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U.S. Nuclear Regulatory Commission
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Gentlemen:

ULNRC-1472

DOCKET NUMBER 50-483
CALLAWAY PLANT
RESPONSE TO NRC SAFETY EVALUATION
OF TOPICAL REPORT WCAP-10858
"AMSAC GENERIC DESIGN PACKAGE"

References:
1. ULNRC-1189 dated 10-14-85, Response to Final ATWS Rule 10CFR50.62
2. NRC (P. W. O'Connor) letter to UE (D. F. Schnell) dated 9-22-86, AMSAC Safety Evaluation
3. ULNRC-1433 dated 1-23-87, AMSAC Response and Implementation Schedules
4. OG-181 dated 4-11-86, WOG Comments on AMSAC Design Specifications
5. OG-171 dated 2-10-86, WOG Comments on Proposed AMSAC Technical Specifications
6. OG-87-10 dated 2-26-87, Addendum 1 to WCAP-10858-P-A and WCAP-11293-A, AMSAC Generic Design Package

This letter provides Callaway Plant design details for the ATWS Mitigation System Actuation Circuitry (AMSAC). This is in response to the NRC safety evaluation of the AMSAC Generic Design Package, WCAP-10858.

The AMSAC conceptual design being proposed for Callaway Plant will actuate a turbine trip and initiate auxiliary feedwater flow upon indication that the steam generator inventory is below the low level setpoint chosen for AMSAC. This logic senses conditions indicative of an ATWS event requiring mitigation, such that established safety limits are not violated (i.e., DNBR and RCS pressure). AMSAC will not sense the loss of primary side heat removal or reactivity excursions since the most severe ATWS scenarios have been determined to be those involving a loss of load or loss of normal feedwater (see WCAP-8330 and WCAP-10858). The AMSAC signal will be delayed by approximately 25 seconds to permit the Reactor Protection System (RPS) to provide the first trip signal.

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The steam generator blowdown isolation and sample isolation valves will be automatically closed in all loops when AMSAC is actuated.

The AMSAC signal will be generated by low water level signals in the steam generators using existing narrow range level transmitters. The coincidence logic is 3/4 with one channel per steam generator.

The AMSAC signal will be automatically blocked below 40% of NSSS thermal power (3425 MWt) since short term protection against high reactor coolant system pressure is not required until 40% power (see Reference 6). This will also prevent inadvertent actuations during plant startups. When power drops below 40%, AMSAC will remain armed for 120 seconds to allow time to perform its function in the event of a turbine trip.

The NRC safety evaluation included 14 plant-specific items to be addressed by the individual utilities. Attachment 1 provides the responses to these 14 items. These responses represent a joint effort between Union Electric and Wolf Creek Nuclear Operating Corporation. Attachment 2 provides the Callaway - specific QA program for AMSAC equipment.

Regarding the response to Item 13 in Attachment 1, Completion of Mitigative Action, the following clarifications are added. The AMSAC design will not preclude operator intervention in the event a spurious actuation signal is diagnosed. The existence of a spurious actuation signal would be evident from checking the control board status panels and steam generator level channels.

The committed response date of March 20, 1987 for this transmittal was discussed with Mr. Paul O'Connor, NRC Licensing Project Manager for Callaway and Wolf Creek, on February 27, 1987. Additional time was needed to develop the common response contained in Attachment 1. This common response should allow for a more efficient NRC review for the SNUPPS plants.

NRC approval will be needed by July, 1987 to support implementation during Callaway Refuel 3. Upon design finalization, integration of AMSAC equipment into the operating procedures and into the training program will begin.

Very truly yours,

Donald F. Schnell

GGY/mat

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PLANT-SPECIFIC DESIGN DETAILS REGARDING ATWS MITIGATING SYSTEM ACTUATION CIRCUITRY

CALLAWAY PLANT AND WOLF CREEK GENERATING STATION

INTRODUCTION

Reference 1 provided generic design options for use by Westinghouse plants in addressing the requirements of 10 CFR 50.62, "Requirements for Reduction of Risk from Anticipated Transients Without Scram (ATWS) Events for Light-Water-Cooled Nuclear Power Plants." Reference 2 reported the completion of an NRC staff review of the generic design information in Reference 1 and identified plant-specific design information required by the NRC staff to verify compliance with 10 CFR 50.62. The plant-specific information applicable to Callaway Plant and Wolf Creek Generating Station is provided in the following paragraphs.

DESIGN CONCEPT

AMSAC Design Option

The AMSAC design employs Option 1 of Reference 1. The design will use existing steam generator level transmitters to actuate a turbine trip and initiate auxiliary feedwater flow. The AMSAC will also initiate closure of steam generator blowdown isolation and sample isolation valves.

ATWS is defined in 10 CFR 50.62 as "an anticipated operational occurrence as defined in Appendix A of this part followed by the failure of the reactor trip portion of the protection system specified in General Design Criterion 20 of Appendix A of this part." In the Callaway and Wolf Creek designs, the reactor trip portion of the protection system and the Balance of Plant (BOP) Engineered Safety Features Actuation System (ESFAS) are separate systems. The Reactor Trip System (RTS) employs the output of the Westinghouse Solid State Protection System (SSPS) to trip the reactor trip breakers resulting in a reactor scram. The BOP ESFAS manufactured by Consolidated Controls Corporation, receives an input signal from the SSPS to actuate various safeguards

equipment including the auxiliary feedwater (AFW) pumps and the steam generator blowdown isolation and sample isolation valves. The existing turbine trip on reactor trip signal is the P-4 permissive generated by opening the reactor trip breakers.

For the Callaway and Wolf Creek AMSAC design, an AMSAC logic cabinet will be installed in the Control Room. The space allotted for the cabinet was incorporated into the original design of the plants. Existing narrow range steam generator level transmitters , not used in the steam generator level control system, will provide signals to the non-Class 1E AMSAC circuits via qualified isolation devices. The coincidence logic for AMSAC initiation is 3/4 low steam generator level signals with one channel provided for each of the four steam generators.* Outputs from AMSAC will provide a signal to the BOP ESFAS through qualified, Class 1E isolation relays to start the AFW pumps. The AFW pump start signal will also close steam generator blowdown and sample isolation valves This use of the existing BOP ESFAS system will provide for the required diversity from the RTS without further complicating the plant safety systems. AMSAC will also provide a signal to the main turbine electrohydraulic control (EHC) system for turbine trip. The auxiliary feedwater flow response time and turbine trip response time are consistent with Reference 1 requirements. Figure 1 provides the conceptual design and layout of the AMSAC.

The Callaway and Wolf Creek main control board alarms have been designed to employ the "dark board" concept to improve human factors performance of the plant operators. This principle requires, to the extent possible, that alarms illuminate to show an abnormal condition. If conditions are normal, the panel alarms remain darkened. Also, to avoid confusion from excessive alarms in the control room, the number of alarms has been kept as low as possible. Only two AMSAC-related alarm windows will be placed on the main control board: an AMSAC Urgent alarm, and an AMSAC Bypass/Offnormal alarm. The AMSAC Urgent alarm indicates that the AMSAC initiation sequence has started and that, after an appropriate time delay, AMSAC will trip the main turbine and start the AFW pumps. The AMSAC Bypass/Offnormal alarm is used to provide the control room operators indication of abnormal or unusual situations affecting AMSAC

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* Consideration is being given to the use of programmable logic control (PLC) in the AMSAC logic. The AMSAC low level setpoint is below the RPS low-low level setpoint consistent with Reference 1.

such as a failure of the C-20 permissive circuitry, a maintenance bypass condition, loss of power supply, and self diagnostics trouble. (The full range of AMSAC offnormal conditions is dependent on supplier options.)

Reference 2 identified 14 plant-specific items to be addressed by utilities. Responses to these items are provided below.

ITEM 1: DIVERSITY

The plant-specific submittal should indicate the degree of diversity that exists between the AMSAC equipment and the existing Reactor Protection System. Equipment diversity to the extent reasonable and practicable to minimize the potential for common cause failures is required from the sensors output to, but not including, the final actuation device, e.g., existing circuit breakers may be used for the auxiliary feedwater initiation. The sensors need not be of a diverse design or manufacture. Existing protection system instrument-sensing lines, sensors, and sensor power supplies may be used. Sensor and instrument sensing lines should be selected such that adverse interactions with existing control systems are avoided.

Response

Existing steam generator water level transmitters, sensing lines and sensor power supplies will be used for input to AMSAC. The AMSAC equipment will be of a different design and diverse from the Westinghouse Reactor Protection System (RPS). This diversity will exist from the RPS isolators (7300 loop power supply cards) to the AMSAC output relays. Existing RPS sensor power supplies will provide power to the level transmitters and perform an isolation function. Power supplies for the non-safety-related AMSAC equipment are diverse in that they will be powered from 125VDC non-1E instrument power from the plant-designated PK system. AMSAC will initiate AFW flow via the Consolidated Controls Corporation (CCC) ESFAS system that starts the motor- and turbine-driven AFW pumps (by opening the latter's steam supply valves) and isolates steam generator blowdown and sampling by means of the AFW Actuation Signal (AFAS). AMSAC initiates turbine trip by means of a separate signal to the existing General Electric turbine control circuitry. Thus, the circuitry for AFW initiation and turbine trip is diverse from the RPS, which consists of the 7300 Process Protection System (PPS) and SSPS cabinets, from the steam

generator level transmitter power supplies, including the required isolation devices, to the AFW pumps and to the EHC system for turbine trip. This is based on the existing diversity and independence between the BOP ESFAS and the RTS.

The steam generator level sensors used as input to AMSAC are different than those used to drive the steam generator level control system. This will alleviate any concern that an adverse interaction will exist between AMSAC and existing control systems.

ITEM 2: LOGIC POWER SUPPLIES

The plant-specific submittal should discuss the logic power supply design. According to the rule, the AMSAC logic power supply is not required to be safety-related (Class 1E). However, logic power should be from an instrument power supply that is independent from the reactor protection system (RPS) power supplies. Our review of additional information submitted by WOG indicated that power to the logic circuits will utilize RPS batteries and inverters. The staff finds this portion of the design unacceptable; therefore, independent power supplies should be provided.

Response

The power input to the AMSAC equipment, with the exception of the Class 1E level transmitters and isolation devices, will be from non-Class 1E buses with battery backup. This supply will be independent from the RPS power input. The RPS power supply is from Class 1E dc buses NK01, NK02, NK03, and NK04 via Class 1E inverters (FSAR Fig. 8.3-6). The AMSAC power supply will be from non-Class 1E dc buses PK01, PK02, PK03, or PK04 (FSAR Figs. 8.3-6 and 8.3-7) and will allow AMSAC to function during a loss of offsite power. The use of this independent power source will substantially decrease the probability of a common mode failure on demand. (Failure occurring or detected only during an actual need or test.)

Direct current power for the BOP ESFAS is supplied from three independent Class 1E buses (NK01, NK02, and NK04.) These buses have separate chargers with battery backup as shown in Callaway FSAR (Wolf Creek USAR) Figure 8.3-6. Loss of power to any of these buses is annunciated in the control room. Although these buses also supply power to

the RPS, as indicated above, their use is justified owing to the low probability of common mode failure on demand occurring simultaneously with an ATWS event.

The PK 125 volt dc system includes four batteries, four battery chargers, four main switchboards, and eight distribution switchboards.

On loss of ac power, or the failure of a charger, the batteries supply power to their respective 125 volt dc buses (PK01, PK02, PK03, or PK04). Buses PK01 and PK02 primarily serve the non-safety-related control and instrumentation loads through 125 volt dc distribution panels. Buses PK03 and PK04 primarily serve the non-safety-related inverter loads.

ITEM 3: SAFETY-RELATED INTERFACE

The plant-specific submittal should show that the implementation is such that the existing protection system continues to meet all applicable safety criteria.

Response

The existing protection system will continue to meet all applicable safety criteria because qualified isolation devices will separate the non-safety-related AMSAC equipment from the existing safety-related Westinghouse 7300 process cabinets, solid state protection system (SSPS), and BOP engineered safety feature actuation system (ESFAS) equipment. Existing separation criteria will continue to be met between safety-related and non-safety-related equipment as described in the Callaway Plant and Wolf Creek Generating Station FSARs (Section 8.3) which use Regulatory Guide 1.75 and IEEE 279-1971 as design bases.

ITEM 4: QUALITY ASSURANCE

The plant-specific submittal should provide information regarding compliance with Generic Letter 85-06, "Quality Assurance Guidance for ATWS Equipment that is not Safety-Related."

Response

Quality Assurance requirements for non-safety-related AMSAC equipment are provided per the Quality Assurance provisions defined in Attachment 2.

ITEM 5: MAINTENANCE BYPASSES

The plant-specific submittal should discuss how maintenance at power is accomplished and how good human factors engineering practice is incorporated into the continuous indication of bypass status in the control room.

Response

Surveillance and maintenance of AMSAC and AMSAC sensor inputs will be performed using approved procedures. To avoid AMSAC actuation during maintenance or surveillance of the AMSAC system or sensor inputs, the AMSAC output signals will be bypassed via a permanently installed bypass switch at the AMSAC panel. Normal maintenance at power will not involve lifting of leads, pulling fuses, tripping breakers, or physically blocking relays.

Indication of AMSAC maintenance bypasses will be continuously indicated via the AMSAC Bypass/Offnormal alarm window on the main control board. The normally dark window will be illuminated whenever the bypass switch is in the "bypass" position. This alarm window, as well as the AMSAC urgent alarm window, will be designed consistent with the original Detailed Control Room Design Review (DCRDR) approved by the NRC.

ITEM 6: OPERATING BYPASSES

The plant-specific submittal should state that operating bypasses are continuously indicated in the control room, provide the basis for the 70 percent or plant-specific operating bypass level, discuss the human factors design aspects of the continuous indication, and discuss the diversity and independence of the C-20 permissive signal (defeats the block of AMSAC).

Response

The plant-specific C-20 permissive setpoint for Callaway and Wolf Creek is 40 percent power. The basis for 40 percent power was provided in Reference 3. The input signals for deriving C-20 will be provided by the two main turbine first stage impulse pressure transmitters. The turbine impulse pressure signals are derived from existing protection system sensing lines, sensors, and power supplies. The logic portion of the C-20 signal is processed in the AMSAC circuitry and is diverse from the SSPS. In the event of a turbine trip, removal of the C-20 permissive signal is delayed for a period of time consistent with reference 1 to avoid blocking AMSAC before it can perform its function.

AMSAC will be enabled by 2/2 turbine impulse pressure transmitters above 40 percent power. Also, AMSAC will be automatically blocked if one of these transmitters indicates power below 40 percent. These are normal conditions. In keeping with the "dark board" human factors concept for the main control boards, the above normal conditions will not result in alarm indications on the main control board. If the AMSAC is not enabled above 40 percent power, the AMSAC Bypass/ Offnormal alarm will sound and illuminate on the main control board.

ITEM 7: MEANS FOR BYPASSING

The plant-specific submittal should state that the means for bypassing is accomplished with a permanently installed, human factored, bypass switch or similar device, and verify that disallowed methods mentioned in the guidance are not utilized.

Response

The means for bypassing AMSAC during testing and maintenance will be accomplished with a permanently installed bypass switch and will not use any of the disallowed methods mentioned in Reference 2.

ITEM 8: MANUAL INITIATION

The plant-specific submittal should discuss how a manual turbine trip and auxiliary feedwater actuation are accomplished by the operator.

Response

The main turbine is tripped by depressing the red trip pushbutton on the EHC control panel in the main control room. Auxiliary feedwater actuation is accomplished by operating the manual auxiliary feedwater actuation switches in the main control room. No additional manual initiation capability is required for AMSAC equipment.

ITEM 9: ELECTRICAL INDEPENDENCE FROM EXISTING REACTOR PROTECTION SYSTEM

The plant-specific submittal should show that electrical independence is achieved. This is required from the sensor output to the final actuation device at which point non-safety-related circuits must be isolated from safety-related circuits by qualified Class 1E isolators. Use of existing isolators is acceptable. However, each plant-specific

submittal should provide an analysis and tests which demonstrate that the existing isolator will function under the maximum worst case fault conditions. The required method for qualifying either the existing or diverse isolators is presented in Appendix A.

Response

AMSAC inputs will be isolated from the RPS by sensor power supplies with isolated outputs. These power supplies are supplied by Westinghouse as part of the 7300-Series Process Protection System. They have been subjected to test faults and noise tests as part of their original qualification testing. This testing is documented in WCAP-8892-A, which has received prior NRC review and approval (see FSAR Section 7.1.2.2.1). This testing was performed at voltage/current levels that exceed the levels to which the isolator could be exposed. The isolators were also subjected to additional testing to simulate static, magnetic, cross talk, and random noise. Existing 7300-Series isolator cards will be used to the extent possible; however, additional 7300-Series isolator cards may be added to isolate AMSAC input channels. These cards will be part of the 7300 Series Process Protection System and are qualified by the testing documented in WCAP-8892-A.

AMSAC output signals to BOP ESFAS will be isolated by qualified isolation relays. These relays have not yet been selected; however, they will be required to provide electrical separation at the maximum voltage/current levels to which they could be exposed. The testing supporting qualification will be consistent with the methodology outlined in Appendix A of Reference 2.

The entire AMSAC design will meet the electrical separation criteria established for Callaway Plant and Wolf Creek Generating Station per FSAR Section 8.3, which uses Regulatory Guide 1.75 and IEEE 279-1971 as design bases.

ITEM 10: PHYSICAL SEPARATION FROM EXISTING REACTOR PROTECTION SYSTEM

Physical separation from existing reactor protection system is not required, unless redundant divisions and channels in the existing reactor trip system are not physically separated. The implementation must be such that separation criteria applied to the existing protection system are not violated. The plant-specific submittal should respond to this concern.

Response

The AMSAC equipment will be physically separated from the existing RPS, and cable routing for AMSAC will be completed using the separation criteria described in FSAR/USAR Section 8.3.1.4. This will ensure that physical separation criteria of existing protection systems are not violated. Figure 1 also provides information about physical separation.

ITEM 11: ENVIRONMENTAL QUALIFICATION

The plant-specific submittal should address the environmental qualification of ATWS equipment for anticipated operational occurrences only, not for accidents.

Response

The AMSAC cabinet and input isolators will be located in the control room area, which is a mild environment area, temperature controlled by redundant Class 1E air conditioning units. The equipment will be required to operate within an ambient temperature range of 60°F to 84°F. The above will be satisfied by manufacturer certification that supplied equipment can operate within applicable environmental extremes.

The AMSAC output isolation relays will be Class 1E relays qualified for environmental conditions associated with anticipated operational occurrences.

Documentation requirements from Reference 4 are not applicable to this equipment.

ITEM 12: TESTABILITY AT POWER

Measures are to be established to test, as appropriate, non-safety-related ATWS equipment prior to installation and periodically. Testing of AMSAC may be performed with AMSAC in bypass. Testing of AMSAC outputs through the final actuation devices will be performed with the plant shutdown. The plant-specific submittals should present the test program and state that the output signal is indicated in the control room in a manner consistent with plant practices including human factors.

Response

Specific test provisions of AMSAC will be dependent on the supplier and equipment selected, but testing prior to operation will be performed to ensure that the equipment

functions correctly. The system will be bypassed for testing. Periodic testing of AMSAC will be performed with a frequency consistent with manufacturer's recommendations to ensure reliability. Testing of AMSAC through the final actuation devices will be performed every refueling outage.

AMSAC equipment will be capable of being tested at power, in bypass, in accordance with approved procedures. Bypassing AMSAC for testing and returning it to service will be controlled by administrative procedures similar to those currently used for other maintenance/testing activities. The bypass indication will be provided automatically in the control room via the AMSAC Bypass/Offnormal alarm on the main control board. Actuation of AMSAC will be indicated via the AMSAC Urgent alarm on the main control board.

ITEM 13: COMPLETION OF MITIGATIVE ACTION

AMSAC shall be designed so that, once actuated, the completion of mitigating action shall be consistent with the plant turbine trip and auxiliary feedwater circuitry. Plant-specific submittals should verify that the protective action, once initiated, goes to completion, and that the subsequent return to operation requires deliberate operator action.

Response

AMSAC will be designed so that, once actuated (after low levels have been concurrently present in 3 of 4 S/G's for 25 seconds), the completion of mitigating action will occur. There will not be any manual AMSAC reset capability. It will automatically reset after the C-20 permissive changes state, which is approximately 120 seconds after plant power level is decreased below 40 percent. This reset will not affect the turbine trip or auxiliary feedwater actuation circuitry. Deliberate operator action is required to reset the turbine trip and auxiliary feedwater actuation circuitry.

AMSAC will provide a trip signal to the 125VDC trip bus in the turbine EHC cabinet. The 125V trip directly energizes the Mechanical Trip Solenoid Valve. In addition, the 24V trip circuit is operated (cross-tripped) and the 125V trip bus is locked up. Further, pressure switch contacts lock-up the hydraulic control system when the Mechanical Trip Valve and Emergency Trip System are tripped, and the generator circuit breaker is open. Reset of the turbine for return to operation could only be accomplished after the AMSAC signal is removed, reactor trip breakers are reset, and a master reset button is pressed.

AFW pumps will be started when BOP ESFAS receives a signal from AMSAC. As described in FSAR Table 7.1-2, BOP ESFAS has been designed to meet the requirements of IEEE 279-1971, specifically IEEE 279, Paragraph 4.16, for completion of mitigative action. AFW is restored to standby by clearing the actuation signal, pressing reset buttons, and securing pumps.

ITEM 14: TECHNICAL SPECIFICATIONS

Technical Specification requirements related to AMSAC will have to be addressed by plant-specific submittals.

Response

Technical Specification requirements for AMSAC are unnecessary as they would not enhance overall plant safety beyond that afforded by planned administrative controls. In addition, AMSAC should not be included in the Technical Specifications since the system does not meet the AIF nor NRC staff criteria for inclusion in the Technical Specifications. The surveillance interval and actions required due to an AMSAC failure will be administratively controlled via plant procedures. This position is consistent with the WOG position on this issue as discussed in References 5 and 6.

REFERENCES

1. WCAP-10858P-A, AMSAC Generic Design Package, October 1986.

2. NRC Safety Evaluation of Topical Report (WCAP-10858) "AMSAC Generic Design Package" (attachment to NRC letters dated 9/22/86 to Union Electric and Kansas Gas & Electric).

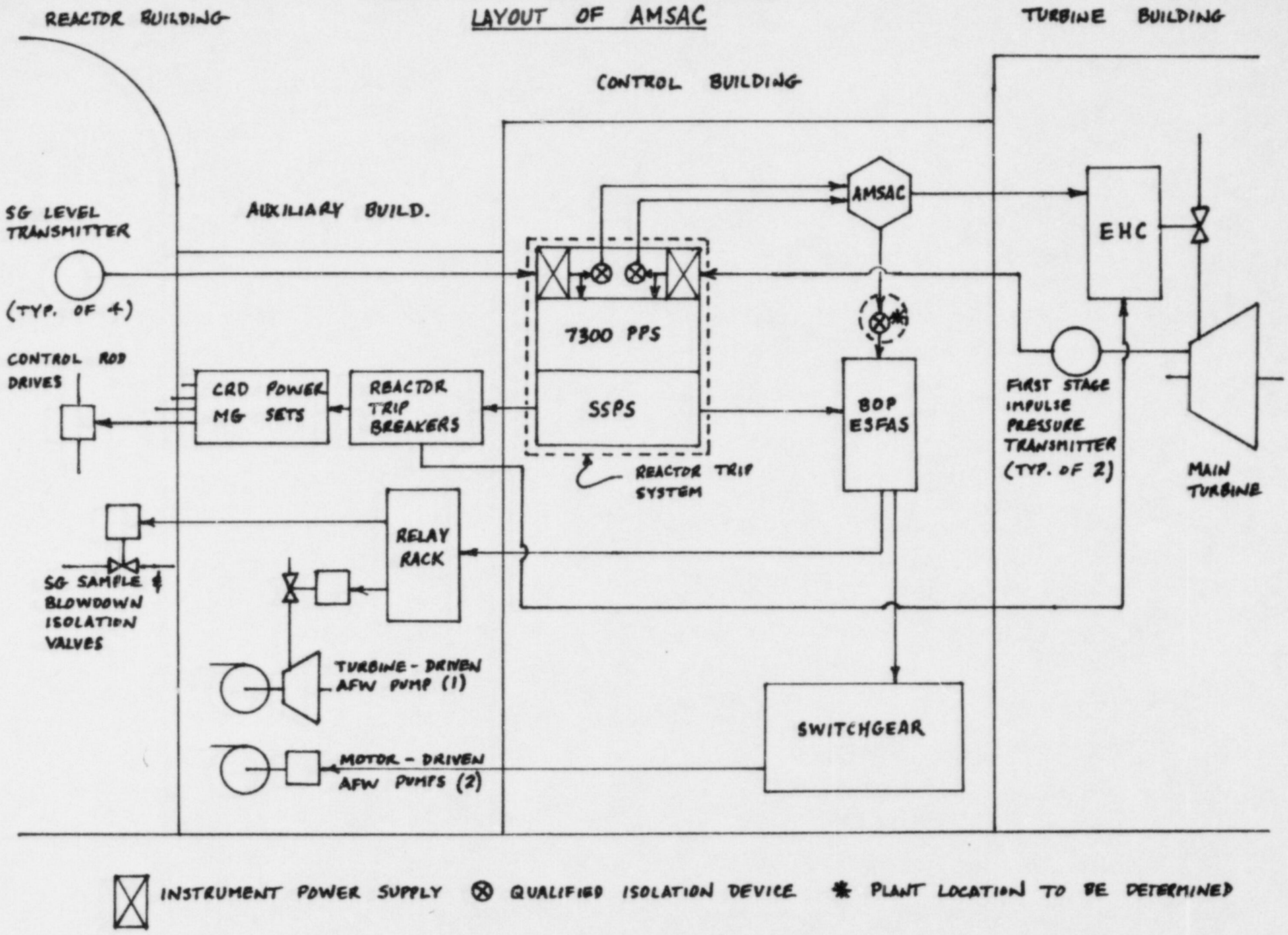
3. Westinghouse Owners Group letter OG-87-10, dated 2/26/87: Addendum 1 to WCAP-10858P-A.

4. 10 CFR 50.49, Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants.

5. Westinghouse Owners Group letter OG-171, dated 2/10/86: WOG Comments on Proposed AMSAC Technical Specifications.

6. Westinghouse Owners Group letter OG-181, dated 4/11/86: WOG Comments on AMSAC Design Specifications.

FIG. 1 CONCEPTUAL DESIGN AND LAYOUT OF AMSAC



SUPPLEMENTAL QUALITY ASSURANCE PROGRAM FOR NONSAFETY-RELATED AMSAC EQUIPMENT

The Quality Assurance Program for Nonsafety-Related AMSAC Equipment is a graded Quality Assurance program. The objective of this document is to provide a description of quality assurance criteria applicable to the reliable operation of the ATWS Mitigation System Actuation Circuitry (AMSAC) equipment to shutdown the reactor in the event that an anticipated transient is accompanied by a failure of the reactor trip system to trip the reactor as designed (ATWS). The Nonsafety-Related AMSAC Equipment QA Program is under the management of the Union Electric Quality Assurance Division and is outlined below:

1.0 ORGANIZATION

The existing line organizations described in Section 1.0 of Union Electric's Operating Quality Assurance Manual (OQAM) are responsible for compliance with this program. No separate or unique organization is required to implement the requirements of this program.

2.0 PROGRAM

This program is based on Sections 1.0 through 18.0 of Union Electric's OQAM. Each section of this program either endorses or is derived from its respective OQAM section. The Plant Operating Manual (POM) contains the procedures which provide the requirements for implementing Union Electric's Operating Quality Assurance Program. These procedures shall also be used to implement the requirements of this program.

3.0 DESIGN CONTROL

Design control shall involve measures within U.E. which include: a definition of design requirements; a design process which includes design analysis and delineation of requirements through the issuance of drawings, specifications, and other design documents (design outputs); and supervisory review to verify the adequacy of design. Existing contractor procedures are acceptable provided they include supervisory review of design activities.

Safety evaluations, as required by 10CFR50.59, which consider the effect of the design as described in the design documents, shall be performed by the responsible UE engineering organization or outside organization(s). These evaluations shall include the basis for the determination that the design change does not involve an unreviewed

safety question. As deemed necessary by the evaluating organization, detailed analyses shall be performed to support the bases of safety evaluations. Safety evaluations approved by the Manager or Assistant Manager, Nuclear Engineering or outside organization are submitted to the ORC for review and approval.

4.0 PROCUREMENT DOCUMENT CONTROL

Provisions within U.E. for the following shall be included in procurement documents, as applicable:

> Basic administrative and technical requirements including drawings, specifications, regulations, special instructions, applicable codes and industrial standards and procedural requirements identified by titles and revision levels; special process instructions; test and examination requirements, including personnel qualifications, with corresponding acceptance criteria; and special requirements for activities such as designing, identifying, fabricating, cleaning, erecting, packaging, handling, shipping, and storing.

The QA Division shall perform a documented, independent review of procurement documents to assure that the applicable requirements of this program are correctly stated.

Additions, modifications, exceptions, and other changes to procurement document technical requirements shall require a review equivalent to that of the original document and approval by the originator or the originating department approval authority.

5.0 INSTRUCTIONS, PROCEDURES, AND DRAWINGS

Activities associated with nonsafety-related AMSAC equipment shall be accomplished in accordance with documented instructions, procedures, drawings, or checklists. Contractor design control is addressed by Section 3.0 of this program.

Maintenance conducted on equipment under this program shall be planned, controlled by procedures, and documented. Work shall be performed using technical manual guidance. Maintenance procedures should be prepared with a level of detail appropriate to the complexity of work to be performed and the skill level of the workers. Any departure from vendor guidance shall be based on adequate engineering rationale.

6.0 DOCUMENT CONTROL

Instructions, procedures, drawings, and vendor technical manuals for equipment in this program shall be controlled in accordance with Section 6.0 of the OQAM.

7.0 CONTROL OF PURCHASED MATERIAL, EQUIPMENT AND SERVICES

Materials, equipment, and services shall conform to procurement documents as prescribed in Section 4.0 of this program.

Acceptance by receipt inspection shall be used as the sole means of item acceptance.

Receipt inspection activities shall include verifying that received items conform to procurement documents by inspecting or, where appropriate, testing using approved procedures and calibrated tools, gauges, and measuring equipment to verify the acceptability of items.

Final acceptance of items shall be by Quality Control personnel or designated inspection personnel. The final acceptance of services shall be the responsibility of the originating organization. Acceptance shall be documented.

8.0 IDENTIFICATION AND CONTROL OF MATERIALS, PARTS AND COMPONENTS

The identification and control of materials, parts, and components shall be accomplished in accordance with documented procedures and apply to materials, parts, and components during storage, installation or use. These procedures shall address control of storage of environmentally sensitive equipment or material and storage of equipment or material that has a limited shelf-life. Materials, parts, and components identified as nonconforming shall be controlled as described in Section 15.0 of this program.

9.0 SPECIAL PROCESSES

Special processes shall be controlled in accordance with Section 9.0 of the OQAM.

10.0 INSPECTION

Inspections shall be performed in accordance with Section 10.0 of the OQAM.

11.0 TEST CONTROL

Testing shall be performed in accordance with Section 11.0 of the OQAM, with one exception. Testing frequency shall be prescribed by the POM, as opposed to the Technical Specifications.

12.0 CONTROL OF MEASURING AND TEST EQUIPMENT

The controls established in Section 12.0 of the OQAM are applicable to the AMSAC graded QA program.

13.0 HANDLING, STORAGE, AND SHIPPING

Items including parts of structures, systems, and components and related consumables shall be handled, stored, shipped, cleaned, and preserved in accordance with procedures, instructions or drawings, to assure that the quality of items is preserved. Applicable manufacturer instructions and recommendations or procurement requirements shall be reviewed and invoked in governing procedures when determined appropriate based on an engineering review.

14.0 INSPECTION, TEST, AND OPERATING STATUS

Plant procedures shall provide instructions relating to the manner of indicating the operational status of nonsafety-related AMSAC equipment, including temporary modifications. These procedures shall address measures for the release and control of equipment during periods of maintenance.

Plant procedures shall establish controls to identify the status of inspection and test activities associated with maintenance, repair, modification, inservice inspection, and instrumentation and control system calibration and testing.

15.0 NONCONFORMING MATERIAL, PARTS OR COMPONENTS

Material nonconformances shall be contrclled in accordance with the requirements of Section 15.0 of the OQAM with one exception. The reporting requirements of 10CFR21 do not apply to nonsafety-related AMSAC equipment.

16.0 CORRECTIVE ACTION

Conditions adverse to quality which impede the implementation or reduce the effectiveness of this program shall be controlled in accordance with the requirements of Section 16.0 of the OQAM with one exception. The reporting requirements of 10CFR21 do not apply.

17.0 RECORDS

QA records shall be maintained which describe changes in the facility and changes in procedures made pursuant to 10CFR50.59. These records shall also include tests and experiments, written safety evaluations, specifications, drawings, vendor technical manuals, and receipt inspection records. QA records shall be maintained and controlled in accordance with Section 17.0 of the OQAM.

18.0 AUDITS

Internal audits of this program shall be performed by the Quality Assurance Division in accordance with the requirements of Section 18.0 of the OQAM. Audits of vendors who supply nonsafety-related AMSAC equipment and services are not required.