WOLF CREEK
NUCLEAR OPERATING CORPORATION

Otto L. Maynard
President and Chief Executive Officer

February 7, 1997

WM 97-0009

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-137
Washington, D. C. 20555

Reference: Letter dated October 9, 1996, from James M. Taylor, USNRC, To N. S. Carns, WCNOC
Subject: Docket No 50-482: Response to "Request for Information Pursuant to 10 CFR 50.54(f) Regarding Adequacy and Availability of Design Bases Information"

Gentlemen:

The attachment to this letter transmits Wolf Creek Nuclear Operating Corporation's (WCNOC) response to a request for information concerning the processes for maintaining the design bases of Wolf Creek Generating Station as outlined in the reference. The requested information is being submitted in accordance with 10 CFR 50.54(f). The information provided in this response is intended to describe processes and procedures as they currently exist. It is not intended to preclude subsequent changes following normal practices, or to require NRC notifications or approvals of such changes other than those currently required. This letter does not create any new commitments, or modify any prior commitments.

The enclosure provides a Summary Overview of WCNOC's response to items (a) through (e) of the reference for concluding that there is reasonable assurance that the design bases are being maintained and that the plant physical and functional characteristics are being maintained consistent with their design bases as defined in 10 CFR 50.2. It also provides a summary of activities that involve design bases (currently planned or in process) at Wolf Creek Generating Station.

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WCNOC recognizes the importance of design bases to the safe operation of WCGS and strives, through its programs, procedures, field verification, training and management oversight, to maintain the design bases pursuant to regulatory requirements. If you have any questions regarding this response, please contact me at (316) 364-8831, extension 4000, or Mr. Richard D. Flannigan at extension 4500.

Very truly yours,

Otto L. Maynard

OLM/jad

Attachment
Enclosure

cc: L. J. Callan (NRC), w/a; w/e
W. D. Johnson (NRC), w/a; w/e
J. F. Ringwald (NRC), w/a; w/e
J. C. Stone (NRC), w/a; w/e

STATE OF KANSAS)
) SS
COUNTY OF COFFEY)

Otto L. Maynard, of lawful age, being first duly sworn upon oath says that he is President and Chief Executive Officer of Wolf Creek Nuclear Operating Corporation; that he has read the foregoing document and knows the content thereof; that he has executed that same for and on behalf of said Corporation with full power and authority to do so; and that the facts therein stated are true and correct to the best of his knowledge, information and belief.

By Otto L. Maynard
Otto L. Maynard
President and
Chief Executive Officer

SUBSCRIBED and sworn to before me this 7th day of February, 1997.

CAROLYN E. LONG
Notary Public - State of Kansas
My Appt. Expires 1-5-99

Carolyn E. Long
Notary Public

Expiration Date 1-5-99

Summary Overview of Wolf Creek Nuclear Operating Corporation's (WCNOC) Response for Information in Accordance with 10 CFR 50.54(f)

Wolf Creek Generating Station (WCGS) was designed as one of the Standardized Nuclear Unit Power Plant System (SNUPPS) plants, by Bechtel Power, Westinghouse and Sargent and Lundy. The SNUPPS design was coordinated with five other utilities. Ultimately, two essentially identical SNUPPS units were constructed and licensed; Callaway Plant, owned and operated by Union Electric Company, and WCGS owned by Kansas Gas and Electric Company (a wholly owned subsidiary of Western Resources, Inc.), Kansas City Power & Light Company, and Kansas Electric Power Cooperative, Inc., and operated by Wolf Creek Nuclear Operating Corporation (WCNOC). WCGS's construction was controlled and monitored by an approved QA/QC program. Plant system, structure and component (SSC) functions were verified by an initial test program. WCGS was granted a full power operating License in June 1985.

Programs and processes used to develop, change and maintain the WCGS design bases are described in the Attachment to WM 97-0009 to the USNRC from O. L. Maynard. Programs and processes include the design and configuration control process, the procedure programs, the design bases capture program, and management oversight. Also described are the ongoing testing and field verification programs that have been established to ascertain and preserve the continuity of the as built design, and the programs to comply with 10 CFR 50.59 and 10 CFR 50.71(e). (Reference Sections I, II, III, and IV of the Attachment.)

Programs, processes, and field verification methods have been established and in place since the Operating License was granted. Changes to these processes and programs have been made through approved change processes established to meet the requirements of 10 CFR 50 Appendix B. Oversight of these processes and programs has been accomplished though the WCNOC Quality Assurance program as well as through the Plant Safety Review Committee, Nuclear Safety Review Committee, and Nuclear Safety Engineering group (ISEG). (Reference Sections I and IV of the Attachment.)

WCNOC, through its established and maintained programs and processes, and field verification, design bases review program, and in conjunction with the results of oversight process provides reasonable assurance that the design bases, as defined in 10 CFR 50.2, have been and is being maintained. This can be evidenced by relatively few occasions where immediate unit shutdown was required, (reference Section III of the Attachment.), results of Quality Assurance Audits and Evaluations, Self Assessments and NRC Inspection Activities.

The purpose of the WCNOC Design Bases Review program is to capture Wolf Creek design bases information along with supporting design information. The program focuses on a systematic organization of design bases information to facilitate retrieval and maintenance by identifying, classifying and assembling correspondence and calculations containing design bases information relevant to significant systems, structures, and components. Based on NUMARC 90-12, "Design Bases Program Guidelines," WCNOC used a mixed approach to perform design bases capture. The Design Bases Review program at WCNOC was

initiated in 1987 and, while the collection and classification portion of the project was completed in 1995, WCNOC considers it to be an ongoing program. The design bases is maintained through the design and configuration control processes (reference Section I of the Attachment).

WCNOC recognizes the need for continued improvement. Over approximately the last year, WCNOC has made several commitments to activities that will include assessments involving the plant design or design bases. Below is a summary of those significant activities and reference to the originating docketed correspondence. The following activities do not constitute new or different commitments.

- Conversion to Improved Standard Technical Specifications. (Letter WO 95-0181, dated December 13, 1995, from O. L. Maynard, WCNOC, to USNRC)
- Response to Generic Letter 96-01. (Letter WO 96-0068, dated April 18, 1996, from O. L. Maynard, WCNOC, to USNRC)
- Engineering Work Product Evaluations (Letter WO 96-0081, dated July 31, 1996, from N. S. Carns, WCNOC, to USNRC)
- Safety System Functional Assessments (Auxiliary Feedwater, Essential Service Water, Component Cooling Water and Residual Heat Removal) to confirm that no potentially safety/operationally significant design concerns exist. (Letters WM 96-0081, dated July 31, 1996, from N. S. Carns, WCNOC, to USNRC; WO 96-0101, dated July 3, 1996, from O. L. Maynard, WCNOC, to USNRC; and WO 96-0118, dated August 22, 1996, from C. C. Warren, WCNOC, to USNRC)
- Non-Safety System Assessments (Feedwater, Service Water, Main Turbine and Main Generation System) to confirm design changes were adequately tested, that those changes were correctly considered in vendor manuals, drawings, spare parts, and procurement documents. (Letters WO 96-0101, dated July 3, 1996, from O. L. Maynard, WCNOC, to USNRC; and WO 96-0118, dated August 22, 1996, from C. C. Warren, WCNOC, to USNRC)
- Updated Safety Analysis Report Review Program. (Letter ET 97-0010, dated February 7, 1997, from R. A. Muench, WCNOC, to USNRC)

Wolf Creek Nuclear Operating Corporation's (WCNOC) Response to Request for Information in Accordance with 10 CFR 50.54(f)

By letter dated October 9, 1996, to N. S. Carns from J. M. Taylor, licensees were required to provide the requested information associated to five areas. Below is WCNOC's response to the five areas. In addition, the letter included a request for information associated to design review or reconstitution programs. This has been addressed in section I.H. A Glossary has been included at the end of this attachment. The initial use of a word defined in the Glossary is in **bold** letters. Subsequent use of that word will be defined as such unless otherwise noted.

(a) Description of engineering design and configuration control processes, including those that implement 10 CFR 50.59, 10 CFR 50.71(e), and Appendix B to 10 CFR Part 50;

WCNOC Response:

I. The Design and Configuration Control Process

I.A. Introduction

Wolf Creek Generating Station (WCGS) was designed as one of the Standardized Nuclear Unit Power Plant Systems (SNUPPS) by Bechtel Power, Westinghouse and Sargent and Lundy. The SNUPPS design was coordinated with five other utilities. Ultimately, two SNUPPS, essentially identical units, were constructed and licensed; Callaway Plant, owned and operated by Union Electric, and WCGS. The WCGS construction was controlled and monitored by an approved QA/QC program. Plant structure, system, and component (SSC) functions were verified by an initial test program (reference Section II.D.1.). WCGS was granted a full power operating License in June 1985.

Programs for the control of the design and configuration at WCGS have been developed to comply with the applicable sections of 10 CFR 50 Appendix B and the applicable ANSI standards. A discussion of the Corrective Action program is provided in Section IV.

A summary of the Design and Configuration Control Processes is provided below. These programs have been structured to maintain the design bases. Although this letter emphasizes safety-related SSCs, non-safety-related SSCs generally are treated in a same, or similar manner. In addition, Wolf Creek Nuclear Operating Corporations (WCNOC's) Regulatory Screening and Evaluation process (10 CFR 50.59), Updated Safety Analysis Report (USAR) revision process (10 CFR 50.71(e)), and **design bases** review program are also described.

I.B. Scope

The design, **modification**, addition, and replacement of SSCs (both safety-related and non safety-related) at WCGS are procedurally controlled to provide for implementation of appropriate measures to maintain design bases integrity and that the documented "as-built" characteristics and information are not degraded. The plant design information is contained in design documents that illustrate the general arrangement and details of safety-related SSCs and define the requirements

for their continuing capability to perform their intended operational or safety design function.

Design process control activities include the translation of regulatory requirements and design bases into specifications, drawings, written procedures, and instructions that define the design. Procedures govern the performance of design analyses regarding nuclear physics, stress, seismic, thermal, hydraulic, radiation, and accident analyses, used to produce design output documents. Requirements for design verification and reviews of design are addressed by plant procedures.

Design process control activities also include: 1) reviewing the applicability of standards; 2) reviewing commercial or previously approved materials, parts, or equipment for suitability of application; 3) reviewing the compatibility of materials used in the design; 4) reviewing the accessibility of equipment and components for inservice inspection, maintenance, and repair; 5) specifying criteria for inspection and testing; and 6) reviewing and approving procedures for special processes, and 7) verifying computer codes and software used in the design process.

Configuration control activities include translating design output documents into appropriate procedures and implementing the design output documents in operations and maintenance activities. Procedures institutionalize design and configuration control processes by establishing requirements, assigning responsibilities, and providing control of design and configuration activities.

I.C. Design Process Controls

Control requirements for the design process are specified in procedures based on WCNOC's commitment to ANSI N45.2.11. These procedures include instructions for defining typical design requirements and communicating needed design information across internal and external interfaces. Procedures also provide guidance for preparing, reviewing, approving, and revising **change packages** and associated documents. Procedures address the control of design and configuration changes and change package implementation. Design control related procedures are released, distributed, and maintained under the established WCNOC Document Control Program.

I.C.1. Design Process

I.C.1.1. Initiation

The design process begins by establishing a need for some engineering action or plant change. The design function of the SSC must then be determined in order to evaluate the impact of the action or change on the safe operation of the plant. When determining design functions, engineering must establish functions of the SSCs during normal and accident operating conditions and establish the resulting safety classification. Engineering must also take failure modes into account. Procedures require design analyses to be sufficiently detailed as to purpose, method, assumptions, design input, references and units to permit an independent review by a technically qualified person.

Procedures require that changes to safety-related equipment be designed and performed in accordance with applicable codes, standards, design requirements, material specifications, and inspection requirements and documented in either **Configuration Change Packages** (CCP) or **Design Change Packages** (DCP). Procedures also require engineering to perform a review to provide reasonable assurance that design bases, regulatory, and programmatic commitments are maintained or, when required, the correct reporting or NRC approval process is entered.

For safety-related SSCs, the design inputs, including any new input documents, must be identified. Design input from responsible work organizations are solicited to provide reasonable assurance a quality product is developed. Design input includes design bases, regulatory requirements, codes and standards, or other design requirements upon which the detailed final design is based. Design input must be captured at a level of detail necessary to permit the design activity to be carried out correctly and to provide a consistent basis for making design decisions, allowing for design verification, and evaluation of the design change.

I.C.1.2. Design Interface Control

As part of design development, procedures require that changes to design information be reviewed. The design interfaces between organizations are identified and controlled by procedures that address the division of design responsibility between WCNOC engineering, other WCGS staff and contractors. Administrative controls are established to specify the communication requirements and distribution of information. Procedures define the inputs, design reviews, verification, and approval responsibilities.

When design activities are performed by an outside organization, procedures require WCNOC to perform a review for conformance with the WCNOC design requirements and regulatory and licensing commitments. In addition, WCNOC identifies and controls design interfaces and coordinates the design process between internal divisions and the outside organization(s).

I.C.1.3. Design Review and Verification

Design changes made to SSCs classified within the scope of 10 CFR 50 Appendix B are required by procedure to be independently verified. Independent verification is the process of reviewing, confirming, or substantiating the design by one or more methods to provide assurance that the design meets the specified design inputs. Procedures require independent verification to be performed by a qualified individual or group other than those who performed the original design or design change. Design control procedures specify requirements for the accomplishment of design verification.

Consistent with 10 CFR 50 Appendix B and Appendix A Criterion 1, the extent of verification activities for individual design activities is commensurate with the safety importance of the system or component, the complexity of the design change, and similarity to previous designs. Procedures identify the responsibilities of the verifier, the features to be verified, the pertinent considerations to be verified, and the documentation required. Procedures require that design verification be accomplished either by testing, design review, alternative calculation, qualification testing, or by a combination of these methods. In

unusual cases, the designer's supervisor may perform the verification. Design verification is normally required prior to release of a design, for use in procurement, manufacturing, or installation activities. Procedures control the justification and documentation of exceptions.

Procedures establish when special reviews are warranted for uniqueness or special design considerations. Procedures govern special design reviews such as Hazards Analysis, Seismic or Environmental Qualification, Cable Separation, Fire Protection, Pipe Break Analysis, Heavy Loads Evaluation, Control Room Habitability, Electrical Distribution Impacts, ALARA, Interface Piping, Probabilistic Safety Assessment Reviews, and Human Factors Evaluation.

I.D. Configuration Control

Configuration Control involves identifying and documenting functional and physical characteristics of the plant and controlling changes to those characteristics. It is also recording and accounting for the changes throughout the modification process and providing the implementation status of the changes to plant personnel. The configuration control process establishes controls for releasing design documents with a timely distribution to users. Documents and revisions thereto are controlled with written procedures that apply to prevent inadvertent use of voided or superseded documents. Procedures specify requirements for the review, approval, and dissemination of design and configuration change packages to affected plant personnel. Procedures also govern the collection, storage, and maintenance of design documents, results of design document reviews, and changes thereto. Changes to design documents are reviewed and approved as part of the design or configuration change process.

I.D.1. Design Change Coordination

Procedures establish how proposed changes to the design or configuration are coordinated with other engineering groups, and technical service organizations to provide reasonable assurance that changes within the expertise of the other disciplines and groups are properly considered for compatibility with concurrent change activities. The extent of this coordination is contingent upon the complexity of the design activity. Procedures also require that proposed changes are coordinated with the organization requesting the change and potentially affected organizations to verify that the design will be responsive to the needs of plant personnel. Operational and field considerations are included in the design.

Through the above process, the affected responsible work organization and the activities required to be completed prior to the modified equipment being returned to an operable status must be identified. Post modification testing and essential drawings must also be identified (reference section I.D.6.2.). The change package is required to be reviewed by an independent reviewer. The change package is then submitted to the responsible Engineering Supervisor for approval. Approval is the process by which the supervisor documents that the disposition is technically sufficient, accurate, and clearly communicated. The supervisor also reviews the disposition for compliance with procedural requirements.

I.D.2. Design Change Release

The change package, including the engineering analysis and any design documents that support the implementation of the proposed change is then issued to the field upon approval. Other affected design documents, that need to be updated once the change is implemented in the field, are required to be documented.

Based on the released change package, work implementation documents are developed, reviewed, and released (reference section I.D.6.2.). After the field work is complete, the process includes a close-out check that design drawings, procedures, specifications, calculations, data bases, design documents, vendor manuals, and the USAR, affected by the change have been or will be updated as procedurally required.

I.D.3. Temporary Modifications

Temporary Modifications are interim and short term changes to the approved station design, and are controlled and tracked in accordance with approved procedures. The proposed temporary modification is procedurally required to be reviewed by engineering against design and licensing documentation, including the USAR, and changes must be reflected on the applicable essential design drawings. Procedures require that a log be maintained of the current status of such temporary modifications. The installation and removal of the temporary modification are required to be independently verified prior to the equipment's return to proper configuration. Other temporary changes such as installation of drain hoses, supplying non-safety-related temporary power, pulling annunciator cards and other troubleshooting are implemented and controlled by administrative procedures.

I.D.4. Operations Configuration Control

Operations maintains control of system configuration by conducting system lineup verifications. System lineup verifications are conducted through the use of component position verification checklists. These checklists are part of the Operations Division procedures and are part of the Qualified Review process (reference Section II.B.). As part of the Qualified Review process, procedures are required to be reviewed and approved. Procedures are also required to include regulatory screenings and be compared against system requirements.

Following maintenance, and prior to system restoration, procedures require that a clearance order restoration be prepared using a variety of sources. These sources may include system drawings, open procedures that may affect system lineup, and the system position verification checklists to provide reasonable assurance that systems are restored to their proper lineup and the design configuration is maintained.

I.D.5. Procurement Process

The procurement process is entered when parts are not available in the WCGS warehouse. These parts may be required for a change package, related field modification, or for maintenance of a component. If the part has never been stocked or it has not been established in the WCGS automated procurement system, procedures require that WCNOC must develop purchase requisitions. Purchase requisition are written to order:

- a like-for-like replacement from the original equipment manufacturer (OEM).
- a like-for-like replacement from a qualified sub-tier supplier.
- a like-for-like replacement from another nuclear utility.
- an alternate item, provided an equivalency evaluation has been performed, documented, and approved utilizing the CCP process.
- a like-for-like replacement that has been downgraded using a safety classification analysis.
- a commercial grade item dedicated for safety-related applications. Orders are processed commercial grade when an OEM or supplier no longer will supply the item under an 10 CFR 50 Appendix B program and a safety classification analysis has determined the item performs a safety-related function. Orders are also processed commercial grade when WCNOC has determined, through cost benefit analysis, that the item is cost effective to purchase commercial grade.

Procedures require that the design bases and regulatory commitments, derived from controlled specifications, drawings and instruction manuals; licensing documents; purchase orders and receipt packages from other utilities and by reverse engineering, are required to be included in the purchase requisition.

Materials Engineering personnel are trained and qualified to develop change packages, safety classification analyses, dedication packages, and automated procurement documents. Materials Engineering personnel are expected to understand the importance of configuration control of not only components, but also individual piece parts. Wolf Creek procedures stress the importance, prior to issuing a purchase requisition, of a piece part having the same fit, form, functional requirements, and material as originally supplied during construction and startup. If any of these attributes have changed, then the design change process must be entered and an equivalency evaluation generated. Procedural controls and requirements for change packages previously discussed in this response (reference sections I.B. and I.C.) are applicable to Materials Engineering personnel performing an equivalency evaluation.

Procedures assign responsibility to Materials Engineering personnel to perform safety classification analyses to downgrade a piece part or component from safety-related to non-safety. Procedures require that safety classification analysis, downgrading an item, contain documentation of the rationale that an item does not perform or affect a safety-related function. The foundation of a safety classification is that the parent component or system continues to perform its safety-related function and that these are not being changed by downgrading. Materials Engineering is procedurally responsible for the inclusion of design characteristics in the purchase requisition.

If an item is evaluated to be safety-related but is no longer available from a manufacturer or supplier with a 10 CFR 50 Appendix B program willing to accept 10 CFR 21 responsibilities, then the item must be commercial grade dedicated. An

item may also be dedicated if WCNOC determines it is cost effective to do so. Procedures to establish commercial grade dedication of an item follow the guidance of EPRI NP-5652, "Guideline for the Utilization of Commercial Grade Items in Nuclear Safety-related Applications (NCIG-07)." Once the item is declared safety-related, WCNOC assumes 10 CFR 21 responsibility. WCNOC's process has one unifying theme; to maintain design configuration control of components and piece parts at WCGS. If the fit, form, function, or material has changed, then Materials Engineering is procedurally required to enter the design change process.

Items received in the warehouse that do not conform to the requirements of the purchase order must be placed on hold until the issue is resolved through a commodity discrepancy report (CDR) (reference Section IV.B.1.).

Items are required to be packaged, handled and stored in the WCGS warehouse in accordance with ANSI Standard N45.2.2-1972 requirements and in accordance with the parent component's design specification. Materials Engineering is responsible for determining requirements for shelf life, packaging, shipping, storage, and storage maintenance of material coded items for use in WCGS SSCs.

I.D.6. Procedure/Process Input from non-Engineering Organizations

There are other activities that may result in input to the design process (reference section I.C.1.1.). These activities are administratively controlled and include mechanisms and guidance for verifying against, documenting, and resolving differences with, the design of WCGS. This section describes some of the configuration controls implemented.

I.D.6.1. Procedures

Activities that affect safety-related structures, systems, and components are required to be conducted using detailed, written, approved, and controlled procedures. Administrative procedures assign responsibilities and authorities. They also provide the control measures for the preparation, review, and approval of station procedures and work instructions that govern safety-related activities. The administrative controls utilized during the operations phase of WCGS are intended to be consistent with the provisions of Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," Revision 2, February 1978 as documented in the Updated Safety Analysis Report.

Surveillance testing and inspection programs are developed, scheduled, and implemented by the Maintenance, Operations, and Engineering Support organizations (reference Section II.D.).

Maintenance (which includes instrumentation and controls) has developed and implemented administrative procedures that describe and control preventive maintenance programs. The Maintenance group has also established administrative procedures and instructions to control and document major repairs and modifications. Repairs or modifications that may affect the functioning of safety-related SSCs must be performed in a manner that provides quality equivalent to that specified by the design specifications, materials specifications, and inspection requirements.

I.D.6.2. Design Change Affects on Procedures And Programs

In addition to configuration activities discussed in section I.D.1., design procedures require affected documents or programs such as essential drawings, operating and test procedures, operator training, post modification testing, and other activities that restrain system operation to be identified during the development phase of a design or configuration change. Hardware and documentation changes are implemented as necessary prior to returning SSCs to service. After receipt of the change package, the responsible work organizations review the change package for impacts on their scope of responsibilities. The responsible work organizations then generate work packages in accordance with work control procedures and complete final planning and scheduling of the modification. For safety-related work activities, Quality Control addresses compliance with a variety of program requirements.

Plant personnel training must be completed as required prior to implementation of the change. Training on maintenance activities must be completed to support maintenance implementation work schedules. Post Modification testing must be completed as required by the change and work package and is required to be based on the changed design. Procedures require that prior to returning the system to operation, the following activities are reviewed: As built configuration agreement with the change package; implementing work and testing activities completed; and procedure program changes and training completed or tracked by work controls program.

I.D.6.3. Procedure/Program Change Affects on Design Requirements

Changes to WCGS procedures and programs including operating, maintenance, and testing procedures are controlled by procedures. The Qualified Review process (reference Section II.B.) requires review and approval by personnel cognizant and knowledgeable of the subject matter. Procedures require that changes are reviewed against the WCGS Technical Specifications, the USAR, and when appropriate, other applicable documents to provide reasonable assurance that the licensing and design requirements are met or maintained. When identified during cross disciplinary reviews, engineering reviews the procedure changes to address compliance with design requirements. Field activities are required by procedure to be suspended when a procedural problem or inadequacy is identified. Procedures require that prior to continuing with activities, the procedure must be corrected, and if appropriate, a corrective action document generated.

I.D.6.4. Maintenance/Instrumentation & Controls Specific Activities

Maintenance or modifications that may affect the function of a safety-related structure, system, or component must be performed in accordance with applicable codes, standards, design requirements, material specifications, and inspection requirements. Maintenance of safety-related equipment is pre-planned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances (for example, skills normally possessed by qualified maintenance personnel may not require detailed step-by-step delineation in a written procedure). It is the responsibility of the Manager Maintenance to implement a maintenance program for safety-related instrumentation, and mechanical and electrical equipment. When failure of safety-related equipment occurs, the cause must be evaluated through the corrective action program. As

experience is gained in the operation of the plant, routine maintenance is altered, through administratively controlled programs, to improve equipment performance. Repair and rework procedures are written and approved, as required.

A preventive maintenance schedule has been developed that prescribes the frequency and type of maintenance to be performed. A schedule was developed early in plant life and is refined and changed through administratively controlled programs as experience with the equipment is gained.

Maintenance is scheduled so as to maintain plant safety. Scheduling considers the possible safety consequences of concurrent or sequential maintenance, testing, or operating activities. Schedule coordination is optimized to provide reasonable assurance that equipment required to be operable for the mode in which the plant exists is available, and that maintenance is performed in a manner within the license limits.

The Manager Maintenance is responsible for assuring that procedures are prepared and implemented for proper control and periodic calibration of plant equipment, to maintain accuracy within necessary design limits, and to confirm adequacy of calibration frequency including test and measuring equipment.

I.E. Regulatory Management

I.E.1. Implementation of 10 CFR 50.59, Changes, Tests, and Experiments

10 CFR 50.59 allows licensees to make changes to their plant or procedures or perform tests, provided an unreviewed safety question does not exist. The program established at WCNOC to implement 10 CFR 50.59 is based on industry guidance. The program is a two phase process governed by an administrative control procedure. It applies to procedurally controlled processes that might invoke a change, temporary or permanent, to the plant or procedures or processes described in the USAR. The USAR change process (reference Section I.E.2.) reinforces the 10 CFR 50.59 process by requiring associated 10 CFR 50.59 documentation.

This process is applied after the technical aspects of the design process, procedure development, or change development are complete and have been determined to be safe.

The initial process step is a regulatory screening of the proposed change. The screening identifies various regulations (i.e., 10 CFR 50.54(q), 10 CFR 50.54(p), and 10 CFR 50.59) that may require NRC approval prior to implementation of the changes. In accordance with the procedure, if the screening documents the proposed change is a change to the license and/or technical specifications, the change is either canceled, reworked to be within the bounds of the license, or an amendment request is initiated and submitted to the NRC for approval prior to implementation. If the screening documents that the proposed change affects the USAR and/or a program requiring prior NRC approval (e.g., Quality Assurance program, Fire Protection Program, Security Plan, Emergency Plan, Operator Training, or Licensee commitments), the change is then evaluated under the appropriate regulation(s).

Procedures require that evaluations performed to comply with 10 CFR 50.59 are based on documentation in the change package (procedural, design, or hardware) that describes the impact of the proposed change on the systems and components

affected and their functions, accident analysis in terms of radiological consequence, failure modes, the original design bases, and the NRC acceptance limits. Based on this set of information, the requirements established by 10 CFR 50.59 are addressed. If the proposed change is identified to be an unreviewed safety question, the proposed change is either canceled, revised, or submitted to the NRC for approval prior to implementation.

The screening and Unreviewed Safety Question Determination (USQD) documentation are prepared and approved by personnel qualified through training. USQDs must be reviewed and approved by the Plant Safety Review Committee (PSRC) prior to implementation of the proposed change. USQDs are also reviewed by the Nuclear Safety Review Committee (NSRC) (reference section I.F.).

10 CFR 50.59 requires each licensee to submit a report that contains a brief description of changes, tests, and experiments that resulted in the performance of a USQD and includes a summary of the USQD for each. WCNOC submits this report on an annual basis and includes those USQDs that have been approved by the PSRC on an annual basis.

In the Design Configuration Control Processes, WCNOC procedures require that the 10 CFR 50.59 screening and evaluation results be maintained as part of the record package that documents the change. WCNOC procedures require USQDs be maintained as plant life records.

I.E.2. Processing Revisions to the Updated Safety Analysis Report (USAR)

The original Final Safety Analysis Report (FSAR) was developed in accordance with Regulatory Guide 1.70, Revision 3. The development, and review of the FSAR by Kansas Gas & Electric (the WCGS owner), the SNUPPS organization, and NRC provides reasonable assurance that the FSAR and plant design were consistent at the time the Operating License was issued. WCNOC has had an established FSAR change process to the FSAR (USAR) since prior to the issuance of the operating license. In 1987, WCNOC updated the FSAR and submitted it to the NRC as the USAR.

Changes to the USAR are submitted to the NRC annually pursuant to procedures and 10 CFR 50.71(e). This submittal reflects changes to the plant, procedures, or analysis as described therein. Additional changes to the USAR may result from administrative changes such as changes to the organization or enhancements to an existing description. Administrative procedures govern the USAR change process.

The Design and Configuration Change Process and procedural change process at WCNOC contain provisions to prompt the initiation of a USAR change whenever a change is proposed that involves the accuracy or completeness of the USAR. The procedure governing the 10 CFR 50.59 process also has a reminder for the initiation of USAR changes. Procedural controls direct that USAR changes are processed upon implementation of the proposed change.

I.F. Nuclear Safety Oversight/Design Review Committees

Independent of the responsibilities of the design or line organization, the requirements of the Plant Safety Review Committee (PSRC) and the Nuclear Safety Review Committee (NSRC) must be satisfied pursuant to Section 6.5 of the WCGS Technical Specifications, NUREG-1136. Design or configuration changes that could

involve an unreviewed safety question, proposed change to technical specifications, or includs an Unreviewed Safety Question Determination (USQD), require review and concurrence by the PSRC prior to implementation. The PSRC reviews design documents and USQDs, as necessary, to identify potential unreviewed safety questions. Procedures also require a review and concurrence of the USQD by the NSRC however, this review may occur after implementation. Procedures direct the NSRC to review appropriate material to check that changes did not in fact, involve an unreviewed safety question. Proposed changes to Technical Specifications are also forwarded to the NSRC for review and approval prior to submittal to the NRC.

Technical Specifications and Procedures also require the PSRC to review Administrative Control procedures (reference Section II.B.).

WCNOC has also established an Independent Safety Engineering Group (ISEG) pursuant to Section 6.2.3. of the WCGS Technical Specifications. The responsibilities of the ISEG include independent review of plant activities and operating experience information. The ISEG performs independent technical evaluations of plant maintenance, modifications, operational problems, and operational analysis activities. The ISEG may develop recommendations for revisions to procedures or modifications to equipment, as necessary. The ISEG also surveys plant maintenance, operations, and test activities to provide verification, independent of the plant operating staff, that maintenance, operations, and test activities are performed in accordance with established procedures. The ISEG further provides support to the NSRC for the performance of specific analyses.

I.G. Information Management Controls

Controls are established for the review, approval, release and distribution of procedures controlling design interfaces, and revisions thereto, pursuant to 10 CFR 50 Appendix B.

WCNOC utilizes a computerized system to record the status and revision of design documents and procedures. This system is referred to as the Configuration Status Accounting Records system (CSARS). In addition, CSARS is used to record change packages (DCPs and CCPs) and associated change and reference documents as well as affected components. CSARS has the capability to interrelate information between design documents, components, and change packages. It is required by procedure to be updated to reflect documentation status and posted changes to avoid interference with other designs under development. The Engineering configuration close-out process (reference Section I.D.2.) provides a verification of and input to CSARS. CSARS is also used to control and document distribution of documents and change packages. Procedures require, prior to use of any design document or procedure for design or safety-related activities, that CSARS be consulted to verify the current revision and posted changes. Quality evaluation oversight functions include periodic assessments of the effectiveness and accuracy of CSARS.

Records are required to be maintained in accordance with 10 CFR 50 Appendix B that reflect current design, including USQDs, design change installation procedures, material identification documents, procurement documents, special process documents, equipment and installation specifications, and as-built drawings.

I.H. Design Bases Review Program

The Design Bases Review program at WCNOC was initiated in 1987. While the collection and classification portion of the project was completed in 1995, WCNOC considers it to be an ongoing program. The review program is based on NUMARC 90-12, "Design Basis Program Guidelines." The purpose of the WCNOC Design Bases Review program was to capture Wolf Creek design bases information along with supporting design information. The program focused on a systematic organization of design bases information to facilitate retrieval and maintenance by identifying, classifying, and assembling correspondence and calculations containing design bases information relevant to significant systems, structures, and components. Based on NUMARC 90-12, WCNOC used a mixed approach to design bases capture.

As part of the Design Bases Review Program, Bechtel, the original A/E, and other vendors were requested to supply WCNOC with design calculations for WCGS. WCNOC developed a program to review, index, and catalog the calculations to identify key elements (i.e., revision, status, subject, system, components, specifications, and references). This calculation data is captured in a computerized database. In addition, WCNOC has participated in the Westinghouse Owner's Group Design Document Program (DDP). This program provides access to pertinent Westinghouse information related to the WCGS original and existing design bases. Westinghouse retrieved, indexed and scanned onto optical disk existing design information relative to its Nuclear Steam Supply System (NSSS). WCNOC has local access to an index of documents identified and the images for those documents applicable to WCGS.

Another integral part of the Design Bases Review Program was the review of identified correspondence. This review was performed to establish the intent of the original design bases and capture this information in a computer database. The computer database provides access to correspondence containing design information and allows retrieval of information by system, specification, component, or subject. A large percentage of the correspondence is available electronically for review.

WCNOC also organized component descriptions, supporting design information with references to regulations, requirements, analyses and design document information into notebooks. These notebooks collated design information along with supporting information to provide historical information relative to the development of the design bases.

(b) Rationale for concluding that design bases requirements are translated into operating, maintenance, and testing procedures;

WCNOC Response:

II. Translation of Design Bases Requirements into Operating, Maintenance, and Testing Procedures

II.A. Introduction

WCNOC procedures interfacing with or affecting plant design have been in place since prior to issuance of the Operating License. These procedures were written to be consistent with plant design input and pursuant to Regulatory Guide 1.33, Revision 2, "Quality Assurance Program Requirements." In conjunction with procedure development, administrative controls were developed for the control of plant procedures. The administrative controls program was developed pursuant to 10 CFR 50 Appendix B and Regulatory Guide 1.33. As required by that program, procedures have been maintained throughout the life of the plant. Configuration control processes have been in place to address design information input into procedures (Reference Section I.D.). Procedures (as delineated in Technical Specification 6.5.1.6 and 6.8.1) are reviewed and approved by the Plant Safety Review Committee and the Plant Manager. Procedures have been subject to Quality Program Evaluations (Audits, Surveillances and plant evaluations) as well as self assessments. Procedures have also been the subject of regulatory inspections. Below is a discussion of various procedure categories and the administrative controls in place. For discussion on the configuration aspects, reference Section I.D. of this response. For discussion on the Corrective Action program, reference Section IV. The cumulative effect of these elements; configuration control, programmatic controls, testing personnel training and qualifications and corrective action, provide reasonable assurance that design bases requirements are translated into operating, maintenance and testing procedures.

II.B. Qualified Review Process

In 1994, WCNOC implemented, through License Amendment 73, a Qualified Review (QR) Process for the development and revision of procedures. The QR process requires procedure review by Qualified Reviewers who are designated by the PSRC Chairman. The Qualified Reviewer determines whether cross disciplinary and technical reviews have been completed and documented as directed by administrative procedures. The QR process also includes provisions for validation, verification and walkdowns as designated by the QR. The responsible program manager for the procedure approves the procedure for use after the Qualified Review process is complete.

Procedures that are classified as Administrative Controls Procedures or that are identified in Section 6.8.1 of the WCGS Technical Specifications (i.e., Emergency Operating Procedures) are reviewed and approved by the PSRC and the Plant Manager. Administrative Controls Procedures must be reviewed and documented by a Qualified Reviewer, the Responsible Manager, the PSRC, and by the Plant Manager. Reviews of Administrative Control Procedures are formally documented.

Temporary Changes to procedures may be made if they do not change the intent of the approved procedure, require a USQD, decrease or modify a quality control hold point, or result in a reduction of personnel or equipment safety. Procedures

require, prior to use, that temporary changes be approved by two cognizant members of the WCNOC staff, knowledgeable in the areas affected by the document. As stipulated by Technical Specification 6.8.3, "At least one of these shall be a member of WCNOC supervision." For temporary changes to operating procedures, at least one of these members must hold a senior reactor operator (SRO) license. Temporary changes to procedures are required to be subsequently reviewed by a Qualified Reviewer and the Responsible Manager within 14 days after approval for use.

II.C. Procedure Change Process

The procedure change process (reference Section I.D.6.) provides reasonable assurance that changes to WCGS procedures are made pursuant to 10 CFR 50 Appendix B, Technical Specification Section 6, and Regulatory Guide 1.33.

II.D. Work Controls

Testing is required to be performed to demonstrate that safety-related, selected special scope, American Society of Mechanical Engineers code equipment, structures, systems, and components perform satisfactorily in service. Test programs include preoperational tests, initial startup tests, surveillance tests, pump and valve tests, inservice tests, other tests including those associated with plant maintenance, modifications, procedure changes, failure analysis, and the acceptance of purchased material, and approved special tests and experiments as defined in 10 CFR 50.59. The testing program is administratively controlled.

Following are discussions of various operating, maintenance, and testing work control activities that provide reasonable assurance that the design bases of WCGS is being translated into procedures.

II.D.1. Pre-Operational Tests

The Startup Manager was responsible for the administration and conduct of the Pre-Operational testing program. The Plant Manager was responsible for the administration and conduct of the initial startup testing program and all post-plant-acceptance testing. Test procedures employed during the Pre-Operational and the initial startup test programs were prepared and approved under the requirements of the Wolf Creek administrative procedures. Pre-Operational test procedures were reviewed by qualified personnel and a PSRC subcommittee, and approved by the Startup Manager. Initial startup test procedures and post-plant-acceptance test procedures were reviewed by qualified personnel and the PSRC, and approved by the Plant Manager.

Upon completion of system Pre-Operational testing, the test results were submitted to the PSRC Subcommittee for its review and subsequent recommendation for approval. This process provided reasonable assurance that, at startup, the plant was consistent with the design.

II.D.2. Operating Procedures

The format of the station operating procedures is intended to meet the requirements of ANSI N18.7. Procedures require that major changes to operating procedures, as determined by the Qualified Reviewer, are to be sent to Engineering for review as well as other affected or knowledgeable groups. When determined by the Qualified Reviewer, procedures are validated. New operating procedures are procedurally required to be reviewed against a verification checklist for the consideration of appropriate documents (including design) and the completion of necessary actions.

Some operations procedures (i.e., EMGs) have specific USAR commitments listed in the reference Section of the procedures. The original system operating and alarm response procedures were generated based on available inputs such as NSSS, architect engineer, vendor supplied instructions, and guidelines. The original WCGS EMGs were modeled after the Westinghouse Owners Group Emergency Response Guidelines (ERGs). The EMGs were reviewed and approved by the NRC prior to receipt of the operating license. Since issuance of the operating license, administrative and configuration controls (reference Section I.D.) have been applied. Additionally, administrative controls require that changes to other procedures, such as the EMG/Off Normal setpoint document, be reviewed by engineering for any technical change.

II.D.3. Inservice Testing Procedures (IST)

This set of procedures includes IST pump and valve testing and leak rate testing that are based on Technical Specification requirements, ASME code, and 10 CFR 50 Appendix J requirements. It also includes HVAC testing, heat exchanger testing, and other industry standard testing. This latter group of testing is based on approved design documents, USAR parameters, or Safety Accident parameters as applicable. In 1990, the IST procedures were transferred to engineering. At approximately the same time, a technical review in the form of a self assessment and general upgrade of the procedures were initiated. The IST procedures were revised to consider the requirements of Generic Letter 89-04, "Guidance on Developing Acceptable Inservice Testing Programs" and ASME OM-10, "Inservice Testing of Valves in Light Water Reactor Power Plants." The technical review of the IST procedures included the creation of an IST Design Bases Document. Administrative controls require this document to be used to check that applicable Technical Specifications, USAR, component specifications, design change packages, accident, and other pertinent information is referenced or stated for each pump and valve included within the scope of the IST program. The review of changes to an IST procedure is administratively required, in addition to the design bases review, by the IST engineer during the procedure change review process to check that requirements are properly implemented. The information contained in the IST Design Bases Document, ASME Code, and NUREG 1482, "Guidelines for Inservice Testing at Nuclear Power Plants." is consulted during the review process for the translation into the procedure.

II.D.4. Surveillance Testing

Test programs, other than IST, are established by the Operations Department to provide reasonable assurance that testing demonstrates component or system performance. Testing is performed in accordance with written procedures that

incorporate or reference the requirements and acceptance limits contained in applicable Technical Specifications, drawings, instructions, procurement documents, specifications, codes, standards, and regulatory requirements. Test program procedures control when a test is required and how it is to be performed.

Test procedures are reviewed by a Qualified Reviewer and approved by the Responsible Manager for the Test Procedure.

Procedures require that test program activities are performed by qualified personnel and meet applicable license commitments, codes, and standards governing testing.

Provisions are established for the performance of surveillance testing to maintain the design of systems and components operate the facility within safety limits, and comply limiting conditions of operations. The testing frequency is at least as frequent as prescribed in the Technical Specifications. The provisions for surveillance testing include the preparation of schedules that reflect the status of planned surveillance tests. Qualified plant staff perform surveillance tests.

II.D.5. Maintenance Procedures

Maintenance work activities are controlled per WCNOC's work control process. This process prescribes a system of pre-work, in-process and post-work reviews. Procedures require the resulting records be cataloged to form the equipment/work history. Field work is controlled by and documented in work packages. Maintenance planners develop the work package instructions based on approved design documents and plant procedures. Preventive Maintenance (PM) is implemented by work packages that consist of approved procedures and or work instructions. Maintenance surveillances tests are performed using approved procedures under the surveillance testing program (reference Section II.D.4.). Another category is emergent work. Procedures require that changes to both procedures and work instructions are reviewed by knowledgeable personnel prior to performing the work or implementing the change. The procedure changes are reviewed with the applicable group as determined by the Qualified Reviewer (reference Section II.B.) to verify consideration of vendor recommendations, and compliance with actual WCGS application, and design and licensing requirements. The use of bulk items is required to be either in accordance with manufacturer's recommendations or approved by engineering. When conflicts or questions arise between field configuration or plant practices and vendor or design documents, corrective action documents are generated and sent to engineering for resolution.

The procedures for PM and surveillance activities were originally based on approved design documents. Changes to these procedures have been controlled. Prior to the Qualified Review (QR) process, changes to these procedures were reviewed by the Maintenance Review Group (MRG). They received interdisciplinary reviews and, when appropriate, a walk through verification. The maintenance review group was disbanded when the QR process was implemented. Since incorporation of the QR process, advanced training has been provided to a select few in the Maintenance Department to perform the qualified reviews and the regulatory screening reviews for procedure changes. If the screenings indicate the need for a USQD, the package is sent to engineering for the detailed USQD review. The PM program has had a very consistent implementation. There have been

only minor approved changes to the PM process since before receipt of the Operating License.

Scope and frequency changes to the PM database are reviewed and approved in accordance with procedures, that consider matters such as the USAR and Technical Specifications, Equipment Qualification, vendor recommendations, equipment history, regulatory and code requirements, industry and station experience, predictive maintenance recommendations, corrective action program recommendations, and Reliability Centered Maintenance recommendations. Changes in scope and frequency require a review by the Reliability Centered Maintenance Coordinator in Engineering.

The post maintenance testing (PMT) process provides the criteria for selection and documentation of PMT. This process verifies the equipment or system performs its design function, that the original deficiency has been corrected, and that no new deficiency has been created.

Post modification testing is developed based on requirements in change package and implementing work package(s).

II.D.6. Material Control Procedures

Procedures are provided for the proper procurement, documentation, and control of safety-related materials and components necessary for plant maintenance and modification.

The procedures contain a level of detail to provide reasonable assurance that purchased materials and components associated with safety-related structures or systems are:

- Purchased to specifications and codes that provide performance at least equivalent to the original equipment.
- Produced or fabricated under quality control that provide performance at least equivalent to that of the original equipment.
- Properly documented to show compliance with applicable specifications, codes and standards.
- Properly inspected, identified, and stored to provide protection against damage or misuse.
- Properly controlled to identify, segregate, and dispose of non-conforming material.

II.E. Corrective Action/Oversight

The application of the Quality Assurance Program (reference Section IV), and oversight functions in accordance with WCGS Technical Specifications (i.e., Plant Safety Review Committee, Nuclear Safety Review Committee, Independent Safety Engineering Group) provide reasonable assurance that program implementation is pursuant to WCGS procedures and applicable codes, standards, and regulations.

II.F. Training and Qualifications

Training and qualification programs have been established for the processes important to the proper translation of design bases requirements into operating maintenance and testing procedures. The program for becoming a Qualified Reviewer for procedures includes a training class that includes specific review of Technical Specifications and procedural requirements pertaining to the procedure review and approval process, and a step-by-step walk-through of the procedure and associated forms. In addition, the PSRC reviews the qualifications of Qualified Reviewer candidates and provides a recommendation to the PSRC chairman. The PSRC chairman formally documents his/her approval of selected individuals as Qualified Reviewers.

The Engineering Support Program establishes qualification requirements for individuals who perform engineering support functions or activities that may affect the safe and reliable operation of the plant. Supervisors of individuals who perform these activities have assembled and maintain qualification standards for each activity. The qualification standards establish the minimum training and performance standards that must be successfully completed prior to the individual being qualified to perform that activity independently. The qualification status of individuals is required by procedure to be monitored on an on-going basis by supervisors to provide reasonable assurance that only qualified individuals perform activities that may affect the safe and reliable operation of the plant.

The qualification program for preparation or approval of 10 CFR 50.59 Screenings and USQDs consists of a training class that describes regulatory requirements associated with Screenings and USQDs, their interface with the USAR and Technical Specifications, and includes a step-by-step walk-through of the applicable process and associated forms.

Procedures require that Operator training material is updated to reflect the changes in the plant. The configuration control process provides reasonable assurance that plant changes are identified. By using the procedures listed above, and the input of Operations Management, there is reasonable assurance that plant changes are covered in the Continuing Training program for Licensed Operators.

Procedures require that records of training and qualifications be maintained by training. Retraining requirements are controlled by procedures. Operator and Technical training programs are based on systematic approach to training techniques and are governed by procedures and INPO practices. These programs have been re-accredited by INPO every four years at WCNOC. This accreditation process provides reassurance that the programs meet the industry standards.

(c) Rationale for concluding that system, structure, and component configuration and performance are consistent with the design bases;

WCNOC Response:

III. System, Structure, and Component Configuration and Performance Consistency in the Design Bases.

III.A. Introduction

Through established and maintained programs for the control of the design and configuration, field verification, personnel qualifications and training (reference Section II.F.), and the Corrective Action process, WCNOC has reasonable confidence that the configuration and performance of systems, structures, and components are consistent with the design bases as defined in 10 CFR 50.2. This is evidenced by the results of programs implemented, oversight processes established and measures taken to assess and correct identified weaknesses.

Programs have been established at WCGS that are designed to satisfy regulatory (i.e., 10 CFR 50 Appendix A and B) and licensing (i.e., USAR, ANSI standards, Regulatory Guides) requirements (reference Section I). The performance of these programs, supporting the design bases, has been assessed throughout the history of WCGS by NRC inspections, licensee initiated self assessments, program implementation, program validation and Quality Assurance evaluations (reference Section IV for program description). Each of these activities has resulted in findings. WCNOC has addressed these findings through the corrective action program. Few of those findings were directly associated to a non-conformance involving the design bases. Below is a summary of some of the more significant programs or assessments completed beginning prior to initial licensing through the present. These examples are being provided as objective evidence for WCNOC's rationale for reasonable assurance that the design bases is being maintained. This section has been organized by activity and provides a brief description of the subject, the findings, if applicable, and the corrective actions taken. In each of these examples, WCNOC has focused the description to capture information related to the design bases aspects of each item.

III.B. Programs

III.B.1. Licensee Reload Design Analysis

An in-house methodology was developed and approved by the USNRC in March 1993, to set the guidelines for performing future analyses (non-LOCA, core physics, thermo-hydraulics). WCNOC performed a comparison evaluation with the original Westinghouse analyses to provide reasonable assurance of the design bases integrity. Whenever possible, the re-analyses used the original assumptions and parameters. Specific plant data were also substituted and justified. The plant specific data were taken from existing approved design documents, the USAR, or verified by field testing. The assumptions and parameters used in the re-analysis were verified. Procedures require that subsequent changes to the results are controlled by the design change process and reflected, as necessary, in the Updated Safety Analysis Report, Chapter 15 Accidents.

III.B.2. Equipment Qualification

The Environmental Qualification (EQ) final report was issued by SNUPPS on January 17, 1986. SNUPPS performed an independent review of the Environmental Qualification programs for NSSS and BOP equipment. This review included identification of systems and equipment required to be qualified and considered equipment location, normal, abnormal, and accident environmental parameters and operability requirements under normal and accident conditions. It also included a review of the qualification program against NUREG-0588, "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment," positions and an in-plant verification of equipment installation requirements.

Procedures establish the EQ program at WCGS. USAR sections 3.11(B) and 3.11(N) discuss the environmental design for the NSSS and Balance of Plant systems. USAR Table 3.11(B)-3 is intended to reflect the information contained in the Equipment Qualification Summary Document (EQSD-II). While performing recent EQ activities and PIR evaluations, differences were identified between the USAR, EQSD-II, CSARS, and the Q-List. A corrective action document was written to identify the inconsistencies, to understand the reason for the inconsistencies, and to correct them.

USAR Table 3.11(B)-3 and EQSD-II changes are being reviewed to establish the reason for changes not reflected in the other document(s). No safety or regulatory significant items have been identified. This effort is continuing and is currently scheduled for completion by March 31, 1997.

III.B.3. Improved Technical Specifications Implementation

WCNOC is developing a submittal to convert from the current (standard) technical specifications to the Improved Standard Technical Specifications based on NUREG-1431 Revision 1. This conversion is being accomplished in consort with Union Electric Company, Pacific Gas & Electric Company, and Texas Utilities Electric. The process allows each plant to maintain its licensing bases, as established by current technical specifications. With appropriate review and justification, each utility may optimize its technical specifications based on another utility members' current technical specifications to maximize commonality. Design bases verification has been included in Technical Specification validation and verification activities. This process was begun in late 1995, with the USNRC submittal planned in 1997. To date, no design bases concerns have been identified through the conversion process.

III.B.4. Plant Walkdowns

Plant walkdowns are one effective means of validating that the as-built and as-operated plant configuration remain consistent with the design bases.

The following are examples of design-bases related walkdowns previously performed at Wolf Creek. For a brief description of these examples refer to the bracketed section:

- Seismic Program (Bulletins 79-14 and 79-02 responses) [Section III.B.5.]
- Equipment Qualification Program (Section III.B.2.)

- MOV Program (Generic Letter 89-10 response), [Section III.B.7.]
- Electrical Distribution System Functional Assessment, [Section III.C.2.]
- Service Water System Self-Assessment, [Section III.C.1.]
- Essential Service Water System Functional Assessment, [Sections III.C.5., III.E.2.] and
- Periodic System Engineering assessments of system status and material condition

III.B.5. Bulletin 79-14 and Bulletin 79-02, Seismic Analysis

In response to Bulletin 79-14, safety-related, Seismic Category I systems were inspected by Bechtel Power Corporation and the as-built installation compared with the design documents used as input to seismic analysis. This walkdown was completed prior to January 1985. Findings were identified and corrected. The USNRC inspected selected as-built safety-related piping systems and documentation. Based on these inspections, the NRC deemed, in inspection report 85-10, that WCNOC fulfilled the requirements of Bulletin 79-14.

Bulletin 79-02, Revision 1, required licensees to review the design and installation procedures for concrete expansion anchor bolts used for pipe support base plates in Seismic Category I systems. In response to Bulletin 79-02, Revision 1, SNUPPS submitted documentation that included discussion on verification from existing Quality Control documentation that the installation, inspection, and testing of concrete expansion anchor bolts installed were in accordance with the design documents. Findings were documented and addressed in the corrective action program. The NRC review was closed in inspection report 82-09.

III.B.6. Generic Letter 89-08

Generic Letter 89-08 was issued to address Flow Accelerated Corrosion (FAC). WCNOC has established through procedures the FAC Monitoring Program. The procedures address six key elements in the program: Corporate commitment, analysis, industry experience, inspections, engineering judgment, and a long term strategy. The FAC Monitoring Program is implemented through susceptibility analyses; selection of examination locations and inspection frequency; establishing minimum wall thickness; evaluation and trending of results; and design changes and modifications to mitigate component wall thinning. This results in providing reasonable assurance that the pressure boundary integrity of the carbon steel piping systems susceptible to FAC will be maintained for the duration of the WCGS Operating License.

III.B.7. Generic Letter 89-10

To address Generic Letter 89-10, Safety-related Motor Operated Valves (MOVs) were evaluated to provide reasonable assurance they would perform their safety-related functions under design bases conditions. Safety-related MOVs were qualified by

analysis based upon in-situ and industry test data. Procedures associated to this project addressed design bases issues as well as the configuration, sizing, weak link, margin, switch setting, trending, and periodic verification issues. Procedures specified conservative inputs so that the analytical methods would conservatively envelop the credible system and field conditions that may be encountered by MOVs under design bases conditions. Activities included walkdowns, calculations, testing, and functional assessments. Regulatory activity associated with the USNRC review and approval of the program was closed on July 21, 1995.

III.B.8. Electrical Load Growth Program

The Electrical Load Growth program, established in 1993, consists of two facets; Wolf Creek Calculation XX-E-006 and the design process. The program was established as a result of the EDSFA (Reference Section III.C.2.). The calculation, analyzing the WCGS AC Electrical Distribution System, was developed using software capable of modeling multi-level voltage power systems containing one or more independent power systems. The programs can model any system configuration including radial design, loop design, or any combination of radial and loop design. Calculation XX-E-006 analyzes bus voltages from 480V to 13.8KV. Several scenarios are analyzed in the calculation to determine final bus voltages. The safety-related and non-safety-related loads that are fed from station buses are tabulated based upon normal and accident conditions.

The Electrical Load Growth program controls the electrical load growth of the WCGS Electrical Distribution System. Through the design process, engineers must identify and analyze for the effects of load growths before the design or configuration change package can be issued.

III.B.9. Fire Hazards Analysis Validation

As part of the WCNOC Thermo-lag Resolution Project, Electrical Design Engineering conducted a validation of the Electrical Fire Hazards Analysis (EFHA) for Fire Areas that contained 10 CFR 50 Appendix R Thermo-lag fire barriers on electrical raceways.

The validation effort was conducted for 11 plant Fire Areas and involved the following:

- Identifying the Fire Areas where Thermo-lag was utilized on electrical raceways for Appendix R separation criteria.
- Identifying the electrical circuits and equipment in or passing through the Fire Area.
- Identifying the physical routing of the electrical circuits and their termination points.
- Identifying which circuits were required to support the safe shut down of the plant.
- Applying the Appendix R criteria to the safe shut down equipment and circuits to establish that fire safe shut down could be achieved.

- The results of the above 5 steps were compared to the USAR Fire Hazards Analysis to identify any differences.

The validation effort identified the following:

- Cases where the original A/E had missed or had identified incorrect routing of safe shutdown circuits.

- Cases where the original A/E had incorrectly applied the criteria of Appendix R.

The above items have been corrected and addressed by the Thermo-lag Resolution Project, completed in January 1997, to bring WCGS into compliance with 10 CFR 50 Appendix R.

III.B.10. Industry Technical Information Program (ITIP)

The purpose of the ITIP is to address lessons learned by translating industry information into actions to improve the safety and reliability of WCGS. ITIP primarily applies to the review of industry technical information originating from external sources such as: Institute of Nuclear Power Operations, Nuclear Regulatory Commission, vendors of WCGS equipment and services, and other utilities such as Union Electric (Callaway). ITIP information is documented and addressed by Performance Improvement Requests (PIRs) (reference Section IV.B.). The ITIP program has been reviewed through the Self Assessment process (reference Section III.C.5.).

III.C. Self Assessments

Self Assessments are designed to be a self critical look at WCNOC programs or processes. The program is procedurally controlled. Findings and recommendations are processed in the corrective action program. (Reference Section IV.)

III.C.1. Service Water System

A functional self assessment of the Service Water System was performed between July 13 and October 15, 1993. The systems included in this assessment were Essential Service Water (EF), Service Water (EA), the Ultimate Heat Sink, and a limited review of Fire Protection. The assessment focused on areas of design, operation, maintenance, testing, training, regulatory compliance, chemistry and environmental controls, and corrective action. The intent of the assessment was to determine the overall condition of the systems and related programs.

Noted strengths were: very good system physical condition with no pressure boundary leaks and only minor external corrosion, and good design of the system that met applicable requirements. No safety significant items were found as a result of this self assessment.

Weaknesses were also identified. WCNOC's response to Generic letter 89-13, heat exchanger test and inspection program, needed to be enhanced. The maintenance program for identifying repetitive failures was weak. System operation was more complex than necessary. A large number of minor documentation errors were

identified and the timeliness of the corrections of these documents seemed excessive. The corrosion monitoring program lacked effectiveness and the existing programs to manage service water system degradation was fragmented.

Some of the corrective actions for the weaknesses identified included the following: An upgrade to the Heat Exchanger Testing And Inspection procedures used at WCGS; The Maintenance Rule and a Reliability Centered Maintenance Program have been instituted at WCGS to address hardware failures; System engineering worked with Operations to develop procedural and hardware enhancements to make the system easier to operate; and the programs, including component Wall Thinning Monitoring, (reference Section III.B.6.) Reliability Centered Maintenance, Maintenance Rule, Lake Water Systems Corrosion, and Fouling Mitigation has been enhanced and other fragmented programs have been consolidated within Support Engineering. Corrective actions are complete.

III.C.2. Electrical Distribution System Functional Assessment (EDSFA)

An EDSFA was performed between January 20 and April 14, 1992. This assessment was followed by an Electrical Distribution System Functional Inspection (EDSFI) (reference Section III.F.1.).

The EDSFA was a two phase assessment. The first phase emphasized the design bases of the electrical distribution systems. The second phase concentrated on verifying that plant operation is consistent with the design bases. Initially, each finding was documented on a punchlist and prioritized. Each of the items were researched and those that required resolution were documented and resolved in the corrective action program. The major weakness identified by the EDSFA were:

- Degraded grid design deficiencies,
- Switchyard Grid Analysis and Stability,
- Fuse Control and Inspection Program,
- Molded Case Circuit Breaker Program,
- Cable Tray Cover fills,
- Calculation Upgrade,
- Load Growth Control, and
- Separation Deficiencies.

III.C.3. Design Process in Operations Division

Self Assessment SEL 94-053, "Design Process in Operations Division," was performed December 13 through December 22, 1994. The final report was issued May 5, 1995. The following is a summary of the self assessment's purpose, scope, results and corrective actions taken.

Self Assessment SEL 94-053 was performed to develop recommendations that would aid in the facilitation of recent changes to the design change process. Attempts were underway to make the design change process more automated.

The self assessment scope included an evaluation of the Design Change process as it related to Operations. Specific areas evaluated were a review of change packages, identification of required activities, completion of required activities, and closure of change packages, and the overall interdependence of these areas.

The self assessment evaluated the overall design control process as effective however, inefficiencies were identified. Two strengths and no weaknesses were identified. The strengths were associated to personnel and computer tracking capabilities. Although not identified as weaknesses, items for improvement were also identified in the self assessment. These identified items included timelines of closure, inconsistencies in the process, and an occasion where a procedure did not get revised.

All items were addressed in the Corrective Action Program and are complete.

The assessment notes that most of the areas identified as needing improvement were currently being changed or evaluated for changes.

III.C.4. Vendor Technical Manuals & Information Program Performance

A Self Assessment appraising the overall status of controlled Vendor Technical Manuals (VTMs) was conducted in June 1995. Of primary concern was the effectiveness of the process for updating VTMs and the efficiency of the process.

Results of the Self Assessment revealed a lack of a comprehensive approach to the maintenance, updating, and tracking of VTMs and information relating thereto. Updates to VTMs were not taking place in a timely manner partly due to a blanket approach of processing all through a cumbersome design change process. At times, information was not consistently sent to Engineering for incorporation into the VTMs.

Comparisons of Wolf Creek selected VTMs to another nuclear plant VTMs, however, showed relatively comparable relevancy of vendor information and structure. No safety issues pertaining to plant hardware as a result of this Self Assessment were identified.

Corrective actions have been taken to centralize ownership of VTM control to Support Engineering and develop a program to maintain and update VTMs. Procedures were developed to strengthen the methods to comply with the commitments to Generic Letter 90-03 "Vendor Interface for Safety-Related Components" for selected vendors of safety-related equipment and to streamline the process for updating VTMs. Controls were established for incoming mail to ensure that vendor technical information was directed to the VTM update process.

The new program and processes have been put into place and implementation has begun.

III.C.5. Auxiliary Feedwater System Functional Assessment

On January 30, 1996, WCGS initiated a plant shutdown due to the loss of all Circulating Water because of ice build-up on the traveling screens. Later, ice build-up on the ESW trash racks caused the loss of the "A" ESW pump on two separate occasions. Evaluations during and after this event called into question design and configuration-related actions and the design adequacy of the ESW system. (Reference Section III.D.1., III.E.2.)

The event resulted in Enforcement Action 96-124 dated July 1, 1996. Corrective actions addressing the Engineering related violations included a commitment to perform an Auxiliary Feedwater System Functional Assessment (as well as others).

This assessment was conducted as a result of the above stated commitment. The assessment evaluated the following for the Auxiliary Feedwater System as its primary goal:

- Adequacy of current design assumptions.
- Adequacy of incorporation of lessons learned from industry experience.
- Agreement of the USAR with the design basis.
- Effectiveness of testing and surveillance programs to verify safety functions.
- Focus of prioritization and scheduling of Engineering activities.

This assessment reviewed an extensive number of documents resulting in the initiation of 187 corrective action documents. Problems identified with this assessment, in three cases resulted in Operability issues and were reportable, but no condition was found that resulted in a plant shutdown or in situations where safety-related systems and components would not have performed their intended function. Corrective actions identified in this self assessment are approximately 50% complete.

Based on the review of 237 design change packages and the associated drawings and vendor manuals, it can be concluded that changes and outputs accomplished by the packages are consistent with the design bases, input/assumptions are consistent with design bases and there have been improvements in the documentation of design inputs coincident with new procedural guidance. It should be noted, however, that in the course of this review, a large number of discrepancies with vendor manuals, drawings, and the CSARS data base were noted.

Based on the review of 80 Industry Technical Information Packages and 111 INPO Operating Experience Notices, it was determined that incorporation of lessons learned from industry experience may need improvement. Three ITIPs were identified in which actions were not completed at the time of closure and/or were not responsive to the identified issue. In addition, two other ITIP reviews represent a lost opportunity to correct a surveillance test deficiency associated with Auxiliary Shutdown Panel Control Switch testing.

Based on the review of over 1400 USAR statements, and subsequent verification of testing, there is good agreement between the USAR and the design bases. Although

the review determined that agreement is adequate, approximately 50 USAR corrections were identified. These problems were typically editorial and typographical changes. Some technical changes resulted during the conversion process from the FSAR to the USAR that do not have specific USQD evaluations referenced. At least two corrections to the USAR were identified as being needed to bring the USAR into agreement with the design bases.

Based on the review of 262 functional requirements, the testing and surveillance programs effectively verify the safety functions required of the AFS. Although the review determined that testing and surveillance programs are generally adequate, three significant PIRs were issued dealing with inadequacies of the surveillance program. All three of these deficiencies dealt with a failure to appropriately implement surveillance requirements identified in the WCGS Technical Specifications. Two of these deficiencies impacted Technical Specification operability and required retest. Upon testing, it was found that the equipment was capable of fulfilling required safety-related functions. Problems identified from this assessment, in some cases resulted in operability issues and were reportable, but no condition was found that resulted in a plant shutdown or in situations where safety-related systems and components would not have performed their intended function.

III.C.6. Quality Assurance Audit K475

At the request of WCNOC Management, the Utility Service Alliance conducted Self Assessment/Quality Verification(SA/QV) Audit K-475 from January 6-17, 1997, in accordance with the WCNOC 10 CFR 50 Appendix B Quality Program. "The purpose of the audit was to assess the effectiveness of WCNOC controls in identifying and preventing issues that degrade the quality of plant operation or safety. NRC Inspection Procedure 40500, "Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems" was utilized as guidance." The Team was comprised of representatives from Washington Public Power Supply Systems, WCNOC, Consumers Power Company, and Omaha Public Power District. This self assessment identified no design bases concerns.

Among the strengths identified by the Audit Team are:

- Senior Management's recognition of and willingness to change the culture by staff augmentation.
- Management's willingness to improve the corrective action program through training and the establishment of the Corrective Action Review Board.
- Staff is competent, knowledgeable, frank, and want to do the right thing
- Staff's willingness to identify problems (low threshold PIRs).
- Ability to identify problems (i.e., audits and self-assessments).
- Strengthen NSRC through staff addition.
- Operational experience of the Central Work Authority.

The Improvement Areas identified by the Audit Team served as further confirmation of the focus WCNOC Management is already placing on the corrective action program and human performance improvement. The areas of improvement were identified as:

- More effective management of the Corrective Action Program,
- More effective in addressing personnel errors,
- Need to increase the sense of urgency in dealing with personnel errors, and
- Performance Improvement & Assessment has been effectively identifying issues, but could be more effective in affecting change within the Wolf Creek organization.

III.D. Incident Investigation Team (IIT)

Following a significant event, administrative procedures require that Wolf Creek Senior Management determine if the establishment of an IIT is appropriate. This decision is generally based on factors such as the potential safety significance of the event, the nature and complexity of the event, and the potential generic safety implications of the event. IITs have been dispatched to conduct prompt, in-depth, and systematic investigations of significant events. Administrative procedures governing these investigations require the IIT to determine and document safety significance, root cause, circumstances, and conditions pertaining to the event, and the recommended corrective actions to prevent recurrence. Corrective actions are documented in the applicable corrective action document. After closure of all corrective action documents, the IIT may be reassembled and perform an effectiveness follow-up of the corrective actions taken.

The following summary of a recent IIT illustrates the application of IITs as an effective self assessment technique in evaluating potential design bases related concerns.

III.D.1. ESW Warming Line Design

On January 30, 1996 A and B ESW pumps were started due to apparent problems with service water. At ~ 0800, "A" ESW pump became inoperable when the trash rack at its intake became completely blocked with frazil ice. A significant amount of frazil ice also accumulated at the "B" ESW intake as it continued to operate throughout the day. "B" ESW intake almost became blocked shortly after sundown that evening as indicated by falling pump suction bay level. This was reported to the Control Room, and ESW heat load was increased by starting a reactor coolant pump and increasing CCW flow to the RHR heat exchanger. This action resulted in the normal "B" ESW pump suction level being restored within a few minutes. The IIT determined the root cause of this event to be inadequate design of the ESW warming line to prevent frazil ice formation under severe climate conditions. Completed corrective actions included physical plant modifications, changes to procedures, and operating and maintenance training. Corrective actions, in part, included an enhanced personnel evaluation process and the review of outstanding safety-related action requests for safety and operational significance.

As a result of this event, WCNOC committed to perform self assessments on four safety-related systems and four non-safety systems to test the effectiveness of previously completed corrective actions and to assure that no additional potentially safe operational significant design concerns exist. (Reference Section V. for list of assessments).

This incident resulted in an NRC Augmented Inspection Team Fact Finding Inspection (Inspection 96-05). A follow-up inspection resulted in four level III and four level IV violations of WCGS Technical Specifications and imposed a civil penalty. Corrective actions for these violations are complete and are currently under NRC review.

III.E. Miscellaneous Design Related Activities

III.E.1. PDR MM 88-08

In early 1988, WCNOC discovered that WCGS had received non-safety-related items, intended for safety-related applications, from the NSSS supplier. The NSSS supplier had, in selected cases, effectively downgraded an item to non-safety-related without WCNOC's knowledge. WCNOC believed the items to be safety-related and accepted them for safety-related use in plant applications(s) specified by the NSSS Supplier.

The procurement process between WCGS and the NSSS supplier was strengthened to resolve this concern, related programs were upgraded, and a comprehensive review was performed of the technical and quality attributes of items affected by this finding to provide reasonable assurance that items with proper design characteristics and safety classifications are installed in the plant.

III.E.2. LER 96-006 Investigation of Plant Trip

On June 6, 1996, a reactor trip occurred at Wolf Creek Generating Station due to "lo-lo" level in Steam Generator "C". The abnormal steam generator level was due to a failure of a 3/16" roll pin in the "C" Steam Generator Main Feedwater Regulating Valve (AE-FCV-530) that allowed the valve plug to separate from the stem. The plug of the valve then dropped to the closed position, reducing feedwater flow through the valve.

An investigation of the plant trip revealed the root cause of this event was inadequate design modification procedures that failed to address stored inventory and future procurement. The investigation also revealed errors in the vendor manual and the vendor drawing for the feedwater regulating valves. These documents were not properly updated as a result of design modifications.

Immediate corrective actions taken included revision of engineering and procurement procedures to ensure the design change process required the proper update of parts in the warehouse, procurement documents, drawings, and vendor manuals.

WCNOC committed to assess the generic nature of the identified root cause for four non-safety and four safety-related systems. Each system will be reviewed to determine if system design changes have adequately addressed spare parts and procurement. In addition, the same design changes will be reviewed to determine if the changes were correctly reflected in associated vendor manuals and drawings. (See Section V for a listing of these assessments.)

The review of the four safety-related systems is being performed as an expansion of the system functional assessment (SFA) of these systems previously committed to as a result of the ESW Warming Line Design Event (reference Section III.D.1.).

III.F. NRC Inspection Activities

III.F.1. Inspection 92-01, EDSFI (Electrical Distribution Safety Functional Inspection)

The EDSFI was a 5 week USNRC inspection. The inspection focused primarily on the design bases of the electrical distribution systems and the verification that the plant was being operated in compliance with the WCGS design bases.

In their inspection, the NRC noted several strengths. "The design of the electrical distribution systems was superior." "The team found the quick availability of design documentation to be a program strength." "The records of system and component testing were noted to be very good." "The housekeeping, cleanliness and labeling, especially the labels for locked valves, was considered to be very good." "The notes and precautions sections of the electrical maintenance procedures were considered superior." "The internal audits of the Industry Technical Information Program (ITIP) program were considered superior."

Weaknesses also identified by the NRC were, the implementation and timeliness of the ITIP program, the control and update of the information contained in the USAR, the lack of documented operability basis and the number of open work requests. One non-cited violation resulted from the NRC findings. The NRC decided that "because of the prompt corrective actions and because of the limited safety significance of the problem, this problem meets the criterion.....for a noncited violation."

Corrective actions included correcting the various document errors, a modification to the EDG keep warm system relief valve orientation and the ESW strainer control circuit to eliminate an unacceptable voltage drop. Corrective action measures were also initiated to address the programmatic issues identified. No design basis issues were identified. Corrective actions are complete and the inspection has been closed.

III.F.2. Inspection 87-032, SSOMI (Safety Systems Outage Modification Inspection)

The purpose of the SSOMI Inspection was to evaluate, through NRC examination of specific work packages, that design engineering and procurement control were adequate to support safety-related modifications, that installation of select modifications conformed to design and installation requirements, and systems have the required operating configurations and have been adequately tested to verify that they are capable of safely performing their intended functions. No design bases concerns were identified. The NRC monitored the corrective actions associated with several findings and determined that adequate corrective action resolution of the identified concerns was achieved prior to restart of the plant.

III.F.3. Inspection 91-202, Operation Safety Team Inspection (OSTI)

The purpose of this inspection was to evaluate whether the facility was being operated in a safe manner. This inspection identified examples of inadequate procedures, failure to follow procedures, improper implementation of Technical Specifications, and operability call concerns. The inspection also identified a concern with Operations input into design and design input into operating procedures. Three violations resulted from the inspection associated with radiological controls procedures and Technical Specification issues. However, the NRC inspection team concluded that the plant was operated safely and with few exceptions, in accordance with regulatory requirements. No design bases concerns were identified. Corrective actions addressed deficiencies in the surveillance testing program and overall programmatic improvements. Corrective actions are complete and the inspection closed.

III.F.4. Inspection 93-05, Engineering

This inspection included review of modifications and design change packages. No violations were identified in the inspection report. Key observations included: Procedures properly addressed design changes and modifications; Plant Modification packages were thorough and well written and safety evaluations were proper.

In Section 1.2.3 of the report, on configuration management, the team determined that no essential drawing revisions were past due for issues, and in fact, none were even in the backlog to be incorporated.

III.F.5. Inspection 95-07, Engineering

The cover letter of the inspection report stated, "Notably the team was impressed with the quality and depth of your assessment of design engineering work products..." "We also recognize the success that your organization has had in reducing the number and age of temporary modifications in the plant." "Your success in this areas is evidence of considerable management attention and involvement in the plant configuration process."

The Executive Summary stated:

The team concluded that the licensees' program and procedures for design control adequately address the requirement of the USAR and ANSI.

The quality and depth of the licensee's self assessments of the design engineering organization work products were exceptional. The licensee had identified all the major weaknesses that were subsequently identified by the team.

Two violations were identified. The first was inadequate USQDs due to weaknesses in rigor and thoroughness. The second was failure to properly document technical concerns. Corrective Actions associated to these violations are complete and the NRC has closed them.

III.F.6. Inspection 96-21, Engineering

The cover letter of the inspection report stated, "Although system engineer knowledge was excellent, it appeared to be the result of the personal initiative taken by system engineers and their immediate supervisors, and not the result of any specific management guidance or administrative requirements." "Communication of management expectations for system engineering had improved;..." This statement was continued with a reference to the previous engineering inspections that identified management oversight weaknesses and the continuation of those weaknesses. The team found, in general, that modification packages included appropriate safety evaluations, post-modification testing, and the associated drawings and procedures were updated as required. The inspection identified several violations of NRC requirements, which among others, included reference to maintenance of design control (i.e., the containment air cooler heat removal calculations assumed incorrect essential service water flow rates). A predecisional enforcement conference was held and subsequent information supplied for NRC consideration. WCNOC will address the identified violations in the violation response.

III.G. Conclusions

With the exception of the ESW Warming Line Design (reference III.D.1.), the activities described above have not identified design bases related concerns that could have impacted safe operation of the plant or required immediate unit shutdown. As discussed, non-conformances were identified that warranted additional evaluation and action. These issues have been addressed through the corrective action program.

(d) Processes for identification of problems and implementation of corrective actions, including actions to determine the extent of problems, actions to prevent recurrence, and reporting to NRC; and

WCNOC Response:

IV. Self Assessment, Quality Verification and Corrective Action Programs

IV.A. Introduction

Below is a discussion of the processes used at WCGS for the Corrective Action Program, Quality Evaluation activities, and self-assessments. Also described are NRC reporting requirements for "non-conforming conditions/degraded conditions."

IV.B. Corrective Action

IV.B.1. Process and Procedures

Corrective action control measures are described in USAR Chapter 17.2, the WCNOC Operating Quality Assurance Program. Corrective action control measures have been established to provide reasonable assurance that conditions adverse to quality are promptly identified, reported, and corrected to preclude recurrence, and any necessary follow-up verification performed.

WCNOC's process for identifying and resolving problems is described and implemented by administratively controlled procedures. These procedures are established to meet the requirements of 10 CFR 50 Appendix B, Criterion XVI for the identification and resolution of conditions adverse to quality. In addition, these procedures are used for resolving other identified concerns and enhancements.

Failures, problems or other concerns with plant structures, systems, components, or parts are identified on an Action Request (AR). An AR can be initiated by any employee or contractor on site using either the Electronic Work Control System (EWCS) or a hardcopy form. The EWCS is an integrated electronic database system used for identifying and screening hardware issues and for planning and creating work packages. (Reference Section I.D.2. and II.D.5.). It is available site-wide, including several areas within the plant. After an AR is initiated, it must be screened by the Central Work Authority (CWA) for operability, reportability, and priority and a disposition determined. For items that are potentially reportable, a Reportability Evaluation Request (RER) is initiated and processed in accordance with administrative procedures. Nonconforming items and more involved issues are forwarded to the maintenance planning organization where a work plan is developed (reference II.D.5.). Procedures require engineering to screen ARs for operability, reportability, significance, or function failure using significance criteria contained in procedures. For AR's identified as involving a significant issue, a Performance Improvement Request (PIR) is initiated to determine the root cause and appropriate corrective actions. Along with determining the specific failure mechanism, the root cause must determine what programmatic or personnel deficiencies led to the failure. Plant-related AR's may be assigned to Engineering to identify issues that must be addressed though the design process.

Personnel, procedural, or programmatic performance problems are identified and resolved applying the PIR process which is controlled through administrative procedures. After a PIR is initiated, it is screened by the CWA for operability, reportability, significance, and priority. For items that are potentially reportable, a Reportability Evaluation Request (RER) is initiated and processed in accordance with administrative procedures. Significance is determined using consequence-based criteria contained in procedures. Once the PIR has been screened, it is forwarded to the responsible manager for resolution.

For non-significant PIRs, the procedure requires the issue to be evaluated, appropriate action taken to correct the problem, and then the PIR is closed.

Procedures require significant PIRs to have a root cause investigation performed to determine corrective actions that can be taken that will prevent similar problems from occurring in the future. Root causes are performed in accordance with an administrative procedure. The procedure summarizes the root cause process described in NUREG/CR-5455, "Development of the NRC's Human Performance Investigation Process (HPIP)." Once a root cause or causes are determined, procedures require that corrective actions be identified in the form of a corrective action plan that will eliminate the causes and prevent similar problems from occurring in the future. After the root cause and a corrective action plan has been developed, an independent review is performed to provide reasonable assurance that the root cause and corrective action plan are adequate and that the corrective actions address the identified root causes.

Procedures require that the significant PIR be reviewed and approved by the responsible manager and then taken before the Corrective Action Review Board (CARB). The CARB is a management review board consisting of the Plant Manager and three other senior management positions. The board's function is to review the root cause and corrective action plan of significant PIRs to ensure they meet management expectations. Along with checking that procedure requirements are met, the CARB also reviews the document for adequate consideration of the generic implications of a problem. The CARB reviews the root cause for investigative depth, and adequacy in order to identify any underlying programmatic problems that may exist.

Procedures require that once corrective actions have been implemented, the PIR must be reviewed and approved by the responsible manager for closure. Procedures require that an effectiveness follow-up date be established for significant PIRs to review the corrective actions and to determine if they have been effective at preventing similar events from occurring. The review is documented on a form and if it is determined the corrective actions have not been effective, a new PIR is initiated to implement new corrective actions and to determine why the previous corrective actions were not effective.

Items received in the warehouse that do not conform to the requirements of the purchase order are placed on hold until the issue is resolved through a commodity discrepancy report (CDR). Procedures require that if an item's disposition is to utilize the item as-is or to repair the item, then Engineering evaluates the proposed corrective action. Items failing one or more of their required critical characteristics for acceptance, during receipt inspection and testing of a commercial grade item, are also placed on hold. The results of the receipt inspection and testing may be evaluated by engineering for revision of the

dedication package or the item may be rejected. Items are placed on hold in the warehouse and a CDR generated for any reason that makes the item's quality indeterminate (reference Section I.D.5.).

IV.B.2. Trending and Analysis

Both AR's and PIR's are tracked on an electronic database system, that allows status, due dates, and responsibilities to be monitored. The database system also provides a means to trend various issues and to identify recurring problems. The PIR database contains information on the PIR such as cause, activity, system, and program area, and can be used during the evaluation of PIRs to determine the scope of problems and assist in determining appropriate actions. A quarterly trend report has been recently developed that identifies negative trends and other recurring issues identified on PIRs. A Monthly Management Report provides an overview of these programs, with information such as number of work packages or PIRs that are open, number initiated and closed, and number overdue.

IV.C. Introduction to Audits, Surveillances, Plant Evaluations, and Self Assessments

The Wolf Creek Operating Quality Assurance Program is located in Chapter 17.2 of the USAR. The Quality program includes provisions for audits, surveillances, and plant evaluations of plant processes and programs. An audit program to comply with ANSI N45.2.12, provides reasonable assurance that compliance is maintained with the operating quality program. If areas are identified that are not meeting procedure requirements, codes or other requirements, or other weaknesses or areas for improvement are identified, procedures require a corrective action document to be initiated.

In addition, individual line organizations conduct self assessments in accordance with administrative procedures to identify strengths, weaknesses and improvement areas in processes, procedures or programs.

IV.C.1. Audits, Surveillances, Plant Evaluations

Procedures identify the Quality Evaluation organization as having the responsibility to conduct audits, surveillances, and plant evaluations to review activities affecting safety-related and special scope processes and programs.

IV.C.1.1. Audits

A comprehensive audit program has been established and implemented by the Quality Evaluation group to verify quality activities' compliance with the Operating Quality Program. The audit program provides reasonable assurance that applicable elements of the Operating Quality Program have been developed, documented, and are being effectively implemented and provide for the reporting and reviewing of results by appropriate levels of management.

Procedures require the audit program, in compliance with ANSI N45.2.12, to verify compliance with the operating quality program. Twenty one different audit topics are evaluated on a set frequency that ranges from every 6 months for Corrective Action to biennial for most 10 CFR 50 Appendix B topics.

Audits document, through the pre-planned and structured evaluation process, the adherence to established procedures, instructions, specifications, codes, and other applicable contractual and licensing requirements. Audits also document the effectiveness of implementation. An audit plan is established at the start of each audit that specifies the areas and requirements to be examined. Procedures require program and implementation deficiencies and opportunities for improvement to be identified on PIRs and, when closed, the corrective action for deficiencies must be verified.

External audits are conducted for the evaluation of procurement sources and as post-award source verification of conformance to procurement documents. Procedural provisions exist that permit Audits conducted by other organizations, including other utilities or architect/engineers, to be used as post-award source verification in lieu of audits performed by WCNOC.

Audits are performed by qualified personnel. Lead Auditors are trained individuals certified to meet ANSI N45.2.23 qualifications that provides reasonable assurance that they are qualified to direct an audit, perform an audit, report audit findings, and to evaluate corrective action(s). Other personnel are assigned to assist lead auditors in the conduct of audits (e.g., other auditors and technical specialists). Personnel selected for auditing assignments are required by procedure to have training or experience commensurate with the scope, complexity, or special nature of the activities to be audited. Procedures direct personnel performing audits to have no direct responsibility for the area audited.

IV.C.1.2. Surveillances

A surveillance program has been established and maintained to perform narrow scope evaluations that include direct observation of activities affecting quality. Surveillances are performed on an as needed basis, at the request of management, and as required by procedure. Surveillances are required by procedure to be conducted by technically competent personnel that are not necessarily Lead Auditors. Surveillances may or may not include entrance meetings or pre-planned checklists. Surveillance activities are planned, conducted, documented, reviewed, and reported in accordance with written procedures. Surveillances, that may be used to fulfill various audit program requirements, are reviewed by a certified Lead Auditor for acceptability prior to use.

IV.C.1.3. Plant Evaluations

A plant evaluation program has been established through procedures and maintained to provide a process for observing, evaluating, and documenting selected activities that occur in the plant. A plant evaluation checklist has been developed to capture the work control requirements associated with work being performed in the field. Plant evaluations are performed by qualified personnel.

IV.C.1.4. Self Assessments

WCNOC has a self assessment program that has been developed and implemented to encourage WCNOC groups to determine the effectiveness of a program, process, procedure, or activity. Self Assessments are a pre-planned and structured evaluation process under the responsibility of WCNOC managers. A team leader is assigned to each self assessment to aid the team in identifying strengths, weaknesses, and recommendation for improvements resulting from the self assessment. The latter two areas are identified on PIRs for tracking and resolution. Section III.C. provides examples of the self assessment process.

IV.D. Nuclear Regulatory Reporting

IV.D.1. 10 CFR 21 Reports

Significant adverse conditions involving a defect or noncompliance in a delivered component or service that could create a substantial safety hazard are reported to the Nuclear Regulatory Commission pursuant to the requirements of 10 CFR 21. Reporting activities are included in procedures. The PSRC reviews potentially reportable defects or noncompliance evaluations performed by the plant staff.

IV.D.2. 10 CFR 50.72 and 10 CFR 50.73 Reports

Event reporting to the Nuclear Regulatory Commission is made pursuant to 10 CFR 50.72 and 10 CFR 50.73. The Duty Shift Supervisor must perform the initial reportability determination pursuant to 10 CFR 50.72 and 10 CFR 50.73. The Duty Shift Supervisor must also make the immediate notification determination. Reporting activities are included in procedures. The PSRC must review Licensee Event Reports (10 CFR 50.73) pursuant to WCGS Technical Specifications.

(e) The overall effectiveness of your current processes and programs in concluding that the configuration of your plant(s) is consistent with the design bases.

WCNOC Response:

V. Overall Effectiveness

The activities that took place to establish the bases for the operating license provide reasonable assurance that the design and configuration of WCGS were consistent with the design bases when WCNOC was granted a full power license. Changes to the plant, procedures, and programs have been controlled throughout the licensing phase and have continued to be controlled and assessed.

WCNOC has established and maintained programs in accordance with 10 CFR 50 Appendix B for the development and control of design and configuration activities. These activities have been checked, where appropriate, using field verification methods and testing. WCNOC has also established and maintained a quality program in accordance with 10 CFR 50 Appendix B to provide reasonable assurance those programs are performing as expected. These programs are controlled through procedures and implemented by trained and qualified personnel. The WCNOC staff is expected to strictly adhere to the procedures that implement these programs. Identified inconsistencies, issues, and concerns with these programs are expected to be documented and addressed in the corrective action program. Plant configuration and operation are expected to adhere to the requirements and assumptions in the design and licensing bases. Deviations or changes from the current bases are expected to be evaluated and the bases revised in the appropriate manner prior to implementing the deviation or change. Design and configuration information is controlled and stored pursuant to an established 10 CFR 50 Appendix B program.

Self Assessments, regulatory and industry audit results, and self identified issues lead us to conclude that, overall, our current processes and programs are sufficiently effective to provide reasonable assurance that the configuration of WCGS is consistent with the design bases as defined in 10 CFR 50.2.

This can be evidenced by relatively few occasions where immediate shutdown was required, (reference Section III.D.1.), results of Quality Assurance audits and evaluations, self assessments, and NRC inspection activities.

Table 1 provides a matrix of factors that establish reasonable assurance that the configuration of WCGS is consistent with our design bases. The matrix also addresses which sections of this attachment include discussions of those factors.

WCNOC understands the need for continuous improvement. Self Assessments continue to be used to evaluate programs against the design and licensing bases. Staff awareness of the design and licensing bases has and continues to increase through training and management oversight. As discrepancies are identified, they will be addressed through corrective action and appropriate change programs. Based on past experience, WCNOC does not expect such findings to represent significant challenges to our ability to operate WCGS in a manner that protects the health and safety of the public. From our review of self assessments, audits and regulatory inspections, we recognize the need to further improve the accessibility of design

and licensing bases information and to assess the fidelity of that information. The following describes a summary of WCNOC's established commitments to this end. These activities do not constitute new or different commitments.

- Conversion to Improved Standard Technical Specifications. (Letter WO 95-0181, dated December 13, 1995, from O. L. Maynard, WCNOC, to USNRC)
- Response to Generic Letter 96-01. (Letter WO 96-0068, dated April 18, 1996, from O. L. Maynard, WCNOC, to USNRC)
- Engineering Work Product Evaluations (Letter WO 96-0081, dated July 31, 1996, from N. S. Carns, WCNOC, to USNRC)
- Safety System Functional Assessments (Auxiliary Feedwater, Essential Service Water, Component Cooling Water and Residual Heat Removal) to confirm that no potentially safety/operationally significant design concerns exist. (Letters WM 96-0081, dated July 31, 1996, from N. S. Carns, WCNOC, to USNRC; WO 96-0101, dated July 3, 1996, from O. L. Maynard, WCNOC, to USNRC; and WO 96-0118, dated August 22, 1996, from C. C. Warren, WCNOC, to USNRC)
- Non-Safety System Assessments (Feedwater, Service Water, Main Turbine and Main Generation System) to confirm design changes were adequately tested, that those changes were correctly considered in vendor manuals, drawings, spare parts, and procurement documents. (Letters WO 96-0101, dated July 3, 1996, from O. L. Maynard, WCNOC, to USNRC; and WO 96-0118, dated August 22, 1996, from C. C. Warren, WCNOC, to USNRC)
- Updated Safety Analysis Report Review Program. (Letter ET 97-0010, dated February 7, 1997, from R. A. Muench, WCNOC, to USNRC)

Table 1
Design Bases Integrity Reasonable Assurance Matrix

Contributing Factor	Reasonable Assurance: Design Bases Maintained and Plant Configuration Conforms with the Design Bases
Operating License Established Processes, Procedures and Configuration Baseline	Sections: I.A; II.A
Administrative Process Change Control (administrative procedures)	Sections: I.B, C, D, E, F, G, and H; II.A, B, C
Work Controls	Sections: II.B, D
Engineering Programs	Sections: II.D.3 and III.B
Field Verification	Section: II.D and III.B.4
Personnel Qualification and Training	Section: I.D.5; II.B and II.F
Information and Documentation Control	Sections: I.G, H
Self-Assessments	Sections: III.C, D; IV.C.1.4
Management Oversight (e.g., Quality Verification, NSRC, PSRC, ISEG) and Corrective action;	Sections: I.F II.A, B, D.1, E III.C.6 IV.A, B, C
Licensee Event Reports	Sections: III.C, D, E IV.D
NRC Inspection Results	Section: III.F

Glossary

Change Package

A general term that applies to both CCPs and DCPs.

Configuration Change Package (CCP)

CCPs are a collection of documentation used to perform a modification to the plant or make changes to design documents that satisfy the existing technical requirements of design output documents required for the SSC to perform its design bases function(s) (e.g., a hardware change, in which the new hardware is equivalent (not identical) to the original item, will meet the technical requirements of the design functions of the original item and applicable interfaces with other SSCs). These equivalency evaluations also provide reasonable assurance the replacement item will not introduce new failure modes.

Design Bases

In accordance with 10 CFR 50.2 and explained in letter dated October 9, 1996 from James M. Taylor, USNRC to N. S. Carns, WCNOC defines design bases as that set of "information that identifies the specific functions to be performed by a structure, system, or component of a facility and the specific values or ranges of values chosen for controlling parameters as reference bounds for design. These values may be (1) restraints derived from generally accepted "state of the art" practices for achieving functional goals, or (2) requirements derived from analysis (based on calculation and/or experiments) of the effects of a postulated accident for which a structure, system, or component must meet its functional goals." "The design bases of a facility, as so defined, is a subset of the licensing basis and is contained in the FSAR."

Design Change Package (DCP)

DCPs are a collection of documentation used to perform a modification to the plant or make changes to design documents that revise the technical requirements needed to perform a SSC's design bases function. DCPs are considered the highest level of engineering change and require the most extensive and formalized documentation. DCPs used to modifying non-safety-related SSCs do not require design inputs and independent verification.

Modification

A change to the physical plant and/or documentation controlled through the design or configuration process and plant procedures. Modifications are implemented though the work control process.