

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, DC 20555

August 29, 1985

IE INFORMATION NOTICE NO. 85-74: STATION BATTERY PROBLEMS

Addressees:

All nuclear power reactor facilities holding an operating license (OL) or a construction permit (CP).

Purpose:

This notice describes problems that have occurred with lead-acid station batteries at several nuclear power plants. These problems were discovered as a result of inspections by the NRC Performance Appraisal Team (PAT). It is expected that recipients will review the information for applicability to their facilities and consider actions, if appropriate, to preclude a similar problem occurring at their facilities. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

All four recent inspections by the PAT identified problems with lead-acid station batteries. Although all of the problems are not listed here, a summary of a few of the more significant problems with lead-acid station batteries that were identified as a result of these inspections is provided below:

Cooper PAT Inspection (November 1984):

The battery rated-load discharge test was performed at a discharge rate significantly less than the manufacturer's recommended rated-load discharge rate for the 8-hour period of the test. The licensee had no records of battery charging following the completion of battery discharge test and consequently the time and date the batteries were returned to service could not be determined. The licensee failed to correct specific gravity measurements for electrolyte temperature and level. The licensee had no written procedures for conducting charges of the station batteries.

McGuire PAT Inspection (February 1985):

Three cells were placed on single-cell chargers for about 2 years, thus raising questions regarding the operability of the battery and electrical independence and separation of the Class 1E dc power systems. The cells on single cell

charge were at voltages higher than specified in the vendor manual. Although one cell in the battery was jumpered out, the float voltage for the entire battery was not reduced; consequently each cell was floated at a voltage higher than specified in the battery vendor manual. The battery performance discharge test was performed improperly because the test was stopped before reaching the minimum specified voltage.

Susquehanna PAT Inspection (February 1985):

There were no station procedures for maintaining station batteries in accordance with the battery vendor's manual or IEEE Std 450-1975, "IEEE Recommended Practice for Maintenance, Testing and Replacement of Large Lead Storage Batteries for Generating Stations and Substations" (which is endorsed by Regulatory Guide 1.129, "Maintenance, Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants"). Intercell resistance values were not compared with previous values to determine when corrective action was required. The licensee did not always conduct equalizing charges when required; nor did the licensee have procedures for monitoring the progress of an equalizing charge or determining when the charge should be terminated. Surveillance procedures for the 60-month rated-capacity discharge test did not conform to IEEE Std 450-1975 because the test was terminated at the end of 8 hours, instead of when the terminal voltage fell to the minimum specified value (usually 1.75 volts per cell). The licensee's procedures did not require that the average specific gravity be calculated and compared to the technical specification acceptance criteria.

San Onofre PAT Inspection (March 1985):

During the first 2 years of operation, the battery capacity tests required by the Final Safety Analysis Report (FSAR) and IEEE Std 450-1980 were not performed on Units 2 and 3. The total battery float voltage was not adjusted to account for two jumpered out cells. The two jumpered out cells did not receive the manufacturer's specified surveillances, maintenance, or charges. The pilot cells were not being changed on a yearly basis, as recommended by the vendor's technical instructions. The station engineer responsible for the technical aspects of battery operation, maintenance, and surveillance did not receive surveillance results and data sheets on a routine basis.

Discussion:


Recent IE inspections of operating facilities indicate that several widespread deficiencies may exist in the operation and maintenance of station batteries. These deficiencies are attributable to a variety of causes, including licensee error, inadequate knowledge of batteries by maintenance technicians and supervisors, and inadequate procedural guidance. The results of these inspections suggest a general lack of appreciation amongst licensee personnel for proper maintenance and surveillance of station batteries. Although batteries contain no moving parts, considerable care and attention to detail is required to maintain them operable. Too often, licensees may be treating these vital engineered safety features (ESF) power supplies as "passive" components and not providing them the necessary management and technical attention.

The following reference materials provide guidance as to the individual requirements for a facility's station batteries.

1. IEEE 450-1975, and 1980
2. Regulatory Guide 1.129, Rev. 1, "Maintenance, Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants" (This regulatory guide endorses IEEE Std 450-1975 with certain exceptions.)
3. Facility Technical Specifications
4. Final Safety Analysis Report (FSAR)
5. Station Battery Vendor Technical Manual (The vendors of station batteries periodically update their manuals to include revised guidance.)

Other recent problems with station batteries were described in IE Information Notice 84-83: VARIOUS BATTERY PROBLEMS, November 14, 1984.

No specific action or written response is required by this information notice. If you have questions about this matter, please contact the Regional Administrator of the appropriate NRC regional office or this office.


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Attachment: List of Recently Issued IE Information Notices

LIST OF RECENTLY ISSUED
IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
84-70 Sup. 1	Reliance On Water Level Instrumentation With A Common Reference Leg	8/26/85	All power reactor facilities holding an OL or CP
85-73	Emergency Diesel Generator Control Circuit Logic Design Error	8/23/85	All power reactor facilities holding an OL or CP
85-72	Uncontrolled Leakage Of Reactor Coolant Outside Containment	8/22/85	All power reactor facilities holding an OL or CP
85-71	Containment Integrated Leak Rate Tests	8/22/85	All power reactor facilities holding an OL or CP
85-70	Teletherapy Unit Full Calibration And Qualified Expert Requirements (10 CFR 35.23 And 10 CFR 35.24)	8/15/85	All material licensees
85-69	Recent Felony Conviction For Cheating On Reactor Operator Requalification Tests	8/15/85	All power reactor facilities holding an OL or CP
85-68	Diesel Generator Failure At Calvert Cliffs Nuclear Station Unit 1	8/14/85	All power reactor facilities holding an OL or CP
85-42 Rev. 1	Loose Phosphor In Panasonic 800 Series Badge Thermoluminescent Dosimeter (TLD) Elements	8/12/85	Materials and fuel cycle licensees
85-67	Valve-Shaft-To-Actuator Key May Fall Out Of Place When Mounted Below Horizontal Axis	8/8/85	All power reactor facilities holding an OL or CP

OL = Operating License
CP = Construction Permit