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Director, Office of Nuclear Reactor Regulation
Attention: D. M. Crutchfield, Chief
Operating Reactors Branch No. 5
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Gentlemen:

Subject: Docket No. 50-206
SEP Topic VI-4
Containment Isolation System (Electrical)
San Onofre Nuclear Generating Station
Unit 1

Your letter of September 3, 1981 forwarded the draft evaluation for the SEP Topic VI-4, Containment isolation System (Electrical) for San Onofre Unit 1. You requested that we inform you of differences in the San Onofre Unit 1 design from the licensing bases assumed in your assessment. The results of our review of the topic evaluation and additional comments are provided as Enclosure 1 to this letter. In addition, your letter identified four specific areas in which design modifications were requested. Our response to these items is provided as Enclosure 2.

If you have any questions regarding the enclosed, please let me know.

Very truly yours,

KP Baskin

Enclosures

A035

Enclosure 1

COMMENTS ON TECHNICAL AND SAFETY
EVALUATION REPORTS, SEP TOPIC VI-4

1. Section 2.2, paragraph 1 of the Technical Evaluation (TE) by EG&G currently reads: "Automatic closure of containment purge and vent isolation valves will occur on any of the following conditions[2]:

   1. High containment pressure (2 psig).
   2. High containment radiation.[6]
   3. Safety injection actuation (through the safety injection sequencer)."

   Condition 3 should read: "Safety injection actuation (through either safety injection sequencer)."

2. Section 2.2, paragraph 3 of the TE currently reads: "The control of the solenoid-operated purge and vent valves use spring-return to neutral control switches. Valve position lights show the actual valve position. The solenoid valves fail closed on loss of air or on loss of power."

   Paragraph 3 should be revised to read: "The controls of the pneumatic/pneumatic operated purge valves, POV-9 (supply) and POV-10 (exhaust), use solenoid-operated valves. The containment purge and vent valves are actuated manually by momentary pushbutton switches and automatically by CIAS.* Valve status lights show the actual status, open or closed. The isolation valves, purge supply and exhaust and vent set, fail closed on loss of air (in addition, the purge valves have accumulators) or on loss of electric power."

3. Section 2.2, paragraph 5 of the TE currently reads: "There is a provision for manual override of the purge and vent valve actuation signals (except for radiation level), and there is a safety injection manual override which is used to prevent inadvertant operation of the SIS* on planned depressurization.[3,4] The CVIS* valves are prevented from changing position on either a reset of the actuation signal, an override of the actuation signal, or when the safety injection override condition is manually established."

   The first sentence of paragraph 5 should be clarified to read: "There are provisions for manual override of actuation signals to the purge valves and to the vent valves (except the high radiation condition which causes purge and vent valve closure despite override) and there are provisions for manual override of the SIS (one block switch per train) which are used to prevent inadvertent operation of the SIS on a planned depressurization".

4. Section 2.3, paragraph 1 of the TE reads, in part: "Override of the containment isolation signal (safety injection or high containment pressure but not high radiation) is also possible. Since a single action overrides both signals, this guideline is not met."

   We have committed, by a letter dated January 15, 1980, K. P. Baskin to D. L. Ziemann, to lock closed a valve of each containment purge line during MODES 1, 2, 3 and 4. In response to your letter dated February 17, 1982, we are proposing a Technical Specification change to

formalize that commitment. These purge lines are the containment ventilation lines for which a single action, "CIS OVR POV-9 POV-10," will effect an override. However, with this commitment, two actions are now required to enable opening of the valves; namely unlocking the valves and initiating the override.

5. Item 1, page 1 of the Revised Safety Evaluation Report (SER) refers to the lack of physical features in accordance with Guideline 2. There are available physical features to enhance the administrative controls of the sequencers' test switches as required by the review Guideline 2. Specifically, there is a lockable door on each panel whereon these toggle test switches are mounted. Each door has an associated "Door Open" light on a control panel. Key control and control panel access procedures will be implemented prior to resumption of power from the next refueling outage requiring that only one control panel door be accessed at a time and that a verfification be made that only one control panel "Door Open" light is lit when "Sequencer in Test" is annunciated. Guideline 2 will be satisfied by using the lockable panel doors and implementing these procedures.

6. Item 2, page 2 of the SE relates to the SIAS* Block Switch. There is no low pressurizer pressure block switch; however, there are "Block SIS Signal" switches. These switches defeat safety injection actuation signals (SIAS) without modifying the high containment pressure signals to the CVIS and the CIS*. The fact that automatic LOCA protection is disarmed is known by the operators to be the principle result of

operating the switches "Block SIS Signal"; and the label of the switch denotes this condition. When the operator actuates the "Block SIS Signal", this condition is displayed on the permissive display panel. There is no accompanying aural signal nor need to acknowledge the blocked condition. The ESF's remaining at full design capability are the automatic CIS including the automatic CVIS. Manual containment spray and manual safety injection are available for plant safety by operator action from the Control Room.

Guideline 1 is met because only one parameter is bypassed; namely, pressurizer pressure. When the safety injection actuation signal (SIAS) is overridden using the "Block SIS Signal" switches the high containment pressure signal will not be affected.

It is true there is no annunciation regarding the impacted CSS*. However, a CSS is an extension of the SIS. In regard to the CSS, actuation is induced by the combination of the SIAS and a high-high containment pressure signal (10 psig) utilizing AND logic. Hence, if the SIS is blocked, then the CSS will be blocked from automatic actuation as well. Additionally, safety injection is one of the inputs to CIS; therefore, blocking SI will also partially block CIS. In lieu of a control room annunciator that would indicate that CSS has been blocked and CIS has been partially blocked, redesigning the lettering on the Block SIS Signal annunciator window to indicate that CSS has also been blocked and the safety injection input to CIS has been blocked (i.e., $\left(\frac{\text{Block SIS/CSS Signal}}{\text{SI to CIS Blocked}}\right)$ will provide the necessary indication to the

operators that the CSS has been disarmed from automatic actuation along with the SIS and the SI input to CIS has been blocked. Accordingly, we will redesign the lettering prior to resumption of power operations from the next refueling outage.

7. In response to Item 3, page 2 of the SE, the diesel generators' radiator fans will be made a load on emergency power to be placed on line with a delay after SIS/LOP* or immediately due to SIS but with no loss of offsite power. This modification will be accomplished during the next refueling outage.

MJT:2716

* CIS - Containment Isolation System

CVIS - Containment Ventilation Isolation System, a part of CIS

SIS - Safety Injection System (ECCS)

CSS - Containment Spray System

CSAS - Containment Spray Actuation Signal

SIAS - Safety Injection Actuation Signal

CIAS - Containment Isolation Actuation Signal

LOP - Loss of Power

Enclosure 2

RESPONSES TO ITEMS OF NRC LETTER,
LS05-81-09-003
SEP TOPIC VI-4, CONTAINMENT
ISOLATION SYSTEM

Item 1a. "The low reactor pressure signal and the high containment pressure signal for containment ventilation isolation...should not be overridden by a single block switch."

Response: There is one instance where the CVIS* is affected by this requirement. The pushbutton switch "CIS OVERRIDE POV-9 POV-10"*, does effect an override of isolation by the purge supply (POV-9) and the purge exhaust (POV-10) whether the isolation actuation signal was due either to pressurizer pressure (through the SIS*) or to containment pressure (directly and through the SIS). However, isolation due to high radioactivity in the sphere atmosphere is not overridden by any control device.

A commitment was made by letter dated January 15, 1980, K. P. Baskin to D. L. Ziemann, to lock closed the valves in the purge lines during Modes 1, 2, 3 and 4. With the valves locked closed, two actions are required to override these valves; namely, unlocking the valves and actuating the overrides. Therefore, changes to existing logic circuits of the sequencers and/or installation of additional logic control circuits such that the CVIAS* cannot be overridden by a single block switch will only be considered if NRC approval is obtained to unlock the CVIS valves during Modes 1, 2, 3 and 4.

Item 1b. "The low reactor pressure signal and the high containment pressure signal for...ESF initiation should not be overridden by a single block switch."

Response: The capability to override initiation of the SIS, CSS*, Auxiliary Feedwater System and CIS is discussed below:

a. Initiation of the SIS is not overridden by a single block switch. There is a separate block switch for each train of safety injection. In addition, the override automatically drops out when the pressurizer pressure exceeds 1900 psig.

b. Initiation of the CSS is not overridden by a single block switch. Each sequencer feeds a CSS train. Since each SLSS has a separate block switch, blocking one sequencer will block only one CSS train. There is a separate "Device Level Manual Override" for the following CSS components only:

i) Refueling Water Pumps (G-27 and G-275)
ii) Containment Spray Flow Limit Valves (CV-517 and CV-518)
iii) Hydrazine Pumps (G-200A and G-200B)
iv) Hydrazine Discharge Valves (SV-600 and SV-601)

valves, CV-949, CV-957 and CV-992, will be eliminated prior to resumption of power operation from the next refueling outage. At the same time, the six inside-containment valves of the Reactor Coolant Sampling System (RCSS) will be provided with capability for automatic containment isolation. However, three valves, CV-955, CV-956 and SV-3302 will have override provisions since they function as PASS valves. These isolation valves will augment administrative controls in that two actions are required to override this line; namely, one override action on each valve: one inside containment and one outside containment. With the installation of the PASS, the RCSS is not required following a containment isolation actuation signal as a result of an accident.

ii) The steam generator sample valves, with "CIS OVERRIDE SV-119 to SV-124", are outside of containment. These valves require two actions to be opened; namely, one action to override the valve and a second action to open it. During the next refueling outage inside containment isolation valves will be added. These valves will be provided with capability for automatic containment isolation and will also have override provisions. With the addition of these inside containment valves four actions will be required to open the line. Following

actuation of containment isolation as a result of an accident, the steam generator sample valves may be required to be operated intermittently in order to obtain low activity samples (i.e., steam generator tube rupture).

iii) The containment purge valves, with "CIS OVERRIDE POV-9 POV-10", are outside of containment and the other valves in these lines are manual valves 9A and 10A, also outside containment. Our letter dated January 15, 1980, K. P. Baskin to D. L. Ziemann, committed to maintain the valves closed and locked during Modes 1, 2, 3, and 4 (acceptable per SRP 6.2.4, II.3.d). Therefore, three actions are required to open these valves; namely, unlocking the valves, initiating the overrides, and manually opening the valves. This augments administrative controls.

Item 2a. "The containment isolation...override switches...should be provided with suitable mechanical features to augment administrative controls".

Response: Inadvertent initiation of CIS OVERRIDE is a very improbable occurrence because of existing administrative controls. The isolation valves with redundancy require two actions to be overridden; namely, one override action on each of the two trains.

The switches used to initiate override are maintained - contact pushbutton switches which are backlighted upon contact. The override is immediately annunciated in the control room by a flashing light and an aural alarm. In addition to these redundant safety features, two separate remote-manual valve controls must be activated in order to allow flow through the line. As discussed in Response d. to Item 1b., the isolation valves without redundancy are locked closed now or will have the override eliminated during the next refueling outage or we will add redundant isolation valves with circuitry for automatic closure. There are sufficient mechanical features to augment administrative control. Additional mechanical features to augment administrative controls will result in further, unnecessary redundancy.

Item 2b. "The...spray override switches...should be provided with suitable mechanical features to augment administrative controls."

Response: The component control switches enable alternative use of CSS components during normal operation. The override switches cannot effect an override condition anywhere in the CSS unless there is a CSAS present. Any "Override" drops out to become the normal control situation when the CSAS is no longer present. Restated, a component level "Override" can be in effect only during a CSAS, which is a desirable configuration. Therefore, there is no requirement for additional features to augment administrative control.

Item 2c. "The...sequencer test switches should be provided with suitable mechanical features to augment administrative controls."

Response: These test switches are located on panels behind doors, each of which is lockable and each energizes its open-status light on a control room panel on opening. Key control and control panel access procedures will be implemented prior to resumption of power from the next refueling outage requiring that only one control panel door be accessed at a time and that a verification be made that only one control panel "Door Open" light is lit when "Sequencer in Test" is annunciated. This will provide suitable mechanical features to augment administrative controls for the test switches.

Item 3a. "Audible alarms are activated when the low pressurizer pressure signal or high containment pressure signal is blocked."

Response: This sentence is technically incorrect. Audible alarms are actuated when the low pressurizer pressure signal and/or high containment pressure signal setpoints are reached and are detected by two of the three sensors for each parameter and train. These signals are inputs for logic circuits of the SIS. The output of these logic circuits can be blocked to prevent activating the SIS.

Item 3b. "...Audible alarms should...indicate that a containment isolation, or a containment ventilation isolation, a containment spray and/or a safety injection train is bypassed".

Response: Annunciation in the Main Control Room is provided to indicate: a CIS override including containment ventilation isolation override; a CSS test-bypass; and a SIS train block and "Sequencer In Test."

Item 4: "We also require that the licensee commit to replace the containment radiation channels that initiate containment isolation when Regulatory Guide 1.141 is approved by the NRC."

Response: Regulatory Guide 1.141 has not yet been issued by the NRC Staff. Therefore, it is inappropriate to commit to this Regulatory Guide at this time.

* CIS - Containment Isolation System

CVIS - Containment Ventilation Isolation System, a part of CIS

SIS - Safety Injection System (ECCS)

CSS - Containment Spray System

CSAS - Containment Spray Actuation Signal

SIAS - Safety Injection Actuation Signal

CIAS - Containment Isolation Actuation Signal

CVIAS - Containment Ventilation Isolation Actuation Signal

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The override can only be used to permit these components, once actuated by a CSAS, to be stopped and then cycled when continuous containment spray is not necessary. The override cannot prevent initiation of the CSS. In addition, once the override has been actuated following CSS initiation, it would be automatically reset when normal conditions are restored (i.e., the CSAS is no longer present).

c. Initiation of the Auxiliary Feedwater System is not overridden by any block switches.

d. Initiation of the CIS is comprised of an SIAS or or a high containment pressure signal. In addition, several valves can be actuated by a high radiation signal which cannot be overridden by any block switches; namely, POV-9, 10 and CV-10, 40, 116. As discussed below, there are three CIS valve sets which can be overridden by a single switch (each set). Corrective actions which will be taken on these valve sets are also discussed below.

i) The reactor coolant sample isolation valves, formerly with "CIS OVERRIDE CV-949, 957, 992," are outside containment. The isolation valves, SV-3302 and SV-3303, of the new Post Accident Sampling System (PASS) were added to this override switch. The capability to override the original