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SSINS No. 6835  
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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT  
WASHINGTON, D.C. 20555

October 15, 1986

IE INFORMATION NOTICE NO. 86-88: COMPENSATORY MEASURES FOR PROLONGED PERIODS  
OF SECURITY SYSTEM FAILURES

Addressees:

All nuclear power reactor facilities holding an operating license or construction permit and fuel fabrication and processing facilities using or possessing formula quantities of special nuclear material.

Purpose:

This notice is provided to alert addressees to increased vulnerability of their sites when compensatory measures are implemented for prolonged or indefinite periods. It is suggested that recipients review the information for applicability to their facilities and consider actions, if appropriate, to preclude similar problems from 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:

There have been several instances of major loss of physical security effectiveness as a result of the failure of critical security subsystems, e.g., the security computers, protected area (PA) alarm system, and PA or vital area (VA) barrier. Although licensee security plans address the compensatory measures to be initiated during circumstances similar to these, in some cases little or no consideration has been given to those situations where the equipment failure requires the plant to employ compensatory measures for prolonged periods of time.

Major losses of security system effectiveness have included gross inadequacies in the PA alarm system and temporary PA configuration because of construction. Construction has required protracted implementation of compensatory measures for several months or years. In other cases, security computer failures have caused employment of measures for 24 hours or more to compensate for near total system outage, i.e., loss of VA access control equipment and PA alarms.

Discussion:

NUREG-1045, "Guidance on the Application of Compensatory Safeguards Measures for Power Reactor Licensees," states that compensatory measures should be applied only for the minimum time necessary to effect the repair or replacement of the failed protection feature. Thus, compensatory measures are intended to be

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LIST OF RECENTLY ISSUED  
IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
86-87	Loss Of Offsite Power Upon An Automatic Bus Transfer	10/10/86	All power reactor facilities holding an OL or CP
86-86	Clarification Of Requirements For Fabrication And Export Of Certain Previously Approved Type B Packages	10/10/86	All registered users of NRC certified packages
86-85	Enforcement Actions Against Medical Licensees For Willfull Failure To Report Misadministrations	10/3/86	All NRC medical licensees
86-84	Rupture Of A Nominal 40-Millicurie Iodine-125 Brachytherapy Seed Causing Significant Spread Of Radioactive Contamination	9/30/86	All NRC medical institution licensees
86-83	Underground Pathways Into Protected Areas, Vital Areas, Material Access Areas, And Controlled Access Areas	9/19/86	All power reactor facilities holding an OL or CP; fuel fabrication and processing facilities
86-82	Failures Of Scram Discharge Volume Vent And Drain Valves	9/16/86	All power reactor facilities holding an OL or CP
86-81	Broken Inner-External Closure Springs On Atwood & Morrill Main Steam Isolation Valves	9/15/86	All power reactor facilities holding an OL or CP
86-80	Unit Startup With Degraded High Pressure Safety Injection System	9/12/86	All power reactor facilities holding an OL or CP
86-79	Degradation Or Loss Of Charging Systems At PWR Nuclear Power Plants Using Swing-Pump Designs	9/2/86	All power reactor facilities holding an OL or CP

OL = Operating License  
CP = Construction Permit

temporary in duration. Furthermore, these measures should be designed to assure an essentially equivalent level of security as the protection feature to be replaced.

Compensatory measures typically include deployment of personnel to substitute for electrical (e.g., alarm systems) or mechanical (e.g., barrier) failures. Studies have shown that even the most conscientious, dedicated security personnel gradually lose their effectiveness when performing such tasks, even when posted for relatively short periods. Furthermore, these personnel are particularly ineffective when fatigued. Studies indicate that with fatigue, especially because of loss of sleep, an individual's detection of visual signals deteriorates markedly, the time it takes for a person to make a decision increases and more errors are made, and reading rates decrease. Other studies show that fatigue results in personnel ignoring some signals because they develop their own subjective standards as to what is important, and as they become more fatigued these personnel ignore more signals.

Apparent vulnerabilities, whether real or not, could encourage an adversary to act against the plant. Since the design basis threat confronting nuclear power plants and fuel facilities includes determined, well-trained and dedicated adversaries who would be capable of collecting and analyzing information concerning a plant's security system and procedures, prolonged use of most typical compensatory measures represent periods of increased vulnerability.

NUREG-1045 recommends backup equipment as the preferred compensatory measures in most of the examples provided. Backup equipment could include additional equipment already installed and operating or portable equipment that can be quickly deployed if it appears that repair or replacement of the failed equipment will take longer than a few hours.

When security personnel are employed as compensatory measures, licensees are reminded that as a general policy security personnel cannot be considered simultaneously available for both compensatory measures and response force duties.

Some methods that have been used by licensees and have proven effective in enhancing alertness and reducing errors, include:


1. Establishing controls on the number of hours worked (excluding time for shift turnover) for normal conditions and in the event that unforeseen problems are encountered (recurring or predictable problems are not unforeseen problems). NRC policy\* on working hours for plant staff who perform safety related functions could be considered in developing these controls. That policy suggests:
  - a. An individual should not be permitted to work more than 16 consecutive hours.

\*See 47 FR 7352, NRC Policy Statement, "Nuclear Power Plant Staff Working Hours," dated 2/18/82; Revised 6/1/82 (47 FR 23836).

- b. An individual should not be permitted to work more than 16 hours in any 24 hour period, nor more than 24 hours in any 48-hour period, nor more than 72 hours in any 7-day period.
  - c. A break of at least 8 hours should be allowed between work periods.
  - d. The use of overtime should be considered on an individual basis and not for the entire staff on a shift.
2. Periodically reassigning security personnel to new duties, typically every 2 hours.

Licensees are reminded that preplanned "compensatory measures" during refueling or major maintenance or modification work should be described in the NRC-approved security plan or contingency plan. Otherwise, licensees should initiate appropriate plan changes under 10 CFR 50.54(p), 50.90, 70.32(e), or 70.34 as applicable.

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

  
Edward L. Jordan, Director  
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and Engineering Response  
Office of Inspection and Enforcement

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Attachment: List of Recently Issued IE Information Notices