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EXECUTIVE SUMMARY

From March 23 through March 27, 1992, representatives of the U.S. Nuclear Regulatory Commission's (NRC's) Vendor Inspection Branch (VIB) and Region II conducted an inspection of Florida Power Corporation's (FPC's) activities related to the procurement and dedication of commercial grade items (CGIs) used in safety-related applications at the Crystal River Nuclear Plant, Unit 3 (CR3). The inspection team reviewed FPC's procurement and dedication program to assess its compliance with the quality assurance (QA) requirements of Appendix B to Part 50 of Title 10 of the Code of Federal Regulations (10 CFR Part 50).

On August 24, 1990, the NRC staff forwarded to the Commission SECY-90-304, "NUMARC Initiatives on Procurement," in which the staff reported the status of the Nuclear Management and Resources Council's (NUMARC's) initiatives on general procurement practices. Procurement initiatives as described in NUMARC 90-13, "Nuclear Procurement Program Improvements," dated October 1990, committed licensees to assess their procurement programs and take specific action to strengthen inadequate programs. The industry initiative on the dedication of CGIs, which was to be accomplished by January 1, 1990, stated that licensee programs should meet the intent of the guidance provided in the Electric Power Research Institute (EPRI) Final Report NP-5652, "Guideline for the Utilization of Commercial Grade Items in Nuclear Safety Related Applications (NCIG-07)," dated June 1988. The staff also stated in SECY-90-304 that it would conduct assessments at selected sites to review the licensees' implementation of improved procurement and commercial grade dedication programs, assess improvements made in the areas covered by the NUMARC initiatives, and report the results of those assessments to the Commission. From February to July 1991, the NRC's Vendor Inspection Branch conducted eight assessments of selected licensees to determine the current status of activities to improve the procurement programs related to industry initiatives and NRC requirements. On September 16, 1991, the NRC staff forwarded to the Commission SECY-91-291, "Status of NRC's Procurement Assessments and Resumption of Programmatic Inspection Activity," in which the staff reported on the results of its assessments and noted that it was resuming inspection and enforcement activities.

The NRC conducted this inspection, the third since completing the eight assessments, to review FPC's procurement and dedication program and its implementation since January 1, 1990 (the effective date of the NUMARC initiative on dedication of CGIs), and also to review the corrective actions for certain installed CGIs that were found to be of unverified quality in the 1989 VIB procurement inspection report (Report 50-302/89-200) and in the subsequent Notice of Violation. The inspection focused on a review of procedures and representative records (including approximately 40 procurement and dedication packages for mechanical and electrical CGIs); interviews with FPC staff, including senior management and CR3 site personnel; and observations by the inspection team members. The inspection team also held meetings with FPC's management to discuss relevant aspects of commercial grade dedication and to discuss areas requiring additional information. The inspection team findings were discussed with FPC's representatives and senior management at the exit meeting held March 27, 1992. The inspection team

identified three deficiencies which are summarized below.

Deficiency 92-201-01

The inspection team identified a number of examples where FPC either installed CGIs in safety-related plant applications or had identified them as available for installation into safety-related applications at CR3 without adequate review for suitability of application of these materials, parts and equipment, that were essential to the safety-related functions of the structures, systems and components. FPC failed to adequately determine the acceptability of using CGIs in safety-related applications which resulted in the use or warehousing of CGIs of indeterminate quality. Examples of this practice included:

- A fuel injector adapter nozzle for the emergency diesel generators (EDGs) procured under PO F670284K.
- Four sets of thrust bearings for decay heat removal pumps procured under PO F670378V.
- Check valve parts for swing check valves used in the raw water system procured under PO F6704047K.
- A centrifugal pump and motor assembly for EDG standby jacket water cooling pumps procured under PO F842798V.

Deficiency 92-201-02

The inspection team identified several weaknesses in the generic procurement program and in the licensee's actions to implement it. These weaknesses contributed to the specific examples of deficient CGI dedication described in Deficiency 92-201-01.

The most significant programmatic weakness resulted from the division of dedication responsibilities between the procurement engineering (PE) staff and the procurement and material quality assurance (PQA) staff. This division of responsibilities resulted in numerous instances in which the licensee inadequately transferred critical characteristics from the functional analysis/critical characteristics review form (FACCR) to the receipt inspection plan (RIP) and source inspection plan (SIP) and ultimately resulted in the dedication of CGIs that did not demonstrate suitability for safety-related applications. The program included no requirements for feedback to PE or for the PE staff to review the PQA staff specification of verification methods and acceptance criteria as a means to obtain assurance for the characteristics listed on the FACCR.

The team also determined that a lack of procedural guidance often led to the inappropriate or incomplete identification of FACCR attributes including the name and functional description of the CGI's parent component; the parent component's safety function; the piece part's (CGI) safety function; the failure modes and effects adverse to safety; and characteristics necessary to ensure performance of the safety functions or prevent the effects of the identified failure modes. These failures, coupled with the inadequate transfer of characteristics into means to obtain assurance by PQA, ultimately

resulted in CR3 using or warehousing CGIs of indeterminate quality.

Another weakness in the CR3 dedication process concerned the performance of source inspections by outside contractors and the use of their documented reports as part of the dedication process. In numerous instances the inspection team found that the source inspection report or vendor quality assurance report provided by the contractor, and accepted by FPC, did not contain adequate evidence to support assurance for the characteristics listed on the SIP. In many cases inadequate guidance was provided to the source inspectors for documenting objective evidence and ensuring that SIP attributes were properly or adequately established. In most cases, the source inspection reports did not support the source inspector's review to determine that no design, material, or manufacturing changes had occurred that would affect the form, fit, or function, and material traceability for a specific CGI. The source inspection activities should have ensured that documentation received from the vendor, such as certificates of conformance (CoCs) and certified material test reports (CMTRs), was acceptable and meaningful. Additionally, the licensee had not implemented procedures to require the PQA or PE staff to review source inspection activities (usually documented on the SIP by the source inspector) and source inspection reports for technical adequacy and accuracy.

Deficiency 92-201-03

The team determined that FPC's corrective actions were inadequate concerning the procurements which formed the basis of the NRC's December 1, 1989, Notice of Violation and Proposed Imposition of Civil Penalty. On April 27, 1990, the NRC withdrew the Notice of Violation and Proposed Civil Penalty "without reaching the merit," that is, the notice was withdrawn for regulatory reasons unrelated to the merits of the findings for which the violations were cited. However, the NRC expects licensees to take timely and appropriate corrective action to rectify deficiencies, regardless of NRC enforcement actions.

The inspection team reviewed the licensee's disposition of the seven examples and found that subsequent to the inspection, FPC had documented justifications for continued operation (JCOs) for the CGIs in the seven examples, but had not completed the corrective action in all cases. During this inspection the team determined that the corrective action for the following examples had not been completed:

- Example 2 - Material Qualification Form (MQF) 1433-89. FPC had not yet replaced the ASCO solenoid valves for main steam valve 148. These valves were scheduled to be replaced in the April 1992 outage.

- Examples 4 and 5 - MQF 1332-88 and MQF 1301-87. FPC had purchased replacement molded case circuit breakers (MCCBs) for the inservice ITE MCCBs, but had not yet installed them. FPC had not been able to resolve the differences between the MCCBs currently in service and the replacement MCCBs. Therefore, the original JCO still remains in effect.

- Example 6 - MQF 972-85. The Johnson Controls solenoid valve remains installed in the air damper system under the original JCO. FPC stated that the system undergoes monthly periodic testing.

The untimely completion of the corrective actions in nearly 3 years is considered by the staff to be of concern. The MCCB issue will be reviewed during a future inspection.

1 INTRODUCTION

During this inspection, the team reviewed the Florida Power Corporation (FPC) program and its implementation for the procurement of commercial grade items (CGIs) used in safety-related applications at the Crystal River Nuclear Plant, Unit 3 (CR3). The team also reviewed the FPC program and its implementation for determination or verification of suitability of those CGIs for their intended or approved safety-related applications, a process referred to as "dedication."

Part 21 of Title 10 of the Code of Federal Regulations (10 CFR Part 21) defines dedication as the point at which an item or service becomes a "basic component," that is, essentially an item (or service) with safety-related functions. However, the 10 CFR Part 21 definition of CGI (Section 21.3(a)(4)(a-1)), distinguishes CGIs from items procured as basic components. The regulation, then, allows the procurement of items that are to become basic components that meet the definition of CGIs without invoking 10 CFR Part 21 in the procurement documents.

When CGIs are procured for safety-related service, their procurement and dedication constitute activities affecting quality, and, therefore, these activities must be controlled in accordance with the requirements of Appendix B to Part 50 of Title 10 of the Code of Federal Regulations (10 CFR Part 50). In particular, Criterion III, "Design Control," and Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B are most pertinent to the procurement and dedication of CGIs. Therefore, the team reviewed the FPC program governing these activities and the implementation of that program for compliance with these and other applicable Appendix B criteria and with the requirements of 10 CFR Part 21.

Additionally, the NRC has provided further guidance to the requirements of Appendix B as they pertain to the procurement and dedication of CGIs in NRC Generic Letter (GL) 89-02, "Actions to Improve the Detection of Counterfeit and Fraudulently Marketed Products," dated March 21, 1989, and GL 91-05, "Licensee Commercial-Grade Procurement and Dedication Programs, dated April 9, 1991. Therefore, the FPC CGI procurement and dedication program and its implementation were also evaluated for consistency with the guidance and NRC staff positions promulgated in these generic letters.

Finally, with respect to procurement in general, including procurement and dedication of CGIs, FPC has committed to various industry standards and other publications (as endorsed or conditionally endorsed by NRC regulatory guides [RGs], NUREGs, and generic letters [GLs]), as stated in the FPC QA program description, as contained or referenced in the FPC Final/Updated Safety Analysis Report for CR3, and as expressed for the industry by the Nuclear Management and Resources Council (NUMARC) in the NUMARC initiative on the dedication of CGIs as part of NUMARC 90-13, "Nuclear Procurement Program Improvements." In particular, FPC, like other nuclear utilities, was committed to have established a program for procurement and dedication of CGIs consistent with Electric Power Research Institute (EPRI) Final Report NP-5652, "Guideline for the Utilization of Commercial Grade Items in Nuclear Safety Related Applications (NCIG-07)," on or before January 1, 1990. The acceptance

methods described in NP-5652 were conditionally endorsed by the NRC in GL 89-02 and the NRC Staff positions on several dedication issues were later clarified in GL 91-05. FPC stated that it had implemented this commitment as of October 1989.

2 COMMERCIAL GRADE DEDICATION PROGRAM REVIEW

2.1 Procedures Review

FPC described and prescribed its program for procuring and dedicating CGIs for safety-related applications at CR3 in three groups of procedures: the Nuclear Procurement and Storage Manual (NP&SM), the Nuclear Engineering Procedures (NEPs), and the instructions and other directives of the Procurement Quality Assurance (PQA) and Material Quality Control (MQC) organizations. The PQA, MQC, and Nuclear Procurement Engineering (PE) organizations use these groups of procedures to perform the various tasks involved in procuring and dedicating CGIs at CR3. The NP&SM includes general guidance and all the pertinent FPC policies and general procedures for procuring and dedicating CGIs at CR3. The NEPs and the instructions and other directives of the PQA and MQC organizations provide more guidance on subjects related to procurement.

The principal NP&SM sections relevant to this inspection were Section 2.0, "Classification of Items and Services," Section 3.0, "General Requirements for Procurement Documents," Section 5.0, "General Purchase Requirements of Safety Related (SR) Items and Services" [sic], Section 6.0, "Safety Related Procurement Methods," Section 7.0, "Evaluation and Control of Supplier Performance," and Section 8.0, "Receipt of Shipments and Receiving Inspection." The team reviewed the currently effective revision of the NP&SM, Revision 7 of October 31, 1989. FPC issued this NP&SM revision to implement the NUMARC CGI dedication initiative and to adopt the dedication methodology of EPRI NP-5652, and this was the revision in effect for the individual dedication documents selected for review.

The two main NEPs of interest were NEP 215, "Configuration Item Data Control," and NEP 254, "Plant Equipment Equivalency Replacement Evaluation." The team reviewed the latest revision of NEP 215 (Revision 10, dated December 31, 1991), which contained additional guidance on the safety classification of parts. The staff reviewed the latest revision of NEP 254 (Revision 5, December 31, 1991), which governed the process of like-for-like or equivalency determinations for replacement items.

The inspection team reviewed Sections 2.0, 3.0, 5.0, and 6.0 of the NP&SM and found it generally consistent with the provisions of EPRI NP-5652. However, these sections included only limited guidance on the principles and considerations to observe while obtaining critical characteristics by deriving them from safety functions and other requirements for verifying the suitability of an application. For example, the licensee must consider failure modes adverse to safety. To supplement this guidance, the licensee included examples of safety functions, critical characteristics, and failure

modes with some standard sets to be applied to certain types of components in generic dedications.

NP&SM Section 6.0 contained a general description of FPC's four procurement methods. In this section FPC stated that the FPC specification method and the FPC verification method were the only methods authorized for procuring FPC's "nuclear grade" items, which are basic components requiring purchase orders that include 10 CFR Part 21 applicability statements. However, FPC stated that CGIs could be procured using any of FPC's four methods as discussed below. The inspection team noted as a strength that all of the FPC procurement methods involved making an engineering determination of critical characteristics using the functional analysis/critical characteristics review (FACCR).

Section 6.1 described FPC's specification procurement method ("S" procurement) requirements in detail. Section 6.1.4 covered the use of specifications or "mini specifications" to procure CGIs, which can be used only when the component need meet no design requirements unique to nuclear facilities. FPC used this method for more complex items, for specifying non-nuclear unique options, and for specifying special test requirements that were to supplement the manufacturer's product information. The supplier must be on the approved nuclear supplier list (ANSL), and acceptance could be by any combination of inspections and tests, surveys, or source inspections as determined by the PQA organization.

NP&SM Section 6.2 described FPC's verification procurement method in detail. FPC uses this method to procure items for safety-related service from suppliers who, for various reasons, may not be on the ANSL. FPC used the verification method for items for which it must specify in the procurement documents that 10 CFR Part 21 applies and for items defined as CGIs. FPC would perform this verification method for components covered by 10 CFR Part 21 if the supplier's QA program lacked certain elements or was not properly implemented to the extent that would require FPC to supplement it with portions of FPC's own QA program activities including one or more of the following: source surveillance or inspections and special receipt inspections and tests. FPC also used this verification method in procuring CGIs similarly to EPRI CGI acceptance methods 1 and 3. Section 6.2.2 prescribed the portions of the process for which the PQA organization was responsible. These actions included preparing a critical characteristic verification plan, although its use was not evident in most of the dedication packages reviewed. Most often, PQA personnel apparently used a receipt inspection plan (RIP) instead of a verification plan. FPC authorized this practice in a note in the procedure that applied to a specific set of circumstances. However, FPC personnel apparently loosely interpreted this note to allow the practice as a rule rather than as the exception. If the circumstances warranted preparing a source inspection plan (SIP), the PQA organization would perform this task. The licensee would document on the RIP the fact that the source inspector completed the "statement of conformance" authorizing shipment of the CGI after completion of the source inspection. However, neither the PQA nor the PE organization was required to review the RIP, the SIP, or their results.

NP&SM Section 6.3 prescribed the procedures to follow for FPC's catalog procurement method ("K" procurement). The procedure allowed for performing "K" procurement for CGIs (for SR applications) when the manufacturer's published product description, including the catalog, instruction manual(s), and drawing(s), is an adequate product specification for the applicable technical requirements. The procedure also called for the supplier of K-procurement items to be an "approved" CGI supplier (listed on the ANSL) for the CGI to be supplied. However, the procedure did not specify the FPC "class" ("A," "B," or "C") of supplier, described as the ANSL level of approval, as discussed below. However, this method was not analogous to any particular EPRI acceptance method; rather, it could require (in addition to standard receipt inspection as a minimum) one or more of the following: a commercial grade survey of the supplier (EPRI method 2), and source inspection(s) (EPRI method 3), and special tests and inspections (EPRI method 1) after receipt (including post installation), depending on the ANSL approval level or class of the CGI supplier. A particular strength of the catalog method was that it required a formal engineering evaluation of the adequacy of the catalog or other product information for use in specifying the technical requirements of the item. The catalog method also required that FPC document the evaluation on a safety-related catalog evaluation form (Attachment 6B to the procedure). This form required the PO to specify a supplier certificate of conformance (CoC) to the catalog (or other) specifications, and provided for including in the PO the source inspection requirements, if specified by the PQA organization. Another strength of this method, as described in the procedure, was the use (as specified by PE on the catalog evaluation form) of a configuration certificate for replacement items, Attachment 6C. The supplier would document and certify on this form any changes to design, material, manufacture, or interchangeability (or to propose alternative with changes described) since a previous procurement referenced on the form. However, most of the dedication files reviewed, to which this process would be applicable, included a standard engineering letter instead of Attachment 6C as the means of requiring design, material, and process change history and effect on, seismic fragility, sensitivity or other aspects of the component.

NP&SM Section 6.4 described FPC's commodity procurement method ("C" procurement) in detail. This was the prescribed method for procuring generic material (or services) that were supposed to be widely produced for general industry use according to nationally recognized standards. The licensee listed rolled stainless steel plate conforming to "ASTM A480-75" as the example. The procedure had the general requirement that such commodities be ordered with manufacturer's markings or be in sealed, marked containers. In the procedure, the licensee did not authorize pressure boundary materials that must meet American Society of Mechanical Engineers (ASME) Code Section III and Specification B31.7 ("S" only). The licensee also did not authorize certain other items such as items not marked by the manufacturer or not of a standard mill size and thus requiring ANSL-listed suppliers. A strength of this procedure was that the licensee required a formal documented engineering evaluation using the commodity evaluation sheet, Attachment 6D (with detailed instructions on Attachment 6D-1). However, this section lacked adequate guidance on acceptance methods, particularly those for verifying material.

The team noted the following categories of programmatic weaknesses:

(1) The procedures did not provide sufficient guidance to aid in performing a technical evaluation. For example, they did not include detailed guidance for documenting the name and functional description of the CGI's parent component and did not include a requirement or provision for this purpose on the FACCR form. Rather, the FACCR only provided for entering the tag number of the parent component. The procedures also did not include detailed guidance on the considerations for determining the safety function of the parent component, rather giving only simplistic examples. FPC claimed that procurement engineers do not need this guidance because they have all necessary design information available in the configuration management information system (CMIS) and have all necessary information on procurement available in the fully integrated materials information system (FIMIS). However, the team observed numerous examples in which the safety function(s) of the parent component were inappropriately specified, including listing parent safety functions that are too remote from the function of the replacement piece part or too general to be used in analyzing the part's safety function(s) and failure modes, or its contribution to (or degradation of) the performance of the parent's safety function. The team concluded that this weakness contributed to the numerous examples observed of incomplete identification (or inappropriate identification) of part safety functions and failure modes that could affect the ability of the parent or surrounding safety-related equipment to perform its function.

(2) The procedures did not include detailed, specific guidance on the principles, process, methodology, and considerations to be used in deriving the critical characteristics of the CGI from its safety functions, failure modes, or any other safety application suitability requirements, including those for seismicity and sometimes those for environmental qualification. The procedures included only simplistic examples and standard applications. The team observed numerous examples of inadequate or incomplete specification of critical characteristics in FACCRs. Some listed were necessary for dedication but inconsistent with the identified safety functions and failure modes. In addition, some that would be essential to the performance of the identified safety functions or necessary to prevent degradation or identified failure modes were inappropriate or omitted altogether.

The team noted a significant strength in the FPC program in that critical characteristics were defined in NP&SM 5.0.3, Note 2, as attributes "essential to form, fit, and functional performance" that "provide assurance that the item will perform its safety function." The definition in Note 2 was consistent with the NRC's position expressed in Generic Letter 91-05. However, weaknesses in the program prevented FPC from using this concept of critical characteristics in practice.

(3) The division of responsibilities between the PE and PQA organizations was the most fundamental weakness in the FPC dedication program. PE was responsible for the first part of the technical evaluation process:

determining safety functions, failure modes and effects, and critical characteristics. The PQA staff had the engineering line responsibility of translating the critical characteristics into verification methods and acceptance criteria. However, FPC had not established a requirement for PQA responding to engineering or for the engineering staff to review the verification methods and acceptance criteria specified by the PQA organization for the identified critical characteristics even though the engineering staff has design responsibility and access to design information. Furthermore, FPC did not require other parts of the quality assurance organization to review this information for consistency with engineering and quality requirements.

The inappropriate division of responsibility, the lack of response and review, and the often inadequate derivation and specification of critical characteristics on the FACCRs, resulted in the numerous examples of verification methods and acceptance criteria that the team found to be inadequately developed from the critical characteristics. The team found that many verification plans (VPs), source inspection plans (SIPs), and receipt inspection plans (RIPs) written by PQA were one or more of the following: incomplete, inappropriate, or lacking specificity necessary for meaningful execution.

The procedures of NP&SM Section 3.0 first established the division of dedication responsibilities with other guidance on PQA's role in verifying the critical characteristics described in Section 7.5. However, the team noted that the good definition of critical characteristics in Note 2 of NP&SM Paragraph 5.0.2 was severely weakened by the next statement in that note: "Selected Critical Characteristics identified in Section C of Attachment 5A [the FACCR form prepared by PE] may take a different form than a critical characteristic for acceptance developed by Procurement Quality Assurance in accordance with Section 7.5." Moreover, the example given indicated that PQA might specify "additional critical characteristics for acceptance" of markings and hardness, when Nuclear Engineering [PE] had specified shear and tensile strength and ductility. The note further stated that markings and material hardness could provide reasonable assurance that the material specified is the material received.

Unfortunately, the explanatory statements and the example in Note 2 had two undesirable effects on the program and on its implementation: (1) they did not support or clarify the stated definition of critical characteristics, but rather negated the dedication principle of specifying critical characteristics that are derived from safety functions or for prevention of failure modes adverse to safety; (2) formally established the notion that PQA could interpret the critical characteristics listed by PE as it deemed appropriate, which often resulted in the inappropriate translation of PE's requirements.

(4) FPC's procedures did not include adequate guidance on including seismic and EQ performance capabilities as critical characteristics to ensure that they will be properly verified where required. Seismic qualification was addressed most frequently either through the plant

equipment equivalency replacement evaluation (PEERE) process or by requiring vendor certifications in purchase orders (POs) using attached, standard "engineering letters," such as letters 1082, 1137, 1176, and 1187. Such letters usually asked the vendor to certify that the design, material, or manufacturing process had not been changed in any manner that would affect the form, fit, function, or "structural integrity" (and later, that would affect seismic performance or fragility or sensitivity) since some previous date listed or referenced previous procurement. However, the team found that because the procedures did not include specific detailed instructions for determining and verifying this fact, the vendor certifications to this effect were often not adequately verified or validated by FPC (or most frequently, by FPC's contractor source inspectors). Thus, these suppliers were not usually surveyed (including evaluating design controls) to supplement the source inspections. This resulted in the numerous examples in which the team found that FPC had not established an adequate basis for demonstrating that replacement parts were equivalent (like-for-like) or were seismically (or sometimes environmentally) qualified.

The team identified as Deficiency 91-201-02 the weaknesses found in the FPC procurement and commercial grade dedication program and in the implementing procedures for this program.

2.2 Commercial Grade Supplier Surveys

Section 7.0 of the NP&SM contained general requirements for evaluating suppliers and maintaining the CR3 ANSL. The team reviewed the current revision of NP&SM 7.0, Revision 4, of September 30, 1989. Section 7.2 addressed evaluation of commercial grade vendors. FPC classified CGI vendors according to the degree to which their documented commercial quality control programs were effectively implemented and to which their activities controlled the critical characteristics applicable to their scope of supply. The classification also reflected the type and degree of verification required. Each class of vendor carried its own requirements for ANSL approval/restriction codes. The procedure required that FPC accept CGI components procured from a Class A CGI vendor if FPC had verified by survey that the vendor maintained adequate control of the critical characteristics applicable to its scope of supply. The procedure specified that this survey must include as a minimum, a CR3 standard receipt inspection, and a review of a CoC attesting that the item/service provided was processed under the specific FPC-approved commercial quality program identified by manual [title and number], revision, and date. The requirements for Class B vendors were similar except that FPC had only conditionally approved the vendor's quality program and must verify separately (after receipt) the critical characteristics not adequately controlled by the vendor because of missing program elements or identified weaknesses. FPC classified as Class C those CGI vendors for whom it had no survey report (or acceptable report). Prospective CGI vendors were to be initially classified "C." The team found as a strength of the process of controlling procurement from commercial grade vendors the verification requirements in Section 7.5 for the three classes of CGI vendors. This section included more detailed requirements for VPs, RIPs, and SIPs. However, a fundamental weakness was that the procedures did not

require these plans to be reviewed or approved by engineering, and did not require final review of the results for technical acceptability.

Section 7.2.5 addressed commercial grade surveys performed by organizations other than FPC. The general guidance in Section 7.2, was similar to that for Appendix B suppliers: use these where available and acceptable. The requirements for reviewing such survey reports were appropriate to determine acceptability commensurate with the requirements for FPC-conducted surveys, covered in Section 7.2.6. However, a weakness common to both sections was the stated practice of having PQA convert the critical characteristics established by engineering into vendor QA/QC program controls deemed by PQA to be necessary to control the critical characteristics. These procedures did not require FPC to verify at the vendor's facility that the critical characteristics for the type of items actually being procured are specifically and effectively controlled .

FPC approved CGI vendors triennially, with annual program reviews. The team noted as a strength the formal requirement to review each vendor's performance annually based on "receiving and source inspections, surveillance reports, NRC reports, etc.;" although the procedure did not specify dedication testing, inservice testing and surveillance/inspections, and inservice failure data from FPC and the industry. Nevertheless, the team was concerned that arbitrary triennial surveys with annual program updates and performance reviews may not be adequate coverage depending on several factors, including, but not necessarily limited to (1) the complexity of the CGI(s) in question; (2) the frequency and size of purchases; (3) the critical characteristics to be verified by survey and the extent to which those are relied upon to support dedication; (4) the strength of the supplier's controls on design, materials, manufacturing processes, and subsuppliers of parts and services; and (5) the strength of the supplier's commitment or obligation either to not make changes in certain products, or at least to inform the customer of any changes made. The procedures did not provide for increasing or decreasing the frequency of the survey on the basis of these factors. The procedures also did not address the survey of distributors where applicable in addition to the manufacturer in accordance with the GL 89-02 comments on the use of EPRI method 2.

Section 7.6 addressed the conduct of source inspections, requiring inspectors, FPC or contractor, to be qualified in accordance with American National Standards Institute (ANSI) Standard N45 2.6. However, the procedures did not require FPC to verify the inspector's technical knowledge or experience in the areas to be inspected, and did not require field surveillance of the performance of contractor-provided source inspectors. Although the procedures required written inspection reports, they did not require either PQA or PE to review the results of the source inspection for either quality or technical accuracy, except where there was a formal supplier exception, deviation request, or nonconformance report generated.

To assess the effectiveness of the implementation of FPC's commercial grade survey program in support of dedication (though very limited), the team also reviewed two completed survey reports for some of the individual dedication packages reviewed. The two commercial grade surveys reviewed were performed

to verify specific critical characteristics and appeared to be adequately performed and documented.

8.3 Source Inspections

The team observed a fundamental weakness with FPC's use of source inspections. At CR3 FPC performed source inspections as an acceptance method analogous to EPRI method 3, "source verification." The team noted that, among the verifications reviewed, the source inspection was the most commonly used method for verifying critical characteristics.

FPC performs source inspections for its Class B or C commercial suppliers in conjunction with its verification ("V") and catalog ("K") methods of procurement. FPC placed the procedure for conducting source inspections in NP&SM Section 7.5, "Establishing Source, Receipt, and Post-Installation Verification Requirements," and NP&SM Section 7.6, "Conduct of Source Inspections." The team reviewed the current revision of Section 7.5 (Revision 7, January 31, 1990), and of Section 7.6, Revision 5.1, January 30, 1990.

The team attributed the inadequacy of source inspection activities to three principal causes:

(1) FPC gave inadequate guidance to the source inspectors for documenting evidence and raw data for verifying critical characteristics. The detailed instructions for the source inspection report called for a narrative summary of inspection activities but did not require that the particular critical characteristics be listed and their method of assurance or results be documented.

Accordingly, the team found numerous examples in which FPC's contractor source inspectors inadequately executed SIPs. These inspectors were employed by Bechtel and Ebasco Services and were presumably qualified, according to ANSI N45.2.6. In some instances, the team found clear indication that the contractor inspectors had not verified SIP attributes. In other cases, the verification was not by the method specified, and in others the team found insufficient evidence to determine whether the SIP attribute was properly verified.

(2) There was a lack of review (and lack of requirement for review) of the technical adequacy and accuracy of the source inspection reports. Receipt inspectors were required simply to document that the "statement of conformance" (a QA shipping release) was signed by the source inspector and received in the documentation package with the item.

The team found that NP&SM Paragraph 8.4.9 required that MQC transmit completed POs including associated documentation to the purchasing clerk, as opposed to PQA. FPC explained that this requirement did not exclude PQA from the routing when the procedure was written because, at that time, PQA was part of the same organization as MQC. However, this was no longer the case, and had not been for some time. Therefore, the procedure, as written, did not require PQA to receive the documents from

MQC for review. An MQC representative stated that an interim change would be or was being prepared to reflect the desired routing and current organizational structure. In addition, the team noted that PQA had no requirement or practice to review the source inspection reports for adequacy and accuracy, that is, for compliance with the SIP and sufficient documented evidence of critical characteristic verification

(3) The procedures did not adequately address review of documentation to establish the traceability of the CGIs as received to their original equipment manufacturers (OEMs) which would be necessary to establish the validity and applicability of vendor controls and/or supplied information or documentation, to the extent they are relied upon to support dedication or qualification.

2.3.1 Ebasco Contracted Source Inspections

The team reviewed FPC's basis for accepting source inspection activities performed by Ebasco Services, Incorporated (Ebasco). The team reviewed numerous documents to evaluate FPC's acceptance of the source inspection activities and interviewed FPC staff to obtain a better understanding of FPC's methodology for acceptance of these services. The documents reviewed included (1) the Florida Power and Light Company's (FPL's) August 7, 1990, audit report of the establishment and implementation of its quality assurance program at Ebasco's Lyndhurst, New Jersey, facility; (2) Ebasco's source inspection reports (SIPs); (3) FPC's vendor quality assurance reports; (4) FPC contract No. N00337AD of December 14, 1990, with Ebasco; and (5) Ebasco's procedures and nuclear QA program manual No. ETR 1001, Revision 14, of June 15, 1990.

The team reviewed the FPL audit report and found that it was not a performance-based audit and did not address the adequacy or effectiveness of the contractor's source inspection activities. Instead, the FPL report stated that certain program elements were reviewed such as "verified qualification records for six inspectors indicating that certifications were adequate." The team noted that during FPC's review of the FPL audit, it found that Ebasco had not properly conducted source inspections during a previous contract with FPC. Consequently, FPC staff recommended to its management that it conditionally accept Ebasco's services based, in part, on an FPC review of Ebasco's SIRs at the completion of its source inspections. The team noted that PQA had initialed and dated the SIRs initially submitted by Ebasco, indicating that FPC had reviewed the SIRs. However, as discussed earlier, the team found that FPC had failed to establish any procedures, instructions, or policies to implement and control a review of source inspection reports.

2.4 Parts Classification

The process of assigning safety classifications to items and services was described and prescribed by Section 2.0 of the NP&SM, "Classification of Items and Services," (Revision 6, September 30, 1989) with additional guidance in NEP 215. Equipment and components, i.e., items with unique system and function-related identifiers called "tag numbers," classified as safety-related in accordance with NP&SM 2.0 and NEP 215, would be listed in the CR3 configuration management information system (CMIS) computer database that

serves CR3 for a Q-list. The Safety Classification Review (SCR) checklist forms (Attachment 2C to NP&SM 2.0) for this process were used to document the justification for classifying items differently than their parent equipment, component, or system was classified in the CMIS; that is, to classify as nonsafety-related (NSR) those items with no identifiable safety functions, and presumably with no credible failure modes adverse to the performance of the parent components' safety functions. FPC would then establish the QA controls applicable to a procurement on the basis of the SCR through use of the Classification of Items (COI) form (Attachment 2A to NP&SM 2.0) or Classification of Services form (Attachment 2B).

In performing the SCR, FPC determines the safety classification of the item by determining if the function it performs is within any of the standard defined safety-related functional categories: (1) maintaining the integrity of the reactor coolant pressure boundary, (2) shutting down the reactor and maintaining it in a safe shutdown condition, and (3) mitigating the effects of design basis accidents and preventing the offsite release of radioactivity in excess of 10 CFR Part 100 guidelines.

After evaluating the item and documenting this evaluation on an SCR form, the CR3 procurement engineer determines the procurement classification and handling of an item to be procured by completing a COI checklist form. The information on the COI form is organized as a "decision tree" flow chart with which the classifier first documents the results of the SCR. If the SCR determination is that the application is safety-related, the classifier would indicate on the COI whether or not the item is available from a supplier with a 10 CFR, Part 50, Appendix B, QA program, and a program for reporting defects and noncompliance pursuant to 10 CFR Part 21. If the item is available from such a supplier, the classifier would designate it as "nuclear grade" (an FPC representative explained that a nuclear grade component is not a CGI, but a basic component as specified by 10 CFR Part 21). The checklist directs the classifier to designate a nuclear grade item by appending the procurement documents with Attachment Q.

Attachment Q indicates, among other things, that 10 CFR Part 21 applies to the procurement, thus invoking it on the supplier. Attachment Q also imposes QA program and documentation requirements such as requiring the supplier to maintain a QA program in accordance with 10 CFR Part 50, Appendix B, and applicable ANSI standards. If FPC approved the supplier's QA program and the supplier is listed on the ANSL, the checklist directs that the "specification" procurement method ("D") be used. If the supplier's QA program has not been fully approved by FPC and the supplier is not listed on the ANSL, the checklist directs that FPC use the "verification" procurement method (type "V"), as described in the NP&SM (Sections 2.0, 5.0, and 6.0).

If the item is not available from an Appendix B supplier, then the checklist applies the three tests or conditions from 10 CFR 21.3(a)(4)(a-1) in question form to determine if the item can be considered a CGI. If the item fails any of the tests, it is considered nuclear grade, and the classifier is directed to the Attachment Q block; but if all three conditions are satisfied, then the item can be considered a CGI and the checklist directs the classifier to append Attachment "C" to the procurement documents and to use methods "D,"

"V," "K" (catalog method) or "C" (commodity method). Attachment C imposes certain nonnuclear technical and quality requirements on the supplier (without affecting the design of the item itself) such as invoking the supplier's commercial quality program (referenced by title and number and by the FPC-approved version, revision, and date) in the manufacture and supply of the item and requiring certification of conformance to that effect as recommended in EPRI NP-5652.

In reviewing these procedures, the team found potential weaknesses in FPC's safety classification process. First, the procedures and SCK checklists did not require FPC to consider failure modes adverse to surrounding and adjacent safety-related equipment or systems, not just the parent component, equipment, or system. Second, the structure of the SCK excluded from classification as safety-related those reactor coolant system (RCS) component parts that are not considered "pressure retaining" under the applicable provisions (Sections III and XI) of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (the ASME Code). However, these parts (such as small instrument lines, valves and other fittings, certain valve parts, gaskets, seals, O-rings, strainers, and filter media) may contribute to retaining pressure or preventing leakage or may have failure modes and effects that are adverse to safety. Such parts may also be subject to system material compatibility requirements or requirements for exclusion of contaminants such as leachable halides or mercury.

Third, Section 2.3.2 stated that all chemicals, including lubricants, even after being classified as available for safety-related service as defined in Section 2.3.1, were to be procured in accordance with Section 4.4 covering "X" procurement; that is, they were to be procured as NSR with special requirements. This paragraph implied that FPC was to observe NSR controls in procuring all lubricants used in safety-related and even EQ applications, even though the engineering organization might impose special requirements.

Finally, Section 2.4.1.3 stated that 10 CFR Part 21 applied to nuclear grade purchases and that the specification method ("D") was to be used for suppliers with 10 CFR Part 50, Appendix B, QA programs. However, it then required that nuclear grade item procurement from other suppliers should use the verification ("V") method; in which case, FPC would assume the 10 CFR Part 21 reporting responsibilities "in lieu of the supplier." In view of the FPC definition of the term "nuclear grade," a basic component, not a CGI per 10 CFR 21.3, Paragraph 2.4.1.3 would allow, contrary to 10 CFR 21.31, for FPC to procure a basic component without stating in the procurement documents that 10 CFR Part 21 applied. FPC maintained that the CGI checklist, if followed instead, would not allow this because it required Attachment "Q" in all nuclear grade item procurement. FPC agreed that Paragraph 2.4.1.3 was at least inconsistent with the COI checklist, and agreed to consider revising it. The team noted that while the paragraph allowing a violation of 10 CFR 21.31 did not in itself constitute such a violation, it was nevertheless inconsistent with the intent of the regulation.

2.5 Material Upgrades

During the previous NRC procurement inspection at CR3 (NRC Inspection Report No. 50-302/89-200), the staff cited violations of 10 CFR Part 50, Appendix B, upon finding deficiencies in the "material qualification" process in which FPC would complete material qualification forms (MQFs) to document dedication of CGIs at CR3. Since that time FPC has made changes in this process to correct the previous deficiencies. FPC's current practice is to perform "material upgrades" and is significantly limited in scope compared to material qualifications. In this practice, FPC completes a material upgrade form (MUF) to document that it has verified as suitable for safety-related service those items originally procured as NSR items without any intention of dedicating them, but has reclassified them as safety-related.

The team reviewed Revision 7, of NP&SM Section 9.1 (September 30, 1989), in which FPC listed the material upgrade requirements. While the MUF process as described in this section represented a significant improvement over the former MQF process, its ineffectiveness was limited by some of the same general dedication program and implementation deficiencies as cited above. The team reviewed several MUF record files and made the following findings:

(1) MUF 0007-90 was for 2 Dresser-Ashcroft model 30EI60L025 bi-metal thermometers purchased as NSR items from Epperson & Company under FPC PO 02004731, of January 31, 1990. The thermometers were replacements for model 30AI60L025, and were identical to it except that they did not have a removable gauge glass bezel. FPC used these thermometers in the lube oil system for the reactor coolant makeup water pump, part of the core emergency cooling support systems (Tag Nos. MU-52, -54, and -56-TI). An Epperson packing list was the only evidence of traceability back to the distributor, Epperson, and supposedly accompanied the items, although FPC did not conduct a formal receiving inspection until one month after receipt. The team found no other evidence of traceability to the OEM in the file.

According to the FACCR, pressure retention was the only safety function of the device. FPC upgraded this CGI because its application had been reclassified as SR (pressure boundary) when maintenance revealed that these thermometers were installed in the lube oil system pipes without thermal wells as had been previously thought. The FACCR listed the failure modes as material degradation and deformation and the effects as leakage. Although the instrument manufacturer recommended thermal wells, FPC made the upgrade primarily because the original thermometers satisfactorily performed the safety function of retaining pressure and because the process interface of the replacements was supposed to be identical to that of the original. On PEERE 105, Revision 2, FPC documented the suitability of the replacement item relying heavily on the thermometer's supposed all-welded stainless steel construction. Accordingly, the FACCR listed part number, certain dimensions, weight, and all-welded stainless steel construction as critical characteristics.

However, on the RIP, FPC listed stainless steel construction (but not "all welded") with several other attributes such as dimensions and

weight under characteristic 4, "Verify component configuration and dimensions agree with those listed below and on the attached PQA/catalog sheets," for which the inspection basis and criteria were given simply as "PQA/catalog," and the inspection method was simply "review." FPC did not list the specific catalog or the specified part number listed on the RIP. Furthermore, the only documented evidence of stainless steel construction on the completed RIP was the words "magnet - OK" with a check mark that had been handwritten in next to the attribute. FPC did not indicate which of the welded parts were checked (stem, threaded plug, or both) or whether the item was found to be magnetic or not. Thus, this check was of questionable value and was inconclusive. If the instrument was not magnetic, it could have been made of a nonmagnetic, but incompatible, alloy such as copper-nickel which would be virtually indistinguishable visually (on a new part) from stainless steel. If it was magnetic, it would most likely have been a magnetic stainless steel, but it could also have been, though unlikely, a much less corrosion-resistant metal, such as carbon steel. Therefore, if a catalog description and verbal assurance during a telephone conference were the only evidence of the vendor's control of the material, merely performing a magnetic check would not be adequate to verify the material properties of a pressure retaining fitting for which material degradation was a concern, presumably to verify long-term corrosion resistance for leak tightness.

(2) MUF 0013-90 documented the upgrade and acceptance of a mounting plate for a States sliding link terminal block. FPC upgraded the NSR material upon visually comparing the thickness and alloy separators of the replacement metal plate with a sample plate that had been procured as a SR item. The plate was allowed a thickness tolerance of +/-10 percent and an alloy separator tolerance of +/-25 percent because the plate was required to have only a low strength. This methodology was probably adequate for the strength requirement of the application. However, the work order under which the terminal blocks were being replaced (when found corroded) indicated that the mounting screws of the installed terminal block were so badly corroded that they could not be removed (presumably implying other means were used, such as drilling). This raised the concern that the original terminal blocks and their mounting plates may not have been suitable for their application/environment. However, the team found no evidence that FPC considered any alternative to the existing type of circuit connection device, despite the evidence of significant corrosion apparently on both the terminal screws and strips which necessitated replacing the terminal block and cleaning "debris" in the bottom of the connection box), and despite the statement on the FACCR that the blocks should be environmentally qualified.

(3) MUF 0014-90 documented upgrade of Amphenol 31-219 double-female BNC coaxial cable connectors (Mil Type UG-914/U) purchased as NSR items from the EMSCO company under FPC PO F890648A, of May 16, 1990, for use in environmentally qualified (in-containment) sensor cables for the valve acoustic flow monitor system.

The basis for traceability to the OEM was stated on the MUF as the PO to

EMSCO and the Amphenol part number, but the FACCR specified an Amphenol marking or packaging and military part number. According to the verification block on MUF 0014-90, the connector was marked with the corresponding military connector number, UG-914/U; although no mention was made of Amphenol packaging or marking. The receiving inspection report listed only the Amphenol part number without any military part number or reference to OEM packaging. The team found no other documented evidence of traceability to the OEM.

The EQ report (T068-3TR-003) by the sensor system manufacturer, Technology for Energy Corporation (TEC) specified this part as an Amphenol type 31-219 connector, military part number "VG-914" [sic] with "KEL-F 81" dielectric (relied upon for EQ temperature and radiation characteristics), characteristic impedance of 50 ohms nominal, brass metal parts, and silver or gold finish. The Amphenol catalog pages in the MUF file listed other specifications such as voltage rating (500 volts peak), dielectric withstand voltage (1500 volts rms), center contact resistance of 1.5 milliohms, outer contact resistance of 0.2 milliohms, braid-to-body resistance of 0.1 milliohms, insulation resistance of 5000 megohms minimum, and RF leakage and insertion loss specifications. The material specification for a female center contact was silver-plated beryllium-copper and other metal parts were to be of "silver-finish" brass. The EQ report, in its discussion of the sensor cabling, indicated the importance of the cabling, which would be influenced by in-line connectors. However, the FACCR listed the critical characteristics (other than markings) as nominal dimensions, "material appearance of body: plated (silver in color) brass," electrical continuity of center conductor, and insulation resistance of "5 megohms at 1000 VDC" [sic] instead of 5000 megohms. FPC provided no technical justification for choosing these critical characteristics instead of the specifications in the catalog and EQ test report, and stated no justification for deviating from the acceptance criteria in the catalog and in the EQ report. Furthermore, FPC did not adequately verify certain critical characteristics, such as the material composition, indicated in the FACCR and gave no technical basis to justify a less rigorous means of verification.

2.6 Follow-up on NRC Procurement Inspection Report (50-302/89-200) Corrective Actions

On August 14, 1989, the Vendor Inspection Branch issued Inspection Report 50-302/89-200 on the previous inspection of the procurement program at CR3. On December 1, 1989, the NRC issued FPC a Notice of Violation and Proposed Imposition of Civil Penalty, which included seven examples of CGIs that FPC had installed in safety-related applications at CR3 without adequately selecting the item or reviewing its suitability. On April 27, 1990, the NRC withdrew the Notice of Violation and Proposed Civil Penalty "without reaching the merit," that is, the notice was withdrawn for regulatory reasons unrelated to the merits of the findings for which the violations were cited. However, the NRC expects licensees to take timely and appropriate corrective action to rectify these deficiencies, regardless of NRC enforcement actions. The team examined the seven examples and found their status to be as follows:

(1) Material Qualification Form (MQF) 1436-89. FPC replaced two ASCO solenoid valves for CAV-6-SV and CAV-7-SV (chemical addition and containment isolation) with nonnuclear grade valves and documented this replacement on Modification Approval Record (MAR) 89-01-016-01. FPC had dedicated these valves merely by visually inspecting them, comparing their part numbers with those in the ASCO Catalog and verifying coil continuity. FPC corrected the deficiency by replacing these two valves with nuclear grade ASCO valves and documenting this replacement on PEERE 0044.

(2) MQF 1433-89. FPC had replaced four ASCO solenoid valves for MSVs 130 and 148 with ASCO valves with different electrical coils. FPC had dedicated these valves merely by visually inspecting them and comparing their part numbers with those in the ASCO commercial grade catalog. FPC has since purchased replacement nuclear grade valves and obtained a certificate of compliance. FPC replaced the valves for MSV 130 and scheduled to replace those for MSV 148 during the April 30, 1992, outage. The untimely replacement of MSV 148 valves is a concern.

(3) MQF 1413-88. FPC purchased Agastat time delay relays to replace an original relay as a like component. FPC dedicated the item by visually checking the physical dimensions and verifying the information on the nameplate. This item was originally thought to perform a safety-related function and hence the above dedication was considered inadequate. However, upon reviewing the matter and discussing it with licensee personnel, the team found that the relays in this application did not have a safety-related function and, therefore, required no further action by FPC.

(4,5) MQF 1332-88 and MQF 1301-87. FPC purchased ITE molded case circuit breakers (MCCBs) as CGIs and dedicated these items merely by visually inspecting them to verify their dimensions and part numbers and to check for physical damage. Although the licensee contended that the MCCBs had been dedicated according to its procedures at the time, the team found the pertinent provisions of procedures at the time required certification of critical characteristics. However, upon reviewing the dedication and installation documents, the team found that FPC had not tested the MCCBs to verify the critical characteristics of tripping on overloads and faults, as stated in the FACCR. FPC had purchased but not yet installed replacement MCCBs that differ in certain respects from the originals. The replacements had a short circuit interrupting rating at 480 Vac whereas the originals had a short circuit interrupting rating at 600 Vac, which FPC relied upon to demonstrate suitability of application.

The licensee prepared a corrective action plan to resolve the matter. The licensee had not resolved the issue at the time of this inspection. When the NRC first found this issue, the licensee prepared a justification for continued operation (JCO) that remains in effect. The NRC will review this matter during a future inspection. The failure to close out the corrective action plan in nearly 3 years is a concern.

(6) MQF 792-85. FPC used a Johnson Controls solenoid valve, model V11HA-100, to replace a Johnson Controls Model V-24-2. The solenoid valve is used for AH-366-SV which controls supply air that opens and closes air handling damper D-60. Exhaust damper D-60 opens when the emergency diesel generator (EDG) supply dampers open and the ventilation fans start. FPC purchased the item as a like-for-like replacement and dedicated it by visually inspecting it to determine equivalency. FPC performs a monthly periodic test of the system. FPC purchased the item directly from Johnson Controls to establish traceability to the OEM with no middle su[illegible] FPC prepared a JCO that still remains in effect. FPC consider[illegible] components operable and suitable for continued use. The untimely corrective action is a concern.

(7) PO F9038125V. FPC issued this purchase order for an anode used to protect service water piping against corrosion. FPC did not obtain assurance with respect to the material hardness or the physical and chemical properties listed on the certified material test report provided by the manufacturer. FPC did not establish traceability from the material manufacturer through the vendor. The team reviewed this item and found that it is does not perform a safety-related function. It is installed in safety-related piping to extend the service life of the piping system. Therefore no further action is planned. The item remains in service.

The team found the status of examples 1, 3 and 7 to be satisfactory. Examples 2, 4, 5 and 6 still require further action by FPC. The licensee has had corrective actions in place, but has not resolved all the issues in a timely manner. This failure to take timely corrective actions is a concern and is identified as Deficiency 92-201-03.

2.7 Trending of Suppliers

The team reviewed FPC's process for tracking and trending deficiencies in the performance of suppliers for CR3. FPC performs this activity as required by Quality Programs Administrative Procedure 27, Revision 10, "Nonconformance Tracking/Trending System." The Supervisor, Quality Systems prepares the report, and the Director, Quality Programs issues the report for review and action. The report is directed to the Senior Vice President, Nuclear Operations, with copies to the appropriate managers.

The report contains three sections related to supplier nonconformances. The first section describes the status of nonconformances issued, both closed and open. This section shows the backlog and age of open items. Most items are closed in less than 3 months. At present, four are more than 6 months old, and none are over a year. The items tracked and trended come from vendor audits, requests for corrective action, vendor audit problem reports, and quality material problem reports. The second section deals with supplier nonconformances by cause codes, such as unacceptable hardware, inadequate documentation and purchase order violations. The team reviewed these data and found 46 percent of the nonconformances to be hardware related. Unacceptable documentation accounts for approximately 18 percent. The third section is an

analysis of the nonconformances of vendors that had 10 or more problem reports or nonconformances during the previous 18 months. Thus it reveals vendors who may warrant attention. Each issue of the trend report indicates those vendors who were added, retained or (by deduction) removed from the list.

The program appears to be successful, in that the report provides managers with information on supplier and vendor performance. However, the trending program does not include any information provided by outside organizations such as the Institute of Nuclear Power Operations (INPO) and the NRC, and other licensees through licensee event reports (LERs).

2.8 Receipt Inspection

The inspection team reviewed sections of the FPC receipt inspection program for commercial grade and basic components that were intended for safety-related use, including those sections on receipt inspection activities. The team observed FPC's "Stores" and quality control (QC) personnel performing receipt inspection activities, discussed the inspections with CR3 Stores and QC staff, and reviewed portions of CR3's receiving inspection program. The team based its review and observations, in part, on the requirements of Appendix B of 10 CFR Part 50, the American National Standards Institute (ANSI) standards, the American Society of Mechanical Engineers (ASME standards, and certain industry guidance, such as the Electric Power Research Institute's (EPRI) Nuclear Procedure No. (NP) 6629, "Guidelines for the Procurement and Receipt of Items for Nuclear Power Plants (NCIG-15)." The inspection team found no concerns in this area.

3 DEDICATION PACKAGE REVIEW

To assist the NRC in reviewing individual dedications, FPC prepared, at the NRC's request, a number of files of dedication records compiled from diverse records, but each pertaining to one dedication, as selected by the team from a review of the lists of CR3 dedication files. FPC organized the review packages by the following disciplines: electrical, instrumentation, mechanical, and materials (including lubricants). FPC also provided the associated commercial audit or commercial grade survey reports in separate files. The team reviewed the records for the selected dedications including purchase requisitions (PRs), requisition review sheets, catalog procurement review forms, POs and attachments (engineering letters and copies of Attachment C), invoices, FACCR forms, RIPs, receiving inspection reports, SIPs and reports, and maintenance work requests (WRs). The following examples are items that FPC purchased as commercial grade and either installed or made available for installation in safety-related plant applications without performing an adequate review for suitability for service.

(1) FPC issued PO F670284K, dated April 3, 1990, to Coltec Industries for an adapter nozzle for the fuel injection nozzle on the EDGs. FPC installed the part in the EDG under modification approval record (MAR) 88-01-12-01. This MAR documents one of the modifications implemented to increase the rating of the EDGs. While reviewing the dedication package for item M-1 the inspection team made the following observations:

On March 23, 1990, PE prepared and approved the FACCR for this item, listing the safety function for the nozzle adapter as "fuel system pressure boundary." The failure modes specified were fracture and thread shear. PE further stated on the FACCR that the effects of the failure could result in a loss of fuel or in fuel leakage to the EDG which could cause the engine to run roughly.

The only critical characteristics listed on the FACCR were (1) the vendor part number and (2) the dimensions and configuration. The critical characteristics were not adequate to address the failure modes stated for the part. Since fracture and thread shear were listed as the failure modes, material properties are important critical characteristics which should have been verified, but were not. PE also did not specify which dimensions needed to be verified, such as length and diameter.

The source inspection requirements for this part were listed in the body of the PO. The SIP requirements stated that the source inspector was to verify the dimensions to the vendor-supplied drawing and to prepare and sign the FPC statement of conformance. While reviewing the FPC statement of conformance prepared by the source inspector on March 23, 1990, the inspection team noted that the source inspector marked "N/A" in the drawing number space. Therefore, the team questioned whether the dimensions had been verified to the vendor drawing. The statement of conformance was the only documentation provided by the source inspector and did not describe the scope of activity that he performed.

In summary, FPC did not adequately describe the safety function for dedication of the adapter nozzle and did not state all of the effects of the part's failure. The critical characteristics stated on the FACCR were not adequate to address the failure modes identified for the part. The FACCR did not specify the dimensions that needed to be verified. Material was not identified as a critical characteristic and thus was not verified. The statement of conformance did not clearly indicate whether or not the source inspector verified the dimensions to the vendor drawing.

(2) This item was a liner between the adapter check valve and the cylinder for the EDG air start check valve. FPC procured this item as a catalog item under the same PO as was issued in item M-1. FPC installed this part under MAR 86-01-12-01. PE prepared and approved the FACCR for this item on March 23, 1990. The FACCR stated that the safety function of the parent component (EDG) was to provide emergency power during accident conditions. The EDG air start system appeared to be the more appropriate parent component based on the safety function of the part stated on the FACCR. The EDG appeared to be too far removed from the specific part in order to have relevant safety functions and failure modes. The FACCR stated that the safety function of the part was to contain air for the air starting system. It appears that the more appropriate safety function for the part was that it provided a flow path in the starting air system. The failure modes specified were fracture and thread shear. The FACCR further stated that the failure

could result in a loss of air during starting. However, FPC did not list the fact that the failure could also result in the EDG failing to start because of a loss of air.

The critical characteristics listed on the FACCR were (1) vendor part number and (2) dimensions and configuration. The critical characteristics were not adequate to address the failure modes stated for the part. As discussed for item (1) above, material and hardness were important critical characteristics that should have been verified, and the FACCR did not specify the dimensions that needed to be verified.

The source inspection requirements for this part were the same as those listed for item (1). The weaknesses found by the inspection team for item (1) also apply to this part.

In summary, the more appropriate parent component was not stated. The critical characteristics stated on the FACCR were not adequate to address the failure modes identified for the part. The FACCR did not specify the dimensions that needed to be verified. Material was not identified as a critical characteristic and thus was not verified. The statement of conformance did not clearly indicate whether or not the source inspector verified the dimensions to the vendors drawings.

(3) FPC issued PO F670378V, dated May 23, 1990, to Miller Bearing Inc. for four sets of thrust bearings for the decay heat removal pumps. FPC determined after completion of this inspection that the installed bearing set is currently installed in a warehoused decay heat removal pump, and not in service.

The FACCR dated May 12, 1990, listed the critical characteristics of the thrust bearings for the decay heat removal pump as configuration, dimensions, and manufacturer bearing number. However, attachment 5E, of NP&SM Section 5, lists typical critical characteristics of a thrust bearing as configuration, dimensions, model number, load rating, and material. The team concluded that the FACCR critical characteristics were not specific enough to adequately determine the suitability of the item for use in its safety-related application.

The team also reviewed the RIP dated May 22, 1990. FPC uses the critical characteristics listed on the FACCR when developing the criteria to be listed on the RIP. The RIP listed the following items to be verified: dimensions listed on the catalog sheet, damage and workmanship, and the manufacturer's part number. However, the RIP did not include configuration, which was included in the FACCR as a critical characteristic for this item, and which was not adequately verified. FPC did not verify the material type and load rating, which, although important characteristics of a bearing, were not listed in either document.

The RIP indicated that only two of the four sets should be sampled. The receiving inspection report indicated that two of the four bearing sets were sampled per MIL-STD-105D. Sampling is not appropriate in this

situation since FPC had not surveyed the vendor and had no basis for the assumption of lot homogeneity, since Miller Bearings, Inc. was neither an approved distributor for MRC Bearings, nor an approved commercial grade supplier.

(4) FPC issued PO F842352K, dated May 12, 1990, to Dresser Pump Division of Dresser Industries, Incorporated, for an impeller for a Worthington pump model 6-HND-134. FPC installed the pump in the building spray system. The inspection team made the following observations while reviewing this dedication package.

The FACCR for this item was prepared on March 30, 1990, and approved March 31, 1990, by PE. The RIP and SIP were prepared by PQA on March 29, 1990, and approved by PQA on March 30, 1990, which was before the FACCR was approved. This did not appear to be in accordance with Section 7.5 of the NP&SM, which states that PQA will develop an RIP and SIP using the critical characteristics provided on the FACCR.

The critical characteristics specified on the FACCR included configuration (double opposing), various dimensions, material (ASTM A-296), number of vanes, and documentation as specified in letter 838. The inspection team noted that FPC listed the number of vanes as a critical characteristic, however, specified no value as being acceptable. The above critical characteristics were not adequately translated to the SIP. The SIP specified that the source inspector perform random dimensional inspections to verify conformance with vendor's provided drawings, bill of material, and shop order. The SIP further specified that the number of vanes and the at-shaft inside diameter (both ends) be recorded. The critical characteristics verified and documented on the SIP were not adequate to ensure that the pump impeller would perform its intended safety function.

The completed SIP, associated inspection report and the supplier's provided documentation stated that the material was supplied per material specification ASTM A-744. The inspection team observed that this material specification differed from that in the FACCR and SIP. The source inspector did not document the material deviation, and PQA did not note the deviation while reviewing the documentation provided by the source inspector. Both PE and PQA stated that the source inspector was not authorized to accept the change to the material specification. The source inspector did not record the number of vanes as required by the SIP. There was no documentation to indicate whether the number of vanes were verified during receipt inspection.

Engineering Letter 838 required that the impeller be subjected to a liquid penetrant or magnetic particle test in accordance with ASME Section V. However, the SIP did not require that the adequacy of the nondestructive testing be verified during performance. PQA personnel stated that their interpretation of this requirement was that FPC must verify the adequacy of the nondestructive testing by reviewing the documentation provided by the supplier.

PE and PQA personnel informed the inspection team that problem report SEPR-92-0002 was written March 17, 1992, to document that the SIP had not incorporated all of the specific critical characteristics stated on the FACCR. The licensee found the problem while reviewing the completed dedication package, after the inspection team had identified the package for review during this inspection. A revised RIP was written and performed on March 17, 1992, which verified and recorded the number of vanes. PQA personnel stated that all of the dimensions stated on the FACCR could not be verified at the site. FPC placed the impeller on QC hold while deciding whether or not to send it back to the supplier who has the proper facilities to verify the dimensions that could not be verified at the site. PQA personnel also stated that material specification ASTM A-296 was discontinued in 1980 and was replaced by specifications A-743 and A-744.

(5) FPC issued PO F842722K, dated September 20, 1990, to Coltec Industries for a lower impeller shaft key for the blower on the Colt EDG. The FACCR was dated May 5, 1990. Attachment 5F to NP&SM Section 5 lists the following critical characteristics typically verified for a shear key; configuration, dimensions, hardness, and material. The FACCR, Section C, lists the following product characteristics critical to assure safety function: vendor part number, configuration and dimensions. The previously mentioned critical characteristics in the FACCR were not believed to be sufficient to assure that the item was suitable to perform its intended safety function. The FPC design engineer responsible for writing the FACCR stated that the critical characteristics suggested by FPC procedures and not included in the FACCR, were adequately verified on the basis of a recent vendor survey, and therefore were not included in his list of critical characteristics. The RIP dated September 20, 1990, identified that the following characteristics needed to be verified: that the material received agreed with the PO description, that the material was free of shipping damage, that FPC received the documentation and that the source inspection was completed. The RIP was found to be deficient because it did not adequately specify the critical characteristics listed in the FACCR; part number and configuration and dimensions. The step, "Verify that the material received agrees with the purchase order description," is an example of characteristics and acceptance criteria listed in the RIP that the team found to be too broad in character to ensure that the item specified in the PO was suitable for service.

The SIP dated September 13, 1990, was written to verify the item critical characteristics by the following methods: review part number and configuration, perform or witness dimensional inspection, and review the vendor's documentation for material to be supplied and determine acceptance per the material requirements. The SIP failed to list necessary methods for verification so that the source inspector could determine that the item was acceptable. There was no indication that the material was adequately verified. Additionally, the SIP was prepared and approved by the same PQA engineer and PE did not confirm that the characteristics listed as critical would be properly assured.

(6) FPC issued PO F844359C, dated May 13, 1991, to Consolidated Power Supply, Birmingham, Alabama, for 32 square feet of ASTM A240, 1/2 inch Type 316 stainless steel material. The FACCR dated April 15, 1991, stated that the critical characteristics were material (ASTM A240, Type 316) and thickness (1/2 inch plus or minus 0.06 inches). The FACCR did not have any basis of purchase stated, however, it did state that the Type 316 plate would be used for structural non-pressure retaining applications, and its typical failure modes could be buckling or elastic failure, with a potential effect of a loss of structural integrity. The team noted that, other than a CoC, neither the FACCR nor the RIP identified or required certification from the material manufacturer, such as by a CMTR, or verification and documentation of traceability such as by a heat number. The team also noted that the RIP required the CR3 QC inspector to verify the material "marking" by using an "inspection method" with "mechanical inspection equipment," and to "check material hardness."

The hardness verification acceptance showed one hardness entry (78 HRB); however, it could not be determined from reviewing the RIP whether the incoming material was tested in only one location, or whether the 78 HRB was the average. The team also reviewed a quality control issue (QCI) form, No. 144476, dated January 14, 1992, and noted that it transferred or released several sizes of ASTM A240 plate, one of which was four square feet of 1/2 inch thick ASTM A240, type 316 material. The QCI line item for the 1/2 inch plate identified FPC PO F844359C and heat/serial No. 849798. Based upon the records in package M-21, the team could not correlate the heat/serial number stated on the QCI to the actual material received on the RIP. Heat/serial No. 849798 was not found by the team in any other documents contained in the package other than the QCI.

(7) FPC issued PO F670407K, Revision 1, dated March 11, 1991, to Anchor Darling Valve Company (AD), Williamsport, Pennsylvania, for AD check valve parts including a disc seat for 24 inch, 150 pound (lb.) rated, swing check valves used in the raw water system (RW), valve numbers RWV-35, 36, and 38. Revision 1 of this PO required FPC source inspection. Since the initial PO did not contain any source inspection requirements, AD shipped the order to FPC without the benefit of the performance of any FPC source inspection activities. Therefore, revision 1 of the PO was actually written to require the disc seat to be shipped back to AD, so that FPC could conduct source inspection activities. The critical characteristics listed on the FACCR were: dimensions, configuration, and ASTM B127-4400 material. The FACCR basis of purchase was "like original: AD drawing W8422083 2/B." The RIP stated in part to verify completion of source inspection by a review of FPC SIP and verify that the material received agrees with PO description. The FPC SIP, dated June 5, 1990, stated, in part, "verify the following critical characteristics... dimensional conformance by performing or witnessing... configuration is per vendor supplied documents [and] verify by review of records that material is B127-4400." This SIP was approved by the same PQA person who prepared it. The SIP copy attached to the Ebasco source inspection report contained the

source inspector's results, including "the material was verified by review of the CoC stating the material to be B127-4400, this was found acceptable."

The team noted during their review of this package that the critical characteristics, basis for purchase, and material were not adequately verified. Also, a like-for-like evaluation for equivalency back to the original PO and drawing revision was not performed. The team also noted that verifying commercial grade material only by a review of a CoC is inadequate.

(8) FPC issued PO F845035D, dated October 28, 1991, to Epperson & Company for a Worcester Controls Corporation 3/4 inch, 3-way ball valve with actuator used as a main steam block valve during a station blackout. This valve is a pressure boundary component for supplying air to the main steam valve actuators (411-414). The critical characteristics of the valve included materials of construction (brass body and stainless steel ball and stem of valve), part number, configuration, and accessories as specified in the PO; and the dimensions and thread sizes as specified in the vendor's drawing.

FPC was to perform a source inspection to verify the critical characteristics listed on the SIP. Completion of the SIP was to be verified during receipt inspection as identified on the receipt inspection plan dated September 18, 1991. The SIP stated "Verify by review of documentation that material of construction is brass body, stainless steel ball and stem. Material traceability must be maintained from documentation to item." The SIP also stated that "Items supplied must be identical with those supplied as original equipment. No changes in the design, material, manufacturing or interchangeability is permitted without approval by FPC <u>prior to shipment</u> per letter(1046A)." Before conducting the source inspection, Ebasco (the contractor who performed the source inspection), learned that Worcester Controls had moved its manufacturing facility from Massachusetts to North Carolina and had changed the design drawing number and part number for the valve. Ebasco requested that, in lieu of a review of exact traceability of material to specific heat or CMTR number, they conduct a general review of the vendor's material control process to ensure that a system is in place for maintaining material control while manufacturing valves. This change in the SIP guidance was accepted by FPC. The Ebasco Services Vendor Quality Assurance Report and the SIP used by the source inspector for documenting the source inspection activities performed on December 12, 1991, did not contain adequate documented objective evidence for the activities supposedly performed. Both documents only stated that a review of the vendor's material control program and certificate of conformance were reviewed for material verification and stated that "all items are as previously supplied" to verify that no design material or manufacturing changes had occurred. Neither the SIP (with inspector notes) or the final report provided any objective evidence as to what was reviewed during the source inspection at Worcester Controls. FPC did not specify which activities should be

performed to verify the vendor's material control program and ultimately the material was not verified.

(9) FPC issued PO F844057V, dated February 25, 1991, to Interscan Corporation for a Sulfur Dioxide Gas Sensor Cell for control room atmosphere toxic gas monitoring and alarm system. The descriptions of the parent system and part safety functions were incomplete, indicating pressure retention only. No functional performance was required to be verified, yet the item was designated Class 1E during purchase requisition review and on Engineering Letter 1176. The part failure modes were incomplete; considered "leakage" (of connection to system), but not leakage of sensor water (which occurred shortly after first sensor was installed requiring its immediate replacement). The critical characteristics were inconsistent with the safety functions as listed. Retention of sensing liquid and composition of the liquid were omitted. The verification methods and acceptance criteria were inappropriate and incomplete. The vendor was required by Engineering Letter 1176 (attached to the PO) to provide a CoC to the effect that the part had undergone no changes in design, material, or manufacturing process that would impact seismic capability since a previous PO had been issued in 1988 (original). Other critical characteristics were to be verified by comparison to original part. Visual verification of configuration was reasonable, but visual for dimensions was questionable, and material by appearance was inadequate. Although not listed as a critical characteristic, its function was to be verified by calibration after installation. Some critical characteristics were to be verified by source inspection. However, the SIP did not list weight, markings or what to verify by functional test; nor was adequate guidance given on how to verify dimensions, what dimensions, or what tolerance was acceptable. The RIP also did not list weight or markings. The validity of the CoC was to be verified during a source inspection by Ebasco. However, the source inspector documented reviewing only two drawings, a 1989 sensor QA dimension drawing, and a 1981 "LD monitor layout" drawing. The SI report was apparently not reviewed for adequacy by PQA or PE.

(10) FPC issued PO F842336V, dated May 4, 1990, to Multiamp Testing Service, Inc., for Multiamp terminal blocks for various Class 1E applications. The FACCR indicated "harsh" environment, but listed as restrictions were: no HELB/LOCA and Zone 30. It was not clear what environmental qualifications were required. The parent and part safety functions, failure modes, and critical characteristics were incomplete or inappropriate, as were the verification methods and acceptance criteria. Both insulation resistance and dielectric strength were listed with inconsistent acceptance criteria.

(11) FPC issued PO F842798V, dated November 1, 1990, to Torque-Quip, Inc., for 1 Burks Pump Company centrifugal pump and motor assembly and two spare motors to be used for (and spares for) EDG standby jacket cooling water pumps. The parent component was not named or described and its safety function was expressed as that of the entire EDG system which was too far removed from the parts description to provide meaningful

information for determining the part safety function. The part safety function was marked "active," but described as pressure boundary only. The critical characteristics listed were configuration, material, and functional flow. Seismic qualification was not listed as a critical characteristic but was addressed via a PEERE. This was also an example of an unsatisfactory source inspection. The original source inspector did not recognize the configuration and markings of the initially supplied items as deviating from the requirements. It was apparently not discovered that the mounting flange was incorrect and the motor was totally enclosed-fan cooled (TEFC) when it was supposed to be totally enclosed-non ventilated (TENV), until installation was attempted.

(12) FPC issued PO F844659K, dated July 30, 1991, to Graybar Electric Company, Tampa, Florida, for 20 Bussman 600 volt, 30-60 ampere, fuse reducers for standard size fuses. The PO specified that the supplier shall provide a CoC attesting that the item or service provided on this PO was processed in accordance with the following QA/QC program: Bussman's QA policy manual BU1500 CTD, dated August 9, 1988. The critical characteristics were listed on the FACCR as part number and description. The FACCR's basis of purchase was stated as "like for like, Drawing No. 201-063, V8-08 thru V8-15." FPC received a CoC from Bussman dated August 9, 1991, which certified that the items listed were manufactured and tested in accordance with Bussman's specifications. The CoC identified FPC PO F844659K as the "reference customer PO number."

The team noted that it appeared Graybar had procured the fuse reducers directly from Bussman; however, there was no objective evidence to substantiate that fact. CR3 had not performed a survey at Graybar to determine that they had adequate warehousing controls in place. The team questioned the Bussman CoC since it referenced FPC's PO number instead of a Graybar PO number. The team requested FPC to provide additional objective evidence to show traceability from Bussman to Graybar. However, FPC was only able to provide a packing list from Graybar to FPC, and was not able to show any other evidence of traceability from Bussman to Graybar. The team concluded that CR3 had not established adequate traceability from the manufacturer to Graybar and did not show that the components Graybar procured directly from Bussman were the same components shipped to FPC.

(13) FPC issued PO F844719D, dated August 12, 1991, to Chemco Electric Supply for Allen Bradley 700-N400A1 convertible pole relays for ESF logic circuits. The part safety function (marked as active) was described as maintaining integrity of safety-related control power supplies - relay contacts used for load status indication, but did not state whether the relays must energize or deenergize to perform this function. The failure modes listed short circuits, but not open circuits. Other failure modes (including failure to change/maintain required state) were stated not to affect operation of associated safety-related loads. The critical characteristics listed on the FACCR included coil resistance, dimensions and configuration, and dielectric strength of coil to ground, but did not consider mechanical load factors, pull-in and dropout

voltages, insulation resistance on contacts, contact resistance, or timing/synchronization. The relays were to be qualified on a like-for-like basis with the relays being replaced.

(14) FPC issued PO F740240K, dated April 5, 1990, to Consolidated Electric Supply Co. for Joslyn-Clark (JCC) type TB137-16, type 4U6-130, type 5UK8-7-76, and 5U6-2-76 convertible pole relays for the safety-related equipment status indication panel and for ESF logic initiation upon loss of offsite power. Safety function of part was stated as the description of conventional relay operation, but never stated whether the relay must change state, and if so, whether they must energize or deenergize to perform their safety functions. Critical characteristics were stated only as part number and configuration and pull-in and dropout testing. Not listed were: seismic qualification, insulation resistance of coil and contacts, contact resistance and timing. The verification of critical characteristics was to be by source inspection. The annotated SIP and source inspection report did not give load factors nor provide coil turns data as required.

(15) FPC issued PO F844454K, dated June 6, 1991, to Consolidated Electric Supply for 12 electrical replacement coils for JCC PM type relays. The critical characteristics listed on the FACCR included: part number, catalog description, configuration, voltage rating, and mechanical load range. Section D of the FACCR stated, "relay coil is like-for-like to that used in originally qualified equipment." The stated safety function of the parent component was to provide engineered safeguards switching functions. FPC Engineering Letter 1187A, dated September 11, 1990, stated, in part, "...each relay shall be subjected to [certain tests for electrical relays]... The manufacturer shall assure and provide certification attesting that there has been no design, material, or manufacturing process changes made since October 1971...."

The team noted that although PO F844454K procured JCC's electrical relay replacement coils, Letter 1187A incorrectly imposed inspection requirements for relays. The team's review of the Ebasco SIR also identified that, although it was required to verify that the vendor's CoC was supported by records, the SIR did not document that any relevant records were reviewed other than the vendor CoC and the coil resistance and turns test report. The team also noted that PQA's subsequent review of the SIR failed to identify that the source inspectors failed to verify the vendor's CoC basis.

(16) FPC issued PO F844090V, dated February 26, 1991, to Interscan Corporation, Chatsworth, California, for two vacuum switches for Interscan's Toxic Gas Monitor System used in the control room complex ventilation system. Section D of the FACCR stated, "certification required per letter 1040 (like-for-like replacement)." Engineering Letter 1040, dated October 12, 1988, required Interscan to furnish a CoC stating that all parts supplied were equivalent or superior to, and interchangeable in form, fit, function and structural integrity with, the parts procured under FPC PO F9067401V. The SIP, dated February 20, 1991, stated, in part, "...2. verify that material meets the

requirements of the procurement documents by review of vendor's records... 3. verify configuration is per vendor drawing I-8213, dated April 1988, [and] 4. verify by review of vendor documentation that certification contents are accurate and are supported by records (letter 1040)... To witness operability of switch prior to shipment. The switch must be installed in a like-type monitor, or a mock-up that has the same functional characteristics as the monitor. The monitor or mock-up must perform in accordance with vendor technical documents with the FPC ordered parts installed (VSI set-point is 50 inches H_2O)."

During the team's review of the Ebasco SIR, dated March 12, 1991, the team identified that not all of the SIP verification requirements were adequately performed or documented. For example, even though SIP item no. 7 required that the parts be installed and tested in a functional mock-up, the SIR does not indicate that it was performed. The report from the source inspector also indicates that a June 28, 1988, revision of drawing I-8213 was used for verification activities, instead of the drawing revision that was stated in the SIP. This March 12, 1991, SIR was reviewed by a PQA representative on April 3, 1991. The team concludes that certain acceptance criteria identified in the SIP were not adequately addressed, performed and/or documented by the source inspection report.

The lack of adequate derivation of safety functions and critical characteristics, inadequate translation of those characteristics into verification methods and acceptance criteria, and the inadequate verification of those critical characteristics (and/or inadequate review to ensure proper verification) resulted in the numerous examples of inadequate dedication found by the team.

The inadequate dedications of the CGIs discussed above, some of which were installed, constituted a failure by FPC to perform and document an adequate review for suitability of application, and in some cases, adequate design verification (seismic or EQ), for items intended for safety service, contrary to the requirements of Criterion III of 10 CFR Part 50, Appendix B. The inadequate dedications also constituted a failure to verify that the items received met the specifications for their safety-related applications contrary to the requirements of Criterion VII of 10 CFR Part 50, Appendix B. Representative examples of inadequate dedications listed in Section 3 are cited as Deficiency 91-201-01.

4 PROCUREMENT AND DEDICATION TRAINING

The training for personnel involved in the procurement, handling, storage and dedication of components for safety-related use was reviewed. Since the personnel functionally report to different sections of the organization, the licensee has provided the following procedures to prescribe training:

* Nuclear Engineering Procedure (NEP) 121, "Indoctrination and Training to Nuclear Engineering Operations and Procedures,"

- Training Department Procedure (TDP) 311, "Nuclear Operations Training Procedure,"

- Nuclear Procurement and Storage Manual, Section 1.5.3, "Training," and

- Warehouse Inspection Group (WIG)-2 Personnel Qualification Record.

NEP 121 pertains to the Nuclear Procurement Engineering Services (PE) personnel. This includes senior electrical, instrumentation and control, and mechanical engineers. The employee's supervisor performs an evaluation to determine the required training using the guidance given in the procedure. Required training must be completed by the employee prior to performing work independently.

TDP 311 describes the training of the specialized certifications training program for personnel who perform audits, inspections, nondestructive examinations, and calibration activities affecting quality. The procedure is detailed and thorough. It is intended to satisfy commitments to regulatory guides and applicable ANSI standards. The procedure covers both initial training for each employee and continuing training or re-training. In addition special training and on-the-job training is provided. Each employee is evaluated through examinations and grading The inspector found the procedure to be satisfactory.

NP&SM Section 1.5.3 describes training requirements for the Nuclear Procurement and Storage Manual. All personnel involved in procurement activities are required to understand and follow the instructions outlined within the manual. The Nuclear Procurement and Storage Committee chairman contacts each manager of each department involved with procurement activities to ensure that personnel are trained on the manual and each manual revision. Technical training is also identified by the Committee when needed. Records of attendence are maintained by the Training and Records Management Department.

The final procedure, WIG-2, provides guidance and instructions for warehouse personnel. Basically, this procedure allows the Supervisor of Nuclear Stores to evaluate the training required for warehouse personnel, such as storekeepers and assistant storekeepers. The Supervisor is responsible for maintaining the employee qualified and may schedule re-training when determined necessary. A qualification record is maintained for each employee. Several records for storekeepers were reviewed by the inspection team and found to be complete. It would appear that the training program for warehouse personnel is satisfactory.

The training program was evaluated by examining training records for several people who perform different parts of the procurement activity. The records were found to be complete and up-to-date. On February 24-28, 1992, special training entitled, "Nuclear Utility Procurement," was presented at CR3. The course was presented by an EPRI NDE representative for 30 FPC people. The course content material was reviewed by the inspection team. The course appeared to provide training in the pertinent areas of procurement and dedication. Licensee management stated that it is their intention to add this

special training to the regular training program for new employees and on-going training when appropriate. This action will be considered a strength in the training program when it is fully implemented.

5 EXIT MEETING

On March 27, 1992, the inspection team conducted an exit meeting with members of the FPC staff and management at the CR3 site. During the exit meeting the team summarized the inspection findings and observations. The following individuals were present.

Florida Power Corporation

P. Beard, Senior Vice President, Nuclear Operations
G. Boldt, Vice President, Nuclear Production
B. Hickle, Director, Quality Programs
P. Tanguay, Director, Nuclear Operations Engineering and Projects
W. Conklin, Director, Nuclear Operations Materials and Controls
R. Widell, Director, Nuclear Operations Site Support
G. Oberndorfer, Manager, Procurement and Material Quality Assurance (QA)
E. Welch, Manager, Nuclear Procurement Engineering Services (NPES)
E. Froats, Manager, Nuclear Compliance
K. Wilson, Manager, Nuclear Licensing
W. Watts, Manager, Purchasing and Contracting
D. Kurtz, Manager, Site Nuclear QA
K. Gardner, Manager, Material Control
J. Colby, Acting Manager, NPES
G. Becker, Manager, Site Nuclear Engineering Services (SNES)
A. Gelston, Acting Manager, SNES
L. Santilli, Supervisor, Materials Quality Control
R. Yost, Supervisor, Quality Audits
D. Bates, Supervisor, Quality Systems
J. Buckner, Nuclear Regulatory Specialist
T. Catchpole, Senior Nuclear QA Specialist

Nuclear Regulatory Commission

B. Grimes, Director, Division of Reactor Inspection and Safeguards
E. Merschoff, Deputy Director, Division of Reactor Safety, Region II
U. Potapovs, Section Chief, VIB
R. McIntyre, Team Leader, VIB
S. Alexander, EQ and Test Engineer, VIB
W. Gleaves, Reactor Engineer, VIB
J. Petrosino, QA Specialist, VIB
M. Thomas, Reactor Inspector, Region II
F. Jape, Section Chief, Region II
P. Holmes-Ray, Senior Resident Inspector, CR3

Other Personnel

B. Bradley, Senior Project Manager, NUMARC
P. Robinson, Attorney, Winston and Strawn