TMI file

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

September 8, 1994

Mr. T. Gary Broughton
Vice President and Director-TMI
GPU Nuclear Corporation
P. O. Box 480
Middletown, PA 17057

SUBJECT: THREE MILE ISLAND NUCLEAR STATION OPERATIONAL SAFEGUARDS RESPONSE EVALUATION (TAC NO. M89607)

Dear Mr. Broughton:

This letter conveys the results and conclusions of the Operational Safeguards Response Evaluation (OSRE) conducted by the NRC's Office of Nuclear Reactor Regulation at the Three Mile Island Nuclear Station from July 18 through July 21, 1994.

The OSRE team was composed of NRC personnel assisted by personnel from the U.S. Army. One purpose of the OSRE program is to evaluate a licensee's ability to respond in a contingency to an external threat by focusing on the interactions between operations and security in establishing priorities for protection of equipment and on the defensive strategies used. The OSRE also includes a safety/safeguards interface review to assure that safeguards measures do not adversely affect safe operation of the facility.

The OSRE conclusions are documented in the enclosed report (Part I, Operational Safeguards Readiness Review; and Part II, Safety/Safeguards Interface Review). This enclosure, which contains safeguards information of a type specified in 10 CFR 73.21, will not be placed in the Public Document Room, and must be protected against unauthorized disclosure.

The drills, exercises, and demonstrations observed by the team and the results of interviews conducted by the team indicated that, overall, the security force demonstrated an effective contingency response capability. The team also noted the high quality and extent of operations involvement in the planning and exercising of the contingency response capability. The team observed two items of minor significance, which are provided for your consideration, and six strengths. We expect that GPU Nuclear Corporation will review the discussions and observations for appropriate action. The team also concluded that effective provisions were in place to assure that safeguards measures did not adversely affect the safe operation of the facility.

The enclosed report does not convey any new regulatory requirement. Its findings have been considered with respect to your ability to meet the general performance objective and requirements of 10 CFR 73.55(a). Because of the overall effectiveness of the contingency response capability at Three Mile Island, no specific response is required to this report.

This letter affects one respondent and, therefore, is not subject to the Office of Management and Budget review under Public Law 96-511.

Sincerely, Original Signed by

Steven A. Varga, Director
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-289

Enclosure: Operational Safeguards Response Evaluation
(Part I, Operational Safeguards Readiness Review;
Part II, Safety/Safeguards Interface Review)

Enclosure contains SAFEGUARDS INFORMATION Upon removal of enclosure this document is DECONTROLLED.

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~~*** SAFEGUARDS INFORMATION ***~~

ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION

NRC Inspection Report: Operational Safeguards Response Evaluation

License No:	DPR-50
Docket No:	50-289
Licensee:	GPU Nuclear
Facility Name:	Three Mile Island Nuclear Station
Inspection at:	Pennsylvania
Inspection Date:	July 18 to 21, 1994
Inspection Team:	David N. Orrik, Team Leader, NRR Michael S. Warren, Security Specialist, NRR Zan-Shing Hsu, Nuclear Engineer, NRR Edward King, Safeguards Inspector, RI
NRC Consultants:	U.S. Army Personnel

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Regulation

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FINAL REPORT

THREE MILE ISLAND NUCLEAR STATION

OPERATIONAL SAFEGUARDS RESPONSE EVALUATION

SAFEGUARDS INFORMATION
DETERMINATION MADE BY

08/31/94

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THREE MILE ISLAND
NUCLEAR STATION

OPERATIONAL SAFEGUARDS RESPONSE EVALUATION

PART I
OPERATIONAL SAFEGUARDS READINESS REVIEW

PART I - OPERATIONAL SAFEGUARDS READINESS REVIEW

1.0 PURPOSE

The NRC conducted an Operational Safeguards Response Evaluation (OSRE) of GPU Nuclear Corporation's (GPUN's or the licensee's) Three Mile Island Nuclear Station (TMI) from July 18 through 21, 1994. [The facility is located in Harrisburg, Pennsylvania.] TMI Unit 1 is a Babcock & Wilcox (B&W) pressurized water reactor with a licensed power of 2568 MWt. TMI Unit 2 is also of B&W design but is in a permanent defueled storage state because of the 1979 accident.

One of the two purposes of the OSRE, addressed in this Part, was to evaluate the licensee's ability to respond to an external threat. The general performance objective of 10 CFR 73.55(a) requires a licensee's physical protection program to be designed to protect against the design basis threat of radiological sabotage as stated in Section 10 CFR 73.1(a). Section 10 CFR 73.55(h) includes a requirement that the licensee take immediate measures to neutralize a threat by requiring armed response personnel to interpose themselves between vital areas of the facility and any adversary attempting entry. The licensee must concurrently request assistance from local law enforcement agencies. In conducting its evaluation, the OSRE team focused on the interactions between operations and security in establishing priorities for protection of equipment and on the defensive strategies used.

1.1 EVALUATION METHODOLOGY

The evaluation team consisted of a nuclear engineer and safeguards specialists from the Office of Nuclear Reactor Regulation (NRR) and an inspector from a regional office. The team also included active-duty U.S. Army personnel acting in a support role to NRC.

In conducting this evaluation, the OSRE team considered a spectrum of external adversaries with varying characteristics. The spectrum was bounded by the characteristics of the design basis threat for radiological sabotage specified in 10 CFR 73.1(a). The external design basis threat is defined as "A determined violent external assault, attack by stealth, or deceptive actions, of several persons with the following attributes, assistance and equipment: (A) Well-trained (including military training and skills) and dedicated individuals, (B) inside assistance which may include a knowledgeable individual who attempts to participate in a passive role (e.g., provide information), an active role (e.g., facilitate entrance and exit, disable alarms and communications, participate in violent attack), or both, (C) suitable weapons, up to and including hand-held automatic weapons, equipped with silencers and having effective long range accuracy, (D) hand carried equipment, including incapacitating agents and explosives for use as tools of entry or for otherwise destroying reactor, facility,

transporter, or container integrity or features of the safeguards system...."

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The team assumed that significant radiological release would be the objective of power reactor radiological sabotage and used prevention of significant core damage as an evaluation criterion. This criterion makes the adversary's success more difficult and more accurately reflects significant public health and safety concerns than would a criterion of prevention of damage to any piece of vital equipment.

The evaluation began with a preliminary target analysis performed before the team arrived on-site.

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The team's initial effort on-site was to walk around the facility observing potential PA entry points, routes, and distances either to equipment or to doors providing access to equipment included in target sets. The team also noted the normal duty stations of personnel who might participate in a contingency response and the locations where special contingency response equipment was stored.

During the next 2 days, the team observed four licensee contingency drills.

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] The team did not actively participate in the drills. The team's input for drills was limited to the selection of a target set, adversary characteristics, and entry points at the PA perimeter. All drills and team input parameters were within the scope of those normally used by the licensee. A team member observed the licensee's critique of each drill.

The team also conducted five table-top drills. These drills simulated overt external assaults. For each exercise, team members interviewed a licensee contingency response team leader. An OSRE team member identified adversary characteristics, an entry point into the PA, and movement toward safety equipment. The response team leader (RTL) indicated how the responding security officers would be deployed and then estimated the time required for response officers to reach interdicting positions, based on the actual locations of the responding officers at the time of the exercise. Both the RTL and an OSRE team member estimated the time required for adversaries to proceed along the route and judged the outcome of engagements between adversaries and responders.

The team used its target set analysis and the results of the drills to evaluate the licensee's efforts at establishing priorities for protection of equipment; the ability of responding officers to arrive at suitable interdicting positions in timely fashion, in sufficient numbers, and appropriately armed and equipped; and the licensee's defensive strategies for deployment of response officers and equipment. The team evaluated how drills were being used both as a training tool and as a means of self-audit of the defensive strategy. The drills were also used to evaluate individual and team tactical movement, command, control, and communications. The drills were not viewed as a pass/fail test.

Team members also interviewed several security officers regarding use of deadly force at the site. A broad spectrum of possible contingencies was used, to assure that force would not be used unnecessarily in situations that did not threaten the health and safety of individuals or the general public and that appropriate force would be used if necessary, in situations such as those discussed in NRC Information Notice No. 89-05, "Use of Deadly Force by Guards Protecting Nuclear Power Reactors Against Radiological Sabotage."

The team interviewed members of the training staff and observed several weapons training techniques. The purpose was to evaluate the appropriateness of the training and experience of the training staff, the facilities available, and the techniques and frequency of training employed to assure that contingency response personnel are qualified to execute the responsibilities assigned to them, as required by 10 CFR Part 73, Appendix B.

2.0 EVALUATION

The team found no weaknesses although they observed two items of minor significance, which are provided for possible consideration by the licensee. These are labeled "Observations." Six strengths of the security program are also noted.

2.1 CONTINGENCY RESPONSE

2.1.1 General Description

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Primary law enforcement support is provided through the Pennsylvania State Police, located in the city of Harrisburg, about 10 miles from the facility. Initial response to the facility is expected to be about three to six officers in 15 to 30 minutes and about 30 officers in about 2 hours. The team's evaluation focused on the capability of the facility security force to neutralize adversaries until sufficient support arrives.

2.1.2 Results of Drills

Three different critical equipment sets were used in the four site contingency drills. The licensee conducted two drills on Tuesday and two on Wednesday.

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Prior to the actual drills, the team conducted five table-top drills with response team leaders using plan views of the PA. All five time-line, table-top drills assumed adversaries with the full capabilities of the design basis threat. The table-top drills indicated that the response force would be able to respond a sufficient number of personnel, appropriately armed, in good position, in time to interdict the adversary force before they reached their targets.

2.1.3 Findings

2.1.3.1 Response Strategy Planning and Execution (STRENGTH)

Based on observation of the table-top and actual drills, the weapons demonstrations, and the results of interviews conducted by the team, the team concluded that the TMI operations-security team had planned and implemented an effective contingency response strategy. The Operations/Security Strategy Book was developed as a critical action guideline to be used by operations staff in responding to an assault by adversaries with the characteristics of

the design basis threat. This guideline included actions based on loss of equipment and long-term mitigation strategies which are beyond Emergency Operation Procedures. In addition to the strategy book, the team was impressed with several other critical elements that were combined to provide this effective strategy.

First, the team was impressed by the quality and extent of operations involvement in the planning and exercising of the contingency response capability. The target analysis which is the foundation for the response strategy was found to be very well thought out and presented. This analysis, performed by operations personnel, appeared to identify all of the minimum target sets, which included some non-vital equipment. The team also noted that the reactor simulator was used as part of both the plant's target set development and the effort to identify those measures that operations could use to counter and mitigate potential sabotage to those equipment sets. In addition to providing training and a self-auditing device for security contingencies, the joint operations-security drills appear to have had a potential side-benefit of contributing to operator training for severe accident management. Additionally, operations personnel have developed a list of operations measures to mitigate severe accidents learned as a result of performing the critical target analysis and participating in the development of the protective strategy.

Second, the table-top and actual drills demonstrated that the security strategy for protecting the plant's most critical equipment had been well thought out. Officers would respond to appropriate response/defensive positions in accordance with a response matrix that considered officers' initial posts or patrols and the location of response weapons. This enabled the officers to be in position, in time, and armed appropriately to interdict armed intruders en route to critical plant equipment. The drills also indicated that security planners had taken advantage of unique plant construction characteristics which effectively restricted intruders' movement towards critical equipment.

Third, in all of the table-top and actual drills during the OSRE, the drill response force demonstrated the ability to quickly bring sufficient response assets, armed appropriately, to bear against armed intruders. Their execution of the plant's protective strategy was effective. The officers deployed quickly and tactically to interdicting positions that provided them with cover and concealment. Command and control during the drills was excellent, and was most notably effective in the quick and appropriate repositioning of response officers. Further, the CCTV cameras that view portions of the PA and the inside of the TB were demonstrated to be potentially very useful assets in a security contingency. The CAS operator used them in two drills to provide real-time information on intruders' movements and actions that enabled timely, effective response action.

A particularly important example of the effectiveness of the response strategy was the protection provided to reactor containment. This

area was identified by TMI operations personnel as being particularly vulnerable, since it includes all critical targets located in one area. In turn, TMI security personnel devised and implemented a specialized protection strategy including delay barriers for this set. Table-top and actual drills conducted during the OSRE demonstrated that the TMI response force could quickly and effectively implement this strategy.

2.1.3.2 Response Strategy from Processing Center (OBSERVATION)

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] The TMI staff had previously identified this potential weakness and advised that they were currently working on a solution to provide some type of cover to responders exiting the PC.

2.1.3.3 Three Mile Island Management Team (STRENGTH)

The OSRE team noted several aspects of the security programs which indicated both strong station management involvement and support and an effective operations and security management team. The overall protective strategy appeared sound and was the result of diligent and cooperative work between security and operations. On-site training was realistic with operations involvement. As discussed previously, training was further enhanced by employment of the simulator in conjunction with some security drills. The quality of the drills, interviews, and weapons demonstration were considered evidence of capable personnel and excellent leadership within the security department. Management has also shown foresight by approving modifications of and additions to security protective measures and equipment, i.e., delay-barriers and defensive positions, which were demonstrated to be effective in the drills. In a similar vein, the team was advised that additional actions and modifications to security strategy were being explored with respect to one difficult-to-protect equipment set. The actions included alarming or providing CCTV coverage of a door in order to provide earlier information of attempted intrusion into a critical area.

2.1.3.4 Contingency Response Training (STRENGTH)

The overall excellent performance of the drill participants indicated well-trained response officers. It appears that the recently intensified contingency response training conducted at TMI, focused by the critical equipment analysis, played a significant role in the security personnel's response drill performance. The mock-adversaries were well prepared and presented a realistic challenge to the response force. The future training challenge is to maintain capable response forces on each shift.

The drills were organized, well controlled, and it appeared that they were used effectively as a training tool. The scenarios normally

used by the licensee covered the full spectrum of characteristics of the design basis threat. The conduct of the drills and performance of the participating officers demonstrated the effectiveness of the training plan and the training staff. The training in response tactics included some relevant techniques developed by the training staff from training being done elsewhere within the industry and at tactical training schools. Also, the facility model used for table-top, time-line exercises was considered a valuable asset for conducting response training and in developing protective strategy and tactics.

2.2 DEADLY FORCE

The team conducted interviews with response team members concerning the use of deadly force on site. Team members used NRC Information Notice No. 89-05, "Use of Deadly Force by Guards Protecting Nuclear Power Reactors Against Radiological Sabotage," as a basis for hypothetical scenarios that were given to officers who could engage an intruder as a member of the response force or as a patrol officer. As a result of deadly force interviews, team members were satisfied that security officers would not use deadly force when unwarranted; however, they would use the appropriate amount of force necessary during situations such as those discussed in NRC Information Notice 89-05.

2.3 WEAPONS MIX AND DEPLOYMENT (STRENGTH)

The mix of duty and response weapons at Three Mile Island was considered appropriate for the site. In addition, [redacted] These weapons could be particularly effective in close engagements with little or no warning, such as might be encountered in the processing center or against adversaries with capabilities less than the design basis threat. In addition, the acquisition and upcoming transition to semi-automatic shotguns should provide improved weapons manipulation, safety, and target acquisition. It should be noted that the actual drills highlighted the importance of the internal responders having response weapons immediately available to them.

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2.4 WEAPONS TRAINING

2.4.1 Tactical Weapons Training (STRENGTH)

The licensee's tactical weapons course of fire included modern and well recognized techniques which are appropriate for the type of close engagements which could occur in a contingency involving external adversaries with capabilities attributed to the design basis threat. These included, but were not limited to, stress shooting

scenarios, moving with a loaded weapon, weapon manipulation, weapon loading and unloading under stress, shooting from various positions and barricades, one hand shooting, gas mask shooting, visually obscured environment shooting (smoke), and target discrimination.

The security officers who participated in the weapons training demonstration showed that they were familiar, skillful, and safe with the weapons. The training staff conducted range activities safely and professionally. The background of the training staff was appropriate for the mix of training required for site contingency situations. The experience and quality of the training staff was especially important since the licensee's compact outdoor range facility limits their ability to simulate the ranges and variety of conditions likely to be encountered on-site as demonstrated in the drills during the OSRE. The training staff showed skill and imagination in modifying the compact range to provide safe, live-fire courses which simulated a variety of site conditions.
(In a related matter, see paragraph 2.4.2.)

2.4.2 Weapons Training for Site Specific Conditions (OBSERVATION)

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Firing from extended distances is significantly different from firing in a close quarters combat situation. Further, much of the simulated weapons fire from both handguns and shotguns was at moving targets. Familiarizing officers with firing from extended distances with shotguns and at moving targets could improve marksmanship under these conditions.

2.4.3 Supplemental Weapons Training (STRENGTH)

The licensee's acquisition of the Firearm Training System (F.A.T.S.) was found to be an excellent supplement to the licensee's live fire training. F.A.T.S. is a computerized interactive training system which simulates tactical situations through video projection. The video scenario presentation can be customized to simulate site specific conditions. The shooter interacts with the video by way of a laser emitting weapon which replicates a duty weapon. This system is useful in improving marksmanship at all skill levels. Additionally, the variety of video scenarios provide excellent reaction and judgement training in positively identifying a target before aiming and shooting. The "Skill Enhancer" addition to the TMI F.A.T.S. system should also prove to be a cost-effective, all-weather training aid.

THREE MILE ISLAND NUCLEAR STATION

OPERATIONAL SAFEGUARDS RESPONSE EVALUATION

PART II

SAFETY/SAFEGUARDS INTERFACE REVIEW

PART II - SAFETY/SAFEGUARDS INTERFACE REVIEW

The second purpose of the OSRE was to assure that safeguards measures do not adversely affect the safe operation of the facility. Section 10 CFR 73.55(d)(7)(ii) requires a licensee to design the access control system to accommodate the potential need for rapid ingress or egress of individuals during emergency conditions, or during situations that could lead to emergency conditions.

To verify this requirement, the team interviewed operations personnel including shift supervisor (SS), two control room operators, an auxiliary operator and the security manager, and conducted a walking tour of the safety related equipment and evacuation routes within the facility. The walking tour and discussions were to assure that both access to and egress from the protected areas (PAs) and vital areas would not hinder proper plant operations and personnel safety in an emergency situation and that security radio transmissions would not interfere with facility operations.

A. Protected Area Emergency Access

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B. Vital Area Emergency Access and Egress

Entry to vital areas is needed under some emergency operating procedures. The team concluded that adequate provisions were in place to assure that safeguards measures would not adversely affect safe operation of the facility.

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There are a limited number of vital areas. Phone equipment is conveniently located throughout the facility for requesting emergency entry to locked vital areas. Further, there are at least 11 security officers who routinely carry vital keys to assist operations personnel to enter locked vital areas. As a result of these measures, licensee operations personnel do not believe there would be any impact on safety due to security access controls.

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For personnel safety, most vital area doors have crash bar or door knobs to provide emergency egress irrespective of the access control system status.

C. Communications

Areas that contain equipment sensitive to radio frequency or electromagnetic interference have warning signs in the areas to prohibit transmitting radio signals.

No safety/safeguards communication problems were identified.