



SACRAMENTO MUNICIPAL UTILITY DISTRICT ☐ P. O. Box 15830, Sacramento CA 95852-1330, (916) 452-3211  
AN ELECTRIC SYSTEM SERVING THE HEART OF CALIFORNIA

GCA 88-116  
FEB 25 1988

U.S. Nuclear Regulatory Commission  
Attn: Frank J. Miraglia, Jr.  
Associate Director for Projects  
11555 Rockville Pike  
Rockville, MD 20852

Docket 50-312  
Rancho Seco Nuclear Generating Station  
License No. DPR-54  
TDI DIESEL INFORMATION

Dear Mr. Miraglia:

The following information regarding the TDI emergency diesel generators is submitted in response to your staff's request.

TDI Starting Air System -- The Starting Air Supply System information is provided in response to an NRC Question. The effects of loss of air on the diesel pneumatic controls and diesel operability is also discussed. This information was previously included in an enclosure to District letter JEW 87-358 (Attachment 1).

Backup Air Supply System -- The TDI Backup Air Supply System is described in Attachment 2. This description addresses the capability of the system to provide backup air for the TDI diesel pneumatic controls.

Diesel Lubricating Oil Consumption -- Attachment 3 discusses the consumption of lubricating oil by the TDI diesels and specifies a stock level of lubricating oil to be available.

TDI Radiator Performance -- Attachment 4 discusses the testing to evaluate the performance of the TDI radiators and the results of the evaluation.

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Frank J. Miraglia, Jr.

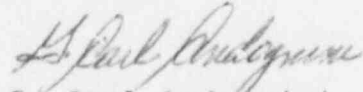
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GCA 88-116

TDI Vibration -- A preliminary report has been developed which addresses the vibration in the various TDI diesel auxiliary piping and components. The report includes isometric diagrams of the respective systems and a matrix in which measured vibration levels are compared with levels allowed by ANSI/ASME OM3-1982. This report is included as Attachment 5. The jacket water and lubricating oil piping are being evaluated at this time. Modifications are being performed to these systems to meet ANSI/ASME OM3-1982 criteria. The final data will be transmitted as soon as the modifications and data acquisition are completed and a report is written.

Please contact me if you have any questions. Members of your staff requiring additional information or clarification may contact Jerry Delezenski at (209) 333-2935, extension 4914.

Sincerely,



G. Carl Andognini  
Chief Executive Officer, Nuclear

Attachments

cc    A. D'Angelo, NRC, Rancho Seco  
      G. Kalman, NRC, Rockville (2)  
      J. Martin, NRC, Walnut Creek  
      D. Crutchfield, NRC, Rockville



SACRAMENTO MUNICIPAL UTILITY DISTRICT □ P. O. Box 15830, Sacramento CA 95852-1830, (916) 452-3211  
AN ELECTRIC SYSTEM SERVING THE HEART OF CALIFORNIA

APR 01 1987

JEW 87-358

Director of Nuclear Reactor Regulation  
Attn: Frank J. Miraglia, Jr.  
Division of PWR Licensing-B  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Docket 50-312  
Rancho Seco Nuclear Generating Station  
License No. DPR-54  
Proposed Amendment 147, Revision 2

Dear Mr. Miraglia:

By letters dated October 2, 1986, and December 19, 1986, the District submitted to the Commission Proposed Amendment No. 147 and No. 147, Revision 1. This proposed amendment requests permission to operate two Transamerica DeLaval (TDI) Diesel Generators to provide additional onsite emergency power. The enclosed amendment revises and/or adds additional sections to the Rancho Seco Technical Specifications and addresses the safety impact when the TDI Diesel Generators are brought into service.

The NRC's technical review of the TDI information raised technical questions which have resulted in clarifying revisions to the proposed Technical Specifications. Enclosure 1, the Description of Proposed Changes, Associated Safety Analysis and the "No Significant Hazards Evaluation," and Enclosure 2, the proposed Technical Specifications, are being resubmitted in their entirety, and are attached. The conclusions of the previous Safety Analyses and the "No Significant Hazards Evaluation" have not been altered by the revisions to the proposed Technical Specifications.

Attachment 1

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APR 01 1987

During its review meeting with the District on Proposed Amendment 147, Revision 1, the NRC asked thirty questions. Enclosure 10 is the response to the thirty questions. Further, during conference calls and other meetings, the NRC raised eleven other questions related to civil engineering design and fire protection. Enclosure 11 responds to questions about the civil engineering design, and Enclosure 12 answers questions concerning fire protection.

The responses to the 45 questions do not significantly alter the information contained in the original Enclosures 3 through 9 of the December 19, 1986, submittal. Where minor changes in the information of Enclosures 3 through 9 do occur, the responses to the 45 questions provide sufficient documentation for the changes. Consequently, the original Enclosures 3 through 9 are not included in this package.

Pursuant to 10 CFR 50.91(b)(1), the Radiological Health Branch of the California State Department of Health Services has been informed of this proposed amendment by mailed copy of this submittal.

Because this is a revision to Proposed Amendment No. 147, no additional license fee is required.

If you have any questions concerning this submittal, please contact Mr. Ron Colombo at (209) 452-3211, extension 4236.

Sincerely,

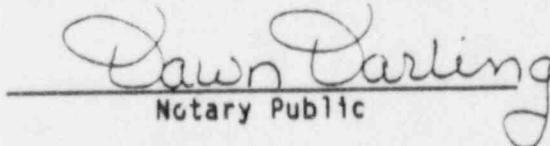


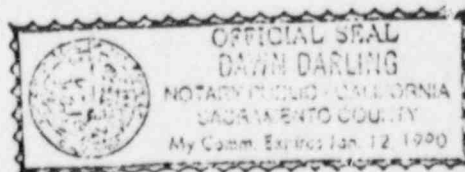
John E. Ward  
Deputy General Manager, Nuclear

Attachments

cc: A. D'Angelo  
G. Kalman  
Region V (2)  
MIPC (2)  
INPO

Sworn to and subscribed before me this 1<sup>st</sup> day of April, 1987.

  
Notary Public



Attachment 1

(continued)

## 8. NRC Question

Discuss the air supply system to the diesel and potential common mode failures since these are not Class 1 compressors. Discuss the effect of loss of air on the pneumatic controls and diesel operability.

### District Response

The air supply system to each diesel is comprised of an air compressor, an air dryer, two air receivers, and associated piping, instrumentation, valves, and strainers. The piping and other components between the air receivers and the diesel are designed and fabricated to seismic Category 1 and quality Class 1 ASME III standards. The air receivers themselves meet Category 1 and Class 1 ASME VIII standards. The Class 1 components are protected from failures in the Class 2 portions (i.e., compressor, dryer, and associated components) by isolation and check valves. Each pair of air receivers is capable of starting the engines at least ten times, as proven by pre-operational testing, without reliance on its air compressor. All parts of the starting air system for each diesel engine are isolated from each other electrically and physically, including the process piping and instrumentation. This design greatly reduces the chances of common mode failure.

Although the air receivers can supply enough air to start each engine, they also supply control air so that the protective functions of the engine (such as the low lube oil pressure trip) will operate properly. An air supply is not required to maintain the diesel engine running continuously, though there are other concerns. As discussed in the Design Basis Report for this modification (ECN A-3748), as the air receiver pressure drops, an alarm will sound at 225 psig, but there will be no other effect because control air pressure is normally maintained by a PCV at 60 psig. The next alarm will occur when the air receiver pressure, hence the control air pressure, reaches 53 psig. If the control air pressure continues to drop below its alarm setpoint at some point a pneumatic sensor will attempt to use the residual air in the tubing to shut down the engine. As a result, the spring-loaded fuel rack shutdown cylinder may partially, yet momentarily close, causing a significant change of engine speed and subsequent unloading of generator loads. Although the engine will resume its normal operating speed, at this point all protective shutdowns will have been lost. Should this scenario occur to one diesel system, the redundant train would be available to take over the emergency loads.

Therefore, to avoid a common mode failure of generator unloading, the engines require a long term supply of control air to maintain power to their emergency loads. This need is common to both engines. During pre-operational testing, the District will verify and report on the capability of the air receivers to maintain at least 60 psig for engine control air over a prolonged time period.

Attachment 1

(continued)



## BACKUP AIR SUPPLY SYSTEM

NRC Inspection Report 50-312/87-29 identified a concern with the capability of the TDI air receiver tanks to maintain 60 psig for engine control for a prolonged period of time. The air receiver tanks were originally intended to supply the backup air supply for the TDI pneumatic controls. This preliminary design was subsequently abandoned in favor of a system where the backup air is provided by a seismically qualified, high pressure bottle system. Each of the two TDI panels has twelve high pressure bottles to provide the required backup air supply.

It was calculated, and a test procedure was implemented to demonstrate, that six bottles are ample to provide seven days continuous backup air for one pneumatic control panel. Rancho Seco's high pressure bottle system therefore provides for seven days air supply (assuming continuous operation) with 100% backup capacity for ease of tank changeout. The capability of the air receiver tanks to maintain 60 psig for prolonged periods of time is no longer an issue.

## TDI DIESEL LUBRICATING OIL CONSUMPTION

The EGS System Status Report identified the need to establish minimum lubricating oil stocking levels equivalent to a seven-day supply for each emergency standby diesel.

During testing of the TDI diesels, lubricating oil consumption rates were recorded. The results of these tests (STP.195A and STP.1134B) indicate a worst-case consumption rate of 1 inch on the GEA diesel sump dipstick during a 24-hour operating period at 3500kw and above. Since one inch of sump level corresponds to 19 gallons of oil, the District will maintain a seven-day stocking level of 266 gallons.

## EVALUATION OF TDI DIESEL RADIATOR PERFORMANCE

Special Test Procedure STP.1134 was initiated in 1987 to record the parameters of the TDI engine cooling system. Due to the extensive coordination required to perform this test, the performance run was not accomplished until January 1988 when the daytime air temperatures were approximately 50 degrees F. As a consequence, the calculations are inconclusive as to the exact actual capacity of the radiators. The cool temperatures caused the bulk of the cooling water flow to be redirected into the block, rather than through the radiator. This is an automatic function to maintain relatively constant engine/oil temperatures and cannot be overridden. Low cooling water flow rates require extrapolation of the results, thus compounding inherent flow measurement inaccuracies.

Rancho Seco will re-evaluate radiator performance at a later time, but no later than this summer, when air temperatures are elevated. This will place a greater demand on the radiators, resulting in higher flow rates and allowing a more accurate calculation of performance.

Rancho Seco considers the radiators to be adequate for present operation for two reasons:

1. The radiators have performed flawlessly during many hours of special tests and maintenance runs without any indication of engine overheating.
2. Testing will identify the excess cooling capacity of the radiators beyond engine requirements, rather than just verify the adequacy of the radiators to handle existing heat loads.