JANUARY 19, 1984

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In The Matter of	)	
	)	
METROPOLITAN EDISON COMPANY	)	Docket No. 50-289 SP
	)	(Restart)
(Three Mile Island Nuclear Station, Unit No. 1)	)	

NOTICE TO THE COMMISSION,
APPEAL BOARD, LICENSING
BOARD AND PARTIES

I enclose for the information of the Commission, Appeal Board, Licensing Board and parties a copy of a report by Licensee entitled "Lessons Learned Workshop" NAD-83-01. The report provides information on Licensee's response to a broad range of lessons learned from the TMI-2 accident, many of which have been discussed in the TMI-1 Restart Proceeding.

Respectfully submitted,

Ernest L. Blake Jr.
Ernest L. Blake, Jr., P.C.
Counsel for Licensee

cc: Attached Service List

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NUCLEAR REGULATORY COMMISSION

Before the Commission

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GPU Nuclear

NAD-83-01

Report of the

LESSONS LEARNED WORKSHOP

Sheraton Valley Forge Hotel

24-25 August 1983

Coordinated by:

Robert L. Long
Vice President, Nuclear Assurance

Ronald A. Knief
Manager, Educational Projects

Report Issued December 22, 1983

GPU Nuclear

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LESSONS LEARNED WORKSHOP

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LESSONS LEARNED WORKSHOP

INTRODUCTION

The Lessons Learned Workshop conducted on 24-25 August 1983 assembled GPU Nuclear and other personnel for the purpose of reviewing major lessons from the TMI-2 accident. The general goal of the workshop was to perform the review, summarize the results, and assign a preliminary status of response to the lessons for both the Oyster Creek and TMI-1 units. (The preliminary goals, objectives, and process for the workshop are stated in Attachment 1.)

This report serves as a reference for educating personnel who were not involved in the TMI-2 accident and related activities (especially newer employees). The workshop presentations (to all participants and Sr. Management) and subsequent review of the worksheets has also helped to focus attention on areas requiring ongoing effort and will assist in ensuring that lesson responses that have already been institutionalized (e.g., in equipment modifications, procedures, or other requirements) will not be undone or reversed without first giving specific attention to their origins.

REVIEW PROCESS

The review process was initiated at the request of GPUN President, R. C. Arnold. R. L. Long and R. A. Knief developed the preliminary scope, subject areas, bibliography, and participant recommendations for review with the Office of the President. This review, supplemented by input from other members of Sr. Management, identified the working group leaders, members, and subject areas in overall and Divisional contexts (as shown by Attachments 2 through 4). The groups were specifically empaneled to represent multi-disciplinary interests and as-wide-as-practicable perspective. The preliminary selections and assignments of topics were made, recognizing both that additions would occur and that overlaps would be likely (e.g., some assessment of training in each of the four working groups). It was also recognized that the groups might not be able to assess the status of GPUN response to all of the topics which would be discussed.

The workshop process began with notification of participants and an assignment for each to review two to three specifically selected references (Attachment 5) and to extract applicable lessons onto worksheets (Attachment 6) or in other written form. (Of the references, NUREGS 0578, 0660, 0737, 0680 were not considered explicitly in the workshop since they represent NRC requirements that have been evaluated, tracked, and inspected extensively at GPUN.) Distribution of the output from these assignments provided the starting point for the initial discussions of the working groups.

Although each group functioned independently and somewhat differently, the following elements were basically common to all:

(1) initial distribution and review of the pre-workshop assignments
(2) additional review of reference documents
(3) brainstorming sessions on each topic

(4) drafting of consolidated lessons learned statements (as opposed to quoting from every document that addressed the subject area) and developing questions to aid in assessment of response implementation
(5) preliminary assessment of status of responses to each lesson for both the Oyster Creek and TMI-1 units
(6) preparation of final summary reports and transparencies for delivery to the entire workshop population, members of Sr. Management, and guests (see Attachment 3) with approximately one hour allowed for each working group's presentation
(7) completion of final worksheets (Attachment 7) on each lesson identified by the working group

Variables among the Groups included extent of lesson consolidation (e.g., WG #3 included a number of individual items in a single statement), order of worksheet and transparency preparation (e.g., WG #1 prepared draft worksheets first and then developed final output in the form of transparencies), and use of subcommittees versus committee-of-the-whole for all or part of the evaluation process. Recognizing these differences, the Working Group leaders met together with R. L. Long and R. A. Knief during each working break to assess progress, compare preliminary results, and establish directions for general consistency in group output. (The general schedule for the Workshop is shown in Attachment 8.)

RESULTS

The overall judgement of the participants was that the workshop process identified the significant lessons from applicable documents and from their own collective experience. No lessons were identified as having been previously overlooked by GPUN.

After the lesson was identified and described and the questions to evaluate implementation were developed, a preliminary response status code was assigned according to the following definitions:

1 -- response is appropriate and implementation is satisfactory,
2 -- response is appropriate and implementation is in progress,
3 -- appropriateness of response or implementation could not be adequately assessed by the Working Group; further review is needed, and
    A -- requires prompt attention, or
    B -- can be evaluated over long term.

A summary of the initial working-group assessments of response by topic area is provided in Attachment 9. The edited worksheets which include lesson statement, evaluation questions, and status assessment are provided in the next four sections of this report.

The preliminary assessments of response status made during the Workshop were part of a continuing process to assure the effectiveness of the GPUN response to the lessons learned from the TMI-2 experience. They provide GPUN Management with a limited "snap-shot" assessment of our response to the lesson statements. Status Code 3A or 3B was used in situations where the collective experience and knowledge of the working group did not encompass the item under consideration.

The worksheets were edited for consistent format and clarity by R. A. Knief and then reviewed by the cognizant working group leaders for accuracy and completeness. Lessons identified in a memorandum by R. L. Long (Attachment 10) that were not already addressed in the workshop output were incorporated; both supplemental questions and separate lesson statements are noted by single asterisks (*) and numbers followed by "a", respectively. Supplemental questions added by R. A. Knief during the editing/review process are noted by double asterisks (**).

The "status code 3" items were assigned to responsible groups for evaluation and assessment (Attachment 11). Actual status for these items as developed through the cognizant GPUN Divisions is indicated on the applicable worksheets in terms of a new status code assignment and a statement supporting the change. The summary data shown in Table 1 reflects the changes that resulted from the reassessment. This data shows that all lessons have been addressed and that there is a 50% - 50% split been complete and ongoing actions at TMI-1 compared to 42% - 58% at Oyster Creek.

In summary, the workshop focused attention on areas of concern and concluded that they have been addressed. The process will help to assure that the lessons learned will not be forgotten.

TABLE 1

Summary of Lessons Learned Responses
Based on Initial Working-Group Assessment of Category 1 and 2 Items
and Division Reassessment of Category 3 Items

		Items in Implementation Status Category							
		1		2		3A		3B	
	Number of Items	In Place		In Progress		Review Needed (Prompt)		(Long-term)	
		TMI	OC	TMI	OC	TMI	OC	TMI	OC
Work Group #1: Operations, Maintenance, and Radiological Controls									
Generic	1			1	1				
Procedures	2	1		1	2				
Rad Con	10	8	7	2	3				
Conduct of Operations	12	5	4	7	8				
Operations Trng. Supp.	4	2	1	2	3				
Maintenance	4	1		3	4				
Chemistry	1			1	1				
Logs/Records	2	1	1	1	1				
Spare Parts	1			1	1				
Group Total	37	18	13	19	24	--	--	--	--
Work Group #2: Technical Support									
Engineering/Analysis	4*	2	2	3	3				
Plant Modifications	1			1	1				
Technical Information	3	1		2	3				
On-Demand Tech Capability	5	4	4	1	1				
Group Total	13	7	6	7	8	--	--	--	--
Work Group #3: Other Support									
Training	8*	1	1	8	8				
Organization/Management	4*	1	1	4	4				
Communications	2	1	1	1	1				
Records & Documents	1			1	1				
Group Total	15	3	3	14	14	--	--	--	--
Work Group #4: Emergency Response									
Recognition	6	5	3	1	3				
Declaration	3	3	2		1				
Communications	11	6	7	5	4				
Response Readiness	11*	8	8	4	4				
Group Total	31	22	20	10	12	--	--	--	--
OVERALL TOTAL	96								
CATEGORY TOTAL	100	50	42	50	58	--	--	--	--

* one item split into two parts with separate status ranking

WORKING GROUP #1

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: GENERIC

LESSON STATEMENT:

We should learn from experience.

[See also Lesson 2-1 (Operating Experience Review)]

QUESTIONS TO EVALUATE IMPLEMENTATION:

What mechanisms exist to capture? Promolgate? Evaluate? Apply?

Are these mechanisms understood? Utilized? Effective?

Are professional, technical, organization, vendor and other utility contacts established? Utilized?

**Is the significance of the experience identified? Communicated to appropriate personnel?

STATUS: 2

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: PROCEDURES

LESSON STATEMENT:

There is need for development and use of adequate procedures.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Does the "Owner" concept ensure continuity, retention of basis, etc. in our procedures?

Are procedure reviews coordinated at the Division/Department level?

Is the operator able to take immediate effective initial action during an emergency?

Are procedures getting too detailed?

Are technical reviews being performed on Unit operating and emergency procedures?

**Is the Technical content of procedures sound? Are the procedures adequate and workable?

**Does procedure development include appropriate reviews by Technical Functions, Operations management, and working level personnel?

STATUS: 3B

REASSESSED STATUS: 2

At TMI-1 ATOG implementation is in progress with procedures being prepared and simulator training scheduled for the first quarter of 1984. ATOG should be implemented by the end of the first quarter of 1984.

The procedure owner concept, which has been developed over the past two years at TMI-1, has contributed significantly to the upgrade of the procedure program. This concept provides a direct input to procedures for users at the working level. Those who actually use the procedures, especially licensed operators, feel that significant progress has been made in making the procedures accurate, concise, technically correct and most importantly, usable and practical.

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

REASSESSED STATUS (Continued):

At TMI-1 a procedure coordinator is assigned full time to ensure that appropriate reviews are conducted and that changes to procedures, as well as new procedures, are produced and issued to the field in a timely manner. The revised review process for procedure review, which was implemented in Tech. Specs. and included the elimination of the PORC, has proved to be exceptionally beneficial in establishing specific ownership and review responsibilities for all procedures. Each important-to-safety procedure must be reviewed by a responsible technical reviewer, an independent safety reviewer, as well as the department/section manager.

In addition to these reviews, other Divisions, including QA/QC and Technical Functions, are required to review specific groups of TMI-1 procedures for the plant to ensure technical adequacy. Many of our procedures have received detailed scrutiny by the NRC and INPO as well as other outside agencies. For the most part, they had determined that our procedures are complete, accurate and workable in the field. In addition to the many checks and balances to ensure that new procedures and major procedure changes are accurate and usable, these changes and/or new procedures are used at the B&W simulator during our crew training periods as another check of their accuracy and usability.

Oyster Creek continues to upgrade its procedures and enforce compliance with procedural control. There has been much improvement in the coordination of procedure reviews and revision at the department level. Plant Engineering is in the process of revising all procedures affected by the present outage modification and maintenance activities and are setting up with Technical Functions to provide for their review also.

In the past year, the emergency procedures have been rewritten into the new symptom-based EOPs and the operators have been involved in the development and final revision. Furthermore, Operations personnel are revising plant operating procedures and soliciting operator's comments in these revisions. At Oyster Creek, all procedures are reviewed by the PORC. All procedures (normal operating, surveillance and emergency) will be revised and in place prior to start-up (approximately 4/29/83).

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: PROCEDURES

LESSON STATEMENT:

There is need for procedure compliance.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Are procedure reviews being accomplished in a timely fashion?

Do procedure reviewers understand their responsibility?

Is the inter-division coordination of procedure concurrance being accomplished in accordance with procedural requirements?

Is the interpretation of corporate policy on compliance with procedures being applied consistently in all Divisions?

**Do Management and supervisory actions, as well as training, support procedure compliance?

STATUS: 3A

REASSESSED STATUS: 1 TMI-1

A need for procedural compliance and management's insistence on procedural compliance has been communicated to our people on numerous occasions and has been supported by strong management action whenever violations occur. Because of the extremely large number of procedures in the plant, occasional problems are encountered with procedural noncompliance. Whenever this is noted, it is immediately brought to senior management's attention and appropriate action, including counseling, disciplinary action if necessary or procedure revision, is taken.

Procedure revisions, although still somewhat lengthy in nature because of the large number of people/organizations who must participate in the review, are considered timely. Procedure reviewers, for the most part, understand their responsibility, although it is important that this be reemphasized to them, especially when cases of inadequate review are noted. Interdivision coordination of procedure review is taking place and is effective.

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

REASSESSED STATUS (Continued):

AP-1029, Conduct of Operations, defines procedural compliance for plant personnel in detail. It states that anyone who believes he cannot follow the procedure should go to his supervisor for guidance and direction. If the supervisor believes the procedure can be followed, he directs the individual to proceed. If the supervisor determines that the procedure cannot be followed, he is required to initiate a temporary change notice. Responsibility for procedural compliance, therefore, falls directly on our supervisor's shoulders.

The enforcement of procedural compliance is a long term action that requires continued attention of management.

REASSESSED STATUS: 2 OC

Procedure compliance is a requirement at Oyster Creek and is stated in the Conduct of Operations and Procedure Control Procedures (106 and 107, respectively). The area has received a lot of attention both from the corporate and plant management level and continues to receive Senior Management emphasis. Plant Engineering is working with Technical Functions to incorporate their review of plant procedures.

From the standpoint of procedure compliance as a lesson learned, it is being followed and continually emphasized at Oyster Creek; however, this attention needs constant enforcement in daily activities.

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: RADIOLOGICAL CONTROLS

LESSON STATEMENT:

The radiological controls must be made effective in providing the desired radiation protection standard through:

- adequate management commitment and support of a high quality program
- worker attitude that recognizes radiological controls as an integral part of the job
- worker accountability for radiological controls deficiencies

QUESTIONS TO EVALUATE IMPLEMENTATION:

Is management commited to a high quality radiation safety program? Is this commitment promulgated to supervision and the work forces?

Do workers make radiological controls part of the job?

Is adequate assessment in place to ensure program compliance?

Do training programs (radiation worker [RWT], on-the-job, and others) emphasize procedure compliance responsibilities? That radiological controls are a responsibility of every worker?

STATUS: 1

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: RADIOLOGICAL CONTROLS

LESSON STATEMENT:

A strong and independent radiological controls organization is required to support and maintain an effective radiation safety program.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Has the Radiological Controls organization been upgraded to provide necessary management and technical support?

Is the organization independent of Operations?

Does the organization have high level management support?

STATUS: 1

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: RADIOLOGICAL CONTROLS

LESSON STATEMENT:

There is need to remove from functional responsibilities of the Radiological Controls organization such operations and production duties as chemistry sampling, rad waste, and decontamination operations.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Have operations and production functions been separated from the Radiological Controls organization?

STATUS: 1

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: RADIOLOGICAL CONTROLS

LESSON STATEMENT:

Radiological procedures must be well written in order to encourage compliance. Necessary procedures must be developed.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Have procedures been upgraded to provide effective work and technical direction and to ensure procedural compliance?

Have procedures been developed for all necessary operations?

Does supervision insist on procedural compliance?

STATUS: 2

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: RADIOLOGICAL CONTROLS

LESSON STATEMENT:

Adequate training for radiation workers and radiological controls technicians must be provided.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Have radiological controls training programs for radiation workers and technicians been upgraded appropriately?

Does actual radiological controls performance in work locations reflect effectiveness of training improvements?

STATUS: 1

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: RADIOLOGICAL CONTROLS

LESSON STATEMENT:

Radiological Controls housekeeping must be good. There needs to be supervisory enforcement of good radiological housekeeping.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Are good housekeeping practices stressed by management? Enforced?

Are good housekeeping practices emphasized in training?

Are workers and their supervisors being held accountable for housekeeping?

Are programs in place to assess housekeeping performance?

STATUS: 3A OC
3B TMI-1

REASSESSED STATUS: 1 TMI-1

Major progress has been made in the past year in good housekeeping and cleanliness practices. The results of management's attention to this area are very apparent and readily visible in the plant. Almost every outside agency who has evaluated TMI-1 and almost all visitors to the plant have commented on the cleanliness and excellent housekeeping practices in the plant.

Workers and their supervisors are held accountable for the cleanliness of their work space, and programs such as off-shift tour monitoring are in place to assess housekeeping performance.

There is always room for improvement in housekeeping and cleanliness standards, and we are and will continue to strive for improvement.

REASSESSED STATUS: 2 OC

Considerable emphasis in the area of Radiological Controls housekeeping at Oyster Creek is being maintained with very satisfactory results. Management strongly stresses good housekeeping practices and recent audits by INPO, NRC, and visitors support our efforts. Weekly housekeeping reports, management follow-up of deficiencies, off-shift tours and the newly formed Radiological Awareness Committee all lend support to stressing good housekeeping at all worker levels of Oyster Creek.

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: RADIOLOGICAL CONTROLS

LESSON STATEMENT:

The dosimetry program must be upgraded, specifically related to the ability to monitor adequately for the beta radiation experienced in the aftermath of the TMI-2 accident.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Has the dosimetry program been upgraded to provide effective monitoring of personnel?

Are technical and operational procedures in place to support the program?

**Is the program evaluated periodically for continued adequacy with respect to state-of-the-art equipment, knowledge, and practices?

STATUS: 1

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: RADIOLOGICAL CONTROLS

LESSON STATEMENT:

The technical quality and content of Rad Con records must be adequate (i.e., dosimetry, surveillance and calibration records). Records must be retrievable.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Are appropriate procedures and practices in place to ensure that adequate records are maintained?

Are records of such quality to support future reference?

Are assessment practices in place to evaluate record quality?

Does training include emphasis on the need for high quality records?

Has the awareness/sensitivity of Rad Con personnel been increased relative to high quality records?

STATUS: 2

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: RADIOLOGICAL CONTROLS

LESSON STATEMENT:

The radiation protection program must include adequate emphasis on reduction of personnel exposures in accordance with ALARA principles.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Has the ALARA concept been incorporated into GPUN policy statements and procedures?

Is ALARA training performed?

Are administrative procedures in place to implement ALARA practices?

**Does management demonstrate support for ALARA?

STATUS: 1

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: RADIOLOGICAL CONTROLS

LESSON STATEMENT:

Improvements are required in the radiological instrumentation calibration program.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Has a comprehensive radiological instrumentation calibration program been established? Is it effective?

Do calibration procedures exist?

Are instruments being accurately calibrated?

STATUS: 1

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: CONDUCT OF OPERATIONS

LESSON STATEMENT:

There is need to recognize, review, and evaluate the impact on continued operation of the aggregate of the off-standard normal conditions.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Is plant equipment status reviewed regularly and problem areas prioritized?

Are shift supervisors looking at the "big picture" when considering many small problems? How?

**How is Operations management appraised of these impacts?

STATUS: 2

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: CONDUCT OF OPERATIONS

LESSON STATEMENT:

There is need for additional qualified personnel on shift, particularly during off normal conditions.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Based on the analysis of the TMI-2 accident and scenarios of other off-normal conditions, can all required and followup actions be performed in a timely manner?

**What plans are in place to assure that manning levels are maintained?

STATUS: 1

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: CONDUCT OF OPERATIONS

LESSON STATEMENT:

A mechanism is needed to make people aware of procedure changes prior to their operating plant equipment.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Does shift turnover include discussion of recent procedure changes?

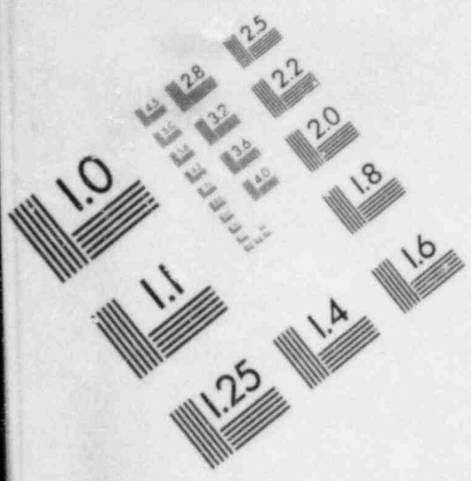
Is a system in place to ensure notification of all operations and training personnel of procedure changes? Is the use of the system documented and traceable?

**How are procedure changes screened to assure that their significance is evident to operating personnel? How is it determined which personnel are affected? What method is used to communicate with them?

STATUS: 2 TMI-1
3B OC

REASSESSED STATUS: 2 OC

The Operations Control Manager will be reviewing all operating procedure changes to identify those requiring operator review. These will then be put on a required reading list.



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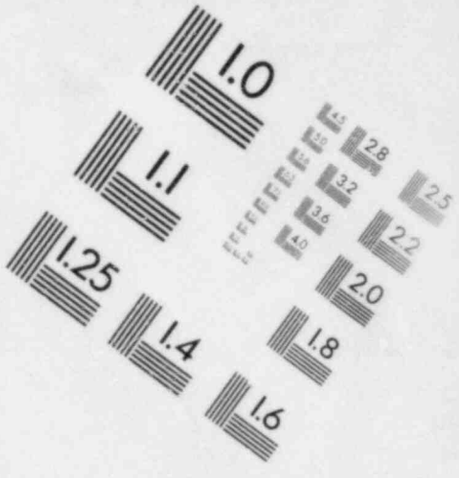

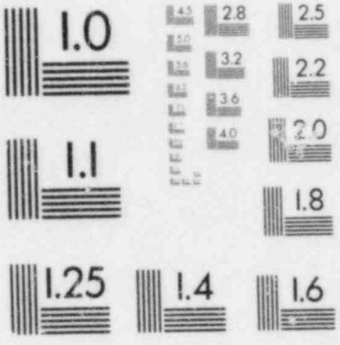

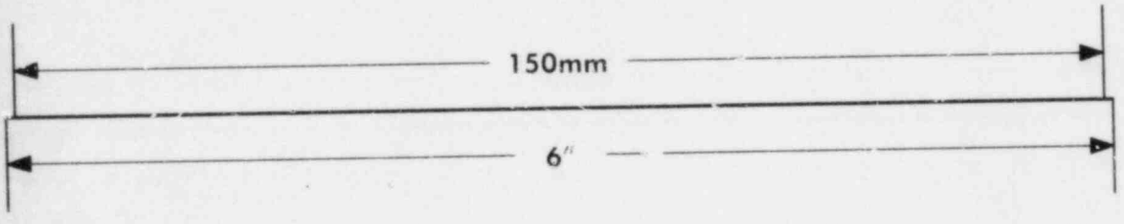

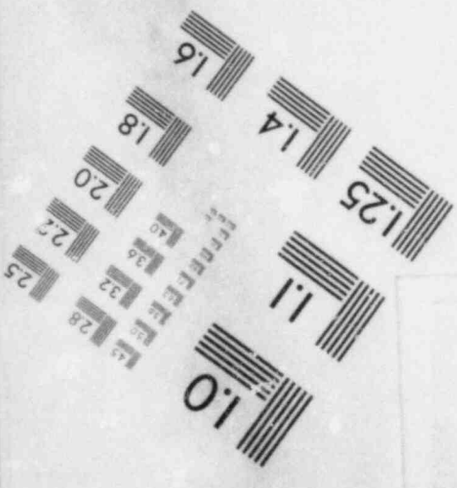

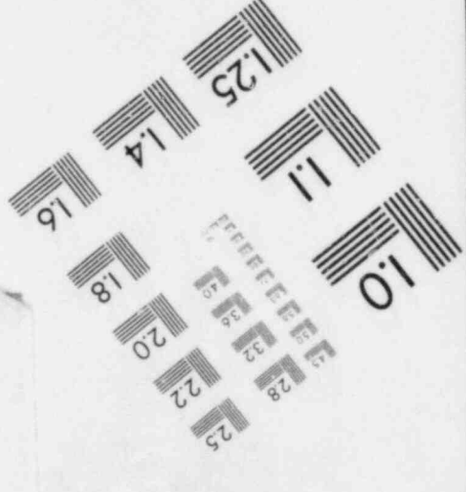

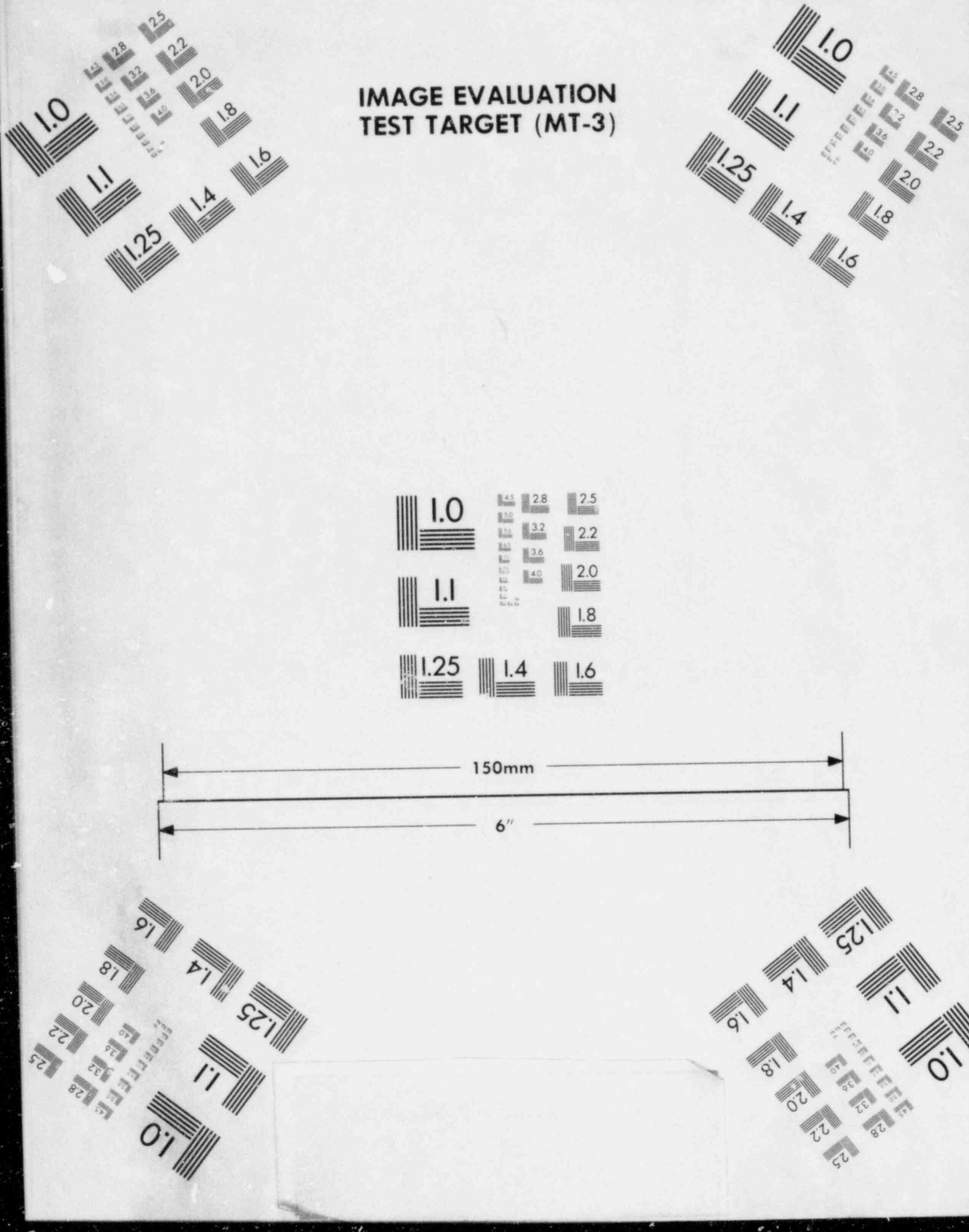
IMAGE EVALUATION
TEST TARGET (MT-3)
1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6
6.3
7.1
8.0
9.0
10
11
12
13
14
150mm
6"

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: CONDUCT OF OPERATIONS

LESSON STATEMENT:

It is necessary to ensure clear understanding of technical specifications with regard to time limits and actions required. Ambiquities must be communicated to management.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Are technical specifications taught in licensed operator training?

Are there guidelines given to the licensed operator to inform management if a limiting condition of operation (LCO) or safety limit is exceeded?

**Are technical specifications exercised in plant drills and at the simulator?

**Are examples of technical specification violations included in training?

**How are personnel other than licensed operators and those who regularly attend shift-cycle requalification programs trained on the technical specifications?

STATUS: 1

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: CONDUCT OF OPERATIONS

LESSON STATEMENT:

If out-of-specification readings or alarms exist on control panels, corrective action must be taken. If the condition cannot be cleared, the component should be identified as inoperative.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Do continuous alarm conditions exist where the associated component has not been declared inoperative?

Are all alarm and off-normal indications followed up and dispositioned?

Do we operate with a clear alarm panel?

How are off-normal indications identified and followed-up?

How are inoperative indicators and alarms identified? Is the inoperative condition evaluated as to its effect on the system? By whom?

**What guidelines exist on continued operations with indicators or alarms?

STATUS: 2

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: CONDUCT OF OPERATIONS

LESSON STATEMENT:

Status of plant equipment and systems must be clearly identified and known by all on-shift personnel.

QUESTIONS TO EVALUATE IMPLEMENTATION:

How often is the status of safety system equipment verified?

Is a formal shift turnover conducted? Documented?

How is the operator made aware of equipment that is taken out-of-service for maintenance?

How is plant status displayed for the operating staff? Communicated to management?

STATUS: 1

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: CONDUCT OF OPERATIONS

LESSON STATEMENT:

More positive control and coordination of plant evolutions is needed in conjunction with better communications among the on-shift staff.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Is the plant staff cognizant of all plant evolutions? How is this ensured?

How is plant status displayed for the operating staff?

Are prejob briefings conducted?

What records are kept that reflect the plant evolutions that have been performed? Are these records used in shift turn over?

*Does the Shift Supervisor clearly communicate the areas of responsibility of each licensed operator during a particular shift (e.g., is a special effort made to explain the responsibilities of a substitute shift member)?

*Do crew members feel their responsibility to ask questions about the actions of the various team members during a transient?

STATUS: 2

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: CONDUCT OF OPERATIONS

LESSON STATEMENT:

Roles, responsibilities, and accountabilities must be clearly identified for all levels within the organization. The organization's role should be singularly the operation and maintenance of all nuclear facilities.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Do job descriptions and accountabilities exist for all operative positions?

Are all operating personnel properly trained to provide them with the skills necessary to accomplish their accountabilities?

Are all personnel held accountable for their actions?

Do personnel evaluations place emphasis on performace relative to job descriptions?

STATUS: 2

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: CONDUCT OF OPERATIONS

LESSON STATEMENT:

Where controls are required in operation, all personnel must adhere to the controls. If controls are looked on as meaningless, this must be resolved with upper management. In the interim, controls must be utilized and any violation treated accordingly.

Management should tour the plant with the intent of developing a closer relationship with the operating staff and of understanding day-to-day functions and attitudes toward controls.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Does guidance exist?

Is the guidance distributed to all operations personnel?

Does management review and act on violations?

Is the frequency of infractions acceptable? How does this compare to available industry averages?

**How is it assured that management tours are conducted and their results documented? What follow-up is done?

STATUS: 2

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: CONDUCT OF OPERATIONS

LESSON STATEMENT:

It is necessary to provide adequate staff to prevent personnel burnout or exhaustion.

QUESTIONS TO EVALUATE IMPLEMENTATION:

How are we assessing burnout or exhaustion effects?

What career paths are available to personnel?

How long do staff vacancies exist?

What shift cycle is used at the facility?

Is turnover high? If so, why?

**Is staffing adequate at present? With approved manning and budget plans?

STATUS: 3A OC
3B TMI-1

REASSESSED STATUS: 2

Within the GPU Nuclear Corporation issues involving personnel burnout or exhaustion are addressed by each Division, with assistance from Human Resources personnel. When signs of burnout/exhaustion become apparent (i.e., through employee behavioral changes, absenteeism increase, lower work performance and/or physical ailments) employees normally discuss the matter with supervision, or vice versa, and actions are taken jointly to attempt resolution. In addition, the Company has adopted the NRC policy statement on "factors causing fatigue of operating personnel at nuclear reactors" (Regulatory Guide 1.33 and NUREG-0377).

Upon the implementation of the six (6) shift operation at Oyster Creek (targeted for 1984), it is believed that adequate staff will be provided at all nuclear sites to reduce possible personnel burnout or exhaustion. In 1981, 1982 and to date in 1983, GPUN's turnover rate has been below the 1% monthly average reported by the Bureau of National Affairs for companies of comparable size.

REASSESSED STATUS (Continued):

Career pathing is a 1984 approved Human Resources' objective and a Company working committee has been created to develop recommendations and address the career path issue. Some of our people have already been provided new career opportunities and advancement within the Company outside the plant operations field. For example, during the past year, two TMI-1 shiftsupervisors have been promoted to new positions not requiring shift work and one reactor operator has been transferred to QA/QC. Two QC and one TMI-1 shift supervisors and two TMI-1 reactor operators have been assigned to the site Training Departments.

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: CONDUCT OF OPERATIONS

LESSON STATEMENT:

Deviation from prescribed responses in normal and emergency situations must be at the direction of the responsible supervisor.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Does training instill and reinforce this mode of operation?

Are all personnel aware of this requirement?

Do supervisors understand this responsibility?

Does the analysis of procedural deviation indicate supervision was aware of the intent before the act? Are such deviations routinely reviewed?

Are supervisors being required to make such decisions?

STATUS: 1

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: CONDUCT OF OPERATIONS

LESSON STATEMENT:

Operations personnel should focus on operation of the plant. Engineering and Maintenance groups should focus on support of operations. Operations personnel should not have collateral or conflicting duties of nonoperational nature.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Is there a regular review of licensed and non-licensed operator duties to ensure that there is no interference with safe plant operation?

What is the ancillary work load of the line operating staff? Is this work load interfering with the performance of operation-related activities?

**Do engineering and maintenance personnel recognize and accept their roles in support of operations?

STATUS: 1 TMI-1
2 O.C.

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: OPERATIONS TRAINING/SUPPORT

LESSON STATEMENT:

There is need to improve simulator training.

[See also Lesson 3-4 (Simulator Training)]

QUESTIONS TO EVALUATE IMPLEMENTATION:

Do operators attend regular simulator training?

Are operators required to demonstrate satisfactory performance at the simulator in dealing with both routine and transient/emergency conditions?

Is the simulator plant specific enough?

**Is the off-site simulator training designed to meet the needs of our operators as identified by cognizant Unit Operations, Training and Tech Functions personnel?

**Are the non-plant specific simulators accurate models of the systems they do represent? Are these models similar enough to our plants to provide meaningful training?

STATUS: 1

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: OPERATORS TRAINING/SUPPORT

LESSON STATEMENT:

Training for licensed operators must be strengthed.

[See also Lessons 2-1 (Technical Review), 3-3 and 3-6 (Operator Training and Retraining)]

QUESTIONS TO EVALUATE IMPLEMENTATION:

Are operators and engineers trained in diagnostic ability?

Is training on-going and comprehensive after licensing?

Is licensee-event report (LER) training included in licensed-operator training?

Do supervisors receive at least as much training as their operators?

Do operators have training in heat transfer and fluid flow?

Is attendance at training sessions satisfactory?

*Can we verify that operators understand the principles of plant behavior and are able to focus on important fundamental questions during a transient?

*Have we emphasized the process of analyzing a transient and made certain that the operators do not focus on a specific transient and the response thereto?

**Does the content of the operator training curricula correspond closely to the industry guideline promulgated by the Institute of Nuclear Power Operations (INPO)?

STATUS: 1 TMI-1
2 OC

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: OPERATIONS TRAINING/SUPPORT

LESSON STATEMENT:

There is need for accredited operator training institutions.+

QUESTIONS TO EVALUATE IMPLEMENTATION:

Is operator training provided by qualified instructors? What is the basis for qualification?

What is the status of accreditation of our operator and other training programs?

STATUS: 3B

+The recommendation as developed by the Kemeny Commission called for national, or at least regional, "academies" to train all operators in non-plant-specific subjects. The industry in rejecting this approach has chosen instead to accredit plant training programs through the Institute of Nuclear Power Operations (INPO).

REASSESSED STATUS: 2

Operator training is provided by instructors technically qualified through the NRC licensing/certification process. Consistent with current NRC requirements, SRO-level qualification is required for those who teach specified knowledges and skills.

Basic and advanced instructor development training is provided to qualify the instructors in teaching and training program development areas.

GPU Nuclear has applied for INPO accreditation for Oyster Creek and TMI-1 licensed and non-licensed operator, shift technical advisor, and radiological controls technician training programs. Self-evaluation reports are being generated with accreditation visits anticipated during 1984. The process will provide an independent assessment of instructor qualification and of training program process and content.

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: OPERATIONS TRAINING/SUPPORT

LESSON STATEMENT:

Non-licensed operator training needs improvement.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Do non-licensed operators have a regular training program?

Do non-licensed operators have a requalification program?

Are attendance and performance at training satisfactory?

**Is the initial training program for non-licensed operators based on input from Operations, Training and Technical Functions? Does it correspond in general to INPO guidelines?

**Is the requalification training program for non-licensed operators fully implemented? Does it correspond in general to INPO guidelines?

STATUS: 3A O.C.
2 TMI-1

REASSESSMENT STATUS: 2 O.C.

Oyster Creek non-licensed operators are currently enrolled in a cyclic requalification program that is designed to provide refresher and upgrade training intended to assure a common level of qualification. When this program is completed, the training is to revert to more traditional requalification training.

A new mode-of-progression training program for replacement non-licensed operators has been developed and materials prepared, with implementation awaiting bargaining unit approval. An interim 220-hour classroom program is ready for implementation pending candidate recruitment.

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: MAINTENANCE PRACTICES/PROCEDURES

LESSON STATEMENT:

Procedures are needed to control maintenance activities.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Are procedures in place to control maintenance activities?

Do maintenance personnel understand the procedural controls governing maintenance activities?

How do we control a maintenance activity with regard to the need for a specific procedure?

How many outstanding quality deficiency reports (QDR) exist related to lack of maintenance procedural control? Is the trend toward increasing or decreasing numbers?

Are all maintenance job orders being completed in accordance with the control procedure which takes into account the determination of procedural requirements and post-maintenance testing?

STATUS: 3B OC
2 TMI-1

REASSESSED STATUS: 2 OC

Procedures do exist at Oyster Creek (OC) for the control of maintenance activities. The M&C Work Management System and OC Plant Procedures such as 105, 113, 116, etc., provide for effective control of maintenance activities. The Work Management System requires input from the Plant at several points in the work package preparation process, ensuring that the Plant exercises control of maintenance activities performed by the Maintenance & Construction Division. Plant procedures govern operational preventative maintenance, surveillances, and calibration.

The need for specific procedures to accomplish maintenance work is addressed in Procedure 105 and is identified during the initiation, approval, and planning process.

Training in procedural controls governing maintenance activities will be accomplished during 1984 for both supervisory and craft personnel. It will incorporate deficiencies identified in this area from Quality Deficiency Reports and exceptions noted from Plant Materiel and Maintenance and Construction Technical Support groups resulting from completion reviews and turnover of work closeout documentation.

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: MAINTENANCE PRACTICES/PROCEDURES

LESSON STATEMENT:

There is need to conduct effective and timely preventative and corrective maintenance (PM/CM) on both safety and non-safety related equipment.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Have we developed and implemented a PM program? How do we evaluate effectiveness? Do we have a PM organization with dedicated maintenance crews?

Do equipment breakdowns repeat after CM? Is the Maintenance backlog being reduced? Is plant availability and system reliability increasing?

Is the rate of equipment breakdown and need for CM assessed? Is CM decreasing as a result of effective PM?

Are PM/CM accomplishments and backlog trends recorded? Monitored?

STATUS: 2 TMI-1
3A OC

REASSESSED STATUS: 2 OC

The preventative maintenance program that exists today at OC incorporates items that are "important to safety" and/or are invoked by technical specification requirements. The preventative maintenance program is continually being refined through review of current preventative maintenance and corrective maintenance activities. No mechanism exists to measure the effectiveness of preventative maintenance other than this review, which is conducted on a case by case basis for each component as maintenance history on that component is generated and reviewed.

The Maintenance & Construction Division assigns craft personnel daily to provide for required preventative maintenance activities. The remainder of craft personnel are assigned to corrective maintenance, training, and other activities.

The maintenance backlog is being reduced and corrective maintenance for equipment breakdown appears to be decreasing, but this effort has not been quantified. Both corrective maintenance and preventative maintenance activities are recorded and monitored but backlog trending is not being accomplished. The Plant Materiel Department is trending equipment history, and will quantify and monitor the preventative maintenance backlog.

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: MAINTENANCE PRACTICES/PROCEDURES

LESSON STATEMENT:

Maintenance activities must be documented.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Do the maintenance history cards truly reflect the total maintenance performed?

Are job orders fully and accurately completed?

Is a daily maintenance activity log maintained?

Do we document all maintenance and enter it into the data base?

Can we plan jobs from the information on past maintenance history of equipment?

Are all maintenance personnel trained in the requirements for maintenance documentation?

Taken as a whole, does maintenance documentation provide an acceptable basis for assessing maintenance effectiveness?

STATUS: 3B OC
2 TMI-1

REASSESSED STATUS: 2 OC

Maintenance activities are being documented utilizing the Work Management System and the Plant Materiel equipment history cards and records. Daily maintenance activities are reviewed by Maintenance & Construction management and Plant personnel via the daily production management meeting and/or the daily activity log.

History, where applicable, is being compiled for use in establishing work requirments and will be used during equipment analyses including trend analyses by Plant Materiel. Repair of symptoms is taking place and more effort to identify root causes is required.

Training of personnel in the requirements for proper documentation and completion of maintenance work activities is scheduled to be accomplished during 1984.

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: MAINTENANCE PRACTICES/PROCEDURES

*LESSON STATEMENT:

There is need to review the impact on operations of maintenance practices. We need to be concerned about operators being put in the position of having to operate equipment which is faulty or is not properly maintained or calibrated.

*QUESTIONS TO EVALUATE IMPLEMENTATION:

Are maintenance personnel sensitive to potential impact of their activities on operations?

Do the Operators feel that they get timely response from Maintenance on their requests for repair, calibration, or maintenance of equipment?

Are we adequately tracking repetitive maintenance problems, identifying root causes, and subsequently taking appropriate corrective action? [See also Lesson 3-7 (Root Cause Evaluation)]

STATUS: 3B

REASSESSED STATUS: 1 TMI-1

Of all areas in the plant, maintenance capability has improved to the largest degree over the past three years. We are now taking on maintenance tasks on a routine and daily basis that in the past were almost always given to contractors. The recent repairs of DHV-1 and the river water pumps are typical examples of major maintenance work that is now being accomplished by our in-house maintenance personnel.

The improvement in maintenance capability has also been a direct result of improvements in the planning, scheduling and tracking of maintenance activities. The unit is also tracking repetitive maintenance problems and attempting to identify root causes and appropriate corrective actions. The scope and activities of the preventative maintenance group have also increased significantly, and it is considered in the long run that their efforts will reduce the amount of corrective maintenance required and the number of forced outages.

REASSESSED STATUS (Continued):

There has been significant change by the operations staff in their level of confidence and belief that they will get timely and appropriate corrective and preventative maintenance actions from the Maintenance Department. It was at the suggestion of the Operations Department that the repair of DHV-1 was initiated. A year ago the Manager of Operations would never have requested this, as he did not at that time have the confidence that the Maintenance Department could carry out such a major evolution in a timely and appropriate manner.

REASSESSED STATUS: 2 OC

At Oyster Creek, the Maintenance & Construction Division will, in 1984, develop a rotating shift maintenance capability to afford operators the resources to address problems on an immediate basis by having personnel continuously available 7 days per week, 24 hours per day.

Training of maintenance personnel to improve their understanding and sensitivity to operators' concerns during the performance of maintenance work will be conducted during 1984.

Maintenance activities are prioritized by the Plant and approved through the Plant Materiel Department to the Maintenance & Construction Division for accomplishment. A daily communication involving the Maintenance & Construction Production Department and the Plant Operations Department to review the Plant's concerns is ongoing and will continue.

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: CHEMISTRY

LESSON STATEMENT:

Control of chemistry in plant operational and support systems is critically important to maintain proper performance, assure component longevity, and minimize radiation levels. Prolonged shutdown is no exception.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Is the responsibility for chemistry control described? Understood?

Are the chemistry facilities, instrumentation, and equipment appropriate? Adequately maintained? Calibrated?

Is the chemistry staff appropriately trained and qualified? Of adequate numbers?

Are the chemistry specifications available? Technically adequate? Cover the range of expected conditions?

Are the conrtol room operators (RO and SRO) sufficiently trained in chemistry?

Is chemistry a management priority? A worker priority?

STATUS: 2

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: LOGS/RECORDS

LESSON STATEMENT:

Logs should be reviewed to ensure that they are adequate. They must be kept neat, clean, orderly, and legible. Logs must contain sufficient detail to reconstruct events, establish plant conditions, and identify significant evolutions. They must be detailed, accurate, and represent the history of the shift.

[See also Lesson 4-11a (Emergency Recordkeeping)]

QUESTIONS TO EVALUATE IMPLEMENTATION:

Does a procedure exist which identifies criteria for log content, format, legibility, etc.?

What controls are established to ensure compliance and feedback for corrective action on questionable or out-of-compliance items?

Are logs and records reviewed from a technical viewpoint to assess or determine out-of-specification conditions or identify patterns or trends which require additional actions or management attention? Are the reviews timely?

Are personnel trained in how to prepare logs and records?

How are guidelines for log preparation enforced?

**Are personnel exercised in their log and record keeping functions during drills and simulator activities?

STATUS: 2 - Continuous supervisory and management attention is required to ensure <u>continued</u> compliance.

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: LOGS/RECORDS

LESSON STATEMENT:

Specific guidance on retention of data is needed.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Do procedures exist specifying retention criteria for logs and records?

Is the guidance given to personnel sufficient to preclude a problem in their records retention area?

Are all surveillance test records retained (whether within or beyond technical specification or other requirements)?

STATUS: 1 - However, the guidance on records retention needs to be improved (clarified).

WORKING GROUP # 1
OPERATIONS, MAINTENANCE, AND RADIOLOGICAL CONTROLS

CATEGORY: SPARE PARTS

LESSON STATEMENT:

A spare/replacement parts program is needed to assure timely availability of these items for critical equipment.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Does each plant have such a program?

Has there been a systematic review of the Unit to assess the current status of spare parts inventory?

Does a procedure exist by which spare parts are procured in conjunction with new equipment?

Is responsibility for the spare parts program defined? Understood?

Is storage and location of spares consistent with ease of location and retrieval? With preservation?

Is the program reviewed vice station and worker productivity?

STATUS: 3A

REASSESSED STATUS: 2

The Materials Management Department has established methods for the processing through procurement to warehousing those items which have been identified for addition to the spare or replacement parts inventory. Spare parts data sheets are distributed to all potential Site and Headquarters requisitioners, and procedures are in effect for the inventory and storage of spare parts. The responsibility for the spare parts program is assigned to the Plant Engineering groups. As requested, Technical Functions provides assistance and also provides the initial ordering of spare parts for the major plant modifications they design.

WORKING GROUP #2

WORKING GROUP # 2
TECHNICAL SUPPORT

CATEGORY: ENGINEERING/ANALYSIS

LESSON STATEMENT:

It is necessary to review and evaluate information pertinent to safe operation of the plant, including:

- Regulatory information and guidance
- Operating experience at other plants
- Own plant events

QUESTIONS TO EVALUATE IMPLEMENTATION:

Are present methods adequate for analyzing, evaluating, and learning from our own plant events?

Are present methods adequate for reviewing industry data?

How is this information communicated between the plant and the support groups?

Is the process for learning from industry experience effective?

*Are we capturing and reviewing for relevance all of the industry experience inputs which are available to us?

*Do we have a way of documentaing that industry experience has been considered and applicability to our plants identified?

*Are the persons charged with the responsibility for doing industry experience reviews sufficiently broad in their background to be able to get the information to the right location in GPUN for action?

*Should there be specific procedures for various groups such as Training, Quality Assurance, Plant Operations, and Plant Engineering to guide personnel through the process of an adequate industry experience review of information when it is received?

**How is the significance of the information identified and communicated to appropriate personnel? Who are these personnel? How is their understanding verified?

WORKING GROUP # 2
TECHNICAL SUPPORT

STATUS: 1

A system has been established which centralizes and tracks the review process for incoming regulatory information and guidance. Operating experience from other facilities is received from NOMIS, Notepad, INPO Good Practices, and other industry sources. Tech Functions has established a Plant Analysis Section with the responsibility to oversee the review and evaluation of this information. This review is done in conjunction with the plant staff. The respective Divisions evaluate their own plant events and initiate corrective actions. Plant Analysis reviews reportable plant events for trends.

WORKING GROUP # 2
TECHNICAL SUPPORT

CATEGORY: ENGINEERING/ANALYSIS

LESSON STATEMENT:

There is need to conduct analysis of plant conditions (normal, off-normal, and accident) and to assess the adequacy of the plant design to accommodate such events.

QUESTIONS TO EVALUATE IMPLEMENTATION:

To what extent do we have analysis of the complete spectrum of events from normal operations to accidents available for use?

Have studies recommended by TMI-2 investigation teams been completed?

Do the plant designs provide suitable long-term cooling modes?

Is maintenance performed in a manner which minimizes its effect on plant safety?

**How are the analysis results communicated to appropriate operating and other personnel?

STATUS: 2

Computer analysis has been performed of off-normal events for procedure guidelines, e.g., ATOG at TMI-1 and Emergency Operating Procedures at Oyster Creek.

The scope and application of the graded approach for quality assurance (which reflects the relative importance of different systems, components, and procedures to safety and levies different review requirements based on importance) have been expanded.

An assessment has been performed to determine the impact of maintenance on plant operations and capabilities.

Probabilistic risk assessment (PRA) has been done of O.C. and is scheduled to start for TMI-1 in 1983.

A reliability section has been created with application at both plants for modifications, procedures, and O&M activities.

Industry and NRC research in support of IDCOR is providing experimental data, improved computer codes, and engineering analysis of degraded core conditions.

WORKING GROUP # 2
TECHNICAL SUPPORT

CATEGORY: ENGINEERING/ANALYSIS

LESSON STATEMENT:

Suitable engineering control must be applied to initial plant installation and plant modification work to ensure that plant safety is not compromised.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Have modifications been started or implemented since the control procedures have been in place that were not controlled by the procedures?

Are plant modifications adequately reviewed for safety?

Are modifications made in a timely manner?

Is there adequate testing of modifications before turnover?

**Is documentation provided to allow adequate training of operations and other personnel?

STATUS: 1 (Capital Projects)
2 (O & M Projects)

Organization and procedures have been changed to control modifications.

Start-up and test (SU&T) department is included within Technical Functions.

SU&T input is required by modification procedures.

WORKING GROUP # 2
TECHNICAL SUPPORT

CATEGORY: ENGINEERING/ANALYSIS

LESSON STATEMENT:

It is necessary to conduct human factors analysis of the plant design.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Have human engineering modifications been effective as aids to plant operation?

Have operator aids been provided where required?

Does the plant computer support operations in normal and off-normal situations?

Have human factors been considered adequately in areas outside the control room?

Is a process in place to maintain high human factors standards throughout the life of the plant?

Are human factors inputs being used to upgrade plant operating, emergency, and maintenance procedures?

*Is the data in the computer readily accessible in a timely way to the operator?

*Is the data needed to analyze transient behavior available on front panels or CRT displays?

*Do the operators feel comfortable with the revised control rooms, the modified alarm displays, and the formats of the information printouts from the computer?

*During emergency-drill evaluations are we verifying that the operators have had access to the information needed to analyze the drill transients?

STATUS: 2

TMI-1 and O.C. Control Room reviews are nearly complete.

Human factors staff has been added in Tech Functions.

Human factors reviews of modifications are beiny conducted as required by procedure.

Human factors are being considered in the implementation of new symptom-based procedures.

WORKING GROUP # 2
TECHNICAL SUPPORT

CATEGORY: PLANT MODIFICATIONS

LESSON STATEMENT:

Modifications to plant systems and equipment are required to:

- Prevent or reduce probability or consequences of an accident
- Permit timely and accurate diagnosis of emergency conditions
- Permit rapid return to stable condition
- Facilitate intermediate and long-term accident recovery

QUESTIONS TO EVALUATE IMPLEMENTATION:

Have all NUREG-0737 required modifications and studies been addressed for O.C. and TMI-1? Resolved? Scheduled?

Are there other (not mandated) modifications or changes that should be made to further enhance the lesson statement? Are they required for restart?

STATUS: 3B

Most of the NUREG-0737 modifications are complete. Examples of modifications which are results of the TMI-2 accident are:

- Human factors
  - TMI-1 Control Room, Tsat alarm
  - O.C. Alarm improvement
- Core Cooling and Post Accident Monitoring
  - TMI-1 inadequate core cooling (ICC) instrumentation, high range rad monitors
  - O.C. containment H_2/O_2
- Post Accident Sampling
- RCS Vents
- Alternate electric power for long-term cooling

REASSESSED STATUS: 2

All NUREG-0737 items for both OC and TMI-1 have been addressed and scheduled. There are details for some items at both plants that have not yet been resolved, but resolution is expected to meet current schedules. Currently, there are no other modifications that should be made that have not been completed or scheduled. Nothing in this area is required for restart of either OC or TMI-1.

WORKING GROUP # 2
TECHNICAL SUPPORT

CATEGORY: TECHNICAL INFORMATION

LESSON STATEMENT:

Engineering document control must be maintained, ensuring that documents are:

- Accurate & complete
- Available to users
- Maintained up-to-date
- In usable form and quality

QUESTIONS TO EVALUATE IMPLEMENTATION:

Do Control Room operators feel that current interim drawings are usable during upset conditions? Normal operations?

Have periodic audits been conducted to ensure that the latest revisions are being used in the conduct of operations? During installation of modifications? Results of these audits?

Can control room operators readily determine the current revision of any drawing?

Is it possible to identify unincorporated changes?

Are up-to-date technical manuals available to plant operations, maintenance, and engineering?

STATUS: 2

Actions taken include:

- As-built and drawing upgrade programs ongoing at TMI-1 and O.C.
- CARIRS being implemented.
- Program established to identify and maintain critical vendor manuals.
- Print books issued for TMI-1 and O.C.
- Control room interim drawing updates being provided at TMI-1 & O.C.

WORKING GROUP # 2
TECHNICAL SUPPORT

CATEGORY: TECHNICAL INFORMATION

LESSON STATEMENT:

Training programs must be technically adequate in content and scope.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Are signature approvals (by appropriate engineering personnel) of lesson plans required? Are they present? Is the timing appropriate?

Do the qualification and requalification examinations reflect improved technical content compared to pre-accident conditions?

How frequently is existing technical content reviewed?

Do instructors obtain signature approval of lesson plan revisions prior to implementation?

Are the reviewers knowledgeable?

Is the scope and frequency of the review program adequate?

**Do the Training Departments receive timely and adequate information on modifications, analyses, and related activities?

STATUS: 2

An established program is in place for Technical Functions review of O.C. & TMI-1 training materials for licensed operators, STAs, and chemistry technicians.

Operating experience review input is made to training.

Modification control procedures provide for technical input to training.

Radiological Controls reviews Rad Tech and Radiation Worker training materials.

WORKING GROUP # 2
TECHNICAL SUPPORT

CATEGORY: TECHNICAL INFORMATION

LESSON STATEMENT:

It is necessary to provide technical input and review of plant procedures to ensure that plant systems and equipment are operated consistent with design intent and required functions during normal events and accidents.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Has improved technical input been incorporated in procedures?

Is the scope of the review program adequate?

Are the guidelines technically sound and maintained current?

Is the technical support reviewer held accountable for ensuring that procedures are consistent with design intent? Has he/she been trained to perform these functions?

Is technical review of procedure changes timely?

**Are the intent and functions of procedures made clear to their users?

STATUS: 1 TMI-1
2 O.C.

A program is in place for technical review of operating, emergency, and selected alarm-response procedures at TMI-1.

Guidelines have been developed for selected operations, emergencies, and operation and maintenance of modifications.

WORKING GROUP # 2
TECHNICAL SUPPORT

CATEGORY: ON-DEMAND TECHNICAL CAPABILITY

LESSON STATEMENT:

Qualified engineering personnel, not directly involved in the actual operation of the plant, must be available on shift to (1) monitor and evaluate plant operations and (2) assist in diagnosing and correcting upset conditions.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Does an adequate program exist for providing full-time shift technical advisor (STA) coverage?

Are the STAs qualified?

Is there an adequate number of qualified STAs to support plant operation? Are they on shift?

Are vacations, sickness, holidays, and turnover accounted for?

Have STAs demonstrated effectiveness through emergency drills?

Do STAs participate in shift turnover?

Do STAs remain proficient after qualification?

*Do the STA and Shift Supervisor understand their respective roles?

**Does the STA function contribute as envisioned to the overall effectiveness of the shifts?

STATUS: 1

Full time STA programs are in place at O.C. and TMI-1.

WORKING GROUP # 2
TECHNICAL SUPPORT

CATEGORY: ON-DEMAND TECHNICAL CAPABILITY

LESSON STATEMENT:

The corporate technical organization must be able to provide adequate support for safe operation.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Are personnel adequately trained to quickly determine root causes of transients and to identify corrective action?

Are personnel sufficiently aware of plant status, procedures, and systems to contribute effectively in time of an accident?

Does the technical staff seek out and remedy potential problems?

Is the staff size and experience adequate to provide support? Is the support timely?

STATUS: 1

Technical Functions Division has responsibility established for adequacy of design, operation, and material condition of plants.

Functional engineering areas of responsibility and staff members have been added to Technical Functions in these areas: risk assessment; reliability; plant analysis; radiological engineering; human engineering; chemical engineering; on site liaison; and engineer training program.

System and component engineers have been designated.

Radiological Controls Division has technical responsibility for radiological calculations.

WORKING GROUP # 2
TECHNICAL SUPPORT

CATEGORY: ON-DEMAND TECHNICAL CAPABILITY

LESSON STATEMENT:

There is need for a technical support organization selected, trained, and available to support plant operations personnel under emergency conditions.

[See also Lesson 4-21 (Emergency Organization)]

QUESTIONS TO EVALUATE IMPLEMENTATION:

Is the organization sufficiently knowledgeable of plant operating practices, procedures, and personnel to provide immediate support?

Are organization personnel badged at sites to provide immediate help?

Does the organization have sufficient personnel in various disciplines to adequately support all important-to-safety (ITS) actions?

Is the technical support organization sufficiently trained in plant transient analysis to provide or recommend corrective actions? *To determine root causes? [See also Lesson 3-7 (Root Cause Evaluation)]

Are emergency response teams trained in their duties and responsibilities? Are they able to respond in a timely manner? Do they provide effective support during simulated emergencies?

STATUS: 1

Emergency response teams have been established on-site and off-site.

WORKING GROUP # 2
TECHNICAL SUPPORT

CATEGORY: ON-DEMAND TECHNICAL CAPABILITY

LESSON STATEMENT:

Facilities should be provided so that users have adequate access to technical information and outside support.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Can technical libraries be easily accessed during off-hours and emergencies?

Have computer programs been verified and benchmarked?

Are communication and data links adequate and reliable?

What outside sources of information are available?

**Are the on-and off-site sources of information and support collectively adequate?

STATUS: 2

Both sites and the corporate offices have established technical libraries enhanced with a wide range of reference material available.

Computer programs and models have been prepared or procured as an analysis aid.

Data links and other means of communication have been established to allow rapid transfer of information.

Reliability problems exist with emergency plan communications systems.

WORKING GROUP # 2
TECHNICAL SUPPORT

CATEGORY: ON-DEMAND TECHNICAL CAPABILITY

LESSON STATEMENT:

It is necessary to provide industry-wide support to operating plants for accident analysis and for operating experience reporting and review.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Has INPO developed a "directory" of industry resource personnel who can assist in a great variety of areas of expertise which may be needed during an accident? Is it available and updated periodically? Has it been used as part of an emergency drill?

Does GPUN have procedures in place for interface with industry support groups? Is the range of assistance adequate?

STATUS: 3B

INPO has been created as the industry organization.

NSSS vendor support for emergencies has been established.

EPRI's NDE center has functioned in support of GPUN activities.

REASSESSED STATUS: 1

INPO has issued an Emergency Resources Manual which lists the various categories of personnel who could reasonably be expected to be available in case of an accident. (Note: This is not to be considered as a commitment by any organization.) The document is available and GPUN has recently provided the information necessary for an update. Although it has never been used by GPUN as part of an emergency drill, the INPO Voluntary Assistance Handbook contains instructions on establishing the interface. Copies of the handbook are available in the various emergency facilities throughout GPUN and the range of assistance appears to be adequate.

WORKING GROUP #3

WORKING GROUP #3
OTHER SUPPORT

CATEGORY: TRAINING

LESSON STATEMENT:

Management should be clearly committed to quality training and this commitment needs to be clearly communicated to all employees. The three participants in the training process (management, Training Department, and the students) must have clearly defined responsibilities and interfaces, and there should be congruence in their expectations of the training process. There should be a positive environment along with natural incentives which create a "desire to learn" on the student's part and a high degree of motivation to teach on the instructor's part. The training process should focus on its role in preparing an individual for the job rather than the need to "pass an exam."

QUESTIONS TO EVALUATE IMPLEMENTATION:

Does GPUN have training-related goals and objectives?

Are departments involved in establishing training needs?

Are periodic meetings held between the training and user organizations to identify training needs, determine progress, and provide feedback?

Is adequate time provided for training?

Do supervisors attend (at least some) of the training provided to their work force?

Does senior management routinely participate in manager/supervisor development training sessions?

Have adequate training facilities and equipment been provided?

Have the responsibilities and interfaces of management, the Training Department, and the students been established? Documented? Clearly communicated?

Are managers, Training Department personnel, and students fully aware of their responsibilities and interfaces?

Do supervisors take prompt, effective actions in cases of their subordinates' training-related misconduct?

WORKING GROUP #3
OTHER SUPPORT

QUESTIONS TO EVALUATE IMPLEMENTATION: (continued)

Do environmental conditions and incentives exist which reinforce the desire to learn and instruct?

Does that training process focus on job-related knowledge rather than passing a test? (Consider items such as:

- job/task analysis
- management and student participation on training content
- effectiveness evaluation of training)

*Do we have adequate recognition that training is an essential part of the job and that on-the-job training is a responsibility of each shift foreman and shift supervisor?

STATUS: 2

WORKING GROUP #3
OTHER SUPPORT

CATEGORY: TRAINING

LESSON STATEMENT:

Training should be designed as integrated programs which are based on substantial user department involvement, and which contain appropriate controls to assure that the right people are trained to accomplish the needed tasks.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Has a determination made by management as to what relevant tasks the different categories of personnel need to be trained to accomplish?

Has consideration been given in the training design process, where appropriate, to the need for:

- screening mechanisms to select appropriate students?
- plant systems knowledge appropriate to the craft or specialty?
- career progression training?
- possible academic or professional accreditation?

Are training programs designed with an appropriate formality and structure, including:

- selection of objectives and content of any initial, continuing, and retraining programs?
- selection of appropriate instructional settings (e.g., classroom, laboratory, walk-through, OJT, or self-study)?

Are subjects which, while not directly part of that personnel classification's skills, are nevertheless part of the job requirements, appropriately integrated into the training? (This especially applies to licensed and non-licensed operator, and technician training programs, and consists of training such as fire brigade, emergency preparedness, radiation worker, and respiratory protection subjects).

Are provisions made for assuring the quality of instruction and instructors? (This involves approval of training programs and lesson plans, evaluation of instructors, and an effective review process of the appropriateness and effectiveness of training, including evaluation of on-the-job, drill, and examination performances.)

Is there a formal training program for instructors?

STATUS: 2

WORKING GROUP #3
OTHER SUPPORT

CATEGORY: TRAINING

LESSON STATEMENT:

The licensed operators should have a thoroughly developed knowledge and understanding of basic theory, plant fundamentals, plant transient response, and diagnosis and decision analysis techniques for complex and unexpected situations. The need for procedure compliance should be understood. Simplistic, universal solutions to complex situations should not be taught or ingrained into the operating philosophy such that "mindsets" are developed to the detriment of nuclear safety.

[See also Lesson 1-28 (Licensed Operator Training)]

QUESTIONS TO EVALUATE IMPLEMENTION:

Have reactor operator (RO) and senior reactor operator (SRO) training programs been upgraded to an acceptable level in the following areas:

- basic theory?
- plant fundamentals?
- plant specific applications of theory?

Have RO's and SRO's been trained in effective techniques for diagnosing complex unexpected situations and effective ways of making decisions under stressful situations?

Have licensed operators been trained on the concept of symptom based emergency operating procedures and the associated emergency operating procedures?

Are the licensed operators thoroughly familiar with the need for procedural compliance and the established requirements for procedure revision, review, and approval?

Are licensed operators taught (in the classroom or on-the-job) misleading "rules of thumb," operating guidelines, etc. which could lead to inappropriate "mindsets" while operating the plant?

STATUS: 2

WORKING GROUP #3
OTHER SUPPORT

CATEGORY: TRAINING

LESSON STATEMENT:

A training simulator should be available which dynamically replicates the full spectrum of steady state, transient, and accident conditions in real time. Such a simulator should be integrated into the training process with full consideration given to its application and availability for maximum student benefit.

[See also Lesson 1-27 (Simulator Training)]

QUESTIONS TO EVALUATE IMPLEMENTATION:

Is there a simulator(s) available which does dynamically replicate the full spectrum of steady-state, transient, and accident conditions in real time?

Has the use of a simulator been fully integrated into the training process in the most effective and efficient manner?

Is sufficient simulator time made available to licensed operators?

STATUS: 2

WORKING GROUP #3
OTHER SUPPORT

CATEGORY: TRAINING

LESSON STATEMENT:

The training program for licensed operators should address the integrated team concept of shift watchstanding. The principles of shift supervisor leadership, oversight, and watchstander communications formality should be stressed.

[See also Lesson 1-21 (Conduct of Operations)]

QUESTIONS TO EVALUATE IMPLEMENTATION:

Does the training program track the team concept?

Does the training program stress the shift supervisor's role as team leader?

Does the training program include lessons on leadership techniques applicable to shift operation management?

Does the program identify communication responsibilities among shift members that support an effective command and control process?

Does the program define "formal communications" and have exercises which promote their use?

Is there direct observation and evaluation of shift operations to verify that training is effectively used in a day-to-day practice?

STATUS: 1

WORKING GROUP #3
OTHER SUPPORT

CATEGORY: TRAINING

LESSON STATEMENT:

There is need for a continuing training program for licensed operators in areas such as: refreshing existing knowledge, upgrading and expanding knowledge, applying plant and industry experience, and becoming aware of plant, technical-specification, procedure, and policy changes.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Is there a continuing training program for licensed operators?

Do mechanisms exist for identifying and tracking training requirements in the following areas:

- Refreshing existing knowledge?
- Upgrading and expanding knowledge?
- Applying plant and industry experience?
- Becoming aware of plant, technical-specification, policy, and procedure changes?

Is training in the specified areas incorporated into the continuing education program?

Do mechanisms exist to evaluate the completeness and effectiveness of the continuing training program?

Is there a mechanism to upgrade the continuing training program based upon experience?

STATUS: 2 (1 when commitments in response to RHR evaluation are satisfied).

WORKING GROUP #3
OTHER SUPPORT

CATEGORY: TRAINING

LESSON STATEMENT:

Managers, supervisors, and the professional staff should be fully familiar with the organizational structure (including its chain of command, functional responsibilities, and policies), root-cause analysis and problem solving techniques, and the plant hardware (systems) and operations.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Has the organizational structure been clearly established and documented?

Are company employees familiar with the GPUN organizational structure, its functional responsibilities, and the chain of command?

Has a root-cause analysis training program been established and implemented? Have all appropriate personnel successfully completed it?

Has a decision-analysis training program been established and implementated? Have all appropriate personnel successfully completed it?

Has a training program addressing plant hardware and operations been developed and implemented? Have all appropriate personnel successfully completed it?

STATUS: 2
3A (Root-Cause Analysis)

REASSESSED STATUS: 2 (including Root-Cause Analysis)

A training program dealing with probabilistic risk assessment (PRA) and encompassing root-cause analysis, decision analysis, risk management, and management oversight risk tree (MORT) analysis has been identified. Pickard, Lowe, & Garrick has been asked to generate a proposal by the end of 1983 for conduct of this training during the first half of 1984.

WORKING GROUP #3
OTHER SUPPORT

CATEGORY: TRAINING

LESSON STATEMENT:

Managers and supervisors should be trained in proper leadership, command and control, and human behavior skills.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Is formal training provided in understanding human behavior, motivation, leadership, communicating GPUN organizational structures, decision making, and employee-related policies?

Are all supervisors, including shift supervisors, required to attend such training?

STATUS: 2

WORKING GROUP #3
OTHER SUPPORT

CATEGORY: MANAGEMENT AND ORGANIZATIONAL EFFECTIVENESS

LESSON STATEMENT:

The organization must be structured and focused to provide adequate support for nuclear plant operation. Management attentions to organization stability, defined accountabilities, defined interfaces, and appropriate staffing levels is needed to ensure both safe and reliable plant operation, as well as the accomplishment of ancillary activities such as plant modifications and long-term planning. Additionally, the plant organization should be structured so that each management position has an appropriate span of control, i.e. not too large. This implies a pyramid in which the functional elements are logically grouped for reporting responsibilities. Staff levels must be large enough to operate the pyramid.

QUESTIONS TO EVALUATE IMPLETMENTION:

Is the span of control appropriately established in the organization?

Does each element of the organization have defined responsibilities including methods of and responsibility for interfacing with other elements of the organization?

Is the organization structured such that its focus is nuclear operations?

Are position descriptions and specifications established for all?

Is the planning and scheduling responsibility clearly defined?

Are established staffing levels appropriate and adequate?

Are key positions in the organization staffed with capable, qualified individuals? Have we achieved satisfactory stability in their area?

Is the necessary administrative support provided to the operating staff?

Does the organization provide for a project-management process where appropriate?

STATUS: 1

WORKING GROUP #3
OTHER SUPPORT

CATEGORY: ORGANIZATIONAL AND MANAGEMENT EFFECTIVENESS

LESSON STATEMENT:

Aggressive management action is essential in achieving the standards of excellence required of a nuclear power organization. For a given organizational structure, constant vigilance must be paid to assuring that the necessary levels of performance, efficiency, and morale are attained and sustained. Attention to proper personnel selection and retention policies and the application of proven management techniques and skills is essential.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Have standards of excellence been defined? Accepted? Implemented?

Is management willing to delegate that which is more properly addressed at a level below their station?

Is a complementing approach used in making assignments?

Are assignments made to different groups consistent?

Are personnel willing to accept responsibility?

Is "chain of command" observed?

Is management receptive to identified problems whether real or perceived?

Are personnel aware of the environment they work under in the broad sense?

Is career path design and implementation being effected?

Has task analysis been performed to give basis for effective performance appraisal?

Is personnel selection made with due consideration of the results of task analysis?

Are financial resources adequate to support staff levels and compensation programs?

WORKING GROUP #3
OTHER SUPPORT

QUESTIONS TO EVALUATE IMPLEMENTATION (continued):

Is overtime controlled to a level that does not affect personnel performance?

Is shift rotation and assignment being analyzed to attempt to define improvements?

Is the turnover rate acceptable?

STATUS: 2
3A (Career Path Development)

REASSESSED STATUS: 2 (including Career Path Development)

GPU Nuclear leadership has been and is dedicated to the attainment of effective and efficient management. Supervisory training programs have been in effect since 1981, and the Company is in the process of instituting the Zenger-Miller Training Program at all three (3) nuclear locations in 1984 to further enhance the managerial skills of supervisory/managerial employees. A Performance Appraisal Program was implemented in 1982, and revised in 1983, to measure adequately employee performance to pre-approved objectives and accountabilities on a "pay for performance" basis. Managers are more closely monitoring exempt employee performance.

As part of the Performance Appraisal process, individual employee plans for improvement have been developed and are being implemented. In 1984, we anticipate the formalization of an overall Manpower Planning Program, including recognition of key management employees with "high potential" for promotion.

A working committee has also been established to address the career progression issue with an anticipated proposal and recommendation to applicable management by the 4th quarter of 1984. The first meeting of the committee was held November 17, 1983 at Oyster Creek.

WORKING GROUP #3
OTHER SUPPORT

CATEGORY: ORGANIZATIONAL AND MANAGEMENT EFFECTIVENESS

LESSON STATEMENT:

Accountability for safety is shared by the entire organization. The safety review process should place the greatest emphasis on doing the job right the first time. The confirmation of safety judgements by successively higher levels of qualified reviewers should be commensurate with the importance of the safety objective. The responsibility for corrective actions must remain with the originator.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Has the accountability for safety been communicated throughout the organization? Is it understood?

Is there a well-defined safety review process? Does it have successively higher levels of qualified reviewers?

Does the safety review process provide for timely reviews?

Does the safety review process place an unnecessary burden on small segments of the organization?

Do safety reviewers maintain their safety focus when conducting reviews?

Is there a significant rejection rate by the safety reviewers of lower-tier work products?

Does IOSRG identify safety review problems not otherwise identified by the line organization?

Is the classification of safety levels consistently understood and applied?

STATUS: 2

WORKING GROUP #3
OTHER SUPPORT

CATEGORY: ORGANIZATIONAL AND MANAGEMENT EFFECTIVENESS

LESSON STATEMENT:

Management must pay particular attention to fostering public confidence in management integrity and competance. Minimum acceptable performance standards for all employees must be established, promulgated, and enforced. Management actions must be consistent with commitments and, to the extent practical, expectations. Public communications must empnasize openness and candor.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Are policies and standards documented, disseminated, and captured in "policy manuals" or equivalent?

Are discussion sessions held with employees to ensure that policies are understood and accepted?

Do employees perceive that standards are enforced fairly and uniformly, including appropriate disciplinary actions?

Are changes to established polices and standards disseminated in a timely fashion?

Are management actions consistant with policies, commitments, and previous actions?

Do management communications emphasize openness and candor?

STATUS: 2

WORKING GROUP #3
OTHER SUPPORT

CATEGORY: COMMUNICATIONS

LESSON STATEMENT:

Internal communications should be structured to allow for sufficient vertical and horizontal communications to provide adequate and timely flow of all relevant information, including down flow of management goals, standards, progress and status, issues, and positions. Information flow must allow for feedback to employees on suggestions or concerns and communication of plant problems from employees or functional groups to management.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Is a formal system in place and functioning that provides for employee input on plant problems or suggestions? Is there an appropriate feedback to the employee?

Are management's goals, standards, progress and status reports, issues statements, and positions clearly and adequately communicated to employees?

Is relevant information on plant status, conditions, maintenance, etc. exchanged on a regular and timely basis between the technical and operating staffs?

Are the technical and operating staffs satisfied with the adequacy of the information being reviewed?

Is there provision for timely interface between staffs or functional groups to discuss or resolve items of particular concern?

Is there any evidence of failure to communicate important experiences between groups?

Is there currently sufficient vertical communication to appraise operators of degraded plant conditions?

Are mechanisms or procedures in place to communicate plant problems upward to management in a timely manner?

Are formal and interpersonal personnel communications used appropriately?

STATUS: 2

WORKING GROUP #3
OTHER SUPPORT

CATEGORY: COMMUNICATIONS

LESSON STATEMENT:

A cohesive, long-term Public Affairs/Public Information Program (PAIP) should be implemented to take into account the specific and varied needs of the audiences to be addressed, including the news media, general public, educators, and public officials. Such a program should be structured to ensure and maintain company credibility and, at the same time, recognize the legitimate concerns of the audience.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Do the company's current communication efforts include any qualitative surveys to determine their effectiveness in dealing with community questions and concerns and the public's ability to understand?

Are structured plans in place for the continuing education or re-education of the news media (e.g., through special seminars, etc.)?

Do current company policies address the need for total openness and candor?

Have programs been developed for sc. ols and educators that accurately reflect the TMI accident and its aftermath?

Does the company have necessary controls in place to allow for speaking with a single voice?

Are all GPU System public information and communications personnel adequately informed of GPUNC statements, positions, etc. to maintain consistency?

Do the tools exist and are they in place to assure GPU System-wide non-emergency communications?

Has the company adequately communicated its response to the lessons-learned from the accident and other progress made in the cleanup?

Does the company make reactionary statements without the benefit of preparation?

Are legislative and other company public affairs contacts with elected or appointed officials adequate?

STATUS: 3B

REASSESSED STATUS: 1

The Communications Division has a comprehensive Public Affairs/Public Information Program in place. It includes the conduct of quantitative public surveys to assess its communications effort. The most recent was completed in October. Structured plans are in place and have been utilized for the continuing education and re-education of the news media. Plant tours, seminars, and formal briefings have been utilized. Present plans call for further formal training regarding emergency preparedness, radiation and waste disposal. Company policies address the need for total openness and candor. There is in place and operating a school program for students and teachers that adequately reflect the TMI accident and its aftermath. The recent visit of 160 area science teachers to the Communications Division is an example.

The "clearance" procedure for public statements provides the necessary control for information releases. GPUNC releases, statements, and responses to inquiries are rapidly provided throughout the GPU system, utilizing high-speed equipment and telephones. There are regularly scheduled meetings between the Vice Presidents, Communications, of all the system companies. Similar meetings are held on a regular basis at the manager level. In addition the GPU system information personnel are involved in the GPUNC emergency communications system. These same processes assure GPU system-wide non-emergency communications.

The program to communicate the lessons learned is ongoing and aggressive. Contact with state and local officials is extensive. And there is a significant newly adopted program for greater GPUNC Communications Division involvement in informing public officials at the Federal level.

WORKING GROUP #3
OTHER SUPPORT

CATEGORY: RECORDS/DOCUMENTATION

LESSON STATEMENT:

Documentation of plant modifications testing and maintenance should be accurate, complete, and timely. Documentation must be readily available to appropriate personnel.

[See also Lesson 2-6 (Engineering Documents)]

QUESTIONS TO EVALUATE IMPLEMENTATION:

Does delay in documentation of plant modifications create problems in operation, maintenance, or modification activities?

Do operators trust documents to use as tools in operating the plant?

Can engineering use current documentation to design modifications or analyze problems?

Can "spare parts" be purchased based on available documentation?

Can maintenance be performed based on available documentation?

Does the current state of documentation require individuals to maintain their own personal records?

STATUS: 2

WORKING GROUP #4

WORKING GROUP # 4
EMERGENCY RESPONSE

CATEGORY: RECOGNITION OF EMERGENCY

LESSON STATEMENT:

There is need for greater awareness and understanding by operators and management of the real possibility for an accident's occurrence.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Do plant operators and management have the proper amount of skepticism to believe the worst; i.e., that the plant might be in serious trouble, the control room operators might have made mistakes, or that a serious problem exists with a critical need to get to the bottom of things and correct the problem?

Do plant operators really believe an accident can occur?

**How have operators and management been made aware of the likelihood for and potential consequences of accidents?

STATUS: 1 TMI-1
3B O.C.

REASSESSED STATUS: 2 OC

With emphasis on the new symptom-based Emergency Operating Procedures, simulator training, and exposure to Industry experience, the operators and management of Oyster Creek have a greater awareness and understanding of the real possibility of an accident's occurence. All operators are aware, given plant conditions and the possible degradation of same, of the likelihood and potential consequences of accidents. The training and lesson learned resulting from the TMI-2 accident have raised the level of management and operator awareness of the potential for an accident.

During drills and exercises increased effort will be directed to demonstrate that the potential for a major radiological emergency in the BWR design is comparable to that for PWR systems.

WORKING GROUP # 4
EMERGENCY RESPONSE

CATEGORY: RECOGNITION OF EMERGENCY

LESSON STATEMENT:

There is need for understanding the capabilities and uses of plant instrumentation to diagnose abnormal plant conditions.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Do plant staff fully understand the plant and its systems?

Do plant operators know direct and indirect uses of all plant instrumentation?

Do plant operators know normal and abnormal ranges of all plant instruments?

Do plant operators know when to verify and believe an instrument? **How to obtain comparable data using alternative instruments?

STATUS: 3B

REASSESSED STATUS: 1

There is continuing improvement in operator's (SRO and RO) knowledge, both of the plant and its systems, as well as normal and abnormal ranges of instrumentation. However, these are areas where continued emphasis will always be applied. It is felt that the operator's qualification and training records demonstrate satisfactory performance in these areas.

Additionally, references to instrument ranges and acceptable limits are spelled out in Standing Orders, Plant Operating and Emergency Procedures and Operator Training lesson plans. Included in the procedures and training is the direction to use alternate instrumentation to assess conditions when a normal instrument reading is suspect and as a means to confirm readings.

WORKING GROUP # 4
EMERGENCY RESPONSE

CATEGORY: RECOGNITION OF EMERGENCY

LESSON STATEMENT:

There is need for more instrumentation and better integration of instrument output to assist operators to diagnose abnormal plant conditions.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Is there a fully functional radiation monitoring system (RMS) integrated into emergency action levels (EAL) with ranges to accommodate accident scenarios?

Is information presented to operators improved from the standpoint of clarity and trendability?

Can operators demonstrate use of the "pressure-temperature plot" and effectively respond to its implications?

STATUS: 1 TMI-1
2 O.C.

WORKING GROUP # 4
EMERGENCY RESPONSE

CATEGORY: RECOGNITION OF EMERGENCY

LESSON STATEMENT:

There is need for better definitions of initiating conditions for accidents.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Does the plant staff understand the ramifications of:

- abnormal radiation levels in various parts of the plant?
- changes in sump levels?
- temperature readings in the core? hot legs?
- activity in the coolant?

Are initiating conditions linked to symptoms and EALs?

STATUS: 1

WORKING GROUP # 4
EMERGENCY RESPONSE

CATEGORY: RECOGNITION OF EMERGENCY

LESSON STATEMENT:

There is need to teach plant staff to recognize what kinds of accidents can occur and how to diagnose and respond.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Is plant staff trained in diagnostic measures to understand abnormal conditions?

Do plant staff satisfactorily demonstrate their diagnostic capability and response during simulator training and emergency exercises?

STATUS: 1

WORKING GROUP # 4
EMERGENCY RESPONSE

CATEGORY: RECOGNITION OF EMERGENCY

LESSON STATEMENT:

There is need to teach operators to acknowledge uncertainty and include the effect of uncertainty in decision making and the diagnostic process.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Do plant operators and supervisors know how to deal with uncertainty?

Do plant operators and supervisors have the proper perspective and priorities in knowing how much attention to focus on radiation dose levels versus plant conditions?

Is appropriate consideration of uncertainties proceduralized and proper training provided to the operator?

STATUS: 2

REASSESSED STATUS (Continued):

Personnel are assigned specific responsibility for capturing records during plant emergencies. The practice of log keeping during emergencies is adequate as observed during actual emergency situations, as well as emergency drills. However, this is an area where continued improvement is required and all our people, but especially senior management such as the shift supervisors, must receive continual instruction and reminders of the importance of accurate and detailed log keeping at all times, including the need to log and record the basis and rationale behind decisions that are reached and implemented.

WORKING GROUP # 4
EMERGENCY RESPONSE

CATEGORY: COMMUNICATIONS

LESSON STATEMENT:

There is need to integrate and coordinate plans and planning processes between onsite and offsite organizations.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Are the station's plans coordinated with county and state plans?

Do we know what offsite agencies' roles are in an emergency?

Can/do we provide meaningful information for execution of their duties?

Do they understand the utility's role in handling an emergency?

Are we aware of each other's strengths and weaknesses?

Are reviews, critiques, and revisions communicated promptly and acted upon?

Do given emergency-planning terms have the same definitions for all parties?

STATUS: 1

WORKING GROUP # 4
EMERGENCY RESPONSE

CATEGORY: COMMUNICATIONS

LESSON STATEMENT:

There is need to maintain training and dialogue with state and local political, regulatory, and emergency response authorities, and the news media under normal and emergency conditions.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Do we know who the various agency and organization heads are? Do we know their function? Under normal conditions? Under emergency conditions?

Have they received any training on responding to a nuclear accident?

What would they be expected to do in an emergency?

What assistance do we provide to help them carry out their duties? Is it enough? What else have they asked for?

STATUS: 1

WORKING GROUP # 4
EMERGENCY RESPONSE

CATEGORY: COMMUNICATIONS

LESSON STATEMENT:

The utility (licensee) has the primary responsibility for providing information on plant status to all levels of government, the news media, and the general public.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Are we prepared to take the lead in providing information on plant status during an emergency?

Do we have hardware, procedures, and qualified people in place to communicate emergency information to government representatives, the media, and the public?

Are we sensitive to the public's concerns, and how they can be influenced by our communication effectiveness?

Do we wait for the NRC to coax us on release policy, or do we take initiative?

*Is there adequate recognition of the desire of the news media to be close to the plant environment for obtaining their interviews and background information?

STATUS: 1

WORKING GROUP # 4
EMERGENCY RESPONSE

CATEGORY: COMMUNICATIONS

LESSON STATEMENT:

There is need for orderly, authoritative, and timely news releases and briefings for media, at a single location by a single company source. Information must flow directly from appropriate plant staff.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Does public information staff have "mainstream" access to all company officials and operational centers?

Are effective notification procedures in place in the control room?

Can control room staff accommodate a public information duty person to write and have early releases approved there?

Is a process in place for timely approval, production, and distribution of releases to the Media Center? from a "further out" EOF especially?

Is the Media Center maintained in readiness, with designated spokesmen?

Has the system been satisfactorily demonstrated in drills and actual events?

*Are press releases properly reviewed?

*Are procedures in place to adequately brief and prepare company spokesmen for appearances before the media?

STATUS: 1

WORKING GROUP # 4
EMERGENCY RESPONSE

CATEGORY: COMMUNICATIONS

LESSON STATEMENT:

There is need to be capable of providing technical perspectives in layman's terms on the significance of emergency events.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Are Company briefers certified and trained?

Are they getting experience short of real emergencies?

Are directors of press releases technically trained?

Is the Media Center supplied with current plant diagrams, slides, and maps?

Do Company briefers have direct access to sources of information?

*Are the spokesmen who are likely to appear in press conferences adequately trained in communicating with news media/lay audiences?

STATUS: 1

WORKING GROUP # 4
EMERGENCY RESPONSE

CATEGORY: COMMUNICATIONS

LESSON STATEMENT:

There is need for better understanding of nuclear power operations, radiation, and the realistic consequences of accidents among the general public and among school students.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Does the general public understand the basic principles of nuclear power and radiation?

Does the public understand what happened during the accident?

Do they know what can and can't happen in a nuclear plant emergency?

Are there any state, county, or utility programs which reach the public directly? Are they effective?

Are there any coordinated efforts among organizations aimed at improving public and school student understanding of nuclear power and radiation issues?

STATUS: 2

WORKING GROUP # 4
EMERGENCY RESPONSE

CATEGORY: COMMUNICATIONS

LESSON STATEMENT:

There is need to ensure that the general public is aware of the kinds of protective actions that may be advised during an emergency, and how they would be informed of such advisories.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Is the general public aware of what protective actions they might be advised to take during an emergency?

Does the public know where to go for information during an emergency?

Does the public know what the siren sound means?

Do they know that there are other possible, more likely protective actions besides evacuation?

Do they understand that the siren sound does not mean evacuate, but is only an attention-getter?

Are the reliable systems in place to ensure that the public is informed during an emergency?

STATUS: 1

WORKING GROUP # 4
EMERGENCY RESPONSE

CATEGORY: RESPONSE READINESS

LESSON STATEMENT:

There is a need to develop a keener appreciation by corporate and Unit personnel of the purpose and need for emergency planning and to be committed to supporting emergency preparedness programs.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Do Directors, managers, and supervisors recognize their responsibility for emergency preparedness to include ensuring that their personnel assigned to the emergency response organizations are qualified and trained?

Are emergency response training commitments being met by assigned personnel and their supervisors?

Do all Divisions include sufficient funding in budgets to support emergency preparedness commitments?

STATUS: 2

WORKING GROUP # 4
EMERGENCY RESPONSE

CATEGORY: RESPONSE READINESS

LESSON STATEMENT:

There is a need to define specific management roles and responsibilities during an emergency.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Are management roles and responsibilities specified in the emergency plan consistent with the overall concept of operations?

Are the interfaces and the specific roles and responsibiities of the various functional organizations clearly established and consistent with the concept of operations?

Are these provisions demonstrated in drills and exercises?

*Is there an appropriate organizational structure preplanned and predesignated to manage a nuclear plant incident?

STATUS: 1

WORKING GROUP # 4
EMERGENCY RESPONSE

CATEGORY: RESPONSE READINESS

LESSON STATEMENT:

There is a need to establish an organization, staffed by qualified personnel, which is specifically designed to be mobilized in a timely manner and provide a sustaining response in an emergency.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Has an emergency response organization been established?

Is it staffed with personnel qualified to perform in their assigned roles?

Does the organizational structure provide the required skills?

Does it provide a capability for sustained operations at appropriate manning levels?

Is the mechanism in place to effect timely mobilization?

STATUS: 1

WORKING GROUP #4
EMERGENCY RESPONSE

CATEGORY: RESPONSE READINESS

LESSON STATEMENT:

There is need to develop procedures for receiving and integrating outside resources into the emergency response organization during an emergency.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Can we obtain qualified technical support personnel in a timely manner from corporate or outside organizations such as Technical Functions, reactor manufacturers, architect/engineers, and other service organizations?

Do we have procedures for acquiring and for integrating these resources into the emergency response organization?

Is communication to support personnel and data links adequate for an emergency? Is access available to diagnostic technical information and plant data?

Are these observed in exercises, drills, training, or actual events?

*Are community emergency personnel from offsite adequately training to respond to potential plant incidents?

STATUS: 1

WORKING GROUP # 4
EMERGENCY RESPONSE

CATEGORY: RESPONSE READINESS

LESSON STATEMENT:

Facilities must be established which are specifically designed and equipped to facilitate communications, accident assessment, direction of corrective actions, and overall response coordination and management.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Does the communication system facilitate the exchange of information between functional centers in both on and offsite emergency facilities?

Are emergency response facilities (ERF) fully equipped with status boards, charts, maps, computer terminals, tables, chairs, and expendables to function effectively?

Are ERFs adequately equipped to meet personnel radiological protection needs?

Are procedures in existence and being followed that will ensure the readiness of ERFs when required?

Are the facilities in functional compliance with the guidelines?

STATUS: 2

WORKING GROUP # 4
EMERGENCY RESPONSE

CATEGORY: RESPONSE READINESS

LESSON STATEMENT:

There is need to establish a common basis for arriving at protective action recommendations which is understood by the technical agencies concerned.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Is adequate guidance and training provided to the ED and ESD to facilitate development of appropriate protective action recommendations (PAR)?

Is there a common basis for developing PARs which is understood by the personnel and agencies involved?

Do ED and ESD personnel understand their responsibility with respect to the development of PARs?

Is adequate guidance provided to the ED and ESD concerning communication of PARs to offsite agencies?

Has it been demonstrated satisfactorily in drills and exercises?

STATUS: 1

WORKING GROUP # 4
EMERGENCY RESPONSE

CATEGORY: RESPONSE READINESS

LESSON STATEMENT:

There is need to develop a dose assessment methodology which is understood by the technical agencies concerned and which provides realistic dose projection in a timely manner.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Are hardware, software, and trained personnel in place to provide timely offsite dose projections for emergency action level (EAL) determination and protective action recommendations(PAR)?

Are real-time meteorology and source-term (instrument) data available to support dose calculations?

Have protective action levels been determined? Have plant conditions and uncertainties in plant conditions been considered? Are the levels understood by appropriate decision makers?

Are procedures, hardware, and trained personnel available to obtain post-accident reactor coolant and effluent samples?

Are "default" source terms (i.e., those used when specific information is unavailable) for dose assessment calculations as realistic as possible in light of knowledge gained from TMI-2 accident?

Are these items assessed in exercises, drills, training, or actual events?

Are communication links available for all appropriate real-time information?

Are provisions in place to obtain accurate historical records that would be suitable for defense in future litigation with individual workers?

Do our algorithms for dose calculations consider plant systems? Are personnel performing dose calculations trained to understand the influence of plant systems?

STATUS: 2

WORKING GROUP # 4
EMERGENCY RESPONSE

CATEGORY: RESPONSE READINESS

LESSON STATEMENT:

There is need to develop a radiological monitoring capability to assess actual environmental impact and verify dose projections.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Has a program been established for real time radiation monitoring in the environs?

Are adequate instrumentation, trained personnel, and transportation available to perform whole body and iodine (in the presence of noble gases) measurements?

Are provisions in place to obtain accurate historical records that would be suitable for defense in future litigation with individual workers?

Is communication available to transmit offsite information to a central location?

Are these items demonstrated in exercises, drills, training, or actual events?

*Are field survey teams adequately trained and provided with necessary equipment to determine the radiation releases from the plant?

*Are the radio communications and other communication links needed for offsite teams adequate and properly maintained?

*Have prearrangements been made for the use of one or more helicopters to transport field teams to make airborne radiation measurements or to move key personnel from one location to another in the event such movement is needed?

STATUS: 1

WORKING GROUP # 4
EMERGENCY RESPONSE

CATEGORY: RESPONSE READINESS

*LESSON STATEMENT:

Emergency radiological controls practices must ensure adequate supplies and proper use of emergency equipment. Adequate knowledge of rapidly changing radiation levels in the plant must be maintained.

*QUESTIONS TO EVALUATE IMPLEMENTATION:

Do we have and do we maintain emergency radiation control equipment in appropriate locations?

Do we have sufficient people trained in the use of emergency equipment?

Are the rad techs trained in proper record keeping under abnormal and rapidly changing radiation environmental conditions?

Are there designated locations for survey maps of the plant which can be used to record radiation levels during an emergency?

Status: 1

WORKING GROUP # 4
EMERGENCY RESPONSE

CATEGORY: RESPONSE READINESS

LESSON STATEMENT:

There is need to develop a comprehensive training program for emergency response personnel and organizations which includes realistic drills and exercises.

QUESTIONS TO EVALUATE IMPLEMENTATION:

Are courses designed and lesson plans developed that provide training for each position on the emergency response organization, including practical factors exercises if appropriate?

Are drill scenarios structured with sufficient "free play" to allow operators to mitigate simulated accidents?

Are personnel adequately trained in handling plant transients as well as communicating information to the agencies that need it?

Are drills consistent with operator training to provide practical applications of both the Emergency Plan and Emergency Operating Procedures?

Has the performance on drills and exercises been satisfactory?

Do drills and exercises cover the spectrum of accident scenarios and responses?

Are drills conducted at a frequency that will ensure a high level of readiness?

*Is the training provided for emergency personnel adequate?

STATUS: 1

WORKING GROUP # 4
EMERGENCY RESPONSE

CATEGORY: RESPONSE READINESS

*LESSON STATEMENT:

Security controls over plant access must be maintained during accident conditions.

*QUESTIONS TO EVALUATE IMPLEMENTATION:

Do we now understand the demands on security for providing access to transient workers and persons called to help during an emergency?

Have we thought through how we provide an abbreviated GET/RWT clearance for personnel to have access to the plant when they are needed?

Can security maintain accountability for personnel during an accident scenario?

STATUS: 1
3B (Abbrieviated GET/RWT clearance)

REASSESSED STATUS: 2 (including abbreviated GET/RWT clearance)

A one-day site-specific training program has been developed at Oyster Creek for individuals who have appropriate past experience and meet certain procedural requirements. The concept can be extended to TMI if it is found to be appropriate.

Representatives of the Radiological and Environmental Controls Division and the Training and Education Department are considering the feasibility of a training program consisting of a roughly one-half-day briefing for selected qualified individuals.

ATTACHMENTS

ATTACHMENT 1

To: Vice President Nuclear Assurance/R. L. Long

From: Manager, Special Projects/R. A. Knief

Subject: Lessons Learned Workshop (Rev. 1, 7/20/83)

This memorandum summarizes the current evaluation for the Lessons Learned Workshop. Attached are a topic outline by Division and a bibliography. The goal, objectives, and process are described below.

OVERALL GOAL--Assemble GPUN personnel who are knowledgable of the TMI-2 accident and recovery activities and of the post-accident requirements for TMI-1 to review the major lessons learned for the purpose of identifying strengths and weaknesses in GPUN initial and ongoing responses so that:

1. resources, including internal review and auditing activities, may be focused on potential problem areas that are identified

2. key personnel who have not been involved in the accident and related activities (especially those who have joined GPUN recently) can gain a better understanding of the events nad responses that have and will continue to drive requirements for doing business at TMI and Oyster Creek

3. lessons already institutionalized (e.g., in equipment, procedures, and other requirements) will not be undone without first examining their original reason for being

4. confidence may exist that significant lessons learned have not been overlooked or otherwise "dropped by the wayside"

OBJECTIVES--During or following the workshop sessions participants are to:

1. identify all major lessons learned that have been reported in government, industry, company, and personal sources

2. assess the intent of each lesson learned by review of pertinent documents

3. delineate the GPUN response to each lesson learned including immediate and ongoing actions, future commitments, and means for institutionalization (e.g., through equipment, procedures, and other requirements)

4. compare each response to the corresponding lesson learned and assess areas of strength and weakness

5. prepare a consolidated list of items identified as requiring further attention and recommend priority for resolution

6. develop a method for reporting (e.g., document, briefing, seminar) the content and the results of the workshop so that Sr. Management and other key personnel will be able to benefit as much as possible from the exercise

PROCESS--The development and conduct of the workshop may consist of the following steps:

1. review of the preliminary outline and bibliography by Sr. Management

2. selection and assignment of participants

3. participant review of the outline and bibliography

4. identification of key lessons learned

5. conduct of workshop sessions emphasizing exchange of information and brainstorming of concerns; general topic areas and participants divided among several multi-disciplinary working groups:

    a. state the lesson learned and establish its intent from review of appropriate documents

    b. delineate the corresponding GPUN response (immediate, ongoing, future commitments, and institutional nature)

    c. compare the lesson learned to the response and assess strengths and weaknesses

    d. consolidate the results of each working group, summarize them, and propose prioritization for potential corrective actions

    e. develop a method for reporting content and results that:

        (1) allows for followup by other reviewers and auditors

        (2) facilitates necessary information transfer to Sr. Management and other personnel who have not participated in the entire workshop

These concepts should provide an appropriate basis for the next iteration in defining the nature and scope of the workshop. I assume that further evaluation and critique will follow soon and that a schedule and location can be established shortly.

PRELIMINARY PLAN
LESSONS LEARNED WORKSHOP

	WORKING GROUP 1 Operations, Maintenance & Rad. Con	WORKING GROUP 2 Technical Support	WORKING GROUP 3 Other Support	WORKING GROUP 4 Emergency Response
Topics	Chemistry Procedures Logs/Records Conduct of Operations Operations/Training Support Rad Con Practices Procedures Maintenance Practices/Planning Spare & Replacement Parts	Technical Support Activities - Operations - Procedures Maintenance - Modifications/Design Changes - Transient Analyses - Training - STAs Licensing/Technical Specs. Human Engineering Industry Experience Revi	Licensed Operator Training Simulator Training Non-licensed Personnel Training - Auxiliary/Equipment Operators - GET/RWT - Chem. Techs. - Rad Con Techs - Maint. Techs. QA Program Human Resources Issues - Position Spec/Desc. - Morale/Attitude Administrative Support/Organization Communications - Internal & External Records/Documentation Controls	Emergency Plan EPIPs Emergency Response Facilities Local Planning (Municipalities, Counties, State) Environmental Controls Dose Assessment External Support Planning Emergency Communications
People	*J. Bachofer M. Ross J. Sullivan T. Van Witbeck J. Hildebrand W. Zewe J. Carroll J. Frew	*G. Broughton G. Capodanno J. Chardos D. Shovlin N. Kazanas S. Levin D. Turner J. DeVine	*R. Keaten R. Whitesel J. Benish P. Christman D. Gaines O. Shalikashvili C. Tracy E. Wallace	*L. Tsaggaris T. Murphy D. Klucsik Rogan M. Roche D. Bedell R. Toole R. Fenton

* Group Leader

RLL
08/24/83

ATTACHMENT 2

ATTACHMENT 3

LESSONS LEARNED WORKSHOP
AUGUST 25-26, 1983

PARTICIPATION LIST

Work Group Participants

Oyster Creek
- J. Sullivan

TMI-1
- P. Christman
- M. Ross
- D. Shovlin
- R. Toole
- W. Zewe

TMI-2
- S. Levin
- J. DeVine

Communications
- D. Klucsik
- D. Bedell

Maintenance & Construction
- J. Frew

Nuclear Assurance
- R. Fenton
- D. Gaines
- N. Kazanas
- R. Knief
- R. Long
- R. Rogan
- O. Shalikashvili
- C. Tracy
- R. Whitesel

Radiological & Environmental Controls
- J. Hildebrand
- T. Murphy
- M. Roche
- D. Turner

Technical Functions
- T. Broughton
- G. Capodanno
- J. Carroll
- R. Keaten
- J. Chardos
- E. Wallace

Other GPU
- J. Bachofer (Met-Ed)
- J. Benish (GPUSC)

Consultants
- A. Tsagarris (S.C.E.)
- T. Van Witbeck (E.I.)

Report Session Attendees (Friday Only)
- R. Arnold
- P. Clark
- I. Finfrock
- P. Fiedler
- W. Gifford
- R. Heward
- H. Hukill
- E. Kinter
- D. Murray
- F. Manganaro
- R. Wilson
- A. Trunk (Kemeny Commission)

LESSONS LEARNED WORKSHOP
August 25-26, 1983

ELEMENTS BY DIVISION

UNITS (TMI - 1/OYSTER CREEK)

- Maintenance
- Chemistry
- Procedures
- Staffing
- Morale/Attitudes
- Logs/Records
- Conduct of Operations
- Operations/Training Support

TECH FUNCTIONS

- Modifications/Design Changes
- Shift Technical Advisors
- Licensing/Tech Specs
- Transient Analysis
- Industry Experience Review
- Operations Support
- Training Support
- Human Engineering
- Procedures

NUCLEAR ASSURANCE

- Quality Assurance
  - Program Coverage
  - Monitoring/Surveillance
- Training & Education
  - Licensed Operator Training
  - Non-Licensed Personnel Training
  - Simulator Training
- Emergency Preparedness
  - Emergency Plan
  - EPIP
  - Emergency Response Facilities
  - External Support Planning
  - Emergency Communications
- Safety Overview

RADIOLOGICAL & ENVIRONMENTAL CONTROLS

- Plant Radiological Controls Practices/Procedures
- Effluent and Environmental Controls
- Dose Assessment
- Organization and Staffing

MAINTENANCE & CONSTRUCTION

- Maintenance Practices
- Maintenance Planning

ADMINISTRATION

- Position Specifications/Descriptions
- Morale/Attitude
- Records/Documentation Control
- Spare & Replacement Parts
- Administrative Support/Organization

COMMUNICATIONS

External

Internal

Emergency

LESSONS LEARNED WORKSHOP
August 25-26, 1983

REFERENCES

NRC Notice of Violation (TMI-2 Accident)

Investigative Reports

Kemeny Commission, Main Report	October 30, 1979
Kemeny Commission, Staff Reports	October 30, 1979
Rogovin Committee, Main Report	January, 1980
Rogovin Committee, Appendices	January, 1980
Governor's Commission [Pennsylvania]	Feburary 26, 1980
U. S. Senate Subcommittee on Nuclear Regulation	June, 1980

NRC Reports (Investigative)

NUREG - 0600	August, 1979
Health Physics Appraisal	August 8, 1980

NRC Reports (Lessons Learned)

NUREG - 0585	October, 1979
NUREG - 0616	December, 1979

NRC Reports (Post TMI-2)

NUREG - 0578	July, 1979
NUREG - 0578 Clarification Letter	October 30, 1979
NUREG - 0640	December, 1979
NUREG - 0660	May, 1980
NUREG - 0660 Clarification Letter	September 5, 1980
NUREG - 0694	June, 1980
NUREG - 0731 (Draft)	September 1980
NUREG - 0737	October 31, 1981
NUREG - 0737 Supplement	January 1983
NUREG - 0855	December, 1981

NRC Reports (TMI-1 Restart)

NUREG - 680	
NUREG - 680, Supp. 1	November, 1980
NUREG - 680, Supp. 2	March, 1981
NUREG - 680, Supp. 3	

GPUN Reports

TMI Management Audit ("B & W Exhibit #843")	February 14, 1983
Review of Operating Efficiency and Management Effectiveness (Booz/Allen)	May 1978
NUS Health Physics Review	March 21, 1979
BETA Rad Con Review	November 12, 1979
Ad Hoc Committee ("Roddis")	January 1980
TMI-I Restart Review ("Keaten")	March 5, 1980
OARP Review Committee ("Uhrig")	June 1, 1980
Faegre & Benson Investigation ("Hartman")	September 17, 1980
Accident Review Task Force ("Keaten")	December 15, 1980
1982 Rad Con Investigation ("Stromberg")	Feburary 26, 1982

Other Reports

NSAC/AIF Reports	September 17, 1979

LESSONS LEARNED WORKSHOP
August 25-26, 1983

WORKSHEET

GROUP:

CATEGORY:

NUMBER

AUTHOR

LESSON LEARNED STATEMENT(S):

REFERENCE(S):

INTENT:

GPUN RESPONSE
STATEMENT:

STATUS:

ADDITIONAL PLANNED:

PROPOSED UPGRADE ACTION:

LESSONS LEARNED WORKSHOP
August 25-26, 1983

WORKSHEET

WORKING GROUP NO. ___

GENERAL CATEGORY: _____

LESSON STATEMENT:

QUESTIONS TO EVALUATE IMPLEMENTATION:

STATUS:

ATTACHMENT 8

PRELIMINARY SCHEDULE

LESSONS LEARNED WORKSHOP

Thursday, August 25, 1983

0815	Workshop Introduction
0815	Working Group Sessions
1015	Break
1030	Working Group Sessions
1130	Lunch
1300	Working Group Sessions
1500	Break
1530	Working Group Sessions
1730	Dinner
1930	Working Group Sessions
2130	Adjournment for Day

Friday, August 26, 1983

0800	Working Groups Report Preparation
1000	Break
1015	Working Group #1 Report
1115	Working Group #2 Report
1215	Lunch
1315	Working Group #3 Report
1415	Working Group #4 Report
1515	Adjournment of Workshop
1530	Meeting of Working Group Leaders w/RLL and RAK

RLL
7/15/83

Summary of Lessons Learned Response Status
Based on Working-Group Assessment

		Items in Implementation Status Category							
		1		2		3A		3B	
	Number of Items	In Place		In Progress		Review Needed (Prompt)		(Long-term)	
		TMI	OC	TMI	OC	TMI	OC	TMI	OC
Work Group #1: Operations, Maintenance, and Radiological Controls									
Generic	1			1	1				
Procedures	2					1	1	1	1
Rad Con	10	7	7	2	2		1	1	
Conduct of Operations	12	5	4	6	6		1	1	1
Operations Trng. Supp.	4	2	1	1	1		1	1	1
Maintenance	4			3			1	1	3
Chemistry	1			1	1				
Logs/Records	2	1	1	1	1				
Spare Parts	1					1	1		
Group Total	37	15	13	15	12	2	6	5	6
Work Group #2: Technical Support									
Engineering/Analysis	4*	2	2	3	3				
Plant Modifications	1							1	1
Technical Information	3	1		2	3				
On-Demand Tech Capability	5	3	3	1	1			1	1
Group Total	13	6	5	6	7	--	--	2	2
Work Group #3: Other Support									
Training	8*	1	1	7	7	1	1		
Organization/Management	4*	1	1	3	3	1	1		
Communications	2			1	1			1	1
Records & Documents	1			1	1				
Group Total	15	2	2	12	12	2	2	1	1
Work Group #4: Emergency Response									
Recognition	6	4	2	1	2			1	2
Declaration	3	3	2		1				
Communications	11	6	7	4	3			1	1
Response Readiness	11*	8	8	3	3			1	1
Group Total	31	21	19	8	9	--	--	3	4
OVERALL TOTAL	96								
CATEGORY TOTALS*	100	44	39	41	40	4	8	11	13

* one item split into two parts with separate status ranking

ATTACHMENT 10

Inter-Office Memorandum

Date August 24, 1983
NA/391

GPU Nuclear

Subject R. L. Long's Reflections on TMI Lessons Learned

To File

Location Cherry Hill

The following is a review of TMI lessons learned which has been developed primarily from my thoughts about the accident, its investigations, and the activities since. I intentionally did not look at any references to trigger ideas; rather, I have tried to identify what I believe are major areas of concern. It would seem to me that most of these, as well as others, should be identified and discussed in the two day workshop. They are not listed in any order of importance or priority.

1. Control Room Data Display and Information Access

2-4

It was very clear that the operators in the TMI-2 accident did not have ready access to some of the information which was needed to systematically analyze the plant behavior. A major human factors engineering study has been made of the TMI-1 and the Oyster Creek Control Rooms and numerous modificiations have been or are being incorporated. Some of the questions we should be asking are:

- Is the data in the computer readily accessible in a timely way to the operator?
- Is all the data needed to analyze transient behavior available on front panels or CRT displays?
- Do the operators feel comfortable with the revised control rooms, the modified alarm displays, and the formats of the information printouts from the computer?
- During emergency drill evaluations - are we verifying that the operators have had access to the information needed to analyze the drill transient?

2. Effective Communications Among Crew Members

1-21

We need to be satisfied that the crew members, including the STA, have developed the ability to communicate as a team. There also needs to be emphasis on communications with the auxiliary operators, the Operations Support and Technical Support Centers, the RAC, and the EACC. Some of the questions we should be asking are:

- Do the STA and Supervisor understand their respective roles?

- Does the Shift Supervisor clearly communicate the areas of responsibility of each licensed operator during a particular shift (for example, is a special effort made to explain the responsibilities of a substitute shift member)?

- Do crew members feel their responsibility to ask questions about the actions of the various team members during a transient?

3. Review of Maintenance Practices

1-33a There was clearly a need to review carefully the impact on operations of various maintenance practices. We need to be concerned about operators being put into a position of having to operate around faulty equipment or equipment which is not properly maintained or calibrated. Some questions to be asked include:

- Are maintenance personnel sensitive to potential impact of their activities on operations?

- Do the operators feel that they get timely response from maintenance on their requests for repair, calibration, or maintenance of equipment?

- Are we adequately tracking repetitive maintenance problems, identifying root causes and subsequently taking appropriate corrective action?

4. Security Controls During Emergency Situations

4-28a During the early days of the TMI accident there was a breakdown in normal security controls over access to the plant. Some questions to be asked include:

- Do we now understand the demands on security for providing access to transient workers and persons called to help during an emergency?

- Have we thought through how we provide an abbreviated GET/RWT clearance for personnel to have access to the plant when they are needed?

- Can security maintain accountability for personnel during an accident scenario?

5. Radiation Protection Equipment/Planning During an Emergency

There were a number of breakdowns in radiation control practices during the TMI-2 accident. In some cases there was not enough equipment of various types to meet the emergency needs. In other cases equipment was

improperly used. Because the radiation environment conditions were changing rapidly, the practices in effect were not adequate to assure a knowledge of radiation levels within the plant during the early days of the accident. Some questions which should be asked include:

4-27a

- Do we have and do we maintain emergency radiation control equipment in appropriate locations?
- Do we have sufficient people trained in the use of emergency equipment?
- Are the rad techs trained in proper record keeping under abnormal and rapidly changing radiation environmental conditions?
- Are there designated locations for survey maps of the plant which can be used to record radiation levels during an emergency?

4-27

- Are the radio communications and other communication links needed for offsite teams adequate and properly maintained?
- Have prearrangements been made for the use of one or more helicopters to transport field teams to make airborne radiation measurements or to move key personnel from one location to another in the event such movement is needed?

6. Root Cause/Evaluation of Plant Problems

3-7

Although root causes were mentioned earlier (Item No. 3), it is important that we have in place a process which identifies repetitive problems and examines specific incidents which may occur to determine whether there are underlying systematic or fundamental deficiencies. The root cause of a repetitive maintenance or the lack of knowledge or understanding leading to a particularly bad decision need to be sought out and corrected. Some questions to be asked include:

- Is there a policy established to seek out root causes of both equipment and personnel problems?
- When identified, are the root cause problems corrected?

7. Industry Experience Review

2-1

Many activities have taken place since the TMI-2 accident to improve the transfer of information throughout the industry. INPO, EPRI, and other groups now provide reviews of plant incidents. The B&W owners group uses the TAP system for looking at B&W plant incidents. Several groups within GPUN have specific assignments to do industry experience reviews. Some questions to be asked include:

- Are we capturing and reviewing for relevance all of the industry experience inputs which are available to us?

- Do we have a way of documenting that industry experience has been considered and applicability to our plants identified?

- Are the persons charged with the responsibility for doing industry experience reviews sufficiently broad in their background to be able to get the information to the right location in GPUN for action?

- Should there be specific procedures for various groups such as Training, Quality Assurance, Plant Operations, Plant Engineering, to guide personnel through the process of an adequate industry experience review of information when it is received?

8. Control of Plant Records

4-11a A serious problem during the TMI-2 event was the difficulty of obtaining and keeping intact the various plant records, such as strip charts, computer printouts, log books, log papers, field readings, telephone records, etc. Some questions to be asked include:

- Are procedures in place to assure the capturing, immediate identification, and filing of plant records?

- Are accurate time marks put on strip chart recorders and other time dependent parameter logs?

- Are computer printouts properly identified and captured as they are provided from the computer?

- Do the various personnel charged with keeping logs recognize the importance of capturing information as it occurs, recording it in a legible way, and making certain of the time entries as well as the identification of the log keeper?

- Does the practice of log keeping breakdown during emergencies or transient plant conditions?

- Are the logs kept during emergency drills reviewed for adequacy?

- Is anyone assigned responsibility for capturing records during a plant emergency?

- Can the Information Management Groups at the sites mobilize to catalog and make available for distribution to review groups the records generated during a plant transient?

9. Public Information

It is very clear from the TMI-2 accident that there are special skills needed to effectively communicate the technical information about an accident sequence in language which can be understood by the news media and the lay public. There is a general need for technically trained personnel who are sensitive to the jargon and who can explain jargon terms in simplified language. It also needs to be recognized that utility company spokesmen are not generally trusted to provide accurate information; thus, there may be a need to make use of groups such as the AIF, ANS, EPRI, and INPO to help communicate facts and analyses regarding the plant situation. Some questions to be asked include:

4-15 - Are press releases properly reviewed?

4-16 - Are the spokesmen who are likely to appear in press conferences adequately trained in communicating with news media/lay audiences?

4-14 - Is there adequate recognition of the desire of the news media to be close to the plant environment for obtaining their interviews and background information?

4-15 - Are procedures in place to adequately brief and prepare company spokesmen for appearances before the media?

10. Technical Support Personnel

It was determined during the TMI-2 event that there is a need to have the technical support personnel in their normal environment with accessibility to their reference materials, textbooks, calculators, computer terminals, etc. There is also a great need for these technical support personnel to have access to plant data. This enables them to do independent analyses of the plant behavior. There was clearly a need for persons who could communicate effectively with the plant staff regarding the problems. Some questions to be asked include:

2-12 - Are the communications and data links adequate?

2-13 - Do we have a "directory" of industry resource persons who can assist in the great variety of areas of expertise which may be needed during an accident?

4-21 - Is there an appropriate organizational structure preplanned and predesignated to manage a nuclear plant incident?

2-11 - Have technical support personnel been adequately trained in analyzing plant transient behavior to quickly determine root causes and to identify appropriate corrective actions for the plant?

11. Communications Systems

4-10 It is very clear that the communications systems should be preplanned and basically in place prior to an incident occurring. Great difficulties resulted at TMI from the lack of telephone, telecopiers, and other communication data links. Some questions to be asked include:

- Do drills verify that adequate communication equipment is available?
- Are the drills developing and improving our peoples' capabilities to communicate by telephone?
- Do the data links adequately present to technical support personnel plant data in a form which can be independently analyzed?

12. Emergency Preparedness

A major problem in the TMI-2 event was the difficulties experienced by the Operations personnel in handling the plant under the very difficult transient conditions and at the same time communicating with all of the outside agencies required by the Emergency Plan. Some questions to be asked include:

4-7 - Are personnel adequately trained in handling the plant transient as well as communicating to the outside regarding that plant transient?

4-27 - Are field survey teams adequately trained and provided with necessary equipment to determine the radiation releases from the plant?

4-23 - Are community emergency personnel <u>from offsite</u> adequately trained to respond to potential plant incidents?

13. Training

Many problems were identified in training programs which existed prior to the accident. It is clear that there is a need to focus on the basic principles of plant operation and transient analysis. It is also clear that individuals need to be trained on how to function as a team in handling a plant transient. Some questions to be asked include:

1-28 - Can we verify that operators understand the principles of plant behavior and are able to focus on important fundamental questions during a transient?

I-28 - Have we emphasized the process of analyzing a transient and made certain that the operators do not focus on a specific transient and how you respond to that particular transient?

3-1 - Do we have adequate recognition that training is an essential part of the job and that on-the-job training is a responsibility of each shift foremen and shift supervisor?

4-28 - Is the training provided for emergency personnel adequate?

These questions and problem areas have been raised, not in a comprehensive way, but with the idea of triggering discussion and concern about assuring the adequacy of our response to the TMI-2 Lessons Learned.

R. L. Long

Robert L. Long
Vice President
Nuclear Assurance

RLL:kg

cc: R. A. Knief, Manager - Educational Projects
P. R. Clark, Executive Vice President

ATTACHMENT 11

Inter-Office Memorandum

Date October 28, 1983
NA/456

GPU Nuclear

Subject LESSONS LEARNED WORKSHOP - ITEMS IDENTIFIED AS UNCERTAIN IN RESPONSE OR IMPLEMENTATION

To

	Location
P. B. Fiedler, Vice President/Director - OC	Cherry Hill Building
H. D. Hukill, Jr., Vice President/Director - TMI-1	
R. F. Wilson, Vice President - Technical Functions	
E. E. Kintner, Vice President - Administration	
W. L. Gifford, Vice President/Director - Communications	
R. W. Heward, Vice President - Radiological & Env. Controls	
F. F. Manganaro, Vice President/Director - Maint. & Constr.	
D. G. Murry, Director - Human Resources	

During the course of the Lessons Learned Workshop on August 24-25, 1983, roughly a hundred lessons from the TMI-2 accident were identified and evaluated. The majority of these were assessed by the participants to have received a satisfactory response by GPUN with either complete or satisfactory ongoing implementation. The remaining twenty-one so called "category 3" items (listed on Attachment 1) were classified as having uncertain status in terms of response and/or implementation. Such an assessment could have resulted from limitations of the workshop process or lack of specific expertise of the working group members.

The cognizant Divisions are requested to assist in closing out the workshop activity by reassessing the status of appropriate category-3 items. The following are general guidelines for the process:

(1) if the item is actually category 1 ("response is appropriate and implementation is satisfactory"), a statement supporting this conclusion should be provided

(2) if the item is actually category 2 ("response is appropriate and implementation is in progress"), a support statement should be accompanied by an implementation schedule

(3) if the item is not either category 1 or 2, provide an action plan and implementation schedule or, as a minimum, provide a schedule for developing an action plan.

Assignments are shown on Attachment 1 in terms of both lead and support responsibilities (for Oyster Creek and TMI-1 separately, as appropriate). The worksheets applicable to your Division are attached. Those in the support role are requested to provide timely input to the lead Division so that a consolidated response can be generated.

It is requested that the assignment be completed by November 14, 1983. Your timely response to this request will facilitate a meaningful wrap up of the overall workshop process.

R. L. Long
Vice President, Nuclear Assurance

RLL/RAK/kvr

Attachment

cc: R. C. Arnold, President, GPUN Corporation
P. R. Clark, Executive Vice President
R. A. Knief, Manager, Educational Projects

SUMMARY OF "CATEGORY 3" ITEMS

Item #	Subject	Lead (Support) Div. Assignment
1-2/4	Lack of adequate procedures (Are procedure ownership and review processes really working?)	OC TMI-1
1-3	Lack of procedural compliance (Are policies on "procedural compliance" understood by the procedure users?)	OC TMI-1
1-10	Radiological controls housekeeping (Does management really stress this adequately?)	OC TMI-1
1-17	Notification of procedure changes (Is a system in place?)	OC
1-24	Adequate staff to prevent burnout or exhaustion (Are effects being assessed? What is being done to correct?)	HR (OC) (TMI-1)
1-29	Accreditation of training	NA
1-30	Non-licensed operator training (What is status of OC program?)	NA
1-31	Maintenance control procedures	M&C (OC)
1-32	Conduct of preventative and corrective maintenance	M&C (OC)
1-33	Documentation of maintenance activities	M&C (OC)
1-33a	Impact of maintenance practices on operations (Do operators get timely response on maintenance problems?)	M&C (OC) (TMI-1)
1-37	Spare parts replacement program	Admin
2-5	Modifications (Has resolution of all NUREG-0737 requirements been documented?)	TF
2-13	Outside technical support (Are procedures in place? Is range of assistance adequate?)	TF

SUMMARY OF "CATEGORY 3" ITEMS

Item #	Subject	Lead (Support) Div. Assignment
3-7	Root cause training	NA
3-10	Career paths	HR
3-14	External communications for non-emergency situations	Comm
4-1	Awareness of accident possibility (Do personnel really believe an accident can occur?)	OC (NA)
4-2	Use of plant instrumentation to diognose abnormal conditions	OC TMI-1
4-11a	Capture of records during emergency conditions	OC TMI-1 (NA) (Admin)
4-28a	Abbreviated GET/RWT clearance	NA (R&EC)