolts, rather than redrill the holes.

2. Conclusion - Allegation 4

The results of the interviews of eight B&R employees, whose names were provided by Mr. Messerly and alleged to have knowledge concerning the improper use of cutting torches on hanger material, is contained in the attached "Assistance to Inspection Report." 1/ Two individuals stated that they recall an instance during a redesign modification of a hanger where it was discovered that holes had been enlarged by a burning torch, therefore, that portion of the hanger was scrapped.

During the onsite followup inspection concerning this matter, the NRC inspector discussed the use of cutting torches with the licensee's welding engineers and fabrication department engineers. The NRC inspector was informed that the use of cutting torches is not prohibited, provided it is done in accordance with prescribed B&R procedures and/or ASME, Section III, Subsection 4211 (thermal cutting). In the case of tubular hanger installations, the preferred method of correction for hole misalignment is to drill offset hole(s). This has been done on many occasions via the design change CMC document. The cognizant project engineer, responsible for approving and issuing CMC's for hanger modifications, stated that he knew of no CMC that involved authorization of hole enlargement or hole relocation on tubular hanger supports utilizing thermal cutting; however, thermal cutting has been permitted as necessary on other types of carbon steel supports, base plates, etc.

The NRC inspector conducted a walk-through of the containment building to examine accessible installed tubular hangers, specifically in the plant areas mentioned by Mr. Messerly during his interview. The inspector examined approximately 60 hangers at the 905' and 860' elevations in the containment building. Although limited in visual accessibility to each 1" or 1-1/4" drilled hole in each section of the tubular hangers, the NRC inspector did not find any hole that was enlarged by a cutting torch.

In addition, the NRC inspector discussed the subject of thermal cutting with the cognizant QC supervising inspector who was involved with inspections of tubular hanger installation during 1980-1982. The QC supervisor stated, that neither he nor any inspector discovered

an installed tubular hanger hole having been enlarged by a cutting torch.

Based on the lack of specificity by Mr. Messerly, the lack of corroborative testimony by Messerly's witnesses, interviews by the NRC inspector with cognizant site personnel, and the (limited) examinations of installed hangers, this allegation could not be substantiated.

There were no violations or deviations identified in this area of the inspection.

Allegation 5

1. Discussion

During the interview on April 14, 1983, Mr. Messerly stated that Richmond Insert anchor bolts installed between elevations 905' and 860' in the reactor containment building have not been installed perpendicular to the concrete surfaces and, therefore, are unacceptable. In addition, Mr. Messerly stated, ". . . whatever angle it is, we would drill it at that angle so that it would come through the tube (i.e., tubular steel) and when it comes out the other side of the tube, it comes out as close to center as we could get it."

Mr. Messerly also stated, "Just go out there and pull any . . . studded rod out of there, pull three of them and two of them is [sic] crooked."

2. Conclusion - Allegation 5

During the NRC inspector's onsite follow up of this matter, the inspector found that the B&R Procedure CP-CPM 9.10, "Fabrication of ASME-Related Component Supports," (original issue 12/28/78) is the primary construction installation procedure to be implemented and followed by the hanger installation crews. The "General Fabrication and Installation Requirements," Section 3.3.1.2 "Installation Tolerances," states in part,

"Field Fit Tolerances

"The tolerances discussed above shall be maintained for support fabrication activities. However, if during the installation, the support won't fit, the members may be "field fit" provided the piping and elevation tolerances shown below have been maintained. All other tolerances regarding axial location, alignment, and base plate attachments must be adhered to unless otherwise noted on the drawing."

In addition, Section 3.3.2, states in part,

> ". . . Surfaces of bolted parts in contact with the bolt or nut shall have a slope of no more than 1:20 with respect to a plane normal to the bolt axis. Where the surface of a high strength bolted part has a slope or more than 1:20, a beveled washer shall be used to compensate for the lack of parallelism."

During discussions with the cognizant design engineers concerning the specific installation requirements relative to the limiting perpendicular angle of the anchor bolts (Richmond Inserts), the NRC inspector was informed that the limiting perpendicular angle of anchor bolts (Richmond Inserts) to the concrete surface is, aside from the requirements of Section 3.3.2, is handled on a case-by-case basis. No enlargement of the existing predrilled holes in the tubular steel is permitted without prior approval; however, numerous CMC's have been issued wherein offset holes have been authorized. The approval is generally accompanied by the requirement that the large square bolt washer be welded in place using a 1/4" fillet on 2 sides. The cognizant engineer further stated that the requirement above only applies to safety-related supports (ASME III, Subsection NF, Classes 1, 2, and 3 component supports). Enlargement of the predrilled holes in the tubular steel for nonsafety supports is permitted without prior engineering approval.

Since Mr. Messerly specifically referred to the 860' and 905' elevations in the reactor containment building in his testimony, it was assumed by the NRC inspector that his specific concern was in reference to the permitted angularity of the safety-related Richmond Insert anchor bolts. Mr. Messerly was apparently of the opinion that the anchor bolt should be precisely perpendicular to the concrete surface, which appears to be a misunderstanding on his part of the installation specification. Furthermore, Mr. Messerly's testimony reflected his awareness and knowledge of the procedural requirements, therefore, it must be assumed that Mr. Messerly did not ignore procedural requirements and did not indiscriminately enlarge predrilled tubular steel holes in safety-related supports. Further, that any offset or enlargement done by Mr. Messerly had prior engineering approval as required. As noted in Allegation 4, paragraph 2, the NRC inspector conducted a limited visual examination of approximately 60 hanger supports at the 905' and 860' elevations in the containment building. During the examination, the NRC inspector found no hole enlargements or anchor bolt angles (parallelism of bolt nut surface to washer surface) that appeared to violate the above installation specifications. It is concluded by the NRC inspector that this specific allegation appears to be more of a design concern by Mr. Messerly, than an improper installation construction practice having been implemented by him.

The need for the Richmond Insert anchor bolt to be precisely perpendicular to the concrete surface is not required according to the documented criteria established by the licensee, therefore, this concern alleged by Mr. Messerly is not substantiated.

There were no violations or deviations identified in this area of the inspection.

Allegation 6

1. Discussion

During Mr. Messerly's interview on April 14, 1983, Mr. Messerly stated, "There was a welding foreman out there that done [sic] a lot of welding illegally without documentation, such as lugs on pipes without purges." In addition, Mr. Messerly identified three individuals who would have knowledge of attachments (lugs) being welded on pipe without an inerting purge 1/, with specific reference to the 832' elevation in the reactor containment building.

2. Conclusion - Allegation 6

As noted in attachment 1/, two individuals identified by Mr. Messerly were interviewed concerning their alleged knowledge of lugs improperly welded on to stainless steel pipe without purging the pipe when required. Both interviewees denied any knowledge of improper welding activities.

During this inspection, the NRC inspector conducted an onsite follow up review of this matter.

The licensee's pipe welding procedures had been established prior to the initial piping installation early in the construction phase. The procedures and implementation activities had been inspected and documented on numerous occasions throughout that phase of construction by the NRC senior resident inspector and independently by NRC regional staff personnel. Therefore, during this inspection, the NRC inspector limited the review to pipe welding purge requirement established by the licensee.

The NRC inspector observed that the primary welding procedures associated with safety-related piping are B&R CPM-6.9, Appendix D, "Welding and Related Processes," and B&R Inspection Procedure QI-QAP-11.1-26, "ASME Pipe Fabrication and Installation Inspection." Paragraph 3.5 of this procedure, states, in part,

> "Purging shall be maintained for welding of attachments to stainless steel piping having a wall thickness of 1/4 inch or less for field welds only. This may be waived on a case-by-case basis by the PWE and Engineering. This waiver shall be documented on the applicable WDC."

In discussing this matter with the cognizant project welding engineers, the NRC inspector was informed that when a welding purge is required for attachment welds, the requirement would be noted on the weld data card (WDC) and a "Hold Point" established for verification by a QC inspector. However, in instances where the purge is waived, an interoffice memo waiving the purge is attached to the WDC. The interoffice memo is controlled by a chronological numbering system and filed within the permanent record files. It was further pointed out by the B&R welding engineers that the majority of stainless steel piping at the 832' elevation have pipe wall thickness in excess of the limiting 1/4" wall, therefore, an inerting purge would not be required for weld of attachment lugs.

Based on the fact that prior NRC inspections have not identified a concern in this area, that Mr. Messerly's allegation lacks specificity (i.e., safety-related piping, pipe line numbers, size, location, etc.), that the majority of stainless steel piping at the 832' elevation exceeds 1/4" wall thickness, and that persons named by Mr. Messerly did not support the allegation, this allegation was not substantiated.

There were no violations or deviations identified in this area of the inspection.

Allegation 7

1. Discussion

It was observed by the NRC inspector in Mr. Messerly's affidavit of February 3, 1983, and during his interview on April 14, 1983, he stated he did not remember seeing the posting of a copy of NRC Form 3, "Notice to Employees," on three main onsite bulletin boards.

2. Conclusion - Allegation 7

The Code of Federal Regulations, Part 50 (10 CFR 50), was revised by 47 FR 30452 to add 10 CFR 50.7, "Employee Protection." The change was published July 14, 1982, and had an effective date of October 12, 1982. An important element of the change is that of a requirement to post NRC Form 3 at locations where the form can be readily viewed by employees on their way to or from their place of work.

During a prior review of this matter by the NRC senior resident inspector (SRI) (see NRC Inspection Report 50-445/83-03; 50-446/83-01, dated March 28, 1983), the NRC Form 3 was observed by the SRI to be posted in early January 1983. However, the precise date (between October through January) of the posting of NRC

Form 3 could not be established. B&R personnel records indicate that Mr. Messerly was terminated on December 6, 1982.

The allegation cannot be refuted nor substantiated. Furthermore, the matter lacks any technical merit relative to an impact on the safety of the plant.

There were no violations or deviations identified in this area of the inspection.

SUPPLEMENTAL INSPECTION

September 9 - 22, 1983

1. Discussion

As noted in the attached assistance to NRC inspection report, "Supplemental," dated September 7, 1983 2/, during the course of an unrelated investigation, information was received that a former B&R millwright had drilled holes through rebar without the required engineering authorization.

During the period September 9 - 22, 1983, the NRC inspector conducted an onsite follow up on this matter.

From the information provided by the interviewees, the NRC inspector identified the specific "Trolley Tracks" 2/, as the drum and spent filter handling equipment, liner trarsfer trolley process aisle rails, located on the 810'-6" floor level, in room 252, of the fuel handling building.

The system is currently in the preoperational testing phase; however, this system is not a safety-related system. In reviewing the construction documentation records regarding the installation of the rail assemblies, the NRC inspector found that the rail base plates, rail clips, drilled Hilti anchor bolts, and rails were installed per drawing, "Anchoring Details for Radwaste Solidification System," Figure 39, Sheet 5 of 5, and by direction of Design Change Authorization (DCA) 7041, Revisions 4, 8, and 9, dated October 22, 1980, October 28, 1982, and November 11, 1982, respectively. It was observed by the NRC inspector that Drawing Figure 39, Sheet 5 of 5, contained the following pertinent notes, "2: Expansion bolts and base plate may be moved in east-west direction to avoid interference with rebar running in north-south direction." and, "3: For rebar running in east-west direction, holes may be drilled through the uppermost #18 bar @ only one rail location and expansion bolts shall be installed through the hole (it is assumed that bar interference shall occur at any one rail only)."

2/ See attached assistance to inspection report "Supplemental," dated September 7, 1983, Report No. A4-83-005.

In addition, Revision 8, of DCA 7041 directed the addition of extending the length of the rails from the original 24'-3" long to 27'-6" (3'-3" section added to east end); also, Revision 9 permitted the modification of Hilti bolts (shortening) to avoid cutting any additional rebar.

The NRC inspector met with the superintendent of the millwright department and interviewed millwright craft personnel that were directly involved in installation of the rail assemblies. During the interviews, the NRC inspector found that the rail assemblies were installed during two different time periods. Although actual dates were not established, it appears that the initial 24'-3" rail sections were installed in late 1982 and the 3'-3" extension sections were installed early in 1983. The individual interviewed on September 1, 1983 2/, stated that he was not aware of the 3'-3" extension of the rails; therefore, his reference to his work activities involved only the installation of the initial 24'-3" rail sections.

In addition, it has been established that, aside from the core drilling foreman, five millwrights and one millwright foreman were directly involved in the installation of the base plates and rail assemblies. (Three of the millwrights and the millwright foreman were individuals also interviewed.)

2. Inspection Findings

As a result of the onsite followup inspection, records review, and interviews with personnel, the inspection findings are as follows:

a. As stated by the millwright interviewed on September 1, 1983 2/, and acknowledged by other millwrights, only the east-west, #18 rebar, running parallel with the east-west rail, was drilled through to accommodate the 1/2" Hilti bolts which secure the rail base plates to the 810'-6" floor. This rebar cutting was authorized per Note 3, Drawing Figure 39, Sheet 5 of 5, DCA 7041.

b. The alleger stated that the 3'-3" extension rails were installed in accordance with the DCA 7041, and that rebar was drilled through for the south rail Hilti bolts by the steel fabrication department drilling crew and that no unauthorized rebar was cut during installation of the 3'-3" rail extension.

c. The millwright foreman stated that during installation of the 24'-3" rail base plates, the steel fabrication department drilling crew foreman arrived with the "rebar eater" drilling equipment by himself, therefore, he assigned one of the millwrights to assist the drilling crew foreman in drilling the holes in which rebar required being cut. He further stated that only rebar that was authorized to be cut per the DCA was cut.

d. During the inspection, two of the millwrights interviewed stated that north-south rebar was encountered during drilling Hilti bolt holes for base plates for the north rail and that since cutting of the particular rebar was not permitted by the DCA, the Hilti bolt was modified (shortened) as authorized by Revision 9 of DCA 7041.

The NRC inspector had a TUGCO licensee representative locate and verify the modification of the specific Hilti bolt. The bolt was located at the west end of the north rail and further supports the millwright's contention that no unauthorized rebar was cut.

e. In discussing the use of the core drilling equipment with the craft supervisory personnel, the NRC inspector was informed that there is no hard set policy as to who can or who cannot use the core drilling equipment as long as the equipment is used properly and the drilling being done is authorized and directed by craft foreman or supervisory personnel. As with the millwright interviewed September 1, 1983 2/, wherein he stated that when the core drilling foreman did not show up, he (the millwright) completed drilling the remaining (approximately 10) 1/2" diameter holes for the south rail base plate Hilti bolts.

f. The NRC inspector found no evidence to support the allegation that unauthorized cutting of rebar was done during installation of the "Trolley Tracks" for the drum and spent filter handling equipment.

3. Results

The allegation that unauthorized cutting of rebar was done during installation of the drum and spent filter handling equipment process aisle rails is considered to be unsubstantiated.