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DOCDATE: 06/19/78
DATE RCVD: 06/30/78

DOCTYPE: LETTER NOTARIZED: NO
SUBJECT:
FURNISHING RESPONSE TO NRC LTR DTD 02/28/78 RE APPLICANT"S PROPOSED MODIFICATIONS CONCERNING INSTALLATION OF IONIZATION DETECTORS IN ALL SAFETY RELATED AREAS THAT CONTAIN COMBUSTIBLES. . . W/ATT DRAWINGS.

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SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT □ 6201 S Street, Box 15830, Sacramento, California 95813; (916) 452-3211

June 19, 1978

Director of Nuclear Reactor Regulation
Attention: Mr. Robert W. Reid, Chief
Operating Reactors, Branch No. 4
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Docket No. 50-312
Rancho Seco Nuclear Generating
Station, Unit No. 1

Dear Mr. Reid:

Please refer to the NRC's Fire Protection Safety Evaluation which was attached to your letter dated February 28, 1978. Paragraph 3.1.37 of this report indicated that the District is going to install ionization detectors in all safety related areas that contain combustibles. The report also indicated that the NRC staff required additional information in the form of design details to assure that the design is acceptable prior to actual implementation of the modifications. The requested information on design details is contained in this letter.

In lieu of installing ionization detection in all safety related areas containing combustibles, the District proposes to install ionization detectors in all areas that have (1) combustibles and (2) equipment and/or cable required for safe shutdown and cooldown except for the turbine building (Fire Area 71), the diesel generator rooms (Fire Area 37 and 38), and the reactor yard area (Fire Area 69).

The approximate location of ionization detectors for all other areas is shown on the attached sketches. The ionization detectors being used in the design are Pyrotronics Model DIS-5B. The location of the detectors was determined by the following guidelines:

1. The detectors were located in close proximity of the combustibles in areas with very little air movement and no direct supply or return air ducts.

2. In areas with supply and return air ducts, the detectors are located as far as possible from the supply air duct, in close proximity to the return duct, and in the general area of the combustible load in the room.

3. Both normal and emergency operations of the HVAC system were considered, in determining the location of the detectors.

[redacted]

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In applying these guidelines, each fire area of the plant where new detectors are being installed was physically checked and walked through to insure proper location and to insure that there was nothing in the room such as low beams or large ducts that could prevent or greatly delay smoke from a combustible reaching the ionization detector.

All ionization detectors will initiate an alarm on the control room annunciator. The annunciator window will indicate what fire alarm zone the detector is in. Each detector in a fire alarm zone is also connected to a light indicating panel that is in an easily accessible location. This panel will indicate what detector is in alarm. This will greatly decrease the operation response to a fire alarm due to an ionization detector.

The alternative to ionization detectors in the other fire areas are listed below:

A. Turbine Building (Fire Area 71):

The atmosphere of the turbine building, its openness, the air movement in the building, and the large amount of welding that takes place in the building would all contribute to either an ionization detector initiating false alarms or not functioning when it should. Therefore, the District proposes that its existing design be accepted as an alternative to adding ionization detectors in the building. This system consists of of the following:

(1) Rate of rise heat detectors in the vicinity of all significant pumps or tanks containing lubricating oil. The detectors are all located in fire zones on the ground floor. Operation of the detectors will initiate a water deluge of the tank or pump in the fire alarm zone and initiate an alarm in the control room. Oil fires are the type of fires that will produce a very large rate of rise in temperature in a very short time. Therefore, with this type of fire the response time of the rate of rise detection will be approximately as fast as an ionization detector and provide a better level of protection in these areas.

(2) On the ground floor and on the mezzanine level, there is a wet-pipe sprinkler system that covers the entire floor area. Activation of this system initiates an alarm in the control room.

(3) Fixed temperature detectors are used in the turbine generator bearing enclosures. These detectors will initiate a $CO_2$ discharge and alarm in the control room. The system is designed to initially give a high temperature alarm and a high-high temperature alarm and discharge. This system is located on the turbine deck.

On the ground floor, the only items required for safe shutdown and cooldown is the nuclear service raw water piping to Diesel Generator "A". However, the rate of rise detectors, which are in close proximity to the storage tanks and pumps containing lubricating oil, which is the major combustible in the building, and the wet-pipe sprinkler system, provide sufficient early warning to allow both automatic and manual suppression at a fire's incipient stages and prevent the fire from making the nuclear service raw water so hot that it cannot effectively cool the diesel engine.

The main steam line piping is the only equipment required for safe shutdown and cooldown on the mezzanine level of the turbine building. The only combustibles on this floor are cable and, as indicated in the Fire Hazard Analysis, even if all this cable is consumed in a fire the maximum building temperature would be 300°F. A cable tray fire on this floor without any suppression will not affect the pressure integrity of the main steam line system. Even though detection and alarm in the control room of a fire to prevent damage to equipment required for safe shutdown and cooldown is not required in this area, the wet-pipe sprinkler system performs this function.

The equipment and/or cabling on the turbine deck required for safe shutdown and cooldown consists of Station Service Transformers X43A and X43B. The only source of combustibles on this level is from a turbine lube oil leak in the turbine-generator bearing housings. As indicated in the Fire Hazard analysis, there is no credible fire that can damage either station service transformer. Even though early detection of a fire to protect the transformers is not required, the heat detectors located in the bearing areas to activate the $CO_2$ system and alarm in the control room provide this requirement.

Heat detectors have been used in the turbine generators due to the high air flow rates that can be encountered and the damp atmosphere, which would make ionization detectors highly unreliable.

Therefore, ionization detectors are not needed in the turbine building to insure early warning of a fire before damage occurs to equipment required for safe shutdown and cooldown.

B. Diesel Generator Rooms (Fire Areas 37 and 38):

Both diesel generator rooms are equipped with fixed temperature heat activated detectors to automatically initiate the $CO_2$ into the room and an alarm in the control room. The initial design of the $CO_2$ system for the diesel generator rooms included ionization detectors so that at the incipient point of the fire an alarm would be given and a quick response initiated. However, during operation of the diesel generator exhaust and supply fans

and operation of the diesel generator, it was determined that the ionization detectors were not reliable for the following reasons:

(1) The high volume of turbulent air flow in the diesel generator room due to the supply and exhaust fan for the room caused the detector to malfunction and go into a trip state. This is unaccepteable because the detectors initiate an automatic discharge of the $CO_2$ system which would make the diesel generator inoperative. Therefore, the District installed in these rooms fixed temperature heat actuated detectors.

(2) Combustion fumes from the diesel also could cause the ionization detector to false trip.

Due to the rapid heatup of the engine exhaust manifold, rate of rise detectors were also deemed inadvisable.

Each diesel generator room is equipped with a room high temperature alarm. This alarm is set at 125°F. Therefore, it is the District's position that the high room temperature alarm and the heat detectors will provide sufficient warning that a fire exists in the diesel generator rooms.

C. Reactor Yard (Fire Area 69):

The reactor yard area (Fire Area 69) is located outside with the major combustibles being cable and cable trays. The District does not consider it practical to install ionization detectors in this area. Also, as stated in Paragraph 5.17.64 the District will be installing thermal insulation on the conduits to the auxiliary feedwater valves so that they will not be damaged during a design basis fire. With this modification a design basis fire in this area will have no impact on equipment required for safe shutdown and cooldown. Therefore, the District finds it unnecessary to install ionization detectors in this area.

To meet the commitment date of completing this task by the end of the 1978 refueling outage, the District will assume that the NRC finds the above described scheme acceptable if we are not contacted prior to July 19, 1978.

Sincerely yours,

J. J. Mattimoe

J. J. Mattimoe
Assistant General Manager
and Chief Engineer