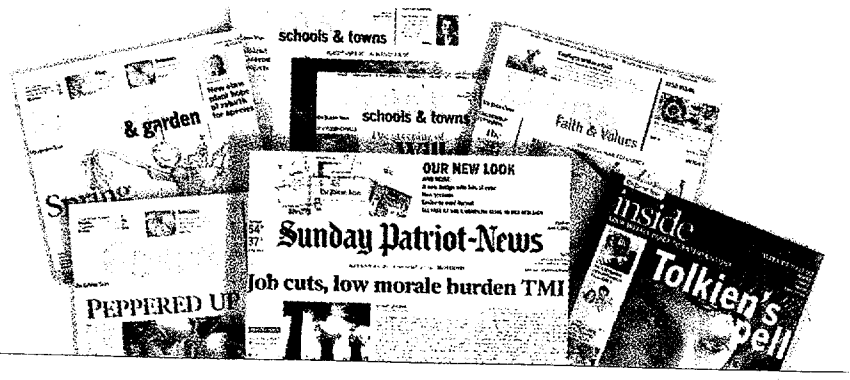
Additional material supplied by Richard Janati, Chief, Division of Nuclear Safety, Pennsylvania Department of Environmental Protection at the 5/1/02 Commission meeting: "Briefing on Results of Agency Action Review Meeting - Reactors"



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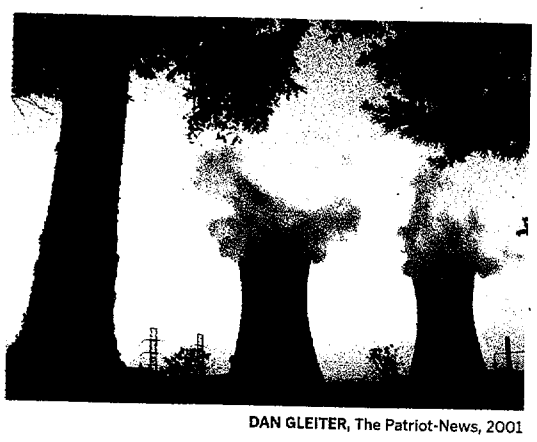
Job cuts, low morale burden TMI

REDUCED FORCE

Here are the number of TMI employees since the recent high:

- 1998 804
- 1999 704
- 2000 579
- 2001 577
- 2002 611



DAN GLEITER, The Patriot-News, 2001

BY BRETT LIEBERMAN
Of Our Washington Bureau

WASHINGTON • Three Mile Island's workforce has been reduced by 25 percent through cutbacks and early retirement incentives, and plant operator Exelon Nuclear acknowledges there are morale problems caused by frequent procedural changes and forced overtime.

The cuts — to a low of 577 employees in 2001 — have led additional workers to quit their jobs at the nuclear plant during the last four years, current and former employees said. They complained of increased workloads and hostile management.

Through interviews and e-mails over several months, employees told The Patriot-News that many veteran TMI workers have become stressed and quit abruptly. At least one person reportedly quit via a message he left on a computer screen. Some left without new jobs.

"It's sad to see the results of our mess, sad to see all the people leaving that island because of this new company in place," a reactor operator wrote in a November e-mail, referring to Exelon, which took over in 1999.

The issue was raised by Hubert J. Miller, regional administrator for the Nuclear Regulatory Commission, during a meeting last week reviewing TMI's performance. Miller and other agency officials said TMI workers told them of being overworked, feeling disillusioned and facing too frequent procedural changes.

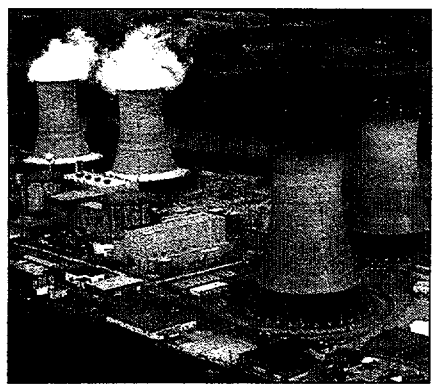
"Too much can be counterproductive even when you have the best intentions," Miller said. He added that many of the changes Exelon is implementing go beyond federal regulations or standards. "This is something you are taking on yourself. It comes with it a burden."

Exelon officials acknowledged

Please see TMI on Back Page

Jet could wreck TMI, NRC admits

Three Mile Island is the only nuclear power plant built "with special design features to protect vital areas from crash impact and fire effects," the NRC states, but they are likely inadequate.



THE PATRIOT-NEWS / 1999

Designers didn't anticipate size, speed of today's planes

March 28, 2002

BY BRETT LIEBERMAN
OF OUR WASHINGTON BUREAU

WASHINGTON — Government regulators have acknowledged for the first time that neither Three Mile Island nor any of the nation's other 102 operating nuclear reactors could withstand the impact of an airliner the size of those that crashed into the World Trade Center and the Pentagon.

Industry representatives and federal government officials downplayed the threat in days after the Sept. 11 attacks, insisting that nuclear containment buildings are "robust" and capable of withstanding explosions and natural disasters.

In newly released documents, however, the Nuclear Regulatory Commission concedes that even an accidental airplane crash was not factored into the designs of 96 percent of U.S. nuclear plants. At those plants where the threat was considered, design changes were aimed at smaller airplanes traveling at slower speeds.

"When the plants were designed, large aircrafts that are presently used were not in use," NRC spokeswoman Sue Gagner said.

The agency also acknowledged that critical systems that provide cooling, electricity and storage of spent fuel are mostly in nonhardened buildings that could not withstand an aircraft or missile attack.

The revelations were included in a report made avail-

See **NUCLEAR** / Back Page

NUCLEAR/Plants vulnerable to crash, agency admits

From Page A1

able by U.S. Rep. Edward J. Markey, D-Mass., based on responses to his queries from NRC Chairman Richard A. Meserve. Markey, a frequent critic of the NRC, said the agency's acknowledgment shows additional steps must be taken to improve nuclear plant safety.

The "NRC has admitted that even an aircraft impact at the auxiliary electrical or cooling facilities could trigger a core meltdown at a nuclear reactor, and yet the NRC refuses to upgrade security, refuses to install anti-aircraft weaponry, refuses to ensure that security at decommissioned reactors is maintained, and refuses to ensure that foreign nationals employed at the reactors undergo security background checks," he said.

Yesterday, the agency maintained that reactors remain difficult targets although it has not evaluated the effects of a plane crash.

"Even though they were not designed to withstand aircraft crashes, they are extremely rugged structures," Gagner said.

While many nuclear plants, including those in Pennsylvania, have had additional protection from National Guard troops and state police since Sept. 11, the NRC has rejected the idea of deploying anti-aircraft weapons.

When most plants were built in the 1960s and 1970s, the NRC and plant owners never contemplated that a large airliner would intentionally be crashed into a nuclear plant. Consideration of an airplane crash was limited to accidents.

Fifty-five of the nation's 60 nuclear plants lie within 15 miles of public airports. Most are small airports, carrying fewer than 100,000 departing passengers a year, according to NRC and FAA data.

Nine operating plants, including TMI, are near airports that serve more than 100,000 passengers. Other airports near nuclear plants include international airports in Charlotte, N.C., and near Pittsburgh.

Three Mile Island in Londonderry Twp., three miles from Harrisburg International Airport, is the only nuclear power plant "constructed with special design features to protect vital areas from crash impact and fire effects," the new documents state.

However, those features — reinforcement of outer walls, thickening of concrete sections, special fire protection and ventilation — would likely be inadequate, according to the NRC.

TMI — which was hit by the nation's worst nuclear accident 23 years ago today, on March 28, 1979 — was designed to withstand the impact of 200,000 pounds at 230 mph. A Boeing 757 or 767 such as those used in the New York and Washington attacks on Sept. 11 weighs 272,500 to 450,000 pounds. The planes used in those attacks traveled at speeds of 350 mph to 537 mph when they struck.

TMI was not built to withstand the impact of a larger airplane because "the probability of an on-site crash was sufficiently low," the NRC stated.

Two other plants — the Limerick nuclear plant near Pottstown and Seabrook plant in Portsmouth, N.H., — incorporated more modest features to help them withstand the impact of an airplane weighing up to 12,500 pounds.

"With respect to the remaining sites, the probability of an aircraft impact was either estimated or judged by inspection to be sufficiently low such that the event need not be considered in the design basis," NRC documents state.

David Lochbaum, nuclear safety engineer for the Union of Concerned Scientists, said it would be difficult to retrofit existing plants, but new safety features should be incorporated in the next generation of plants.

"The plants are what they are," said Lochbaum. "It's too late to go back and install 6 more feet of concrete."

Brett Lieberman may be reached at (202)383-7833 or blieberman@patriot-news.com.

April 16

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Nuke plants' plans are late

TMI operators seek extension to study security

BY BRETT MARCY
Of The Patriot-News

Nearly three out of every four of the nation's nuclear power plant operators — including Three Mile Island — failed to meet a Nuclear Regulatory Commission deadline to submit plans for implementing federally mandated security upgrades, according to industry sources.

The NRC, which is the federal agency that regulates the commercial nuclear power industry, announced in February it was requiring enhanced security measures at all U.S. power plants in response to the Sept. 11 terrorist attacks.

Each plant operator was required to submit a schedule for implementing those new security measures within 20 days of the order, but at least 47 of the 64 licensed operators missed that deadline, according to the Nuclear Con-

PLANTS: Operators miss deadline

Continued from Page A1

ly troubling," wrote Paul Leventhal and Edwin Lyman, both of NCI, in a letter to U.S. Rep. James Greenwood, R-Pa. Greenwood is chairman of the Subcommittee on Oversight and Investigations Committee on Energy and Commerce, which has been investigating plant security.

Leventhal and Lyman also wrote that the operators' delays in submitting their plans for implementing the new security measures could result in their failure to meet the Aug. 31 deadline to have the new measures in place.

An official with the Nuclear Energy Institute, a public policy organization of the nuclear energy and technologies industry, said it's too early to talk about missing the deadline.

"The deadline we're focused on is the Aug. 31 implementation deadline," said Steve Kerekes, spokesman for NEI. "There are some areas that require additional analysis, and we notified the NRC that we need more time to conduct those analyses."

Only one to three of the nearly 30 new security requirements ordered by the NRC prompted plant operators to ask for more time, according to NRC spokeswoman Diane Screnci. She would not say what actions the agency is requiring, but said plant operators needed more time to conduct engineering studies.

Screnci said the NRC is evaluating the requests for extensions and has not yet responded to any of them.

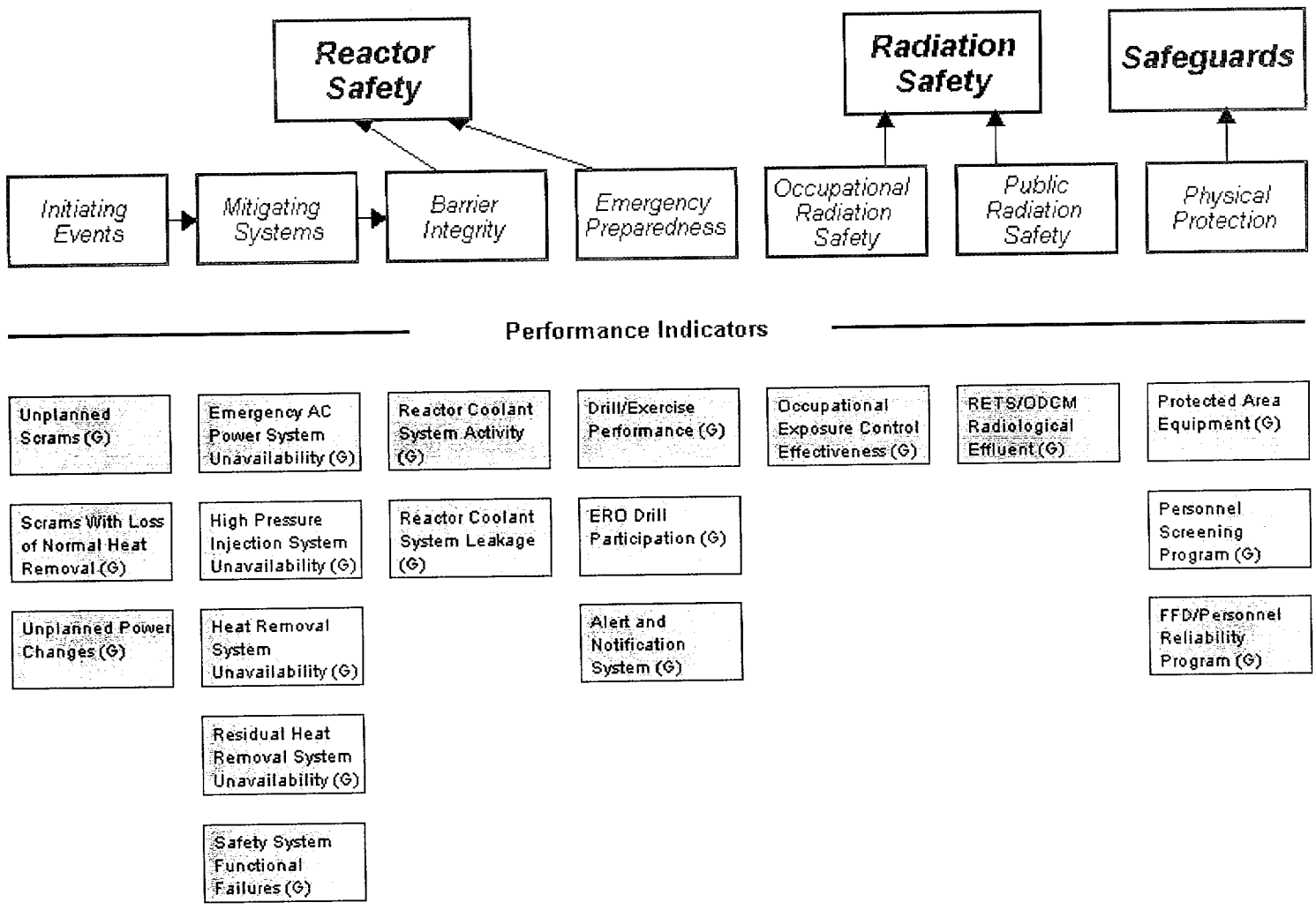
Though details of the NRC's guidelines have not been released, in general they require plants to: increase patrols, augment security posts, install additional barriers, provide vehicle checks at a greater stand-off distance, enhance coordination with law enforcement and military authorities, and impose more restrictive access for all personnel.

Dave Simon, spokesman for Exelon Nuclear, parent company of TMI in Londonderry Twp., said only one issue is preventing the company from submitting its plan to the NRC on time.

He said Exelon asked for a 45-day extension for all of its nuclear power plants to further study the strength of its concrete barriers and the ability of its facilities to withstand a sudden impact or blast.

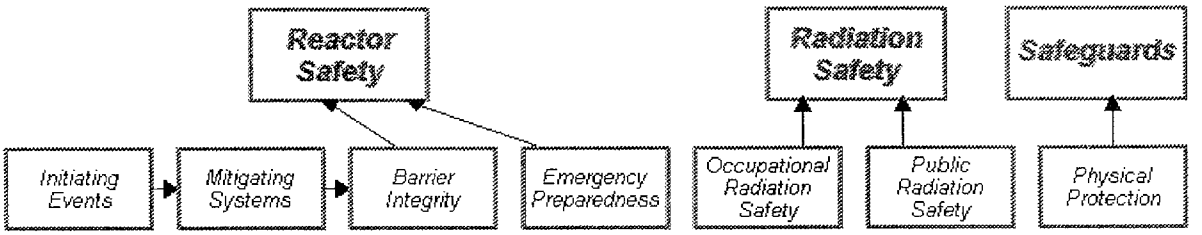
"This is just paperwork," Simon said of the requirement. "We're asking to do additional analyses. We expect to meet the Aug. 31 deadline on the ground."

He added that Exelon has



Last Modified: March 1, 2002

Legend: R=Red W=White T=Thresholds under development N=Not Applicable
Y=Yellow G=Green I=Insufficient data to calculate PI U=Unique Design



Most Significant Inspection Findings

4Q/2001	G	G	Findings without color designation	No findings this quarter	No findings this quarter	No findings this quarter	No findings this quarter
3Q/2001	No findings this quarter	G	No findings this quarter	No findings this quarter	No findings this quarter	No findings this quarter	No findings this quarter
2Q/2001	No findings this quarter	G	No findings this quarter	No findings this quarter	No findings this quarter	No findings this quarter	No findings this quarter
1Q/2001	No findings this quarter	G	No findings this quarter	No findings this quarter	No findings this quarter	No findings this quarter	No findings this quarter

Miscellaneous findings

Additional Inspection & Assessment Information

- Assessment Reports/Inspection Plans:
  - 4Q/2001
  - 3Q/2001
  - 2Q/2001
  - 1Q/2001
- Cross Reference Of Assessment Reports
- List of Inspection Reports
- List of Assessment Letters/Inspection Plans

Last Modified: March 1, 2002

Action Matrix Summary | Inspection Findings Summary | PI Summary | Reactor Oversight Process

Beaver Valley 1

Initiating Events

Significance: G Dec 29, 2001
Identified By: NRC
Item Type: NCV NonCited Violation
HUMAN PERFORMANCE, COMMUNICATION, AND PROCEDURAL ADHERENECE DEFICIENCEIES DURING SAFETY-RELATED MAINTENANCE
The inspectors identified a Non-Cited Violation of Technical Specification 6.8.1 for failure to properly perform maintenance which can affect the performance of safety-related equipment in accordance with written procedures or instructions. On several occasions, safety-related work activities were not properly controlled, resulting in unexpected control room alarms and indications. In one instance, Unit 1 operators responded by manually tripping the reactor, while the reactor was subcritical. In another instance, Unit 1 automatic reactor coolant system pressure control was disabled, and operators had to manually establish pressure control pending system restoration. Human performance deficiencies, such as poor communications between operators and technicians, were the cause of each event. In each case, the performance deficiency caused or increased the likelihood of an initiating event. The safety significance of this finding was very low (Green) because the performance deficiency did not cause any accident mitigation equipment or functions to be unavailable.
Inspection Report# : 2001010*(pdf)*

Significance: G Dec 29, 2001
Identified By: NRC
Item Type: FIN Finding
FAILURE TO IDENTIFY AND PERFORM PREVENTIVE MAINTENANCE TASKS IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS CAUSED UNIT 1 LOSS OF INSTRUMENT AIR AND TRIP
The inspectors determined that failure to identify and perform preventive maintenance tasks for instrument air dryer 1IA-D-1 in accordance with manufacturer recommendations was the root cause of the June 22, 2001, Unit 1 loss of instrument air (LOIA) and subsequent manual reactor trip. The LOIA increased the likelihood that mitigation equipment (specifically the power conversion system, auxiliary feedwater bleed path, and primary heat removal feed/bleed) would not be available. The LOIA and loss of component cooling water to the reactor coolant pumps also increased the potential for a reactor coolant system leak. The issue was determined to effect the initiating event and barrier integrity cornerstones. The safety significance of this finding was very low (Green) because the performance deficiency did not cause any accident mitigation equipment or functions to be unavailable.
Inspection Report# : 2001010*(pdf)*

Significance: G Dec 29, 2001
Identified By: NRC
Item Type: FIN Finding
INADEQUATE WORK PLANNING AND HUMAN PERFORMANCE ERRORS CAUSE UNIT 1 LOSS OF INSTRUMENT AIR AND MANUAL REACTOR TRIP
The inspectors determined that inadequate work planning and maintenance technician performance errors

caused a Unit 1 loss of instrument air (LOIA) and manual reactor trip on December 7, 2001. The equipment clearance, posted to completely de-energize the 'B' air compressor prior to beginning work failed to identify an energized contact which connected the 'A' and 'B' air compressors. Additionally, electricians used incorrect tools and failed to adequately perform safety checks to verify the 'B' air compressor circuitry was completely deenergized. The event review team also identified a latent vulnerability of the air system which had not been recognized following a similar reactor trip on June 22, 2001. A modification to the air dryer system several years ago, increased air system usage beyond the capacity of the backup diesel powered air compressor. As a result, although operators started the diesel air compressor promptly on December 7, they were unable to recover instrument air pressure prior to the reactor trip. The LOIA increased the likelihood that mitigation equipment (specifically the power conversion system, auxiliary feedwater bleed path, and primary heat removal feed/bleed) would not be available. The issue was determined to effect the initiating event and barrier integrity cornerstones. The safety significance of this event was very low (Green) because the performance deficiency did not cause any accident mitigation equipment or functions to be unavailable.
Inspection Report# : 2001010*(pdf)*

Significance: G Nov 10, 2001
Identified By: NRC
Item Type: NCV NonCited Violation
FAILURE TO VERIFY PLANT CONFIGURATION CAUSES REACTOR VESSEL OVERFILL, INCREASED PLANT RISK, AND INCREASED RADIATION EXPOSURE
The inspectors identified a Non-Cited Violation of Technical Specification (TS) 6.8.1 for failure to follow a procedure to verify plant configuration before manipulating a valve which resulted in an unexpected discharge of borated water into the reactor. Control room operators did not adequately verify all potential flow paths prior to opening a valve (MOV-SI-863A), which resulted in approximately 600 gallons of borated water being discharged into the reactor vessel. As a result, the reactor plant remained in a higher risk configuration (reduced reactor coolant inventory and time to boil) for an additional 24 hours. Further, system restoration following this human performance error resulted in additional personnel radiation exposure (approximately 1.2 man-rem). This finding was of very low safety significance because all systems providing core cooling remained operable and reactor criticality was not challenged.
Inspection Report# : 2001009*(pdf)*

Significance: G May 13, 2000
Identified By: NRC
Item Type: FIN Finding
INADEQUATE MAINTENANCE ON AN AUXILIARY STEAM PRESSURE CONTROL VALVE.
Inadequate maintenance on an auxiliary steam pressure control valve resulted in failure of the valve and a subsequent Unit 1 manual reactor trip due to degraded condenser vacuum. The finding was determined to have very low safety significance because mitigating equipment was not affected by the event and condenser vacuum was restored shortly after the reactor trip.
Inspection Report# : 2000004*(pdf)*

Mitigating Systems

Significance: G Nov 10, 2001
Identified By: NRC
Item Type: NCV NonCited Violation
FAILURE TO PRESCRIBE AND VERIFY AUXILIARY FEEDWATER PUMP TURBINE OIL LEVEL REQUIREMENTS IN PLANT PROCEDURES
The inspectors identified a Non-Cited Violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for failure to adequately prescribe vendor specified Auxiliary Feedwater Pump turbine bearing oil level requirements in plant procedures. This condition could result in inadequate oil lubrication to the turbine bearing and an increase in plant risk due to eventual unavailability of the Auxiliary Feedwater Pump. This finding was of very low significance because the Auxiliary Feedwater Pump oil level was found to be at the appropriate level and the pump was not inoperable.

Inspection Report# : 2001009*(pdf)*

Significance: G Sep 29, 2001
Identified By: NRC
Item Type: NCV NonCited Violation
INADEQUATE CORRECTIVE ACTION FOR MISPERFORMANCE OF SAFETY-RELATED PROCEDURES
The inspectors identified a Non-Cited Violation of 10 CFR 50 Appendix B, Criterion XVI "Corrective Action," for failure to implement effective corrective measures to preclude repeated misperformance of safety-related procedures including Unit 1 Operating Surveillance Test (OST)-36.2, "Diesel Generator No. 2 Monthly Test," Rev. 32. This problem reflected ineffective problem resolution and human performance deficiencies. Operator fatigue was a contributing factor to the degraded human performance. The finding was of very low safety significance because the emergency diesel generator procedure performance errors did not represent an actual loss of safety function.
Inspection Report# : 2001008*(pdf)*

Significance: G Jul 27, 2001
Identified By: NRC
Item Type: NCV NonCited Violation
FAILURE TO EVALUATE TEST FAILURES ASSOCIATED WITH TWO MOLDED CASE CIRCUIT BREAKERS TO PREVENT RECURRENCE
A Non-Cited Violation of 10 CFR 50 Appendix B, Criterion XVI was identified for failure to assure the cause of safety related molded-case circuit breaker (MCCB) test failures was identified and corrective actions taken to preclude recurrence. Two safety-related MCCBs, which had been removed from service several years ago, failed during recent testing. However, the licensee did not initiate a condition report to assure the cause would be identified and appropriate corrective actions would be taken. The MCCB test failures are significant because many MCCBs in safety-related applications were installed during initial plant construction and have not been subject to a periodic testing program. The issue affects the mitigating systems cornerstone because the problem could affect the operability and availability of mitigating systems. However, because the two breakers that failed the test acceptance criteria had already been removed from safety-related applications and were currently spares, there was no actual loss of safety function. For the MCCBs that were in service, the licensee's evaluation determined them to be operable. Consequently the finding is considered to be of very low safety significance (Green). Because the finding is of very low safety significance and is being addressed with the licensee's corrective action process, this finding is being treated as a Non-Cited Violation, consistent with Section VI.A.1 of the NRC Enforcement Policy.
Inspection Report# : 2001011*(pdf)*

Significance: G Jun 08, 2001
Identified By: NRC
Item Type: NCV NonCited Violation
INADEQUATE PROCEDURE FOR SAFE SHUTDOWN FROM OUTSIDE OF THE CONTROL ROOM COULD RESULT IN DAMAGE TO EMERGENCY DIESEL GENERATOR
The team identified a non-cited violation of 10 CFR 50, Appendix R for failure to have adequate procedures to assure safe shutdown capability. The team found that the procedure for shutdown from outside the control room did not provide adequate direction to promptly verify river water (RW) cooling to the protected emergency diesel generator (EDG). The delay in verifying RW cooling to the running EDG could result in damage to the EDG and a loss of all AC power. The safety significance of this finding was very low because the likelihood of a fire that would cause a loss of all RW and necessitate a shutdown from outside of the control room was small.
Inspection Report# : 2001005*(pdf)*

Significance: G Mar 31, 2001
Identified By: NRC
Item Type: NCV NonCited Violation
FAILURE TO PROPERLY CONTROL COMBUSTIBLE MATERIALS IN ACCORDANCE WITH THE FIRE