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UNION ELECTRIC

Donald F. Schnell
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February 6, 1997

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Gentlemen: ULNRC-3531

DOCKET NO. 50-483
CALLAWAY PLANT
RESPONSE TO REQUEST FOR INFORMATION
PURSUANT TO 10 CFR 50.54(f) REGARDING ADEQUACY
AND AVAILABILITY OF DESIGN BASIS INFORMATION

Reference: Letter from J. M. Taylor to C. W. Mueller
dated October 9, 1996

The reference letter requested Union Electric to provide information to the NRC Staff regarding the adequacy and availability of design bases information for the Callaway Plant. Attachment 1 to this letter provides that information.

The information set forth in Attachment 1 describes processes, procedures and plans in place as of the date of this letter. It is not intended to preclude subsequent changes following normal administrative procedures or to require NRC notification or consent for such changes other than those currently required.

The only additional commitments for future work intended to verify adequacy and availability of design basis information are discussed in Section 5.0 of this submittal. Those commitments are:

1. A review of Callaway in accordance with the guidelines of NEI 96-05; and

2. Completion of two Safety System Functional Assessments by December 31, 1998.

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Please contact us if you have questions or require further assistance.

Very truly yours,

Donald F. Schnell

DES/plr

STATE OF MISSOURI)
) S S
CITY OF ST. LOUIS)

Donald F. Schnell, of lawful age, being first duly sworn upon oath says that he Senior Vice President-Nuclear and an officer of Union Electric Company; that he has read the foregoing document and knows the content thereof; that he has executed the same for and on behalf of said company 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 Donald F. Schnell
Donald F. Schnell
Senior Vice President
Nuclear

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

Patricia L. Reynolds

PATRICIA L. REYNOLDS
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UNION ELECTRIC COMPANY RESPONSE TO NRC REQUEST PER 10 CFR 50.54(f) DATED OCTOBER 9, 1996

INTRODUCTION

This Attachment provides information in response to the NRC's "Request for Information Pursuant to 10 CFR 50.54(f) Regarding Adequacy of Design Bases Information" as contained in a letter from Mr. James M. Taylor to Mr. C. W. Mueller dated October 9, 1996. The enclosed information describes the programs and processes in place at our Callaway Plant (Docket 50-483) to maintain configuration and operation of the plant in accordance with the design bases as defined in 10 CFR 50.2.[1] It also describes Union Electric's rationale for concluding that those programs and processes work as designed. The section designations used herein and responses to requests for information are taken from pages 6 and 7 of the October 9 letter. A follow-on section describes the design bases review and reconciliation program performed at Callaway. Finally, information is provided on plans for further internal reviews of Callaway design bases information.

The construction permit for Callaway Plant was received in April, 1976. The plant was designed as one of the Standardized Nuclear Unit Power Plant Systems (SNUPPS) by Bechtel Power (power block), Westinghouse (NSSS), and Sverdrup and Parcel and Associates (site facilities). The design of the Power Block and NSSS was coordinated by Union Electric and the four other SNUPPS Utilities: Kansas Gas and Electric, Kansas City Power and Light, Rochester Gas and Electric, and Northern States Power. Work on the FSAR began in 1978 by the SNUPPS utilities, Bechtel and Westinghouse. Coordination of design development, construction, and the FSAR was handled by a Technical Committee and a Licensing Committee. Content of the FSAR was developed in accordance with Regulatory Guide 1.70, Revision 2. This process is described in more detail in the Callaway FSAR, Section 1.4 and provides reasonable assurance that the FSAR and the plant design were consistent at the time the Operating License was issued.

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[1] The NRC definition of design bases is explained in footnote 4 of the October 9, 1996 letter: "Design bases mean that information which 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. . . ." Footnote 4 goes on to state that: "The design bases of a facility, as so defined, is a subset of the licensing bases and is contained in the Final Safety Analysis Report (FSAR). Information developed to implement the design bases is contained in other documents, some of which are docketed and some of which are retained by the licensee."

The following Sections describe, in part, programs and procedures that are pertinent to design bases control. The procedure numbering system for Callaway Plant consists of a three letter prefix followed by a two letter designator and a serial number. For example, the APA prefix identifies Administrative procedures; "FDP" identifies Licensing and Fuels procedures; and "EDP" identifies Nuclear Engineering Department Procedures. Administrative Procedures (APA-ZZ-XXXXX) apply to multiple departments, are approved by the Plant Manager, and are reviewed by the Onsite Review Committee. Department procedures (FDP, EDP-ZZ-XXXXX) are generally applicable to a single department and are developed and approved within that department.

The October 9 letter requests the following information from each licensee:

(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; (See Section 1.0)

(b) Rationale for concluding that design bases requirements are translated into operating, maintenance, and testing procedures; (See Section 2.0)

(c) Rationale for concluding that system, structure, and component configuration and performance are consistent with the design bases; (See Section 3.0)

(d) Processes for identification of problems and implementation of corrective actions, including actions to determine the extent of problems, action to prevent recurrence, and reporting to NRC; (See Section 4.0) and

(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. (See Section 5.0)

The October 9 letter also asks whether a design review or reconstitution program has been undertaken, and if not, requests that the licensee provide a rationale for not implementing such a program. The licensee is also asked to provide a description of the programs, including how correctness and accessibility of the design bases information are maintained current. If the program has not been completed, the licensee is to provide an implementation schedule and expected completion dates for SSCs and plant-level design attribute reviews, and the method for prioritization. (See Section 6.0)

Union Electric herewith supplies the requested information, organized into sections as indicated above.

Section 1.0

"(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;"

UNION ELECTRIC RESPONSE

1.1 Description and Scope of Programs

Callaway Plant engineering design and configuration control processes are defined and administered through approved plant procedures and programs which were developed per the requirements of Callaway's licensing documents. These procedures and programs, which are extensive, describe the process methods and actions to be performed when changes to the plant are made. The procedures and programs cover physical changes (design modifications or additions, temporary modifications, material equivalency, etc.), operational changes (system operation methods, operability evaluations, etc.) and procedural changes which affect the plant licensing bases or design bases. Cross-referencing is used throughout each procedure to integrate the processes and provide a mechanism for updating the procedures as program changes are made. Regulatory commitments are annotated in procedures so that these commitments are maintained or properly changed when the procedures are revised. An overview of the major engineering and configuration control procedures and programs is provided below:

1.2 Configuration Control Procedures

1.2.1 Procedure APA-ZZ-00604 "Requests for Resolution"

This procedure describes the process and administrative controls for initiating Requests for Resolution (RFR's). These documents serve as the means for initiating all design changes and form the basis for changes to the plant and for engineering evaluations of non-conformances to the original design or licensing bases.

1.2.2 Procedure EDP-ZZ-04015 "Evaluating and Processing Requests for Resolution"

The engineering process for evaluation and disposition of RFR's is outlined in this procedure. Its scope includes requests for general engineering evaluations, operability evaluations, design change requests, vendor part number changes, material equivalency changes, minor

modifications, setpoint changes and as-built clarifications. This process forms the basis for making changes to plant design bases documents. This procedure notes that licensing impact review and the appropriate formal evaluations (i.e. 10 CFR 50.59, Environmental, etc.) are to be performed in accordance with APA-ZZ-00140, described in Section 1.2.6.

1.2.3 Procedure APA-ZZ-00600 "Design Change Control"

This procedure establishes the program for processing design change RFR's which have been approved for development and implementation. The program requires that all necessary licensing evaluations are performed, technical evaluations and calculations are generated, and configuration documents (drawings, procedures, computer databases, etc.) are revised to accurately reflect the design and licensing bases. Implementing work package requirements and controls are covered by this procedure. Extensive reviews are performed as part of the process to include departments which may be affected by the change (e.g. Operations, Maintenance, I&C, Health Physics, Training). Systems Engineering is also actively involved in the review process and provides the criteria for functional testing subsequent to design change implementation. This procedure notes that licensing impact review and the appropriate formal evaluations (e.g. 10 CFR 50.59, Environmental, etc.) are to be performed in accordance with APA-ZZ-00140, described in Section 1.2.6.

1.2.4 Procedure APA-ZZ-00605 "Temporary System Modifications"

This procedure outlines the process for evaluating and implementing plant system modifications which are necessary to address immediate operational needs which are temporary in nature. The procedure defines the means for identification, evaluation, review, implementation and removal of temporary modifications. This procedure notes that licensing impact review and the appropriate formal evaluations (e.g. 10 CFR 50.59, Environmental, etc.) are to be performed in accordance with APA-ZZ-00140, described in Section 1.2.6.

1.2.5 Procedure APA-ZZ-00108 "Primary Licensing Documents: Change/Revision Process"

This procedure describes the program for processing revisions and change notices to Callaway Plant primary licensing documents (FSAR, Tech Specs, Environmental Protection Plan, Radiological Emergency

Response Plan, Security Plan, Operating Quality Assurance Manual, etc.) to satisfy regulatory requirements, including 10 CFR 50.71(e).

The FSAR is maintained in hard copy and on the Callaway mainframe computer as a database. Changes to plant equipment and procedures that result in a change to the FSAR are processed as Change Notices (CN). When the plant change is implemented, the hard copy is modified to indicate a CN against the affected FSAR pages and the computer database is updated to reflect the revised information. CN's are collected and used to generate FSAR revisions to the hard copy version every 18 months as required by 10 CFR 50.71(c).

Qualified reviews and cross-disciplinary reviews are performed as necessary for verification of the changes or evaluations. This procedure notes that licensing impact review and the appropriate formal evaluations (e.g. 10 CFR 50.59, Environmental, etc.) are to be performed in accordance with APA-ZZ-00140, described in Section 1.2.6.

1.2.6 Procedure APA-ZZ-00140 "Safety, Environmental, and Other Licensing Evaluations"

This procedure establishes a program for performance and documentation of safety, environmental and other licensing evaluations to satisfy the requirements of 10 CFR 50.49, 50.59, 50.54, 50.63, 50.91, 50.92, the Operating Quality Assurance Manual (OQAM), and other plant procedures such as those described above which refer to APA-ZZ-00140. Detailed screening forms are required to be completed and technical evaluations are required to be performed by cognizant personnel to assure that design bases documentation is maintained. Qualified reviews and cross-disciplinary reviews, as necessary, are required to be performed for verification of the changes and evaluations.

APA-ZZ-00140 contains detailed guidance for application of 10 CFR 50.59. The guidance is based on NEI 96-07, "Guidelines for 10 CFR 50.59 Safety Evaluations". Callaway personnel responsible for initiating changes to plant equipment and procedures are trained in the use of these guidelines. The procedure provides instructions for timing of evaluations and qualifications of personnel performing and reviewing 50.59 evaluations. Screening questions are included in the procedure to ensure that changes to the plant and procedures are evaluated to determine the need for a formal safety evaluation (FSE). A finding that no FSE is required must be justified with a written statement.

1.2.7 Other Procedures Controlling Plant Configuration and Evaluations

The following procedures also provide programmatic controls for verification and documentation that plant design changes and evaluations processed (as described above) are adequately analyzed and incorporated into the plant configuration documents and databases to assure maintenance of Callaway Plant design and licensing bases:

Procedure EDP-ZZ-04005 "Design Development"
Procedure EDP-ZZ-04032 "Design Input Control"
Procedure EDP-ZZ-04033 "Design Verification"
Procedure EDP-ZZ-04023 "Calculations"- Nuclear Engineering
Procedure EDP-ZZ-04024 "Configuration Control"
Procedure EDP-ZZ-04100 "Review, Planning, Implementation and Closure of Mod Packages"
Procedure APA-ZZ-00111 "Engineering Specifications"
Procedure APA-ZZ-00304 "Control of Callaway Equipment Lists"
Procedure APA-ZZ-00400, "Procurement of Parts, Supplies, Materials and Services"
Procedure EDP-ZZ-04021 "Review of Supplier Documents"
Procedure FDP-ZZ-00002 "Calculations" - Licensing and Fuels
Procedure FDP-ZZ-01005 "Control of Nuclear Analysis Activities"
Procedure FDP-ZZ-00005 "Reload Design Control and Coordination"
Procedure FDP-ZZ-04004 "Performance of PRA Evaluations"
Procedure FDP-ZZ-00100 "Final Safety Analysis Report (FSAR) and Operating License (OL) Change/Revision Process"

1.3 Provisions for Compliance with 10 CFR 50, Appendix B

Collectively, the techniques employed in the processes described above provide control features required for compliance with Appendix B to 10 CFR 50, Quality Assurance Criteria III, IV, V, VI, and XI. These features are described in detail in the Callaway Plant Operating Quality Assurance Manual (OQAM) (referenced in FSAR, Section 17.0) and include:

- Identification and control of design interfaces and coordination among various organizations to ensure adequate review, approval and revision of documents.

- Provisions to ensure that the appropriate quality standards and design inputs are specified and included in the design documents.

- Provisions for independent design reviews and checks to verify the adequacy of the design.

- Measures to assure that applicable regulatory, design bases, and other requirements necessary to assure adequate quality are included in procurement documents for material, equipment and services.

- Activities affecting quality are prescribed by documented instructions, procedures and drawings to assure adequate quality is maintained.

- Testing is performed to demonstrate that all systems, structures and components will perform in accordance with the design criteria.

- Measures are established to control the review, approval and issue of documents which are affected by the engineering design process (e.g. licensing documents, including the FSAR, calculations, procedures, drawings, computerized databases, etc.).

1.4 Process Controls

Additional processes which have been established to provide reasonable assurance that engineering design and configuration control are maintained consistent with licensing and design bases documentation, for routine activities, are described in the following procedures.

1.4.1 Procedure APA-ZZ-00101 "Procedure Preparation, Review and Approval"

This procedure establishes the process to prepare and maintain all Callaway Plant procedures and includes a screening form which identifies any change that may affect a licensing document or program (i.e. FSAR, Technical Specifications, Environmental Protection Plan, RERP, Security Plan, etc.). Additional evaluations and reviews are invoked for changes which might affect these licensing or design bases programs.

A Reference Tracking System is in place to identify other procedures which may be affected when a change to any plant procedure is initiated. Procedure APA-ZZ-00106, "Reference Tracking System," controls this process such that the overall plant impact of a change may be evaluated and to provide consistency between all procedures. A mainframe computer application maintains this cross-reference listing for ease of

inquiry and for notification of personnel responsible for affected procedures.

A review and approval matrix is also provided in this procedure to ensure that the appropriate level of qualified review and cross-disciplinary review is performed so that changes are adequately reflected in all aspects of the plant configuration. Callaway Plant personnel who prepare and review procedures must complete a formal training course (T55.006P.6) and must be authorized by plant management as a Qualified Reviewer. Controlled lists of personnel designated as Qualified Reviewer and/or Approver are maintained on the plant's mainframe computer.

1.4.2 Procedure APA-ZZ-00540 "Commitment Management Program"

This procedure provides a numerical tracking system for managing commitments made by Union Electric which are implemented by Callaway Plant procedures. A mainframe computer application has been developed for inquiry and tracking of commitments. This process is designed to provide reasonable assurance that commitments made by Union Electric to external agencies are not deleted or revised without proper review and approval.

1.4.3 Procedure EDP-ZZ-04055 "Design Bases Control"

This procedure describes Callaway's Design Bases Program and its elements which are used to support technical and licensing evaluations required for changes to plant design. Sources of design and licensing bases information are identified along with guidance on how the information is located, validated, and maintained for future use.

1.4.4 Procedure TDP-ZZ-00065 "Training and Qualification of Engineering Support Personnel"

A thorough training and qualification program is in place for all engineering personnel assigned to the Callaway Plant. Engineering Qualification Records are completed for each individual which provide a checklist of tasks or knowledge items to be completed. These items include procedure reviews (including those described above) and completion of Training Department modules such as Design Change-General, Qualified Reviewer, 10 CFR 50.59, Plant Systems, Applied Fundamentals, Codes & Standards, Quality Assurance Indoctrination and Plant Operations.

Specific training modules are also completed to qualify personnel for work performance in various engineering groups such as Design Control, Systems, Technical Support, Licensing & Fuels, and Quality Assurance. These modules include advanced technical training topics.

1.4.5 Procedure APA-ZZ-00320 "Initiating and Processing Work Requests"

This procedure provides the instructions for identifying routine corrective maintenance items, initiating the appropriate work documentation, execution of the work itself, and appropriate retesting. The process provides for screening of routine work items such that work activities which may involve a design change are evaluated via the appropriate process (i.e. RFR, Temporary Modification, etc.).

1.4.6 Procedure APA-ZZ-00662 "ASME Section XI Repair/Replacement Program"

Controls are established for work on systems and components covered by ASME Section XI, for which additional engineering evaluation may be required. Again, screening criteria are provided to ensure that the appropriate level of evaluation is performed such that the design bases are maintained.

1.4.7 Procedure EDP-ZZ-04010 "Special Test Procedures"

The process for development and implementation of special tests is established to ensure that the tests are controlled and do not violate design bases requirements.

1.5 Review of Processes and Procedures

Engineering design and configuration control processes include varying levels of review by plant personnel, some of which were covered in the preceding discussion. Design changes and all procedural changes receive an independent review by a person qualified in the particular area or discipline for which the evaluation is being performed (Qualified Reviewer). The changes and evaluations are then approved by the appropriate level of management. Design changes, evaluations and procedural changes also receive cross-disciplinary reviews by other departments or personnel who are qualified in related areas or disciplines which may be affected. Final approval level for these changes consists of a responsible supervisor or higher.

1.5.1 Onsite Review Committee (ORC)

The ORC responsibilities are defined by procedure APA-ZZ-00091, which includes review and recommendation for approval to the Callaway Plant Manager of:

- All Administrative Procedures and changes thereto.
- 50.59 safety evaluations for changes to procedures, changes to equipment, systems or facilities, or for tests or experiments.
- Proposed procedure changes, changes to equipment, systems or facilities, or for tests or experiments which may involve an unreviewed safety question or may involve a change to the Technical Specifications.
- Proposed changes to the Technical Specifications or the Operating License.
- All RFR's involving an operability evaluation.

1.5.2 Nuclear Safety Review Board (NSRB)

The NSRB responsibilities are defined by procedure APA-ZZ-00090, which includes review and approval of:

- Proposed changes to the Technical Specifications and the Operating License.
- Proposed procedure changes, changes to equipment, systems and facilities, and for tests or experiments which may involve an unreviewed safety question or may involve a change to the Technical Specifications.

Each process and the associated procedures define the specific review and approval levels required. Tables and matrices are provided in some cases, such as with APA-ZZ-00101, to define personnel responsibilities and the appropriate departments to be involved in the change and approval process.

1.6 Organizational Responsibilities and Interfaces

Organizational responsibilities and interfaces are well defined within the process procedures previously described. Plant procedures detail the responsibilities of each individual directly involved in the process. In general, the Superintendent-Design Engineering is responsible for implementation of design change processes, including those developed in accordance with APA-ZZ-00600 and APA-ZZ-00140, and shares responsibility for configuration control with the Superintendent-Technical Support and Superintendent-Systems Engineering. The Manager-Nuclear Engineering has overall responsibility for design change and configuration control.

The Manager-Licensing & Fuels is responsible for implementation of changes involving licensing documents, such as the FSAR, which are controlled by APA-ZZ-00108.

The Manager-Quality Assurance is responsible for maintaining the Quality Assurance Program in accordance with Appendix B to 10 CFR Part 50, which is controlled by the Operating Quality Assurance Manual (OQAM) and APA-ZZ-00108.

In addition to the responsibilities described above, individual engineers and other plant personnel are responsible for compliance with plant procedures when implementing these processes. Nuclear Division Department Heads are responsible for ensuring that cross-disciplinary reviews are performed when required, and for ensuring that procedures and other configuration documents are revised as required to be consistent with the analyzed design and licensing bases.

Section 2.0

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

UNION ELECTRIC RESPONSE

Several complimentary processes are in place at Callaway Plant which provide reasonable assurance that design bases requirements are properly translated into the plant's procedures. These include the procedure development and revision process, the design change and configuration control processes discussed in Section 1.0, regular Quality Assurance audits and surveillances of these processes discussed in Section 3.8, Safety System Functional Inspection style self assessments (SSFAs) of safety related systems discussed in Section 3.9, and the Corrective Action Program discussed in Section 4.1. The results of NRC Inspections and reviews discussed in Section 3.10 are also utilized to correct identified problems and improve processes. The following sections describe the controls in place for the procedure development and revision process.

2.1 Operating Quality Assurance Manual

Section 5 of Callaway's Operating Quality Assurance Manual (OQAM), "Instructions, Procedures and Drawings", contains the general requirements for development, use and revision of procedures.

2.1.1 Activities affecting quality are accomplished and controlled by:

- Preparing procedures, instructions, specifications, drawings and checklists which specify the methods for complying with 10 CFR 50, Appendix B and the Technical Specifications;

- Including in these documents quantitative or qualitative acceptance criteria for verifying that an activity has been satisfactorily accomplished;

- Having responsible personnel approve these documents prior to accomplishing an activity; and

- Using approved drawings, procedures, instructions and checklists to accomplish an activity.

2.1.2 The Manager, Callaway Plant is responsible for providing specific guidance via Administrative Procedures for the development, review and approval of other plant procedures to govern activities which affect safety or quality consistent with the Technical Specifications. Similar guidance is provided for revisions and temporary changes to plant procedures.

2.1.3 Administrative Procedures are reviewed by the Quality Assurance Department.

2.1.4 The OQAM includes procedural coverage in the following areas: design control; design change control; preparation, review, approval, and revision of specifications, drawings, requisitions, and procedures (instructions).

2.2 Conformance to Design Basis

Section 3 of Callaway's OQAM "Design Control," contains the general requirements for the design change process as follows:

- Design, modification, addition, and replacement of safety-related structures, systems, and components are monitored to assure appropriate design control measures are implemented.

- Maintenance or modifications which may affect functioning of safety-related structures, systems, or components is performed in a manner to ensure quality at least equivalent to that specified in original design bases and requirements, materials specifications and inspection requirements. A suitable level of confidence in structures, systems, and components on which maintenance or modifications have been performed is attained by appropriate inspection and performance testing.

- Control of design is specified in procedures. These procedures include instructions for defining typical design requirements; communicating needed design information across internal and external interfaces; preparing, reviewing, approving, releasing, distributing, revising, and maintaining design documents; performing design reviews and reviews of design; and controlling field changes.

- Modifications to structures, systems, and components consider, as a minimum, the design bases described in the Callaway FSAR and the Technical Specifications. Design criteria documents consist of original plant design criteria, system descriptions and other documents defining design input which govern the plant as described in the FSAR.

- Design activities include the accurate translation of regulatory requirements and design bases into specifications, drawings, written procedures, and instructions (design outputs).

- Procedures and instructions related to equipment or systems that are modified are reviewed and updated prior to releasing the equipment or systems to perform safety-related functions. Plant personnel are made aware of changes affecting the performance of their duties through procedure revisions, specific training in the operation of modified equipment or systems, and other appropriate means.

OQAM design control requirements are incorporated into Callaway's administrative and departmental procedures. The design control procedures provide reasonable assurance that the design bases are accurately reflected in Callaway's operating, maintenance and testing procedures.

The QA Department at Callaway has the responsibility to review operations, maintenance and testing procedures on a sampling basis. Most personnel in the QA Department have engineering degrees. Technical reviews of procedures by QA personnel help ensure that procedures correctly reflect the design bases. QA Department reviews are discussed further in Section 3.0.

2.3 Administrative Control of Procedures

The OQAM requirements are further delineated in Callaway's administrative and departmental procedures. Procedure APA-ZZ-00101 "Procedure Preparation, Review and Approval", establishes the process to prepare and maintain all Callaway Plant procedures and includes a screening form which identifies any change that may affect a licensing document or program (e.g. FSAR, Technical Specifications, Environmental Protection Plan, RERP, Security Plan, etc.). Additional evaluations and reviews are invoked for changes which might affect these licensing or design bases programs.

A review and approval matrix is included in this procedure which provides the appropriate level of qualified review and cross-disciplinary review required for each procedure type. This matrix aids the procedure preparer in identifying which work groups should review the procedures to ensure that technical requirements, regulatory requirements, and design bases are adequately covered. Callaway Plant personnel who prepare and review procedures must complete a formal training course and must be authorized by plant management as a Qualified Reviewer.

Procedure APA-ZZ-00540, "Commitment Management Program", provides a tracking system for managing commitments made by Union Electric and implemented by Callaway Plant procedures. This tracking system is designed to ensure that commitments made by Union Electric to external agencies are fulfilled and not deleted or revised without proper review and approval.

All administrative procedures are reviewed by the Onsite Review Committee (ORC) and the Plant Manager is the approval authority. As stated above, all administrative procedure revisions are also reviewed by the QA Department. In addition, all procedures for which the screening criteria identify a potential change to the licensing or design bases (e.g. A change to procedures as described in the FSAR) are also reviewed by the ORC. Callaway has developed the good practice of having the responsible System Engineer provide a review of most major revisions to operating, maintenance and testing procedures.

These controls provide reasonable assurance that technical requirements along with regulatory requirements are included in Callaway's operating, maintenance and test procedures.

Section 3.0

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

UNION ELECTRIC RESPONSE

3.1 Initial Design and Construction of Callaway

Callaway was designed as one of the Standardized Nuclear Unit Power Plant Systems (SNUPPS) plants. The design and licensing process was a coordinated effort of Union Electric, Kansas City Power and Light, Kansas Gas and Electric, Northern States Power, and Rochester Gas and Electric. Major contractors responsible for the SNUPPS design included Bechtel Power Corporation (power block), Westinghouse (NSSS), General Electric (turbine-generator) and Sverdrup Corporation (site facilities). A Technical Committee of the utilities reviewed the standardized design as it developed and coordinated feedback from construction activities into design. A Licensing Committee coordinated the FSAR development for the power block and worked closely with the designers and Technical Committee to assure that the FSAR accurately reflected the as-built design. Union Electric Nuclear Engineering and Licensing Departments performed the same function for site specific design features documented in the FSAR. During the final months before the Operating License was issued in June, 1984, a process was developed to track construction completion against the FSAR and other documented NRC commitments. This process assured that final plant configuration matched the FSAR description of the plant.

Callaway Plant construction and as-built configuration were controlled in accordance with an approved QA/QC Program during the plant's construction from 1975 through 1984. Numerous construction and inspection records were generated to verify and validate that the configuration of the plant was consistent with the final design documentation. An Initial Test Program was implemented which subsequently verified that structures, systems and components would function to meet the design bases performance requirements. This Initial Test Program combined with on-going operational programs in place at Callaway provides reasonable assurance that system, structure, and component configuration and performance are consistent with the design bases.

3.2 Initial Test Program

Callaway Plant's Initial Test Program was conducted as two separate and sequential subprograms (preoperational testing and startup testing). Callaway Plant preoperational test and startup test procedures were developed and implemented to verify that system operational parameters complied with design and licensing bases documents. The procedures (FSAR, Rev. 0, Chapter 14) were developed by the responsible design organization, in coordination with Union Electric Operations and Startup Test groups.

Approximately 149 preoperational test procedures and 65 acceptance test procedures were implemented to:

- Demonstrate the capability of safety-related structures, systems and components to meet performance requirements and to satisfy design bases criteria.

- Demonstrate the capability of nonsafety-related systems and components to satisfy reliability and availability requirements.

Approximately 50 startup test procedures were implemented to:

- Ensure that fuel loading was accomplished in a safe manner.

- Confirm the design bases for safety-related systems and components.

- Demonstrate, where practical, that the plant operated and responded correctly to anticipated transients and postulated accidents.

- Ensure that the plant could be brought to rated capacity and sustain power operation safely.

Each test procedure was reviewed by the cognizant design organization and Union Electric to ensure that test procedure objectives and acceptance criteria were consistent with current design document requirements. Test data sheets utilized to document test results were filed with the applicable test procedures.

3.3 Surveillance Program

A Surveillance Program has been maintained which includes periodic performance of hundreds of test procedures to ensure that plant systems,

structures and components meet design and licensing bases criteria set forth in Operating License documents such as the Plant Technical Specifications.

Periodic surveillance tests provide data which is compared with values in the design and licensing bases to ensure that the performance of systems, structures and components remains consistent. This testing program is controlled in accordance with plant procedure APA-ZZ-00340 "Surveillance Program Administration".

The Surveillance Program for Callaway includes the Inservice Inspection Program (ISI) and the Inservice Test Program (IST) for ASME Section XI components. These programs are administered through procedures EDP-ZZ-01003 and APA-ZZ-00356. The results of inspections performed via these programs provide configuration, performance verification and trending information useful in predicting future performance. Likewise, a Predictive Performance Program has been established per procedure EDP-ZZ-01110 to trend performance of many specific components. Examples of specific component trending procedures are:

- EDP-ZZ-01111, Rotating Equipment Predictive Performance Manual (PPM)
- EDP-ZZ-01112, Heat Exchanger Predictive Performance Manual
- EDP-ZZ-01113, Electrical Distribution & Control Equipment Predictive Performance Manual
- EDP-ZZ-01114, Motor Operated Valve Predictive Performance Manual
- EDP-ZZ-01115, Flow-Accelerated Corrosion of Piping & Components PPM
- EDP-ZZ-01116, Secondary Thermal Performance Predictive Performance Manual
- EDP-ZZ-01120, Filter Unit Predictive Performance Manual
- EDP-ZZ-01121, Raw Water System Corrosion Predictive Performance Manual
- EDP-ZZ-01122, Check Valve Predictive Performance Manual

All of these measures provide feedback used to verify performance and configuration consistency with current design bases.

3.4 50.59 Reviews of Plant Changes

Safety evaluation reviews are performed in accordance with procedure APA-ZZ-00140 "Safety, Environmental and Other Licensing Evaluations" for design, licensing, and procedure changes (See Section 1.2.6). The FSAR is the primary reference used to determine if a change requires a formal safety evaluation. Screening questions are addressed to determine if a formal safety evaluation is

required, and guidance is given to determine if an unreviewed safety question exists and how to document the evaluation.

3.5 Plant Walkdowns

Prior to initial startup and during the operation of the plant, numerous walkdowns have been performed to confirm that plant configuration is consistent with design bases documentation. Examples include:

- NRC Bulletin 79-14 (Plant walkdown and inspection of safety-related piping systems)
- EQ Package walkdowns (verification of installed versus tested configurations)
- Fuse Inspections (verification of sizes, types, etc.)
- Core Load Jumper Inspections (verification of MOV thermal overload jumper configuration)
- Raychem Splice Inspections (verification of Containment electrical penetration splice configuration)
- MOV/Limitorque Inspections (verification of MOV and internal wiring configuration, etc.)
- SSFA System walkdowns (Engineering verification of configuration, operation, etc. for Essential Service Water, Residual Heat Removal, Control Building HVAC, Auxiliary Feedwater, Component Cooling Water and Electrical Systems)
- Seismic walkdowns (review of plant configuration for seismic risk assessment) for Individual Plant Evaluation for External Events (IPEEE)
- Thermo-lag fire barrier walkdowns (verification of electrical support configuration and design)
- System Engineering periodic walkdowns (verification of configuration, operation, etc.)

In addition, plant walkdowns are performed by engineering personnel prior to and after modification implementation to verify that the system configuration is consistent with design documentation.

3.6 Independent Safety Engineering Group (ISEG) Reviews

Industry experience reviews are performed routinely by the ISEG to assess Callaway Plant design and performance relative to significant events that have occurred throughout the nuclear industry. These reviews, along with other reviews performed by the ISEG for activities performed at Callaway, provide an added measure of confidence that the design bases are adequate and consistent with plant configuration.

3.7 Design Bases Reviews

A Design Bases Review Program has been initiated for the Callaway Plant and is discussed in detail later in this response. A Design Basis Task Team was formed in 1993 to review Callaway's program and provide recommendations for enhancements. The Design Bases Program is consistent with NUMARC 90-12 guidelines and provides for the availability of current design bases information for the Callaway Plant. Some enhancements were implemented as a result of the task team review, such as additional on-site training and consolidation of hard-copy design bases resources into a centralized location. Training course T62.013B.6 was developed and has been conducted for Nuclear Engineering and Quality Assurance personnel at Callaway. On-going review efforts in the Design Bases Program enhance the effectiveness of the program.

3.8 Quality Assurance Department Reviews

The Quality Assurance (QA) Department has performed many reviews designed to provide reasonable assurance that system, structure, and component configuration and performance are consistent with the design bases. These include regular QA audits and surveillances of the design activities at Callaway and the operation and maintenance of plant equipment. The QA department has also coordinated and led seven Safety System Functional Assessments (SSFA's). These SSFAs have provided substantial improvements in the design bases information at Callaway. Details of these self assessments are described in Section 3.9.

The Union Electric Operating Quality Assurance Manual (OQAM) Section No. 3, "Design Control" requires that design, modification, addition, and replacement of safety related structures, systems and components be controlled in accordance with regulatory commitments. OQAM Section 18, "Audits",

requires that an audit of the Design Control Program be conducted by the Quality Assurance Department, at least every two years.

To ensure that all safety related functional areas of the plant are uniformly and effectively assessed, the Quality Assurance Department has formed a specific module for each functional area. The Design Control Functional Area (DCFA) module defines assessment coverage of activities associated with the Callaway Plant design as defined by documents such as drawings, specifications and licensing documents. The DCFA module defines assessments of the development and installation of permanent and temporary plant modifications, with emphasis on the control of changes to existing design. In addition, QA personnel assigned to the DCFA have primary responsibility for assessment of Engineering Evaluations. The DCFA module consists of the following seven major program elements for assessment:

- System Design/Qualification
- Design Change/Analysis
- Modification, Installation and Verification
- Testing
- Configuration Control
- Safety Evaluation/Safety Analysis
- Technical Specifications

A comprehensive set of critical attributes is defined for each of these program elements. The critical attributes were developed by QA in conjunction with knowledgeable individuals from the responsible departments. This assures that effective, periodic assessments are performed of activities important to the success of the specific program element. Currently, three QA engineers are assigned to audit DCFA activities. All have Engineering degrees which cover different disciplines. All assigned auditors meet the education and experience requirements and have demonstrated the high level of performance necessary to be a qualified Lead Auditor in accordance with ANSI N45.2.23-1978. The extensive design control experience possessed by these auditors has contributed to effective assessments of Callaway Plant's Design Control Program.

Recent QA Design Control Audits have assessed such areas as Nuclear Safety Evaluations, Design Bases Program, Design Changes, Temporary Modifications and Request for Resolution (RFRs). These audits, along with other assessment activities, such as procedure reviews, design change reviews and individual 10 CFR 50.59 evaluations, are performed to verify the technical adequacy and programmatic compliance of design changes. Deviations and enhancement opportunities identified during these assessments have been documented in accordance with Callaway Plant's Corrective Action Program.

Although auditors assigned to the DCFA have primary QA responsibility for assessing Design Control activities, elements of the Design Control Program are routinely assessed in QA reviews of other functional areas, such as:

- The I&C functional area which assesses implementation of management and technical activities in support of I&C surveillances, maintenance and modification programs.

- The Materials Monitoring functional area which assesses reactor core and fuel assembly design activities.

- The Maintenance functional area which assesses implementation of management and technical activities in support of preventive, corrective, and modification maintenance programs.

- The Operations functional area which assesses control room activities to ensure that plant conditions are being maintained within limits established in the operating license and Technical Specifications.

Similarly most of the twenty QA functional area assessment modules contain critical attributes which assess some elements of the Design Control Program.

3.9 Safety System Functional Assessments

In 1988, Union Electric initiated a proactive program to conduct Safety System Functional Inspection (SSFI)-type self-assessments (SSFAs). The assessment teams consist of experienced utility personnel representing most departments (Operations, Systems Engineering, Design Engineering, Training, Maintenance, Quality Assurance, Licensing and Fuels) and are coordinated and led by an experienced Audit Team Leader from the Quality Assurance (QA) Department. Technical specialists from other nuclear plants have also been utilized during these assessments. The NRC SSFI Inspection Procedure 2515, Appendix D, Safety System Functional Inspection, provides guidance for performing these assessments. Later assessments also utilized NSAC 121, Guidelines for Performing Safety System Functional Inspections.

The initial SSFA reviewed Callaway Plant's Essential Service Water (ESW) System. The objectives of the assessment were to verify that design bases of the ESW System were being maintained and to evaluate the effectiveness of the SSFA in identifying improvement opportunities for Callaway Plant. The assessment initially focused on establishing the design bases of the ESW System. The SSFA then proceeded to review the design change process and the

operation, maintenance and testing of the ESW System to verify its capability to perform design functions.

The team found that the design bases were adequately documented in the various design documents. However, at that time retrieving the design documents was difficult, time consuming, and required reconciling conflicting documents to determine which contained the correct information. The team also found that the original design calculations, which provide verification of the design bases for the ESW system, had not yet been incorporated into the Union Electric document control system and therefore were not controlled as required by Callaway's Operating Quality Assurance Program. Operations department procedures for ESW system operation were also reviewed during this assessment. These procedures contained a number of minor errors, omissions and inconsistencies. The SSFA team performed walkdowns of the system and compared the plant configuration with as-built schematic, isometric, and hanger location drawings. Some minor deviations were identified, but, the team concluded that the as-built drawings correctly reflected the actual configuration of the plant.

The concerns identified during the ESW SSFA were addressed under Callaway's established Corrective Action Program. In response to the problems identified, Nuclear Engineering initiated a Design Bases Review Program. This program is discussed in further detail in Section 6.0.

It was recognized that the SSFA produced beneficial improvements in the reliability and performance of the ESW System and was an effective process for assessment of the design bases. Therefore, Callaway Plant management established a long-range action plan to perform SSFAs of other safety significant systems. We have subsequently completed the following SSFAs: Residual Heat Removal System-1990, Electrical Distribution System-1991, Control Building Heating, Ventilation and Air Conditioning-1993, Instrumentation and Controls System-1994, Auxiliary Feedwater-1994, and Component Cooling Water-1995. These systems have the greatest potential impact on core damage frequency as identified by the Callaway Probabilistic Risk Assessment (PRA).

An additional benefit resulting from the SSFA process was the knowledge gained by the assessors of the system's design bases and operating characteristics. This was recognized early by Callaway Plant management and resulted in our decision to continue performing these assessments using utility personnel in order to retain this knowledge "in-house." System Engineers as well as Design Engineers have been assigned to participate in these assessments to improve their knowledge of the system's design bases and the Design Bases

Database located in the Callaway Records Information System (CRIS) computer application.

As found in the initial SSFA, subsequent SSFA teams identified some inconsistencies in the design information reviewed. These results were not unexpected because of the volume of information available and diversity of sources which provide the same information. The FSAR, Technical Specifications, Calculations, Westinghouse Project Information Package (PIP), System Descriptions, Requests For Resolution (RFR), correspondence, and drawings all contain design input information and, in some cases, contain design bases information. Nuclear Engineering realizes that such information may be contained in more than one source and, in fact, some references are not updated or controlled (e.g. PIP and System Description). Responsible engineers are required to review all design information sources to determine the current bases. The teams have found that the FSAR is generally being maintained in accordance with regulatory commitments.

To date, no SSFA has identified any FSAR inaccuracies that would have impacted safe operation of the plant or affected conclusions regarding operability reviews or 50.59 evaluations. Of course, deviations were identified during the conduct of these assessments that warranted management evaluation and action. These issues were dispositioned using Callaway's Corrective Action Program.

The most recent SSFA team concluded that currently design bases information is retrievable, with most of the information easily retrievable. The Design Bases Database developed and maintained by Nuclear Engineering was found to be extremely helpful in locating this information. Thus, we believe that corrective actions taken in response to the initial SSFA findings were effective in enhancing the retrievability of design bases information.

The Callaway design control program was also reviewed by the SSFA Teams along with several modifications that have affected the systems being reviewed. The design control program was determined to be effective for ensuring design changes are consistent with the design bases of the system or component. Modification packages reviewed during these assessments were found to contain adequate documentation. The assessments also verified that the design was adequate to accomplish its purpose, that Nuclear Safety Evaluations were technically accurate, that Design Input Reports were completed adequately and that configuration control of as-built documents and the Callaway Equipment List (CEL) were accurate.

3.10 NRC Reviews of Callaway

Independent reviews conducted by the Nuclear Regulatory Commission (NRC) provide the public and plant management with information regarding regulatory compliance and safe operation of the plant. Over the years, the NRC's inspection findings have supported our rationale that Callaway design bases have been properly maintained. Union Electric management continues to use NRC inspection findings as one of the tools to improve safety and reliability of the plant. A high priority is placed on resolving NRC concerns and adverse findings in a timely manner.

Callaway's design control program has consistently received high marks in NRC inspection summaries, labeling the program as a strength in the organization. Callaway design bases control programs and the capabilities of personnel responsible for implementing and maintaining these programs are examples of strengths recognized by NRC. Findings from the NRC's 1989 and 1991 in-depth inspections concluded that Callaway's design control program had many strengths and no violations of NRC requirements were identified. NRC inspectors reviewed modification design, 10 CFR 50.59 safety evaluations, post-modification testing, supporting procedures, potential for an unreviewed safety question, and field verifications. Some of the strengths cited by the inspectors were:

- Modification safety evaluations reviewed were very comprehensive. Sources of information were documented well to facilitate reviews.
- The on-site QA group was actively involved in self-initiated corrective actions for the modification process. This area was also noted as a strength in the previous modification inspection report (89014).
- Engineering Staff provided timely and excellent support for plant operations.[2]

Since 1991, Callaway's design control program has undergone cyclic reviews during engineering core inspections performed for the NRC's Systematic Assessment of Licensee Performance (SALP). The performance rating of "Category 1" assigned to the Engineering area was due, in-part, to excellence in design bases reviews, understanding of the plant design bases, and methods to capture design bases information.

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[2] NRC Inspection Report No. 50-483/91010(DRS)

Supporting this fact is the NRC's findings during a 1993 Electrical Distribution System Function Inspection (EDSFI). NRC inspectors singled-out the quality of the engineering and technical support staff as the greatest strength. NRC inspectors performed a review of Callaway's Electrical Distribution System finding no violations of NRC requirements. The experience, knowledge, and dedication of Callaway workers provides a high level of assurance that design bases requirements are properly translated into procedures used to operate, repair, and test the facility. Another strength noted was that the internal EDSFA performed at Callaway was thorough in identifying weaknesses and deficiencies in the electrical distribution system.

In 1991, NRC inspectors performed an in-depth inspection of Callaway's safety assessment and quality verification programs. The following are excerpts from the inspection report :

> "The licensee's self-assessment capability and quality assurance implementation program were determined to be very good. The Operations Review Committee (ORC) and Nuclear Safety Review Board (NSRB) performed their functions well. The Independent Safety Engineering Group (ISEG) and the Quality Assurance Surveillance/Audit Group (QA) were noted strengths in the licensee's organization. The licensee recently moved to combine several corrective action programs into one all-encompassing Suggestion Occurrence Solution (SOS) System Program. This program has lowered the threshold for reporting deficiencies and is an example of the licensee's continued commitment to the identification and resolution of plant deficiencies."[3]

A review of NRC inspection reports for the past six years found many instances where inspectors cited Callaway's self-assessment efforts as a strength in the organization. QA performance-based audits/surveillances and Safety System Function Assessments (SSFA) were found to contribute to safety system availability and reliability. Callaway continues to maintain a culture where all workers are encouraged to "self-assess" and bring all concerns, regardless of importance, to the attention of management for resolution.

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[3] NRC Inspection Report No. 50-483/91007(DRP)

Section 4.0

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

UNION ELECTRIC RESPONSE

4.1 Procedure Requirements

Callaway Plant's primary mechanism for Corrective Action identification and resolution is the Suggestion-Occurrence-Solution (SOS) Program which is implemented in accordance with plant administrative procedure APA-ZZ-00500, "Corrective Action Program". This procedure defines the responsibilities of all personnel with respect to non-conforming conditions. The SOS system is a computerized, on-line system available to all plant personnel. The SOS System is intended to identify all concerns within the Nuclear Division (including significant equipment concerns) except for routine equipment corrective maintenance covered by the Work Request System. It provides a process for documenting, reporting, prioritizing, tracking, trending and ultimately resolving all identified concerns. If a concern is deemed significant by the originator or reviewer of the SOS (including reportability concerns), the SOS is required to be promptly delivered to the Site Licensing engineer or Shift Supervisor for initial reportability determination.

If the SOS is determined to be an immediate plant operational concern, operability concern, or 10 CFR 50.72 immediate reportability concern, the Shift Supervisor or Site Licensing takes appropriate action upon notification in accordance with plant procedures, Technical Specifications, and/or the Offsite Dose Calculation Manual. In such situations, prompt corrective actions are taken to restore the situation or affected plant equipment to an acceptable status.

Reportability determinations are made in accordance with plant administrative procedure APA-ZZ-00520 entitled "Reporting Requirements and Responsibilities". The Shift Supervisor (SS) is responsible for making and documenting 10 CFR 50.72 immediate telephone notifications to the NRC per APA-ZZ-00520. In addition to APA-ZZ-00520 reportability guidance, a reportability matrix employing key word search capability is provided on the Local Area Network to help assist plant personnel in reportability determinations and SOS significance. The SS evaluates and notes plant status, preliminary operability determinations, and the need for an engineering operability evaluation. The SS forwards the SOS to Site Licensing for

processing and further reportability evaluation. If Site Licensing cannot make a reportability determination based upon the originator's description, the SOS is assigned to the appropriate department for resolution. This step usually includes, but is not limited to, assignment to Nuclear Engineering for operability evaluations. The referenced department will provide the requested evaluation as soon as practical and forward the response to Site Licensing for final reportability determination. Upon review of the evaluation, Site Licensing documents a reportability determination on the SOS system and forwards that determination to the plant On-Site Review Committee for final approval. If the documented concern is determined to be reportable, the responsible department, as outlined in APA-ZZ-00520, is assigned action to provide the required report. Site Licensing is assigned action for 10 CFR 50.73 Licensee Event Reports.

The Emergency Duty Officer is responsible for determination of the need to call out an Event Review Team (ERT) when a significant event occurs. The ERT consists of personnel pertinent to the event investigation as outlined in Attachment 2 of plant administrative procedure APA-ZZ-00542, "Event Review Program". The ERT is assembled in a timely fashion following the event occurrence such that it can accurately reconstruct the circumstances surrounding the event, identify a likely cause for the event, recommend corrective actions to prevent event recurrence and identify action departments to implement the recommended corrective actions. Recommended corrective actions are placed on the associated SOS and are assigned to the appropriate action department for evaluation.

4.2 Root Cause Determination and Corrective Action Tracking

Following initial evaluation of the SOS by department representatives (and ERT members for significant events), the SOS is assigned a priority and processed by the Site Licensing department, and electronically forwarded to the appropriate action department heads or designees. APA-ZZ-00500 requires that significant SOS occurrences provide a root cause, remedial corrective action and corrective action to prevent recurrence prior to close-out. The responsible department head decides which root cause determination method to use. The determination may simply be based on observation of the circumstances surrounding the event or it may involve a formal root cause analysis. The level of depth to which departments perform root cause analysis is generally commensurate with the significance of the event and its level of complexity. Corrective actions are based upon the findings of the root cause analysis and generally apply to the direct cause and contributing factors to the documented event. Closure of SOS occurrences does not occur until completion of identified corrective actions or until assignment to another procedurally-controlled program which will ensure proper tracking of corrective action completion. Significant SOS's are not

closed until reviewed by the plant On-site Review Committee. This review provides additional assurance that significant plant concerns have been appropriately assessed and that corrective actions will be effective in preventing event recurrence.

The SOS data screen has several fields to facilitate input of trend data such that adverse trends can be identified and events can be stratified and retrieved during database reviews. Quality Assurance reviews the SOS system for trends and issues an SOS when an adverse trend is identified. This SOS is assigned to the responsible department(s) such that additional corrective action can be taken to eliminate the adverse trends.

4.3 Review of Operating Experience

Callaway's Independent Safety Engineering Group (ISEG) reviews external Operating Experience (OE) received under the INPO SEE-IN program per JDP-ZZ-04100, "Operating Experience Reviews." All SOERs and SERs receive a detailed review. O&MRs, SENs, SOs and OE items are screened for applicability to Callaway. The O&MRs, SOs, SENs and OEs that are determined to be applicable to Callaway receive a detailed review. These detailed reviews include input from affected departments (e.g. Operations, Maintenance, Engineering) and determine the extent of impact on Callaway and the appropriate corrective actions to be taken. Since Callaway and Wolf Creek are similarly designed plants, Wolf Creek LERs are also reviewed by the ISEG group for applicability to Callaway.

NRC identified industry experience (Generic Letters, Bulletins and Information Notices) are reviewed by UE's Regulatory Operations Group for applicability and distributed for response (FDP-ZZ-02001). The Vendor Technical Information Program (VTIP) is administered by Engineering to review 10 CFR 21 reports, Westinghouse Technical Bulletins and other vendor technical information (EDP-ZZ-06000).

These programs serve to identify, review and address events and deficiencies from other plants that are potentially applicable to Callaway.

Section 5.0

"(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."**

UNION ELECTRIC RESPONSE

Sections 1.0, 2.0, and 3.0 describe the Union Electric processes for design control, licensing document control, implementation of 10 CFR 50, Appendix B, and the rationale for assuring that plant SSCs are configured and operated as defined in the design bases. Section 4.0 describes the corrective action program implemented at Callaway for responding to deviations from programs discussed in the other sections. Descriptions in those sections reference procedures governing relevant activities and individuals responsible for those procedures. This section discusses the means by which Union Electric Senior Management seeks to assure that the processes previously discussed are effective and are implemented as described.

Union Electric senior management relies largely on the processes discussed in Section 3.0 as a means of satisfying itself that there is reasonable assurance that the design bases for the plant continue to be met. Union Electric personnel were involved extensively in the original design, construction, testing and licensing of the plant as discussed in Section 3.0 Many senior staff members have been associated with Callaway since its initial design. A review and punchlist process just prior to issuance of the operating license added to our confidence that the design and actual plant configuration matched.

Nuclear Engineering assumed responsibility for design control from Bechtel in 1987 following Refuel 1. The design control process discussed in Section 1.0 has been in place since initial licensing and has been refined based on our experience and the experience of others in the industry. Section 6.0 discusses the Design Bases Review and Reconciliation program performed at Callaway in the late 1980's and early 1990's. All of these factors add to the confidence we have in the effectiveness of our processes and programs.

The most significant contributors to Union Electric's confidence in the design bases have been the independent reviews and the corrective action program at Callaway. As discussed in Section 3.0, several SSFA's have been performed on risk significant systems. The objective of these in-depth "vertical slice" reviews is to evaluate current configuration and operation of the system against its original design as modified and documented in licensing documents. These assessments also evaluate programmatic controls for effectiveness. As problems are identified, corrective action is initiated through the SOS program which is discussed in Section 4.0.

NRC reviews of design controls at Callaway have generally confirmed the conclusions of UE's assessments. The presence of a highly competent onsite Engineering Department and the all-encompassing purview of a highly qualified QA Department which continually assesses programs and processes have given us high confidence in the documented design bases.

While our confidence remains high that we operate and support Callaway Plant in accordance with regulatory commitments, recent industry events prompted Union Electric to initiate a review of Callaway in accordance with the NEI Initiative as described in NEI 96-05. It is anticipated that this review will be completed in the second quarter of 1997. Differences and/or deficiencies found during these reviews will be corrected consistent with the need to maintain design bases.

Additionally, UE intends to perform SSFAs on the Auxiliary Building HVAC System (GL) and the CVCS/High Pressure Coolant Injection (BG/EM) System during the next two years. It is anticipated that the scope of these reviews will be similar to past SSFAs and will, therefore, include design bases reviews. The need for further assessments will be determined after 1998.

Section 6.0

"Indicate whether a design review or reconstitution program has been undertaken, and if not, a rationale for not implementing such a program. Provide a description of the programs including how correctness and accessibility of the design bases information are maintained current. If the program has not been completed, provide an implementation schedule and expected completion dates for SSCs and plant-level design attribute reviews, and the method for prioritization."

UNION ELECTRIC RESPONSE

6.1 Program Description, Objectives and Scope

The Callaway Plant (SNUPPS) design is of a later vintage than most other nuclear power facilities in the United States and Union Electric is fortunate in the fact that most of the design bases documents were well defined and available to Callaway personnel subsequent to startup and commercial operation in late 1984. For this reason, a major reconstitution effort has not been required to establish design and licensing bases documentation. However, many calculations have been re-analyzed to assure validity of the design bases for associated systems and/or components. These include:

- All safety-related electrical loading calculations;
- Many HVAC calculations;
- Numerous piping stress calculations (ASME Class 2 & 3) using CAEPIPE models;
- All new Class 1 & Class 1 extension pipe stress runs for an on-going snubber reduction program.

In addition, a design review program has been undertaken and is near completion. The review program is tailored to meet the intent of NUMARC 90-12 "Design Basis Program Guidelines", using the "Index" method for formatting design bases and supporting design bases information. Callaway personnel actively participated in the NUMARC Design Basis Issues Working Group which developed the NUMARC 90-12 guideline. A summary of our design review program is provided below.

Callaway developed a Design Bases action plan in January, 1989 for the review and reconciliation of design bases information. The principal objectives of the review program were to identify sources of design bases and supporting design bases information relevant to Callaway and to develop a process by which the information could be retrieved in an effective manner for future use (i.e. thorough retrieval of the most current information in a timely manner). The process to be used for retrieval of the design information would rely on the plant mainframe computer system. The scope of the program was to include as a minimum, all safety-related systems, structures and components.

To accomplish the objectives described above, a document review and indexing process was developed to extract key information from design related documents and index the information in a computer database. Many design and licensing bases documents were already accessible via the mainframe computer system, or were generic in nature such that review and indexing was not performed. These documents included:

- Code of Federal Regulations
- Regulatory Guides
- FSAR (Currently resides as on-line computer application in addition to hardcopy)
- Safety Evaluation Report (SER)
- Operation License (OL) and Amendments
- Plant Technical Specifications
- Industry Codes and Standards
- System Descriptions
- Design Specifications

Review and indexing of more specific supporting design bases documents, which were numerous and difficult to locate by manual methods, was initiated in March, 1989. These documents included:

- Design Calculations: Generated by Bechtel;
  generated by Sverdrup & Parcel;
  and generated by Union Electric.

- Requests for Resolution (RFR's): initiated and dispositioned by Nuclear Engineering.

- Correspondence: SNP (SNUPPS project to Bechtel from Westinghouse)
  SLNRC (SNUPPS letter to NRC)
  SLT (SNUPPS letter to Technical Committee)
  SLW (SNUPPS letter to Westinghouse)
  SLO/SLOS (SNUPPS letter to others or Operations Committee)
  SLBE (SNUPPS letter to Bechtel Engineering)
  SLK (SNUPPS letter to KG&E)
  SLU (SNUPPS letter to Union Electric)
  SLM (SNUPPS letter to Management Committee)
  BLSE (Bechtel letter to SNUPPS Engineering)
  BLWE/BLWES (Bechtel letter to Westinghouse)
  BLGE (Bechtel letter to General Electric)
  BLUE (Bechtel letter to Union Electric)
  BLKE (Bechtel letter to KG&E Engineering)
  GLBE (GE letter to Bechtel Engineering)

Procedures were developed to control this process and train the technicians who would perform the review and indexing operations. Nuclear Engineering personnel supervised the project and were actively involved in the review process. This has helped to establish and maintain in-house knowledge of the retrieval system.

Through the use of manual data input forms, information was extracted for each design information document and was entered as input into a personal computer to create a database which included field level data such as: Document Number, General Description, Plant Systems, Component Identification, Keywords, Reference Documents, and more. This effort, which continued through the end of 1993, resulted in the capture of over 27,000 on-site design information documents which were collected as input into the Design Bases Database. At that time, the Design Bases Database was uploaded from the PC to the

mainframe computer application "Callaway Records Information System" or "CRIS".

Since the database upload, on-line applications for Union Electric calculations and correspondence, along with other mainframe applications such as the RFR System, have been in place and interface directly with CRIS to provide automatic indexing for newly generated design information documents. The only design documents which are not automatically indexed are those generated by outside vendors. In those cases, design documents received from outside vendors are input into the system via a manual input form which is included in the Design Bases Control procedure described later in this section.

Although NSSS design bases information is available onsite, most of the NSSS supporting design documentation (e.g. calculations, design guides, etc.) was originally held by Westinghouse as proprietary information. On-site access to this supporting design documentation has been limited. Design changes and evaluations which could affect NSSS systems have utilized input and/or analysis provided by Westinghouse to assure that the design and licensing bases are maintained. However, Callaway's design review program has also included participation in the Westinghouse Owners Group (WOG) Design Document Program (DDP) Subgroup. This subgroup was formed in mid-1993 to obtain access to NSSS design information documents. The Subgroup, which consisted of 11 utilities and Westinghouse, completed the review and database indexing of approximately 70,000 high-priority design information documents in 1995. The total cost of the project was approximately $5.5 million with individual utility costs of approximately $500,000 each. Optical images of plant-applicable documents were delivered to the utilities, in addition to the entire computerized database, early in 1996. Approximately 10,000 of these documents are applicable to the Callaway Plant and will be incorporated into the computerized CRIS records retrieval system. This additional information will enhance Callaway's Design Bases Program. Approximately 15% or 1,500 of these documents were deemed proprietary by Westinghouse and images will therefore not be available for incorporation into Callaway's imaging system. Other NSSS design information, which was not included within the scope of the DDP, will be unavailable onsite as well. Of approximately 130 Westinghouse shop orders which were identified as sources for design information, 25 were included within the DDP scope. For those cases where additional design information is needed to support NSSS evaluations or design changes, Union Electric will work with Westinghouse to maintain consistency between design bases and plant configuration.

6.2 Design Bases Maintenance

In order to maintain the correctness and accessibility of the current design bases, Callaway Plant has an established Design Bases Program which is outlined in plant procedure EDP-ZZ-04055 "Design Bases Control". The purpose of this program is to identify and control design and licensing bases information necessary to support technical and licensing evaluations required for changes to design of the plant, or to support evaluations for non-conformances. In addition, the program describes sources of design and licensing bases information, and how the sources are located, validated, and maintained for future use. Callaway Plant personnel are responsible for researching design and licensing bases information identified in this procedure to determine the existing bases for systems, structures and components which are to be modified or evaluated via processes described earlier in this response. The following essential elements of Callaway's Design Bases Program provide a high level of assurance that an effective program is in place in accordance with NUMARC 90-12 Guidelines:

- Identification of design & licensing bases information.
- Location and control of design & licensing bases information for retrievability through the document control and records retrieval process (CRIS).
- Maintenance of design & licensing bases information (on-line computer logs, other computer applications, manual input forms, and licensing document change process).
- Verification of design & licensing bases information via the qualified review and cross-disciplinary review process (required for new calculations, RFR's, modifications, licensing changes, etc.).
- Validation of design & licensing bases information via internal and external audits (Quality Assurance SSFA and EDSFA reviews, NRC SSFI and EDSFI reviews and QA reviews of design controls).
- Programmatic control of activities which affect design & licensing bases information through the use of plant procedures governing each activity.

Sources of design and licensing bases information identified as part of the program include:

- Code of Federal Regulations
- Regulatory Guides
- FSAR (Currently resides as on-line computer application in addition to hardcopy)

- Safety Evaluation Report (SER)
- Operating License (OL) and Amendments
- Plant Technical Specifications
- Industry Codes and Standards (Mandated or invoked from other sources)
- System Descriptions
- Design Specifications
- Discipline Criteria Documents (General design documents via A/E)
- Calculations (UE and vendor)
- Qualification Reports
- Hazards Analyses (missiles, flooding, high energy line breaks, seismic II/I, fire, tornadoes)
- Topical Reports (A/E reports to support design and licensing documents)
- Construction Variances
- Correspondence (Between Union Electric, A/E's, vendors, NRC)
- Modification Packages, Requests for Resolution (RFR's) and Non-conforming Material Reports (NMR's)
- Design Guides (Engineering design/analysis methods developed by UE Nuclear Engineering)

6.3 Implementation Schedule for Remaining Items

Items which remain to be completed as part of the design review program include the following:

- Conversion and upload of Westinghouse design information (received from WOG Design Document Program Subgroup) into Callaway's records retrieval system, or CRIS. The target completion date is December 31, 1997.

- Enhancement of the CRIS application for retrieval of modification packages by converting key field information from the Nuclear Engineering Design Change application into existing records which do not now contain all necessary information. In addition, development of an enhanced computer application for plant modifications similar to that for RFR's, calculations and correspondence which will feed CRIS automatically. The target completion date is December 31, 1997.

6.4 Verification and Validation

The Design Bases Program described above has evolved and improved as a result of the ongoing design review program which commenced in 1990. This Design Bases Program, in conjunction with engineering/configuration control processes and verification and validation processes described previously, provides reasonable assurance that Callaway's design and licensing bases are maintained consistent with the plant's configuration.

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