

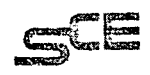
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K. P. BASKIN
MANAGER OF NUCLEAR ENGINEERING,
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November 26, 1980

Director, Office of Nuclear Reactor Regulation
Attention: Mr. Frank Miraglia, Branch Chief
Licensing Branch 3
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Gentlemen:

Subject: Docket Nos. 50-361 and 50-362
San Onofre Nuclear Generating Station
Units 2&3

Enclosed are sixty-three (63) copies of responses to several NRC questions enclosed in the NRC letter dated November 7, 1980. Enclosure 1 is a list of the responses which are included in Enclosure 2.

It is presently planned to transmit our responses to the bulk of the remaining questions by letter dated December 5, 1980, along with a schedule commitment for any remaining unanswered questions. Review of our responses would then be discussed with the NRC in a series of meetings to be held the week of December 15, 1980.

Direct distribution of these responses will be made as part of the Amendment 22 distribution and will be in accordance with the service list provided by SCE's letter of October 29, 1979. An affidavit attesting to the fact that distribution has been completed will be provided within ten days of docketing of Amendment 22.

Please let me know if you have any questions or need any additional information.

Very truly yours,

K P Baskin

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Enclosure

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RESPONSES TO NRC QUESTIONS
 SAN ONOFRE NUCLEAR GENERATING STATION
 UNITS 2 AND 3

<u>QUESTION</u>	<u>SUBJECT</u>
010.67	Spent fuel pool temperature
010.68	Spent fuel pool temperature
010.72	Steam supply-aux. feed pump turbine
015.51	Containment fire protection diagram
015.56	RCP oil containment and collection
031.3	I.D. Nos. for 600 volt power cables and containment building fan motors
031.4	Environmental qualification - 600 volt power cables
040.69	Equipment qualification
040.70	Equipment qualification
040.71	Training - diesel generators
040.74	Electric prelube oil pump
040.75	Diesel generator readiness
040.77	Standby diesel generator
040.78	Diesel generator starting
040.79	Diesel generator operations
121.29	LP Turbine information
121.32	Evaluation of turbine missiles
231.33	Structural analysis of fuel element assemblies
321.12	Continuous effluent monitor recording
321.13	Containment purge exhaust release rate
321.15	Calibration of effluent monitors
321.17	Iodine/particulate effluent sampling
321.18	Filters lead shield
321.19	Sample volumes calibration
321.20	Flow controlling devices
331.23	Operating shift crew
331.24	Personnel selection and training
331.25	Radiation Protection Manager
331.26	Chemistry and Radiation Protection
331.27	Chemistry and Radiation Protection
432.18	Emergency Plan (EP) agency interrelationships
432.20	EP agency interface
432.21	EP technical assistance
432.22	EP DOE agreement
432.24	EP emergency class conditions
432.25	EP initial messages

QUESTION

SUBJECT

432.26	EP followup messages
432.27	EP public notification
432.28	EP public program description
432.29	EP personnel alert
432.30	EP communications systems periodic test
432.31	EP news media contact
432.32	EP spokesperson
432.33	EP EOF design schedule/location
432.34	EP EOF staffing level
432.36	EP offsite meteorological capacity
432.37	EP meteorological instrumentation/procedures
432.38	EP receipt of field data
432.40	EP map of radiation monitors
432.46	EP field monitoring capability
433.47	EP assessment of radiological hazards
432.48	EP dose rate/measurement
432.50	EP personnel protective clothing/equipment
432.51	EP agency officials protective actions
432.52	EP maps of sampling/monitor points
432.56	EP total population exposure
432.57	EP exercises and drills
432.59	EP audits

ENCLOSURE (2)

RESPONSE TO NRC QUESTIONS

Responses to NRC Questions
San Onofre 2&3

Question 010.67

For the maximum spent fuel storage case involving storage of 800 assemblies, it is stated in the FSAR that, with two spent fuel pool trains in service, the maximum fuel pool temperature would be 150°F. Standard Review Plan (SRP) 9.1.3 states that the pool temperature should be kept at or below 140°F for the maximum heat load with normal cooling systems in operation. Therefore, demonstrate that fuel pool operation at 150°F for extended time periods will not result in degraded safety conditions due to the effect of the higher temperatures on the effectiveness of the spent fuel pool cleanup system ion exchanger and filter, the effect on fuel handling building ventilation systems including the charcoal filters, and the effect on operator access to the spent fuel storage facility to perform safety related operations.

Response

Amendment 21 to the FSAR revised the maximum fuel pool temperature from 150F to 140F, for the maximum spent fuel storage case involving storage of 800 assemblies with two spent fuel pool trains in service. This lower temperature is a direct result of a reduction in the temperature of the component cooling water (CCW) system, which cools the spent fuel pool heat exchangers. The CCW system has a lower heat load during this period of time and hence a lower temperature which results in removing more heat from the spent fuel pool without exceeding the maximum temperature of 140F.

Reference

FSAR subsection 9.1.3 was revised in Amendment 21.

Responses to NRC Questions
San Onofre 2&3

Question 010.68

For the maximum fuel storage case discussed in request 010.67, assuming failure of one fuel pool cooling train, state what the pool temperature would be and its effects on safe fuel pool operation, considering the following alternatives:

- a. Backup cooling systems are utilized. In this connection, provide the flow paths utilized and demonstrate the feasibility of utilizing these systems.
- b. Backup cooling systems are unavailable.

Response

- a. As stated in FSAR paragraph 9.1.3.3, the shutdown cooling system may be used as backup cooling for the spent fuel pool cooling system when the full core is removed from the reactor vessel. This is done by using either one of the low pressure safety injection pump (LPSI) and shutdown cooling heat exchanger trains to cool the water from the spent fuel pool. The flow path for the backup cooling system is shown in FSAR figures 6.2-33, 6.3-1 and 9.1-1. The flow path is described as follows: The LPSI pumps take suction from the spent fuel pool through line 010-14"-D-LLO shown on figure 9.1-1. The suction line then proceeds from line 010-14"-D-LLO to a tee with line 009-10"-D-LLO through a locked closed valve, 10"-013-D-212 and into line 007-10"-D-LLO where the line leaves figure 9.1-1 and goes onto figure 6.3-1. Line 007-10"-D-LLO then proceeds through a spectacle blind, through locked closed valve 10"-033-C-173 and into a tee with line 017-18"-C-KE0. From this point on, either shutdown cooling path may be used through the shutdown cooling heat exchangers which are shown on figure 6.2-33. From the outlet side of shutdown heat exchanger E004 line 003-12"-C-KE1 tees into line 027-12"-C-KE1 which combines with line 028-12"-C-KE1, from shutdown heat exchanger E003, and forms line 027-14"-C-KE1 which leaves figure 6.2-33 and returns to the upper righthand portion of figure 6.3-1. On figure 6.3-1 line 027-14"-C-KE1 tees into line 053-8"-C-KE1 which proceeds through locked closed valve 8"-018-C-173 changes number to line 133-8"-D-LLO and then returns to the upper left hand portion of figure 9.1-1. Line 133-8"-D-LLO then proceeds through locked closed valve 8"-026-D-212 where it becomes line 109-8"-D-LLO. From this point on the normal spent fuel pool cooling path is used.

Calculations have demonstrated that either shutdown heat exchanger is capable of removing in excess of the 40.3×10^6 Btu/hr maximum heat load from the spent fuel pool while maintaining a spent fuel pool temperature of not greater than 140F. Additional calculations demonstrate that the shutdown heat exchangers will receive the minimum required flow to remove the heat.

Responses to NRC Questions
San Onofre 2&3

- b. Since there are two redundant Class IE shutdown cooling paths, either of which may be used to remove the maximum heat load from the spent fuel pool, a backup cooling system shall always be available for the maximum fuel storage case.

Reference

See FSAR subsection 9.1.3. No FSAR changes were made.

Responses to NRC Questions
San Onofre 2&3

Question 010.72

The steam supply line to the auxiliary feedwater pump turbine drive is routed in a trench covered with heavy grating. Since this pump is needed for safe shutdown, provide the results of an analysis which demonstrates that this steam line will not be incapacitated by tornado missiles.

Response

In accordance with NRC Standard Review Plan Section 10.4.9 and Branch Technical Position ASB 10-1 position B.5, an additional motor-driven auxiliary feedwater pump was incorporated in San Onofre Units 2 and 3 design. The revised system is described in FSAR subsection 10.4.9 as submitted in Amendment 21 to the FSAR. The auxiliary feedwater system has therefore been designed such that the steam line to the auxiliary feedwater pump turbine may be incapacitated by tornado missiles without affecting the ability of the AFWS to perform its intended function, assuming a concurrent single active failure in either one of the other trains.

References

FSAR, subsection 10.4.9. No FSAR change was made.

Fire Hazard Analysis
Questions and Responses
San Onofre 2&3

Question FQ015.51

Provide diagrams of containment indicating circuit routing for safe shutdown systems. The drawings should identify the circuit functions and clearly indicate each circuit's physical relationship to other safe shutdown circuits. Reference Q015.12.

Response

Drawings of the containment indicating circuit routing for safe shutdown systems are being prepared and will be submitted to the NRC in December 1980.

Reference

None.

Fire Hazards Analysis
Questions and Responses
San Onofre 2&3

Question FQ015.56

It is our position that you provide an engineered oil containment and collection system for the reactor coolant pumps to protect against a pressurized oil spray igniting and affecting other safety related equipment or pumps. The installation must satisfy Reg. Guide 1.29, paragraph C.2. Reference Q015.30.

Response

An engineered oil containment and collection system for the reactor coolant pumps will be installed to protect against a pressurized oil spray igniting and affecting safety-related equipment.

Reference

None.

Responses to NRC Questions
San Onofre 2&3

Question 031.3

State the complete model and/or manufacturers identification number(s) for the 600 volt power cables and the containment building fan motors.

Response

All 600 volt power cables are manufactured by General Electric. Within the containment, G.E. Vulkene Supreme cable is used for all Class IE applications. Outside of the containment, a combination of G.E. Vulkene Supreme and G.E. ethylene propylene rubber insulated cable with neoprene jacket, (no trade name), is used on Class IE circuits.

Safety related containment fans are provided by Joy Manufacturing Co. and utilize the following Reliance Electric Co. motors:

<u>Fan No.</u>	<u>Description</u>	<u>Reliance Motor Model No.</u>
A-071	Dome Air Circulating Fan	600287-26
A-072	" " " "	"
A-073	" " " "	"
A-074	" " " "	"
E-399	Containment Emgy. Cooling Unit	600287-36
E-400	" " " "	
E-401	" " " "	
E-402	" " " "	

Reference

FSAR section 3.11A. No FSAR change was made.

Responses to NRC Questions
San Onofre 2&3

Question 031.4

Address the following which relate to the environmental qualification information provided for the 600 volt power cables.

- a. Justify the use of these cables for the San Onofre Station since the test results provided show that when these cables are thermally and radiation aged they have substantial deterioration of the jackets which in one case was repaired before the steam and chemical spray was applied and again during the high potential test (Refer to Cable B10.). Further, provide justification for not maintaining an electrical load on Cable B10 throughout the steam and chemical exposure test.
- b. Provide supporting data which clearly indicates that the LOCA environmental qualification conditions equals or exceeds the maximum calculated MSLB environmental qualification conditions.

Response

The information requested above was provided in response to NRC Question 040.68 which was included in Amendment 21.

References

Response to NRC Question 040.68.

Question 040.69

The following questions have been prepared based on review of environmental and seismic equipment qualification plans provided by the application identified: Bechtel Power Corporation Purchase Specification No. S023-302-3.

1. Ref. Response to NRC Question 040.50 dated 5/78, amendment 9, Table 040.50-1 and FSAR 3.11-2.
 - (a). Provide your equipment qualification plan as outlined in Section 5.3 of IEEE 323-1971.
 - (b). The use of previous operating experience and history can be acceptable (per IEEE 323-1971) for environmental qualification, however, the information must be complete especially with regard to service conditions and equipment performance and presented in an auditable form.
2. Identify the qualified life of the 480 V-Load Center.
3. Provide your acceptance criteria.
4. Provide test results when obtained.

Response

As discussed with the Equipment Qualification Branch, (NRC Questions 031.1 and 031.2) the response to this question will be provided in a generic submittal to the NRC as part of the overall environmental qualification review being conducted in accordance with NUREG 0588. Submittal is planned for February 1981.

References

Response to NRC Questions 031.1 and 031.2.

Responses to NRC Questions
San Onofre 2&3

Question 040.70

The following questions have been prepared based on review of environmental and seismic equipment qualification plans provided by the application identified: Bechtel Power Corporation Purchase Specification No. S023-3024 and Square D Company Report No. 432201:

1. Ref. Response to NRC Question 040.50 dated 5/78, amendment 9, Table 040.50-1 and FSAR 3.11-2.
 - (a). Provide your equipment qualification plan as outlined in Section 5.3 of IEEE 323-1971.
 - (b). The use of previous operating experience and history can be acceptable (per IEEE 323-1971) for environmental qualification, however, the information must be complete especially with regard to service conditions and equipment performance and presented in an auditable form.
2. Identify the qualified life of the 480 V-AC Motor Control Centers.
3. Provide your acceptance criteria.
4. Provide test results when obtained.

Response

As discussed with the Equipment Qualification Branch, (NRC Questions 031.1 and 031.2) the response to this question will be provided in a generic submittal to the NRC as part of the overall environmental qualification review being conducted in accordance with NUREG 0588. Submittal is planned for February 1981.

References

Response to NRC Questions 031.1 and 031.2.

Responses to NRC Questions
San Onofre 2&3

Question 040.71

Provide a detail discussion (or plan) of the level of training proposed for your operators, maintenance crew, quality assurance, and supervisory personnel responsible for the operation and maintenance of the emergency diesel generators. Identify the number and type of personnel that will be dedicated to the operations and maintenance of the emergency diesel generators and the number and type that will be assigned from your general plant operations and maintenance groups to assist when needed.

In your discussion identify the amount and kind of training that will be received by each of the above categories and the type of ongoing training program planned to assure optimum availability of the emergency generators.

Also, discuss the level of education and minimum experience requirements for the various categories of operations and maintenance personnel associated with the emergency diesel generators.

Response

The Operations Department training associated with the diesel generators is the same as that associated with any safety-related equipment. This training is accomplished in a formal classroom and the on-shift "hands-on" program leading to a Reactor Operator or Senior Reactor Operator license. All Control Operators and Assistant Control Operators must successfully complete this program and receive an NRC license prior to assuming their respective positions following fuel loading. There are 18 Control Operators and 54 Assistant Control Operators in the planned permanent Units 2&3 organization.

The formal classroom training for the emergency diesel generators is of 3 days duration. A typical course outline for formal training relative to the diesel generators is as follows:

- 1) Function and purpose of the system
- 2) Sequence of events after loss of power
 - a) Loading sequence
 - b) Load shedding sequence
- 3) Alarms and indications
- 4) Component systems and parameters (temp., press., etc.)
 - a) Cooling
 - b) Lube oil
 - c) Fuel supply
 - d) Fuel transfer
 - e) Air starting
 - f) Turbo charging

Responses to NRC Questions
San Onofre 2&3

- 5) Automatic trip
- 6) Technical Specification requirements

In addition to the above, "hands-on" training in operating the diesel generators will be provided to the above operating personnel during the plant startup phase and during surveillance testing after issuance of the plant operating license. A retraining program of 2 years duration is required for each licensed operator in accordance with 10CRF 50.55 (Appendix A). This program covers and updates the same material discussed above for the initial license training.

The maintenance department has scheduled two of the six foremen, one an electrical supervisor, the other a mechanical supervisor, for the General Motors Diesel School and the Woodward Diesel Generator Governer School. These schools are of a 5 day duration each and will give the foremen the required knowledge to maintain and identify problems that could occur with the diesel generators. Other foremen will be sent as required. These foremen will be the key maintenance personnel on the diesel generators and will become the knowledgeable supervisors of the maintenance crews during work conducted on the generators. All training of the maintenance personnel other than the foreman will be "hands-on" while being supervised by their foreman.

A list of the types and numbers of maintenance personnel, planned in the permanent Units 2&3 Station organization, that would be available for diesel generator up-keep for Units 2&3 is as follows:

	<u>Type</u>	<u>Number</u>
1)	Field Engineer	1
2)	Foremen	6
3)	Welders	2
4)	Boiler & Condenser Mechanic	10
5)	Machinists	8
6)	Electricians	13
7)	Crane Operator	2
8)	Helpers	12

Training and indoctrination of Quality Assurance personnel will be provided consistent with Section 17.2.2.2 of SCE topical report SCE-1-A, Quality Assurance Program, for safety-related activities. Training and indoctrination programs provide that personnel performing quality assurance inspections, surveillance and audits have the required education, experience and training to assure that activities are performed consistent with established requirements. Such programs include the following areas:

- a) Auditor training and certification in accordance with ANSI N45.2.2.3
- b) Nondestructive testing certification in accordance with SNT-TC-1A
- c) Inspection and testing certification in accordance with ANSI N45.2.6

Responses to NRC Questions
San Onofre 2&3

- d) Quality assurance procedures
- e) Specialized technical subjects such as welding inspection, electrical equipment inspection and testing, nondestructive examination techniques

Participation in these training programs by Quality Assurance personnel is a function of their assigned work activities and responsibilities.

Supervisory personnel, in the permanent Units 2&3 operations organization, consist of: six Watch Engineers and eight Operating Foreman. Each will have a Senior Reactor Operator's license and will complete the same diesel generator specific training discussed for the operations personnel above. Also, they will be required to attend a requalification training program, in accordance with 10CFR 50.55 (Appendix A), for a continuous period not to exceed 2 years. This program is the same discussed earlier with regard to the diesel generators.

Supervisory personnel in the permanent Units 2&3 maintenance organization consist of: one Maintenance Supervisor, two Assistant Supervisors, two Field Engineers, and six Foremen. Training consists of formal and "on the job." As discussed earlier, two foremen will attend the General Motors Diesel School and the Woodward Diesel Generator Govenner School.

The level of education and minimum experience requirements of the operations, maintenance and supervisory personnel will meet or exceed the requirements of ANSI N18.1-1971, Selection and Training of Nuclear Power Plant Personnel, as discussed in FSAR section 13, Qualifications of Nuclear Plant Personnel.

Training to fill vacancies in the supervisory, operations, and maintenance staffs will be conducted to provide a sufficient reserve of qualified individuals to assure reliable operation and maintenance of the diesel generators.

In addition to those listed above, the following manpower resources are available to assist in operation and maintenance of the diesel generators:

- 1) Thirty Nuclear Plant Equipment Operators who will be in training for Reactor Operator's licenses and could work under the direct supervision of licensed operators.
- 2) Apporximately 400 maintenance men in the Company's Division Maintenance Force. These men have worked on machinery of this type and can be called upon if needed.

Reference

FSAR section 8.3. No FSAR change was made.

Responses to NRC Questions
San Onofre 2&3

Question 040.74

An emergency diesel generator unit in a nuclear power plant is normally in the ready standby mode unless there is a loss of offsite power, an accident, or the diesel generator is under test. Long periods on standby have a tendency to drain or nearly empty the engine, lube oil piping system. On an emergency start of the engine as much as 5 to 14 or more seconds may elapse from the start of cranking until full lube oil pressure is attained even though full engine speed is generally reached in about five seconds. With an essentially dry engine, the momentary lack of lubrication at the various moving parts may damage bearing surfaces producing incipient or actual component failure with resultant equipment unavailability.

The emergency condition of readiness requires this equipment to attain full rated speed and enable automatic sequencing of electric load within ten seconds. For this reason, and to improve upon the availability of this equipment on demand, it is necessary to establish as quickly as possible an oil film in the wearing parts of the diesel engine. Lubricating oil is normally delivered to the engine wearing parts by one or more engine driven pump(s). During the starting cycle the pump(s) accelerates slowly with the engine and may not supply the required quantity of lubricating oil where needed fast enough. To remedy this condition, as a minimum, an electrically driven lubricating oil pump, powered from a reliable DC power supply, should be installed in the lube oil system to operate in parallel with the engine driven main lube pump. The electric driven prelube pump should operate only during the engine cranking cycle or until satisfactory lube oil pressure is established in the engine main lube distribution header. The installation of this prelube pump should be coordinated with the respective engine manufacturer. Some diesel engines include a lube oil circulating pump as an integral part of the lube oil preheating system which is in use while the diesel engine is in the standby mode. In this case an additional prelube oil pump may not be needed.

Confirm your compliance with the above requirement or provide your justification for not installing an electric prelube oil pump.

Response

Each individual diesel engine installed in SONGS 2&3 has a factory mounted 6 gal/min ac motor-driven pump and a standby 3 gal/min dc motor-driven soak back pump.

The ac motor-driven pump operates continuously whenever the diesel engine is shutdown and in the "standby" mode. This pump continuously circulates warm oil to the turbo-charger bearings and maintains the lube oil system full of oil. This will minimize the amount of time required for the main lube oil pump to begin circulating lube oil through the engine

Responses to NRC Questions
San Onofre 2&3

following receipt for a start signal.

EMD operating experience has shown, that for those engines furnished with electric circulating oil pumps, special prelube has not been necessary prior to manual start.

Therefore, based upon design provisions and operating experience, a special "pre-lube" system for the SONGS 2&3 diesel engine units is not considered necessary.

Reference

FSAR subsection 9.5.7. No FSAR changes were made.

Question 040.75

Periodic testing and test loading of an emergency diesel generator in a nuclear power plant is a necessary function to demonstrate the operability, capability and availability of the unit on demand. Periodic testing coupled with good preventive maintenance practices will assure optimum equipment readiness and availability on demand. This is the desired goal.

To achieve this optimum equipment readiness status, the following requirements should be met:

1. The equipment should be tested with a minimum loading of 25 percent of rated load. No load or light load operation will cause incomplete combustion of fuel resulting in the formation of gum and varnish deposits on the cylinder walls, intake and exhaust valves, pistons and piston rings, etc., and accumulation of unburned fuel in the turbo-charger and exhaust system. The consequences of no load or light load operation are potential equipment failure due to the gum and varnish deposits and fire in the engine exhaust system.
2. Periodic surveillance testing should be performed in accordance with the applicable NRC guidelines (R.g. 1.108), and with the recommendations of the engine manufacturer. Conflicts between any such recommendations and the NRC guidelines, particularly with respect to test frequency, loading and duration, should be identified and justified.
3. Preventive maintenance should go beyond the normal routine adjustments, servicing and repair of components when a malfunction occurs. Preventive maintenance should encompass investigative testing of components which have a history of repeated malfunctioning and require constant attention and repair. In such cases consideration should be given to replacement of those components with other products which have a record of demonstrated reliability, rather than repetitive repair and maintenance of the existing components. Testing of the unit after adjustments or repairs have been made only confirms that the equipment is operable and does not necessarily mean that the root cause of the problem has been eliminated or alleviated.
4. Upon completion of repairs or maintenance and prior to an actual start, run, and load test a final equipment check should be made to assure that all electrical circuits are functional, i.e., fuses are in place, switches and circuit breakers are in their proper position, no loose wires, all test leads have been removed, and all valves are in the proper position to permit a manual start of the equipment. After the unit has been satisfactorily started and load tested, return the unit to ready automatic standby service and under the control of the control room operator. Provide a discussion of how the above requirements have been implemented in the emergency diesel generator system design and how they will be considered when the plant is in commercial operation, i.e., by what means will the above requirements be enforced.

Responses to NRC Questions
San Onofre 2&3

Response

- 1) Station Operating Instructions "Diesel Generator Operation" S023-2-13 considers gum varnish formation as a result of testing, with minimum or no loading, of the emergency diesel generators, in the following manner.
 - a) "If the diesel is operated at less than 20% load for four and one-half (4 1/2) hours the diesel should be run for 30 minutes at 40% load to clean out the exhaust stacks."

NOTE: General Motors Electro-Motive Division, has stated that with consideration to the Units 2&3 machines, 20% instead of 25% load (mentioned in the question) is sufficient to limit gum varnish formation.

 - b) "The diesel generators should not be allowed to operate unloaded, synchronous speed conditions for greater than 30 minutes."
- 2) Periodic surveillance testing will be performed on a 31-day schedule consistent with the recommendations of Regulatory Guide 1.108. The testing will be in accordance with test procedure S023-3-3.23, "31 day surveillance test procedure", and technical specification 3/4.8.1.1, "AC Sources-Operating."
- 3) Preventive maintenance (cleaning oil filters, checking oil viscosity, levels, etc.) will be completed as scheduled in the Equipment Operating Manual (with regards to hours equipment ran, etc.). Additional preventive maintenance will be done in regards to standby condition of the diesels. If during surveillance testing a mechanical or electrical problem arises, the problem will be corrected using the required tools and parts necessary to complete the job and restore reliable operation to the diesel generator. The experience and training of the foreman supervising the job and his attention to details will determine the root cause of the problem. This will be reflected on the Licensee Event Report (LER) (NUREG-0161). This report will contain a detailed description of the problem, the consequences of the problem, the cause or causes of the problem, the corrective actions taken, and any actions taken to prevent its recurrence. All maintenance being done on the diesel generators will be accomplished using a designated maintenance procedure including a Check-Off List for complete removal, inspection, and re-assembly of any component found to degrade the system's reliability.
- 4) Upon completion of any repairs or maintenance, a periodic surveillance test, required by Station Order S023-0-111, "Equipment Testing Before and After Maintenance," will be performed prior to declaring that the system is operable. The diesel generator will be prepared to operate in accordance with Station Operating Instruction S023-2-13, "Diesel Generator Operation."

Responses to NRC Questions
San Onofre 2&3

This instruction includes a check-off list for position and indication of electrical and mechanical systems associated with the diesel generator. The completed check-off list will then be submitted to the Watch Engineer for his review and approval. The "31-day surveillance test procedure," S023-3-3.23, will then be completed to demonstrate operability of the diesel before returning it to service.

Reference

FSAR section 8.3. No FSAR change was made.

Responses to NRC Questions
San Onofre 2&3

Question 040.77

Provide a discussion of the measures that have been taken in the design of the standby diesel generator air starting system to preclude the fouling of the air start valve or filter with moisture and contaminants such as oil carryover and rust. (SRP 9.5.6, Part III, item 1).

Response

The air start system is protected by filters consisting of an inner and outer screen which hold four felt pad filter elements. One filter per compressor is located at the compressor inlet and removes contaminants. A refrigerated air dryer located between the compressor and air receiver tank removes moisture from the air start system prior to entering the receiver. The inlet pipe to the receiver enters at the bottom and exits from the top. A drain line in the bottom of the receiver provides for removal of small amounts of condensate that have collected in the tank. A Y-tank strainer, containing a monel mesh screen and located immediately upstream of the air start valve, effectively removes any remaining impurities from the air being piped to the air start valve and motor.

The air line lubricator, located between the air start valve and starting motor, emits an oil-air mist into the starting system air to provide lubrication for the starting motor. The injection of lubricating oil to the starting motor at a point downstream of the air start valve ensures that the air start valve will not be contaminated by lube oil carryover.

The air start system is flushed per ANSI N45.2.1-1973 Class C requirements to remove rust and other contaminants before diesel generator system startup.

From the above it can be concluded that the design of the diesel generator air start system precludes fouling due to oil carryover and rust.

Reference

FSAR subsection 9.5.6. No. FSAR changes were made.

Responses to NRC Questions
San Onofre 2&3

Question 040.78

- (A) Experience at some operating plants has shown that diesel engines have failed to start due to accumulation of dust and other deliterious material on electrical equipment associated with starting of the diesel generators (e.g., auxiliary relay contacts, control switches - etc.). Describe the provisions that have been made in your diesel generator building design, electrical starting system, and combustion air and ventilation air intake design(s) to preclude this condition to assure availability of the diesel generator on demand.
- (B) Also describe under normal plant operation what procedure(s) will be used to minimize accumulation of dust in the diesel generator room, specifically address concrete dust control. In your response also consider the condition when Unit 1 is in operation and Unit 2 is under construction (abnormal generation of dust).

Response

- (A) All electrical equipment associated with starting the engines is enclosed in dust tight, NEMA 4 type enclosures. Therefore, contamination by dirt or dust which enters the room via the ventilation system is not considered to present a problem. Similiarly, accumulation of dust in the diesel engine spaces is also not considered to be a problem and will be controlled by means of normal plant housekeeping.
- (B) Existing housekeeping practices at San Onofre Unit 1 have been adequate to minimize the accumulation of dust in the diesel generator room and thereby avoid failures of the engines due to accumulation of dust. The housekeeping requirements of ANSI N45.23 also will be prescribed in written procedures applied to Units 2&3.

The diesel generators for Unit 2 are located on the extreme north side of Unit 2. Unit 3 is located south of Unit 2. Virtually all significant dust generating activities will have been completed prior to operation of Unit 2. Thus, when Unit 2 is in operation and Unit 3 is under construction, no abnormal generation of dust in the vicinity of the Unit 2 diesel generators is expected.

Unit 1 and Units 2&3 diesel generators are contained in similar concrete buildings. Concrete dust has not been a source of engine failures on Unit 1. Therefore, it is considered that the housekeeping practices and design configurations discussed above are adequate to preclude failures due to the accumulation of concrete dust.

Reference

FSAR subsection 9.5.8. No FSAR changes were made.

Responses to NRC Questions
San Onofre 2&3

Question 040.79

The diesel generators are required to start automatically on loss of all offsite power and in the event of a LOCA. The diesel generator sets should be capable of operation at less than full load for extended periods without degradation of performance or reliability. Should a LOCA occur with availability of offsite power, discuss the design provisions and other parameters that have been considered in the selection of the diesel generators to enable them to run unloaded (on standby) for extended periods without degradation of engine performance or reliability. Expand your PSAR/FSAR to include and explicitly define the capability of your design with regard to this requirement. (SRP 9.5.5, Part III, Item 7).

Response

The Electro-Motive Division of General Motors, manufacturers of the diesel engines, have stated minimum continuous load restrictions in their operating manual. These restrictions will be incorporated into the plant operating procedures. These stated that the engines should not be operated at full load speed for extended periods of time at loads below 20% of the full load rating.

In the event of receipt of a safety injection actuation signal (SIAS) without concurrent or subsequent receipt of a loss of offsite voltage signal (LOVS), the diesel-generators will start and come up to rated speed and voltage with no load and will remain in this mode unless a LOVS is received.

No load operation will be limited by operating procedure to 30 minutes duration. Therefore, as part of the accident procedures the operators are instructed to override the SIAS and manually shutdown the diesel-generators after 30 minutes of operation. Should a LOVS be received after the diesel generators have been manually shutdown, they will automatically restart, come up to proper speed and voltage within 10 seconds and begin accepting loads.

Reference

Revised FSAR section 8.3.

Responses to NRC Questions
San Onofre 2&3

Question 121.29

Provide the following information for each LP turbine:

- a. Turbine type
- b. For each disc:
 - (1) type of material including material specifications
 - (2) tensile properties data
 - (3) toughness properties data including Fracture Appearance Transition Temperature and upper energy and temperature
 - (4) Keyway temperatures
 - (5) critical crack size at operating and design overspeed
 - (6) crack growth rate
 - (7) calculated bore and keyway stress at operating and design overspeed
 - (8) calculated K_{Ic} data
 - (9) Minimum yield strength specified for each disc

Response

- a. Turbine type has been provided in FSAR paragraph 10.2.2.2.2.
- b. For each disc:
 - (1) The type of material including material specifications have been provided in FSAR paragraph 10.2.3.1 and table 1.8-3 (page 1.8-10).
 - (2) The tensile properties data has been provided in FSAR paragraph 10.2.3.1.D.
 - (3) The toughness properties data including fracture appearance transition temperature have been provided in FSAR paragraph 10.2.3.1.D. The upper energy and temperature will be provided by January 1981.
 - (4) Keyway temperature will be provided by January 1981.
 - (5) Critical crack size at design overspeed has been provided in FSAR paragraph 10.2.3.2. at operating overspeed will be provided by January 1981.
 - (6) The crack growth rate has been provided in FSAR paragraph 10.2.3.2.
 - (7) The calculated bore and keyway stress at operating and design overspeed will be provided by January 1981.
 - (8) The calculated KIC data has been provided in FSAR paragraph 10.2.3.2.
 - (9) The minimum yield strength will be provided by January 1981.

Responses to NRC Questions
San Onofre 2&3

Question 121.32 /

Indicate whether an analysis and evaluation regarding turbine missiles have been performed for your plant and provided to the staff. If such an analysis and evaluation has been performed and reported, please provide appropriate references to the available documentation. In the event that such studies have not been made, consideration should be given to scheduling such an action.

Response

The analysis and evaluation regarding turbine missiles have been provided in FSAR paragraph 3.5.1.3.

Reference

FSAR section 3.5. No FSAR changes were made.

Responses to NRC Questions
San Onofre 2&3

Question 231.33 /

Provide the data requested in the forms given in Appendix A so that we may complete our review of the generic methods and the plant-specific audit being conducted of the structural analysis of fuel element assemblies for combined seismic and LOCA loads.

Response

Fuel assembly static and dynamic test data and material descriptions for San Onofre Units 2 and 3 fuel was provided in CEN-140(S)P by Southern California Edison letter dated November 18, 1980. A copy was provided to EG and G (Mr. R. L. Grubb) by CE in letter S-CE-6277 of October 21, 1980. The above submittal was complete with the exception of spacer grid crush strength data which will be supplied following completion of production grid testing. Acceleration time history of a horizontal SSE, and vertical LOCA data will also be provided later. Expected transmittal dates for the above are:

December 1980 - Acceleration time history of a horizontal SSE

December 1980 - Vertical LOCA data

January 1981 - Spacer Grid Crush Strength data

References

No FSAR change was made. SCE to NRC letter dated November 18, 1980.

Responses to NRC Questions
San Onofre 2&3

Question 321.12

In your submittal, you have stated that the effluent monitors will provide continuous recording of the effluent in the control room. It is our position that this should be done for each separate release pathway. Explain how you can accomplish this with a single monitor which can switch back and forth between continuous vent and containment purge exhausts.

Response

The purpose of the wide range effluent monitor is to provide an expanded range for monitoring radiological effluents following a postulated accident. During normal operation both the Unit 2 and Unit 3 monitors will be aligned to sample the plant vent stack as shown on figure 321.12-1. With this alignment, one of the filters (c) for both the low and high range flow paths will be assigned to the plant vent stack.

For a postulated accident in Unit 2, the Unit 2 containment purge system will be isolated as described in FSAR subsection 6.2.4. The operator using radiological information provided by the high range incontainment monitors (FSAR subsection 12.3.4), containment airborne monitors (FSAR paragraph 11.5.2.1.4.5), emergency radiation monitoring system (FSAR subsection 12.3.4) and postaccident sample system (FSAR subsection 9.3.6) would decide when to initiate containment purge. Prior to purging the containment, the wide range effluent monitors would be aligned as shown on figure 321.122.

With the post-accident configuration as shown on figure 321.122, the Unit 3 wide range effluent monitor would be sampling from the plant stack. Because of the common continuous exhaust plenum the radiation release through the Unit 3 plant stack would be one-half the total plant release.

The post-accident configuration will result in the following activity being on the filters for a postulated accident in Unit 2:

- 1) Unit 2 wide range effluent monitor C filter will contain one-half of the total particulate and iodine from plant stack releases during normal operations up to time of purge of Unit 2 containment following a postulated accident.
- 2) Unit 2 wide range effluent monitor B filter will contain particulate and iodine from containment purge releases following a postulated Unit 2 accident.
- 3) Unit 3 wide range effluent monitor C filter will contain one-half of the total particulate and iodine from plant stack releases during normal operations up to time of purge of Unit 2 containment following a postulated accident (identical to Unit 2 C filter).

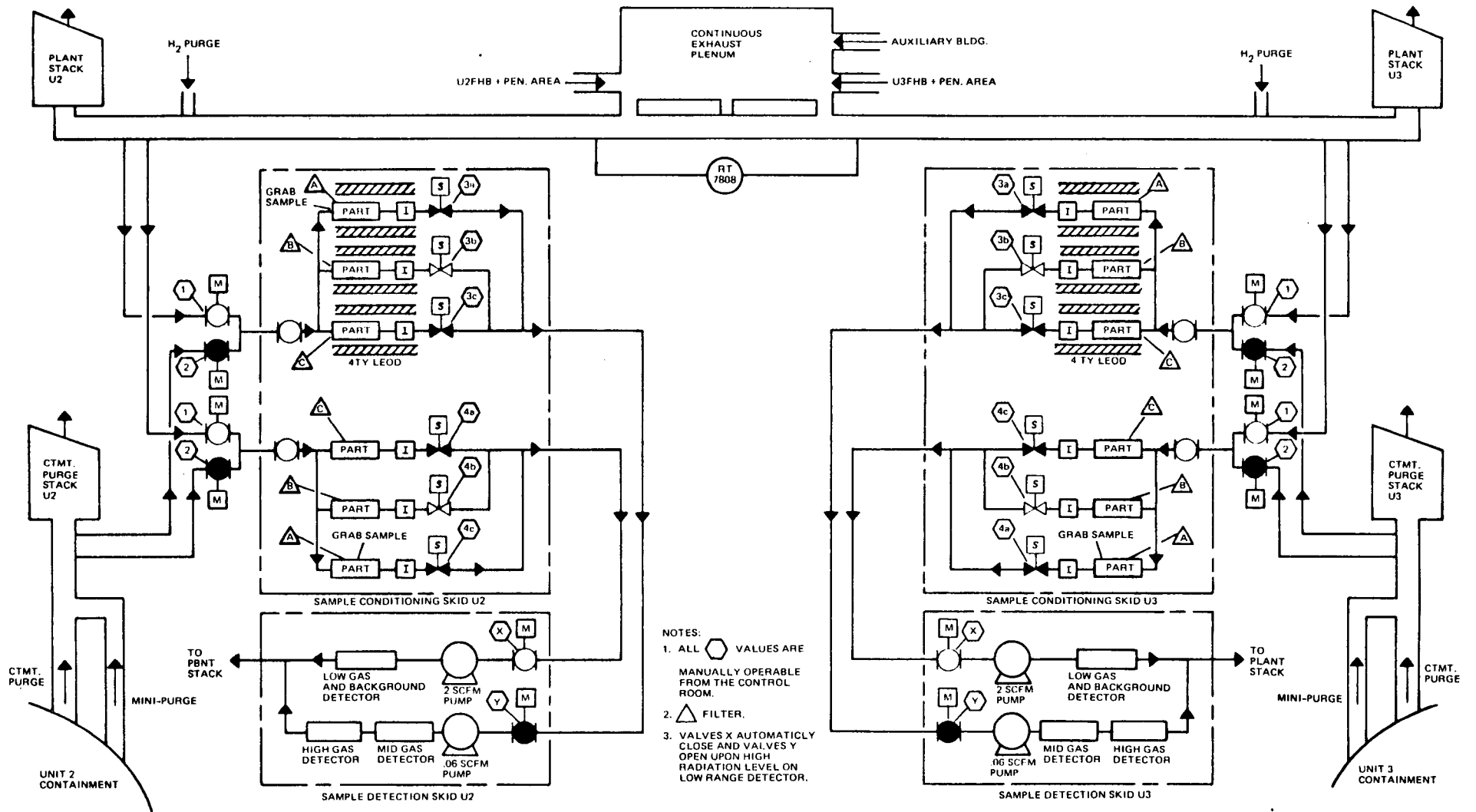
Responses to NRC Questions
San Onofre 2&3

- 4) Unit 3 wide range effluent monitor B filter will contain one-half of the total particulate and iodine from plant stack releases during purging of Unit 2 containment following postulated Unit 2 accident.
- 5) At the operator's discretion, a grab sample (A) can be taken. The controls and recorders for the wide range effluent monitors are located in the control room panels 2L-405 and 3L-405 as described in FSAR paragraphs 11.5.2.1.1.5 and 11.5.2.1.1.6. At the time of switchover to the monitor configuration for containment purge the continuous recorders in the control room will be marked to indicate switchover has occurred.

Both the Unit 2 and Unit 3 wide range effluent monitors switchable between the containment purge and plant vent stacks will be installed prior to operation of Unit 2 above 5% power.

References

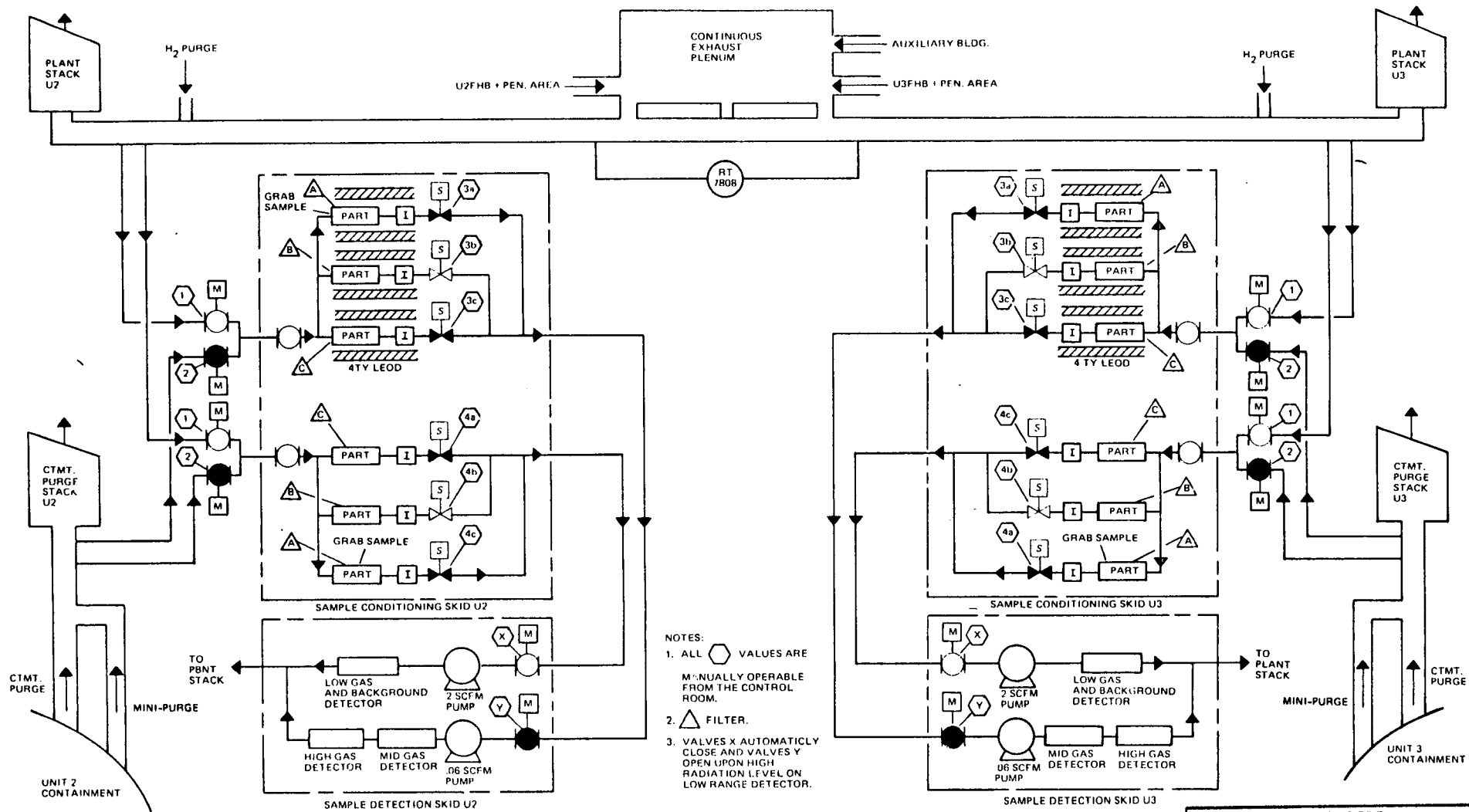
FSAR section 11.5. No FSAR change was made.



**SAN ONOFRE
NUCLEAR GENERATING STATION
Units 2 & 3**

WIDE RANGE EFFLUENT MONITOR
CONFIGURATION FOR NORMAL OPERATION

Figure 321.12-1



- NOTES:
1. ALL VALUES ARE MANUALLY OPERABLE FROM THE CONTROL ROOM.
 2. FILTER.
 3. VALVES X AUTOMATICLY CLOSE AND VALVES Y OPEN UPON HIGH RADIATION LEVEL ON LOW RANGE DETECTOR.

SAN ONOFRE NUCLEAR GENERATING STATION
Units 2 & 3
 WIDE RANGE EFFLUENT MONITOR
 CONFIGURATION FOR CONTAINMENT
 PURGE FOLLOWING POSTULATED
 UNIT 2 ACCIDENT
 Figure 321.12-2

Responses to NRC Questions
San Onofre 2&3

Question 321.13

How will you quantify the containment purge exhaust releases under widely varying containment purge exhaust rates ranging from a low 50 CFM to a high 40,000 CFM?

Response

The design containment purge stack flow rates are 2,000 standard ft³/min during operation and 40,000 standard ft³/min during plant shutdown. The wide range effluent monitoring system is designed to maintain isokinetic conditions with variations in stack flowrates of ± 25% from design values.

If the stack flowrates vary more than 25% from the design values, the isokinetic conditions are no longer present; however, the noble gas detector will continue to operate. Upon significant variation in flowrates from design conditions (e.g., more than +50%) the calculation of noble gas release rates will be incorrect and a channel failure alarm is generated.

Reference

FSAR section 11.5. No FSAR change was made.

Responses to NRC Questions
San Onofre 2&3

Question 321.15

Describe how you will initially calibrate the monitors and also at what frequency you will calibrate them periodically.

Response

The detectors used in the wide range effluent monitor will have a primary laboratory calibration report. This calibration report establishes the linearity of the detector. Field calibration of these detectors involves using a single calibration source which, when placed in the proper geometry relative to the detector, verifies a single point on the detector calibration curve. The frequency of field calibration for the wide range effluent monitor is every refueling.

Calibration of the main steam line detectors involves the use of a RT-10 calibrator. The RT-10 calibrator contains 10mCi of Cs-137. The calibrator is hung on the detector bracket. The geometry of the calibrator and source can be changed so as to obtain two different radiation levels within the range of each detector. The frequency of calibration for the main steam line detectors is every refueling.

The initial calibration for the high range in-containment monitor involves the use of a current source to generate a signal output. This is then verified by using a calibrated Cs-137 radiation source and standard geometry. For field calibration a RT-11 calibrator is being developed. The RT-11 will contain a line source of approximately 100 millicuries/cc of Cs-137 providing a source of 1.2 to 1.5 R/h. This calibrator will be capable of being hung on the detector and will be shielded to reduce background levels. The frequency of calibration of the high range in-containment monitors is every refueling.

Reference

Refer to FSAR paragraph 11.5.2.1.5.2 and revised FSAR paragraph 12.3.4.5.

Responses to NRC Questions
San Onofre 2&3

Question 321.17

How will you determine iodine and particulate effluent releases via containment purge and continuous vent exhausts if you provide only a single sampler for both the vents?

Response

Refer to response to NRC Question 321.12.

References

None

Responses to NRC Questions
San Onofre 2&3

Question 321.18

Will the 4" lead shield that surrounds the filters be equivalent to the basis set forth for shielding envelope by NRC in its September 5 letter to all licensees and applicants on "Preliminary Clarification of TMI Action Plan Requirements"?

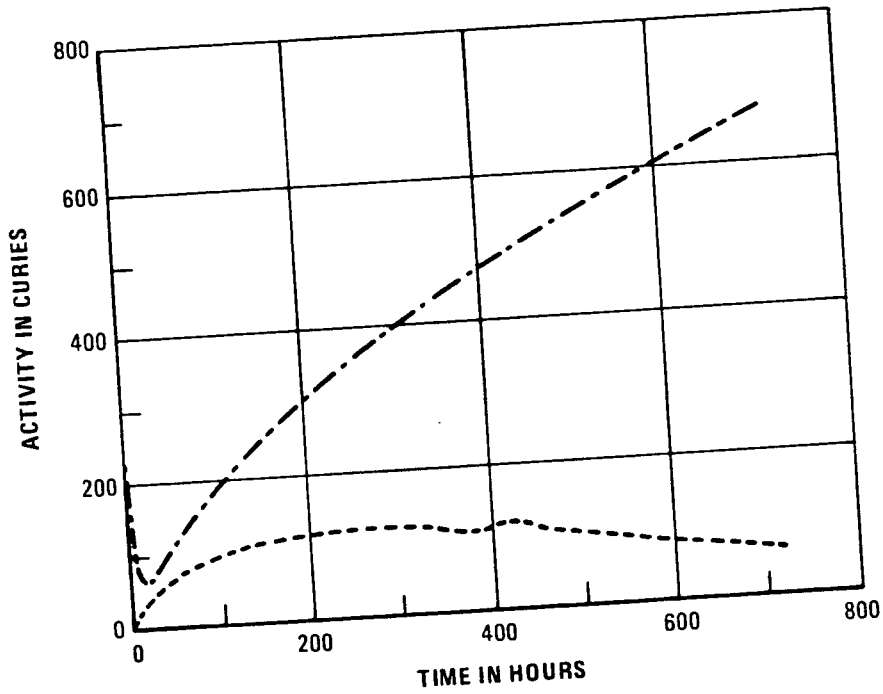
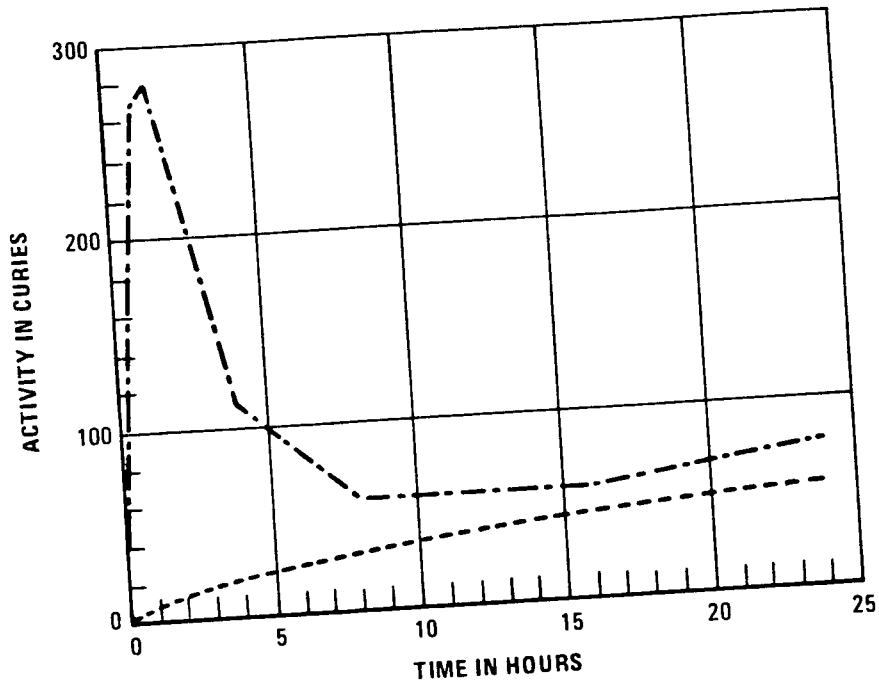
Response

The 4π lead shield surrounding the wide range effluent monitor high range particulate and iodine filters is 2 inches thick. The design basis for the filter shielding is $10^5 \mu\text{Ci/cc}$ of noble gas and $10^2 \mu\text{Ci/cc}$ iodines leaving the stack at the design flowrate. The filter is modeled as a flow thru system assuming a 99% particulate filter efficiency and 95% silver zeolite efficiency. The model considers buildup of daughter products, as well as the actual gamma energies for each isotope. Figure 321.18-1 shows the buildup of activity on the shielded filters. Figure 321.18-2 shows the dose rate versus time for these filters.

This design basis exceeds the shielding basis presented in Table II.F.1-2 of the September 5 letter to all licensees and applicants.

Reference

Refer to FSAR paragraph 11.5.2.1.1.8 and response to NUREG 0660.

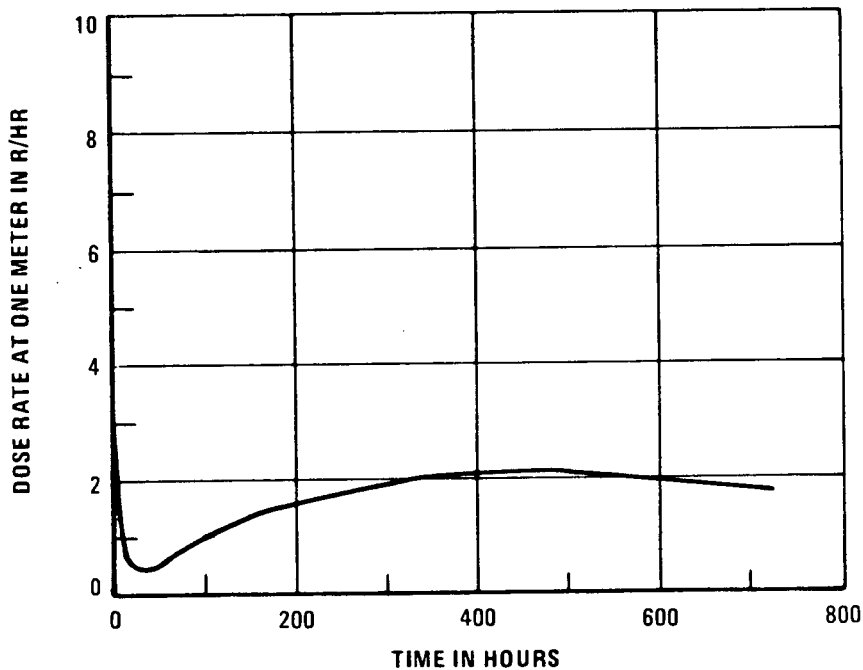
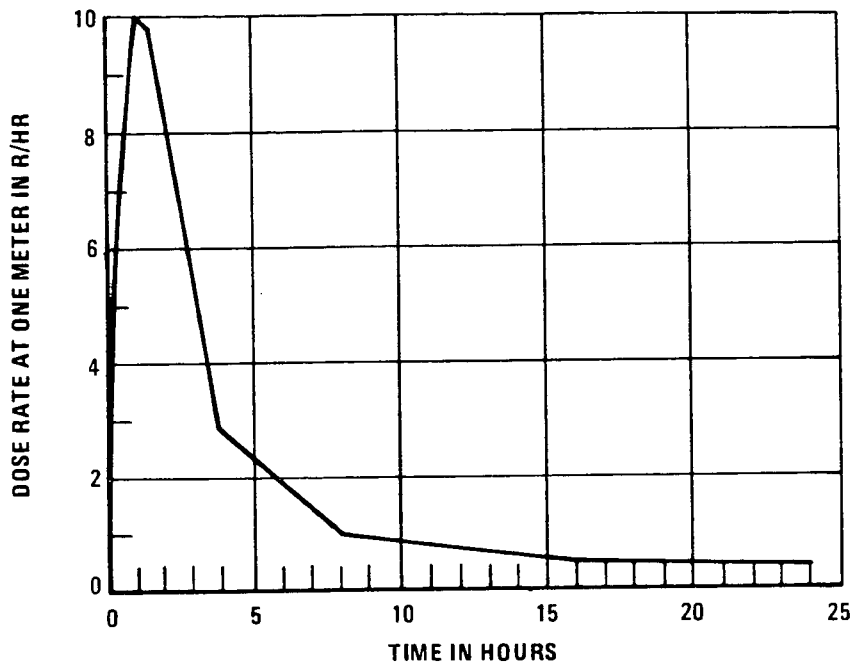


NUCLIDE TYPE
 - - - - - PARTICULATE
 - HALOGENS

SAN ONOFRE
NUCLEAR GENERATING STATION
Units 2 & 3

WIDE RANGE EFFLUENT MONITOR
 FILTER HALOGEN AND
 PARTICULATE ACTIVITY

Figure 321.18-1



SAN ONOFRE NUCLEAR GENERATING STATION Units 2 & 3
WIDE RANGE EFFLUENT MONITOR FILTER EXTERNAL DOSE
Figure 321.18-2

Responses to NRC Questions
San Onofre Units 2&3

Question 321.19

Describe how you will initially calibrate the sample volumes and analysis and also at what frequency you will check them periodically.

Response

The calibration method, and frequencies for the wide range effluent, main steam line and high range in-containment monitors are discussed in FSAR paragraphs 11.5.2.1.5.2 and 12.3.4.5 and response to NRC Question 321.15.

References

Refer to FSAR paragraphs 11.5.2.1.5.2 and 12.3.4.5.

Responses to NRC Questions
San Onofre 2&3

Question 321.20

Demonstrate that the flow controlling devices have the capability to maintain iso-kinetic conditions with variations in stack or duct design flow velocity of ± 20 percent.

Response

The RM-80 micro processor will match the wide range effluent detector flowrate to the stack flowrates to maintain iso-kinetic conditions with variations in the design stack flowrates of $\pm 25\%$.

Reference

See revised FSAR paragraph 11.5.2.1.1.8 and response to NUREG 0660.

Responses to NRC Questions
San Onofre 2&3

Question 331.23

Section 13.1.2.3 (Operating Shift Crew) of the FSAR, implies that a HP technician will not be onsite during all shifts. NUREG -0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," requires that a health physics technician be onsite at all times. Show how you plan to comply with this criteria and revise appropriate portions of the FSAR.

Response

A Radiation Protection Technician will be onsite at all times. FSAR paragraph 13.1.2.3, Operating Shift Crews, has been revised to clearly state this commitment.

Reference

Revised FSAR paragraph 13.1.2.3

Responses to NRC Questions
San Onofre 2&3

Question 331.24

In Section 13.1.2.3, you state that the Supervision of Plant Chemistry and Radiation Protection, Assistant Chemical/Radiation Protection Engineer, and Chemical Radiation Protection Foreman will all meet the minimum requirements of Regulatory Guide 1.8, "Personnel Selection and Training" which references ANSI 18.1. Provide updated resumes for the personnel who have been chosen to fill these positions with a breakdown of their qualifications corresponding to Regulatory Guide 1.8/ANSI 18.1 requirements (education, training, experience). The experience referenced for all above personnel must be in the individuals speciality, which in this case would be radiation protection.

Response

The Supervisor of Plant Chemistry and Radiation Protection for San Onofre Units 2 and 3 has recently been assigned to the Unit 1 supervisor position. Efforts are currently in progress to fill the San Onofre Unit 2 and 3 position. The selected individual will meet the recommendations of Regulatory Guide 1.8 and the resume of the individual will be provided in the FSAR.

Tables 331.24-1, 331.24-2, 331.24-3, and 331.24-4 provide an outline of the training and qualifications of the Assistant Chemical/Radiation Protection Engineer (J. P. Albers) and the Chemical Radiation Protection Foreman (S. P. Corey) respectively. The work experience and education of these individuals satisfy the requirements of ANSI 18.1.

Reference

FSAR section 13.1. No FSAR change was made.

Table 331.24-1

TRAINING

John P. Albers

<u>Type of Training</u>	<u>Where Trained</u>	<u>Duration</u>	<u>On the Job</u>	<u>Formal Course</u>
1. Principles and Practices of Radiation Protection	a. San Diego State University M.S. Degree Radiological Health Physics	2 years		X
	b. Argonne National Laboratory: University of Chicago Graduate Student Research Participation Program: TLD studies	3 months	X	X
	c. Rockwell International Health Physics	80 hours		X
	d. Oak Ridge National Laboratory Emergency Handling of Radiation Accidents	40 hours		X
	e. Los Alamos Scientific Laboratory Respiratory Protection	40 hours		X
	f. San Diego Chapter Health Physics Society: Health Physics Certification Course	17 weeks		X
	g. Rockwell International Reactor Operations	40 hours		X
	h. Pacific Gas and Electric Company Dept. of Engineering Research	6 months	X	
	i. San Onofre Nuclear Generating Station	3 years	X	

Responses to NRC Questions
San Onofre 2&3

Table 331.24-1

<u>Type of Training</u>	<u>Where Trained</u>
2. Radioactivity Measurement Standardization and Monitoring Techniques and Instruments	Same as above
3. Mathematics and Calculations basic to the use and measurement of radioactivity	Same as above
4. Biological effects of radiation	Same as above

Responses to NRC Questions
San Onofre 2&3

Table 331.24-2

EXPERIENCE WITH RADIATION

John P. Albers

1. Isotope - Cs - 137
Maximum Amount - 130 Ci
Experience at San Onofre Nuclear Generating Station Unit 1
Duration - 3 years
Type of Use - Calibration
2. Isotope - Ra - 226
Maximum Amount - 50 mCi
Experience at San Onofre Nuclear Generation Station Unit 1
Duration - 3 years
Type of Use - Calibration
3. Material - Mixed Fussion Products and Activated Corrosion
Products
Maximum Amount - 150 Ci
Experience at San Onofre Nuclear Generating Station Unit 1
Duration - 3 years
Type of Use - Solid Waste Shipments
4. Material - Cs-137
Maximum Amount - 5 mCi
Experience at Pacific Gas & Electric Company/Department of Engineering
Research
Duration - 6 months

Table 331.24-3
TRAINING

Stephen P. Corey

<u>Type of Training</u>	<u>Where Trained</u>	<u>Duration</u>	<u>On the Job</u>	<u>Formal Course</u>
1. Principles and Practices of Radiation Protection	a. Rockwell International Energy Systems Group	40 hours		X
	b. Southern California Edison Division Laboratory	6 months	X	
	c. San Onofre Nuclear Generating Station	5 years	X	
2. Radioactivity Measurement Standardization and Monitoring Techniques and Instruments	Same as above			
3. Mathematics and Calculations basic to the use and measurement of radioactivity	Same as above			
4. Biological Effects of Radiation	Same as above			

Table 331.24-4

EXPERIENCE WITH RADIATION

Stephen P. Corey

1. Isotope - Cs - 137
Maximum Amount - 130 Ci
Experience at San Onofre Nuclear Generating Station Unit 1
Duration - 3 years
Type of Use - Calibration
2. Isotope - Ra - 226
Maximum Amount - 50 mCi
Experience at San Onofre Nuclear Generating Station Unit 1
Duration - 3 years
Type of Use - Calibration
3. Material - Mixed Fission Products
Maximum Amount - 120-150 Ci
Experience at San Onofre Nuclear Generating Station Unit 1
Duration - 3 years
Type of Use - Spent Resin Shipments

Responses to NRC Questions
San Onofre 2&3

Question 331.25

According to the draft document "Criteria for Utility Management and Technical Competence", the Radiation Protection Section shall be separate from the Chemistry Section. In addition, the Radiation Protection Manager shall 1) report directly to the Plant Manager or Unit 2&3 Superintendent, 2) report at the same level as the Supervisor of Plant Operations, and 3) be a member of PORC. It is our position that you make the above changes and revise your FSAR and proposed Technical Specifications accordingly.

Response

The draft document "Criteria for Utility Management and Technical Competence" and other NRC and industry criteria have been reviewed and efforts are now in progress to reorganize consistent with these recommendations. It has already been determined that health physics and chemistry sections will be separated and that the additional three (3) requirements identified in the question will be satisfied. The FSAR will be revised by approximately January, 1981 to reflect the reorganization.

Reference

FSAR section 13.1. No FSAR change was made.

Question 331.26

In section 13.1.2.3, you state that the Watch Engineer is responsible for implementing the radiation protection program in the absence of the Supervisor of Chemistry and Radiation Protection or his designated alternative. It is our position that this authority be delegated to a person more qualified in radiation protection in the absence of the supervisor of Chemistry and Radiation Protection.

Response

A senior or designated individual from the Radiation Protection section will implement the radiation protection program in the absence of the Supervisor of Radiation Protection. There will be a Radiation Protection Technician onsite at all times to perform this duty. This individual will report to the Watch Engineer.

Reference

Revised FSAR paragraph 13.1.2.3. Response to NRC Question 331.23.

Response to NRC Questions
San Onofre 2&3

Question 331.27

Based on information contained in the draft document, "Criteria for Utility Management and Technical Competence", it is our position that your organization chain contain a qualified health physicist to provide backup in the event of the absence of the Supervisor of Chemistry and Radiation Protection. The December 1979 revision of ANSI 3.1 specifies that individuals temporarily filling the RPM position should have a B.S. degree in science or engineering, 2 years experience in radiation protection, 1 year of which should be nuclear power plant experience, 6 months of which should be onsite. It is our position that such experience be professional experience. Provide an outline of the qualifications of the individual who will act as the backup for the RPM in his absence.

Response

Mr. John P. Albers, Assistant Radiation Protection Engineer III, will be the individual who will act as the backup in the event that the supervisor of radiation protection is absent.

Tables 331.24-1 and 331.24-2, of the response to question 331.24 provide an outline of Mr. J. P. Albers training and experience respectively.

Reference

Response to NRC Question 331.24. FSAR section 13.1. No FSAR change was made.

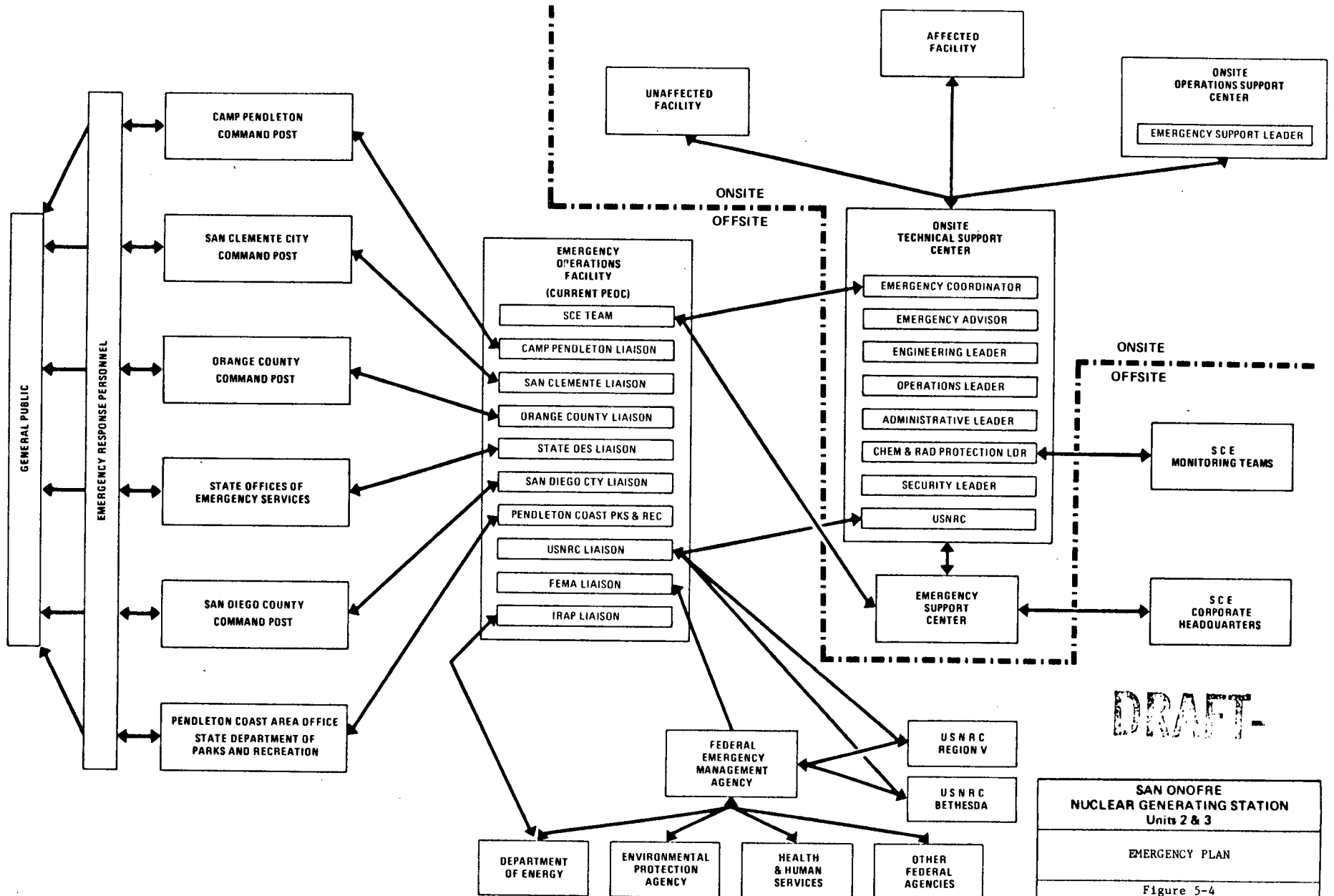
Responses to NRC Questions
San Onofre 2&3

Question 432.18

Illustrate the interrelationships among the licensee and other involved organizations (State, local governments, DOE, laboratories etc.).

Response

The present Figure 5.4 in the Emergency Plan will be replaced with the attached draft Figure 5.4. A finished version of this figure will be incorporated into the revised Emergency Plan. This figure will provide the information required above.



DRAFT

SAN ONOFRE
NUCLEAR GENERATING STATION
Units 2 & 3

EMERGENCY PLAN

Figure 5-4

Responses to NRC Questions
San Onofre 2&3

Question 432.20

Specify the interfaces among the onsite functional areas of emergency activity, headquarters support, local services support, and State and local government organizations. Illustrate these interfaces with a block diagram.

Identify the organization that corresponds to the EOF as described in NUREG 0654. Use the same block diagram to illustrate the relationship between the TSC, the EOF, and the corporate organization.

Response

The interfaces between the groups are identified in Section 3.0, Section 5.4, and in Table 5.3 of the Emergency Plan.

Responses to NRC Questions
San Onofre 2&3

Question 432.21

Specify the contractors and private organizations (laboratories, vendors, etc.) who may be requested to provide technical assistance to the emergency organization.

Response

Section 5.3.2 will be re-designated 5.3.3 and a new Section 5.3.2 inserted in the Emergency Plan. The new section will identify sources of technical expertise which may be called upon to provide technical assistance in an emergency. The organizations which will be included are: Bechtel Power Corporation (A-E), Combustion Engineering (NSSS), and the Institute for Nuclear Power Operations (INPO).

Personnel obtained from these sources are expected to be utilized in the emergency operations facility or in the onsite technical support center.

Responses to NRC Questions
San Onofre 2&3

Question 432.22

More detail is needed on the agreement made with DOE, as outlined in NUREG-0654. Also, the agreement letter, presumably contained in Appendix A, is missing.

Response

The personnel and other resources from the DOE Interagency Radiological Assistance Plan (IRAP) will not be called upon to respond onsite to an emergency at SONGS. The IRAP involvement is with the offsite agencies. In the emergency plans of the counties within the emergency planning zone, the responsibility for radiological assesement, including coordination of IRAP support, has been assigned to the State of California. The detailed information on the use of IRAP will be found in the State's emergency planning.

This protocol is consistent with the interim 44 CFR 351.24, which assigns emergency response planning functions to the DOE. Paragraph (f) contains the provision that the FRMAP (Federal Radiological Monitoring and Assessment Plan-the successor of IRAP) "...provides the framework through which participating Federal agencies will coordiante their emergency radiological monitoring and assessment activities with those of State and local governments..."

Space will be available in the new emergency operations facility for IRAP (FRMAP) liaisons, as agents of local and State governments.

Responses to NRC Questions
San Onofre 2&3

Question 432.24

All example conditions found in NUREG-0610 should be included in each emergency class. The specific instruments, parameters, or equipment status shall be shown for establishing each emergency class.

Response

Table 4.1 of the SONGS 2 & 3 EP tabulates all of the initiating conditions applicable to SONGS 2 & 3. For each initiating condition, the applicable parameter or equipment status corresponding to each of the emergency classifications is specified.

Numerical values for these emergency action levels (EAL) are specified, except for values related to the Technical Specification Limiting Conditions for Operation.

Sections 4.1.1 through 4.1.4 will be revised to include all applicable EALs as identified in Table 4.1.

The latest revision of NUREG-0654 provides that "The specific instruments, parameters or equipment status shall be shown for establishing each emergency class in the in-plant emergency procedures..." Emergency Procedure S023-VIII-1.1, "Classification of Emergencies", is under revision to incorporate the required data. The format of this procedure will consist of separate tabs for each initiating condition. On each of these tabs, the parameter values and the instruments used, and/or equipment status corresponding to each of the emergency classifications will be tabulated.

Responses to NRC Questions
San Onofre 2&3

Question 432.25

Establish, in conjunction with State and local organizations the contents of the initial messages to be sent from the plant. Provide the list of items to be incorporated in these messages.

Response

Emergency Procedure S023-VIII-1.4 "Offsite Notifications" provides four initial notification forms - one for each emergency classification. Copies of these forms are in place at the Station and at each of the primary offsite agencies' contact point. These forms provide information on the class of emergency, whether or not a release is/has taken place, potentially affected areas, and protective action recommendations, as appropriate to the class of emergency. The forms contain pre-worded information and blanks for incident-specific data.

To assist primary offsite agencies with interpretation of the Station condition, the initiating conditions are keyed to an emergency event manual. This event manual, provided to the lead agencies, describes in laymen's terms the nature of the emergency, expected onsite and offsite actions, and potential for escalation. The emergency event manual for SONGS 1 is expected to be complete in January 1981. The corresponding manual for SONGS 2 & 3 will be prepared subsequent to the completion of the manual for SONGS 1.

Responses to NRC Questions
San Onofre 2&3

Question 432.26

Make provisions for follow-up messages to the facility to authorities. Such messages shall contain information listed as items a through n to NUREG-0654.

Response

Emergency Procedure S023-VIII-1.4, "Offsite Notifications" provides a follow-up notification form containing the information tabulated in NUREG-0654 Section E, criteria 4a through 4n. The procedure provides that the form will be completed and follow-up calls made to each of the lead agencies notified initially, as soon as initial notifications are complete, and periodically through the duration of the emergency.

Responses to NRC Questions
San Onofre 2&3

Question 432.27

Establish administrative and physical means to notify and instruct the public within the plume exposure EPZ, as described in Appendix 3 of NUREG-0654.

Response

Administrative

As provided in Section 6 of the Emergency Plan, Station personnel will notify the primary response agencies of any emergency at the SONGS facilities. This initial notification is to include recommendations for appropriate protective actions. The agencies thus notified are:

- o City of San Clemente
- o Camp Pendleton, USMC
- o Pendleton Coast Area Office, State Dept. of Parks and Recreation
- o San Juan Capistrano
- o Orange County
- o San Diego County
- o State office of Emergency Services

In accordance with their individual response plans, and based on their evaluation of the protective action recommendation, these primary agencies may trigger the siren system and release appropriate public information messages to the Emergency Broadcast System (EBS) coordinating station or other local radio stations.

In the pre-accident public information program, the public will be instructed that the sirens are simply alerting devices and that their response to the sirens is to turn on radios to the pre-designated stations for further instructions.

The response plans and SOPs of the primary agencies listed above describe administrative controls on the activation of the public warning system.

Physical

SCE Contracted with Wylie Laboratories for a public warning study in the area encompassed by the EPZ. This study recommended siren types and locations using the NUREG-0654 Appendix 3 criteria.

SCE will purchase and arrange for the installation of the necessary sirens with projected completion of installation by July 1, 1981.

Responses to NRC Questions
San Onofre 2&3

Question 432.28

Describe your program to the public on matters such as emergency action levels, protective actions and evacuation.

Response

SEC will provide supporting information and otherwise assist local agencies in providing messages for public notification.

Such information is provided to the lead offsite agencies in the initial and follow-up notification forms described in the responses to comments on criteria E.3 and E.4. The emergency event manual described in the response to the comment on criterion E.3, provides the local authorities additional information which can be utilized as they deem appropriate.

SCE is currently developing a public information program, to commence about April 1, 1981, which will include the subject matter and frequency specified in Section II.G.1 of NUREG-0654 / FEMA REP-1, Revision 1. This program will be directed to the resident and visitor population within the plume exposure pathway EPZ and contiguous areas. A coordinated program is planned with elements carried out by local government in addition to SCE.

Responses to NRC Questions
San Onofre 2&3

Question 432.29

Describe provisions to alert or activate your emergency personnel (onsite and offsite).

Response

Onsite personnel are alerted by the Station public address system and/or Station alarms as described in paragraphs 6.1.1.1, 6.1.2.1, 6.1.3.1, 6.1.4.1, and as tabulated in Table 7.1.

Offsite personnel (corporate offices) are notified via communications systems tabulated in Table 7.1.

Offsite personnel (off-duty) are notified via telephone.

Emergency Procedure S023-VIII-1.3, "Activation of SCE Emergency Centers and Organizations" provides call-lists for augmentation of on-duty personnel and activation of the emergency centers.

Responses to NRC Questions
San Onofre 2&3

Question 432.30

Provide commitment to periodically test the communications systems.

Response

A new section, 8.4, "Emergency Communications Testing" will be added to the Emergency Plan. This section will describe the testing program for emergency communications, and will include the following provisions:

1. Pacific Telephone System Direct Lines

The Pacific Telephone System direct lines located in the Control Room and other normally staffed locations are routinely used in the performance of normal Station activities and are therefore exempt from periodic testing.

2. SCE Private Automatic Exchange System (PAX)

PAX telephones are routinely used in the performance of normal Station activities and are therefore exempt from periodic testing.

3. SCE and SDG&E Magneto System

These magneto systems are routinely used by shift personnel in the performance of routine Station activities and are therefore exempt from periodic testing.

4. Station Public Address System

The Station public address system is routinely used in the performance of normal Station activities and is therefore exempt from periodic testing pursuant to this Emergency Plan.

5. Two-way Radio (UHF Paging System)

The UHF paging system is routinely used by shift personnel in the performance of routine Station activities and is therefore exempt from periodic testing. However, this equipment is subject to periodic testing in accordance with the FCC commercial radio service license covering their operation.

6. Emergency Communications

The following listed communications systems will be tested at least monthly:

- o All telephones and other communication equipment located in the Onsite Technical Support Center, and the Onsite Operations Support Center including direct lines to the primary response agencies and the PEOC (interim-EOF).

Responses to NRC Questions
San Onofre 2&3

- o USMC PAX Telephone System (Control Room)
- o California Department of Parks and Recreation Radio (Control Room)
- o USMC Radio (Control Room)
- o USMC Telephone (Direct line to Central Fire Station and Base Duty Officer, Camp Pendleton).

7. USNRC Hotlines

The USNRC Hotline (OPX and HPN) will be tested in accordance with current NRC directives on the used of these systems.

8. Emergency Operations Facility Communications

When constructed, communication systems under the control of SCE at the EOF will be tested at least annually.

9. Portable Radio Receivers

Portable radio transceivers stored in emergency kits and emergency equipment cabinets will be tested quarterly as part of the inventory and maintenance of emergency equipment specified in Section 8.3 of the Emergency Plan. In addition, these transceivers are subject to periodic testing in accordance with the FCC commercial radio service license covering their operation.

Responses to NRC Questions
San Onofre 2&3

Question 432.31

Designate the principal points of contact and physical locations for use by the news media during an emergency.

Response

Upon occurrence of a Site or General Emergency, a public relations team will be dispatched to the Primary Emergency Operations Center (PEOC) which is located at the San Clemente City Hall and serves as the interim EOF. The Vice President Nuclear Engineering and Operations heads this team and is designated as the primary spokesperson for SCE. Formal press releases will be prepared and answers to technical queries will be provided by the Emergency Support Center. Press briefings will be conducted at the PEOC.

Upon completion of the emergency operations facility, this activity will be carried out within the EOF.

In the event that there is extensive media coverage of the emergency, arrangements have been made to set up the media operations center in the gymnasium of the Boy's and Girl's Club of San Clemente.

For Unusual Event and Alert Emergency classifications, press releases and other media relations will be handled by the SCE Public Relations staff at the Corporate Headquarters in Rosemead.

A new Section 6.6, "Emergency News Operations" including the information provided above will be incorporated into the Emergency Plan.

Responses to NRC Questions
San Onofre 2&3

Question 432.32

Designate a spokesperson who will have access to all necessary information.

Response

The Vice President Nuclear Engineering and Operations is designated as the primary spokesperson for SCE in the event of a Site or General Emergency. This individual has access to all information regarding the emergency response via the Emergency Support Center.

For Unusual Events and Alerts, SCE Public Relations personnel will serve as spokespersons. The Emergency Coordinator will be responsible for ensuring these personnel receive pertinent information.

A new Section 6.6 "Emergency News Operations", including the above information, will be incorporated in the Emergency Plan.

Responses to NRC Questions
San Onofre 2&3

Question 432.33

Indicate when the design of the EOF will be completed. Provide its proposed location.

Response

Negotiations are currently underway with the US Marine Corps for a long term lease on land in the Camp Pendleton area upon which to build the emergency operations facility.

The proposed EOF location is 1.0 kilometer from the reactor plant site in the north-northwest direction.

Design and engineering activities are being performed for the EOF to the extent that can be done without the knowledge of the specific criteria to be issued in NUREG-0696, Rev. 1. Design activities for the EOF are expected to be complete about May 1981 and the EOF will be available for use by July 1982.

Until such time as this facility is available, the Primary Emergency Operations Center, in the San Clemente City Hall, will be used as the EOF as described in the current version of the Emergency Plan.

Responses to NRC Questions
San Onofre 2&3

Question 432.34

Provide information on the staffing level of the EOF.

Response

Section 5.4 of the Emergency Plan, "Coordination With Participating Government Agencies", provides that each of the primary response agencies will provide a representative to the Primary Emergency Operations Center at the San Clemente City Hall. In addition, SCE will send a public relations team of six individuals including the Vice President Nuclear Engineering and Operations, the Manager of Nuclear Affairs, the Manager of Nuclear Engineering, Licensing and Safety, the Manager of Nuclear Engineering and Safety, the Manager of Corporate Communications, and a SDG & E representative. The Station will dispatch a Chemical and Radiation Protection Engineer. Space will be provided for representatives of State and Federal Government agencies.

Representatives from the following jurisdictions will be present:

- o Orange County
- o San Diego County
- o Camp Pendleton Marine Corps Base
- o City of San Clemente
- o City of San Juan Capistrano
- o Pendleton Coast Area Office, State Dept. of Parks and Recreation

Technical support and station liaison for the SCE team will be provided via dedicated communication links with the Emergency Support Center in the Administration and Warehouse Building onsite.

Provisions for more extensive staffing are being made in the design of the new EOF.

Responses to NRC Questions
San Onofre 2&3

3. Evacuation is an appropriate protective action for:
 - o An incident involving a release, or potential release, which is projected to result in an offsite dose greater than 500 mrem whole body, or 7500 mrem to the child thyroid, in situations where the lead time between declaration of the emergency and population relocation is compatible with plume movement.
 - o Situations which do not provide for advance warning, but for which substantial reductions in population dose can be made by avoiding exposure to residual radioactivity (plume fallout) in the wake of sudden severe incidents. In these cases, sheltering should be maintained until the plume passes, if possible.
4. Thyroid prophylaxis will not be recommended by SCE personnel to offsite agencies, since State Department of Health clearance is required for administration of this drug.
5. No protective action will be recommended for incidents involving actual or potential radioactivity releases which are projected to result in projected whole body or thyroid doses less than about 170 mrem to members of the general public. This provision is based on recommendations of the National Council on Radiation Protection and Measurements contained in NCRP Report No. 39, which establishes 170 mrem as the annual limit for exposure of critical organs for the population from all sources of exposure except natural radiation and medical exposures.

Offsite agencies responsible for implementing protective actions for the public will assign protective actions based on their evaluation of the SCE recommendation.

The role of SCE in offsite protective actions is to provide offsite agencies with timely notifications of emergencies, appropriate recommendations for protective actions, appropriate accident assessment data, and data from offsite monitoring performed by SCE personnel in the event of a release; to provide a capability for warning the public in a timely manner; and to assist local officials with pre-incident public information programs.

Responses to NRC Questions
San Onofre 2&3

Question 432.36

Identify offsite meteorological capacity in the vicinity of your plant.

Response

The following locations are sources of offsite meteorological information in the vicinity of SONGS. These sources could be used in the event that the onsite instrumentation at both SONGS 2 & 3 and at SONGS 1 are unavailable.

- o Oceanside Airport
- o El Toro Marine Corps Air Station
- o Orange Co. Airport
- o Camp Pendleton Headquarters Landing Field

Table 7.3 will be revised to indicate these sources.

Responses to NRC Questions
San Onofre 2&3

Question 432.37

Provide meteorological instrumentation and procedures which satisfy the criteria in Appendix 2 and provisions to obtain representative real-time meteorological information from other sources. (The NRC staff will establish a schedule for the implementation of the requirements, set forth in this Appendix.)

Response

A primary meteorological measurements system is in place at SONGS. This equipment is tabulated in Table 7.3 in the Emergency Plan. Procedures for the calculation of atmospheric dispersion and downwind doses are in place. These procedures are based on map overlays. A computer assisted atmospheric dispersion and downwind dose assessment system has been purchased and installation is expected by September 1981.

SCE will, as necessary, upgrade existing instrumentation and procedures to provide meteorological measurement, atmospheric transport and diffusion assessment, and remote interrogation capabilities in accordance with Appendix 2 to NUREG-0654, Revision 1, by June 1983.

Question 432.38

Establish a central point for the receipt and analysis of all field monitoring data.

Response

The responsibility for coordination and performance of radiological assessment functions by SCE personnel and agents of SCE is assigned to the Chemical and Radiation Protection Leader in Section 5.2.6 of the Emergency Plan. This individual is to be located in the Onsite Technical Support Center (OTSC) during an emergency. Thus, the OTSC is designated as the central point for the receipt and analysis of field monitoring data generated by or for SCE. Following evaluation, appropriate data will be reported to the Primary Emergency Operations Center for use by State, local, and Federal agencies. A Chemical and Radiation Protection Engineer is dispatched to the PEOC to facilitate the data exchange and to assist offsite agencies with interpretation of the reported data.

In addition to the field monitoring by SCE, local government plans provide for monitoring as described in their respective plans. The coordination of all field monitoring data assessment is performed at the PEOC.

Responses to NRC Questions
San Onofre 2&3

Question 432.40

Provide a map showing the location of onsite and offsite radiation monitors.

Response

Radiological monitoring systems have been engineered to monitor radioactivity levels in all of the important processes and effluent points. These systems are described in detail in section 11.5 of the FSAR. These systems are being augmented to meet the Post TMI Requirements set forth in the NRC's letter to all applicants for operating licenses dated October 31, 1980 (NUREG-0737, Item II.F.1). The instrumentation requirements identified therein will be in place by January 1, 1982.

Radiological monitoring systems have also been engineered to monitor general radiation levels and airborne radioactivity levels in all areas of the facility important for personnel access where radiation could be present. These systems are described in subsection 12.3.4 of the FSAR. Figures 12.3-1 through 12.3-25 inclusive are general arrangement drawings of the station showing radiation zones and the locations of the area and airborne radiation monitors.

An offsite radiation monitoring system is being engineered for the San Onofre site. It is intended that this system meet the draft guidance of the proposed revision 2 of Regulating Guide 1.97. Table 2, "Containment", and the NRC Radiological Assessment Branch Technical Position for Environmental Radiological Monitoring Programs. Portions of the system should be in place by October, 1981 and the complete system should be operational by July 1, 1982.

Responses to NRC Questions
San Onofre 2&3

Question 432.46

(See H.8) Also, there shall be provisions for access to meteorological information by emergency response centers.

Response

Meteorological and radiation monitoring data and emergency dose assessments and forecasts will be transmitted to the EOF when it is built. During the interim period, these data will be transmitted to the PEOC via dedicated telephone circuits.

Question 432.47

Provide methods, equipment, and expertise to make rapid assessments of the actual or potential magnitude and locations of any radiological hazards through liquid or gaseous release pathways. (This shall include activation, notification means, field team composition, transportation, communications, monitoring equipment, and estimated deployment times.)

Response

Radiological assessment activities are initiated and performed as generally described in Section 6.2 of the Emergency Plan. Emergency procedures (see Appendix C to the Plan) describe activation of monitoring activities and provide methods for performing these activities. These emergency procedures are supported by chemistry and radiation protection procedures which describe use of equipment and provide survey routes and analysis methods.

Monitoring personnel onsite are notified by the Station Public Address system. Off-duty Station personnel are called-in by means of the telephone.

Table 5.2 of the Emergency Plan identifies those personnel who will comprise monitoring teams during normal working hours and at all other times. The monitoring teams will normally be comprised of a Chemical and Radiation Protection Technician and one other individual. At least one monitoring team can be dispatched at all times, with additional teams drawn from called-in off-duty personnel. Four additional personnel for this function can be provided within 30 minutes and additional 5 individuals can be made available in 60 minutes.

Monitoring team personnel are trained in accordance with Table 8.1. The composition of the monitoring teams and their participation in training and in periodic drills and exercises (as described in Section 8.1) provide a sufficient level of expertise. The Chemical and Radiation Protection Engineer is the primary Chemical and Radiation Protection Leader during an emergency. This is normally the individual having the requisite experience and education specified for the Radiation Protection Manager in Regulatory Guide 1.8.

Offsite monitoring teams will utilize SCE company vehicles which are readily available onsite.

Offsite monitoring teams will maintain communications with the Station via portable radio transceivers, or transceivers installed in a SCE vehicle, that are operated on the assigned SCE commercial radio service channel.

Monitoring equipment that is available to monitoring team personnel is tabulated in Table 7.4. In addition to these instruments, other instruments located at the various emergency centers are tabulated in Appendix D.

Responses to NRC Questions
San Onofre 2&3

Question 432.48

Establish means for relating the various measured parameters to dose rates for key isotopes and gross radioactivity measurements.

Response

An emergency procedure will be prepared which associates environmental contamination levels, airborne activity levels, drinking water activity, and milk activity with integrated dose commitment from exposure, inhalation, or ingestion of the deposited activity. This methodology will generally be based on guidance contained in Regulatory Guide 1.109, and DHEW Guidance contained in 43 FR 58790, and on the model in WASH-1400, Appendix 6. This procedure will be in place prior to April 1, 1981.

Responses to NRC Questions
San Onofre 2&3

Question 432.50

Provide, for individuals onsite, respiratory protection, protective clothing and radioprotective drugs.

Response

Adequate respiratory protection will be provided for the personnel discussed in Table 4-4, Emergency Measures Timing and Personnel Requirements, General Emergency, SONGS 2 & 3 Emergency Plan. Respiratory protection equipment will be strategically located and onsite individuals will be trained to locate and use the equipment under emergency conditions.

Protective clothing will be available for all individuals requiring its use. Sufficient supplies will be available onsite to support the necessary activities of an emergency or rescue team.

Radioprotective drugs, specifically KI, will be available for all onsite individuals. Supplies of KI will be located at various locations around the plant site to accommodate distribution to onsite individuals or individuals arriving onsite.

Responses to NRC Questions
San Onofre 2&3

Question 432.51

Expand Section 6.4.2 of your plan to describe the mechanism for recommending protective actions to State and local officials. Such recommendations should be based on emergency action levels and Table 2-1 of EPA-510/1-75-001, and taking into account factors such as evacuation time and local protection.

Response

A new section 6.4.2.1, entitled "Protective Action Guides" is provided below. Current Sections 6.4.2.1, .2, and .3 will be renumbered.

1) Protective Action Guides and Recommendation or Protective Actions

Protective action guides are the projected radiological dose, or dose commitment, to individuals in the general public which warrant protective action following a significant release of radioactive material. Protective action guides (PAGs) have been established by the State of California. More restrictive than the PAGs established by the US Environmental Protection Agency, the protective action guides for whole body and child thyroid exposure for the general public are:

General Public Protective Action Guides

<u>Whole Body</u> <u>(mrem)</u>	<u>Child</u> <u>Thyroid</u> <u>(Mrem)</u>
500	7500

These protective action guides are used as follows:

1. Protective actions such as sheltering or evacuation are mandatory in affected areas if projected offsite doses exceed the protective action guides established above.
2. Sheltering is an appropriate protective action for:
 - o Severe events in which evacuation cannot be implemented because of inadequate lead time due to rapid passage of the plume ("puff" release). Evacuation time estimates indicate that 2-1/2 hours are necessary to evacuate out to a two mile radius, 4-1/2 hours out to 5 miles, and 7-1/2 hours out to 10 miles.
 - o Sheltering will be indicated when local constraints, such as inclement weather, road conditions, etc., dictate that directing the public to seek shelter is a more feasible and effective protective measure than evacuation. Studies indicate that a normal wood structure that can be made reasonably snug can reduce the direct exposure to the plume by a factor of ten and can minimize inhalation dose for about two-hours.

Responses to NRC Questions
San Onofre 2&3

Question 432.52

Provide maps to show preselected radiological sampling and monitoring points and population distribution. These shall be in a format described in Table J-1.

Response

Maps of the population distribution by radii and by radial sector are included in the SONGS 2 & 3 Environmental Statement. Copies of these maps will be included as an appendix to the Emergency Plan.

Maps of the population distribution by evacuation sector (as required in NUREG-0654) are in preparation. Preliminary data on expected evacuation zones and the estimated population of each are tabulated below. When the evacuation implementation procedures for the plume exposure pathway EPZ are completed, they will incorporate population distribution maps for the evacuation zones.

<u>Zone</u>	<u>1980 Resident Population</u>
<u>Orange County</u>	
Dana Point	7805
Capistrano Beach and Doheny State Beach Park	8295
San Juan Capistrano-East of San Juan Creek	9510
San Juan Capistrano-West of San Juan Creek	11,155
San Clemente	36,245
<u>San Diego County</u>	
Within two mile radius of SONGS	7435 2645*
Two-ten mile radius of SONGS	13565*
*Within Camp Pendleton, USMC	

Radiological sampling and survey maps will be incorporated in the Emergency Procedures for performing these activities. In addition, appropriate copies of these maps will be available in the PEOC (EOF-when ready) to assist offsite agencies with interpretation of monitoring results. The designators for monitoring points will be keyed to the sector/radii designators identified in Table J-1 of NURGE-0654.

Responses to NRC Questions
San Onofre 2&3

Question 432.56

The recovery plan shall include a method of periodically estimating total population exposure.

Response

A new Section 9.4, entitled "Post-Accident Evaluation" is provided below:

9.4 POST-ACCIDENT EVALUATION

Following the termination of the emergency stage of the accident and the commencement of recovery operations, appropriate evaluations to assess Station conditions will be performed. The outcome of these evaluations will form the basis of recovery planning and licensee event reports to the USNRC. The scope of these evaluations will be consistent with the emergency classification, the nature of the initiating events, and the preliminary assessment of Station equipment status.

An integral part of these evaluations will be the estimation of the total population exposure that are the consequence of radioactivity releases during the emergency. Analyses will be performed to estimate population exposure from all applicable exposure pathways identified in Regulatory Guide 1.109 and the analyses will utilize monitoring and sampling data obtained during the incident and actual meteorology. The methodology for performing these analyses is provided in the environmental monitoring program described in the SONGS Environmental Technical Specifications as it related to compliance with 10 CFR 50 Appendix I requirements.

Responses to NRC Questions
San Onofre 2&3

Question 432.57

The plan should include a discussion of the exercises and drills to be held periodically. The information you supplied in Section 8.1 and Table 8-1 is brief. The description of these drills and exercises should follow the general outline and reach the level of detail suggested by NUREG-0654.

Response

A new Section 8.1.2 is attached.

8.1.2 Drills and Exercises

Exercises are realistic, pre-planned simulations of accidents, designed and conducted in such a manner that the response of the emergency organization, and other station personnel closely approximates the response to an actual incident. Drills are pre-planned simulations in which the participants are "walked" or "talked" through one or more procedures, or aspects of the Emergency Preparedness Plan. The primary purpose of drills is to provide individuals with hands-on training in a controlled situation. Drills are evaluated by the drill instructor. The response of station personnel to an actual emergency condition may be allowed to satisfy a particular drill requirement, provided that a critique is performed and documented in the manner specified for a drill.

Periodic exercises and drills will be conducted in order to test the state of emergency preparedness of all participating personnel, organizations, and agencies. Each exercise or drill will be conducted to: (1) ensure that the participants are familiar with their respective duties and responsibilities, (2) verify the adequacy of the SONGS 2 & 3 Emergency Plan and the methods used in the Emergency Procedures, (3) test communications networks and systems, (4) check the availability of emergency supplies and equipment, (5) verify the operability of emergency equipment, and (6) verify the adequacy of interrelationships with offsite agency plans.

The Emergency Planning Administrator is responsible for planning, scheduling and coordinating all emergency planning-related exercises. The Training Administrator is responsible for planning, scheduling, and coordinating all emergency squad-related drills. All exercises are subject to the review and approval of the Nuclear Plant Manager.

Exercises and drills will be conducted to simulate actual emergency conditions as closely as possible and may be scheduled such that more than one drill or exercise can be conducted simultaneously. Exercise scenarios will be prepared that involve participation of emergency squads and monitoring teams and all or specific parts of the onsite and offsite emergency organizations including varying degrees of participation of state, county, and Federal agencies and organizations

Responses to NRC Questions
San Onofre 2&3

and local offsite support personnel and organizations. Scenarios will identify objective of the exercise, date, time, narrative summary of the exercise, observer arrangements, sequence of events, tabulation of the sequence of events.

The Nuclear Plant Manager will normally notify the offsite emergency response organizations and agencies at least thirty days in advance of the scheduled date of an exercise that may involve their participation.

Recommendations for revision to the SONGS 2 & 3 Emergency Plan and the Emergency Procedures and/or the upgrading of emergency equipment and supplies as a result of an exercise or drill shall be forwarded to the Emergency Planning Administrator by observers or participants.

Drills and Exercise are scheduled on the following frequency:

1) Radiation Emergency Exercise

- An exercise appropriate to a Site or General Emergency shall be conducted at least once per calendar year for the SONGS site. This exercise shall test the integrated capability and a major portion of the basic elements of the Emergency Plan. The SONGS unit (#1, or #2 & 3) simulated to be the affected unit in the exercise scenario will be alternated each year to provide the staffs of each facility an opportunity to be the controlling unit in the exercise. The other SONGS unit will participate to the extent appropriate to the emergency situation at the other unit.
- This exercise will normally involve participation by one or more offsite emergency response organizations to some extent annually. The State and local organizations participate in exercises as described in 10 CFR 50 Appendix E. As interpreted for the SONGS site, the State of California will participate in a full-scale exercise at SONGS at least once every three years, alternating with other nuclear facilities in California. Local government agencies will participate in the full-scale exercise with the State. In years between State involvement in the annual exercise, the local governments will participate in a small scale exercise which involves testing communication links and at least one other aspect of their emergency plan. Federal agencies may participate at least once every 5 years in an exercise at SONGS.
- The scenario for the exercise will be varied each year to provide for testing all elements of the Emergency Plan and all components of the onsite and corporate support emergency organizations within a five year period.

Responses to NRC Questions
San Onofre 2&3

- Participation of the general public in exercises pursuant to this part is not mandatory.
- Each exercise will be observed and critiqued by qualified observers from Federal, State and/or county governments. A formal evaluation will result from these critiques.

2) Fire Emergency Drills

- Each fire brigade member will participate in training, including exercises, that meet or exceed the Technical Specification requirements (NFPA Code 27 - 1976).
- At least one drill in the calendar year shall involve the participation of a local offsite fire department.

3) Medical Emergency Drill

- At least one drill per calendar year shall be conducted. The drill will involve the participation of some, if not all, of the local medical support personnel and organizations (eg., physicians, ambulance service, hospital, etc.) and may involve cases of contaminated/injured personnel and/or possible radiation overexposure. The offsite portions of the medical emergency drill may be included in the scenario for the annual radiation emergency exercise.

4) Radiation Emergency Drills

- At least one drill involving collection and analysis of all environmental radiological sample media (eg., water, grass, soil, and air.) both onsite and offsite shall be conducted annually.
- Drills involving response to simulated abnormal airborne samples and/or direct radiation measurements in the site environs, and as appropriate, analysis of these samples, shall be conducted semi-annually.
- Drills involving analysis and sampling of inplant liquids using post-accident sampling procedures and liquids with actual elevated radiation levels shall be conducted annually for Chemical and Radiation Protection Technicians.

Responses to NRC Questions
San Onofre 2&3

Question 432.59

Commit to conducting independent audits of your emergency plan at least once every two years. The audit shall include the plan, its implementing procedures, training, readiness testing and equipment. Management controls shall be implemented for evaluation and correction of audit findings.

Response

San Onofre Units 2 and 3 Technical Specifications paragraph 6.5.2.8e currently requires an audit of the Emergency Plan and procedures every two years. Management control of the audit process including documentation and retention of records is addressed by SCE Topical Report SCE-1-A "QA Program" Sections 17.2.17 and 17.2.18. These provisions satisfy the above NRC requirements.