Mr. William T. Cottle
Executive Vice President &
General Manager, Nuclear
Houston Lighting & Power Company
South Texas Project Electric
Generating Station
P. O. Box 289
Wadsworth, TX 77483

July 31, 1996

SUBJECT: TRIP REPORT BY QUALITY ASSURANCE BRANCH TO PALO VERDE NUCLEAR GENERATING STATION AS PART OF THE GRADED QUALITY ASSURANCE INITIATIVE (TAC NOS. M92450 AND M92451)

Dear Mr. Cottle:

Enclosed is a trip report dated July 1, 1996, documenting the June 5-6, 1996, trip to Palo Verde Nuclear Generating Station (PVNGS) by the Nuclear Regulatory Commission (NRC). The Quality Assurance (QA) Branch visited the site to continue discussions with the Palo Verde licensee on enhancements and changes to the procurement processes at Palo Verde as a result of NRC staff comments and concerns raised by the branch during a previous, September 6-7, 1995, site visit to Palo Verde.

This trip by the QA Branch is part of the voluntary Graded Quality Assurance Initiative being conducted by the NRC staff with the licensees of three sites: PVNGS, Grand Gulf, and South Texas. The NRC's objective is to develop guidelines for a graded QA program at nuclear power plants. The QA Branch has a commitment to keep all the licensees informed of results from the branch's information-gathering visits and this letter is to provide a copy of the branch's trip report to you, and your staff, for your information.

Sincerely,

Original signed by
Thomas W. Alexion, Project Manager
Project Directorate IV-1
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket Nos. 50-498 and 499

Enclosure: Trip Report dated July 1, 1996

cc w/encl: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

July 1, 1996

MEMORANDUM TO: Suzanne Black, Chief
Quality Assurance and Maintenance Branch
Division of Reactor Controls and Human Factors, NRR

FROM: Juan Peralta
Quality Assurance and Safety Assessment Section
Quality Assurance and Maintenance Branch

SUBJECT: TRIP REPORT - JUNE 5-6, 1996 ASSESSMENT OF THE PALO VERDE NUCLEAR GENERATING STATION GRADED QUALITY ASSURANCE INITIATIVE AND OTHER TOPICS OF INTEREST

On June 5 and 6, 1996 members of the NRC staff met with representatives of Arizona Public Service's Palo Verde Nuclear Generating Station (PVNGS) to continue discussions on enhancements and/or changes made to procurement processes as a result of comments and concerns raised by the staff during a September 6-7, 1995 site visit (Trip Report dated October 27, 1995).

Other topics discussed during the visit included (1) quality assurance (QA) program changes proposed by PVNGS in an April 4, 1996 letter submitted to the NRC pursuant to 10 CFR 50.54(a), (2) PVNGS' use of computer systems to store QA records, (3) risk-informed decision making processes used by QA personnel to prioritize oversight activities at PVNGS, and (4) other risk-informed initiatives at PVNGS.

The staff also had the opportunity to witness an Maintenance Rule Expert Panel session which provided insights into the licensee's decision making process to address the requirements of paragraph (a)(1) of the Rule.

Staff Comments and Concerns Related to Commercial Grade Item (CGI) Dedication and Procurement Practices at PVNGS

In its October 27, 1995 trip report the staff articulated concerns that the following 4 areas of graded QA procurement activities required improvement: (1) procedural guidance for performing low-risk-significant procurement and CGI dedication, (2) use of post-installation testing in the CGI dedication process, (3) a feedback mechanism that provides timely trending information on equipment failures that may have resulted from the grading of QA elements or processes, and (4) assuring continued seismic qualification through the CGI dedication process.

Based on these concerns and other staff expectations conveyed to PVNGS through subsequent meetings and industry interactions, PVNGS has substantially enhanced its procurement and CGI dedication procedures and processes. The staff examined PVNGS draft Procedure 87DP-OMC09, "Item Procurement Specification (IPS) Requirements" which was significantly revised to address the staff concerns. For instance, PVNGS draft Procedure 87DP-OMC09, Form J,

ENCLOSURE

"Graded QA Checklist" (Attachment 1) incorporates a more comprehensive approach to guiding the procurement engineering staff in their efforts to address the criteria which PVNGS utilizes for grading QA requirements for the dedication of CGIs. Nevertheless, the staff cautioned PVNGS that the seismic qualification of replacement items still needs to be adequately maintained in a manner consistent with the facility's design bases requirements regardless of the parent component or system risk-significance (87DP-OMC09, Form J, Question No. 15). The staff emphasized that this area will be reviewed with other technical branches in NRR.

With respect to a feedback mechanism, the staff was informed that PVNGS would take advantage of the Maintenance Rule (MR) functional failure trending mechanism to address this area of staff's concern. PVNGS stated that for the purposes of MR implementation, PVNGS intends to evaluate all functional failures without discriminating whether they are maintenance-preventible or not. The staff agreed to consider whether a MR functional failure trending mechanism, as implemented by PVNGS, would be a suitable vehicle to "capture" the feedback mechanism for the purposes of graded QA. Additional feedback into this process would be provided through trending of repetitive equipment failures, including any failures that may occur during post-installation testing.

PVNGS plans to formally address the staff's comments and concerns by submitting a response to the staff's October 27, 1995 trip report in the very near future. Although PVNGS had previously taken the position that environmentally qualified (EQ) equipment would (initially) not be within the scope of the graded QA initiative at the site, the staff was informed that the upcoming response letter would include the details of how PVNGS intends to include EQ equipment in the graded QA program.

Use of Computer Systems to Store QA Records at PVNGS

Currently, the Office of Nuclear Reactor Regulation (NRR) is working with the lead office in the NRC (Office of Information Resources Management) to develop pertinent guidance in the area of electronic records storage thereby providing licensees, and others as appropriate, with clear and objective NRC expectations for compliance with Appendix B to 10 CFR 50, and 10 CFR 50.71.

This area has received added emphasis recently as utilities and NSSS suppliers move forward in their efforts to avail themselves of the latest information technology tools while cutting costs. On September 10, 1995 PVNGS informed the NRC of its intention to store various QA records in electronic form on a computer document management system (DMS).

On October 20, 1988 the NRC issued Generic Letter (GL) 88-18, "Plant Record Storage on Optical Disks" to inform licensees on the staff expectations for compliance with the provisions of Appendix B to 10 CFR 50. The guidance in GL 88-18, however, has been superseded as licensees take advantage of technological advances in the records storage area. The purpose of this exchange with Nuclear Information Records Management was to elicit PVNGS' views on the subject and for the staff to obtain information on any lessons learned during the development of the DMS, including potential shortcomings or limitations found

with respect to the ability of state-of the-art equipment and software products to prevent or mitigate loss of data. The information exchanged was useful and PVNGS expressed its willingness to participate in similar activities as the staff formulates guidance in the electronic records storage area.

Maintenance Rule (MR) Expert Panel Session

For the purposes of compliance with 10 CFR 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants," PVNGS implements the guidance in Procedure No. 71DP-0EM01, "Risk Management Program Expert Panel" (Attachment 2). 71DP-0EM01 establishes the rules, organization and detailed activities of the MR Expert Panel.

During a June 6, 1996 MR Expert Panel session, the staff was invited to participate as observers. The session was focused on the determination of the need to establish performance goals, as required by 10 CFR 50.65(a)(1), for the structures, systems, and components affected by 2 recent functional failure events at PVNGS (Unit 1 RCP Shaft Failure and a stuck fuel assembly incident).

QA Program Changes Proposed by PVNGS in April 4, 1996 Letter to NRC

The NRC staff is currently reviewing QA program changes proposed by PVNGS via letter to NRC dated April 4, 1996. On June 6, 1996, QA representatives and the staff met for brief discussion on the proposed changes.

The staff clarified that the purpose of the meeting was to gain a better understanding of the changes while at the same time providing the staff the opportunity to convey current staff's expectations in the affected QA areas.

After a brief discussion during which PVNGS staff outlined the rationale for making the changes, it was agreed if there are specific areas of concern, or that require further clarification, the NRC responsible reviewer would contact PVNGS QA representatives in order to resolve any review issues.

Risk-Informed Decision Making to Prioritize Oversight Activities at PVNGS

The QA organization at PVNGS has embarked on an ambitious undertaking to prioritize and manage their oversight and quality control activities in a manner that enhances their ability to allocate personnel resources based on the safety significance of the affected SSCs and/or their potential impact on commercial operations. PVNGS staff outlined their conceptual approaches to developing a more objective process to target the application of QA verification resources (audits, monitoring, surveillance, etc.).

Attachment 1: As stated
Attachment 2: As stated
Attachment 3: PVNGS Personnel Contacted

FORM J GRADED QA CHECKLIST	IPS CHANGE NOTICE DRAFT	IPS NUMBER	REV	IPSCN(GC)#
		PAGE		

Item Type: C/I Number:

*** Refer to Appendix B of 87DP-0MC09 for the significance of selected answers. Annotate additional information required to supplement the specific dedication in the remarks section.

Criterion 1: The effect of malfunction or failure of the item on nuclear safety or safe plant operations

1.	Is this item a Commercial Grade Item?	YES ☐	NO ☐
2.	Is the C/I controlled by a Record Type "E" in the database? (Use IO50a)	YES ☐	NO ☐
3.	What system(s) is this C/I used in? (Use WMJ001)		
4.	Are all the systems listed in Question 3 listed in Engineering Study 13-NS-B28 as Low Risk Significant Systems?	YES ☐	NO ☐
5.	Is the system(s) exempt from 10 CFR 50.49 (EQ) program requirements? (WMN029)	YES ☐	NO ☐

Criterion 2: The design and fabrication, complexity or uniqueness of the item.

6.	Is this a simple or complex item?	Simple ☐	Complex ☐
7.	Does this item perform an active function?	YES ☐	NO ☐

*** Questions 8-15 should be answered through a telecon with the manufacturer/vendor.

Manufacturer/Vendor:		Telephone Number:	
Contact:		Position:	
8.	Is this a unique item?	YES ☐	NO ☐
	Comments:		
9.	Is this item used throughout the nuclear industry?	YES ☐	NO ☐
	Comments:		
10.	Is the manufacturing process fully automated?	YES ☐	NO ☐
	Comments:		
11.	Are the items manufactured using large production runs?	YES ☐	NO ☐
	Comments:		

FORM J GRADED QA CHECKLIST	IPS CHANGE NOTICE DRAFT	IPS NUMBER	REV	IPSCN(GC)#
		PAGE		

Item Type: C/I Number:

Criterion 3: The need for special controls, surveillance or monitoring processes, equipment and operational activities.

12.	Are special processes (work hardening, plating, coating, welding) required in the manufacturing process?	YES ☐	NO ☐
	Comments:		
13.	How long has the manufacturer produced this item at its current location?		
	Comments:		
14.	Does the manufacturer have a quality program accredited by a national or international organization (e.g. ISO 9000, QPL, etc)?	YES ☐	NO ☐
	Comments:		
15.	Has the manufacturer changed the design or manufacturing process of this item in the past?	YES ☐	NO ☐
	Comments:		

Criterion 4: The degree to which functionality can be demonstrated by inspection or test.

16.	What is/are the safety functions of the component? (Use WMN029)		
17.	Can the functionality be verified by receipt inspections and tests?	YES ☐	NO ☐

Criterion 5. The quality history and degree of standardization of the item.

18.	Are there any negative comments indicating substandard activities concerning this item in the NRC Bulletins?	YES ☐	NO ☐
	Comments:		

FORM J GRADED QA CHECKLIST	IPS CHANGE NOTICE DRAFT	IPS NUMBER	REV	IPSCN(GC)#
		PAGE		

Item Type: C/I Number:

19.	Is there any information indicating substandard activities concerning this item in the Generic Letters?	YES ☐	NO ☐
	Comments:		
20.	Is there any information indicating substandard activities concerning this item in the NRC Letters?	YES ☐	NO ☐
	Comments:		
21.	Is there any information indicating substandard activities concerning this item in the Information Notices?	YES ☐	NO ☐
	Comments:		
22.	Is there any information indicating substandard activities concerning this item in the NRC Circulars?	YES ☐	NO ☐
	Comments:		
23.	Is there any information indicating substandard activities concerning this item in the NPRDS Network?	YES ☐	NO ☐
	Comments:		
24.	Is there any information indicating substandard activities concerning this item in the NMMB Graded QA database?	YES ☐	NO ☐
	Comments:		

FORM J GRADED QA CHECKLIST	IPS CHANGE NOTICE	IPS NUMBER	REV	IPSCN(GC)#
		PAGE		

Item Type: C/I Number:

EVALUATION:

DRAFT

IPS FORM J

The IPS Form J is utilized to document the evaluation conducted in support of selecting CVAs for Graded Quality Assurance dedication activities. The Form is designed to allow the preparer to answer a series of questions in checklist format to assist in the determination of appropriate CVAs based on an evaluation of the five criteria required by the PVNGS UFSAR.

This section of the Appendix provides the significance for each answer selected. Any additional information required to supplement the specific dedication shall be documented in the remarks section of the Form J.

Question 1:

YES — The item is a structure, system, or component, or part thereof that affects it safety function that was not designed or manufactured as a Basic Component. The capability to verify all of the item's critical characteristics during the dedication process exists.

NO — This item shall not be dedicated utilizing the Graded QA or Commercial Grade Dedication processes. Procure the item as Safety Related Non-ASME Section III (P03).

Question 2:

YES — Record type "E" class/items are specific model related Equipment Configuration Management (ECM) items. Record type "E" class/items which are listed on the approved BOM for a specific component model, provide the link/control between the class/item and the EQID application component. The BOM exception process will ensure that engineering reviews are conducted for Graded QA items which are requested against EQID applications not evaluated by this IPSCN.

NO — This item is record type "A" (commodity) or "O" (non-ECM). Class/items with these record types are not approved for the Graded QA process due to the lack of material control to EQID applications. Procure this item as Safety Related Non-ASME Section III (P03) or Safety Related Commercial Grade (P01).

Question 3:

Significance is not necessary.

Question 4:

YES — Engineering Study 13-NS-B28 was developed to document the results of the PVNGS Expert Panel's selection of Low Risk Significant Systems. By definition, the failure of a Low Risk Significant System or its parts has minimal effect on nuclear safety or safe plant operations.

NO — The Graded QA approach to procurement is approved for only those items located in systems which are classified as Low Risk Significant by the PVNGS Expert Panel. Procure this item as Safety Related Non-ASME Section III (P03) or Safety Related Commercial Grade (P01).

Question 5

YES — The dedication of this item is not required to meet material verification requirements associated with the 10 CFR 50.49 program.

NO — PVNGS has voluntarily excluded class/Items required to meet 10 CFR 50.49 program requirements from the Graded QA process. Procure this item as Safety Related Non-ASME Section III (P03) or Safety Related Commercial Grade (P01).

Question 6

SIMPLE — Simple items are adaptable to standard inspections/tests of the end product to verify critical characteristics. The receipt inspection does not require operations which would affect the integrity or function of the item. Typically, these items are not components with many parts which would increase the difficulty of the manufacturing process. Examples of simple items are: Fasteners, O-rings, Stems, Spacers, etc. Manufacturing processes for simple items are standardized allowing for large production runs of homogeneous products.

COMPLEX — Complex items are typically components containing many parts which are manufactured separately and then assembled at a central location. The critical characteristics for many complex items cannot be verified through receipt inspection alone. Surveillance and post installation activities may need to be accomplished. The manufacturing process for complex items involves many QA controls and provide more opportunities for deficiencies than simple items. Performance testing of the final product may be necessary to verify the manufacturing process. Examples of complex items are: Motors, Large Valves, Pumps, Transmitters, etc.

Question 7

YES — This is an item which requires mechanical movement or change of state in order to accomplish its intended safety function. An active function increases the complexity of an item and its associated manufacturing process. A critical verification attribute (CVA) should be selected to verify the performance of the active function. Multiple CVAs could be utilized in lieu of performance testing.

NO — This is an item which does not require mechanical movement or change of state in order to accomplish its intended safety function. A passive function is a characteristic of a simple item. The ability of the item to perform its safety function may not involve performance tests. Additional CVAs are typically selected based on the remaining criteria in the checklist.

Question 8

YES — Unique items have specialized manufacturing processes which may require increased tests/inspections to verify quality. The aspects of these items which make them unique require special attention in the evaluation section. The quality history of unique items may be considered incomplete due to their specialized nature.

NO — The manufacturing and design process among manufacturers' is similar for this item. The ordinary nature of this item increases the value of the quality history reviews.

Question 9

YES — The quality history reviews completed as part of this evaluation may contain useful information on performance history due to the widespread use of this item.

NO — Less credence should be placed on the quality history reviews as this item is not used extensively in the nuclear industry. A lack of failures indicated by the reviews will not constitute a good performance history unless other valid trending data is available.

Question 10

YES — A fully automated manufacturing process will eliminate the sporadic errors normally found in manufacturing processes which utilize manual labor. Errors due to uncalibrated machines, or incorrect design will normally produce lots with identical problems which should surface during valid performance reviews.

NO — Manufacturing processes which require human performance are prone to producing products with sporadic errors. The need for effective QA controls increases proportionately to the manufacturing difficulty and amount of human intervention involved. The sporadic nature of problems in this manufacturing process detracts from the emphasis which may be placed on the quality history reviews.

Question 11

Yes — Large production runs during the manufacturing process are indicative of simple, standard items. A manufacturing facility must maintain standard processes in order to sustain large production runs. The quality history reviews completed as part of this evaluation may contain useful information on performance history due to the high quantity of items on the market.

NO — As the complexity of an item increases, the manufacturing process becomes more difficult and requires more controls. Complex items are typically not manufactured with large production runs. This could also be an indication of a manufacturing process which is not fully automated.

Question 12

YES — Special processes are use to create critical characteristics necessary for an item's end use application. For example, fasteners used in high strength applications may be work hardened and steels used in corrosive environments may be plated. Nondestructive examinations (NDEs), tensile testing, etc. are considered special processes. However, these are activities conducted by the manufacturer to verify the production process. Special processes require specific controls to ensure success. Depending on the length of time this item has been manufactured and the quality history, CVAs may be required to ensure the manufacturer is maintaining proper control over the special processes.

NO — Additional CVAs do not need to be considered in order to ensure the manufacturer is maintaining control over special processes.

Question 13

The quality history reviews and special processes question rely, in part, on the length of time the manufacturer has produced this item. As manufacturers move facilities, one cannot assume the processes at the original facility will be controlled as well in the new facility. The quality history reviews should not be heavily considered for items which are being developed for the first time or from a new location. Trending databases should not be considered valid until the item has been on the market for several years.

A manufacturer who has produced an item for several years at the same location and has a good quality record presumably maintains good control over special processes. Data is inconclusive for new manufacturers or those at new locations..

Question 14:

YES — Manufacturers are held to high quality standards in order to gain and maintain an accredited quality program. Items manufactured at these facilities are typically good quality. The processes for these manufacturers are usually standardized with good quality control. The responsible individual should get a copy of the certification as backup documentation.

NO — The lack of accreditation is not reason to preclude procuring the item as Graded QA. This question is meant to credit those manufacturers who have made the effort to improve the quality of their manufacturing process. The other questions should be used as input in the evaluation process.

Question 15:

YES — A substitution evaluation must be completed in accordance with 87DP-0MC06. Differences in seismic characteristics are evaluated in the MEE process.

NO — Due to the low risk significance of the parent system, the responsible individual can assume that the seismic characteristics within this item have not changed.

Question 16:

The component safety functions dictate the CVAs which may be required to dedicate the item. The safety functions should be considered throughout the evaluation process to determine the applicability of the answers for each question. The CVAs developed as a result of the safety function should be reviewed to determine if a test is available to provide reasonable assurance that the CVAs are present in the item.

Question 17

YES — Functionality is the ability of the item to perform correctly in its end use application. This may be achieved through performance testing or verification of other CVAs which when present will assure functionality. Performance testing, either on the bench or post installation, provides a great deal of reasonable assurance that the item will achieve its safety function.

NO — Functionality cannot be demonstrated through receipt inspection or testing. If functionality is required for the Graded QA dedication, it should be assured through source surveillance or audit activities at the manufacturer's location.

Questions 18-24

These database searches are designed to investigate failures, unacceptable performance trends and commitments. CVAs should be selected to account for adverse findings or commitments during these searches.

Evaluation

The evaluation section of this form is utilized to develop the necessary CVAs for a Graded QA dedication. As with commercial grade dedication, CVA selection is based on sound engineering judgement utilizing questions 1-24 as input. The Graded QA process was developed to accept additional risk during dedication based on the low risk significance of an item. This should result in monetary rewards by allowing an alternate procurement option to P03 and less CVA verification than a normal commercial grade dedication.

The four categories to consider in CVA selection are Materials of Construction, Physical Properties, Configuration/Dimensions and Performance. A list of CVAs is found in Appendix C of 87DP-0MC06. The part number (I07) and General Configuration (S03) should be included in the dedication plan. The answers to questions 1-24 should be evaluated as they pertain to the item's safety functions. For example, bolts which are plated during the manufacturing process but are used in non-corrosive environments may not require CVAs to verify the special plating process.

Criterion 1 (questions 1-5) determines if the item may be dedicated using the Graded QA process.

Criterion 2 (questions 6-11) provides input into the validity of the quality history review and the necessity of a performance test. Individual CVAs may be inspected in lieu of a performance test. For example, rather than verify spring constant, the responsible individual may verify the spring's material of construction, free length, coil diameter, wire diameter and number of coils.

Criterion 3 (questions 12-15) may indicate additional CVAs (presence of plating, hardness, etc.) necessary to ensure the manufacturer is controlling the special processes required to produce the item. The responsible individual should consider the length of time the manufacturer has produced this item and the results of the quality history review.

Criterion 4 (questions 16-17) determines if a performance (functional) test can be performed on site. Items which cannot be functionally tested on site should have additional CVAs selected or a source surveillance performed if a functional test is required. The CVAs selected should provide some input into the ability of the item to perform its safety functions.

Criterion 5 (questions 18-24) documents quality history data which can be utilized to select CVAs. The quality history review consists of searching the applicable databases using manufacturer, part number, item type, system, etc.. The responsible individual should document the basis for validating this information.

The responsible individual should document the basis for CVA selection in this evaluation section using the data collected in questions 1-24. Any information not used should be justified.

APPENDIX I

Post Installation Performance Testing Criteria

DRAFT

1.0 During the evaluation of commercial grade items, the Materials Engineer may require the accomplishment of a performance test after installation. The purpose of this test is to verify critical verification attributes (CVAs) which have not been verified through other means such as receipt testing, vendor surveys or vendor audits. Materials Engineering may also require post installation performance tests when the cost savings are overwhelming when compared to other verification methods.

2.0 In most cases, maintenance conducts functional/performance tests in the form of Surveillance Tests (STs) after installing equipment. The Material Engineer shall evaluate the appropriate ST to determine if this test will provide the verification required for the applicable CVA.

NOTE:

Maintenance may only complete portions of an ST after installing equipment. For example, an ST may include two sections for testing a power supply. One section performs a continuity verification while the other performs a complete functional verification. After installation, maintenance may only require the continuity check while the dedication requires a functional test. In these cases, the Material Engineer shall utilize the SIMS Special Maintenance Requirements (WMQ003) screen in accordance with section 4.0 below to clarify which section of the ST is required.

3.0 The Form F for the critical verification attribute requiring a post installation performance test shall indicate "Successful Functional Test" in the acceptance criteria block and "V05" in the Verification Method (VM) block. An APS note is added to the MMIS-Item Configuration Definition (IO50a) screen to indicate a "Performance Test is Required IAW ST XXXX-XXXX."

4.0 For instances where the ST is not acceptable or where a performance/functional test is not performed after installation, the performance test requirements with applicable acceptance criteria and tolerances will be annotated on the SIMS Special Maintenance Requirements (WMQ003) screen. An APS note is added to the IO50a screen to indicate a post installation test is required (e.g. Performance Test is Required. See Screen WMQ003 For Testing Requirements Under IPS XXXX-XXX, Group XXXX).

5.0 When ordering material for use in safety-related Q work orders, the Work Planner is responsible to check the IO50a screen to determine possible performance test requirements. The Work Planner will include steps in the Work Order to require a performance/functional test in accordance with an appropriate ST or if WMQ003 screen requirements exist, the accomplishment of the performance test as dictated by the WMQ003 requirements.

6.0 Material requiring a post installation performance test is not required to be segregated from standard stock in the warehouse and does not require special tagging.

7.0 Requests On Stores (ROSs) are not required to be verified by either Materials Engineering or Quality Control Receiving prior to releasing material to the field.

8.0 Material failures determined through post installation performance tests shall be sent back to the warehouse via the Material Returned To Stores (MRS) process. The MRS shall indicate failure as a result of Post Installation Performance testing. Stores shall forward the material and MRS to Quality Control Receiving for inclusion in the Warehouse Discrepancy Notice (WDN) process.

OVERVIEW

Introduction

This procedure supplements *"Maintenance Rule"* [30DP-0MR01] by establishing the rules, organization and detailed activities of the Expert Panel (ExP).

The ExP is a tool which can be used to evaluate PVNGS systems or components based upon various safety/ risk perspectives.

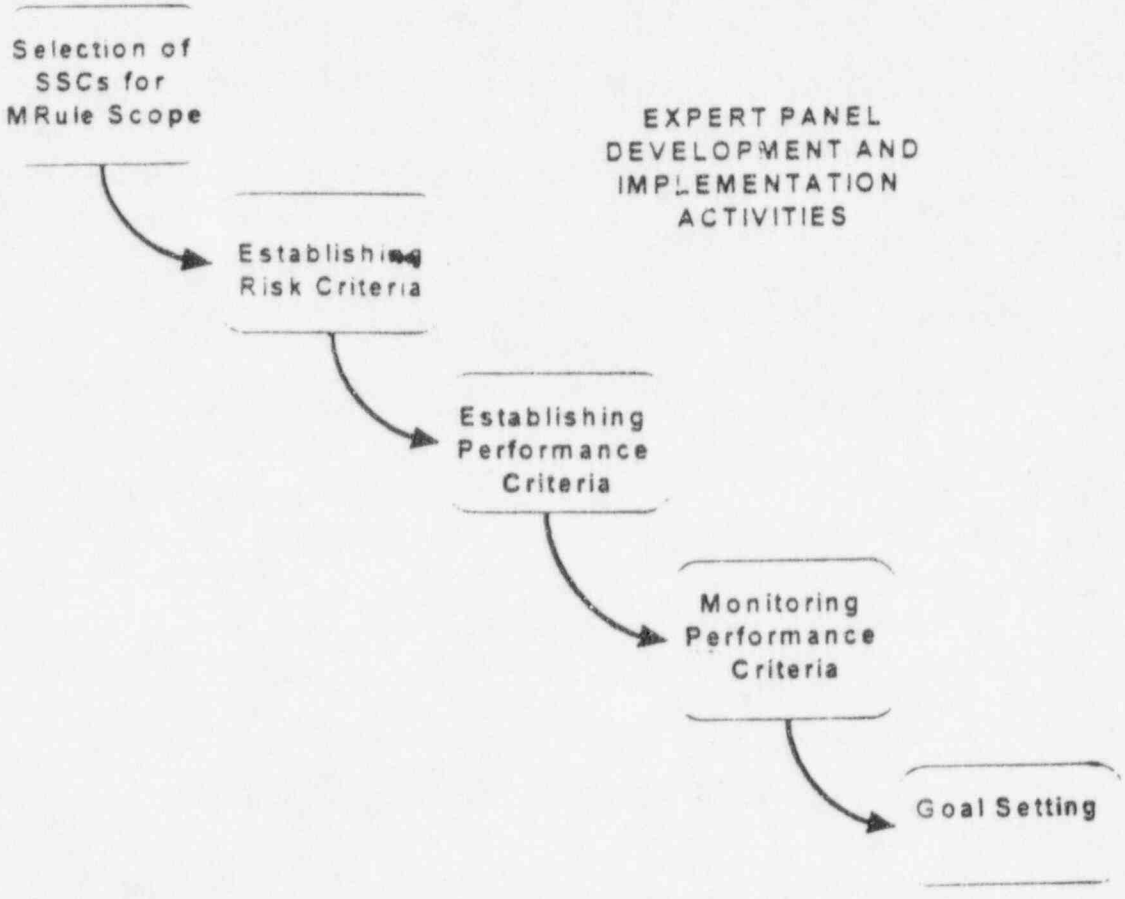
Expert Panel Functions

The Expert Panel functions to:

- Develop and implement MRule activities
- Support programs/activities where a risk/ performance based approach is requested.

MRule Activities

"Maintenance Rule" [30DP-0MR01] identifies the principal elements needed to implement the Maintenance Rule. The principal elements covered by this procedure are:



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Attachment 2

Overview, Continued

Basis for Document Content

This document implements guidance contained in:

"Maintenance Rule" [30DP-0MR01]

"Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants" [NUMARC 93-01].

"Monitoring the Effectiveness of Maintenance at Nuclear Power Plants" [Regulatory Guide 1.160].

In this document

This table lists the sections contained in this document:

Section 1.0 - Expert Panel Organization

Introduction

This section provides requirements for establishing and maintaining an Expert Panel for implementing the Maintenance Rule and other risk based applications.

In this section: This section contains:

Section 1.1 - Requirements and Guidance

Sub-Section 1.1.1 - 10CFR50.65

The MRule contains no requirements for establishing an Expert Panel.

Sub-Section 1.1.2 - NUMARC 93-01 Guidance

Composition and use of Expert Panel:

NUMARC 93-01 recommends the use of an Expert Panel with expertise in PRA, Engineering, Operations and Maintenance to perform a risk ranking of SSCs to assist in establishing performance criteria. It also notes that the panel can provide significant insights into other areas of MRule Implementation.

Section 1.2 - Expert Panel Organization

Introduction

In this section the ExP organization is described. This includes:

- Membership and Qualifications
- Rules of Conduct
- Training

Sub-Section 1.2.1 - Membership and Qualifications

ExP Membership and Qualifications

The ExP consists of at least six (6) members (and alternates) designated by the affected Department Leaders, with minimum qualifications as specified in the following table:

Member	Qualifications
Maintenance member	Six (6) years Nuclear Power Experience with at least four (4) years Maintenance related experience at PVNGS.
Operations member	Six (6) years Nuclear Power Experience with at least four (4) years CRS or SS experience at PVNGS.
Transient Analysis member	B. S. Degree in an Engineering Discipline and six (6) years Nuclear Power Experience with at least four (4) years Transient Analysis experience at PVNGS.
Site Scheduling member	Six (6) years Nuclear Power Experience with at least four (4) years Work Control related experience at PVNGS.
System Engineering member	B. S. Degree in an Engineering Discipline (or equivalent) and six (6) years Nuclear Power Experience with at least four (4) years Engineering experience at PVNGS.
Probabilistic Risk Assessment (PRA) member	B. S. Degree in an Engineering Discipline (or equivalent) and six (6) years Nuclear Power Experience with at least four (4) years PRA experience at PVNGS.
Responsible Engineer for affected SSCs	Qualified Engineer
Subject Matter Expert (temporary member as requested by ExP)	Six (6) years Nuclear Power Experience with at least four (4) years experience in the subject matter at PVNGS.

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Sub-Section 1.2.2 - Expert Panel Rules of Conduct

Chairperson and Vice Chairperson

The Chairperson and Vice Chairperson are appointed, by the Director of Maintenance and Department Leader, Specialty Engineering, from the ExP membership to serve for one (1) year.

ExP Quorum

Three (3) members are required for decision making. The minimum quorum requirements are as follows:

Decision Type	Minimum Quorum Requirement
Scoping and Risk Ranking	• PRA • Operations • System Engineering
Goal Setting and Establishing Performance Criteria	• PRA • Responsible System Engineer • Maintenance
Dispositioning Systems into [a][1] or [a][2]	• Responsible System Engineer • Maintenance • General ExP member
Risk Informed Applications	• PRA • Subject Matter Expert • General ExP member

ExP Activity Approvals

Decisions are approved by the ExP based on majority rule.

IF the activity is approved with comments THEN the Chairperson provides final approval following comment incorporation.

ExP Rules

The following general rules apply:

- Meetings should be held monthly and as convened by the Chairperson.
- Minority and majority positions, IF requested by the minority, are documented in the ExP meeting minutes.
- Meeting minutes should be distributed in a timely manner after the meeting.
- An Action Item List shall be maintained of all actions the ExP has identified.

Continued on next page

Sub-Section 1.2.2 - Expert Panel Rules of Conduct, cont'd

Notification of ExP Actions to Appropriate Personnel

Notifications shall be made as follows:

ExP Action	Notify
ExP minutes General information	• Department Leaders, Specialty and System Engineering • Affected organizations • ExP members
SSCs being placed into [a][1]	• Director of Maintenance and Director of Engineering • Director Nuclear Fuel • Department Leaders, Specialty and System Engineering • Responsible Program group, if any.
SSCs that are in [a][1] that show continuing declining trends	• same as SSCs being placed into [a][1] • Vice Presidents of Engineering and Nuclear Production

Sub-Section 1.2.3 - Expert Panel Training

ExP Members and Alternates Training Records

All permanent ExP members, alternates and ad hoc members listed in sub-section 1.2.1 will complete and maintain the following reading list before participating in ExP activities:

Expert Panel Members Training Record

(sample)

- 10CFR50.65, Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, 6/28/91
- Federal Register Vol. 56, No. 132/31306, Statement of Considerations for the Maintenance Rule
- Regulatory Guide 1.160, Monitoring the Effectiveness of Maintenance at Nuclear Power Plants
- NUMARC 93-01, Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants
- NUREG 1526, Early Implementation of the Maintenance Rule at Nine Nuclear Power Plants, June 1995
- Risk Management Program Expert Panel, 71DP-0EM01
- Maintenance Rule, 30DP-0MR01

Employee Number _____ Last Name, First Name, M. I. _____

I have reviewed and understand the above documents and have been briefed on the use of PRA in determining Risk Significance.

Signature _____ Date _____

Section 2.0 - Expert Panel Activities

Introduction This section describes the ExP activities necessary to ensure the Maintenance Rule is properly implemented at PVNGS.

In this section: This section contains:

Section 2.1 - Selection of SSCs for MRule Scope

Introduction:

An important ExP activity is to select the SSCs included within the MRule. The SSCs scoped into the MRule are listed in the MRule Scoping Matrix in ***"Engineering Scoping Study"*** [13-NS-C09].

To develop the list of MRule SSCs the PVNGS Expert Panel:

- Reviewed PVNGS Documentation Sources
- Used and applied NUMARC Scoping Questions
- Developed the Scoping Selection Matrix

Sub-Section 2.1.1 - PVNGS Documentation Sources

Documentation Sources for scoping process

The following documentation sources are used to make scoping decisions:

- Updated Final Safety Analysis Report [UFSAR] - Design functions are identified from information provided in the Final Safety Analysis Report.
- Design Basis Documents - Design functions are identified from information provided in Design Basis Documents.
- Licensee Event Reports [LERs] - PVNGS LERs are reviewed to identify safety-related and nonsafety-related functions that have caused a reactor trip or safety system actuation.
- PVNGS Unit Trip Reports.
- Trip Reduction Task Force [*CRIT*].
- Emergency Operating Procedures [EOPs] - Emergency Operating Procedures, and those Abnormal Operating Procedures [AOPs] referenced by EOPs, are reviewed to identify safety-related and nonsafety-related functions that are required by EOPs and that provide significant benefit in the mitigation of accidents or transients.
- Related Industry Experience documents
  - MRule scoping results from several NSSS plants were reviewed to benchmark PVNGS with similar plants.

Sub Section 2.1.2 NUMARC Scoping Questions

Determination of SSCs in the scope of MRule

Each Primary System/Secondary System and Structure were evaluated against each of the Five [5] MRule scoping questions contained in NUMARC 93-01. Reference the five questions listed below. A 'yes' answer to any of the scoping questions resulted in the SSC being within the scope of the MRule.

Scoping Question #1

Safety Related SSCs [Identified **"SR"** on MRule Scoping Matrix.]

"Are the safety-related SSCs relied upon to remain functional during and following design basis events to ensure:

- ***Integrity of the reactor coolant pressure boundary; or***
- ***Capability to shut down the reactor and maintain it in a safe condition; or***
- ***Capability to prevent or mitigate the consequences of all accidents that could result in potential offsite exposure comparable to the 10CFR100 guidelines?"***

Evaluation:

All safety-related SSCs were evaluated by searching the SIMS data base for Safety Related components. Additional systems were added to accommodate:

- Containment isolation valves
- Refueling water tank

Scoping Question #2

Nonsafety-Related SSCs that Mitigate Accidents or Transients [Identified as **"MA"** in MRule Scoping Matrix.]

"Are [safety and] nonsafety-related SSCs relied upon to mitigate accidents or transients?

Evaluation:

This criteria is evaluated by performing review of:

- UFSAR, EOPs, and other design and licensing documents.
- Systems modeled in the PVNGS PRA
- Industry operating experience reports

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Sub-Section 2.1.2 - NUMARC Scoping Questions, Continued

Scoping Question #3

Nonsafety-Related SSCs that are used to directly mitigate accidents in Emergency Operating Procedures [Identified as "EOP" in the MRule scoping Matrix.]

"Are [safety and] nonsafety-related SSCs used in plant Emergency Operating Procedures [EOPs]?"

Evaluation:

Evaluated by performing a review of the EOPs and those AOPs referenced by EOPs. SSCs identified in the EOPs. and those AOPs referenced by EOPs, used solely for economic or long-term return to power were not included in the scope.

Scoping Question #4

Nonsafety-Related SSCs Whose Failure Prevents Safety-Related SSCs from Fulfilling their Safety-Related Function [Identified as "PF" on the MRule Scoping Matrix.]

"Will the failure of nonsafety-related SSCs prevent safety-related SSCs from fulfilling their safety-related function?"

Evaluation:

The scoping evaluation considered:

- IF the assumed failure of the entire non-safety related SSC could prevent a safety-related system from fulfilling its safety-related function.
- The PVNGS PRA.
- Review of the system design basis manuals was conducted to ensure systems that may not have been modeled in the PRA were scoped into the Maintenance Rule if they met this criteria.

Scoping Question #5

Nonsafety-Related SSCs Whose Failure Cause a Trip, or Actuates Safety Systems [Identified as "TRIP" on the MRule Scoping Matrix.]

"Will [safety and] nonsafety-related SSCs cause a SCRAM or actuation of safety-related systems?"

Evaluation:

SSCs reviews for inclusion in MRule scope as follows:

- Those whose failure has caused a reactor trip or safety system actuation. [*CRIT*]
- Identified in other completed evaluations as being capable of causing a reactor trip or safety system actuation.
- Engineering evaluations associated with PRA and Appendix R.
- Immediate actions contained in operations procedures.
- Industry operating experience review.

Sub-Section 2.1.3 - SSC Scoping Selection Matrix

Scoping process	Members of the Expert Panel performed the initial scoping effort. The full Panel convened and made the final scoping determination. The final product is the identification of PVNGS systems scoped into the MRule program. The results of this effort are found in the *"Engineering Scoping Study"* [13-NS-C09], Appendix A, in a matrix format.
Exclusions from scoping criteria	SSCs that do not meet the preceding scoping criteria are considered to be outside the scope of the MRule. These SSCs will continue to have appropriate maintenance activities performed on them, based on economic consequences. The following excuses were not used to exclude SSCs from the scope of the MRule: • The SSC is very reliable, inherently reliable, or has never failed at this site. • Redundant trains will prevent the failure of the overall system from causing a reactor trip. • Operator actions will prevent the failure of the system from causing a reactor trip. • The failure of the system will not directly cause a trip. Example: a loss of circulating water that caused a turbine trip and subsequently resulted in reactor trip would be in the scope even though the system failure would not cause a DIRECT reactor trip.
Scoping Study contents	The MRule Scoping Study contains the following information on each Primary Secondary System, as a minimum: • Primary System designator, Secondary System designator, and System Title. • Y/N Responses to the five MRule scoping questions. • MRule Function descriptions and notes. • Applicable reference documents used for scoping.
Scope Changes	Recommended scope changes are brought to the Expert Panel by the System Engineer. Recommendations for scope change result from modifications, system problem occurrences, trend analysis, industry operating experience, etc.
MRule Scoping Document ownership	Maintenance of 13-NS-C09 and associated documentation is the responsibility of Speciality Engineering.
MRule Scoping Documentation	Scoping determinations are documented in the ExP meeting minutes. Scoping determinations are incorporated into 13-NS-C09.

Section 2.2 - Risk Assessment

Introduction	Following the selection process, the ExP is responsible to determine the risk significance of MRule SSCs. At PVNGS a risk ranking evaluation process is used to determine the risk significance. The results are documented in ***"Risk Significant Determination for Implementation of the Maintenance Rule"*** **[13-NS-C14]**.

Sub-Section 2.2.1 - ExP Role in Determining Risk Significance

Initial MRule Risk Significance Determination	The ExP determined the initial Risk Significance of SSCs for MRule Scope as described in ***"Maintenance Rule"*** **[30DP-0MR01], Establishing Risk Criteria.**
Ongoing Mrule Risk Significance Determinations	The ExP approves all additions and changes to Risk Significance determinations for MRule SSCs using the logic applied during the historical risk determination process.
Risk Significance Document Ownership	Maintenance of **13-NS-C14** and associated documentation is the responsibility of Specialty Engineering.
Risk Significance Documentation	The Risk Significance determinations are documented in the ExP meeting minutes. Risk Significance determinations are incorporated by Specialty Engineering into **13-NS-C14**.

Sub-Section 2.2.2 - Risk Ranking Evaluation

Purpose	A Risk ranking evaluation is performed to support the risk assessment process. The evaluation encompasses the ranking of SSCs and the scope of the evaluation.

Ranking Evaluation Elements	A ranking evaluation has the following process elements:
	• Perform Risk significance analysis in agreement with ***"System Level Risk Ranking Guide"*** **[71IG-0EP01]**.
	• Review Ranking results (at least annually and following significant changes) ensuring changes are incorporated into the PRA prior to ranking. . The review shall include:
	  • Design Modifications
	  • Changes to EOPs and AOPs
	  • Changes to UFSAR and Licensing Basis documents
	  • Updates required to **13-NS-C14**.
	Each step in the above process is approved by the ExP.

Section 2.3 - Establishing Performance Criteria

Introduction

The ExP is responsible to approve the Performance Criteria for MRule SSCs. While all components within an MRule scoped system are included in the MRule Program, a graded approach to establishing Performance Criteria and Monitoring Performance is used. This means that specific train level performance criteria are established for those portions of the system that perform a significant safety function while all other components are included in the plant level monitoring. Performance Criteria are found in the System Basis which is described in Section 2.4.

ExP Role in Historical Performance Criteria Selection

The ExP and the System Engineer selected the initial Performance Criteria for MRule SSCs as described in ***"Maintenance Rule"*** **[30DP-0MR01], Establishing Performance Criteria.**

ExP Role in Ongoing Mrule Performance Criteria Selection

The ExP approves all additions and changes to Performance Criteria determinations for MRule SSCs using the logic and guidance applied during the historical performance criteria selection process.

Establishing Performance Criteria Process Elements

Establishing Performance Criteria has the following process elements:

Step	Action	What	Who
1	Prepare	System boundary scoping	System or Responsible Engineer
2	Perform	Calculation of acceptable performance levels using the PRA where possible	PRA section
3	Develop	Performance Criteria as described in ***"Performance Criteria Guideline"*** [71IG-0EP01]	ExP
4	Review	Performance Criteria following significant changes to the PRA or risk ranking or design Modifications	ExP and System or Responsible Engineer

Each step in the above process is approved by the ExP.

Performance Criteria Documentation Ownership

The Performance Criteria is maintained in the System Basis which is owned by the System or Responsible Engineering Department.

Performance Criteria Documentation

The determinations are documented in the ExP meeting minutes and maintained by the Engineer in the System Basis. The System Basis is described in Section 2.4.

Section 2.4 - System Basis

Introduction to System Basis	The System Basis is an electronic file that summarizes important MRule data on MRule Systems.
System Basis Content	The System Basis *as a minimum* should have the following content: • System and Major components • MRule functions (i.e., reactivity control, etc.) • Basis for Reliability and Unavailability • Reliability and Unavailability for MRule function's SSCs including: Applicable Modes Performance Criteria General and Special Accounting Rules • System Scoping Diagram • Revision History
System Basis Approval	The System Basis is approved by the ExP. Approvals are documented in the ExP meeting minutes
System Basis Maintenance	The System basis is maintained by the System or Responsible Engineer.
System Basis Ownership	The System Basis is owned by the System or Responsible Engineering Department.
System Basis Documentation	System Basis determinations are documented in the ExP meeting minutes and in revisions to the System Basis.

Section 2.5 : Performance Monitoring

Introduction

Following establishment of the Performance Criteria and the System Basis. the ExP and the System Engineer monitors performance of MRule SSCs against the established Performance Criteria.

Data Collection and Trending

The ExP and the System Engineer monitor Performance Criteria for MRule SSCs as described in ***"Maintenance Rule"*** **[30DP-0MR01], Monitoring Performance Criteria.**

ExP Reviews of SSC Performance

The ExP ensures that plant performance is reviewed in accordance with ***"[a][1]/ [a][2] Evaluation and Goal Setting"*** **[71IG-0EP02]**, as follows:

Review Frequency	Review	To
As required by System or Responsible Engineer	Data on: • Repetitive Functional Failures • Clearly declining Trends • High Risk Significant Failures • Failure to meet goals • Failure to meet Performance Criteria	Determine if additional actions for [a][1] are needed or if placement to [a][2] from [a][1] is indicated
Monthly	MRule annunciator report	Determine if an evaluation for [a][1] placement is needed
Annually	Review risk based program information (i.e., R1-IST, Graded Procurement, etc.)	Determine if changes to the risk ranking should be considered

Annual Performance Report

An annual report is developed in agreement with ***"Performance Monitoring Instruction"*** **[30IG-0MR01]**. The ExP reviews and provides input to the final Annual Report.

Performance Monitoring Documentation

The results of Performance Monitoring reviews are documented in the ExP meeting minutes.

Section 2.6 - Goal Setting

Introduction	The System or Responsible Engineer uses the Performance Monitoring data to identify SSCs that are not meeting Performance Criteria goals. These SSCs are candidates for appropriate corrective actions plans which are developed by the System or Responsible Engineer and provided to the ExP for use in the goal setting process.
The ExP and the Goal Setting Process	The Goal Setting Process is described in *"Maintenance Rule"* [30DP-0MR01], Goal Setting. The ExP oversees this process which includes dispositioning SSCs to [a][1] or [a][2], goal setting and corrective action plans.
Determining If Category [a][1] Placement is required	The ExP dispositions MRule SSCs to category [a][1] as specified in *"[a][1]/[a][2] Evaluation and Goal Setting"* [71IG-0EP02].
Development of Goals	Goals are established as specified in "1IG-0EP02.
Approval of Goals	Goals are approved by the ExP.
Documentation of Goals	Goals are documented in the ExP meeting minutes.
Corrective Action Plans	When Goal Setting is required a Corrective Action Plan is developed. Corrective actions are tracked and implemented using the CRDR process, *"Condition Reporting"* [90AC-0IP04]. The ExP approves Corrective Action Plans.

Section 2.7 - Other Risk Based Applications

ExP Role in Risk Based Applications	The ExP will support programs/activities where a risk/performance based approach is requested. The ExP decides on a case by case basis the process for proceduralizing and documenting the activity.

PVNGS Personnel Contacted

- **Procurement and CGI Dedication (6/5/96)**

  Don Lamontagne - Licensing
  Don Kissinger - QA
  Fawaz Jabali - QA
  Carter Rogers - Licensing
  Mike Heider - Materials Engineering

- **Use of Computer System for QA Records Storage (6/5/96)**

  Carter Rogers - Licensing
  Ann Orr - Nuclear Information Records Management
  Mandy Lockhart - Nuclear Information Records Management
  Debra Hernandez - Nuclear Information Records Management
  Glenn Michael - Licensing
  Tony Medrano - Nuclear Information Records Management

- **MR Expert Panel Session (6/6/96)**

  Bruce Johnson - Panel Member
  Mike Oren - Panel Member
  Steve Ryan - Panel Member
  John Brannen - Panel Member
  James Webb - Panel Member
  Sharon Boardman - Panel Member
  Lonnie Bullington - Panel Member (Back-up)
  Brad Davis - Panel Member (Back-up)
  John Holmes - PVNGS
  Dave Fan - PVNGS
  Jer Chin Shih - PVNGS
  Carter Rogers - Licensing
  Stephen Jones - PVNGS
  Steven Moyers - PVNGS

- **Quality Assurance (6/6/96)**

  Don Wheeler - QA
  Dale Heech - QA
  Gary Shanker- QA
  Dan Baldwin - QA
  Craig Seaman - QA
  Carter Rogers - Licensing

- **Materials Management (6/6/95)**

  Mike Heider - Procurement
  Carl Churchman - Manager
  Carter Rogers - Licensing

- **Licensing Department (6/6/96)**

  Scott Bauer, Acting Manager
  Pat Brandjes - PVNGS
  Carter Rogers