



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

APR 24 1981

AEOD/E109

This is an internal, pre-decisional document not necessarily representing a position of AEOD or NRC.

MEMORANDUM FOR: Carlyle Michelson, Director
Office for Analysis and Evaluation
of Operational Data

FROM: Matthew Chiramal
Office for Analysis and Evaluation
of Operational Data

SUBJECT: PROPOSED WATCH LIST ITEM - POTENTIAL COMMON
MODE FAILURE OF DIESEL GENERATORS

References: 1) IE Region II Daily Report dated 3/18/81.
2) NRC LER output on Fires in Diesel Generators
from 1969 to the present.

On March 17, 1981, while Farley-1 was in a cold shutdown condition, one train of safety injection system inadvertently actuated. The event was caused by operator error during surveillance testing. The SI actuation automatically started both emergency diesel generators. Subsequently while loading the diesel generators following a period of unloaded operation, the exhaust manifold of one of the engines caught on fire. The diesel was immediately stopped and the fire extinguished.

The event raises the concern of a potential common mode failure for diesel engines with turbo-chargers. On an SI actuation at a nuclear plant, the diesel generators will automatically start and will continue to run unloaded as long as offsite power is available (or until the operator manually stops them). Subsequently, if offsite power is lost the diesel generators will energize the associated safety-related buses and will automatically pick up load. Such a sequence can cause a fire in the exhaust manifold due to deposits of unburnt exhaust gases. Since the diesel engines are not designed for operation under such conditions, the fire has the potential for rendering the diesels inoperable.

To explore previous occurrences of such an event the NRC LER data base from 1969 to the present were searched on the keywords "Fires" and "Diesel". Twelve events involving fires in diesel engines were found. Only one event, however, could be attributed to an initial no load and subsequent load operation. That event occurred at Kewaunee in September 1977.

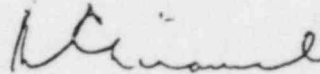
A45

8210050027 820628
PDR FOIA
UDELL82-261 PDR

For that event the cause of the fire was determined to be carbon residue build up in the exhaust path through the turbo-charger due to intermittent no-load or light-load operation. The diesel engine vendor subsequently recommended a four hour high load operation (with fire watch) to eliminate the exhaust residue buildup - the monthly surveillance procedure at Kewaunee was changed to accomodate this. Similar procedures are followed at some of the other operating nuclear stations.

Since only two events were found at present, consideration of this mode of failure to be of serious concern is not recommended. This type of failure, however, should be included in our "watch" list. If more such failures appear then corrective actions could be generally implemented, e.g., requiring surveillance procedures such as those at Kewaunee.

The AEOD Sequence Coding and Search Procedure (SCSP) will be revised by T. Wolf to include "fire" as a searchable item so that similar events can be followed.



Matthew Chiramai
Office for Analysis and Evaluation
of Operational Data

cc: C. J. Heltemes
T. Wolf
F. Ashe