Nutherm Dedication Plan for Replacement MSFIS System, Rev. 0

NUTHERM

DEDICATION PLAN

FOR

REPLACEMENT MSFIS SYSTEM

WOLF CREEK NUCLEAR OPERATING CORPORATION
PURCHASE ORDER NO. 734527

NUTHERM DOCUMENT NUMBER WCN-9715DP, REV. 0

Prepared By: _____ Date: 1/18/07
Tom Sterbis
Project Engineering Manager

Reviewed and Approved By: _____ Date: 1/18/07
Wayne Weaver
EQ Manager

Nutherm INTERNATIONAL, INC.
501 South 11th Street
Mt. Vernon IL 62864
PHONE: 618-244-6000
FAX: 618-244-6641

REVISIONS

The revision number is indicated at the top of each page, for all revisions. To delineate the exact location of a given revision, a vertical line is used on the right margin. However, for a complete report rewrite, no vertical lines are used.

REVISION LOG

REVISION	DATE	PAGE	SECTION	REFERENCE

TABLE OF CONTENTS

PURPOSE

The purpose of this dedication plan is to present and define the critical characteristics and the applicable processes and standards which will be used to dedicate the commercial grade items described in the "Device Descriptions" section of this document.

This dedication plan addresses critical characteristics primarily. Additional testing and verification, beyond that required for dedication of the units described in the "Device Descriptions" section of this document, will be performed (as applicable) to ensure items purchased through Nutherm International are the items described in the customers specification sheets and/or Purchase Order.

All qualification work is accomplished in accordance with customer purchase order and specification requirements, Nuclear Regulatory Commission Guidelines, and applicable Institute of Electrical and Electronic Engineers Standards.

APPLICABLE STANDARDS AND DOCUMENTS

- IEEE 344-1975 –"Recommended Practices for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations."
- IEEE 323-1974 – "Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations"
- 10CFR50, Appendix B. –"Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants"
- Nutherm International, Inc. Quality Assurance Manual No.: QA-N-10179-5.
- EPRI NP-5652-"Guideline for the Utilization of Commercial Grade Items in Nuclear Safety Related Applications"
- EPRI TR-102260-"Supplemental Guidance for the Application of EPRI NP-5652 on the Utilization of Commercial Grade Items"
- EPRI TR-102323-R1-1997 – "Guidelines for Electromagnetic Interference Testing in Power Plants"
- Regulatory Guide 1.180-R1-"Guidelines for Evaluating Electromagnetic and Radio-Frequency Interference in Safety-Related Instrumentation and Control Systems"
- IEEE 649-1991 – "Standard for Qualifying Class 1E Motor Control Centers for Nuclear Power Generating Stations"
- Wolf Creek Generating Station Specification J-105A(Q), Rev. 2

- EPRI TR-106439 – "Guideline on Evaluation and Acceptance of Commercial Grade Digital Equipment of Nuclear Safety Applications"

DEVICE DESCRIPTION

The Main Steam and Feedwater Isolation System (MSFIS) has two distinct functions:

- Steam Line Isolation System (SLIS) – Main Steam Line Isolation minimizes the uncontrolled cool down of the Reactor Coolant System (RCS) that would result from a main steam line rupture. Input signals pass from the detectors through the Solid State Protection System (SSPS) to the MSFIS cabinet where the output signal is generated.

- Feedwater Isolation System (FWIS) – Feedwater isolation minimizes the potential for excessive post-trip cool down of the RCS due to overfilling the steam generators. It also prevents moisture carryover caused by high steam generator levels, and isolates normal Feedwater in the event of a high Energy Line Break inside containment.

MSFIS will include a safety-related logic-controller-based system to perform the control functions of the Main Steam Isolation Valves (MSIVs) and Main Feedwater Isolation Valves (MFIVs) with system-medium actuators. The MSFIS System has two redundant subsystems located in separate cabinets:

MSFIS Channel I (1) located in MSFIS Cabinet SA075A (Train A)

MSFIS Channel IV (4) located in MSFIS Cabinet SA075B (Train B)

Each MSFIS cabinet is capable of supplying the control logic outputs required for operating each of the 4 Main Steam Isolation Valves and 4 Main Feedwater Isolation Valves.

Dedication activities will be performed by Nutherm International Inc. on the control system ALS Racks and Assembly Panels for Channels I and IV.

DEDICATION DESCRIPTION

GENERAL

The dedication process, per EPRI Report 5652, assumes that "the design requirements of the item have been satisfactorily translated into specification requirements as reflected in the procurement document." The guideline goes on to describe three fundamental issues which, once addressed, provide a foundation for the acceptance process of a particular item. The three fundamental issues as described in EPRI Report 5652 are as follows:

- Determine the safety function of the item
- Confirm the item is commercial grade
- Identify critical characteristics.

These three fundamental issues are addressed during the technical review process and a Component Dedication Planner (CDP) is generated for each item to be dedicated.

EPRI NP-5652 is used as a guideline for the dedication process of commercial grade items. As stated in section 1.3.4, 'the methods in the guideline are in conformance with existing regulatory requirements. The methods for accepting commercial grade items are consistent with the provisions of Criterion VII of Appendix B to 10CFR50 which states:

> "Measures shall be established to assure that purchased material, equipment, and services, whether purchased directly or through contractors and subcontractors, conform to the procurement documents. These measures shall include provisions, as appropriate, for source evaluation and selection, objective evidence of quality furnished by the contractor or subcontractor, inspection at the contractor or subcontractor, inspection at the contractor or subcontractor source, and examination of products upon delivery."

Nutherm International has incorporated the guideline into its QA program and in-place procedures for the dedication of commercial grade items. See Figure 1 for a block diagram of the generic dedication process. The methods referred to (Method 1 thru 4) are described in detail in EPRI NP-5652. Nutherm International employs a combination of method 1 and other acceptance methods. Figure 2 is a schematic logic diagram for employing method 1, taken from EPRI NP-5652. Though not all inclusive, the diagram provides a general feel for the dedication process using this method.

MSFIS REPLACEMENT SYSTEM

The critical characteristics are divided into three general categories; Product Information, Physical Attributes, and Performance. EPRI TR-106439 incorporated Product Information in the Physical Attributes categories and added Dependability. Though the MSFIS system is not a digital system in the strictest definition as it is not software based, many of the critical characteristics and dedication activities described in EPRI TR-106439 are applicable and have been incorporated into this Dedication Plan. The critical characteristics of this system are varied enough that all four acceptance methods will be used to verify acceptability. For newer, more complex systems this is not unusual. System and other experts will be used, as applicable, to provide any necessary technical expertise throughout the dedication process.

Nutherm has identified the following critical characteristics for the replacement MSFIS:

Physical/Product Information

- Model number
- Software revision number
- Case type, dimensions
- Card configuration, number, revision, type
- Mounting configuration
- Sub-component configuration

Interfaces

- Electrical power
- Input signals
- Output signals
- Front Panel interface (HMI)

Performance

Control capabilities

- Timing functions
- Cycle time
- Reset function
- Alarm function
- Bypass/Operate function
- Hot swap capability
- Single power supply operation
- ESFAS operation
- Output logic
- Proper input to output operation
- Command priorities
- Indication

Human-machine interface performance

Environmental Compatibility

- EMI
- Seismic

Behavior Under Abnormal/Fault Conditions

- Loss and re-gain of power
- Loss of one or more outputs
- Conflicting inputs
- Over/under range inputs

- Over/under range power

Dependability

Built-In Quality

- Quality of design and manufacture
- Failure modes and failure management

Configuration Control

Reliability

Problem reporting

These categories are discussed in more detail in the following sections.

PRODUCT INFORMATION

Product information verification is required to provide reasonable assurance that the item ordered is in fact the item received. This portion of the dedication process includes, but is not limited to, Part Number verification and Manufacturer verification. Product information verification is performed and documented at receipt inspection in accordance with Nutherm International, Inc. Quality Assurance Manual No.: QA-N-10179-5 and the applicable approved procedures. Section 1.3.3 of EPRI NP-5652 states;

> "Part number verification is an integral step in the acceptance of commercial grade items and is included in each of the four acceptance methods. Verification of a part number and the utilization of the acceptance methods in this guideline provide assurance of acceptability. Since suppliers furnish commercial grade items for general industrial use, they may change the product design or the manufacturing process, and not the part number. These actions are taken without concern for the nuclear end user's design requirements. The methods described in this guideline provide various means to accept a commercial grade item without sole reliance upon part number verification."

Because of possible changes by the manufacturer, Product Information alone is an insufficient basis for acceptance of commercial grade items for nuclear safety related applications. By combining Product Information verification with the applicable testing, comparisons, etc. of an item's Physical Attributes, Performance characteristics, and Dependability characteristics reasonable assurance of acceptability can be achieved.

Each cabinet of the MSFIS System contains the following which will be verified during the dedication process:

- 2 ALS Control System Racks; one Main Steam (MS) rack and one identical Feed Water (FW) rack. Each Rack contains the following boards:
  - 1 Core Logic board (CLB)
  - 2 Digital Input boards (IPB)

- 1 Solid-State Output board (SOB)
- 3 Solid State FET & Sensor Output boards (FSB)
- 1 Service & Test board (STB)
- 2 Redundant Power Supply Modules (PSU)

- 1 Assembly panel, with MS and FW components as follows:
  - 125V Terminal and Distribution Block
  - 125V Fuse Blocks for Solenoid Outputs
  - 125V Fuse Block and Suppression Filter to Power Supplies

Board revision, chip revision, layout, and firmware revision are all part of the Product Information verification process.

PHYSICAL ATTRIBUTES

Physical attributes are those characteristics of the item that deal with its construction, materials, shape, form and fit, etc. The critical characteristics classified as physical attributes are determined during the Technical Review and listed on the CDP. The Project Manager evaluates critical physical attributes based on the item's safety function and determines the best method to verify them. Typically, for dedication, these characteristics are compared with a tested item in the Nutherm International, Inc. Test Specimen Library. The comparison is documented, then reviewed and evaluated by the Nutherm Engineering department. Any differences between the tested item and the dedicated item are evaluated with respect to the level that the item is being dedicated to (e.g. Seismic, Mild Environment) and documented either on the Comparison sheet or a Record of Dedication. Through the comparison process, reasonable assurance is gained of the physical similarity between the item to be dedicated and the item previously tested.

MSFIS System critical physical characteristics are listed above. Similarity will be established to the qualified part as well as design documents during the dedication process, with any differences noted and evaluated for impact on qualification by Nutherm Engineering Department.

PERFORMANCE

The Performance section of the dedication plan lists the operational critical characteristics determined during the technical evaluation. Performance characteristics are verified through testing, analysis, or, in the case of UL listings, comparison with manufacturer cutsheets. Performance testing is typically performed at the Nutherm Testing Facility, in accordance with approved procedures. Test results are documented, evaluated by the Nutherm Engineering Department for acceptability, and reviewed by Nutherm QA.

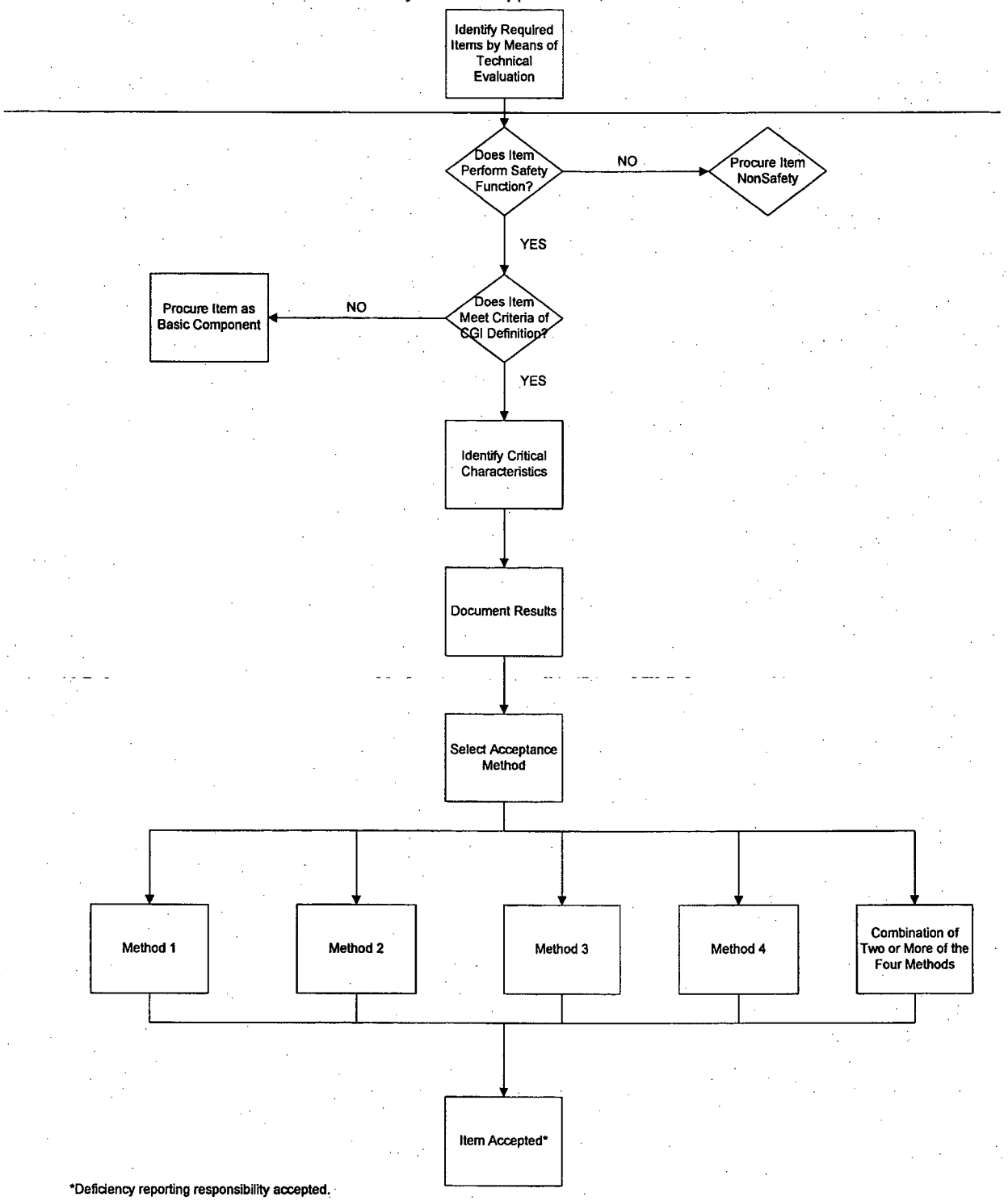
All testing at the Nutherm Test Laboratory is performed by technicians Certified Level II (minimum) in accordance with ANSI N45.2.6 and the requirements of the Nutherm Quality Assurance Program. All quantitative data is taken using measuring and test equipment (M&TE) which is calibrated under the Nutherm Quality Assurance Program, by calibration facilities which operate under Nutherm approved 10CFR50, Appendix B Quality Assurance programs. Standards used in performance of calibration are traceable to NIST. When no national standards exist, the basis for calibration is otherwise documented. In all cases, the accuracy of the M&TE used is equal to or greater than the accuracy requirement specified by the engineering department for the test. The description of the test equipment used is presented on the test data sheets.

Performance testing will be performed on the MSFIS systems to verify proper operation and compliance with the applicable sections of Wolf Creek specification J-105A. In addition to and/or as part of the Dedication testing, a Final Acceptance Test (FAT) will be performed on the supplied MSFIS control system. A detailed test procedure for FAT testing will be developed by Nutherm, in cooperation with CS Innovations, for approval by Wolf Creek prior to the start of testing.

DEPENDABILITY

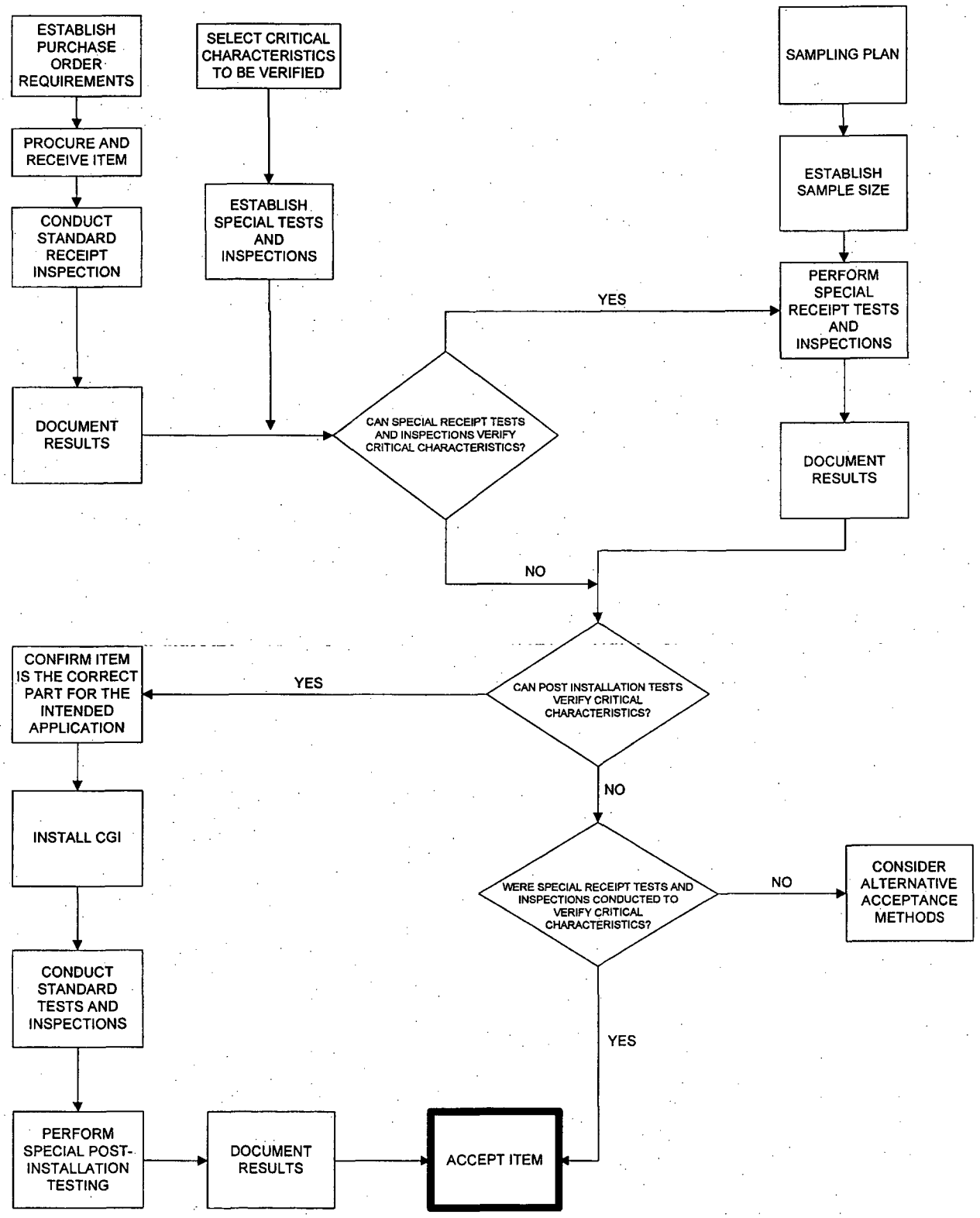
The Dependability category of critical characteristics is described in detail in EPRI TR-106439. These characteristics are difficult to verify through testing and inspection alone. Because built-in features can have a significant impact on the robustness of electronic devices, dedication activities will continue throughout the design and prototype phases following the life cycle approach. Various verification and validation steps with appropriate documentation will be performed at the different phases of the life cycle. To gain reasonable assurance in the dependability of the MSFIS system, a combination of inspections, vendor process reviews, verification and validation steps, design review, and product development and documentation review will be used to verify the critical characteristics listed in this plan.

Figure 1. Generic Process for acceptance of Commercial Grade Items Used in Safety Related Applications, Per EPRI NP-5652



*Deficiency reporting responsibility accepted.

FIGURE 2 Method 1 - Special Tests and Inspections



CS Innovations LLC letter 91000-00008, "Application for Withholding Proprietary Information from Public Disclosure"

CS INNOVATIONS LLC
CS INNOVATIONS
9150 E. DEL CAMINO, SUITE 110
SCOTTSDALE, AZ, 85256

Direct phone: 480-612-2040
Fax: 623-505-1055
e-mail: steen@cs-innovation.com

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555-0001

Our ref: 9100-00008
April 6th, 2007

APPLICATION FOR WITHHOLDING PROPRIETARY INFORMATION FROM PUBLIC DISCLOSURE

Subject: **6000-00010, "ALS Design Tools"** dated April 2007
(CS Innovations LLC 2006 Confidential and Proprietary)

The proprietary information for which withholding is being requested in the above referenced report is further identified in Affidavit 9100-00009 signed by the owner of the proprietary information, CS Innovations LLC. The affidavit, which accompanies this letter, sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR Section 2.390 of the Commission's regulations.

Accordingly, this letter authorizes the utilization of the accompanying affidavit by the Wolf Creek Nuclear Operating Corporation.

Correspondence with respect to the proprietary aspects of the application for withholding or the CSI affidavit should reference this letter, 9100-00008, and should be addressed to Steen D. Sorensen, President & CEO, CS Innovations LLC, 9150 E. Del Camino, Suite 110, Scottsdale, AZ, 85256.

Very truly yours,

Steen D. Sorensen
President & CEO

AFFIDAVIT

State of Arizona
County of Maricopa

Before me, the undersigned authority, personally appeared Steen D. Sorensen, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of CS Innovations LLC (CSI), and that the averments of fact set forth in this Affidavit are true and correct to the best of his knowledge, information, and belief:

Steen D. Sorensen, President & CEO

Sworn to and subscribed
before me this 12th day
of April, 2007

Notary Public

STEVEN STAMPS
Notary Public - Arizona
Maricopa County
My Commission Expires
October 31, 2009

(1) I am President & CEO, CS Innovations LLC (CSI), and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rule making proceedings, and am authorized to apply for its withholding on behalf of CSI.

(2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Commission's regulations and in conjunction with the CSI "Application for Withholding" accompanying this Affidavit.

(3) I have personal knowledge of the criteria and procedures utilized by CSI in designating information as a trade secret, privileged or as confidential commercial or financial information.

(4) Pursuant to the provisions of paragraph (b)(4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining the information sought to be withheld from public disclosure should be withheld.

(i) The information sought to be withheld from public disclosure is owned and been held in confidence by CSI.

(ii) The information is of a type customarily held in confidence by CSI and not customarily disclosure to the public. CSI has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determining when and whether to hold certain types of information in confidence. The application of that system and substance of that system constitutes CSI policy and provides the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

(a) The information reveals the distinguishing aspects of a process (or component structure, tool, method, etc.) where prevention of its use by any of CSI's competitors without license from CSI constitutes a competitive economic advantage over other companies.

(b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.) the application of which data secures a competitive economic advantage, e.g. by optimization or improved marketability.

(c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.

(d) It reveals costs or price information, production capacities, budget levels, or commercial strategies of CSI, its customers or suppliers.

(e) It reveals aspects of past, present, or future CSI or customer funded development plans and programs of potential commercial value to CSI.

(f) It contains patentable ideas, for which patent protection may be desirable.

There are sound policy reasons behind the CSI system which include the following:

(a) The use of such information by CSI gives CSI a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the CSI competitive position.

(b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the CSI ability to sell products and services involving the use of the information.

(c) Use by our competitor would put CSI at a competitive disadvantage by reducing his expenditure of resources at our expense.

(d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving CSI of a competitive advantage.

(e) The CSI capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.

(iii) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.390, it is to be received in confidence by the Commission.

(iv) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.

(v) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in 6000-00010, "ALS Design Tools " dated April 2007 (CS Innovations LLC 2006 Confidential and Proprietary). The information is provided in support of a submittal to the Commission, being transmitted by the Wolf Creek Nuclear Operating Corporation and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk.

This information is part of that which will enable CSI to:

(a) Provide a replacement MSFIS Controls for Wolf Creek Generating Station.

Further this information has substantial commercial value as follows:

(a) The information requested to be withheld reveals the distinguishing aspects of a methodology which was developed by CSI.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of CSI.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive CSI effort and the expenditure of a considerable sum of money.

In order for competitors of CSI to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

Further the deponent sayeth not.