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EXECUTIVE SUMMARY

Between May 13 and May 17, 1991, the U.S. Nuclear Regulatory Commission's (NRC's) Vendor Inspection Branch conducted an assessment of the Consumers Power Company's (CPC's, the licensee's) activities to procure and dedicate commercial-grade items (CGIs) used in safety-related applications at the Palisades Nuclear Generating Plant (PNGP). The assessment team reviewed CPC's procurement program in order to assess the power company's 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) and to assess the status of CPC's implementation of the Nuclear Management and Resources Council (NUMARC) initiatives on procurement and commercial-grade dedication.

The NUMARC Board of Directors has approved procurement initiatives as described in NUMARC 90-13, "Nuclear Procurement Program Improvements," which commit licensees to assess their procurement programs and take specific action to strengthen inadequate programs. The first phase of these initiatives addresses dedication of CGIs, and was scheduled to be implemented by January 1, 1990. It commits licensees to meet the intent of the guidance provided in Electric Power Research Institute (EPRI) NP-5652, "Guideline for the Utilization of Commercial Grade Items in Nuclear Safety Related Applications (NCIG-07)." The NRC has conditionally endorsed this EPRI guideline in Generic Letter (GL) 89-02, "Actions to Improve the Detection of Counterfeit and Fraudulently Marketed Products," March 21, 1989. The second phase of the initiatives is the comprehensive procurement initiative and addresses vendor audits, tests and inspections, obsolescence, information exchange, and general procurement. In this phase, licensees commit to review their programs by July 1, 1991, to determine, on the basis of guidance in NUMARC 90-13, if improvements are needed in the above areas, and to complete such improvements by July 1, 1992.

The staff performed this assessment to determine the current status of the activities to improve the procurement program in relation to the industry's commitments discussed above and NRC requirements in this area. The NRC assessment team reviewed procedures and representative records, interviewed CPC's staff (including senior managers and PNGP personnel), and made observations. The team also met with CPC's corporate and plant managers to discuss relevant aspects of commercial-grade dedication and to identify areas requiring additional information. At the exit meeting on May 17, 1991, the assessment team discussed its observations with CPC representatives and senior managers. The assessment team's specific conclusions are summarized below.

- CPC has not made a significant effort to strengthen its commercial-grade dedication program, and the overall program description does not appear consistent with the dedication philosophy described in EPRI NP-5652, as endorsed by NRC GL 89-02. The assessment team also noted that the program description, including most of the pertinent implementing procedures, did not completely address the issues contained in NRC GL 89-02 which specified certain restrictions or conditions concerning the use of EPRI NP-5652 dedication methods as acceptable methods to comply with Appendix B. Specifically, the PNGP QA program did not address the GL 89-02 restrictions on the use of EPRI Methods 2 and 4. If modified and implemented to address these concerns, and others noted below, the existing program could provide adequate controls over the commercial-grade procurement process.

- CPC's management provided limited support and resources to improve its commercial-grade dedication program. The assessment team noted that the recent steam generator replacement outage contributed to CPC's lack of resources and attention towards improving the procurement and commercial-grade dedication program and its implementation at the PNGP.

- CPC's practice is that not all of the critical characteristics identified to assure safety function need to be verified. The NRC staff's position is that Appendix B requires the licensee to verify all characteristics that are critical to ensure that the item performs its safety functions for its particular plant application.

- Quality Assurance Department Procedure (QADP) 7.5, "Commercial Grade Surveys," required that CPC perform a survey of commercial-grade suppliers once every three years and did not require periodic reviews and evaluations of the supplier during this period. The assessment team noted that it may be necessary to perform commercial-grade surveys at a frequency other than on a triannual basis due to changes in the supplier's quality program, procedures, processes, management, or personnel performing the work activities. Commercial-grade surveys should be scheduled at a frequency commensurate with the status, importance, and complexity of the item or process being surveyed.

- The program did not require CPC to identify the quality assurance/control program or procedures used by commercial-grade suppliers to control the manufacture of the item as referenced in EPRI NP-5652.

- Palisades Administrative Procedure (PAP) 10.03, "Procurement of Material," Material Management Procedure (MMP) 10, "Acceptance and Dedication Planning," and PAP 9.30, "Q-List," required CPC to identify and document the safety functions and critical characteristics of only those items dedicated under CPC's dedication plan approach, which represents approximately 20 percent of the total population of commercial-grade dedications performed at the PNGP.

- CPC had revised PAP 10.03 and MMP 10 to incorporate the guidance of EPRI NP-5652 and to address the findings of several internal QA audits. However, CPC had not substantially improved the program to correct the fundamental cause of those findings.

- The assessment team found inconsistencies in the procedures involving the definitions and usage of terms such as "critical" and "quality" characteristics.

- The program did not provide for establishing documented verifiable traceability of CGIs to their original equipment manufacturer (OEM) as addressed in Criterion VIII of Appendix B and NRC GL 89-02. The types of OEM information of concern includes: qualification type testing; production sample destructive testing; and information on the history of changes to the design, the material, and the manufacturing process. This is of particular significance because the licensee often verified critical characteristics under the current program against information, including certificates of conformance, supplied by the vendor and the acceptance method referred to

as engineering document review. However, PAP 10.03 and MMP 10 did not require the use of commercial-grade surveys, as described under acceptance Method 2 in EPRI NP-5652, to validate that information. If only certificates of conformance are used, the procedures still required that the licensee consult the Evaluated Certificate of Conformance Suppliers List (ECCSL). However, most of the suppliers listed were evaluated for general acceptance of certificates of conformance on the basis of broad-based, programmatic audits, some of which were several years old.

- The PNGP staff stated that it would consult the ECCSL only to determine if a commercial-grade survey of a supplier had been accomplished. However, the procedures did not prescribe this limitation. The procedures did not require that the licensee review the survey report to verify that it applies to the items being dedicated and to determine if any of the critical characteristics for specific applications of PNGP could be verified on the basis of that survey.

- Since late 1990, QADP 7.5 has provided methods for surveying commercial-grade suppliers. These surveys must identify the specific critical characteristics of the item purchased as specified in Method 2 of EPRI NP-5652. However, in the dedication program procedures PAP 10.03 and MMP 10, the licensee did not address the use of or reference to this procedure or the associated QADP 7.2, "Supplier Evaluation." Although QADP 7.5 required that the supplier's quality program be documented and effectively implemented, this procedure did not completely address the issues contained in NRC GL 89-02. Specifically, the procedure did not address the verification of the program controls of both distributors and manufacturers when applicable. No other procedure addressed this situation.

- PAP 10.03 did not require the licensee to document the technical evaluation associated with the safety classification of replacement parts and was not consistent with the requirements of QADPs 7.2 and 7.5.

1 INTRODUCTION

The NRC's Vendor Inspection Branch assessed Consumers Power Company's (CPC's) efforts to improve programs for procuring and dedicating commercial-grade items (CGIs) used in safety-related applications. The NRC staff reviewed the CPC program to assess its compliance with Appendix B to 10 CFR Part 50 and to assess the status of implementation of the Nuclear Management and Resources Council (NUMARC) procurement initiatives for the Palisades Nuclear Generating Plant (PNGP). The staff performed the assessment from May 13 to May 17, 1991, at the Jackson, Michigan, office of CPC and the PNGP site, located at Covert, Michigan. In performing the assessment, the staff made observations, held discussions with the licensee's managers and corporate and site personnel, and reviewed records and procedures for the licensee's procurement and commercial-grade dedication program.

The NRC staff is conducting assessments at selected licensees' facilities to review their implementation of improved programs to dedicate CGIs and to assess the improvements made in the areas covered by NUMARC's comprehensive procurement initiative. This initiative, approved on June 28, 1990, by the NUMARC Board of Directors, directed licensees to meet the guidance provided in Electric Power Research Institute (EPRI) NP-5652 and to review and strengthen their procurement programs in accordance with specific guidance provided in NUMARC 90-13.

The specific areas reviewed and the team's observations are described in Sections 2 through 4 of this report. Section 5 describes the conclusions, strengths, and weaknesses, and Section 6 describes the exit meeting. The Appendix is a list of the persons contacted during the assessment.

2 COMMERCIAL-GRADE DEDICATION PROGRAM REVIEW

The assessment team reviewed CPC's programs and related commitments associated with the implementation of the NUMARC initiatives, including the program for procuring and dedicating CGIs used in safety-related applications at the PNGP. "Dedication" is the process by which an item, not manufactured and supplied under an approved 10 CFR Part 50 Appendix B QA program, is verified to be suitable for use in a nuclear safety-related application. A commercial-grade dedication program must be conducted under an Appendix B QA program because it consists of activities affecting quality.

2.1 Procurement Process and Procedures

The procurement process for the PNGP was described and prescribed in a hierarchy of procedural documentation beginning at the CPC corporate level with the Nuclear Operations Department Material Management Standard (NODS) M01, "The Procurement Process," which governs the overall procurement process for all the CPC nuclear plants. The team reviewed the currently effective revision of this standard, Revision 20, April 12, 1990, which added the first reference in this document to EPRI NP-5652. In Section 5.3.1, the procedure addressed the use of acceptance plans in addition to or in conjunction with a receipt inspection. The acceptance methods described in Section 5.3.2 were receipt inspection (in conjunction with a review of the supplier's document); certificates of conformance or certificates

of compliance; source verification; and post-installation test. The procedure described the circumstances under which this method would be appropriate for verifying acceptance by certificate of conformance as being similar to those circumstances under which receipt inspection could be used. A receipt inspection could be used when the item is simple in design and involves standard materials, processes, and tests. Although on this basis the procedure discouraged the use of certificates of conformance, it did not recognize the actual circumstances under which it may be preferable, or at least more practical, to accept certain attributes of an item on the basis of certificates of conformance, if adequate supporting documentation is provided when required, and if the validity of all the documentation including the certificates of conformance is adequately verified before placing the item in service. Although the procedure did address inclusion of supporting documentation when required, it included the following note pertaining to acceptance of certificates of conformance:

> The evaluation of the supplier's ability to provide a valid Certificate of Conformance or Compliance need not be completed at the time the order is placed, and need not be completed in order to accept and use the items.

The note also required that the evaluation be completed in a timely manner and commendably included the effects on past procurements. However, allowing the use of unvalidated certificates of conformance for accepting and using items in safety-related applications is inimical to ensuring the suitability of the application.

Section 5.3.2.c described the circumstances under which the licensee should verify the source. Some of the conditions given were appropriate, but the procedure included the statement "when the quality of commercial, 'off the shelf,' items ordered without imposition of QA program requirements on the supplier cannot be verified by receipt inspection, source verification shall be applied." Altnough this may be one condition under which source verification may be appropriate, this provision of the procedure excluded the use of commercial-grade surveys which may be acceptable under similar circumstances. This method is not recognized elsewhere in the procedure.

Section 5.3.3 dealt specifically, but superficially, with commercial-grade dedication. It stated, in part: "Suitability and dedication of a commercial grade item for a safety-related application may be accomplished by any one of the following: a. Like-for-like replacement:...b. Alternate replacement:...c. First-time procurement:...." Although it was not clear how suitability was to be verified, the section reasonably described the distinctions between these types of procurements, but did not explain how an item was determined to be like-for-like.

The assessment team concluded that NODS-M01 did not provide an adequate framework, consistent with 10 CFR Part 50 Appendix B, GL 89-02, or EPRI NP-5652, within which CPC could implement acceptable programs to dedicate CGIs for use in safety-related applications at its nuclear power plants.

PAP 10.03, "Procurement of Material," governs the overall procurement process for the PNGP. The team reviewed the currently effective revision of this procedure, Revision 8, of December 27, 1989. The team found that Paragraph 4.5 correctly defined "critical quality characteristics" in a similar manner to that in

which the term was defined in NODS-M01. However, in practice, not all critical characteristics must be verified.

This procedure also defined the PNGP quality classifications for procurement. Procurements of items intended for safety-related plant applications from a supplier with an approved 10 CFR Part 50 Appendix B QA program, and who accepts the reporting responsibilities of 10 CFR Part 21, are designated class "Q" procurements. Procurement of items for safety-related applications from commercial-grade suppliers (who may be listed in the ECCSL when the items meet the definition of a CGI in 10 CFR 21.3(a)(4)(a-1) are designated class "CQ" procurements. Nonsafety-related procurements are designated "NQ," and certain of these which involve special considerations such as seismic and environmental qualification, special shielding or enclosures, or fire protection are designated "AQ" because they carry augmented quality requirements. Also, certain radwaste systems and components have special requirements and are treated as safety-related.

The two major phases of the procurement process before receipt are the technical review of the procurement documents and the QA review. Section 4.8 did not define QA review, but only stated which group performed it. Section 4.9 addressed the dedication plan, stating that it can include basic receipt inspection, testing, certification, and verification of critical characteristics. Although this term is used elsewhere in the industry, it was not defined for the PNGP. This section introduced the first of many ambiguities and inconsistencies involving terms and their definitions. This section also used the "acceptance method worksheet" referred to elsewhere in the PNGP program procedures as an acceptance plan worksheet (APW) and "dedication plan agreement" referred to elsewhere in the program simply as a dedication plan (DP). Section 6.3 discussed the determination of safety functions and quality characteristics, but PAP 10.03 did not require documenting the technical evaluation associated with the safety classification replacement parts. Attachment 5 to PAP 10.03, "Technical Review," provided the only guidance, merely asking if the item was safety-related. Although the licensee had not yet implemented PNGP's new procedure which covered technical evaluation and safety classification, the assessment team's review of a draft version is discussed in Section 2.2 of this report.

Attachment 5 also provided three means of specifying the acceptance methods to be employed in any given procurement:

- Section 2.A Notelines - instructions for a receipt inspection that was documented either in the purchase requisition (an Authorization to Purchase or (ATP)) or in a document used to requisition material from stock to be dedicated (an Authorization to Add, Delete, or Redescribe Stock Items, Form 1069). Notelines may or may not appear on the purchase order (PO).

- Section 2.B Acceptance Plan Worksheet - used for multiple acceptance activities such as material analysis, source surveillance, receipt inspection, or bench testing, which are all to be listed on the APW. This worksheet could be used in conjunction with a DP. The inspectors noted that the form used as the APW provided for documenting the quality characteristics and associated acceptance criteria, but not critical quality characteristics.

- Section 2.C Dedication Plan - used to perform verification activities for a CGI after the licensee performed a receipt inspection specifying post-receipt inspection activities such as installation tests, system hydrostatic

tests, or installation activities to verify acceptance. The PNGP staff stated that DPs, which are the only documents on which all critical quality characteristics are supposed to be listed, were used in only about 20 percent of the CGI dedications performed. However, the assessment team reviewed various DPs and found that only a sample of the critical quality characteristics were selected to be verified in order to provide reasonable assurance that the item received is the item specified. The assessment team also noted that the description of the block contents on the form was inconsistent with the terms and instructions in the implementing procedure for DPs further adding to the ambiguity regarding which characteristics must be verified. Following the description of the DP was the question "Is the item commercial grade?" This paragraph did not reference or describe the tests for making a CGI determination. The next paragraph introduced a new subject abruptly, discussing the verification of attributes such as part number, material, catalog number, drawing, model number and serial number, but did not describe a means for formally documenting this information.

- The paragraph "Commerical Grade" provided several options without requiring any action. Paragraph 5 provided for the use of certificates of conformance if the vendor was on the ECCSL. However, PAP 10.03 and MMP 10 did not require the licensee to use commerical-grade surveys, as described under acceptance Method 2 in EPRI NP-5652 to validate that information. The value of using the ECCSL was questionable because most of the suppliers listed were evaluated for general acceptance of certificates of conformance on the basis of broad-based, programmatic, QA audits, some of which were several years old. The PNGP staff stated that the ECCSL was only consulted to determine if a commercial-grade survey of a supplier had been accomplished. However, the procedures did not prescribe this limitation on the use of the survey. In addition, the procedures did not require that the licensee review the survey report to determine if it applies to the items being dedicated and to determine which if any of the critical characteristics for PNGP applications could be verified from that survey.

Since late 1990, QADP 7.5 has provided methods for surveying commercial-grade suppliers to evaluate specific items and critical characteristics consistent with the provisions of EPRI NP-5652. However, use of or reference to this procedure or the associated QADP 7.2, "Supplier Evaluation," were not addressed in dedication program procedures PAP 10.03 and MMP 10. Although QADP 7.5 required that the supplier's quality program be documented and effectively implemented, this procedure did not completely address the issues contained in GL 89-02 regarding verification of the program controls of both distributors and manufacturers when applicable. This situation was not addressed elsewhere in the procedures for the PNGP dedication program.

In addition, EPRI NP-5652 provides guidance on measures to add assurance that CGIs are manufactured and tested in accordance with the supplier's commercial quality controls as reviewed and approved during commercial-grade surveys. However, CPC had not yet implemented that guidance in that the team found no programmatic requirements at the PNGP for invoking the supplier's documented commercial quality controls (specifically identified) in procurement documents or requiring supplier certifications to identify the specific controls or standards under which the CGIs were produced. The licensee did not have specific guidance to verify that such certifications were provided and that identified controls or programs matched those invoked in the procurement documents as reviewed and approved in the associated survey.

The team reviewed the other principal document governing aspects of procurement and dedication, MMP 10, Revision 1, of July 26, 1989, and identified the following deficiencies:

- The references in this procedure did not include EPRI NP-5652 or GL 89-02.

- Paragraph 4.14, in the Section "Definitions," defined "critical characteristics," differently from the definition in PAP 10.03. It was defined as those critical or functional attributes of an item that are necessary to ensure fitness for use. However, the paragraph then allowed them to be selected from the quality characteristics identified in PAP 10.03.

- In Section I.A of Attachment 3 to MMP 10, the licensee listed the following types of acceptance methods that are "normally used" for "Q" material and equipment and "may include:" (1) engineering document review, (2) source verification, (3) receipt inspection, (4) receipt inspection documented in a valid certificate of conformance, (as opposed to APW) and (5) DP with critical characteristics to be verified by the "user department" at time of installation. The assessment team could not determine the manner in which critical characteristics would be verified through APWs or DPs for "Q" procurements, that is, to procure basic components, not CGIs. Paragraph I.P, which was supposed to cover CGIs, "CQ" materials, and equipment, stated that acceptance methods normally used are the same as for "Q" materials and equipment. While this may be true in practice, this erroneous statement fails to recognize the fundamental distinctions between Appendix B manufacturers and commercial-grade suppliers.

- Attachment 4 to MMP 10 provided a sample APW and the instructions on completing it. The instructions specified quality characteristics but did not require the licensee to identify safety functions or critical characteristics. Although space was provided for listing the acceptance criteria, the procedures did not require, nor provide space for documenting the test or inspection results, and did not require or provide for documenting the traceability of such results to the item itself.

Appendix B to 10 CFR Part 50 (in particular, Criteria III and VII) requires that licensees ensure that all material, equipment, and services are suitable for their safety-related applications. Therefore, the licensee must (1) identify the important characteristics for each item required to assure that the item will perform its safety function; (2) establish methods of verification and appropriate acceptance criteria; and (3) document the verification of conformance to these criteria to provide reasonable assurance that the items will perform their safety functions under all design basis conditions. Therefore, the PNGP dedication program should satisfy these criteria for CGIs.

However, upon reviewing the program and the implementing procedures and holding discussions with the PNGP staff, the assessment team concluded that it was CPC's position and practice that not all of those characteristics identified as critical (defined appropriately in CPC procedures as those essential to safety function) need be verified but rather, only those necessary to show that the item received is the item specified. The NRC position is that the licensee needs to verify all critical characteristics which are essential to the performance of the item's safety function to assure that the item received is the item specified.

Finally, the program procedures did not provide for establishing documented verifiable traceability of CGIs to their OEM. Such traceability is important both to help identify counterfeit and fraudulent material and to demonstrate that the information supplied by the vendor applies to the actual items received. OEM information of concern includes qualification type testing; production sample destructive testing; and information on the history of changes to the design, material, and manufacturing process. This is of particular significance to the licensee for PNGP because it often verified acceptance by verifying the critical characteristics under the current program as implemented against information and documentation supplied by the vendor, including certificates of conformance and engineering documents.

2.2 Draft Technical Evaluation Checklist

The licensee developed PNGP's draft technical evaluation checklist, Revision Draft 4 of Attachment 2 to PAP 10.04, using the guidance of EPRI NP-6406, "Guidelines for the Technical Evaluation of Replacement Items in Nuclear Power Plants (NCIG-11)," which has not been endorsed by the NRC. In reviewing this draft checklist, the assessment team identified the following deficiencies:

2.2.1 Section 6.1 of the checklist contained three criteria for determining if a replacement item could be considered "like-for-like." The checklist stated that any one of these criteria was sufficient for a like-for-like determination. The like-for-like criteria were as follows:

> (a) Same as original, same manufacturer, same internal controls, same supplier (an identical item); or (b) Identical item, purchased from alternate supplier; or (c) Manufactured by another manufacturer, to the same design and industry standards, and under at least as stringent controls as was the original.

The first of these criteria corresponded roughly to part of the definition of like-for-like given in GL 91-05: the item was purchased at the same time from the same supplier as the item being replaced. The second criterion corresponded to the second of three procurement scenarios listed in Section 3.5.1.1, "Like-for-Like Evaluation," of EPRI NP-6406 that this EPRI report describes as ones that "do not affect the validity of the "Like for Like" determination." However, PNGP's third like-for-like criterion (6.1.c), although roughly corresponding to the third NP-6406 like-for-like procurement scenario, was not an appropriate criterion for a like-for-like determination. Merely manufacturing to "industry standards" according to NP-6406, or even to "the same design and industry standards" according to the PNGP checklist, does not guarantee that the items will be identical in form, fit, function, including fabrication processes and materials. As stated in GL 91-05, a like-for-like determination could be made if the items were procured from the same vendor at the same time. Otherwise, the licensee must verify that the design, materials, or manufacturing processes have not been changed since the items being replaced had been procured. This verification may be difficult when the replacement item was purchased at a different time from a different manufacturer.

2.2.2 Section 3.0 of the checklist contained two tests for determining if any given function of a part of a safety-related component should itself be classified as safety-related. The first test (3.0.c) was to determine if any of the functions of the part (required to be listed in Table 3.1 of the checklist) is active or passive, as defined in PAP 10.04. If active, then that function was considered to be safety-related and the checklist, operating as a logic tree, sent the reviewer to section 4.1 which designated the part as safety-related. If the function was determined to be passive per Section 3.0.d, then a failure modes and effects test was applied. Each failure mode (to be listed in Table 5.1) was evaluated for its effect on the part's parent component and for its effect on the performance of the safety function of "any other component." If there was no effect on the parent component (only), the classifier or reviewer was sent to Section 4.2 where the part was designated nonsafety-related. If it was determined, however, that a passive failure mode could prevent the parent component (or "any other component") from performing its safety function, then the checklist directed the reviewer to Section 4.1 where the part would be designated as safety-related.

Section 4.1, in addition to designating the part as safety-related, contained the three tests for meeting the 10 CFR Part 21 definition of a CGI for procurement purposes. However, Section 4.2, which designated the part nonsafety-related, stated, in part: "If it [the part] could prevent some other component (not its parent component) from performing a safety related function,...the item must be purchased AQ." However, as stated, Section 4.2 directly contradicted the provision in Section 3.0.d that with a passive failure mode affecting a safety function of the parent component or any other component, the part would be classified safety-related (i.e., to be purchased "Q" or "CQ"). While it is recognized that this statement in Section 4.2 should not logically be encountered if the determination were made in Section 3.0.d that any passive failure mode of the part could affect any component's safety function (thus sending the classifier to Section 4.1), its presence in contradiction to Section 3.0.d, created an ambiguity in which the checklist effectively directed two mutually exclusive dispositions of the part under the same condition. The assessment team found that ambiguity could result from the qualifier added in Section 3.0.d that included "any other component" in the conditions for determining that the passive failure mode would render the part safety-related. Nevertheless, if the intent of Section 4.2 was to exclude parts with passive failure modes affecting other than the parent component from the category of safety-related (i.e., "AQ"), then the condition in the second test under Section 3.0.d was misstated by including "any other component." Conversely, if the intent was to classify parts with such passive failure modes (affecting parent and/or any other component) as safety-related, then the statement in Section 4.2 was inconsistent and it would be impossible to comply with the provisions of Section 4.2 without violating Section 3.0.d.

2.2.3 Section 5.0 provided for determining the part's "critical characteristics for design," presumably as defined in EPRI NP-6406 on which the licensee claimed to have based draft procedure PAP 10.04. However, this section was inconsistent with NP-6406 in that it provided for consideration only of the passive failure modes in determining the critical characteristics for design. In Section 5.0.c, the licensee equated these modes with "design characteristic(s) (resistance to failure) [sic] which will provide assurance of the part's capability to perform its safety function." The mere resistance to these passive failure modes alone does not guarantee successful performance of any active safety functions. In addition, this provision excluded the identification of the critical characteristics for design that would be derived directly from those active safety functions in addition to those related to resistance to passive failure modes as called for in Section 3.4 of EPRI NP-6406.

2.2.4 Section 4.2, designated the part as nonsafety-related and commendably contained certain operability and reliability considerations that are often overlooked for nonsafety-related components and their parts. These considerations include seismic and environmental qualification and special shielding or enclosures. While these considerations can be important for certain nonsafety-related equipment, they are of primary importance to safety-related equipment. However, the checklist did not provide for including these considerations in determining the critical characteristics to be derived from safety-related functions. Although the paragraphs addressing the seismic and environmental aspects in Section 4.2 called for checking the corresponding box in Table 3.1 (shielding/enclosure has no box in the table), if a part were classified safety-related, the classifier properly following the steps should not get to Section 4.2. Thus, these items would not be considered for safety-related functions.

2.2.5 Used in conjunction with Attachments 1 and 3 to PAP 10.04, the Attachment 2 technical evaluation checklist would lead the procurement parts classifier or dedicator to select from the list of critical characteristics for design only those critical characteristics for acceptance that would provide reasonable assurance that the item received is the item specified. Although the licensee need not verify all design characteristics of an item, the licensee must verify all those essential to the performance of its safety functions and to its suitability for its safety-related application under all design basis conditions.

2.3 Pre-1990 Program

To assess the progress that the licensee for PNGP claimed to have made in improving its procurement and dedication process since 1987, the team reviewed two previous revisions to PAP 10.03: Revision 6, of April 4, 1988, and Revision 7, of December 4, 1988. The team found that Revision 6 mentioned CGIs in the context of their 10 CFR Part 21 definition but did not address commercial-grade dedication.

Revision 7, approved after EPRI issued NP-[illegible]2 in June 1988, referenced this document in its final draft form. Revision [illegible] defined the CPC terms "quality characteristics" and "critical quality characteristics," defining "critical quality characteristics" as those quality characteristics which, when verified as acceptable, provide reasonable assurance that the item will perform its intended functions. Nevertheless, the procedure only superficially addressed the process of performing commercial-grade dedication in Attachment 5, "Technical Review," which simply required that quality characteristics and critical quality characteristics be determined or verified and that acceptance methods be determined. While some examples of critical characteristics were provided in Attachment 6, the team found no means by which to document the process formally. The licensee had revised PAP 10.03 and MMP 10 to incorporate the guidance of EPRI NP-5652 and to respond to internal QA audit findings. However, the licensee had not corrected the fundamental cause of those findings.

In summary, the team identified several weaknesses in the procurement and dedication program as described and prescribed in currently effective procedures. The most significant weakness was the slow progress in improving the program in accordance with the first phase of the NUMARC procurement initiatives to be implemented by January 1, 1990. The team noted that CPC had identified concerns similar to those raised during this assessment previously in several internal QA audits performed by CPC since 1988.

2.4 Material Receipt, Documentation and Procedure Control

The licensee performs receipt inspection of CGIs (scheduled for dedication) at the PNGP in two phases. In phase one, the licensee reviews purchase documents before releasing them for planning inspections. In phase two, the licensee inspects the item after receipt which is controlled by MMP 30, "Receipt Inspection," Revision 2, December 12, 1990. Upon receiving procurement documents for Q, CQ, and AQ items, the receipt inspector or assigned material management personnel prepare a receipt inspection checklist (RIC) identifying receiving inspections to be performed based on information obtained from procurement documents. All receipt inspections performed must be identified on procurement documents and may include notelines, reference to generic receipt inspection plans (GRIPs), acceptance plans, or other instructions. If a DP has been prepared for the tests following the receipt inspection (and usually after installation), the preparer will note the DP on the RIC. Before completing the RIC, the preparer will compare the various procurement documents for agreement with the ATP and identify any discrepancies to the initiator for resolution. If a package is rejected during the review process, the package is placed on hold until the discrepancies are resolved. If the information agrees, the reviewer stamps the purchase documents, initials and dates indicating acceptance, and then completes the RIC, which is reviewed and approved by a certified Level II receipt inspector. Section 5.2.2.a of PNGP Procedure MMP 30 provides for the licensee to begin completing the RIC after receiving the item but does not describe the specific conditions for this practice. All incoming shipments are first processed by the material management stock clerk who reviews the shipping and delivery instructions on the PO to determine if any special conditions apply to the item. Inspections, if required, are performed in accordance with the requirements of the RIC. Section 5.2.2.d of MMP 30 provides detailed instructions for reviewing certificates of conformance but does not address the review

of certificates of compliance. Receipt inspection personnel interviewed were not aware that a certificate of compliance required additional information such as a certified mill test report to substantiate the statements made on the certificate.

The assessment team noted the following weakness in the receipt inspection program: MMP 30 did not provide requirements for accepting certificates of compliance. For example, the PO and PR for DP 90-M-036 required a certificate of compliance for the body and bonnet of a relief valve (RV 2104). The certificate of compliance received identified the material but did not have or reference any additional information to substantiate the statement as required by Section 4.2 of MMP 10.

If the receipt inspection of the item cannot be completed or accepted and the problem cannot be resolved, the licensee places a hold tag on the item and notes this action on the RIC. If the RIC references a DP, the licensee must perform additional post-receipt testing as part of the dedication process. The licensee adds a commercial-grade stick-on tag before implementing a DP. Section 6.1.7 of Procedure 5.13, "Material Control During Maintenance," Revision 3, March 20, 1990, with Change Notice MRN-A-90-064, provided controls for ensuring that DP testing is incorporated in the work order package.

The licensee has only a small staff for performing receipt inspections at PNGP. Thus, the licensee only reviews documents and takes measurements. Other PNGP or CPC organizations perform special tests and analysis. The Laboratory Commercial Services (LCS) division of CPC has a fully equipped metrology department and can calibrate every instrument used during receipt inspection at the PNGP. Also, the LCS Chemical Services and Metallurgical Services Departments conduct studies and perform chemical and failure analysis, particle and alloy analysis, optical and electron microscopy, and physical testing. The technical evaluation and testing personnel conduct technical studies, evaluations, and tests in the electrical, mechanical, and environmental disciplines and can perform vibration testing, including seismic qualification and rotating equipment signature analysis. The nondestructive testing services department offers a wide variety of services including eddy current, acoustic emission, and radiography. The LCS QA program, according to published literature, meets the requirements of 10 CFR 50 Appendix B, and LCS accepts 10 CFR Part 21 reporting responsibilities. Licensees other than CPC also use the facility. The assessment team concluded that the LCS facility, if fully used by PNGP, is a strength of the licensee's commercial-grade dedication activities. The team also concluded that the receipt inspection program, if properly implemented, should provide the necessary controls for accepting material if the procurement documents correctly identify required inspections to be performed to support the dedication process.

2.5 Parts Classification System

The licensee classified procurement documents as "Q," meaning that the items described therein are safety-related or important to safety (nonsafety-related, but supplied in accordance with technical and quality requirements identified in the various procurement fields on the Q list). "CQ" items are within the scope of the Q list and are purchased as commercial-grade and dedicated as "Q" for both safety-related and important-to-safety applications. "NQ" items are

those items that are not within the scope of the Q-list and are not processed through QA reviews and receipt inspection. If the licensee can not determine the Q list status of a component, structure, or other item, or desires a change to the Q list, a request is processed in accordance with MMP 9.30, "Q-List," Revision 6, of January 24, 1990, to initiate the necessary reviews and changes. However, the request is not required for spare parts or for equipment below the component level because equipment at this level is not included in the Q list or the PNGP database.

The assessment team reviewed the PNGP program requirements for parts classification including the requirements for documenting the analysis and evaluations supporting the classification process. Section 6.3 of PAP 10.03 required that the originator of procurement documents determine the safety-related functions and a preliminary classification of the item to be purchased in accordance with PAP 9.30 and indicated that the technical and QA reviewers will formally determine the procurement classification. The procedure stated that the classification of parts and subcomponents depends upon the safety function of the parent component. The team noted that the procedure did not require the licensee to document the technical evaluation. Section 7.3 specified only that the technical reviewer know the technical and quality requirements for the item being purchased and know who has access to pertinent information. Section 7.3 also stated that the originator shall assist the technical reviewer in completing the final "Q", "CQ", or "NQ" procurement classifications. Attachment 5 contained the requirements for performing technical reviews and provided guidance to the reviewer for determining the classification of the item. Section 7.4 addressed the QA review of procurement documents and required that the QA reviewer determine the classification of an item in accordance with MMP 10. Attachment 1 of MMP 10 provided the QA reviewer the same guidance for determining the classification of an item as provided to the originator of the procurement documents.

The assessment team concluded that a weakness existed in the parts classification process in that the procedures incorporated little of the guidance contained in Appendix B of EPRI NP-5652 and Sections 3.2 and 3.3 of EPRI NP-6406. PNGP procedures also failed to address a number of the essential elements of the classification process such as the item's failure modes and the effects of these failure modes on the parent component and on surrounding components.

The assessment team interviewed two PNGP senior engineers and concluded that they were familiar with most of the elements that should be considered when performing a technical evaluation to classify an item. The team noted that the basis for the evaluation was not documented because PNGP procedures only required the licensee to identify the classification of the part and the evaluator's signature approving the classification. Criterion III of Appendix B applies to changing an item's classification from safety-related to nonsafety-related or in performing the initial technical evaluation to determine a part's classification.

2.6 Commercial-Grade Supplier Selection, Qualification, and Surveys

The NRC assessment team reviewed the process of selecting and qualifying commercial-grade suppliers used for PNGP procurements. QADP 7.5 provides the requirements for qualifying suppliers and performing commercial-grade surveys. The assessment team also reviewed Revision 1 of QADP 7.5, approved on April 19, 1991, with an effective date of June 19, 1991, to determine the progress made by the licensee in this area.

2.6.1 Supplier Selection

PNGP material management personnel informed the assessment team that the OEM, or its authorized distributor, is the desired source from which to obtain a replacement component or part. If the OEM cannot provide an identical replacement, the next step is to request an equivalent replacement and evaluate its acceptability. When the OEM no longer stocks or carries the product, the licensee would attempt to procure the replacement item from another licensee or alternate source. If an identical or equivalent replacement component or part is not available, the design change process provides the alternative route of purchasing the item. If the item to be purchased is safety-related, the licensee would attempt to purchase from a supplier who has an Appendix B QA program and will accept 10 CFR Part 21 reporting responsibilities. If the OEM or selected supplier will not accept this responsibility and the safety-related replacement item is not a basic component, the licensee would purchase the item as commercial-grade and dedicate it.

While reviewing PNGP's use of EPRI Method 2 to verify critical characteristics, the assessment team noted that the licensee reviewed the ECCSL in order to select suppliers qualified to supply certificates of conformance. Procedures MMP 10 and PAP 10.03 addressed the use of the ECCSL which required that approved suppliers furnishing certificates of conformance be shown on the list. PNGP uses certificates of conformance as a method to take credit for the supplier's program controlling a critical characteristic as provided for by Method 2 of EPRI.

The assessment team reviewed QADP 7.2 and identified discrepancies between CPC Corporate QA in Jackson, Michigan, and the PNGP materials management procedures. Both Procedures, MMP 10 and PAP 10.03, reference the ECCSL and required its use in determining if a certificate of conformance could be used to verify critical characteristics. QADP 7.2 did not require the licensee to perform commercial-grade surveys and did not address the ECCSL. The assessment team interviewed both PNGP and CPC Corporate personnel and noted that the ECCSL was no longer being maintained and that it should only be used to determine if a commercial-grade survey had been performed in accordance with QADP 7.5. The assessment team also noted that if the ECCSL indicated that a commercial-grade survey had been performed, PNGP material management personnel must obtain a copy of the survey and determine if it confirmed that the supplier's program adequately controlled the specific item's characteristic which it desired to verify using EPRI Method 2. If a commercial-grade survey had not been performed, material management would request that one be performed in accordance with QADP 7.5. This process appeared consistent with QADPs 7.2 and 7.5, but PNGP site procedures still only address the review of the ECCSL as the basis for determining if a certificate of conformance could be used to verify and item's critical characteristics. The assessment team identified this as a significant weakness since many CGIs dedicated relied on the use of certificates of conformance. Many of the suppliers listed on the ECCSL were qualified by audits and surveys performed to requirements not consistent with QADP 7.5 and EPRI NP-5652. Also, MMP 10, PAP 10.03, and QADP 7.5 did not address the issue of surveying both the manufacturer and the distributor of the item, as contained in GL 89-02.

2.6.2 Supplier Qualification and Surveys

The Supplier Evaluation and Corrective Action (SECA) section of CPC's QA department, located in Jackson, Michigan, performs and evaluates commercial-grade surveys based upon the needs identified by materials management. Before 1989, CPC performed only programmatic and broad-based surveys and audits. From late 1989 until the end of 1990, the licensee considered many of the elements of EPRI NP-5652 when performing commercial-grade surveys, but did not achieve full compliance until early 1991. PNGP personnel stated that by June 1991, the ECCSL would be replaced by the Commercial-Grade Suppliers List (CGSL) which will identify the suppliers surveyed and the item and the specific characteristics that can be verified using EPRI Method 2. PNGP's existing program should be strengthened by implementing the CGSL. However, the team noted that neither Revision 1 of QADP 7.5 nor any other PNGP procedure addressed the control or use of the CGSL. The licensee noted that the procedure only required that suppliers be surveyed triennially if they actually supplied components within that period. However, the procedure had no provisions by which to perform periodic annual evaluations to evaluate the supplier's performance.

The assessment team reviewed the following commercial-grade surveys to determine if the requirements of QADP 7.5 were being effectively implemented:

(1) Ellis & Watts survey of spare parts for heating, ventilating and air conditioning (HVAC) equipment, May 9, 1991

(2) John Crane, Incorporated, for mechanical shaft seals, April 12, 1991

(3) Moore Products Company for pressure regulators, April 4, 1991

After reviewing the surveys, the assessment team concluded that additional procedural guidance was necessary to address the methods used to confirm and document that a supplier (including its subsupplier) is controlling and verifying critical characteristics.

The team found that much of the discussion contained in the surveys reviewed described the process based on reviews of procedures and programs and not on actual observations of the work activity controlling the critical characteristic. A review of the QA program and procedures may not be sufficient for confirming that the selected CGI's critical characteristics are properly controlled. For example, the Ellis & Watts survey described the manner in which the material, dimensions, rating, and part number should be controlled and verified. However, the CPC survey team did not observe any design evaluations, nuclear fabrication activities, inspections, receiving activities, or review records for these activities. The CPC survey team did not review or discuss the performance of engineering evaluations and design control measures to determine the form, fit, and function of spare HVAC parts not meeting the requirements of the original equipment drawing.

The surveys reviewed also indicated that some suppliers audited their subsuppliers, maintained approved supplier lists and accepted certificates of conformance. An audit or commercial-grade survey which only confirms that a supplier has established a quality assurance/control program and procedures to provide requirements for controlling, reviewing, and auditing supplier's subsuppliers, may not be an adequate basis for concluding that a subsupplier is adequately controlling the item's critical characteristics. If a subsupplier is verifying

a critical characteristic and the purchaser is taking credit for this verification through its prime supplier, EPRI NP-5652 specifies that the purchaser confirm that the critical characteristics are being controlled. The assessment team noted that the method used by CPC to confirm that each critical characteristic was being controlled was not clearly identified and documented in the survey reports.

The assessment team concluded that the licensee had well defined and controlled its use of third party audits. CPC uses these audits for maintaining its Appendix B suppliers list and will use third party commercial-grade surveys to support its CGSL. QADPs 7.2, 7.5, and 18.2 provide requirements for screening third party audits and surveys and, if properly implemented, should provide assurance that they are acceptable for use in the supplier qualification process. The team noted that when adverse findings or discrepancies are identified, materials management reviews the documents for the effect on past procurements.

2.7 Fraud Detection

When the NRC conducted the assessment, the licensee had not yet implemented its program for detecting fraudulent material, "Procurement Misrepresented Products Detection Program," which contained six major elements: investigating issues, assessing procurement annually, assessing nonconforming material reports (NMRs) annually, testing, visiting suppliers, and disseminating information. The team noted that the licensee had received NRC Information Notice (IN) 89-70, "Possible Indications of Misrepresented Vendor Products," including Supplement 1, and had processed it along with GL 89-02. PNGP personnel stated that the licensee had incorporated the information contained in the GL into the fraud detection program. The team reviewed the receiving inspection and procurement programs, interviewed PNGP personnel, and found that the licensee was not yet implementing the program. The team also reviewed Revision 2 of the program, of July 16, 1990, and found that it did not specifically address receipt inspection which is a major component of fraud detection as noted in IN 89-70 and GL 89-02. The team also noted that PAP 10.03 and MMP 30, "Receipt Inspection," did not completely address the issues contained in these documents. PAP 10.03 provided the only specific guidance on fraudulent products and stated, "Molded case circuit breakers shall be purchased as new, with traceability to the manufacturer." Additionally, attachments to 3 of the 30 GRIPs reviewed (GR-E05, GR-E11 and GR-M06) also provided guidance for detecting fraudulent products during receipt inspections. Personnel performing receipt inspections had received some offsite training concerning fraudulent materials but no onsite training existed in this area. CPC participates in the joint audit process of the Nuclear Utility Procurement Issues Council and the Institute for Nuclear Power Operations.

2.8 Review of Procurement Packages

The NRC assessment team reviewed several procurement packages to determine if the licensee had implemented the necessary procedural controls to ensure that quality characteristics, identified in the DPs and APWs, were correctly translated into the procurement documents.

2.8.1 DP 90-M-007, February 14, 1990, dedicated an air filter for a valve operator. The quality characteristic that directly affected the air filter safety function was listed as quantity of flow. The specified means of verifying this quality characteristic was to stroke the valve according to procedure ESS-M-8 or the installing work order.

2.8.2 DP 90-M-009, November 31, 1990, dedicated a check valve for use in a diesel engine fuel system. The quality characteristics that directly affected the check valve safety function were listed as opening pressure, shell pressure, material, connection size, and part number. The licensee was to verify the opening pressure and shell pressure after receipt inspection by Technical Specification Test RM-55A or RM-55B and the corresponding work order. The licensee would verify the connection size and part number during receipt inspection. The only verification of material was a visual examination conducted during receipt inspection. Independent material certification or testing was not performed nor required. PNGP personnel stated that normally only a standard receipt inspection (visual examination) is conducted to verify brass material.

2.8.3 DP 90-M-016, February 15, 1990, dedicated a lube oil pump for a diesel generator prelube system. The quality characteristics that directly affected the pump safety function were listed as operability and temperature. The assessment team noted that although the pressure retaining function was listed as "Q" for this component, it was not listed as a quality characteristic in the DP. The characteristics to be verified after receipt inspection were listed as operability and lube oil temperature. The acceptance method used to verify that the lube oil pump operated was that the prelube failure alarm did not initiate. A certificate of conformance stating that the pump was equivalent to the original pump ordered (which was supported by a survey of the manufacturer's distribution office performed in 1988) was also required. However, the assessment team was not aware of any survey of the manufacturing facility for this item.

2.8.4 DP 91-I-012, March 4, 1991, dedicated a one-half inch valve used to isolate an instrument line from the primary coolant system. The quality characteristic that directly affected the valve's safety function was listed as the pressure retaining capability of the valve, which was to be verified by a pressure test at 2060 pounds per square inch gauge (psig). Material testing for this item consisted of confirming the material was non-magnetic during the receipt inspection.

2.8.5 DP 91-M-013, March 5, 1991, dedicated a relief valve. The quality characteristics which directly affected the relief valve safety function were listed as connections, material, and cracking pressure. The quality characteristic to be verified after receipt inspection was cracking pressure with an acceptance criterion of 150 psig. No verification of reseating pressure was specified since it was not listed as a quality characteristic and no form of material certification was required.

2.8.6 DP 91-I-008, March 25, 1991, dedicated a Nanmac H12-1 digital temperature-indicating switch purchased under PO 1010-5541-CQ for use in plant equipment having identification numbers TIS-1900, 1901, 1902 and 1903. A review of this file identified the following discrepancies:

- The printout for these mark numbers, generated from the Automated Material Management System (AMMS) plant equipment configuration database, called for a type H8-2 switch for TIS-1900. TIS-1901,

1902 and 1903 were supposed to be type H12-3 switches. The file contained no evidence of an engineering equivalence evaluation.

- The safety functions listed on the DP were very general, and the quality characteristics and the critical characteristics restated the item's safety function of temperature indication and switch actuation.

- The licensee had not yet performed preinstallation calibration checks but would perform these just before use. However, the procedure to be used and identification of the referenced calibration sheets was not listed.

- The receipt inspection report referenced GRIP E05-12 which was not in the file. The review of a sample GRIP E05-12 indicated that seismic and/or environmental qualification for these items were to be verified, but there was no documentation in the file to support this.

2.8.7 DP 90-E-032, October 3, 1990, dedicated Teledyne, type 256L100-80, big beam, emergency lighting units (ELUs) purchased from Englewood Electrical Supply in Jackson, Michigan, under PO 2004-6279-CQ for use in various emergency lighting locations throughout the plant. The file included a copy of work request 137103 and work order 24001277 (completed August 24, 1990), which documented the installation and testing of one of the units as plant equipment number ELU-1. The team reviewed this file and identified the following discrepancies:

- The AMMS printout indicated that the model number of the beams used was 2S6L100-80 as opposed to the 256L100-80 used in the PO. The file contained no other information to resolve this discrepancy.

- The quality characteristics were incorrectly and incompletely stated under Item 5 of the DP in that the entry was a description of the voltage test with some unclear acceptance criteria as opposed to a statement of the quality characteristics such as the charging voltage and the battery voltage under load with alternating current (ac) power off. Not mentioned were such important lighting characteristics as the minimum light intensity (or average incident light in target area) at the lowest allowable battery voltage, or at end of minimum required operating time (the work order indicated an 8.5 hour "duration test"); and area required to be illuminated.

- Under Item 6 of the DP, only voltage verification and a functional check were required to be verified. It was not clear how this would provide reasonable assurance of the item's ability to adequately perform its safety function.

- The acceptance criteria listed in Item 7 of the DP basically restated what was listed in Item 6, substituting that the "light will have to light per Technical Specification AE-5" for "work with ac power off" as in Item 6, which has the same meaning, except that the specification actually consisted of a functional check and a light-aiming check for each light. This file did not contain the acceptance criteria for the

voltage checks listed inappropriately in Item 5, and did not contain the operating time requirement listed in the work order. The work order also stated that Technical Specification AE-5A was to be performed but this was not mentioned in the DP. The team noted that no light intensity acceptance criteria were listed, nor was it identified as a quality characteristic.

- Item 8 of the DP should describe the manner in which the critical characteristics are to be verified. Item 8 should include references to procedure numbers and other elements. However, Item 8 listed only Technical Specification AE-5 which verified only that the light comes on with ac power off and that the unit was properly aimed. The specification did not require the licensee to verify the voltage or operating time.

- The team reviewed Work Order 24001277 and Work Request 137103 for replacing ELU-1 and found that procedure SC-87-364 was used, but it was not mentioned elsewhere in the file. The work order was signed off as completed and released on August 24, 1990, yet the narrative under the summary of work performed section stated that Technical Specification AE-5 should be performed. The work order included no entry indicating that these had been completed and that the 6.2-volt direct current (vdc) load voltage check had been completed. The work order also stated that the licensee had measured a 6.5-vdc float voltage but did not indicate the quality characteristic to which this voltage corresponded. It was noted that no electrical checks of the transformer were required that would not be verifiable indirectly by the charge voltage such as insulation resistance and there was no indication that the licensee had considered the shelf life of the battery. Also, this file contained no documentation to support the traceability of the parts to their OEMs or of the consideration of seismic or environmental qualification issues.

The assessment team also reviewed APW packages 90-047, 90-064 and 90-142 in which the licensee had procured and accepted CGIs for safety-related applications in 1990. The APWs identified the quality characteristics and the acceptance methods for the items. The licensee performed standard receipt inspections and reviewed documents for acceptance. The licensee also verified the quality characteristics by reviewing the PO, the item tags and markings, and a certificate of conformance from the supplier. The packages did not indicate source verification and did not require post-receipt testing. The assessment team considered the quality characteristic determination to be generally adequate, however, the verification methods were weak. Further, the licensee had not identified the safety classification and function of the item in the APWs.

In summary, the team found that the licensee had not identified clearly and consistently the safety functions specific to the particular application. The licensee had not adequately identified the critical characteristics as dictated by safety function and had not selected all of these for verification. The licensee had not always adequately performed acceptance testing to verify those characteristics that were selected. Standard receipt inspection consisted of verifying markings, such as part number, and visually examining the item for conformance to the PO. Many of the DPs only included a standard receipt inspection and an operability test for dedication.

2.9 Corporate Quality Assurance Internal Audits

The assessment team reviewed three internal QA audits performed by CPC's corporate QA department since January 1990. In a February 1989 audit, CPC concluded that the procurement process at the PNGP did not conform to the EPRI guideline CPC responded to this finding by committing to conduct audits in this area semi-annually. The team reviewed the following reports: QA-89-17, February 23, 1990; QA-90-10, August 17, 1990; and QA-90-13, January 11, 1991.

Audit QA-89-17 indicated that the licensee had made limited progress since February 1989 and also identified two findings: inadequate storage and control of material, and inadequate procurement procedures. The CPC audit team also concluded that the plant administrative and material management procedures were disjointed and lacked the required specificity to accomplish the various tasks. The audit team identified specific weaknesses in the selection of critical characteristics, dedication, receipt testing, and the suppliers' QA program.

Audit QA-90-10 indicated that the licensee was continuing to align its procurement process to EPRI NP-5652. However, the licensee had not yet completed the revisions to its procedures to specify a complete program. The CPC audit team found that the licensee had failed to implement DPs and to follow procedures for classifying chemicals and consumables. The audit team also noted that the licensee's evaluations of commercial-grade suppliers were inadequate. The audit team reviewed previous audit findings and found that corrective action involving procedure revisions was either not completed or did not adequately resolve the problems.

Audit QA-90-13 resulted in three findings: inadequate storage, procedural inadequacies for storing compressed gas cylinders, and failure to perform source verifications. Followup of previous audit findings indicated that the licensee was continuing to perform corrective actions.

The NRC assessment team reviewed the responses and corrective actions to these audits. However, the licensee had not yet completed its substantial effort to revise the commercial-grade procurement and dedication program to align it with the industry's initiatives. CPC indicated that it had not further developed a major program revision draft. Further, the assessment team noted that the licensee was conducting a self-assessment to assess the procurement process and its alignment with the industry's initiatives.

2.10 Management Involvement and Commitment

The licensee for PNGP initiated changes to the program in late 1987 when the EPRI guideline was in its third draft. In November 1987, the licensee established a plant policy for procuring and dedicating CGIs and in May 1988, established the material management department to assist in implementing the program. The licensee brought a number of existing functions together in the new department including five personnel from the QA department. Since 1988, the licensee has made several changes including implementing the NUMARC initiative on procurement and commercial-grade dedication which was formally incorporated into PAP 10.03 in January 1989. The licensee also revised other procedures to incorporate the EPRI guidance, including MMP 10 and QADP 7.5.

The assessment team found licensee management participated in the procurement and commercial-grade dedication program at the PNGP. For example, the Vice

President of Nuclear Operations commissioned the current internal procurement self-assessment and the plant manager participated on NUMARC's Nuclear Plant Equipment Procurement working group which initiated the NUMARC procurement initiatives. In May 1991, the licensee added several more personnel, including degreed engineers, to the material management staff and the corporate supplier evaluation department. However, due to the recent steam generator replacement outage, the licensee had not devoted sufficient management attention to develop and implement an effective program.

3 PROCUREMENT TRAINING REVIEW

In 1988, the licensee provided initial training on the PNGP procurement program and the use of its procedures. Since that time, the licensee has provided supplemental training. At the time of the assessment, the licensee had not developed a formal training course on procurement and commercial-grade dedication. However, the self-assessment has prompted the licensee to begin planning a formal course on procurement scheduled for late 1991. Details on the course content were not available at the time of the assessment.

Late in 1988 before implementing PAP 10.03, the licensee provided about 30 personnel with training on this procedure which implemented the program. Since then, the materials management group has made several presentations to plant personnel on the procurement and commercial-grade dedication process. This group made one of the presentations in response to a QA audit finding. Members of the procurement engineering group have attended industry seminars and workshops on commercial-grade dedication. Several system engineers who were originators of the DPs indicated to the NRC assessment team that they were familiar with the program and its procedures. However, PNGP personnel interviewed during the NRC assessment had limited knowledge of the commercial-grade dedication process, as outlined in EPRI NP-5652 and GL 89-02.

Corporate QA personnel from SECA, who perform vendor surveys, regularly attend industry seminars and workshops on commercial-grade dedication and perform individual study of the industry's initiatives. The QA personnel received this training even though many of them have helped to develop the industry's procurement initiatives. Members of the SECA group interviewed during the NRC assessment appeared knowledgeable of the commercial-grade dedication process as outlined in EPRI NP-5652 and GL 89-02.

4 IMPLEMENTATION OF NUMARC COMPREHENSIVE PROCUREMENT INITIATIVE

The assessment team reviewed the status of CPC's implementation of the NUMARC comprehensive procurement initiative (CPI) as described in NUMARC 90-13, "Nuclear Procurement Program Improvements," approved by the NUMARC Board of Directors on June 28, 1990. This initiative commits licensees to assess their procurement programs and take specific action to strengthen inadequate programs. The CPI calls for licensees to complete their review by July 1, 1991, and to complete implementation by July 1, 1992. These guidelines are summarized in the enclosure to a commission paper, "NUMARC Initiatives on Procurement" (SECY 90-304), August 24, 1990.

On January 11, 1991, the licensee's Support Services Director of the Nuclear Operations Department (NOD) issued a memorandum, "Procurement Self-Assessment," to the NOD Vice President and the plant general manager proposing to establish

a self-assessment team. The self-assessment was to assess current NOD procurement and material control polices, programs, processes, procedures and activities against the intent of the NUMARC CPI and identify redundant enhancements needed to effectively implement it. On March 11, 1991, the assessment team began full-time assessment activities. The team consisted of six full-time members representing material management, engineering, and QA from both PNGP and the Big Rock Point Plant including the CPC general office. An engineering consultant was also added to the licensee's team.

The PNGP management informed the NRC assessment team that the licensee will meet the NUMARC CPI milestone of July 1, 1991. At the time of the NRC assessment, the licensee had completed half of the self-assessment and had not yet developed the documentation to support the team's draft recommendations or conclusions. The schedule also called for the licensee to complete revisions to NODs A-21 and M-01 by the middle of September 1991. During interviews, the NRC assessment team found that the cognizant managers generally understood the implications and commitments of the NUMARC CPI however, the team could not judge the effectiveness of the licensee's program to meet the goals of the CPI.

5 CONCLUSIONS

CPC had not significantly strengthened, improved, and implemented its commercial-grade dedication program since it committed to implement the guidance contained in EPRI NP-5652, as modified by GL 89-02, by January 1, 1990. Specific weaknesses were: (1) CPC's understanding that not all the critical characteristics identified need to be verified, but only those necessary to demonstrate that the item received was the item specified, (2) procedures that did not require CPC to identify and document the item's safety functions and critical characteristics for items other than DPs, and (3) the lack of an improvement to the program to reflect internal QA audit findings. The NRC assessment team found strengths in certain aspects of the licensee's training program, and its extensive testing capabilities to perform EPRI Method 1 acceptance activities.

6 EXIT MEETING

On May 17, 1991, the assessment team conducted an exit meeting at the PNGP site. The Appendix is a list of the persons contacted during the assessment. During the exit meeting, the team summarized the scope of the assessment and its observations. Throughout the assessment, the team met with licensee management and staff to discuss concerns. The licensee did not identify any information as proprietary.

APPENDIX

PERSONS CONTACTED

Consumers Power Company

D. Hoffman, Vice President, Nuclear Operations
G. Slade, Plant General Manager
T. Palmisano, Manager, Adminstration and Planning
R. Orosz, Manager, Nuclear Engineering and Construction
R. Volt, Manager, Jackson Test Laboratory
R. Rice, Operations Manager
D. Hughes, Director, Nuclear Services
G. Daggett, Supervisor, Procurement Engineering
J. Kuemin, Licensing
W. Jewell, Procurement Engineering
D. Jones, Supplier Evaluation
D. Anderson, Performance Assessment
S. Peachum, Senior Engineer
D. Morse, Materials Management
C. Yeisley, Senior Engineer
K. Osborne, System Engineering Superintendent
P. Donnelly, Safety & Licensing Director
A. Crickenberger, Material Services Supervisor
J. Alderink, Industry Experience and Assessment
R. Beeker, Quality Assurance Supervisor
M. Fox, Senior Quality Assurance Consultant
P. Fitton, Senior Engineer
R. Margol, Staff Engineer
P. Farron, Consultant

U.S. Nuclear Regulatory Commission

R. Pettis, Team Leader, VIB
S. Alexander, EQ and Test Engineer, VIB
B. Rogers, Reactor Engineer, VIB
L. Campbell, Reactor Engineer, VIB
C. VanDenburgh, Section Chief, VIB
G. Wright, Branch Chief, Region III
P. Rescheske, Reactor Inspector, Region III
R. Langstaff, Reactor Inspector, Region III
R. Roton, Resident Inspector, PNGP

Northeast Utilities

M. Ahern, Procurement Engineer, Millstone Plant

NUMARC

B. Bradley, Senior Project Manager

All persons listed attended the exit meeting on May 17, 1991.

At the time of the assessment, CPC was conducting a self-assessment to review the comprehensive procurement initiative improvements suggested in NUMARC 90-13, "Nuclear Procurement Program Improvements." The initiative called for the licensee to complete its review by July 1, 1991, and to complete implementation by July 1, 1992. Although CPC could not provide documentation during the assessment to support its progress in this area, CPC management stated that it would meet these goals.

The assessment team identified weaknesses both in the overall procurement program and its implementation. In several internal quality assurance (QA) audits performed since 1989, CPC had identifed concerns similar to those raised by the assessment team. Despite CPC's procedural revisions to incorporate the philosophy described in EPRI NP-5652, and in response to internal QA audit findings, the program was not substantially improved to correct the fundamental cause of those findings and to align the program with regulatory requirements.

CPC believed that not all the critical characteristics identified needed to be verified, but only those necessary to demonstrate that the item received was the item specified. While this position may be consistent with the EPRI NP-5652 definition of critical characteristics, we interpret the "item specified" to encompass attributes necessary for performance of the item's safety functions. Generic Letter 91-05, "Licensee Commercial-Grade Procurement and Dedication Programs," April 9, 1991, states that the licensee is responsible for identifying these attributes, establishing acceptance criteria and providing reasonable assurance of conformance to these criteria. The assessment team also noted that for the majority of dedications performed, procedures did not require that CPC identify and document the safety function and critical characteristics of the item.

In accordance with 10 CFR 2.790(a), the staff will place a copy of this letter and the enclosures in the NRC Public Document Room.

Although no response is required to this report, we expect you to consider the concerns raised herein. If you have any questions concerning this assessment, we will be pleased to discuss them with you. Thank you for cooperating in this assessment process.

Sincerely,
/s/
Bruce A. Boger, Director
Division of Reactor Projects III, IV, V
Office of Nuclear Reactor Regulation

Enclosure:
Assessment Report 50-255/91-201

*See next page for concurrence

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