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TERA

EXEMPT ✓

OCT 16 1981

MEMORANDUM FOR: William L. Fisher, Acting Chief
General Programs Section, PDB

FROM: G. C. Gower, Senior Program Development Specialist, PDB

SUBJECT: SOUTH TEXAS PROJECT AND ZIMMER

Enclosed are copies of the summary reports prepared on South Texas (STP) and Zimmer as a result of reviewing the headquarters inspection files, and the draft report of investigation (81-13) on Zimmer.

There is a difference in the two reports primarily because of the approach taken. STP was looked at first with a more involved set of guidelines; whereas in the case of Zimmer approximately the same time was expended on file review, but significantly less time was devoted to report preparation.

G. C. Gower, Senior Program
Development Specialist, PDB:PDA:IE

Enclosures:
As stated

cc: N. C. Moseley
J. Taylor
S. E. Bryan
J. Stone

Distribution:

GCGower
PDB r/f ✓

Study was a literature search only and had no benefit from site visits, interviews etc.

OFFICE	10/16/81						
NAME	GCGower:mb						
DATE	10/16/81						

Review of the South Texas Project
Construction Inspection Coverage -
Allegations and Their Investigation

A. Purpose

The purpose of this review was to gather available information and prepare lists of significant problems, from which determinations might be made relative to basic causes behind the problems; determine if the defined IE inspection program could have identified the problems and then develop recommendations for program changes if needed. The attached note (Attachment A) provides additional guidance on this effort.

B. Method

The inspection file folders on the South Texas Project were reviewed starting in 1974 (predocketing) up through 1979. These records include the investigation reports and enforcement correspondence.

HL&P's response to the NRC Order to Show Cause, Congressional testimony and Commission correspondence were also reviewed.

From the inspection reports lists of allegations (1977 thru 1979) were developed and later sorted into eight problem areas (Appendix 1A). Whether or not each allegation was substantiated is noted in the margin.

The HL&P's response, noted above, was reviewed to obtain a list of other significant problems developed by the HL&P and B&R Safety-Related Welding Task Force (Appendix 1C). This task force was set up to help HL&P respond to the Show Cause Order.

A likely basic cause for each of the significant problems was developed to the extent possible from the written record and discussions with other PDA staff. (Appendices 1B and 1C).

To determine the degree to which the routine IE inspection program could have identified the problems indicated by the allegations and those found as a result of their investigation, comparisons were made in each case against relevant parts of the IE inspection procedures and where some degree of coverage was apparent the inspection procedure numbers were given. (Appendices 1A, 2A, 2B, 2C, 2D, and 2E).

In order to determine the extent to which routine inspections made at STP (thru 12/79) found the same - or quite similar - problems identified as a result of allegations and their investigation, a review of each routine inspection report was made and each identified problem that

appeared to be the same, or reasonably similar, was listed (Appendix 3). Along with this listing notations were made whether or not enforcement resulted.

Also during the file review a listing was made of those persons in the licensee and contractor organizations that attended the exit discussions following each routine inspection (listing not included here).

C. Discussion

1. Appendix 1A provides a listing of STP allegations sorted into eight problem areas. This listing served to group the allegations so that one might speculate as to the basic causes behind the identified problems. Appendices 1A and 1B deal with allegations and 1C covers the finding from the licensee's Task Force on Safety-Related Welding Practices. The eight problem areas identified are as follows:

   a) Records Falsification and QC Documentation (21)*

   b) QC Inspectors Threatened Undue Presssures (12)

   c) Inadequate Support for QC Inspectors (5)

   d) Procedural Violations (17)

   e) QC Inspectors and Workers not Qualified (3)

   f) Nonconformance Reporting System Inadequate (4)

   g) Document Control Problems (2)

   h) Miscellaneous (8)

   Items a, b and d appear significant due to the numbers of allegations listed. Item d, Procedural Violations stand out in that 11 of the 17 allegations were substantiated. Further verification of this problem is evident from the enforcement history which shows that from 1976 thru 1979 there were 23 citations out of 36 total, or 64% of the enforcement actions, were against Criterion V (Instructions, Procedures & Drawings). The record indicates that early evidence of a trend had been established in this problem area by late 1978 since 11 citations had been issued against Criterion V by that time.

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* number of allegations in problem area.

Item e) dealing with unqualified workers and QC inspectors is not noteworthy in terms of the number of allegations (only 3 - none substantiated) but appears to be tied into part of Appendix 1C where basic causes have been assigned to the 9 significant problems identified by the task force on welding. With one exception, the causes attributed to these findings, if correct, point in one way or another to the qualifications and experience of welding engineers, welding foremen, NDE personnel and QC inspectors, all of which may have been in short supply within the area at the time.

With respect to item a) Records Falsification, 9 of the 21 allegations were substantiated. The first allegation occurred in 1977 and was confirmed. It was not until the first investigation in April 1979 that the second and third allegations were substantiated. From 5/79 thru 12/79 almost every allegation was substantiated. The basic causes listed for this problem are speculative since they have been inferred from the situations described. The problems in this area at STP were, for the most part, in the Cadwelding area and to a lesser extent in concrete placement. Several points seem evident from this problem at STP (and other recent cases): 1) it is doubtful that most of the record falsification problems would have been detected had it not been for allegations ; 2) the same, or similar problems, are likely to exist to some extent in other construction areas but without allegations they probably will go undetected and, 3) if the above is correct, new inspection/ investigation methods and techniques are needed to reduce and control this problem.

Regarding item b, QC Inspectors Threatened and Undue Pressures Applied, the first allegation occurred in July 1977; two followed in 1978 and the rest (9) were made in 1979. All were the subject of investigations. The last series of eight occurred in late 1979 and prompted the special investigation (79-19).
The record is quite clear that the basic cause behind the problem stemmed primarily from pressures to move plant construction along or prevent further delays. There is evidence that animosity built up between QC and construction forces for various reasons, some of which were: QC inspectors felt they were doing in-process inspections normally done by construction workers; QC inspectors were not given sufficient time to complete their inspections before the next work phase was scheduled to start; some QC inspectors lacked proper training and qualifications in the areas they were assigned to inspect; and there were repeated instances when QC inspectors were overruled by their own supervision.

Item c above, Inadequate Support for QC Inspectors, is listed as a separate problem; however, the relationship this set of allega-

tions has with item b above is quite apparent. Three of the five allegations were substantiated. It is difficult to pinpoint a single basic cause for this problem. The record indicates several factors were involved such as: management's (B&R) posture relative to QA/QC as reflected in parts of their brochure titled, "B&R Quality Assurance Program at the STP Jobsite;" there is evidence that some QC inspectors were not fully trained and qualified in the areas they inspected and quite often support for QC positions lessened or faded away as they moved to higher levels in the management chain.

The problems identified by allegations and sorted into the areas shown as items f, g, and h, above, do not stand out as significant problems to the extent the other five items do as described above. Fourteen total allegations were sorted into these three areas; seven were not substantiated, five were, and two were not investigated. Basic causes are listed for items f and g; however, no attempt was made to list causes for item h due to the mixed nature of the allegations placed in this group.

2. Could the IE Inspection Program Identify the Problems and Their Basic Causes?

Following the eight problem areas identified in Appendix 1A are sections titled, Possible IE Inspection Procedure Coverage. In this section IE Inspection Procedure numbers are listed where there appears to be inspection requirements relevant to the allegations or indicated problem areas. In several cases procedures are listed that have effective dates in 1980 and would not have been in use at STP at the time of interest.

The same determinations as to possible inspection coverage of the 79-19 STP investigation findings and the result of the licensee's Special Task Force on Safety-Related Welding are shown in Appendices 2A thru 2E where the findings are matched up with relevant inspection procedures.

Few IE inspection procedures were found to cover the allegations/problem areas listed in Appendix 1A. Those that did were general in nature and limited to assuring that the licensee had QA/QC procedures covering the areas. Two inspection procedures, 35060B and 35061B (which were made effective 7-1-80 and 4-1-80 respectively) were found to have rather specific inspection requirements that could have touched upon the problem areas had they been issued and implemented.

3. Routine Inspection Coverage

There is good IE inspection procedure coverage of the problem areas indicated by the 79-19 investigation findings and the results of the licensee's Special Task Force on Safety-Related Welding as shown in Appendices 2A thru 2E. However, the degree to which the procedures, if implemented, would have turned up the same, or similar, problems is thought to be strongly influenced by the experience, practical knowledge and technical depth of the inspectors. This is especially the case in the problem areas listed in Appendices 2B, 2C, 2D and 2E.

In the routine inspection areas having to do with determining the qualifications of welders, NDE personnel, and QC inspectors, there appears to be a problem of knowing where and what to look for. It was noted that the routine inspections did find unqualified personnel; and the investigators (79-19) identified unqualified personnel, but for different reasons. Also, those involved in the licensee's task force on welding found unqualified welders and NDE personnel in yet other areas of their qualification requirements.

The routine IE inspection program, as evidenced by the inspection reports, enforcement actions and unresolved items as shown in Appendix 3, identified few, if any instances of 1) record falsification, 2) undue pressure, intimidation or threats against QC inspectors, or 3) inadequate support for QC personnel. The inspection record shows that with the above exceptions, the routine inspection program at STP did provide general coverage in the problem areas identified.

One new inspection procedure has been issued, 35061B, effective 4-1-80, that contains a requirement for private meetings with QC inspectors. This requirement may help bring to the surface earlier the type of concerns that personnel at STP came forth with in the form of allegations. This procedure also includes inspection points dealing with incompetent craftsmen and foremen, independence of QC inspection activities, adequate treatment of reported nonconformances, trend analysis of nonconformances and the effectiveness of the licensee's audit program. These inspection areas cut across many of the problem areas that surfaced at STP in the form of allegations.

4. Recommendations

To make the IE program more sensitive and discriminating it is recommended:

a) That special procedures be issued to provide detailed guidance on the investigation and followup of allegations.

b) That the task of investigating allegations, of the STP variety, be assigned to investigators and other skilled inspectors that are not routinely associated with the plant's inspection effort.

c) That inspection guidance be provided to require licensee corporate representation at exit discussions at a level above site managers and supervisors on a periodic basis and more often when it is apparent that persistent problems are not being promptly corrected.

d) That guidance be provided to re-emphasize the importance of drafting citations to ensure, where appropriate, that individual items of noncompliance are viewed by IE as symptomatic, with possible broader implications; that will require licensee review and possibly corrective action beyond the single item of noncompliance.

e) That existing procedures, such as 350608 and 350618 and perhaps other licensee performance appraisal procedures, be modified to require a more in depth analysis of licensee's enforcement history (and allegations) to determine if trends are apparent that might indicate specific areas of weakness, QA/QC inadequacies or management difficulties.

f) That the whole problem of records falsification be examined by IE. This effort could include matters such as its potential impact on quality, relative sensitivity of areas involved, IE's capability to detect falsification, need for added inspector awareness, new skills and techniques to deal with it.

g) That efforts be made to enhance IE's capability to detect unqualified craftsmen, NDE personnel and QC inspectors. To sharpen the IE inspector's skills in this area, special training sessions conducted by certification specialists should be considered. The potential for local shortages of skilled workers and fully trained technical staff in the area where plants are to be constructed should be recognized early and inspection emphasis provided to deal with the problem at the onset.

Attachment A

CHECK OF MAJOR CONSTRUCTION CASES

1. List the basic cause for each of the significant problems identified as a result of allegations and the investigation(s) which followed. (Include other big problems which were identified "too late" as a result of events or licensee investigation.)

2. Determine if the defined inspection program (IE Manual) could have identified the problems and their basic cause. Make a list showing for each problem an assessment of the ability of the present program to identify the basic cause.

3. Determine if the routine inspections which were made identified any of the problems. Make a list showing the extent of identification. (Prior to any discussion with Regional personnel on this item, talk to Moseley, Taylor, or Bryan.)

4. Develop recommendations for program modifications (including enforcement, Event Report followup) to make program more sensitive and discriminating.

Source Documents

(1) Inspection Reports

(2) Investigation Reports

(3) 10CFR 50.55, 10CFR 21 Reports

(4) Enforcement Correspondence and Responses

(5) Inspector Evaluation Reports (if any)

Problem Areas Identified or Indicated As a Result of Allegations and The Investigations that Followed

a) Records Falsification and QC Documentation

S*	- PTL reports falsified to show tests were done(1**	77-03
NS	- Cadweld records made to show QC inspections were done when they were not(2	78-09
NS	- Inaccurate Cadweld as-builts drawings(2	78-12
NS	- Cadweld location sketch lacks sufficient data(2	78-15
NS	- Excessive time (6 weeks+) to record Cadweld date	78-15
NS	- Construction personnel record Cadweld locations instead of QC personnel(2	78-15
?	- Cadweld locations shown at wrong elevation(2	78-15
NS	- Cadweld powder lots and sleeves not traceable(2	
S	- Cadweld examination checklists changed prior to being stored in records vault	79-01
NS	- Data on "duty copies" of examination checklists not transferred to record copies	79-01
NS	- Cadweld preignition inspection records falsified	79-01
NS	- Cadweld records are all "screwed up," much "whiting out" and signing off of ECs and as-builts(2	79-01
S	- Cadweld accepted although QC records show excessive voids(2	79-01

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*S = substantiated, NS = not substantiated

? = neither confirmed or refuted

** see end of list for numbers of IE proceudres that may call for inspection coverage.

-continued-

S	- There are widespread discrepancies in documentation of Cadweld as-built locations(2)	79-09
?	- Cadweld inspection reports were signed by QC inspectors who had not performed the inspections	79-14
S	- One hundred sixteen (116) Cadwelds could not be accounted for(2)	79-14
NS	- Some completed Cadweld inspections forms left hanging on field shack wall and not submitted to QA records	79-14
S	- Inspection report showed an entry by a person other than the inspector actually responsible for the report	79-14
S	- Traceability of embeds is lost after leaving B&R Receiving group(3)	79-19
S	- QC inspector falsified concrete curing records	79-19
S	- Surveillance Deficiency Report of B&R was changed for no apparent reason and concrete audit schedule was changed for no apparent reason(3)	79-19

Possible IE Inspection Procedure Coverage

1) 45055B

2) 47053B, 47054B,

3) 35100B

b) QC Inspectors Threatened, Undue Pressures(1

?	- Civil QC inspector threatened with beating by B&R construction foreman	77-08
NS	- B&R signs paychecks implying QC should not hold up construction	78-12
?	- QC inspectors expected to do in-process inspections of work besides their own	78-12
?	- Two B&R QC inspectors were intimidated by five B&R construction workers	79-14
S	- QC/QA personnel told that their supervisors know if any inspector talks to NRC and that NRC is tired of STP complaints	79-19
S	- QC inspector was threatened by general foreman	79-19
NS	- QC inspector was threatened by construction worker	79-19
NS	- QC inspector was threatened by carpenter	79-19
S	- QC inspector was threatened by general foreman with harm	79-19
S	- QC inspectors told that if they talk to NRC they will be fired	79-19
S	- QC inspectors are taught not to expect any support from supervisors	79-19

Possible IE Inspection Procedure Coverage

1) 47051B and 35100B includes inspection areas on independence of QA/QC. Procedures 35060B and 35061B (effective 7-1-80 and 4-1-80) include coverage of this problem area

c) Inadequate Support for QC Inspectors(2

NS	- QC civil inspectors lack technical assistance from QA engineers	78-12
?	- Inaccessability to upper management	78-12
S	- Concrete pour card signed off by supervisor after QC inspector refused to sign it.	79-09
S	- QC inspectors have lost support of their supervisors when inspectors are confronted by construction personnel	79-19
S	- QC inspectors do not have immediate communications (by radio) with their supervisors. Supervisors refused to supply radios	79-19

Possible IE Inspection Procedure Coverage

1) 47051B and 35100B includes inspection areas that may have detected this problem area. Two new procedures, 35060B and 35061B were made effective on 7-1-80 and 4-1-80 which includes more definitive inspection requirements regarding problems with QA/QC effectiveness.

d) Procedural Violations

NS	- QC hold points lifted by construction or licensee personnel(1	78-09
NS	- Performance of repairs without procedures(3	78-12
NS	- Unqualified helpers doing Cadwelding(2	78-15
S	- Cadweld centering marks made after firing of Cadwelds	78-15
S	- Lack of second shift QC inspection coverage for Cadwelding(2	78-12
?	- Cadwelding is done during wet weather	78-15
?	- Waterproofing membranes installed without proper QC inspection	79-14
S	- Holes in concrete walls resulting from removal of tapered form ties not filled with grout	79-14
S	- QC inspector instructed to disregard a stop-work notice and sign a concrete pour card in violation of procedure(1	79-14
NS	- Void in concrete was not repaired in accordance with approved procedures(3	79-14
S	- General foreman knowingly violated concrete specification on freefall and lateral movement	79-19
S	- QC inspector and construction personnel agreed to pour 24 inch lifts instead of 18 inch lifts as specifications require	79-19
S	- Concrete foreman left while pour was in progress and placement crew would not correct procedural violations with pour	79-19
S	- Vendors used markers containing halogens on stainless steel and stored stainless with carbon steel	79-19
S	- Nonconformance Reports (NCRs) procedures not followed in that NCR drafts are not numbered (serialized), only approved NCR are serialized	79-19

-continued-

S - Cadwelders were not requalified as required by specification where 2 of 15 splices were rejected by QC(4) 79-19

S - Part of containment shell wall concrete pour was not totally inspected for cleanliness(4) 79-19

Possible IE Inspection Procedure Coverage

1) 47051B and 35100B includes inspection of the QA program elements pertinent to this problem, but a more direct procedure, 35061B was made effective on 4-1-80 which is more direct in inspecting for this problem.

2) 35061B effective 4-1-80, 47053B and 47054B in some areas.

3) 47051B

4) 47053B

e) QC Inspectors/Workers not Qualified

NS	- QC inspector couldn't read civil drawings - failed test records not in vault[1] [2]	78-09
NS	- Not sufficient time to study new procedures	78-12
?	- B&R foreman can neither read nor write[2]	78-15

Possible IE Inspection Procedure Coverage

1) 35100B (qualification procedure requirements)

2) 35061B (effective 4-1-80)

f) Nonconformance Reporting System Inadequate

NS	- QC inspectors encountered resistance from QA to process nonconformance reports (NCR)(1 (2	78-12
NS	- NCR were rejected for no reason(2	78-12
NS	- QC inspectors instructed not to submit NCRs on valid deficiencies(2	78-12
S	- Large number of nonconformance reports about maintenance of stored equipment are being filed away with no action(2	79-19

Possible IE Inspection Procedure Coverage

1) 35100B (requirement for procedure)

2) 35061B (effective 4-1-80)

g) Document Control Problems

NS	- Control of drawings and documents used by crafts is poor(1	78-12
S	- Cadweld location sketch lost(1	78-15

Possible IE Inspection Procedure Coverage

1) 35100B (requirement for procedure)

2) 35061B (effective 4-1-80)

h) Miscellaneous

NS	- QC inspector attempted to bribe B&R construction person	78-14
S	- Only 3 QC civil inspectors do Cadweld inspections(1	78-15
S	- Unit 2 structures mislocated by one foot from position on drawings	78-15
NS	- B&R QC inspectors involved in continuous card games	79-14
S	- Concrete foreman stated that construction practices were worse on previous pours causing significant voiding	79-19
NS	- Former B&R employee sent a memo to B&R management stating he had information that would make current NRC investigtion "look like a picnic"	79-19
*	- Cracks exist in structural steel chip in boron injection room	79-19
*	- Pipe sleeve weld in containmnet building contains a defect	79-19

Possible IE Inspection Procedure Coverage

1) 47053B

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* not investigated

Probable Causes for Problem Areas Identified as a Result of Allegations and Their Investigation

a) Records Falsification and QC Documentation Problems

There were 21 separate allegations falling within these two general - but related - areas. Nine of the allegations were substantiated; ten were not and two were neither substantiated nor refuted.

Some basic causes for these problems could be: failure to follow procedures explicitly, insufficient time to do job correctly, lack of job diligence, poor attitude and indifference to NRC requirements.

b) QC Inspectors Threatened - Undue Pressures Applied

There were 12 separate allegations falling within this area. Six were substantiated; three were not and three were neither substantiated nor refuted.

The most obvious basic cause for this group of problems stems from production pressures. However, the record indicates that animosity built up between the inspectors and the construction forces for various reasons: Friction occurred because QC inspectors were expected to do routine in-process inspections as well as their own. Also, pressures occurred when QC was not allowed enough time to complete their inspections. There is evidence that some QC inspectors lacked proper training and qualification in the areas they inspected. Repeated instances of QC being overruled - some valid, some not - contributed to this problem.

c) Inadequate Support for QC Inspectors

There were five allegations with this problem area. Three were substantiated; one was not and one could not be verified or refuted.

It is believed that the basic causes for this problem area are three-fold: unqualified QC inspection personnel, support for QC positions in contention with construction often lessened or faded away as the issue moved to higher levels of management; i.e., lack of organizational freedom and management attitude as exemplified by the B&R brochure, titled, "Implementation of the B&R QA Program at STP Jobsite."

d) Procedural Violations

There were 17 separate allegations involving procedural violations, most of which dealt with concrete and Cadwelding activities. Eleven allegations were substantiated; four were not and two were neither substantiated nor refuted. Production pressures are believed to be the major cause for this group of problems. Other factors that appear to have contributed are: disagreement with part, or all of the requirements called for in the procedures, indifference to procedural requirements and a poor attitude with respect to having to do most everything by procedure.

e) QC Inspectors and Workers not Qualified

There were three allegations in this problem area; none of which were fully substantiated.

Even though investigators were not able to substantiate these allegations, it is generally acknowledged that the conditions alleged did exist. Lack of an experienced and trained pool of workers to draw from, lack of adequate training before being placed in the job for various reasons are believed to be the major causes behind this problem area.

f) Nonconformance Reporting System Inadequate

There were four allegations in this problem area. Only one was substantiated, leaving three not substantiated.

The nature of three of the allegations - although not substantiated - leads one to conclude their basic cause to be related to construction pressures. Another cause, thought to have played a part in this area, is that some reported nonconformances were thought by some not to be valid for various reasons or were minor concerns not worthy of documenting.

g) General Document Control Problems

There were two allegations in this area; only one was substantiated. The basic cause for reported problems in this area appears to have been inattention to procedural requirements by clerical personnel, sloppy record keeping practices, or a failure to appreciate the need - which may translate into inadequate training practices.

Significant Problems Identified by Licensee Task Force Related to Welding Practices and Basic Causes

1. Qualification files for 21 of 70 NDE inspectors had various irregularities in qualification. The 21 cases identified involved the following: uncertified personnel performing NDE, no recertification after rehire, inspector signed as being certified at higher level and absence of eye exam or re-examination.

2. Nine of twenty-one NDE inspectors' documentation showed insufficient training and/or experience.

The basic causes for the above two problems are believed to be a shortage of experienced and fully qualified persons available for hire, coupled with a high turnover rate. Inadequate contractor training programs also contributed to the overall problem.

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3. Twenty-four percent of the radiographed welds previously accepted were considered unacceptable because of improper identification, penetrameter documentation, rejectable indications, or lack of required sensitivity or density.

4. Fourteen of forty-three socket welds re-examined found to have unsatisfactory conditions.

5. Six of thirteen pipe butt welds revealed surface indications.

6. Of seventy-nine Category I AWS structural steel welds examined, sixty-one had irregularities such as contour, overlaps, arc strikes and undersized welds.

The basic causes for items 3 through 6 appear to stem from conditions such as lack of fully qualified or experienced NDE and welding inspection personnel. Also, one cannot rule out the possibility that production pressures may have played some role in bringing about a lenient weld acceptance policy.

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7. AWS Category I shop and field erection weld documentation indicated: a lack of adequate traceability, lack of assurance all quality checks were done, lack of assurance that all welds were indeed documented and a lack of assurance that welders were always welding within the limits of his qualifications with respect to positions.

Assigning a likely basic cause for the above problem is most difficult without having examined the particular documents.

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8. Welder performance qualifications for ASME piping and Category I structural steel (by radiography) showed that film side penetrameters were used rather than source side penetrameters during RT of welder test coupons and that less stringent ASME acceptance criteria were used instead of the required AWS criteria.

9. Some inconsistencies were noted regarding the effectivity dates of various codes and standards.

It would appear that the basic cause for the above two problems rests primarily with the Welding Engineer's performance in his job. The Welding Foreman, also, would be expected to have caught this deficiency. Inadequate QC surveillance contributed to this problem at some point.

Review of IE Investigation Report (79-19) for Routine Inspection Coverage of Concrete Activities

Investigation Findings	Relevant IE Procedure
Poor vibrator practice, insufficient lighting at night	47053B, 2.f 47054B, 2.f
Rebar ties not wired in place	47053B, i,b; 4.d, 47054 B 1.b
Insufficient number of preplacement inspectors, poor scheduling of work	47053B, 2.f 47054B, 2.f
Failure to take remedial action on identified problems (concrete pours)	35100B, 7.a 47053B, 1.c
Pumped concrete sampling point not as per specifications	47053B, 2,e, 47054B, 2.d.
B&R inspector qualifications requirement lack adequate experience levels	35100B, 1.b 47056 B, 1.b (5)
Five B&R and three PTL inspectors lacked required experience for certification; however records showed them to be certified	47056 B, 1.b (5)

Review of IE Investigation Report (79-19) for Routine Inspection Coverage of Welding and NDE Activities

Investigation Findings	Relevant IE Procedure
QA Manual completely outdated ('76 vs '79)	35100B, 8 35200B, 1.d.(1)
Improper methods used to qualify welders (making of specimens)	55055B 55065B
Improper radiograph technique used to qualify welders (location of penetrameters)	55055B
Welding in unprotected areas and under generally dirty conditions	55053B, 2
Absence of required weld records on structural steel hangers and clips	55051B, 2.h 55055B, 1,2,3, 49053B
Design changes made prior to review and approval requirements	35100B, 3 35200B, 1.e (3)
Liquid penetrant examination not evaluated according to requirements	55055B, 4 55061B, 2
Inadequate procedures covering radiograph traceability, acceptance criteria, dark room practices, final x-ray film quality	55051B, 2.J 55065 B 55071B, 2.J
Failure to detect and record rejectable defects noted on radiograph of pipe welds	55071B, 2.d 49053B, 3 55061B, 2
Welder qualification test coupons did not meet minimum quality requirements of ASME. Film interpretation faulty.	55053B 55061B, 2
Radiographers qualified as Level I, II, and III had not been adequately trained as film interpreters	48051B, 55051B, 2.e. 55073C, 2.c

Review of Investigation Report (79-19) for Inspection Coverage of Activities Related to Project Audit Systems, Surveillance Systems and Control of Nonconformances

Investigation Findings	Relevant IE Procedure
No effective program to review, analyze NCRs, ECs and FREA for trending purposes and correction of repetitive problems	35100B, 7
HL&P and B&R failed to require or perform supplemental audits when conditions indicated a need	35100B, 2 35200B, 1.d. (6)
HL&P failed to audit site QA functions to the depth necessary and in areas required by procedures	35100B, 2 35200B, 1.d.(6)
B&R failed to audit B&R site QH/QC activities to the depth required and at frequencies (supplemental) indicated by repetitive deficiencies	35100B, 2 35200B, 1.d(6)
Civil surveillance activities were not properly documented as required by procedures	35100B, 10
Upper management was not advised of failure to take action on repetitive deficiencies in B&R surveillance in accordance with requirements	35100B, 7 35200B, 1.d(6)

Review of Special Task Force Report Related to Safety-Related Welding for Routine Inspection Coverage of Task Force Findings

Task Force was formed to look into
Show Cause Order, Items (3)(a) and (3)(b)

Task Force Findings	Relevant IE Procedure
1. Qualification files for 21 of 70 NDE inspectors had various irregularities in qualification:	55051B 2.e.
a) uncertified personnel performing NDE (7)	55073C 2.c.
b) lack of recertification after rehire (3)	
c) inspector signed as higher level (5)	
d) no eye exam during NDE exam (1)	
e) expiration of eye exam certificate (1)	
2. Nine of twenty-one NDE inspectors' documentation showed insufficient training and/or experience for performing duties	55073C 2.c.
3. Twenty-four percent of the radiographed welds previously accepted were considered unacceptable because of:	55065B Part 2. d. of above procedure may cover these items if IE inspector has exceptional experience in radiography
a) improper identification	
b) improper use of documentation of penetrameter	
c) lack of required sensitivity	
d) lack of required density	
e) rejectable indications	
4. Fourteen of forty-three socket welds re-examined (visual or LP) found to have unsatisfactory conditions	?

-continued-

	Task Force Findings	Relevant IE Procedure
5.	Six of thirteen ECW pipe butt welds revealed indications (surface, weld spatter, sharp corners)	55053B 2.
6.	AWS Category I shop and field erection weld documentation reviewed showed:	55053B, 2.g.
	a) lack of sufficient traceability of final inspection documentation in all cases sampled	55053B, 2.g.
	b) lack of evidence that the inspector in all cases sampled performed all in-process checks (random sample)	55053C, 2.b.(1)
	c) lack of assurance that all the existing documentation represents all completed field welds	55055B
	d) lack of verifiable documentation that welders who were qualified in limited positions were always welding within their qualifications	55053B, 2.c. 55053C, 2.b.(3)
7.	Of seventy-nine Category I AWS structural steel welds examined, sixty-one had irregularities such as improper contour, undersized welds, overlaps and arc strikes.	55053B 2
8.	Welder performance qualifications for ASME piping and Category I structural steel (by radiography) showed:	55055B 55065B
	a) use of film side versus source side penetrameters on some welder coupons	*
	b) use of less stringent ASME acceptance criteria instead of AWS criteria for AWS test coupons	*
9.	Past audit reports show that written audit plans were not made in accordance with ANSI 45.2.12	35100B, 2 (new) 35060B, 5 (7-1-80) **(77-07, 77-12 and 79-13 mid term QA 8/79)

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	Task Force Findings	Relevant IE Procedure
10.	Some inconsistencies were noted regarding codes and standards effectivety dates	35100B, 3 & 4 55051B, 2

* IE investigation 79-19 observed this deficiency.

** Problem area adressed in these IE reports.

Appendix 3

Review of Routine STP Inspections to Determine Extent to Which Problems Areas Were Identified

The Same or Similar Problem Identified	IE Report	Enforcement
Lack of procedures to control field design changes (B&R)	74-01* 74-02* 75-01* 75-02*	yes
Indoctrination/training and qualification of personnel-procedural deficiencies	74-01*	
Qualification of QA auditors	74-01* 74-02*	
Foundation soil densities lower than expected	76-02	UI**
HL&P failed to perform scheduled audit	76-02	UI
B&R did not follow procedure on vibrofloation work	76-03	yes
Problem about verification and record keeping of rebar installation	76-06	UI
Unqualified welder used on containment liner - lack of procedural control	76-07	yes
Construction procedures for Cadwelding not followed	77-05	yes
QC procedures for Cadwelds not followed	77-05	yes
Problem with transposition of data on QC records	77-05	no

* predocketing/preconstruction inspections

** unresolved item

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The Same or Similar Problem Identified	IE Report	Enforcement
Surveillance of earthwork not done as required by schedule	77-06	yes
Unqualified QC personnel used on concrete work	77-06	yes
Problem with signoff of QC records on concrete	77-06	UI
Problem with weld seam buildup on containment liner	77-07	UI
Unqualified QC inspector used on concrete work (repeat item)	77-09	yes
Problem with lack of followup on HL&P internal audit findings	77-10	UI
QC audit records not maintained by HL&P - no audit check list	77-12	yes
Audit not performed by Design Review Committee	77-12	yes
Failure to follow procedures during concrete placement - cold weather precautions and improper vibrating	78-01	yes
Problems with UT procedure on special weld	78-03	UI
Failure to follow procedures for control of welding (PDM)	78-04	yes
Problems noted with verification of soil compaction	78-04	UI
Failure to provide revised drawings for containment	78-07	yes

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The Same or Similar Problem Identified	IE Report	Enforcement
Incomplete inspection of structural steel - documented as complete	78-07	yes
Failure to follow procedures on QC surveillance	78-16	yes
Level I rather than Level II Cadweld inspector used on job	78-17	yes
Failure to control superseded field drawings	79-02	yes
Failure to follow procedures on cleaning pour areas prior to placement	79-04	yes
Problem with control of drawings, FREAs and DCNs (same concern noted in 79-02 inspection)	79-05	UI
Failure to have procedure for monitoring welding operations	79-08	yes
Problems noted with missing concrete pour card and adequacy of concrete procedure	79-11	UI
Failure to follow procedures for maintaining PDM QA manuals	79-13	yes
Failure to follow procedures for conduct of PDM site audits	79-13	yes
Failure to maintain completed checklists in audit files (repeat item 77-12)	79-13	yes
Failure to destroy or stamp a deleted QA procedure (B&R QA manual)	79-13	yes