ATTACHMENT I

RANCHO SECO TECHNICAL SPECIFICATION
(Pages affected by Proposed Amendment No. 153)

Bases

Every reasonable effort will be made to maintain all safety instrumentation in operation. A startup is not permitted unless three power range neutron instrument channels and two channels each of the following are operable: four reactor coolant temperature instrument channels, four reactor coolant flow instrument channels, four reactor coolant pressure instrument channels, four pressure temperature instrument channels, four flux-imbalance flow instrument channels, four power-number of pumps instrument channels, and four high reactor building pressure instrument channels. The safety features actuation system must have two analog channels functioning correctly prior to startup.

Operation at rated power is permitted as long as the systems have at least the redundancy requirements of Column B (Table 3.5.1-1). This is in agreement with redundancy and single failure criteria of IEEE 279 as described in FSAR section 7.

There are four reactor protection channels. Normal trip logic is two out of four. Required trip logic for the power range instrumentation channels is two out of three. Minimum trip logic on other instrumentation channels is one out of two.

The four reactor protection channels were provided with key operated bypass switches interlocked to allow on-line testing or maintenance on only one channel at a time during power operation. Each channel is provided alarm and lights to indicate when that channel is bypassed.

Each reactor protection channel key operated shutdown bypass switch is provided with alarm and lights to indicate when the shutdown bypass switch is being used. There are four shutdown bypass keys in the control room under the administrative control of the shift supervisor. The keys will not
163→ be used during reactor power operation except for testing the shutdown
← bypass functions on a channel already in channel bypass.

The source range and intermediate range nuclear flux instrumentation scales overlap by one decade. This decade overlap will be achieved at 10^{-10} amps on the intermediate range scale.

Power is normally supplied to the control rod drive mechanisms from two separate parallel 480 volt sources. Redundant trip devices are employed in each of these sources. If any one of these trip devices fails in the untripped state on-line repairs to the failed device, when practical, will be made, and the remaining trip devices will be tested. Eight hours is ample time to test the remaining trip devices and in many cases make on-line repairs.

The OPERABILITY of the SFAS instrumentation systems and bypasses ensure that 1) the associated SFAS action will be initiated when the parameter monitored by each channel or combination thereof reaches its setpoint, 2) the specified coincidence

3.5 INSTRUMENTATION SYSTEMS

3.5.1 OPERATIONAL SAFETY INSTRUMENTATION

Applicability

Applies to unit instrumentation and control systems.

Objective

To delineate the conditions of the unit instrumentation and safety circuits necessary to assure reactor safety.

Specifications

3.5.1.1 Startup and operation are not permitted unless the requirements of table 3.5.1-1, Columns A and B are met.

3.5.1.2 In the event the number of protection channels operable falls below the limit given under table 3.5.1-1, Columns A and B, operation shall be limited as specified in Column C.

In the event the number of operable Process Instrumentation channels is less than the Total Number of Channel(s), restore the inoperable channels to operable status within 7 days, or be in at least hot shutdown within the next 12 hours. If the number of operable channels is less than the minimum channels operable, either restore the inoperable channels to operable within 48 hours or be in at least hot shutdown within the next 12 hours.

3.5.1.3 For on-line testing or in the event of a protection instrument or channel failure, a key operated channel bypass switch associated with each reactor protection channel will be used to lock the channel trip relay in the untripped state as indicated by a light. Only one channel shall be locked in this untripped state at any one time.

3.5.1.4 The key operated shutdown bypass switch associated with each reactor protection channel shall not be used during reactor power operation except for testing the shutdown bypass functions on a channel already in channel bypass. 163→ ←

3.5.1.5 During startup when the intermediate range instrument comes on scale, the overlap between the intermediate range and the source range instrumentation shall not be less than one decade. If the overlap is less than one decade, the flux level shall be maintained in the source range until the one decade overlap is achieved.

3.5.1.6 In the event that one of the trip devices in either of the sources supplying power to the control rod drive mechanisms fails in the untripped state, the power supplied to the rod drive mechanisms through the failed trip device shall be manually removed within 30 minutes. The condition will be corrected and the remaining trip devices shall be tested within eight hours. If the condition is not corrected and the remaining trip devices are not tested within the eight-hour period, the reactor shall be placed in the hot shutdown condition within an additional four hours.

ATTACHMENT II

FACILITY CHANGE SAFETY ANALYSIS
PROPOSED AMENDMENT NO. 163

DESCRIPTION:

Proposed Amendment No. 163 adds the following words to Technical Specification Section 3.5.1.4 and the Bases for Section 3.5.1: "...except for testing the shutdown bypass functions on a channel already in channel bypass."

This change provides an exception to the Technical Specification requirement that the key-operated shutdown bypass switch not be used during reactor power operation.

REASON FOR CHANGE:

Purpose

Licensee Event Report Number 87-027 reported that the shutdown bypass key(s) were issued for the performance of RPS channel calibrations during power operation. This is in violation of Technical Specification Section 3.5.1.4, which directs that the shutdown bypass keys not be used during power operation.

This amendment to Technical Specifications is proposed in response to a commitment stated in LER 87-027. This commitment was to submit a Technical Specification change which permits testing of the shutdown bypass high-pressure setpoint during power operations whenever the same channel is in maintenance bypass.

EVALUATION AND BASIS FOR SAFETY FINDINGS:

Systems, Subsystems, Components Affected

This proposed amendment affects the channel bypass switches and shutdown bypass switches of the Reactor Protection System.

The Reactor Protection System is described in USAR Section 7.1.2 (Reactor Protection System and Anticipatory Reactor Trip System). Technical Specification requirements are addressed in Sections 2.3 (Limiting Safety System Settings, Protective Instrumentation), 3.5.1 (Operational Safety Instrumentation), and Table 4.1-1 (Instrument Surveillance Requirements).

Safety Functions of Affected Systems/Components

The Reactor Protection System (RPS) monitors parameters related to safe operation and trips the reactor to protect the reactor core against fuel rod cladding damage. It also assists in protecting against reactor coolant system damage caused by high system pressure by limiting energy input to the system through reactor trip action (USAR Section 7.1.2).

Safety Functions of Affected Systems/Components (Cont.)

The RPS consists of four identical protection channels, each terminating in a trip relay within the reactor trip module. In the normal, untripped state, each protection channel passes current to the terminating relay and holds it energized as long as all inputs are untripped. Should any inputs trip, the terminating relay in that protective channel trips. Multiple relays form a coincidence network in each reactor trip module. When any two coincidence protection channels trip, all reactor trip modules trip, commanding all control rod drive breakers to trip, scramming the reactor. The four RPS protection channels are identical in their functions, which combine in the system logic to trip the reactor automatically to protect the reactor core and reactor coolant system.

Each RPS channel is provided with two bypass switches: a channel bypass switch and a shutdown bypass switch. The channel bypass allows the channel to be bypassed without initiating a trip. Actuation of the switch initiates a visual alarm on the main console which remains in effect during any channel bypass. During on-line testing, the RPS will operate in 2-out-of-3 coincidence. The shutdown bypass switch enables the power/imbalance/flow, power/RC pumps, low-pressure, and pressure/temperature trips to be bypassed in order to allow control rod tests to be performed prior to startup. The use of the shutdown bypass key switch is under administrative control. (USAR Section 7.1.2.3.8, Bypassing.)

Effects on Safety Functions

Each RPS channel is provided with a key-operated channel bypass switch. Whenever a channel is bypassed, the channel trip relay remains energized. Once the channel bypass is used, the subsequent removal of a critical module, placing a test module in TEST, or tripping of a critical value bistable will not de-energize the channel trip relay, and will not produce a channel trip signal. RPS logic will be changed from 2-out-of-4 logic coincidence to 2-out-of-3 coincidence. Electrical interlocks prevent bypassing more than one RPS channel at a time using the channel bypass switch.

The shutdown bypass switch is a key-operated switch which permits control rod drive testing below the low-pressure trip setpoint of 1900 psig. Unlike the channel bypass switch, the shutdown bypass switch does not bypass all of the trip functions in the RPS channel. Contained within each shutdown bypass switch is a shutdown bypass high-pressure bistable, set to open its associated contacts at 1820 psig, increasing. In the event that RCS pressure exceeds this when, or after, the shutdown bypass is initiated, the appropriate channel reactor trip relay is de-energized and a trip signal is initiated.

Therefore, when the channel bypass (maintenance bypass) is initiated, that respective RPS channel is removed from the RPS coincidence logic. Administrative controls and electrical interlocks prevent placing more than one RPS channel in channel bypass at a time. Once an RPS channel is bypassed

Effects on Safety Functions (Cont.)

using the channel bypass, and the RPS coincidence logic becomes 2-out-of-3, placing the same RPS channel in shutdown bypass does not affect the coincidence logic of the remaining RPS channels. Placing the RPS system in a 2-out-of-3 coincidence mode is addressed in USAR Section 7.1.2.3.1, System Logic. This proposed amendment does not alter the functionality of the Reactor Protection System. Once the channel bypass has been initiated, using the shutdown bypass will not degrade the system's ability to trip all control rods nor will it spuriously initiate a trip action. Accordingly, Proposed Amendment No. 157 does not effect the safety function of the reactor protection system.

Analysis of Effects on Safety Functions

The channel bypass (maintenance bypass) enables a single protection channel to be bypassed without initiating a trip. That bypass is permitted by Technical Specification 1.4.4 (Reactor Protection System Logic) because the plant is analyzed for the resultant 2-out-of-3 coincidence logic configuration. The channel bypass switches are electrically interlocked such that if one protection channel is in the channel bypass position, another channel cannot be placed in bypass. An attempt to place another channel in channel bypass would have no effect on the second channel.

Placing an RPS channel's key-operated shutdown bypass switch in bypass when the RCS pressure is greater than 1820 psig will cause that channel to trip. This occurrence would place the RPS into a 1-out-of-3 coincidence logic, and a subsequent single failure could cause insertion of control rods. However, by first placing that RPS channel in bypass using the key-operated channel bypass switch, any trip function will be totally bypassed. The RPS would then be placed into a 2-out-of-3 coincidence logic (an analyzed condition), and a single failure would neither spuriously trip, nor prevent the trip of the reactor protection system. The use of the shutdown bypass key would procedurally only allow its use during power operation on a channel already in channel (maintenance) bypass.

The only failure mode associated with this proposed amendment is if the channel (maintenance) bypass is returned to normal prior to returning the shutdown bypass to normal. If this occurs, the respective RPS channel will trip and the system will be placed in a 1-out-of-3 coincidence logic. This will not degrade the reactor protection system's ability to trip all control rods. Returning the channel bypass switch and the shutdown bypass switch to normal will be administratively controlled by procedure.

Proposed Amendment No. 163 will not involve a change to the facility as described in the USAR (chapter 7). The appropriate surveillance procedures will need to be revised to allow testing of the "shutdown bypass function" during power operation as long as the same RPS channel is in maintenance bypass.

Summary

Proposed Amendment No. 163 provides an exception to the Technical Specification requirement that the key-operated shutdown bypass switch not be used during reactor power operation. Licensee Event Report Number 87-027 reported that the shutdown bypass key(s) were issued for the performance of RPS channel calibrations during power operation. This is in violation of Technical Specification Section 3.5.1.4, which directs that the shutdown bypass keys not be used during power operation.

The proposed amendment affects the reactor protection system. Due to the condition of the system when the shutdown bypass is to be used during power operations (the same RPS channel is bypassed using the channel bypass), there is no effect on the safety function of the reactor protection system. The only failure mode associated with this proposed amendment would place the reactor protection system in a conservative, 1-out-of-3 coincidence logic mode.

The proposed amendment does not result in a change to the facility as described in the USAR.

The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the Safety Analysis Report will not be increased because the use of the shutdown bypass on an RPS channel already bypassed with the channel (maintenance) bypass will not change the functionality or coincidence logic of the RPS system.

The possibility for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report will not be created because the functionality of the RPS remains unchanged.

The margin of safety as defined in the basis for any Technical Specification is not reduced because the proposed amendment to Technical Specifications will not change the system from the analyzed, 2-out-of-3, coincidence logic mode.

Therefore, the implementation of Proposed Amendment No. 163 will not involve an Unreviewed Safety Question.

ATTACHMENT III

NO SIGNIFICANT HAZARDS CONSIDERATION

Proposed Amendment No. 163 provides an exception to the Technical Specification requirement that the key-operated shutdown bypass switch not be used during reactor power operation. Licensee Event Report Number 87-027 reported that the shutdown bypass key(s) was issued for the performance of Reactor Protection System (RPS) channel calibrations during power operation. This is in violation of Technical Specification Section 3.5.1.4, which directs that the shutdown bypass keys not be used during power operation. The exception allows for testing of the shutdown bypass function provided the testing is done on a channel that is already in maintenance bypass.

The District has reviewed the proposed change against each of the criterion of 10 CFR 50.92, and concluded that plant operation with proposed changes to the Technical Specification would not:

a. Involve a significant increase in the probability or consequences of an accident previously evaluated.

   The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated will not be increased because the use of the shutdown bypass on a RPS channel already bypassed with the channel (maintenance) bypass will not change the functionality or coincidence logic of the RPS system

b. Create the possibility of a new or different kind of accident from any previously analyzed.

   The possibility for an accident or malfunction of a different type than any evaluated previously will not be created because the functionality of the RPS remains unchanged.

c. Involve a significant reduction in a margin of safety.

   The margin of safety as defined in the basis for any Technical Specification is not reduced because the proposed amendment will not change the system from the analyzed, 2-out-of-3, coincidence logic mode.

The District concludes that the change proposed in Proposed Amendment No. 163 does not constitute a significant hazard or will in any way endanger the health and safety of the public.