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David W. Rogers
Plant Safety and Licensing Director

Palisades Nuclear Plant: 27780 Blue Star Memorial Highway, Covert, MI 49043

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Nuclear Regulatory Commission
Document Control Desk
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DOCKET 50-255 - LICENSE DPR-20 - PALISADES PLANT -
LICENSEE EVENT REPORT 94-007 - EDG FUEL OIL SUPPLY DOES NOT MEET LICENSING BASIS

Licensee Event Report (LER) 94-007 is attached. This event is reportable in accordance with 10CFR50.73(a)(2)(ii)(B) as a condition outside the design basis.

David W. Rogers

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Plant Safety and Licensing Director

CC Administrator, Region III, USNRC
NRC Resident Inspector - Palisades

Attachment

IE22
1/1

NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Palisades Plant	0 5 0 0 0 2 5 5	1 OF 0 4

TITLE (4)
EDG FUEL OIL SUPPLY DOES NOT MEET LICENSING BASIS

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (8)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	
									N/A	0 5 0 0 0
0 3	0 8	9 4	9 4	0 0 7	0 0	0 4	0 7	9 4	N/A	0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
N		20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	0 0 0	20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	X 50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
James L. Kuemin, Licensing Administrator	AREA CODE 6 1 6 7 6 4 - 8 9 1 3

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X YES (If yes, complete EXPECTED SUBMISSION DATE)	NO		0 5	2 0	9 4

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On March 8, 1994 the plant was in cold shutdown. During an evaluation of the emergency diesel generator (EDG) fuel oil supply system it was determined that the emergency diesel generator fuel oil transfer system, including the storage tank, T-10 and associated piping, is not tornado protected. It was also established that this condition did not meet the original General Design Criteria (GDC-2). It has also been determined that the storage tank and associated piping has not been maintained as safety related since plant construction and the diesel fuel oil transfer system is nct fully protected from the effects of a design basis seiche as determined in the Systematic Evaluation Program (SEP).

The cause of the event is incomplete design basis information.

Corrective action for this event includes providing interim measurers to ensure a continuous diesel fuel oil supply is available to the EDGs in the event of a design basis event. Additional physical protection and procedures for a transfer of diesel fuel oil to the EDGs will be in place prior to plant startup.

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EVENT DESCRIPTION

On March 8, 1994 the plant was in cold shutdown. During an evaluation of the emergency diesel generator (EDG) [EK] fuel oil supply system [DC] it was determined that the emergency diesel generator fuel oil transfer system, including the storage tank, T-10 [DC;TK] and associated piping, is not tornado protected. It was also established that this condition did not meet the original General Design Criteria (GDC-2). It has also been determined that the storage tank and associated piping has not been maintained as safety related since plant construction and the diesel fuel oil transfer system is not fully protected from the effects of a design basis seiche as determined in the Systematic Evaluation Program (SEP).

A fully qualified diesel fuel oil transfer system has become more important as load changes to the emergency diesel generators have resulted in an increase in the fuel oil usage rate and thus a corresponding increase in the quantity of fuel that must be stored to meet design requirements. Additionally, the increased fuel usage rate impacts the need to replace the fuel oil in the diesel generators' day tanks in a shorter time frame.

Although the above situations exist, it is concluded that the current design is sufficient to ensure safe shutdown in the event of a design basis accident provided certain compensatory measures are taken.

These compensatory measures are to increase the reliability of the EDGs in a tornado and in a flooding event resulting from a seiche. Consideration will be given to long term actions to improve the EDG fuel oil transfer system and to provide a fully qualified 7-day fuel oil supply.

CAUSE OF THE EVENT

The cause of this event is incomplete design basis information.

ANALYSIS OF THE EVENT

There are two emergency diesel generators at Palisades designed to provide a dependable onsite power source capable of starting and supplying the essential loads to safely shut down the plant and maintain it safely shut down in all plant conditions. The generators have sufficient capacity to supply the minimum necessary engineered safeguards loads with only one generator operating.

Each diesel generator is supplied fuel oil by its diesel belly tank, an adjacent day tank and a common transfer system. The transfer system consists of an underground fuel oil storage tank, T-10, a single supply line and two transfer pumps, P-18A and P-18B. One of the two transfer pumps, P-18A, has automatic controls and is supplied power from a non-safety related but reliable power source. The other pump, P-18B, has manual controls but is fed from a safety related power supply. Operator action is therefore required to start either pump following a loss of offsite power. A 7-day fuel oil supply for one EDG is provided by the storage and transfer system. The storage requirements are met by the combined capacities of the belly tank, day tank, and underground storage tank.

An additional diesel fuel oil storage tank (T-926) also exists. No credit has been taken in the licensing basis for T-926. Because of its rugged construction in a concrete encasement, tank T-926 has been judged (engineering judgement) as able to withstand the effects of a design basis tornado or tornado missile, seismic event, or seiche. The transfer piping from T-926 is, however, located in structures which would not withstand these events.

The Palisades licensing basis has always assumed some dependence on the ability to procure off site sources of fuel oil. The original FSAR and Technical Specifications bases both point to capability to provide refilling of the EDG day tanks from outside the diesel generator rooms. This dependence was also considered during the Systematic Evaluation Program in the NRC's evaluation of Topic VII-3, dated December 31, 1981.

There has been ongoing evaluation of the EDG fuel oil supply as follow-up to the NRC's EDSFI and as part of our Configuration Control Project. In 1993 concerns were raised in-house about our ability to provide a 7-day diesel fuel oil supply. This question arose following a bounding worst case calculation which concluded that the diesel generator fuel oil consumption rate would result in consumption of the EDG belly and day tanks in 11.2 hours versus 27.6 hours assumed in the FSAR and Technical Specifications bases. The issue was resolved when analyses were performed which concluded that an on-site 7-day diesel fuel oil supply was available. The FSAR was revised to incorporate the 11.2 hours. Other actions were also taken or assigned.

One of these actions was to conduct a seismic walkdown and an evaluation of the diesel fuel oil transfer system in conjunction with other seismic evaluation (SQUG) walkdowns. The result of the walkdown and evaluation was that the transfer system from the T-10 tank was determined to be seismically qualified. The transfer system from the T-926 tank was evaluated and judged to be inadequate due to threaded pipe fittings and because the piping is routed through structures that are not seismically qualified.

Continuation of evaluation of the documentation related to the diesel fuel oil transfer system from the T-10 storage tank to the EDG day tanks resulted in the recent determination that the tank was originally intended to be protected from tornado and tornado missile damage in accordance with the original GDC-2 requirements. During original construction the design, to include a concrete cover on T-10, was changed and the cover was not installed. Our evaluation has now determined that the tank and transfer system does not meet the original requirements. Further evaluation was conducted to compare the design to the original General Design Criteria in an effort to identify all other potential GDC issues related to the diesel fuel oil transfer system. Other evidence was found that indicates the diesel fuel oil storage and transfer system from the T-10 tank was originally meant to be safety related but it has never been treated as such.

The original criteria for flooding of the T-10 tank and transfer system appear to have been considered and met. During the Systematic Evaluation Program (SEP Topic II-3.A, II-3.B, and II-3.C; NRC SER supplement received by letter dated October 7, 1982) in 1982 a new flood level, as a result of a seiche, was developed by the NRC. The new flood level which is the present licensing basis assumes a maximum monthly mean lake level of 582.6 feet and a probable maximum flood level of 593.5 feet. Since during the SEP the diesel fuel oil transfer system was considered to be non-safety related, flooding of the transfer pumps was not reviewed in this issue evaluation. With this new flood level, consideration of the effects of the seiche have now been reconsidered. To fully qualify the diesel fuel oil transfer system from the effects of the licensing basis flood, the pumps need to be protected from the flooding effects of the seiche.

Review of the other relevant original GDCs resulted in a determination that they have been met by the diesel fuel oil transfer system.

Safety Significance

To provide assurance that the treatment of the diesel fuel oil transfer system as non-safety related over the years has not affected the reliability of the system, an evaluation of the system material condition was conducted of the active and passive system components. This evaluation considered the available data including surveillance and operating procedures, maintenance, testing and operational information that would provide reliability information on the system components. No records of excavation of the underground components, as an indication of corrosion, were located, but no evidence of component deterioration was located either.

The conclusion of the evaluation is that the diesel fuel oil transfer system is reliable and functional. Sufficient surveillance, maintenance and operational activities provide this assurance even though the system has not been maintained as safety related over the years.

It has been concluded that the current design is sufficient to ensure safe shutdown in a design basis accident provided certain compensatory measures are taken. The measures are to increase the reliability of the EDGs in a tornado and in a flooding event resulting from a seiche. The major action is to provide a manually connected transfer hose and air pump to transfer oil from the T-926 tank to the diesel generator day tanks. In the interim, until the diesel fuel oil transfer pumps are protected from the flooding effects of a seiche, this manual transfer capability will be available in the unlikely event of a tornado missile or seiche. Further longer term actions to improve the EDG fuel oil transfer system will be required in order to provide a fully qualified 7-day fuel oil supply.

CORRECTIVE ACTIONS

Short Term Actions to be completed prior to plant start-up

- Provide barriers around T-10 for routine protection from vehicles.
- Provide procedures and equipment to transfer oil from T-926 directly to the diesel generator day tanks.
- Provide a barrier at the T-926 connection to T-10.
- Provide a memo to the plant staff defining the safety related aspects of the T-10 tank and the diesel fuel oil transfer system.

Long Term Actions

- Protect the fuel oil transfer pumps from potential flooding from a seiche. This action will be completed by June 30, 1994.
- Consider a system upgrade to provide a fully qualified 7-day diesel fuel oil supply.
- Clarify the FSAR as to the licensing basis of the system by the next FSAR update.
- Update plant documents.