

can be compared in its various aspects of construction are Rancho-Seco, Turkey Point 3 and 4, and Oconee. In the Report called "Enhancement of Onsite Emergency Diesel [sic] Generator Reliability" (NUREG/CR-0660), there is an analysis of the problems that have occurred with diesel generators at various reactors, including Rancho-Seco and Turkey Point 3 and 4. The Licensee Event Reports (LER) state that Rancho-Seco had a total of eight events that were engine and related problems. Five of them had to do with starting problems, one with cooling, and two with the governer. There were four electrical problems. This chart also states that Turkey Point 3 had seven engine and related problems. Five had to do with starting, one with fuel system, and one with cooling. There were also four electrical malfunctions having to do with relays and breakers and three in the general category. Turkey Point 4 reported one starting problem and one electrical problem with relays and breakers and one design problem. Since these diesel generators are similar to the type installed at Midland, these failures establish a basis for a contention that similar malfunctions can occur with these diesel generators.

In its Memorandum and Order, LBP-82-118, 16 NRC___ (December 30, 1982), the Board accepted some portions of Ms. Sinclair's station blackout contention and rejected others. With respect to the above stated additional argument in support of her contention, the Board stated that:

In her reply submitted on October 15, 1982 (at pp. 4-5), Ms. Sinclair referred to several other events at other reactors (Rancho Seco, Turkey Point 3, and 4, and Oconee) which, she claimed, could occur at Midland and contribute to station blackout. We were not sure of the relationship between these reactors and Midland, particularly with respect to the similarity of the respective diesel generators. We therefore requested the Applicant and Staff to brief this question.

The Board further noted that, after receiving the briefs, it would decide whether to expand the contention to include as a basis, the additional argument contained in Ms. Sinclair's October 15 reply.

II. DISCUSSION

As discussed in the attached "Relationship of Midland to Turkey Point 3 and 4, Rancho Seco, Oconee with respect to their Diesel Generator Installations," Oconee has no diesel generators. It therefore has no relevance to Ms. Sinclair's station blackout contention. Turkey Point 3 and 4 and Rancho Seco use diesel generators to provide on-site emergency power. However, there is insufficient similarity between their diesel generator installations and the ones at Midland to warrant admitting the additional argument contained in Ms. Sinclair's October 15 reply as a basis to her station blackout contention. The Staff required the diesel installations at Midland to conform to the thirteen recommendations set forth in NUREG/CR-0660, "Enhancement of On-site Emergency Diesel Generator Reliability" (1979). Turkey Point 3 and 4 and Rancho Seco were licensed before NUREG/CR-0660 was issued. Hence, their diesel generator installations did not have to conform to the recommendations developed by the NUREG. Indeed, diesel generator failures at Turkey Point 3 and 4 and Rancho Seco formed part of the basis of those recommendations. Similarly, a comparison of failures due to the design logic of the diesel generator installations at Midland, Turkey Point 3 and 4 and Rancho Seco further shows that the additional argument contained in Ms. Sinclair's October 15 reply should not be accepted as a basis to her station blackout contention. Finally, Midland is better equipped than Turkey Point 3 and 4 and Rancho Seco to avoid the two most common causes of diesel generator failure - starting difficulties and problems with relays and breakers. Accordingly, Ms. Sinclair's reference to diesel generator failures at other facilities does not constitute an acceptable basis for her station blackout contention in this proceeding.

III. CONCLUSION

For the foregoing reasons, the Staff opposes the expansion of Ms. Sinclair's station blackout contention to include as a basis the additional argument contained in Ms. Sinclair's October 15 reply.

Respectfully submitted,



Michael N. Wilcove
Counsel for NRC Staff

Dated in Bethesda, Maryland
this 24th day of January 1983

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
)
CONSUMERS POWER COMPANY) Docket Nos. 50-329 OM & OL
) 50-330 OM & OL
(Midland Plant, Units 1 and 2))

CERTIFICATE OF SERVICE

I hereby certify that copies of "NRC STAFF BRIEF WITH RESPECT TO PROPOSED ADDITIONAL BASIS TO INTERVENOR MARY SINCLAIR'S STATION BLACKOUT CONTENTION" in the above-captioned proceeding have been served on the following by deposit in the United States mail, first class, or, as indicated by an asterisk through deposit in the Nuclear Regulatory Commission's internal mail system, this 24th day of January 1983:

*Charles Bechhoefer, Esq.
Administrative Judge
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

*Dr. Jerry Harbour
Administrative Judge
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dr. Frederick P. Cowan
Administrative Judge
6152 N. Verde Trail
Apt. B-125
Boca Raton, Florida 33433

James E. Brunner, Esq.
Consumers Power Company
212 West Michigan Avenue
Jackson, Michigan 49201

Frank J. Kelley
Attorney General of the State
of Michigan
Steward H. Freeman
Assistant Attorney General
Environmental Protection Division
525 W. Ottawa St., 720 Law Bldg.
Lansing, Michigan 48913

Ms. Mary Sinclair
5711 Summerset Street
Midland, Michigan 48640

Michael I. Miller, Esq.
Ronald G. Zamarin, Esq.
Alan S. Farnell, Esq.
Isham, Lincoln & Beale
Three First National Plaza
52nd Floor
Chicago, Illinois 60602

Ms. Barbara Staminis
5795 N. River
Freeland, Michigan 48623

James R. Kates
203 S. Washington Avenue
Saginaw, Michigan 48605

Wendell H. Marshall, President
Mapleton Intervenors
RFD 10
Midland, Michigan 48640

Wayne Hearn
Bay City Times
311 Fifth Street
Bay City, Michigan 48706

Paul C. Rau
Midland Daily News
124 McDonald Street
Midland, Michigan 48640

Myron M. Cherry, p.c.
Peter Flynn, p.c.
Cherry & Flynn
Three First National Plaza
Suite 3700
Chicago, IL 60602

T. J. Creswell
Michigan Division
Legal Department
Dow Chemical Company
Midland, Michigan 48640

*Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

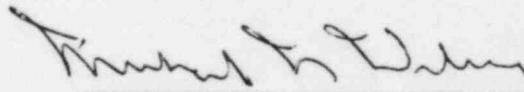
*Atomic Safety and Licensing Appeal
Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

*Docketing and Service Section
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Steve J. Gadler, P.E.
2120 Carter Avenue
St. Paul, MN 55108

Frederick C. Williams
Isham, Lincoln & Beale
1120 Connecticut Avenue, NW
Washington, D.C. 20036

Lee L. Bishop
Harmon & Weiss
1725 I Street, N.W.
Suite 506
Washington, D.C. 20006



Michael N. Wilcove
Counsel for NRC Staff

RELATIONSHIP OF MIDLAND TO TURKEY POINT 3 AND 4,
RANCHO SECO AND OCONEE WITH RESPECT TO THEIR
DIESEL GENERATOR INSTALLATIONS

In her reply to the Applicant's and Staff's responses to her station blackout contention, dated October 15, 1982 (October 15 reply), intervenor Mary Sinclair states that the reactors at Midland can be compared to the ones at Oconee, Rancho Seco and Turkey Point 3 and 4. With respect to Oconee, the Staff notes that it has no diesel generators. Rather, emergency power is provided by an on-site hydroelectric generator station.^{1/} Hence, Oconee has no relevance to Ms. Sinclair's station blackout contention. While Rancho Seco and Turkey Point 3 and 4 do use diesel generators to provide on-site emergency power, there is not much similarity between their diesel generators and the ones at Midland.

A key difference among the diesel generator installations at Rancho Seco, Turkey Point 3 and 4 and Midland is that the Staff required that the diesel generator installations at Midland conform to the requirements developed by NUREG/CR-0660, "Enhancement of On-site Emergency Diesel Generator Reliability" (1979). The ones at the other two facilities did not have to conform to the requirements of NUREG/CR-0660 since Turkey Point 3 and 4 and Rancho Seco were licensed before NUREG/CR-0660 was issued. NUREG/CR-0660 is a five task program intended to formulate ways in which the reliability of diesel generators at nuclear power plants could be improved. The fifth task, titled "Recommendations" sets forth thirteen recommendations for making diesel generators more reliable. These

^{1/} Final Safety Analysis Report, Oconee Plant § 8.3.1.

recommendations are based on a thorough analysis of diesel generator failure data for an eight year period (1969-1977). Of the thirteen recommendations, eleven apply to Midland. The Staff has reviewed the diesel generator installations at Midland against these eleven recommendations, and the installations conform in all respects.^{2/} Some aspects of this conformance have been detailed below.

In developing its thirteen recommendations for improving diesel generator reliability, the task force examined 592 Licensee Event Reports (LER's) from 1969 to September 28, 1977 which identify "610 failures and/or troubles" in diesel generators at nuclear power plants.^{3/} Included in the LER's examined are all those which Ms. Sinclair cites in her October 15 reply as being types of failures which might occur at Midland.^{4/} The diesel generator installations at Midland, therefore, differ significantly from those at Rancho Seco and Turkey Point 3 and 4 because the Midland installations met standards which were based, in part, on diesel generator failures at Turkey Point 3 and 4 and Rancho Seco.

A more detailed look at certain areas where the diesel generator installations at Midland and those at Rancho Seco and Turkey Point 3

^{2/} Safety Evaluation Report related to the Operation of the Midland Plant, Units 1 and 2, § 9.5.4.1 (Staff Exhibit 14).

^{3/} NUREG/CR-0660, p. I-1

^{4/} Id., pp. A-1 to A-4.

and 4 differ further shows that the diesel generator problems which Ms. Sinclair cites in her October 15 reply are significantly less credible events at Midland. The areas examined are (1) system design logic, (2) starting systems and (3) electrical systems.

1. System Design Logic

The system design logic for the diesel generators at Midland is similar to the one for the deisel generators at Rancho Seco.^{5/} However, NUREG/CR 0660 does not attribute any LER's for Rancho Seco to problems with design logic.^{6/} Comparing the system design logic for the diesel generators at Midland to that for Turkey Point shows marked differences. The Midland design logic calls for two emergency diesel generators per reactor, with each generator having sufficient power rating to handle the maximum emergency load.^{7/} The generators for each reactor are completely independent, and there are no connections between reactors.^{8/} Therefore, each reactor is provided with 100% diesel generator redundancy. The design logic at Turkey Point 3 and 4, however, calls for only two diesel generators to be shared between the two reactors.^{9/}

5/ Final Safety Analysis Report, Rancho Seco Plant, § 8.2.3 ("Rancho Seco FSAR").

6/ NUREG/CR-0660, p. A-3.

7/ Final Safety Analysis Report, Midland Plant, § 8.2.3 ("Midland FSAR").

8/ Id.

9/ Final Safety Analysis Report, Turkey Point Plant, § 8.2.3 ("Turkey Point FSAR").

2. Starting Systems

As stated in NUREG/CR 0660, starting problems are the single largest cause of diesel generator failures.^{10/} With respect to avoiding starting problems, Midland's starting system is different from and superior to the ones at both Rancho Seco and Turkey Point 3 and 4. Rust in the compressed air systems which start the engines is the most significant cause of starting failures.^{11/} At Midland, the compressed air systems are equipped with in-line, full flow, automatic dryers. These air dryers will remove virtually all moisture from the compressed air, thereby virtually eliminating the potential for rust to form in the system.^{12/} The compressed air systems at Rancho Seco and Turkey Point 3 and 4 are not equipped with air dryers.^{13/} At Midland, the air receivers and safety related piping are made of stainless steel, which does not rust.^{14/} At Rancho Seco and Turkey Point 3 and 4, they are made of ferrous metal, which does rust.^{15/} Finally, at Midland, each diesel generator has two compressed air systems which operate independently of each other, thereby providing for 100% redundancy.^{16/} While each diesel

^{10/} NUREG/CR-0660 p. V-2.

^{11/} Id.

^{12/} Midland FSAR, § 9.5.6.

^{13/} Turkey Point FSAR § 8.2.3. Rancho Seco FSAR § 8.2.3.

^{14/} Midland FSAR § 8.2.3.

^{15/} Turkey Point FSAR § 8.2.3. Rancho Seco FSAR § 8.2.3.

^{16/} Midland FSAR § 9.5.6.

generator at Rancho Seco also has two independent compressed air systems,^{17/} the diesel generators at Turkey Point 3 and 4 each have only one compressed air system, allowing for no redundancy.^{18/}

3. Electrical Systems

Problems with relays and breakers are the second biggest cause of diesel generator failures.^{19/} Dust and dirt accumulating on such things as contact surfaces and mechanical components is the biggest cause of relay and breaker malfunctions.^{20/} Such dust and dirt primarily comes from (1) outside air which is drawn into the diesel generator rooms for both combustion and ventilation purposes and (2) from concrete walls and floors in the diesel generator building.^{21/} At Midland, the potential problems associated with dust and dirt are eliminated by the following means: 1) all ventilation air entering the diesel generator building is filtered; (2) combustion air for the diesel generators is ducted directly from the outside to the diesel engine air intake and does not pass through the diesel generator room; (3) all relays and breakers associated with diesel generator operation are enclosed in metal cabinets which provide dust protection equivalent to a NEMA 12 (dust tight) enclosure; (4) relays are fitted with dust covers in addition to being in metal cabinets; and (5) concrete walls and floors in the diesel generator buildings will have a surface treatment which will prevent formation of

^{17/} Rancho Seco FSAR §8.2.3.

^{18/} Turkey Point FSAR § 8.2.3.

^{19/} NUREG/CR-0660, p. V-4.

^{20/} Id.

^{21/} NUREG/CR-0660, pp. V-4, V-17.

concrete dust.^{22/} Turkey Point 3 and 4 and Rancho Seco do not have similar means to prevent the accumulation of dust and dirt.^{23/}

CONCLUSION

NUREG/CR 0660 sets forth stringent criteria which diesel generator installations must meet. Midland was required to meet them and has done so. Turkey Point 3 and 4 and Rancho Seco were not required to do so. The criteria were developed, in part, by examining the very LER's which Ms. Sinclair cites in her October 15 reply. Furthermore, comparisons in other areas - including the abilities of the diesel generator installations to deal with the two most common causes of failure - further show the dissimilarities of the installations. While the design logic of the diesel generator installations at Midland and at Rancho Seco are similar, NUREG/CR 0660 cites no LER's for Rancho Seco which were attributable to design logic. With respect to the design logic for the diesel generator installations at Turkey Point 3 and 4, the design logic for the installations at Midland is superior. As for the two most common causes of diesel generator failure - starting difficulties and problems with breakers and relays - Midland is much better equipped to avoid these problems than are Rancho Seco and Turkey Point 3 and 4. Hence, the Staff believes that the diesel generator installations at Midland are sufficiently dissimilar to those at Turkey Point 3 and 4 and at Rancho Seco so that the failures which Ms. Sinclair cites in her October 15 reply are significantly less credible events at Midland.

^{22/} Midland FSAR § 9.5.8.

^{23/} See Turkey Point FSAR §8.2.3., Rancho Seco FSAR § 8.2.3.