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IE Circular No. 80-05

EMERGENCY DIESEL-GENERATOR LUBRICATING OIL ADDITION AND ONSITE SUPPLY

Description of Circumstances:

On January 17, 1980, the Kewaunee Nuclear Power Plant experienced a partial loss of offsite power which resulted in a turbine trip, reactor trip, and one emergency diesel engine driven generator (diesel-generator or D/G) supplying power to one engineered safeguards bus. Offsite power continued to supply the other engineered safeguards bus.

During the day before, on 1-16-80, this diesel-generator had successfully completed a 24-hour loaded test run but had a low lube oil alarm condition with oil level 1/2-inch low. The D/G was fully operational in this condition. Before oil could be added on 1/17/80, the D/G was required for emergency power following the failure of the reserve auxiliary transformer.

The normal oil fill location could not be used while the D/G was operating. The D/G Technical Manual (TM) indicated that oil could be added with the engine running, but did not describe the method to be used. Lube oil was added by pumping into the engine through a pipe that was assumed to be a lube oil line; this line was color coded in the TM and painted with the lube oil system color code. Three barrels of oil were added via this line while the D/G was operating. After transferring the emergency bus to off-site power through the tertiary auxiliary transformer the D/G was shut down. With the D/G shut down two more barrels of oil were added through this line without increasing the sump level. Then two more barrels of oil were added through a different addition point and the level was restored to normal.

The following day a factory representative determined that the first five barrels of oil had been added to the engine air box through a mismarked (should have been color coded as an air line) drain connection. Four and a half barrels of oil were drained out after which the diesel-generator was satisfactorily test operated. It is believed that the diesel engine could have been damaged had an engine start been attempted while the five barrels of oil were in the air box. Further, it is noted that procedures for adding oil to the operating diesel engine were not available and that the personnel performing the addition were not familiar with, nor trained on, how to add oil to a running engine or how to verify that oil had been properly added.

This event brought to light an additional problem which may be generic. During the previous day's test run of the diesel-generator lube oil consumption was approximately 3 gal/hr. During the loss of power event, the licensee had three barrels (165 gallons) of lube oil available onsite. The licensee's

Technical Specifications require a seven day supply of fuel oil for one diesel-generator be available onsite. To meet the intent of the Technical Specifications, a seven day supply of lube oil should also be available onsite.

The diesel engines are model 999-20 manufactured by the Electro-Motive Division of General Motors Corporation. These diesel engines use a 2-stroke cycle and lube oil consumption is normally higher than for the 4-stroke cycle diesel engines. Vendor representatives and NRC consultants indicate that lube oil consumption rate varies with engine condition and load. Further, the 3 gal/hr consumption rate is considered to be in the normal range.

Recommended Action for Licensee's Consideration:

All holders of operating licenses for nuclear power reactor facilities should be aware of the potential problems described above. Because of the generic nature of these matters, it is recommended that the considerations identified above be reviewed at your facility in the following respects:

1. Verify the existence and adequacy of procedures or instructions for adding lubricating oil to safety related equipment. This should include the following:
 - a) Whether or not, how and where lube oil can be added while the equipment is in operation,
 - b) Particular assurance that the wrong kind of oil is not inadvertently added to the lubricating oil system, and
 - c) That the expected rise in level occurs for each unit of lube oil added.

These operating procedures or instructions should be available locally in the area of the affected equipment.

2. Verify that personnel are trained in such approved procedures and demonstrate an ability for using these procedures to add oil while the D/G is operating and that they understand how to verify that the proper amount of oil has been added.
3. Verify that the color coded, or otherwise marked, lines associated with the diesel-generator are correct and that the line or point for adding lube oil has been clearly identified.
4. Verify that appropriate procedures or instructions exist, and personnel are trained, on the proper addition of lube oil and the performance of maintenance during operation of other similar vital equipment.

5. Determine the lube oil usage rate for each diesel engine under full load conditions including the rates considered to be excessive. Provide adequate inventory of lubricating oil of the proper grade consistent with the highest usage emergency diesel-generator(s) operating for the time period specified in the plant Technical Specifications for fuel oil supply. When lube oil consumption rates become excessive, provisions should be included for overhaul of the diesel engine.

All holders of construction permits for nuclear power reactor facilities should be aware of the potential problems identified above and initiate appropriate procedures prior to initial fuel loading.

No written response to this Circular is required. If you require additional information regarding these matters, contact the Director of the appropriate NRC Regional Office.

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Enclosure

RECENTLY ISSUED
IE CIRCULARS

Circular No.	Subject	Date of Issue	Issued to
80-04	Securing of Threaded Locking Devices on Safety-Related Equipment	3/14/80	All holders of a power reactor OL or CP
80-03	Protection from Toxic Gas Hazards	3/6/80	All holders of a power reactor OL
80-02	Nuclear Power Plant Staff Work Hours	2/1/80	All holders of Reactor OLs, including research and test reactors, and CPs
80-01	Service Advice for GE Induction Disc Relays	1/17/80	All licensees of nuclear power reactor operating facilities and holders of nuclear power reactor CPs
79-25	Shock Arrestor Strut Assembly Interference	12/20/79	All licensees and holders of power reactor CPs
79-24	Proper Installation and Calibration of Core Spray Pipe Break Detection Equipment on BWRs.	11/26/79	All Holders of a Power Reactor OL or CP
79-23	Motor Starters and Contactors Failed to Operate	11/26/79	All Power Reactor Operating Facilities and Holders of Reactor CPs
79-22	Stroke Times for Power Operated Relief Valves	11/16/79	All Power Reactor Operating Facilities and all Utilities having a CP
79-21	Prevention of Unplanned Releases of Radioactivity	10/19/79	All holders of Power Reactor OLs and CPs
79-20	Failure of GTE Sylvania Relay, Type PM Bulletin 7305, Catalog 5U12-11-AC with a 12V AC Coil	9/24/79	All holders of Power Reactor OLs and CPs