UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

OCT 27 1994

MEMORANDUM TO: T. P. Gwynn, Director, Division of Reactor Safety

FROM: J. I. Tapia, Reactor Engineer/Examiner, Division of Reactor Safety

SUBJECT: GAO INQUIRY

The following attachment is provided in response to the October 11, 1994, inquiry from the General Accounting Office concerning 10 examples from the June, 1993 Diagnostic Evaluation Team (DET) Report on the South Texas Project Electric Generating Station. The GAO inquiry was to identify whether the subject matter in the 10 examples was previously addressed in NRC Inspection Reports and to describe the safety significance of each example.

cc:
L. Callan
J. Montgomery
T. Gwynn
J. Pellet

Attachment: As Stated

F/17

ATTACHMENT

*Example 1: on page 8, the DET Report reads;
"Strained staffing resources also contributed to several plant events. The licensee concluded that inadequate staffing for a surveillance procedure contributed to a non-licensed RPO throttling the wrong train of essential cooling water (ECW). Earlier that same day, another RPO inadvertently de-energized the Unit 2 plant computer system. Prior to the latter event, the RPO had worked 8 consecutive midnight shifts, several of which were of 12-hour duration. In another example, an electrical transient and accompanying transfer of residual heat removal (RHR) control to the remote shutdown panel occurred when an RPO failed to correctly return an inverter to service. The SRO on duty during the event later stated that he was extremely busy with administrative tasks and therefore failed to stop and conduct an adequate pre-job discussion with the RPO."

The example paraphrases three events which are addressed in NRC Inspection Report 93-11. The first event, which occurred on March 21, 1993, involved throttling the wrong train of ECW and is specifically addressed in Section 2.5.1 of the Report. The second event, which occurred on March 18, 1993, involved inadvertently de-energizing the Unit 2 plant computer system and is specifically addressed in Section 2.5.2 of the Report. The third example involved incorrectly returning an inverter to service and is specifically addressed in Section 2.8 of the Report. In addition, the third example was the subject of Notice of Violation 9311-03.

Although each example was of regulatory concern, individually they were not particularly safety significance since they occurred when the reactor was in a No Mode condition (fuel unloaded from the reactor vessel). Nevertheless, they represented additional examples of the ongoing concern with poor performance, as noted in the Report. Additional Reports, wherein strained staffing may have caused or contributed to the events discussed, include the following: 90-29, 90-30, 90-34, 91-01, 91-08, 91-11, 91-15, 91-16, 91-22, 91-28, 91-34, 92-05, 92-14, 92-21, 92-24, 92-26, 92-29, 92-32, 92-35, 92-99, 93-04, 93-11, 93-15, and 93-16. Inadequate staffing is specifically addressed in several of these reports and in some cases, Notices of Violation were issued. Collectively, the issue of strained staffing is potentially significant because it may affect the overall quality of operations.

*Example 2: on page 12, the DET Report reads;
"Poor procedures contributed to two occasions in which an RHR pump tripped on low flow. One of these trips occurred during a reactor cavity draindown."

These particular events are specifically addressed in NRC Inspection Report 92-32, Section 2.4. The Report notes that between November 9 through 19, 1992, Unit 1 experienced four RHR pump trips due to low flow conditions. The trips were of low safety significance because shutdown cooling was being maintained by other trains or because shutdown cooling was not required since the plant was in a No Mode condition. Two of the four trips were considered to have resulted from incomplete procedural guidance. Additional examples of poor procedures leading to plant events can be reviewed in the following Inspection Reports: 90-34, 90-38, 91-01, 91-11, 91-25, 91-28, 91-30, 91-34,

91-35, 92-08, 92-15, 92-17, 92-22, 92-24, 92-26, 92-29, 92-32, 92-35, 92-36, 93-04, 93-05, 93-12, 93-13, and 93-15.

*Example 3: on page 15, the DET Report reads;
"A feedwater isolation bypass valve (a containment isolation valve) was found partially open for over a year. Maintenance had been performed on the valve to correct a failure to get a closed indication light in the control room. Maintenance personnel stroked the valve several times and then adjusted the closed limit switch to bring in the closed light without confirming the actual position of the valve. Five months later the licensee issued another SR to correct an apparent discrepancy between the control room indication and the local position indication. However, the potential safety significance of this condition was not properly recognized and the SR was worked six months later. At that time maintenance personnel determined that the valve was only going 75 percent closed."

This example is specifically documented in NRC Inspection Report 93-19. This inspection was a reactive inspection to address this particular problem and another problem dealing with the environmental qualifications of a RHR valve. Several Unresolved Items were documented in Inspection Report 93-19. A followup inspection of the Unresolved Items is documented in Inspection Report 93-35 and a Notice of Violation was issued for a failure to assure that the condition adverse to quality was promptly corrected. This issue was potentially safety significance because a potential for a release path in the case of a steam generator tube rupture accident.

*Example 4: on page 19 and 20, the DET Report reads;
"The lack of parts caused safety-related equipment to remain inoperable and degraded the performance of equipment important to safety. The lack of readily available parts contributed to the size of the maintenance backlog. Approximately 25 percent of all non-outage corrective maintenance work packages were routinely in a part holds status. Numerous general usage material such as bolts, nuts, gaskets and desiccant were not available as general issue items from the warehouse. To support emergent work, needed items were obtained by substituting parts that were reserved for other planned work. This time-consuming process frequently occurred, hampering maintenance effectiveness. Examples of unavailable parts which adversely impacted equipment performance included:

- In December 1992, during maintenance to repair an AFW turbine trip throttle valve, a replacement disc and seat were not available in the warehouse. The valve was reassembled and the system declared operable. This leaking valve contributed to numerous overspeed turbine trips in January and February of 1993.

- The lack of parts contributed to valves within the primary containment being inoperable for a year. during the 1991 refuel outage, "T" drains

were not available for installation into some new valve motors. Without the "T" drains installed, moisture could not drain from the motors and could damage the components after an accident. A failure of the work control system later resulted in the "T" drains not being installed in a timely manner.

- The Unit 2 secondary side B PORV was inoperable because of an internal hydraulic leak that caused premature failure of a pressure switch. The internal leak caused the hydraulic pump to cycle frequently and eventually resulted in the high pressure switch failing low. The hydraulic pump ran continuously until its thermal overloads tripped. The switch was replaced but the leak was not fixed because of a lack of parts.

- Previously, several switches on the CH system failed and were replaced. However, if they had failed again no replacements were in the warehouse or on order when the inventories were reviewed by the team."

The issue of spare parts was addressed in several NRC Inspection Reports when it was determined that it contributed to effective and timely corrective actions which were necessary to maintain a high level of system and component reliability and availability. The NRC inspections did not identify any instance in which a lack of spare parts caused an immediate safety concern. The following reports provide details: 90-29, 92-14, 92-24, 92-35, 93-05, 93-07, and 93-19. The DET Report statement that approximately 25 percent of all non-outage corrective maintenance work packages were routinely in a parts hold status, may give a reader the impression that the work was delayed as a result of being in that status. This is not necessarily the case; work can be preplanned and awaiting delivery of materials with a future work start date scheduled. The DET Report gives four examples in which unavailability of parts adversely impacted equipment performance. For the first example concerning the repair of an AFW turbine trip throttle valve, NRC Inspection Report 92-35, Section 3.3.2, specifically addresses this particular event. The second example concerning "T" drains is addressed in Report 93-19, Section 2.2. The licensee subsequently issued LER 93-08 on this event and a followup inspection, documented in Report 93-35, Section 3.7, resulted in a Notice of Violation. The third example concerning a failure of a pressure switch associated with a PORV is specifically addressed in Report 92-24, Section 5.2. The fourth example concerning switches on the CH system is specifically addressed in Report 92-24, Section 3.2.1 and resulted in a Notice of Violation. This issue was originally identified in Report 91-34, Section 5.5 as an Unresolved Item.

*Example 5: on page 30, the DET Report reads;
"The licensee did not have an effective method to determine the size and composition of the engineering backlog. This conclusion is based on the fact that the data initially given to the team was grossly inaccurate and it

subsequently took more that 4 weeks to provide reasonably accurate data. The backlog consisted of approximately 10,800 work items on May 1, 1993, including 253 modifications, 395 engineering change notices, 6674 preventive maintenance feedback items, 209 predictive maintenance items, 200 Station Problem Report (SPR) investigation items, 690 plant change form items, 204 design change notices, 381 request-for-action items, 54 TMs, 385 procedures, 33 vendor equipment technical information program (VETIP) items, 51 vendor packages, 660 "closure" items, 44 operating experience review (OER) items, and other miscellaneous items. The backlog did not include work assignments of administrative or contractor personnel."

The issue of Engineering Backlog was documented in the following NRC Inspection Reports; 92-04, 92-21, and 92-24. Report 92-04 specifically reviewed the licensee's engineering programs, including the backlog. While it was noted that certain areas of engineering warranted continued management attention, the inspection found that the licensee's engineering programs were providing quality products and good plant support. It was not noted that the licensee's methodology for tracking the work backlog was ineffective. SALP Report 91-99 rated Engineering/Technical Support as good, with the comment that, although the resolution of technical issues was good, some plant modifications were not implemented in a timely manner. SALP Report 92-99 rated Engineering/Technical Support as good, and noted that engineering-related corrective actions for system and equipment problems were generally good. However, the Report also noted that, although the modification process was generally satisfactory, there was a significant backlog in vendor document changes, and, that the process for revising procedures resulting from modifications was considered a program weakness.

*Example 6: on page 33, the SALP Report reads;
"Substantial recurrent problems noted by maintenance, operations, engineering or other groups often resulted in design modifications to resolve the problem. However, the modifications were not installed in a timely manner. In April 1993, the licensee conducted a modification scoping meeting to discuss the various due dates and installation windows in preparation for executive review of the 1994 modification budget. Over 150 modifications, many involving multiple components, were reviewed. The licensee speculated that approximately 50 percent of the modifications scheduled would actually be worked. Many of the modifications considered for 1994, 1995 or 1996 were initiated between 1987 and 1990. During the same meeting, over 100 ECNs were discussed for implementation, most of which were initiated during 1988 to 1990."

Untimely modifications are addressed in the following NRC Reports: 90-29, Section 3.2.2, wherein the inspection focused on an evaluation of the overall process for the development and implementation of plant modifications; 92-05, Section 4.1, which discusses a manual reactor trip which occurred because of untimely repair of rainwater intrusion onto the feedwater control system; 92-08, Section 5.2, wherein a temporary modification to power supplies to valves was not made permanent in more than 3 years; 92-14, Section 6.2, which

discusses untimely repair of the ECW strainers; 92-24, Section 4.3. was a review of the status of outstanding temporary modifications; 93-04, Section 4.1.2, was a review of the problems associated with a trip of the startup feed pump which included timeliness of a modification; 92-32, Section 9.3, which again discusses rainwater intrusion; and 92-36, Section 5.1, which discusses the problem with an SSPS logic train test pushbutton. As stated above, SALP Report 91-99 also notes problems with the timely implementation of modifications. Additionally, SALP Report 92-99 notes that the implementation of modifications has been untimely.

*Example 7: on page 36, the DET report reads;
"The licensee did not resolve numerous fire protection issues in a timely manner. The issues included excessive shrinkage of penetration seals, an unreliable fire alarm system, a large backlog of service requests on fire protection systems, and inadequate control of transient combustibles in the plant. Management did not adequately oversee and direct the efforts to resolve these issues in a timely manner."

Inspection Report 92-05, Section 5.2, discusses an inadvertent actuation of the fire alarm system. Report 92-32, Section 2.7, discusses an inadvertent discharge of the halon system in the computer room. Report 92-35, Section 5.3, discusses a Notice of Violation which was issued for a failure to control transient combustible material. Inspection Report 93-09 also documents a Notice of Violation for failing to control transient combustible material. This inspection was a review of the licensee's fire protection/prevention program. The inspection verified that the licensee had maintained an effective program.

*Example 8: on page 42, the DET report reads;
"Management did not adequately budget for or effectively manage spare/replacement parts. Lack of parts availability had adversely impacted the SR backlog. The licensee had established a master parts list with minimum and maximum stocking levels. However, several problems identified by the team indicated that this system may have been based on an inaccurate economic model, coupled with errors in the plant labeling system (parts identification numbers). It appeared that management considered the entire inventory as homogeneous when assessing inventory turnover frequency rather than separating long-term strategic from rotating stock. When requested by the team to provide numbers identifying the turnover of routinely used parts, it was apparent that these figures were not considered or monitored by STP. The low reported turnover rates, when coupled with the lack of available consumables reported by maintenance and the budgeted figure for parts obsolescence and disposal, indicated that STP was not adequately stocking those parts routinely used. This was exacerbated by the failure of the master parts list system to adequately account for surges in usage. The master parts list also had errors in its design data, due to inadequacies in the vendor information tracking program. Further, the performance indicator related to stocked material

availability was inaccurate due to the common practice of not starting work until it was known that parts were available."

This issue is very similar to Example 4, previously addressed. NRC Inspections do not typically address the licensee's budgetary process. With respect to the adequacy of available parts, the inspections focus on instances where a lack of spare parts impacts on timely corrective actions. The following inspection reports contain information associated with this subject: 90-29, 91-19, 92-24, 92-35, and 93-04. The content of Reports 90-29, 92-24 and 92-35 are discussed in Example 4. Report 91-19, Section 4.4, addresses component labeling weaknesses. Report 93-04, Sections 4.1.1 and 4.3, note problems with availability of solenoid valves for the PORVs and governor buffer springs for the turbine driven AFW pumps.

*Example 9: on page 43 and 44, the DET Report reads;
"The licensee had established several formal methods for employees to communicate upward to management. The Speakout Program was intended for safety concerns and the Employee Assistance Program (EAP) was intended for nonsafety concerns. Although both programs were supposed to be anonymous, there was a perception among many employees that these programs were not, which limited their effectiveness. There was also the perception that management was not interested in hearing about problems as demonstrated by the lack of results when issues were brought forward. Some employees had used the Speakout Program to express concerns for the lack of maintenance training, but their expressions of concern proved to be ineffective. Some employees expressed concern that some issues, such as excessive overtime, were processed as nonsafety concerns in the EAP. Although personnel expressed reluctance to report some problems, the team did not detect any reluctance for employees to report issues perceived as immediate safety concerns."

NRC reviews of the STP employee concerns programs, Nuclear Security Department program, and/or specific investigative files are documented in the following 26 Inspection Reports and one NUREG:

1. 85-17;85-15
2. 85-18;85-16
3. 85-19;85-17
4. 86-03
5. 86-06
6. 86-10
7. 86-33
8. 86-38
9. 87-07
10. 87-30
11. 87-41
12. 87-45
13. 87-50
14. 87-56
15. 87-70

16. 87-77
17. 88-02
18. 88-55
19. 88-72
20. 91-12
21. 91-21
22. 91-23
23. 92-07
24. 93-30
25. 93-52
26. 94-21
NUREG 1306

Note: the first 3 reports have separate numbers for each unit.

*Example 10: on page 44, the DET reads;
"The team found several examples where confusion and lack of training resulted in SPRs not being issued in a timely manner on safety-related equipment. The team observed the impact of this failure to document identified problems during licensee meetings to discuss SDG work. Management was not sufficiently aware of these problems or their significance because SPRs had not been written. The licensee's QA department had repeatedly notified management of a weakness in the definition of "conditions adverse to quality" which resulted in licensee personnel not being aware of when to write a SPR. This QA finding had not effectively addressed this concern. Additionally, lack of effectiveness in reporting problems reflected workers' willingness to live with problems, due at least in part to conflicting management expectations and standards regarding material condition."

The following NRC Inspection Reports provide documentation wherein failure to issue an SPR was addressed:

1. 92-14: a failed batch integrator and a failed battery did not receive SPRs.
2. 92-17: a Notice of Violation was issued for the adverse impact associated with initiating SPRs.
3. 92-21: a loose turbocharger support for the emergency diesel did not receive an SPR.
4. 92-32: an SPR was not generated when appropriate after an RHR pump trip.
5. 92-35: the Operational Safety Team Inspection identified several examples where an SPR should have been written and resulted in a Notice of Violation.
6. 92-36: an SPR was not written for a broken terminal lug on a CCW valve.
7. 93-07: an SPR was not written for problems with the turbine driven AFW pump.
8. 93-13: SPRs were not written for problems with motor operated valves.
9. 93-21: an SPR was not written for missing fasteners on the Solid State Protection System cabinets.
10. 93-22: an SPR was not written for problems with a Class 1E distribution panel power supply transformer.

The significance of not writing SPRs is that the condition may not receive the appropriate amount of review and may result in a failure to perform an operability determination and/or in an ineffective root cause determination.

VIOLATIONS IDENTIFIED AT THE SOUTH TEXAS PROJECT DURING FOLLOWUP OF ISSUES RAISED BY THE DIAGNOSTIC EVALUATION TEAM

1. Severity Level IV Violation 50-498/9321-01

The licensee failed to ensure that the seismic qualification of the Qualified Display Processing System (QDPS) was maintained by taking prompt and effective corrective action to evaluate the effect of missing fasteners identified in the card cages and power supply racks. This condition, originally identified by the system engineer on January 4, 1993, did not receive an evaluation for system operability until April 29, 1993, after identification of the condition by a member of the NRC Diagnostic Evaluation Team (reference DET Report Section 2.2.1). The licensee's operability evaluation subsequently determined that two Technical Specification governed safety-related components, the Steam Generator Power Operated Relief Valves and the Reactor Coolant System Subcooling Monitor, should have been declared inoperable as a result of these missing fasteners. Thus, the failure to take adequate corrective action resulted in potential violations of Technical Specifications 3.7.1.6 and Technical Specification 3.3.3.6.

2. Severity Level IV Violation 50-499/9335-03

On May 5, 1993, the licensee discovered that the Unit 2 RHR Pump Suction Motor Operated Valve, RHR-0060B, had not been environmentally qualified because the valve motor had been replaced in November 1990, without the two required T-drains. (Reference DET Report Section 2.2.4) Thus, the "B" train of RHR was rendered inoperable from November 1990, to April 1993. During this time, Unit 2 had been operated in a mode requiring all trains to be operable in accordance with TS 3.5.6.

3. Severity Level IV Violation 50-498/9335-02; 50-499/9335-02
Noncited Violation in Inspection Report 50-498/9335; 50-499/9335

The DET raised an issue concerning a feedwater isolation bypass valve being left open for an extended period of time (reference DET Report Section 2.2.1). Followup of this issue was documented in Inspection Report 498/9319-03; 499/9319-03. The followup by the NRC and the licensee determined that the valve had not been left open, but questions were raised in this report about the possible improper reclassification of the associated positioner from safety related to nonsafety related. Followup of this issue in Inspection Report 50-498/9335; 50-499/9335 determined that the licensee's incorrect reclassification of the positioners was a violation of Criterion III in Appendix B to 10 CFR Part 50, which requires that licensees assure that the applicable design

F/18

basis for components that prevent or mitigate the consequences of postulated accidents are correctly translated into specifications, procedures, and instructions. In addition the inspection identified a Severity Level IV violation for the licensee's failure to take prompt corrective action to disposition engineering change notice packages concerning the qualification of the positioners.

4. Noncited Violation in Inspection Report 50-498/9404; 50-499/9404
Severity Level IV Violation 50-498/9417-01

The DET raised an issue concerning the operability of the essential chillers (reference DET Report Section 2.3.7). In response the licensee performed evaluations and design modifications. NRC review of these modifications identified a noncited violation for failure to perform postmodification testing in the required sequence for one chiller and a Severity Level IV violation for performing an inadequate postmodification test on another chiller.