

B. H. Whitley
Director
Regulatory Affairs

Southern Nuclear
Operating Company, Inc.
42 Inverness Center Parkway
Birmingham, AL 35242

Tel 205.992.7079
Fax 205.992.5296



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Southern Nuclear Operating Company
Vogtle Electric Generating Plant Units 3 and 4
Request for License Amendment and Exemption:
Qualified Data Processing System and Safety Display
Description Changes (LAR-16-020)

Ladies and Gentlemen:

Pursuant to 10 CFR 52.98(c) and in accordance with 10 CFR 50.90, Southern Nuclear Operating Company (SNC), the licensee for Vogtle Electric Generating Plant (VEGP) Units 3 and 4, requests an amendment to Combined License Numbers NPF-91 and NPF-92, for VEGP Units 3 and 4, respectively. The requested amendment requires changes to the UFSAR in the form of departures from the plant-specific DCD Tier 2 information and involves changes to plant-specific Tier 1 (and associated COL Appendix C) information and Tier 2* information.

The proposed changes update the Protection and Safety Monitoring System (PMS) design, specifically the description of the roles of the qualified data processing system (QDPS) and the safety displays. The proposed changes add Main Control Room (MCR) safety-related display divisions A and D to plant-specific Tier 1 (and associated COL Appendix C) and the UFSAR, and correct the name of the QDPS in the UFSAR by referring to the QDPS as a system, rather than a subsystem.

Enclosure 1 provides the description, technical evaluation, regulatory evaluation (including the Significant Hazards Consideration determination), and environmental considerations for the proposed changes in the License Amendment Request (LAR).

Enclosure 2 provides the background and supporting basis for the requested exemption.

Enclosure 3 provides the proposed changes to the licensing basis documents.

This letter contains no regulatory commitments.

In order to support the Vogtle Units 3 and 4 ITAAC schedule, SNC requests NRC staff review and approval of the license amendment no later than December 9, 2016. Approval by this date will allow sufficient time to implement licensing basis changes prior to closure of affected ITAAC activities. SNC expects to implement the proposed amendment within thirty days of approval. South Carolina Electric & Gas Company (SCE&G) has stated that the current requested approval date for Virgil. C. Summer Nuclear Station (VCSNS) Units 2 and 3 is July 28, 2017.

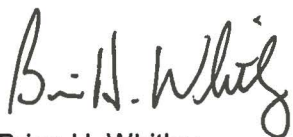
In accordance with 10 CFR 50.91, SNC is notifying the State of Georgia of this LAR by transmitting a copy of this letter and enclosures to the designated State Official.

Should you have any questions, please contact Mr. Christopher L. Whitfield at (205) 992-5071.

Mr. Brian H. Whitley states that: he is the Regulatory Affairs Director of Southern Nuclear Operating Company; he is authorized to execute this oath on behalf of Southern Nuclear Operating Company; and to the best of his knowledge and belief, the facts set forth in this letter are true.

Respectfully submitted,

SOUTHERN NUCLEAR OPERATING COMPANY



Brian H. Whitley



BHW/CLW/ljs

Sworn to and subscribed before me this 9th day of September, 2016

Notary Public: Lisa Myrick Spears

My commission expires: June 18, 2019

- Enclosures: 1) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Request for License Amendment: Qualified Data Processing System and Safety Display Description Changes (LAR-16-020)
- 2) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Exemption Request: Qualified Data Processing System and Safety Display Description Changes (LAR-16-020)
- 3) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Proposed Changes to the Licensing Basis Documents (LAR-16-020)

cc:

Southern Nuclear Operating Company / Georgia Power Company

Mr. S. E. Kuczynski (w/o enclosures)

Mr. M. D. Rauckhorst

Mr. D. G. Bost (w/o enclosures)

Mr. M. D. Meier (w/o enclosures)

Mr. D. H. Jones (w/o enclosures)

Ms. K. D. Fili (w/o enclosures)

Mr. D. L. McKinney (w/o enclosures)

Mr. T.W. Yelverton (w/o enclosures)

Mr. B. H. Whitley

Mr. C. R. Pierce

Mr. D. L. Fulton

Mr. M. J. Yox

Mr. J. C. Haswell

Mr. T. R. Takats

Mr. W. A. Sparkman

Mr. J. P. Redd

Ms. A. C. Chamberlain

Document Services RTYPE: VND.LI.L00

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Nuclear Regulatory Commission

Ms. C. Haney (w/o enclosures)

Mr. S. Lee (w/o enclosures)

Mr. L. Burkhart (w/o enclosures)

Ms. J. Dixon-Herrity (w/o enclosures)

Mr. P. Kallan

Mr. C. Patel

Mr. W. C. Gleaves

Mr. B. M. Bovol

Ms. R. Reyes

Ms. M. A. Sutton

Mr. M. E. Ernestes

Mr. G. Khouri

Mr. J. D. Fuller

Ms. S. Temple

Ms. J. Uhle

Mr. T.E. Chandler

Ms. P. Braxton

Mr. T. Brimfield

Mr. M. Kowal

Mr. A. Lerch

State of Georgia

Mr. R. Dunn

Oglethorpe Power Corporation

Mr. M. W. Price
Mr. K. T. Haynes
Ms. A. Whaley

Municipal Electric Authority of Georgia

Mr. J. E. Fuller
Mr. S. M. Jackson

Dalton Utilities

Mr. T. Bundros

WECTEC

Ms. K. Stoner (w/o enclosures)
Mr. C. A. Castell

Westinghouse Electric Company, LLC

Mr. R. Easterling (w/o enclosures)
Mr. J. W. Crenshaw (w/o enclosures)
Mr. C. D. Churchman (w/o enclosures)
Mr. L. Woodcock
Mr. P. A. Russ
Mr. A. F. Dohse
Mr. M. Y. Shaqqo

Other

Mr. J. E. Hesler, Bechtel Power Corporation
Ms. L. A. Matis, Tetra Tech NUS, Inc.
Dr. W. R. Jacobs, Jr., Ph.D., GDS Associates, Inc.
Mr. S. Roetger, Georgia Public Service Commission
Ms. S. W. Kernizan, Georgia Public Service Commission
Mr. K. C. Greene, Troutman Sanders
Mr. S. Blanton, Balch Bingham
Mr. R. Grumbir, APOG
Mr. N. R. Kellenberger, South Carolina Electric & Gas Company
Mr. D. Kersey, South Carolina Electric & Gas Company
Mr. B. Kitchen, Duke Energy
Mr. S. Franzone, Florida Power & Light

Southern Nuclear Operating Company

ND-16-1573

Enclosure 1

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Request for License Amendment:

Qualified Data Processing System and Safety Display Description Changes

(LAR-16-020)

(Enclosure 1 consists of 15 pages, including this cover page)

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Enclosure 1

Request for License Amendment: Qualified Data Processing System and Safety Display
Description Changes (LAR-16-020)

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Enclosure 1

Request for License Amendment: Qualified Data Processing System and Safety Display Description Changes (LAR-16-020)

Pursuant to 10 CFR 52.98(c) and in accordance with 10 CFR 50.90, Southern Nuclear Operating Company (SNC, or the "Licensee") hereby requests an amendment to Combined License (COL) Nos. NPF-91 and NPF-92 for Vogtle Electric Generating Plant (VEGP) Units 3 and 4, respectively.

1. SUMMARY DESCRIPTION

The requested amendment proposes changes to the design as described in the Combined License (COL) and Updated Final Safety Analysis Report (UFSAR) concerning the protection and safety monitoring system (PMS) design, specifically the description of the roles of the qualified data processing system (QDPS) and the safety displays. The proposed changes add Main Control Room (MCR) safety-related display Divisions A and D to COL Appendix C (and plant-specific Tier 1) and UFSAR, and correct the name of the QDPS in the UFSAR to refer to it as a system, rather than a subsystem.

The requested amendment requires changes to the UFSAR in the form of departures from the plant-specific DCD Tier 2 information (as detailed in Section 2) and involves changes to plant-specific Tier 1 information (and corresponding changes to the COL Appendix C) and Tier 2* information. This enclosure requests approval of the license amendment necessary to implement the Tier 2, Tier 2*, and COL Appendix C changes. Enclosure 2 requests the exemption necessary to implement the changes to the plant-specific Tier 1 information.

2. DETAILED DESCRIPTION

Design Description

As described in UFSAR subsection 7.1.1, the PMS is a digital Instrumentation and Control (I&C) system that detects off-normal conditions and actuates the appropriate safety-related functions necessary to achieve and maintain the plant in a safe shutdown condition. The PMS controls safety-related components in the plant that are operated from the main control room or remote shutdown workstation. In addition, the PMS provides the equipment necessary to monitor plant safety-related functions during and following an accident.

As described in WCAP-16675-P (Proprietary) and WCAP-16675-NP (Non-Proprietary), "AP1000 Protection and Safety Monitoring System Architecture Technical Report," the QDPS provides data to support the safety-related display of select parameters in the MCR. Two QDPS subsystems are provided in the PMS architecture. One QDPS subsystem is located in Division B and the other QDPS subsystem is located in Division C. The divisions are physically separated and electrically isolated from each other. The QDPS divisions are powered from the Class 1E dc and uninterruptible power supply system (UPS) for 72 hours after a loss of all ac power (station blackout). After 72 hours, the ancillary diesel generators provide power for the QDPS subsystems. The QDPS is qualified for a post-accident monitoring time of two weeks.

The functions performed by the QDPS are:

- Provide safety-related data processing
- Provide the operator with sufficient operational data to support post-accident monitoring in the event of a failure of the other display systems
- Provide data to the Real-Time Data Network for use by other systems in the plant, via the high speed data network and the Maintenance Test Panel (MTP)
- Process data for MCR display, and to meet Regulatory Guide 1.97 requirements

Plant data obtained from sensors and other PMS divisions is processed by the QDPS and provided to the safety displays, which provide the visual interface to the operators. The Division A, B, C, and D safety displays are a subsystem of the PMS. The functions performed by the safety displays are:

- Provide operator control of safety system blocks and resets in accordance with the functional requirements documents and functional logic diagrams
- Provide manual control of safety components with onerous consequences
- Display values of safety system parameters
- Provide trending for pre-defined safety system parameters
- Provide high-level status of the health of the safety system
- Provide the operator with the ability to perform periodic calibration of the Nuclear Instrumentation Subsystem (NIS)
- Provide display of QDPS variables

The safety displays are located in the MCR in environmental zone 3, which is a mild environment. All four divisions of the safety displays are qualified for a post-accident monitoring time of two weeks.

Supporting Technical Details

WCAP-16675-P (Proprietary) and WCAP-16675-NP (Non-Proprietary), UFSAR Subsections 1.9.2 2(v), 1.9.3 (2)(xix), 1.9.4.2.1 I.D.5(2), 7.5.4, 18.8, 18.8.3.2, 18.12.2, and UFSAR Tables 3I.6-2, 3.11-1, 14.3-6 and 17.4-1 contain descriptions of QDPS displays or descriptions of data being displayed by the QDPS. The QDPS is not a display and does not itself display data, rather the Division B and Division C QDPS are processing systems that provide the data to be displayed by the Division A, B, C, and D safety displays. The proposed changes revise the roles of the QDPS and safety displays to describe the QDPS as a separate processing system that provides data to the PMS safety displays.

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UFSAR Subsection 1.9.4.2.1 I.D.5(2) states that the verification and validation (V&V) of the QDPS complies with the process described in Section 18.11. The V&V process documented in the references listed in UFSAR Subsection 18.11.2 does not specifically check the defined aspects of the QDPS itself; rather the V&V process checks the adequacy of the safety displays, which receive post-accident monitoring data from the QDPS.

COL Appendix C (and corresponding plant-specific Tier 1) Table 2.5.2-1 identifies the PMS equipment and corresponding seismic category, safety class, and harsh environment qualification requirements. The equipment listed in COL Appendix C (and corresponding plant-specific Tier 1) Table 2.5.2-1 is subject to Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) for:

- Verification of the Design Commitments associated with the seismic design aspects of the PMS seismic Category I equipment (ITAAC 2.5.02.02.i, 2.5.02.02.ii, and 2.5.02.02.iii)
- Verification that the Class 1E equipment can withstand electrical surges, electromagnetic interference, radio frequency interference, and electrostatic discharge conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function (ITAAC 2.5.02.03)
- Verification that the Class 1E equipment can withstand the room ambient temperature, humidity, pressure, and mechanical vibration conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function (ITAAC 2.5.02.04)
- Verification that the Class 1E equipment is powered from its respective Class 1E division (ITAAC 2.5.02.05a).

Division B and Division C of the MCR safety-related displays are included in Tier 1 Table 2.5.2-1 and thus are included in the scope of the ITAAC listed above. However, Division A and Division D of the MCR safety-related displays are not currently included in Table 2.5.2-1. To require that all divisions of the safety-related displays are verified by the appropriate PMS ITAAC, the proposed changes revise the listing of PMS equipment as identified in COL Appendix C (and plant-specific Tier 1) Table 2.5.2-1 to add Divisions A and D of the MCR safety-related displays.

UFSAR Table 3.11-1 identifies the environmentally qualified electrical and mechanical equipment. In addition to listing the qualification program applicable to each piece of equipment, UFSAR Table 3.11-1 identifies the equipment's function [combination of Engineered Safety Features (ESF), Post-Accident Monitoring System (PAMS), or Reactor Trip (RT)] and required post-accident operating time. UFSAR Table 3I.6-2 identifies the potential high frequency sensitive AP1000 safety-related equipment. Divisions A, B, C and D of the safety displays are not currently listed in UFSAR Tables 3.11-1 or 3I.6-2. However, Divisions B and C of "QDPS MCR Display Units" are currently listed in UFSAR Tables 3I.6-2 and 3.11-1. As previously stated, the Division B and Division C QDPS contain no display units. To resolve this inconsistency, the proposed changes replace Division B and Division

C of the “QDPS MCR Display Units” with Divisions A, B, C and D of the safety displays in the listing of PMS equipment identified in UFSAR Tables 3.11-1 and 3I.6-2.

The licensing basis is inconsistent with regard to the use of the name for the QDPS. UFSAR Subsections 7.1.2.5 and 7.5.4 state that the QDPS is a “subsystem”, however the QDPS is referred to as a system in COL Appendix C (and plant-specific Tier 1) Section 3.2 and UFSAR Subsections 1.9.3 (2)(v), 1.9.3 (2)(xix), 1.9.4.2.1 I.D.5(2), 18.2.2.2, 18.8, 18.8.1.8, 18.8.3.2, and 18.12.2 and the detailed PMS design. The QDPS is a system which contains two QDPS subsystems, one in Division B and one in Division C. Since UFSAR Subsections 7.1.2.5 and 7.5.4 are referring to the QDPS as a whole, the appropriate description of the QDPS is to refer to it as a system. Therefore, plant-specific Tier 2 information in UFSAR Subsection 7.1.2.5 and Subsection 7.5.4 is revised implement this change.

Description of Changes to Current Licensing Basis Documents

COL Appendix C (and plant-specific Tier 1) changes:

- Section 2.5.2 is revised to indicate that the PMS has four divisions of safety-related post-accident parameter displays.
- Table 2.5.2-1 is revised to add entries for the Division A and Division D MCR safety-related displays.
- Section 3.2 is revised to remove the QDPS as a human-system interface (HSI) resource and refer to the safety-related displays as an HSI resource.

UFSAR Tier 2* changes:

- UFSAR Subsection 18.8.3.2 is revised to correct the description of the safety displays by removing reference to the QDPS.
- UFSAR Subsection 18.12.2 is revised to correct the description of the safety displays by removing reference to the QDPS.

UFSAR Tier 2 changes:

- UFSAR Table 1.6-1 is revised to indicate WCAP-16675-P (Proprietary) and WCAP-16675-NP (Non-Proprietary) are modified by changes provided in UFSAR Appendix 7A.
- UFSAR Subsection 1.9.3 (2)(v) is revised to more accurately describe the role of the PMS safety displays.
- UFSAR Subsection 1.9.3 (2)(xix) is revised to more accurately describe the roles of the QDPS and the safety displays.
- UFSAR Subsection 1.9.4.2.1 I.D.5(2) is revised to more accurately describe the safety displays. In addition, UFSAR Subsection 1.9.4.2.1 I.D.5(2) is revised to indicate that the safety displays are subjected to verification and validation.

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- UFSAR Subsection 1.9.4.2.4 HF5.2 is revised to more accurately describe the roles of the QDPS and the safety displays.
- UFSAR Table 3.11-1 is revised to replace Division B and Division C of the QDPS MCR display units with Division A, B, C, and D of the qualified safety displays.
- UFSAR Table 3I.6-2 is revised to replace Division B and Division C of the QDPS MCR display units with Division A, B, C, and D of the qualified safety displays.
- UFSAR Subsection 7.1.2.5 is revised to identify the QDPS as a system.
- UFSAR Subsection 7.1.2.12 is revised to identify the safety-related display instrumentation as part of the PMS safety display subsystem, and to more accurately reference the location of the associated equipment descriptions.
- UFSAR Subsection 7.1.7 is revised to indicate WCAP-16675-P (Proprietary) and WCAP-16675-NP (Non-Proprietary) are modified by changes provided in UFSAR Appendix 7A.
- UFSAR Table 7.5-1, Note 12 is revised to refer to the “qualified system” as the “QDPS”.
- UFSAR Subsection 7.5.4 is revised to more accurately describe the roles of the QDPS and the safety displays and to include a description of the safety displays and a reference to WCAP-16675-P (Proprietary) and WCAP-16675-NP (Non-Proprietary) Section 4.1. In addition, UFSAR Subsection 7.5.4 is revised to refer to the QDPS as a system.
- UFSAR Appendix 7A is revised to provide updates to WCAP-16675-P (Proprietary) and WCAP-16675-NP (Non-Proprietary) to more accurately describe the QDPS.
- UFSAR Table 14.3-6 (reference to Section 7.1.2.5) is revised to indicate the PMS has two divisions of safety-related post-accident parameter data processing equipment.
- UFSAR Table 14.3-6 (reference to Section 7.5.4) is revised to indicate the PMS has four divisions of safety-related post-accident parameter display.
- UFSAR Table 17.4-1 is revised to more accurately describe the safety displays by removing reference to the QDPS.
- UFSAR Subsection 18.2.2.2 is revised to remove the QDPS as an HSI resource and refer to the PMS safety displays as an HSI resource.
- UFSAR Subsection 18.8 is revised to remove the QDPS as an HSI resource and refer to the PMS safety displays as an HSI resource. In addition, UFSAR Section 18.8 is revised to more accurately describe the QDPS and safety displays.
- UFSAR Subsection 18.8.1.8 is revised to remove the QDPS as an HSI resource and refer to the safety-related displays as an HSI resource.

- UFSAR Subsection 18.8.3.2 is revised to replace the QDPS visual display units with the PMS safety displays as being located in the main control area.

3. TECHNICAL EVALUATION

The QDPS provides data to support the safety-related display of select parameters in the MCR. Plant data obtained from sensors and other PMS divisions is processed by the Division B and Division C QDPS and provided to the Division A, B, C, and D safety displays, which provide the visual interface to the operators in the MCR. Therefore, the QDPS itself is not a display; rather it is the processing system that provides the necessary data to be displayed by the qualified safety displays. The proposed changes revise the design as described in the UFSAR [including incorporated by reference document WCAP-16675-P (Proprietary) and WCAP-16675-NP (Non-Proprietary)] and COL Appendix C (and corresponding plant-specific Tier 1) to clarify that the QDPS and safety displays are not one in the same. The proposed changes also revise the description of the V&V identified in UFSAR Subsection 1.9.4.2.1 I.D.5(2) to indicate that the safety displays are subject to verification and validation. The V&V process documented in the references within UFSAR Subsection 18.11.2 do not specifically check the defined aspects of the QDPS itself; rather the V&V process checks the adequacy of the safety displays, which receive post-accident monitoring data from the QDPS. In addition, the proposed changes revise the COL Appendix C (and corresponding plant-specific Tier 1) Table 2.5.2-1, and UFSAR Tables 3.11-1 and 3I.6-2 to add Division A and Division D safety displays. The proposed changes add the requirement that the Division A and Division D safety displays are verified by the appropriate PMS system-based ITAAC, and identify all four divisions of the safety displays' qualification requirements in the ITAAC. The proposed changes add the Division A and Division D safety displays to the scope of ITAAC 2.5.02.02.i, 2.5.02.02.ii, 2.5.02.02.iii, 2.5.02.03, 2.5.02.04, and 2.5.02.05a. However, the proposed changes do not involve any changes to the ITAAC Design Commitment, Inspections, Tests, Analyses, or Acceptance Criteria.

The proposed changes to revise the roles of the QDPS and safety displays, and the addition of the safety displays to the COL Appendix C (and corresponding plant-specific Tier 1) Table 2.5.2-1 and UFSAR Tables 3I.6-2 and 3.11-1 would not adversely affect any safety-related structure, system, or component (SSC), function, design analysis or safety analysis, and would not adversely affect the function of any instrumentation signal or display parameter. Therefore, the requested changes would not result in a decrease in the level of safety otherwise provided by the design.

The QDPS and safety display functions will continue to meet the current licensing basis and acceptance criteria. The proposed changes do not adversely affect the capability of the system to provide monitoring of plant conditions following an accident that includes core damage. The proposed changes do not adversely affect the operators' ability to prevent, diagnose or properly respond to accidents. In addition, the proposed changes to the description of the role of the QDPS in relation to the role of the safety displays do not adversely affect the automatic indication of the status (i.e., bypassed or operable) of safety systems. The proposed changes do not change any equipment qualification or fission product barrier. The addition of Division A and Division D of the qualified safety displays to

UFSAR Table 3.11-1 identifies the qualification requirements for these displays in the UFSAR, and the addition of Division A and Division D of the qualified safety displays to COL Appendix C (and plant-specific Tier 1) Table 2.5.2-1 adds the requirement that the displays are verified by the appropriate PMS system-level ITAAC. The changes do not result in a new failure mode, malfunction or sequence of events that could affect safety-related or nonsafety-related equipment. This activity would not allow for a new fission product release path, result in a new fission product barrier failure mode, or create a new sequence of events that would result in significant fuel cladding failures. The proposed changes are unrelated to any aspects of plant construction or operation that would introduce any changes to effluent types (e.g., effluents containing chemicals or biocides, sanitary system effluents, and other effluents) or affect any plant radiological or non-radiological effluent release quantities. Furthermore, the proposed changes would not diminish the functionality of any design or operational features that are credited with controlling the release of effluents during plant operation. The proposed amendment does not affect any accident evaluated in the UFSAR.

The proposed changes would not affect any safety-related design code, function, design analysis, safety analysis input or result, or design/safety margin. No safety analysis or design basis acceptance limit/criterion is challenged or exceeded by the requested changes, thus, no margin of safety is reduced.

The proposed changes do not affect plant radiation, and controls under 10 CFR 20 preclude a significant increase in occupational radiation exposure. Consequently, these changes have no effect on individual or cumulative occupational radiation exposure during plant operation.

4. REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

10 CFR 52.98(f) requires NRC approval for any modification to, addition to, or deletion from the terms and conditions of a COL. This activity involves a departure from plant-specific Tier 1 information; therefore, this activity requires a proposed amendment to the COL. Accordingly, NRC approval is required prior to making the plant-specific changes in this license amendment request.

10 CFR Part 52, Appendix D, VIII.B.6 and VIII.B.5.a, require prior NRC approval for departure from Tier 2* information and for Tier 2 information departures that involve changes to Tier 1 or Tier 2* information, respectively. The proposed amendment includes changes to UFSAR Tier 2 information that involve change to Tier 1 and Tier 2* information. Therefore, a license amendment request (LAR) (as supplied herein) is required.

10 CFR 50 Appendix A, General Design Criteria (GDC) 13, *Instrumentation and Control*, states that, "Instrumentation shall be provided to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure adequate safety, including those variables and systems that can affect the fission process, the integrity

of the reactor core, the reactor coolant pressure boundary, and the containment and its associated systems. Appropriate controls shall be provided to maintain these variables and systems within prescribed operating ranges.” The proposed changes revise the design as described in the UFSAR regarding the description of the QDPS and its relationship to the safety displays. The proposed changes do not introduce any new display parameters, or adversely affect the function of any instrumentation signal or existing display parameter. The proposed changes also involve the addition of Division A and Division D of the safety-related displays to UFSAR Table 3.11-1, 3I.6-2, and COL Appendix C (and plant-specific Tier 1) Table 2.5.2-1. The proposed addition of Division A and Division D of the displays identifies the qualification requirements in the UFSAR for all 4 divisions of the safety displays, and provides the requirement that appropriate PMS ITAAC are applied to all divisions of safety displays. The proposed addition of Division A and Division D of the safety displays does not introduce any new display parameters, or adversely affect the function of any instrumentation signal or existing display parameter. Therefore, the requirements of 10 CFR 50 Appendix A, GDC 13 are satisfied.

10 CFR 50 Appendix A, GDC 20, *Protection System Functions*, states that, “The protection system shall be designed (1) to initiate automatically the operation of appropriate systems, including the reactivity control systems, to assure that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences and (2) to sense accident conditions and to initiate the operation of systems and components important to safety.” The proposed changes do not change any capability or function of the PMS to automatically initiate the operation of appropriate systems, including the reactivity control systems. In addition, the proposed changes revise the design as described in the UFSAR regarding the description of the roles of the QDPS and the safety displays to clarify that the QDPS is the processing system that provides input to the safety displays, and to clarify that the QDPS is itself not a safety-related display. The proposed changes do not adversely affect the capability of the system to sense accident conditions and to initiate the operation of systems and components important to safety. Therefore, the requirements of 10 CFR 50 Appendix A, GDC 20 are satisfied.

10 CFR 50 Appendix A, GDC 22, *Protection System Independence*, states that, “The protection system shall be designed to assure that the effects of natural phenomena, and of normal operating, maintenance, testing, and postulated accident conditions on redundant channels do not result in the loss of the protection function or shall be demonstrated to be acceptable on some other defined basis. Design techniques, such as functional diversity or diversity in component design and principles of operation, shall be used to the extent practical to prevent loss of the protection function.” The proposed changes do not adversely impact the electrical independence or the physical separation characteristics of the PMS. Changing the design as described in the UFSAR regarding the description of the QDPS and its relationship to the safety displays does not alter the design of any isolation devices utilized by the PMS. The Division B QDPS provides input to the Division B and Division D safety displays, whereas the Division C QDPS provides input to the Division C and Division A safety displays. Divisions B and C of the QDPS are electrically isolated and physically separated from each other. Therefore, the requirements of 10 CFR 50 Appendix A, GDC 22 are satisfied.

10 CFR 50.34(f), *Additional TMI-related requirements*, paragraph (v) requires that the plant provide automatic indication of the bypassed and operable status of safety systems. The proposed changes revise the description of the roles the QDPS and the PMS safety displays to describe the QDPS as not being a display, rather as the processing system that provides the required post-accident monitoring data to the safety displays. In addition, the proposed changes add Division A and Division D of the safety displays to COL Appendix C (and plant-specific Tier 1) Table 2.5.2-1 and UFSAR Tables 3.11-1 and 3I.6-2. The proposed changes do not adversely affect the indication of any bypassed and operable status of safety systems. Therefore, the requirements of 10 CFR 50.34(f) paragraph (v) are satisfied.

10 CFR 50.34(f), *Additional TMI-related requirements*, paragraph (xix) requires that the plant provide instrumentation adequate for monitoring plant conditions following an accident that includes core damage. The proposed changes revise the description of the roles between the QDPS and the PMS safety displays to describe the QDPS as not being a display, rather as the processing system that provides the required post-accident monitoring data to the safety displays. In addition, the proposed changes add Division A and Division D of the safety displays to COL Appendix C (and plant-specific Tier 1) Table 2.5.2-1 and UFSAR Tables 3.11-1 and 3I.6-2. The addition of Division A and D of the safety displays, and the revision of the description of the QDPS in relation to the safety displays, does not adversely affect the function of the Division B and Division C QDPS to process data obtained from plant sensors and other PMS divisions and provide the processed data to qualified safety related displays located in the MCR. The proposed changes do not adversely impact the function of the safety displays to display the data obtained from the QDPS. Therefore, the requirements of 10 CFR 50.34(f) paragraph (xix) are satisfied.

4.2 Precedent

None.

4.3 Significant Hazards Consideration Determination

The requested amendment proposes changes to the design as described in the Combined License (COL) and Updated Final Safety Analysis Report (UFSAR) concerning the protection and safety monitoring system (PMS) design, specifically the description of the roles of the qualified data processing system (QDPS) and the safety displays. The proposed changes add Main Control Room (MCR) safety-related display Divisions A and D to COL Appendix C (and plant-specific Tier 1) and the UFSAR, and correct the name of the QDPS in the UFSAR to refer to it as a system, rather than a subsystem.

The requested amendment requires changes to the UFSAR in the form of departures from the plant-specific DCD Tier 2 information (as detailed in Section 2) and involves changes to plant-specific Tier 1 information (and corresponding changes to the COL Appendix C) and Tier 2* information. This enclosure requests approval of the license amendment necessary to implement the Tier 2, Tier 2*, and COL Appendix C changes. Enclosure 2 requests the exemption necessary to implement the changes to the plant-specific Tier 1 information.

The evaluation to determine whether or not a significant hazards consideration is involved with the proposed amendment was completed by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

4.3.1 Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

The proposed change to the roles of the qualified data processing system (QDPS) and safety-related displays, as well as the change to add Division A and Division D of the main control room (MCR) safety-related displays to the listing of PMS equipment, as identified in Combined License (COL) Appendix C (and plant-specific Tier 1) Table 2.5.2-1 and Updated Final Safety Analysis Report (UFSAR) Table 3.11-1 and 3I.6-2 do not alter any accident initiating component/system failure or event, thus the probabilities of the accidents previously evaluated are not affected.

The proposed changes do not adversely affect safety-related equipment or a radioactive material barrier, and this activity does not involve the containment of radioactive material.

The radioactive material source terms and release paths used in the safety analysis are unchanged, thus the radiological releases in the UFSAR accident analysis are not affected.

Therefore, the proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

4.3.2 Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

The proposed change to the roles of the QDPS and safety-related displays, as well as the change to add Division A and Division D of the MCR safety-related displays to the listing of PMS equipment, as identified in COL Appendix C (and plant-specific Tier 1) Table 2.5.2-1 and UFSAR Table 3.11-1 and 3I.6-2 does not create the possibility of a new or different kind of accident from any accident previously evaluated. The proposed changes do not alter the design or capability of any sensors which provide input to the QDPS. The functionality of the QDPS to process the input obtained from sensors into data to be sent to the safety displays is not affected by the proposed changes. The proposed changes do not affect any functions performed by the safety displays, nor do the proposed changes affect the capability of the safety displays to display the data received from the QDPS.

Therefore, the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

4.3.3 Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No

There is no safety-related structure, system or component (SSC) or function adversely affected by the proposed change to the roles of the QDPS and safety-related displays, nor by the change to add Division A and Division D of the MCR safety-related displays to the listing of Protection and Safety Monitoring System (PMS) equipment. The proposed changes do not alter the mechanisms by which system components are actuated or controlled. Because no safety analysis or design basis acceptance limit/criterion is challenged or exceeded by the proposed changes, no margin of safety is reduced.

Therefore, the proposed amendment does not involve a significant reduction in a margin of safety.

Based on the above, it is concluded that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

4.4 Conclusions

Based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public. The above evaluations demonstrate that the requested changes can be accommodated without an increase in the probability or consequences of an accident previously evaluated, without creating the possibility of a new or different kind of accident from any accident previously evaluated, and without a significant reduction in a margin of safety. Having arrived at negative declarations with regard to the criteria of 10 CFR 50.92, this assessment determined that the requested change does not involve a Significant Hazards Consideration.

5. ENVIRONMENTAL CONSIDERATIONS

The requested amendment proposes changes to the design as described in the Combined License (COL) and Updated Final Safety Analysis Report (UFSAR) concerning the protection and safety monitoring system (PMS) design, specifically the description of the roles of the qualified data processing system (QDPS) and the safety displays. The proposed changes add Main Control Room (MCR) safety-related display Divisions A and D to COL Appendix C (and plant-specific Tier 1) and UFSAR, and correct the name of the QDPS in the UFSAR to refer to it as a system, rather than a subsystem.

The requested amendment requires changes to the UFSAR in the form of departures from the plant-specific DCD Tier 2 information (as detailed in Section 2) and involves changes to

plant-specific Tier 1 information (and corresponding changes to the COL Appendix C) and Tier 2* information. This enclosure requests approval of the license amendment necessary to implement the Tier 2, Tier 2*, and COL Appendix C changes. Enclosure 2 requests the exemption necessary to implement the changes to the plant-specific Tier 1 information.

The Licensee has determined that the anticipated construction and operational effects of the proposed amendment meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9), in that:

(i) There is no significant hazards consideration.

As documented in Section 4.3, Significant Hazards Consideration Determination, of this license amendment request, an evaluation was completed to determine whether or not a significant hazards consideration is involved by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment." The Significant Hazards Consideration determined that (1) the proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated; (2) the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated; and (3) the proposed amendment does not involve a significant reduction in a margin of safety.

Therefore, it is concluded that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of "no significant hazards consideration" is justified.

(ii) There is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite.

The proposed change to the description of the roles of the QDPS and safety displays, and the proposed inclusion of Division A and Division D of the safety displays in COL Appendix C (and plant-specific Tier 1) Table 2.5.2-1 and UFSAR Tables 3.11-1 and 3I.6-2 is unrelated to any aspects of plant construction or operation that would introduce any changes to effluent types (e.g., effluents containing chemicals or biocides, sanitary system effluents, and other effluents) or affect any plant radiological or non-radiological effluent release quantities. Furthermore, the proposed changes do not affect any effluent release path or diminish the functionality of any design or operational features that are credited with controlling the release of effluents during plant operation.

Therefore, it is concluded that the proposed amendment does not involve a significant change in the types or a significant increase in the amounts of any effluents that may be released offsite.

(iii) There is no significant increase in individual or cumulative occupational radiation exposure.

The proposed change to the description of the roles of the QDPS and safety displays, and the proposed inclusion of Division A and Division D of the safety displays in COL Appendix C (and plant-specific Tier 1) Table 2.5.2-1 and UFSAR Tables 3.11-1 and 3I.6-2 does not affect or alter plant radiation zones (addressed in UFSAR Section 12.3) and controls under 10 CFR 20 preclude a significant increase in occupational radiation exposure.

Therefore, the proposed amendment does not involve a significant increase in individual or cumulative occupational radiation exposure.

Based on the above review of the proposed amendment, it has been determined that there are no anticipated construction and operational effects of the proposed amendment involving (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in the individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), an environmental impact statement or environmental assessment of the proposed amendment is not required.

6. REFERENCES

None.

Southern Nuclear Operating Company

ND-16-1573

Enclosure 2

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Exemption Request:

Qualified Data Processing System and Safety Display Description Changes

(LAR-16-020)

(This Enclosure consists of 8 pages, including this cover page)

1.0 Purpose

Southern Nuclear Operating Company (the Licensee) requests a permanent exemption from the provisions of 10 CFR 52, Appendix D, Section III.B, *Design Certification Rule for the AP1000 Design, Scope and Contents*, to allow a departure from elements of the certification information in Tier 1 of the generic AP1000 Design Control Document (DCD). The regulation, 10 CFR 52, Appendix D, Section III.B, requires an applicant or licensee referencing Appendix D to 10 CFR Part 52 to incorporate by reference and comply with the requirements of Appendix D, including certified information in DCD Tier 1. The Tier 1 information for which a plant-specific departure and exemption is being requested includes clarifications to the description of the roles of the qualified data processing system (QDPS) and the safety displays, and the addition of Divisions A and D of the safety displays to the list of equipment addressed by the system-level ITAAC.

This request for exemption provides the technical and regulatory basis to demonstrate that 10 CFR 52.63, §52.7, and §50.12 requirements are met and will apply the requirements of 10 CFR 52, Appendix D, Section VIII.A.4 to allow departures from generic Tier 1 information due to proposed clarifications to Tier 1 Subsection 2.5.2 and Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) Table 2.5.2-1 for the inspections of Main Control Room safety-related displays and Tier 1 Section 3.2 for the clarification of human-system interface (HSI) components.

2.0 Background

The Licensee is the holder of Combined License Nos. NPF-91 and NPF-92, which authorize construction and operation of two Westinghouse Electric Company AP1000 nuclear plants, named Vogtle Electric Generating Plant (VEGP) Units 3 and 4, respectively.

As described in UFSAR subsection 7.1.1, the Protection and Safety Monitoring System (PMS) is a digital Instrumentation and Control (I&C) system which detects off-normal conditions and actuates the appropriate safety-related functions necessary to achieve and maintain the plant in a safe shutdown condition. The PMS controls safety-related components in the plant that are operated from the main control room (MCR) or remote shutdown workstation. In addition, the PMS provides the equipment necessary to monitor the plant safety-related functions during and following an accident.

As described in WCAP-16675-P (Proprietary) and WCAP-16675-NP (Non-Proprietary), "AP1000 Protection and Safety Monitoring System Architecture Technical Report," the Qualified Data Processing System (QDPS) provides data to support the safety-related display of select parameters in the MCR. Two QDPS subsystems are provided in the PMS architecture. One QDPS subsystem is located in Division B and the other QDPS subsystem is located in Division C. The divisions are physically separated and electrically isolated from each other. The QDPS divisions are powered from the Class 1E dc and uninterruptible power supply system (UPS) for 72 hours after a loss of all ac power (station blackout). After 72 hours, the ancillary diesel generators provide power for the QDPS subsystems. The QDPS is qualified for a post-accident monitoring time of two weeks. Plant data obtained from sensors and other PMS divisions is processed by

the QDPS and provided to the safety displays, which provide the visual interface to the operators. The Divisions A, B, C, and D safety displays are a subsystem of the PMS.

WCAP-16675-P (Proprietary) and WCAP-16675-NP (Non-Proprietary), UFSAR Sections 1.9.3 (2)(v), 1.9.3 (2)(xix), 1.9.4.2.1 I.D.5(2), 7.5.4, 18.8, 18.8.3.2, 18.12.2, and UFSAR Tables 3I.6-2, 3.11-1, 14.3-6 and 17.4-1 contain descriptions of QDPS displays or descriptions of data being displayed by the QDPS. The QDPS is not a display and does not itself display data, rather the Division B and Division C QDPS is a processing system that provides the data to be displayed by the Divisions A, B, C, and D safety displays. The proposed changes revise the roles of the QDPS and Safety Displays to describe the QDPS as a separate processing system that provides data to the PMS safety displays.

Plant specific DCD Tier 1 Table 2.5.2-1 lists the PMS equipment and identifies for each piece of equipment the seismic category, safety class, and harsh environment qualification requirement. The equipment listed in this table is subject to Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) for:

- Verification of the Design Commitments associated with the seismic design aspects of the PMS seismic Category I equipment (Tier 1 Table 2.5.2-1, Items 2.i, 2.ii, and 2.iii)
- Verification that the Class 1E equipment can withstand electrical surges, electromagnetic interference, radio frequency interference, and electrostatic discharge conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function (Tier 1 Table 2.5.2-8 Item 3)
- Verification that the Class 1E equipment can withstand the room ambient temperature, humidity, pressure, and mechanical vibration conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function (Tier 1 Table 2.5.2-8 Item 4)
- Verification that the Class 1E equipment is powered from its respective Class 1E division (Tier 1 Table 2.5.2-8 Item 5.a).

Division B and division C of the MCR safety-related displays are included in Table 2.5.2-1 and thus are included in the scope of the ITAAC listed above. However, Division A and Division D of the MCR safety-related displays are not currently included in Table 2.5.2-1. To require that all divisions of the safety-related displays are verified by the appropriate PMS ITAAC, the proposed changes revise the listing of PMS equipment as identified in Table 2.5.2-1 to add Divisions A and D of the MCR safety-related displays. In addition, the proposed changes revise plant-specific DCD Tier 1 Section 2.5.2 to indicate that the PMS has four divisions of safety-related post-accident parameter displays.

3.0 Technical Justification of Acceptability

The proposed changes to revise the roles of the QDPS and safety displays, to revise the PMS design description in plant-specific DCD Tier 1 Section 2.5.2 to indicate that the PMS has four divisions of safety-related post-accident parameter displays, and the addition of the Division A and Division D safety displays to the corresponding plant-specific DCD Tier 1 Table 2.5.2-1 would not adversely affect any safety-related SSC, function, design analysis or safety analysis, and would not adversely affect the function of any instrumentation signal or display parameter. Therefore, the requested changes would not result in a decrease in the level of safety otherwise provided by the design.

The QDPS and safety display functions will continue to meet the current licensing basis and acceptance criteria. The proposed changes do not adversely affect the capability of the system to provide monitoring of plant conditions following an accident that includes core damage. The proposed changes do not adversely affect the operators' ability to prevent, diagnose or properly respond to accidents. In addition, the proposed changes to the description of the role of the QDPS in relation to the role of the safety displays do not adversely affect the automatic indication of the bypassed and operable status of safety systems. The proposed changes would not change any equipment qualification or fission product barrier. The addition of Division A and Division D of the qualified safety displays to plant-specific DCD Tier 1 Table 2.5.2-1 adds the requirement that the displays are verified by the appropriate PMS system-level ITAAC. The changes do not result in a new failure mode, malfunction or sequence of events that could affect safety-related or nonsafety-related equipment. This activity would not allow for a new fission product release path, result in a new fission product barrier failure mode, or create a new sequence of events that would result in significant fuel cladding failures. The proposed changes are unrelated to any aspects of plant construction or operation that would introduce any changes to effluent types (e.g., effluents containing chemicals or biocides, sanitary system effluents, and other effluents) or affect any plant radiological or non-radiological effluent release quantities. Furthermore, the proposed changes would not diminish the functionality of any design or operational features that are credited with controlling the release of effluents during plant operation.

Detailed technical justification supporting this request for exemption is provided in Section 3 of the associated License Amendment Request in Enclosure 1 of this letter.

4.0 Justification of Exemption

10 CFR Part 52, Appendix D, Section VIII.A.4 and 10 CFR 52.63(b)(1) govern the issuance of exemptions from elements of the certified design information for AP1000 nuclear power plants. Since SNC has identified changes to the Tier 1 information as discussed in Enclosure 1 of the accompanying License Amendment Request, an exemption from the certified design information in Tier 1 is needed.

10 CFR Part 52, Appendix D, and 10 CFR 50.12, §52.7, and §52.63 state that the NRC may grant exemptions from the requirements of the regulations provided six conditions are met: 1) the exemption is authorized by law [§50.12(a)(1)]; 2) the exemption will not present an undue risk to the health and safety of the public [§50.12(a)(1)]; 3) the exemption is consistent with the common defense and security [§50.12(a)(1)]; 4) special

circumstances are present [§50.12(a)(2)]; 5) the special circumstances outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption [§52.63(b)(1)]; and 6) the design change will not result in a significant decrease in the level of safety [Part 52, App. D, VIII.A.4].

The requested exemption satisfies the criteria for granting specific exemptions, as described below.

1. This exemption is authorized by law

The NRC has authority under 10 CFR 52.63, §52.7, and §50.12 to grant exemptions from the requirements of NRC regulations. Specifically, 10 CFR 50.12 and §52.7 state that the NRC may grant exemptions from the requirements of 10 CFR Part 52 upon a proper showing. No law exists that would preclude the changes covered by this exemption request. Additionally, granting of the proposed exemption does not result in a violation of the Atomic Energy Act of 1954, as amended, or the Commission's regulations.

Accordingly, this requested exemption is "authorized by law," as required by 10 CFR 50.12(a)(1).

2. This exemption will not present an undue risk to the health and safety of the public

The proposed exemption from the requirements of 10 CFR 52, Appendix D, Section III.B would allow changes to elements of the plant-specific Tier 1 DCD to depart from the AP1000 certified (Tier 1) design information. The plant-specific DCD Tier 1 will continue to reflect the approved licensing basis for VEGP Units 3 and 4, and will maintain a consistent level of detail with that which is currently provided elsewhere in Tier 1 of the DCD. Therefore, the affected plant-specific DCD Tier 1 ITAAC will continue to serve its required purpose.

The clarification for the roles of the QDPS and safety displays, does not represent any adverse impact to the design function of the PMS or the equipment or components therein and will continue to protect the health and safety of the public in the same manner. The clarification for the roles of the QDPS and safety displays does not introduce any new industrial, chemical, or radiological hazards that would represent a public health or safety risk, nor does it modify or remove any design or operational controls or safeguards intended to mitigate any existing on-site hazards. Furthermore, the proposed change would not allow for a new fission product release path, result in a new fission product barrier failure mode, or create a new sequence of events that would result in fuel cladding failures. Accordingly, this change does not present an undue risk from any existing or proposed equipment or systems.

Therefore, the requested exemption from 10 CFR 52, Appendix D, Section III.B would not present an undue risk to the health and safety of the public.

3. The exemption is consistent with the common defense and security

The requested exemption from the requirements of 10 CFR 52, Appendix D, Section III.B would allow the licensee to depart from elements of the plant-specific DCD Tier 1 design information. The proposed exemption does not alter the design, function, or operation of any structures or plant equipment that are necessary to maintain a safe and secure status of the plant. The requested exemption has no impact on plant security or safeguards procedures.

Therefore, the requested exemption is consistent with the common defense and security.

4. Special circumstances are present

10 CFR 50.12(a)(2) lists six “special circumstances” for which an exemption may be granted. Pursuant to the regulation, it is necessary for one of these special circumstances to be present in order for the NRC to consider granting an exemption request. The requested exemption meets the special circumstances of 10 CFR 50.12(a)(2)(ii). That subsection defines special circumstances as when “Application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule.”

The rule under consideration in this request for exemption is 10 CFR 52, Appendix D, Section III.B, which requires that a licensee referencing the AP1000 Design Certification Rule (10 CFR Part 52, Appendix D) shall incorporate by reference and comply with the requirements of Appendix D, including Tier 1 information. The VEGP Units 3 and 4 COLs reference the AP1000 Design Certification Rule and incorporate by reference the requirements of 10 CFR Part 52, Appendix D, including Tier 1 information. The underlying purpose of Appendix D, Section III.B is to describe and define the scope and contents of the AP1000 design certification, and to require compliance with the design certification information in Appendix D.

The changes proposed by the requested exemption clarify the roles of the QDPS and safety displays, for the purposes of performing ITAAC that verify the PMS is constructed in accordance with the certified design.

The proposed clarification for the roles of the QDPS and safety displays, discussed in Section 2.0, maintains the required design functions of roles for the QDPS and safety displays to display safety-related post-accident parameters. The proposed changes do not affect any function or feature used for the prevention and mitigation of accidents or their safety analyses. No safety-related structure, system, component (SSC) or function is involved. The proposed changes do not involve nor interface with any SSC accident initiator or initiating sequence of events related to the accidents evaluated and therefore do not have an adverse effect on any SSC’s design function. Accordingly, this exemption from the certification information will enable the Licensee to safely construct and operate the AP1000 facility consistent with the design certified by the NRC in 10 CFR 52, Appendix D.

Therefore, special circumstances are present, because application of the current generic certified design information in Tier 1 as required by 10 CFR Part 52, Appendix D, Section

III.B, in the particular circumstances discussed in this request is not necessary to achieve the underlying purpose of the rule.

5. The special circumstances outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption.

Based on the nature of the changes to the plant-specific Tier 1 information and the understanding that these changes support the design functions associated with the roles for the QDPS and safety displays, it is expected that this exemption may be requested by other AP1000 licensees and applicants. However, a review of the reduction in standardization resulting from the departure from the standard DCD determined that even if other AP1000 licensees and applicants do not request this same departure, the special circumstances will continue to outweigh any decrease in safety from the reduction in standardization because the key design functions of the system associated with this request will continue to be maintained. Furthermore, the justification provided in the license amendment request and this exemption request and the associated mark-ups demonstrate that there is a limited change from the standard information provided in the generic AP1000 DCD, which is offset by the special circumstances identified above.

Therefore, the special circumstances associated with the requested exemption outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption.

6. The design change will not result in a significant decrease in the level of safety.

The exemption revises the plant-specific DCD Tier 1 information by clarifying the design functions associated with the roles for the QDPS and safety displays as discussed in Section 2.0. The clarification of the roles for the QDPS and safety displays do not change the design requirements of the PMS, because these functions continue to be met and the associated ITAAC continue to verify that the affected PMS equipment is constructed and installed in accordance with the approved design. There is no reduction in the level of safety.

5.0 Risk Assessment

A risk assessment was not determined to be applicable to address the acceptability of this proposal.

6.0 Precedent Exemptions

None

7.0 Environmental Consideration

The Licensee requests a departure from elements of the certified information in Tier 1 of the generic AP1000 DCD. The Licensee has determined that the proposed departure would require a permanent exemption from the requirements of 10 CFR 52, Appendix D, Section III.B, *Design Certification Rule for the AP1000 Design, Scope and Contents*, with respect to installation or use of facility components located within the restricted area, as defined in 10 CFR Part 20, or which changes an inspection or a surveillance requirement; however, the Licensee evaluation of the proposed exemption has determined that the proposed exemption meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9).

Based on the above review of the proposed exemption, the Licensee has determined that the proposed activity does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in the individual or cumulative occupational radiation exposure. Accordingly, the proposed exemption meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), an environmental impact statement or environmental assessment of the proposed exemption is not required.

Specific details of the environmental considerations supporting this request for exemption are provided in Section 5 of the associated License Amendment Request provided in Enclosure 1 of this letter.

8.0 Conclusion

The proposed changes to Tier 1 are necessary to clarify the description of the roles of the qualified data processing system (QDPS) and the safety displays and to add Divisions A and D of the safety displays to Table 2.5.2-1. The exemption request meets the requirements of 10 CFR 52.63, *Finality of design certifications*, 10 CFR 52.7, *Specific exemptions*, 10 CFR 50.12, *Specific exemptions*, and 10 CFR 52 Appendix D, *Design Certification Rule for the AP1000*. Specifically, the exemption request meets the criteria of 10 CFR 50.12(a)(1) in that the request is authorized by law, presents no undue risk to public health and safety, and is consistent with the common defense and security. Furthermore, approval of this request does not result in a significant decrease in the level of safety, satisfies the underlying purpose of the AP1000 Design Certification Rule, and does not present a significant decrease in safety as a result of a reduction in standardization.

9.0 References

None

Southern Nuclear Operating Company

ND-16-1573

Enclosure 3

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Proposed Changes to the Licensing Basis Documents

(LAR-16-020)

Note:

Added text is shown as [Blue Underline](#)

Deleted text is shown as ~~Red Strikethrough~~

Omitted text is shown as three asterisks (***)

(Enclosure 2 consists of 16 pages, including this cover page)

Appendix C (and plant-specific Tier 1) Section 2.5, Subsection 2.5.2, “Protection and Safety Monitoring System”

Revise Subsection 2.5.2 to indicate that the PMS has four divisions of safety-related post-accident parameter displays.

2.5.2 Protection and Safety Monitoring System

Design Description

The protection and safety monitoring system (PMS) initiates reactor trip and actuation of engineered safety features in response to plant conditions monitored by process instrumentation and provides safety-related displays. The PMS has the equipment identified in Table 2.5.2-1. The PMS has four divisions of Reactor Trip and Engineered Safety Features Actuation, and ~~two~~ four divisions of safety-related post-accident parameter displays. The functional arrangement of the PMS is depicted in Figure 2.5.2-1 and the component locations of the PMS are as shown in Table 2.5.2-9.

* * *

Appendix C Section 2.5, Table 2.5.2-1, “PMS Equipment Name and Classification”

Revise Table 2.5.2-1 to add Division A and Division B for safety-related displays.

Table 2.5.2-1 PMS Equipment Name and Classification			
Equipment Name	Seismic Cat. I	Class 1E	Qual. for Harsh Envir.
* * *			
MCR Safety-related Display, Division A	Yes	Yes	No
MCR Safety-related Display, Division B	Yes	Yes	No
MCR Safety-related Display, Division C	Yes	Yes	No
MCR Safety-related Display, Division D	Yes	Yes	No
* * *			

Appendix C Section 3.2, “Human Factors Engineering”

Revise to remove the Qualified Data Processing System (QDPS) as a Human-System Interface and to add the safety-related displays in its place.

3.2 Human Factors Engineering

Design Description

The AP1000 human-system interface (HSI) will be developed and implemented based upon a human factors engineering (HFE) program. Figure 3.2-1 illustrates the HFE program elements. The HSI scope includes the design of the operation and control centers system (OCS) and each of the HSI resources. For the purposes of the HFE program, the OCS includes the main control room (MCR), the remote shutdown workstation (RSW), the local control stations, and the associated workstations for each of these centers. The HSI resources include the wall panel information system, alarm system, plant information system (nonsafety-related displays), qualified ~~data processing system~~ (safety-related displays), and soft and dedicated controls. Minimum inventories of controls, displays, and visual alerts are specified as part of the HSI for the MCR and the RSW.

UFSAR Table 1.6-1, “Material Referenced”

Revise Tier 2 information to indicate that WCAP-16675-P and WCAP-16675-NP are modified by changes provided in UFSAR Appendix 7A.

DCD Section Number	Westinghouse Topical Report Number	Title
7.1		* * *
	WCAP-16675-P WCAP-16675-NP	AP1000 Protection and Safety Monitoring System Architecture Technical Report, Revision 5 (as modified by changes provided in UFSAR Appendix 7A)
		* * *

UFSAR Section, 1.9, “Compliance with Regulatory Criteria”

Revise Tier 2 information in UFSAR Subsection 1.9.3 (2)(v), Three Mile Island Issues, regarding the AP1000 Response for compliance with 10 CFR 50.34(f)(2)(v) to change descriptions of displays to reflect changes to PMS Safety Displays.

* * *

Class 1E signals are provided to the qualified data processor, which is part of the protection and safety monitoring system, for accident monitoring displays. The display of this data is incorporated in the process data displays on the ~~graphic CRTs~~ [PMS safety displays](#) in the AP1000 main control room.

* * *

Revise Tier 2 information in UFSAR Subsection 1.9.3, Three Mile Island Issues, regarding the AP1000 Response for compliance with 10 CFR 50.34(f)(2)(xix) to change descriptions of displays to reflect changes to PMS Safety Displays.

* * *

AP1000 Response:

The AP1000 post-accident monitoring system was developed by using Regulatory Guide 1.97 as a guidance document.

Data used for post-accident monitoring is displayed either by the normal control room display system or by the ~~qualified data processing system~~ [PMS safety display subsystem](#).

The normal control room display system is used for display of nonsafety-related signals which are not required to be displayed by a qualified system. The ~~qualified data processing system~~ [PMS safety display subsystem](#) provides for the display of signals which must be displayed by a qualified system.

The qualified data processing system is a microprocessor-based, safety-related system that provides instrumentation to monitor the plant variables and systems during and following an accident. The system consists of two independent, electrically isolated, physically separated divisions.

* * *

Revise Tier 2 information in UFSAR Subsection 1.9.4.2.1, TMI Action Plan Issues, regarding the AP1000 Response for compliance with TMI action plan item I.D.5(2), to change descriptions of displays to reflect changes to PMS Safety Displays.

* * *

~~The~~This instrumentation is used by the operator to monitor and maintain the safety of the plant during operating conditions, including anticipated operational occurrences and accident and post-accident conditions. A set of plant parameters identified according to the Regulatory Guide 1.97 guidelines are processed ~~and displayed~~ by the qualified data processing system (QDPS) and displayed by the safety displays of the PMS safety display subsystem, which is discussed in Section 18.8. The verification and validation (V&V) of the ~~QDPS~~ safety displays complies with the V&V process described in Section 18.11.

* * *

Revise Tier 2 information in UFSAR Subsection 1.9.4.2.4, Human Factors Issues, regarding the AP1000 Response for compliance with human factors issue HF5.2, Review Criteria for Human Factors Aspects of Advanced Controls and Instrumentation, to change descriptions of displays to reflect changes to PMS Safety Displays.

* * *

The AP1000 human system interface (HSI)/man-machine interface (MMI) includes the following resources:

- Alarm system
- Computerized Procedure System
- Plant Information System
- ~~Qualified Data Process System (QDPS)~~PMS Safety Display Subsystem
- Controls (dedicated and soft)
- Wall Panel Information System (WPIS)

The implementation plan for the design of each of these human system interfaces (HSI design) is described in Section 18.8. The mission statements and high-level information for each of these resources is also provided in Section 18.8. The plant information system provides display at the operators workstation. The ~~qualified data process system~~protection and safety monitoring system provides qualified (Class 1E) displays to the operator, located at the dedicated safety panel. The alarm system provides alarm overviews which are integrated into the wall panel information system and it provides alarm support displays at the operator's workstation. Alarms are integrated into the workstation displays. There will be a navigational link from an alarm support display for a specific alarm to its associated alarm response procedure as presented to the operator by the computerized procedure system. Design guidelines for each human system interface is developed as part of the human system interface design (as described in Section 18.8). These design guidelines are developed from existing industry guidelines and considerations specific to the technology planned for the human system interface. Human factors engineering specialists are part of the human factors engineering/ man-machine interphase design team (Section 18.2) and will be involved in the development of the design guidelines.

UFSAR Table 3.11-1 “Environmentally Qualified Electrical and Mechanical Equipment”

Revise Tier 2 information in UFSAR Table 3.11-1 to replace Division B and Division C of the QDPS display units with Divisions A, B, C and D of the MCR qualified safety display.

Description	AP1000 Tag No.	Envir. Zone (Note 2)	Function (Note 1)	Operating Time Required (Note 5)	Qualification Program (Note 6)
* * *					
MAIN CONTROL ROOM					
Switch Station (Including Switches)	N/A	3	RT ESF	5 min 24 hr	E
Qualified Safety Display Division A	PMS-JD-QSPA01	3	ESF PAMS	24 hr 2 wks	E
Qualified Safety Display Division B	PMS-JD-QSPB01	3	ESF PAMS	24 hr 2 wks	E
Qualified Safety Display Division C	PMS-JD-QSPC01	3	ESF PAMS	24 hr 2 wks	E
Qualified Safety Display Division D	PMS-JD-QSPD01	3	ESF PAMS	24 hr 2 wks	E
QDPS MCR Display Unit	PMS-JY-001B	3	PAMS	2-wks	E
QDPS MCR Display Unit	PMS-JY-001C	3	PAMS	2-wks	E
* * *					

UFSAR Table 3I.6-2, “List of Potential High Frequency Sensitive AP1000 Safety-Related electrical and Electro-mechanical Equipment”

Revise Tier 2 information in UFSAR Table 3I.6-2 to replace Division B and Division C of the QDPS display units with Divisions A, B, C and D of the MCR qualified safety display.

Description	AP1000 Tag Number
* * *	
Switch Station (Including Switches)	N/A
Qualified Safety Display Division A	PMS-JD-QSPA01
Qualified Safety Display Division B	PMS-JD-QSPB01
Qualified Safety Display Division C	PMS-JD-QSPC01
Qualified Safety Display Division D	PMS-JD-QSPD01
QDPS MCR Display Unit	PMS-JY-001B
QDPS MCR Display Unit	PMS-JY-001C
* * *	

UFSAR Subsection 7.1.2, “Protection and Safety Monitoring System”

Revise Tier 2 information in UFSAR Subsection 7.1.2.5 (including the subsection title and associated Table of Contents page) to change the name of the QDPS to refer to it as a system.

* * *

7.1.2.5 Qualified Data Processing ~~Subsystems~~System

Reference 19, Section 4.2 describes the Qualified Data Processing ~~Subsystems~~System (QDPS).

* * *

Revise Tier 2 information in UFSAR Subsection 7.1.2.12 to indicate the safety-related display instrumentation as part of the PMS safety display subsystem.

7.1.2.12 Safety-Related Display Instrumentation

Safety-related display ([PMS safety display subsystem](#)) instrumentation provides the operator with information to determine the effect of automatic and manual actions taken following reactor trip due to a Condition II, III, or IV event as defined in Chapter 15. This instrumentation also provides for operator display of the information necessary to meet Regulatory Guide 1.97. A description of the equipment used to provide this function is provided in [Reference 19, Section 4.1](#) ~~Subsection 7.1.2.5~~. A description of the data provided to the operator by this instrumentation is provided in Section 7.5. [A description of the equipment used to provide data to the safety-related display instrumentation is provided in Subsection 7.1.2.5.](#)

UFSAR Subsection 7.1.7, “References”

Revise Tier 2 information in UFSAR Subsection 7.1.7 to indicate WCAP-16675-P (Proprietary) and WCAP-16675-NP (Non-Proprietary) are modified by changes provided in UFSAR Appendix 7A

7.1.7 References

* * *

17. WCAP-16361-P (Proprietary) and WCAP-16361-NP (Non-Proprietary), “Westinghouse Setpoint Methodology for Protection Systems – AP1000,” February 2011.
18. APP-GW-GLR-017, AP1000 Standard Combined License Technical Report, “Resolution of Common Q NRC Items,” Westinghouse Electric Company LLC.
19. WCAP-16675-P (Proprietary) and WCAP-16675-NP (Non-Proprietary), “AP1000 Protection and Safety Monitoring System Architecture Technical Report,” Revision 5 ([as modified by changes provided in UFSAR Appendix 7A](#)).

* * *

UFSAR Section 7.5, “Safety-Related Display Information”

Revise Tier 2 information in UFSAR Table 7.5-1, “Post-Accident Monitoring System,” Note 12 to refer to the “qualified system” as the “QDPS.”

* * *

Notes:

* * *

12. These devices are backup verification to ~~qualified system~~ [QDPS](#) status parameters. These devices are purchased to perform in their anticipated service environments for the plant conditions for which they must function.

* * *

UFSAR Section 7.5, Subsection 7.5.4, “Processing and Display Equipment”

Revise Tier 2 information in UFSAR Subsection 7.5.4, “Processing and Display Equipment,” to change the description of the roles for the QDPS and safety displays, add descriptions of the safety display, and change the name of the QDPS to refer to it as a system.

7.5.4 Processing and Display Equipment

* * *

The protection and safety monitoring system provides signal conditioning, communications, and display functions for Category 1 variables and for Category 2 variables that are energized from the Class 1E dc uninterruptible power supply system. The plant control system and the data display and processing system provides signal conditioning, communications and display functions for Category 3 variables and for Category 2 variables that are energized from the non-Class 1E dc uninterruptible power system. The data display and processing system also provides an alternate display of the variables which are displayed by the protection and safety monitoring system. Electrical separation of the data display and processing system and the protection and safety monitoring system is maintained through the use of isolation devices in the interconnections connecting the two systems, as discussed in Subsection 7.1.2.10. The portion of the protection and safety monitoring system which is dedicated to providing ~~the safety-related display function for~~ post-accident monitoring is referred to as the qualified data processing ~~subsystems~~[system](#) and ~~are~~[is](#) discussed in Subsection 7.1.2.5. [Post-accident information is displayed in the MCR on the four divisions of safety displays of the PMS safety display subsystem.](#)

The qualified data processing ~~subsystems are~~ [system is](#) divided into two separate electrical divisions. Each of the two electrical divisions is connected to a Class 1E dc uninterruptible power system with sufficient battery capacity to provide necessary electrical power for at least 72 hours. If all ac power sources are lost for a period of time that exceeds 72 hours, the power supply system will be energized from the ancillary diesel generator or from ac power sources which are brought to the site from other locations. See Section 8.3.

UFSAR Appendix 7A, “INSTRUMENTATION AND CONTROLS LICENSING BASIS DOCUMENT CHANGES”:

Revise Tier 2 information in UFSAR Appendix 7A to add WCAP-16675-P (Proprietary) and WCAP-16675-NP (Non-Proprietary) to more accurately describe the QDPS.

[Notes (not for incorporation into the UFSAR):

1. For clarity, entirely new text that is being added to UFSAR Appendix 7A is depicted in blue font in these markups; new markups to add or delete text to the existing Appendix 7A text are identified with blue underlined font or red strike-out font, respectively; and existing markups in Appendix 7A that are unchanged by this LAR are depicted with black font (underlined or strike-out) as per the current UFSAR Appendix 7A.
2. LAR-15-017 is under NRC review to add Section 7A.8 for WCAP-16675-P and WCAP-16675-NP. If the addition of Section 7A.8 has already been approved for incorporation into the UFSAR, then only the changes in blue to Sections 1.3 and 4.2 are needed for this LAR. The changes marked in blue are specific to the QDPS as described in this LAR and share no technical relation to the changes described in LAR-15-017. However, if the changes in LAR-15-017 to add Section 7A.8 are not approved, then the green text below will be needed for this LAR in order to introduce Section 7A.8 as a new section in the UFSAR.]

7A.8 WCAP-16675-P and WCAP-16675-NP, AP1000 Protection and Safety Monitoring System Architecture Technical Report

The UFSAR incorporates by reference Tier 2 documents WCAP-16675-P and WCAP-16675-NP, AP1000 Protection and Safety Monitoring System Architecture Technical Report. See Table 1.6-1. WCAP-16675, Revision 5, includes the following revisions and additions as indicated by strikethroughs and underlines.

- **Revise Section 1.3, “Qualified Data Processing System Functions” as follows:**

1.3. QUALIFIED DATA PROCESSING SYSTEM FUNCTIONS

* * *

The portion of the PMS that is dedicated to providing the post-accident monitoring data for the safety-related display function displays located in the Main Control Room (MCR) is referred to as the Qualified Data Processing Subsystem-System (QDPS). ~~The QDPS provides safety-related display of selected parameters in the control room.~~ The QDPS function is provided by ~~consists of~~ a redundant configuration of ~~sensors,~~ QDPS Qualified Data Processing (QDP) cabinets hardware, and qualified displays.

The QDPS performs the following functions:

- Provides safety-related data processing for displays ~~and display~~.
- Provides the operator with sufficient operational data to safely shut the plant down ~~support post-accident monitoring~~ in the event of a failure of the other display systems.

* * *

- **Revise Section 4.2, Qualified Data Processing Subsystem, as follows:**

4.2 QUALIFIED DATA PROCESSING SUBSYSTEM

The QDPS of the PMS provides data to support the safety-related display of selected parameters in the control room.

Two QDPS subsystems are provided in the PMS architecture. One QDPS subsystem is located in Division B and the other QDPS subsystem is located in Division C. The divisions are physically separated and electrically isolated from each other. The description provided below illustrates the operation of one of the two identical QDPS subsystems.

The QDPS subsystems are a redundant configuration ~~consisting of dedicated sensor inputs, shared sensor inputs, a QDPS subrack, and qualified display units in the MCR,~~ as shown in Figure 4-1.

The QDPS subsystems perform the following functions:

- Provide safety-related data processing ~~and display.~~
- Provide the operator with sufficient operational data to ~~safely shut the plant down~~ support post-accident monitoring in the event of a failure of the other display systems.

* * *

UFSAR Table 14.3-6, “Probabilistic Risk Assessment”:

Revise Tier 2 information in UFSAR Table 14.3-6 to indicate that PMS has two divisions of safety-related post-accident parameter data processing equipment and four divisions of safety displays.

Reference	Design Feature	Value
* * *		
Section 7.1.2	PMS has four divisions of reactor trip and ESF actuation.	
Section 7.1.2.5	PMS has two divisions of safety-related post-accident parameter display data processing equipment .	
Section 7.1.2.9	PMS automatically blocks an attempt to bypass more than one channel of a function that uses 2-out-of-4 logic.	
* * *		
Section 7.3.1.2.20	The RNS containment isolation MOVs are actuated via PMS.	
Section 7.5.4	PMS has two four divisions of safety-related post-accident parameter display.	
Section 7.6.1.1	An interlock is provided for the normally closed motor-operated normal residual heat removal system inner and outer suction isolation valves. Each valve is interlocked so that it cannot be opened unless the reactor coolant system pressure is below a preset pressure.	
* * *		

UFSAR Table 17.4-1, “Risk-Significant SSCs Within the Scope of D-RAP”:

Revise Tier 2 information in UFSAR Table 17.4-1 to correct the description of the safety displays by removing the reference to the QDPS.

System, Structure, or Component (SSC) ⁽¹⁾	Rationale ⁽²⁾	Insights and Assumptions
* * *		
System: Protection and Safety Monitoring System (PMS)		
PMS Actuation Software	RAW/CCF	The PMS software provides the automatic reactor trip and ESF actuation functions listed in Tables 7.2-2 and 7.3-1.
PMS Actuation Hardware	RAW/CCF	The PMS hardware provides the automatic reactor trip and ESF actuation functions listed in Tables 7.2-2 and 7.3-1.
Main Control Room (MCR) 1E Displays and System Level Controls (OCS-JC-010, -011)	RAW/CCF	This includes the Class 1E PMS (QDPS) displays and controls. These displays and system level controls provide important plant indications to allow the operator to monitor and control the plant during accidents.
* * *		

UFSAR Subsection 18.2.2.2, “Organizational Placement and Authority”

Revise Tier 2 information in UFSAR Subsection 18.2.2.2 to remove the QDPS as a human system interface (HSI) resource and refer to the safety displays as an HSI resource.

* * *

detailed design of the human system interfaces. The human system interface design function is responsible for the functional design of the human system interfaces, main control room and workstation layout (ergonomics), controls, the information system (displays), the wall panel information system, the ~~qualified data processing system~~[PMS safety displays](#), the alarm system, and computerized procedures system design and specification. The responsibilities of the human system interface technical lead include coordinating the technical work of the functional engineering groups, providing the administrative and technical interface between the functional engineering groups and the advisors/reviewers team, and tracking the identification and resolution of human factors engineering design issues through operating experience review.

UFSAR Section 18.8, “Human System Interface Design”

Revise Tier 2 information in UFSAR Section 18.8 to remove the QDPS as an HSI resource and refer to the safety displays as an HSI resource. In addition, revise the last paragraph to correct the description of the QDPS and safety displays.

This section provides an implementation plan for the design of the human system interface (HSI) and information on the human factors design for the non-HSI portion of the plant. The human system interface includes the design of the operation and control centers system (OCS) and each of the human system interface resources.

The operation and control centers system includes the main control room, the technical support center, the remote shutdown room, emergency operations facility, local control stations and associated workstations for each of these centers. The AP1000 human system interface resources include:

- Wall panel information system
- Alarm system
- Plant information system
- Computerized procedure system
- Soft controls/dedicated controls
- ~~Qualified data processing system~~[PMS safety displays](#)

* * *

The mission of the [PMS safety displays](#)~~qualified data processing system~~ is to provide a Class 1E system to present to the main control room operators the plant parameters which demonstrate the safety of the plant. The qualified data processing system provides for the display of the variables as described in Section 7.5 ~~through safety-related displays~~. The informational content of qualified data processing system ~~displays~~ is provided to the remote shutdown workstation through the plant information system.

Revise Tier 2 information in the first paragraph of UFSAR Subsection 18.8.1.8, “General Human System Interface Design Feature Selection,” to remove the QDPS as an HSI resource and refer to the safety displays as an HSI resource.

18.8.1.8 General Human System Interface Design Feature Selection

The AP1000 human system interface resources include the wall panel information system, alarm system, plant information system, computerized procedure system, controls, (soft and dedicated) and the [PMS safety displays](#)~~qualified data processing system~~. These human system interface resources are used as a starting point to define how the human system interface supports operator performance. *[Reference 25 describes the operator decision-making model that is used by the task analysis activities to identify the operator’s information and control requirements.]** The human system interface resources are mapped to the major classes of operator activities identified from this model. Figure 18.8-2 illustrates this mapping. The human performance requirements that each human system interface resource supports are identified as part of the design process.

* * *

UFSAR Subsection 18.8.3.2, “Main Control Area Mission and Major Tasks”

Revise Tier 2 * information to change the description of the safety-related display from QDPS to PMS Safety Displays.

* * *

*A dedicated safety panel is located in the main control area. The ~~qualified data processing system visual display units~~ [PMS safety displays](#) and the dedicated safety system controls are provided in this panel. These visual display units are the only monitoring display devices in the main control room that are seismically qualified and provide the post-accident monitoring capabilities in accordance with Regulatory Guide 1.97. Dedicated system-level safety system control switches are located on the dedicated safety panel to provide the operators with safety system actuation capabilities.]** A minimum inventory of these dedicated displays and controls are presented in Section 18.12.

UFSAR Subsection 18.12.2, “Minimum Inventory of Main Control Room Fixed Displays, Alarms and Controls”

Revise Tier 2* information to change the description of the safety-related display from QDPS to PMS Safety Displays.

Minimum Inventory Selection Criteria

* * *

For the main control room, the minimum inventory of displays is provided by the ~~safety-related displays of the qualified data processing system~~ [PMS safety displays](#). For the remote shutdown workstation, the minimum inventory of displays is provided by the nonsafety-related displays of the plant information system.

* * *