November 1, 1984

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

LICENSEE'S TESTIMONY OF DR. ROBERT L. LONG AND DR. RICHARD P. COE ON THE ISSUE OF LICENSED OPERATOR TRAINING AT TMI-1

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This is the testimony of Dr. Robert L. Long and Dr. Richard P. Coe, the GPU Nuclear Corporation Vice-President of Nuclear Assurance and Director, Training & Education, respectively. It addresses the following issues:

(1) Does GPU Nuclear management, particularly within the training organization, understand and accept its responsibility for the cheating revealed in the 1981 reopened hearings?

(2) Has GPU Nuclear properly responded to the cheating that occurred, insofar as its response relates to the TMI-1 licensed operator training program?

(3) Are there appropriate individuals managing the current TMI-1 licensed operator training program?

(4) Are the current licensed operator training instructors subject to the appropriate qualification requirements and educational development?

(5) Does GPU Nuclear Corp. have appropriate goals for its TMI-1 licensed operator training program?

Our testimony represents a collaborative effort; however, Dr. Long has focused primarily on Issues (1), (2) and (3) identified above, whereas Dr. Coe's attention has been directed largely at issues (4) and (5). Attached hereto as Attachments 1 and 2 are our professional qualification statements.

I. MANAGEMENT RESPONSIBILITY FOR CHEATING (BY DR. LONG)

The investigations and reviews of training which followed the TMI-2 accident generated a large number of recommendations. These recommendations focused on numerous ways in which various review groups felt nuclear plant training programs, particularly for licensed operators, should be changed. None of these recommendations addressed the need for control of the examination process. As I began taking on training responsibilities in 1980, my attention was focused on responding to these recommendations and I, as well, overlooked the need to critically review the processes in use to prevent cheating during the examination and testing activities of the T&E Department.

ALAB-772 (footnote 48) refers to the Licensing Board's concern about my understanding of my responsibility. I do understand and accept my responsibility for the breakdown in the integrity of the operator training and testing program.

At the TMI Training Department level, a primary element in the failure to safeguard the examination process was the failure to provide full-time proctoring for written examinations. I do not believe that this failure stemmed from any disrespect by the TMI instructors for the examination process. Rather, there was a belief among the training personnel based on their experience in educational and training programs and their knowledge of the operators, that everyone recognized that one is expected to do one's own work on an examination and that cheating is not only unacceptable, but results in penalties if apprehended. A corollary of this belief was the perception at the time that the primary reason to have a proctor present during an examination was to be able to provide clarification for students for questions they might have during the examination, not to be a deterrent to cheating.

In retrospect these beliefs, which I shared, were naive and should have been challenged, particularly in light of the unprecedented requirement we and the NRC imposed that all licensed operators would have to undergo an additional complete NRC license examination to continue in their positions as licensed operators at TMI-1. Operations and training management personnel should have been monitoring closely the attitudes and concerns of each individual license holder, to ensure that we understood and addressed any fears, uncertainty or gaps in the operators' acceptance of the importance of the NRC exam and their preparations for it.

Given the personal pressures on individuals which might lead to attempts to cheat, we should have clearly articulated the guidelines for taking examinations and should have been looking for any evidence (e.g., attempts to cheat, feelings of discouragement) which would have indicated that individual license candidates were experiencing difficulties. Also, our program should have been structured to reinforce the view that tests are one's own work product. It was not. For this, I take responsibility.

Finally, I must observe that the individuals who chose to cheat also have to accept the responsibility and consequences of that choice. They could have, and should have, requested additional help from their Operations or Training supervisors or indicated in some manner that they were not ready to take the exam in question. Had they done so, I believe Operations or Training would have been responsive and, for example, would have provided the extra help needed to prepare for quizzes and examinations.

II. MANAGEMENT RESPONSE TO CHEATING

A. Overall Management Response (By Dr. Long)

In July and August 1981 the initial response to the cheating on the NRC exams was focused upon the "mechanics" of Training & Education Department examination and testing processes. Immediately after the announcement of the cheating incident and during the several months of subsequent investigations, I was directly involved with the T&E Department managers and supervisors in analyzing and developing appropriate responses to these events. On several occasions I met personally with the entire staffs of the Training Departments at both TMI and Oyster Creek. These meetings were basically question and answer/discussion sessions to clarify issues and gain acceptance for and commitment to enforcement of the very stringent examination control procedures which were being implemented. Initially, some instructors and trainees felt that the contents of the examination procedures were an over-reaction to the cheating incidents and that T&E was now unfairly assuming that everyone was a potential cheater. Through the open discussion of such concerns, we were able to persuade both instructors and trainees that we have a special obligation to adopt practices which will prevent any recurrence of cheating as well as assure individuals that they would not be unjustly accused of cheating (because the examination procedures are so tightly controlled).

Following the issuance of the Special Master's Report and the Licensing Board's 1982 decision, GPUN initiated a variety of activities, including the use of outside reviewers, to respond to the "lessons learned" from the whole sequence of events brought out by the cheating hearings. The GPUN Office of the President was actively involved in these activities and met quarterly with the Director of T&E and the T&E Managers to ensure active follow-up of identified problem areas. Through analysis and discussion, we identified a number of root cause concerns which had to be addressed. These included the need to restore and maintain credibility in the training programs and personnel management practices of the corporation. The integrity of the entire training process had to be reviewed and more formal procedures developed for test preparation, instructor evaluation, program planning, and training interfaces with all the training "user groups." Although I had recognized from the beginning of my assignment as Director of T&E that instructors can and do influence employee attitudes, additional steps were taken to stress this impact and to clearly identify the value of the training process to all employees.

A significant step in restoring and maintaining credibility in the management of training and operations has been the activity of the Vice President - TMI-1, Mr. Henry Hukill. Mr. Hukill interviews all licensed operator candidates prior to certifying them for their initial license or relicensing. At a minimum, each licensed operator is interviewed annually. The

following subjects are discussed and instructions and guidance given to the operators during these interviews:

- Importance of their duties to the safety and health of the public and their fellow employees.
- Requirement for procedural compliance.
- Importance of the NRC examination process in licensing operators.
- Duties and responsibilities of the Company and its employees as a regulated industry.
- The essentiality of honesty and integrity in all aspects of plant operation and maintenance, including training and the examinations associated therewith.
- The cheating that occurred in 1981, including possible causes therefore and the corrective measures taken.
- The requirement to openly address all nuclear safety related questions or problems with management, and if they are not satisfied with the answers thereto from management, their personal responsibility to bring them to the attention of the NRC.
- Current events, schedules, problems and incidents.
- The difference between honest mistakes and intentional/willful violation of procedures and rules. Included is a discussion of the bases for procedures, rules and regulations.

Each operator is given the opportunity during the interview to ask questions or raise issues and/or problems with the Vice President. Mr. Hukill attempts to resolve, through his Staff and Training, any issues or questions raised by the operators.

Another step in restoring and maintaining credibility in the training programs and management commitment to quality training has been the active program of both unannounced and announced visits to observe classroom delivery of training. TMI operator training is "audited" by both Training and Operations management and the Vice Presidents of Nuclear Assurance and TMI-1. These audits/visits provide management visibility and first-hand observation and evaluation of training. The results and conclusions of all audits are, for the most part, fed back to Training except for those audits of special interest where managers feel that they have seen what they came for, are satisfied with the results and believe there is no further need for communication. Other vehicles for feedback are verbal communications or written memoranda from the auditing manager to Training management summarizing their observations. Thus, GPU Nuclear management makes frequent visits to the TMI Training Center and the visits are visible to the students in the classes. The fact that management is there and that students, including operators, can have first-hand discussions with management about their training provides the students with concrete evidence of management's ongoing concern that the training activities are carried out effectively.

In August of 1982 the TMI-1 Operations and Maintenance Director initiated, during each week of requalification training, a one-hour "Management Interface" meeting which is held for operations, maintenance and technician personnel attending training. This meeting makes employees aware of programs and policies being implemented that affect their daily work patterns, and assures them that management is aware and appreciates the end result of changing policies on the worker. One of the following three people attend each of these meetings: Mr. Hukill, Vice President TMI-1; Mr. Ronald Toole, Operations and Maintenance Director; or Mr. Joseph Colitz, Plant Engineering Director. A second manager typically from a support organization, (e.g., Training, QA, Rad Con, etc.), also attends. Between them, these managers address the status of situations in their respective areas and respond to questions from the trainees in give-and-take discussions.

Another method of keeping management informed regarding the implementation and effectiveness of the training programs is the submittal by the Training and Education Department of bi-weekly "significant events" reports which highlight to the Division Director and Office of the President such things as training attendance, program initiations and completions, licensing and requalification exam performance and simulator training activities.

Beginning in the Spring of 1983, I initiated Nuclear Assurance Division (NAD) Employee Meetings for the purposes of

(1) encouraging and fostering better understanding of NAD employees regarding activities of the various Division Departments, and (2) encouraging and improving NAD relationships with other GPUN divisions. The meetings have been well-received by employees and have been continued at approximately six-month intervals. Each group of meetings is announced by memorandum and the speakers are identified in agenda prepared for the meetings at each location. In the first three rounds of meetings, there were five speakers, one from each NAD Department and a division Director from another division. There also was an opportunity for employees to interact with me through questions and answers and discussion. In the fall 1984 round of meetings, we gave employees training in brainstorming techniques, and had them develop lists of brainstorming ideas for improving the effectiveness of the NAD work activities. These brainstorming ideas are now being evaluated by employee committees to recommend those which should be further developed and implemented.

Yet another activity to keep management informed and in touch with Operations personnel is the attendance by senior managers from Nuclear Assurance, Operations and Training at the simulator training sessions at Lynchburg to evaluate training being conducted by B&W. This allows management to evaluate the quality of B&W's training at the simulator as well as to evaluate our licensed operators' and licensed operator candidates' performance on the simulator.

Finally, several activities which began in 1980 have been refined and formalized and continue to significantly aid communications between the Training and Operations Departments. To ensure that the training content is relevant to the needs of the operators, training programs, schedules, and program content -- including learning objectives -- are approved by the Operations management prior to the conduct of training. We have learned that the more mutual involvement that takes place in operator training, the better-focused that training becomes, and this causes the operators to be more receptive to the training. Also, during requalification training, at the end of each week the shift foreman or supervisor from the crew that is just completing training meets with the Supervisor - Licensed Operator Training, the Supervisor - Non-licensed Operator Training, the Operator Training Manager, and either the shift foreman or the supervisor from the crew entering training the next week. This meeting discusses the week's training and what needs to be improved or emphasized for the following week. These meetings have helped training to focus on more specific needs of different crews regarding the same subject areas. We also have found that we sometimes develop a common thread over six weeks which is useful to us in working to improve the training the next time it is scheduled.

All of the examples cited above are part of an ongoing GPUN management commitment to find ways to stay abreast of the real and perceived concerns of our employees. We have taken

very seriously the "lessons learned" from the cheating hearings and will continue to seek ways to maintain the credibility and integrity of the training process and the effectiveness of our overall TMI-2 plant operations activities.

B. Promotions of C.E. Husted and E.R. Frederick (By Dr. Long)

The Appeal Board and NRC Staff have raised questions, in ALAB-772 and NUREG-0680, Supplement 5 regarding management's judgment in its assignments and promotions of E. R. Frederick and C. E. Husted. Although both individuals have been reassigned and are no longer involved with either licensed or non-licensed operator training, in this section I will briefly describe their Met Ed/GPUN employment history and the management decisions regarding their career progress.

1. Management Decisions Regarding Mr. Frederick

Mr. Frederick began his employment with Met Ed/GPUN in November 1973. At that time, he had approximately five years of experience in the Navy Nuclear Power Program. Since joining Met Ed/GPUN he has gained nearly five years of experience as an auxiliary operator and licensed reactor operator on TMI-2, and approximately five years experience in the TMI Training Department as an instructor and supervisor. His Navy experience included training as an electrician and nuclear power plant operator. He received an NRC RO license on TMI-2 in October, 1977 and an SRO license on TMI-2 in January, 1982.

Mr. Frederick was one of two licensed reactor operators on shift at the time of the initiation of the TMI-2 accident. As a result, over the past five years he also has been involved in numerous inquiries, studies, legal proceedings and investigations relating to the TMI-2 accident.

In July of 1979, Mr. Frederick began his assignment as an operator training instructor in the TMI Training Department. From the beginning of this assignment, Mr. Frederick was conscientious in his preparation, and enthusiastic and effective in his classroom presentation.

In February, 1982, Mr. Frederick was promoted to Supervisor Non-Licensed Operator Training when the incumbent in that position left the company. His promotion was based on a demonstrated ability as an instructor and effective interactions with other instructors and his Training & Education Department supervisors and managers. He also had capably served as an interim supervisor of licensed operator training in the period prior to Mr. Newton's employment. In addition he had shown a particular sense of responsibility in assisting trainees in recognizing and learning how to respond to events identified in the lessons learned from the TMI-2 accident. As Director of Training and Education at that time, I concurred with and approved the Training Department recommendation. This concurrence was based on a review of his performance and on personal observations of his behavior and capabilities in Training Department activities, e.g., in the Instructor Development Training Program.

His performance as Supervisor Non-Licensed Operator Training was excellent and he was considered a primary candidate for Supervisor, Licensed Operator Training TMI-1 when that position became available in March, 1983. He had maintained his TMI-2 SRO license and was enthusiastic about working towards acquiring an NRC SRO Instructor Certification on TMI-1. His promotion was reviewed with the TMI-1 Operations Department, and they expressed some lingering concern about assuring that what some perceived as an old "know-it-all" attitude problem had been corrected. However, they agreed that he had performed well in his recent assignments and that similar performance could be expected in the new position.

As indicated by his performance reviews, Mr. Frederick was very effective as the Supervisor, Licensed Operator Training and on occasion in early 1984 as Acting Operator Training Manager in Mr. Leonard's absence. Thus, in all of his assignments in the TMI Training Department he demonstrated his ability to both teach and supervise the activities of other instructors.

In March of 1984, while serving as the Supervisor, Licensed Operator Training, Mr. Frederick took the NRC TMI-1 SRO Certification examination. In early April 1984, the results were received from NRC that he had failed both the written and oral portions of the exam. After careful review by the Training & Education Department management and a personal interview that I conducted with Mr. Frederick, I was satisfied that his failure related primarily to a lack of sufficient time

in the plant to be intimately familiar with TMI-1 Administrative Procedures, a section of the exam with which most March 1984 candidates had also experienced difficulty. I confirmed that he did not, in my judgment, have any attitude problem, such as over-assuredness or lack of recognition of the importance of the exam process.

I concurred with the recommendation of the TMI Training Section to assign an Acting Supervisor of Licensed Operator Training to free up Mr. Frederick full-time to prepare for his reexamination by NRC. This was done in June 1984. While Mr. Frederick was in this temporary assignment of full-time study, the NRC issued in July 1984 NUREG-0680 Supp. 5 which reflected NRC Staff concerns about Mr. Frederick and an intention to withhold Mr. Frederick's TMI-1 SRO Certification so that ". . . the licensee can assign Frederick no duties associated with TMI-1 licensed operator training until these issues are resolved."

Given this NRC position, and faced with uncertainty regarding Mr. Frederick's readiness to sit for the reexam, the decision was made to withdraw his application for the TMI-1 SRO Instructor Certification and to reassign Mr. Frederick until all NRC questions and concerns are resolved.

In summary, I believe that the handling of Mr. Frederick during the time since the TMI-2 accident has demonstrated GPU Nuclear's commitment to fairly evaluate its employee's performance and to advance employees appropriately based on their

performance. Decisions regarding his advancement were carefully reviewed and, in each case, his subsequent performance verified that he could handle effectively the increased responsibilities.

2. Management Decisions Regarding Mr. Husted

Mr. Husted began his employment with Med Ed/GPUN in February, 1974. He has approximately five and one-half years experience in the Navy Nuclear Power Program. Since joining Met Ed/GPUN, he has acquired about three years of experience as an auxiliary and licensed reactor operator on TMI-1 and about five years experience in the TMI Training Section. His Navy experience included training as a machinist mate and a nuclear plant watchstander. He received his NRC RO license on TMI-1 in June, 1978 and SRO license on TMI-1 in July, 1980.

In July, 1978 Mr. Husted joined the Training Section as a TMI-1 Licensed Operator Instructor. His performance as an instructor was consistent and improved with experience and additional instructor and supervisory training.

During the 1981 investigation and Licensing Board hearings on cheating, Mr. Husted displayed a serious attitude problem which led to the Licensing Board expressing "doubts . . . about his competence to instill a sense of seriousness about the important need for integrity, discipline and public confidence in the TMI Training program." LBP-82-56, ¶ 2168. The Board recommended ". . . that the qualifications and delivery performance of Mr. Husted receive particular attention during the forthcoming review of the TMI Training program."

In June 1982. I met with Manager Plant Training-TMI, Dr. Knief, and the Operator Training Manager, Mr. Newton, to develop a plan of action for an ongoing assessment of Mr. Husted's attitude and performance as a licensed operator instructor. This plan included an interview of Mr. Husted by myself and VP/Director TMI-1, Mr. H. D. Hukill. In that interview, we were satisfied that Mr. Husted understood the seriousness with which we viewed his behavior in his interactions with the NRC I&E investigations, the intervenors during his deposition, and the Special Master and others during his appearance in the reopened hearings. As a result of these incidents, which we informed him were inappropriate, Mr. Husted was advised that his job performance and attitudes would be closely monitored for an extended period.

The monitoring program and special counseling with TMI Training Section management had actually begun prior to the June meeting and continued on a regular documented basis through December, 1983. In addition to observations and evaluations by Training Section personnel, the TMI-1 Operations Department performed special observations and submitted written reports to Mr. Hukill on Mr. Husted's performance and attitudes. All of these reports indicated that Mr. Husted was performing very satisfactorily and that there was no evidence of undesirable attitudes or lack of respect for the training and licensing processes.

In March, 1983, when the supervisory position for this sub-section became open, Mr. Husted was considered as a candidate. Based on the very thorough and extensive recent observations of his performance and attitudes, the TMI Training Section recommended and the Director of Training & Education, Dr. Coe, and I concurred in his appointment as Supervisor - Non-Licensed Operator Training. It should be noted that in June 1983, GPUN made a commitment to Governor Thornburg to remove Mr. Husted's SRO license and to not use him as a TMI-1 licensed operator or instructor of licensed operators.

Mr. Husted performed very effectively as Supervisor - Non-Licensed Operator Training until June 1984 when ALAB-772 directed that he be removed from this position. He was then assigned to the Nuclear Safety Assessment Department to work on the TMI-1 probabilistic risk assessment project where his excellent knowledge of TMI-1 plant systems could be used very advantageously.

In summary, I believe that as with Mr. Frederick, GPUN's handling of Mr. Husted since the cheating hearings demonstrated our commitment to address employee performance/attitude problems, resolve them if possible, and then to advance employees appropriately based on their performance. Decisions regarding Mr. Husted's assignments and promotion were carefully reviewed. His subsequent performance was verified so as to ensure that he had corrected the problem we had identified to him and that he could handle effectively the responsibilities assigned to him.

C. T&E Department Response (By Dr. Coe)

Of course part of the company's reponse to cheating was it's effort to insure that individuals would never again be in a position to be tempted to cheat. The GPUN Control of Examinations procedure is a very detailed process that clearly communicates to all parties the GPUN commitment to the security of examinations and the responsibility of everyone involved in insuring the proper conduct of such exams. Examinations are classified in four basic security categories:

o Category 1 - written examinations where grades serve as a basis for certifying satisfactory completion of training.

o Category 2 - written examinations used as rapid feedback to assist the examiner in assessing the effectiveness of training.

o Category 3 - oral examinations conducted by an individual examiner or a board.

o Category 4 - practical factors examinations where evaluation of skill levels are based on performance of actual or simulated tasks.

This division into categories allows for different levels of security and administrative controls. Security of Category 1 examinations apply from the time the questions are assembled until final administration and grading. Security also applies to question and answer banks in this category. Category 1 examinations are page-numbered and are not reused without written approval of the Manager of Training. Access to

Category 1 examination materials are restricted on a need-to-know basis and the policy also includes provisions for locked storage, assuring security passwords for data processing systems, limited access to exam materials, numerical accounting of exam copies, and an established question bank requiring 40% content difference for consecutive week's training (cyclic) exams. Non-cyclic training requires multiple exam versions differing at least 50% in content. The procedure also identifies the methods of transporting examinations between sites and the shredding of surplus examination material.

The security for Category 2 exams applies from initial assembly through final grading. These exams may be reissued to subsequent classes.

Category 3 and 4 examinations are less restrictive in their security.

Administration requirements and specific instructions for proctoring are clearly identified by category as well. Each Category 1 examination has a coversheet that identifies the following information:

- examination title and location where administered;
- whether the examination is open-book or closed-book;
- authorized reference material;
- any special instructions;
- title of each section of examination;
- point value of each section;

- o total point value of examination;
- o time limits for completing exam;
- o minimum acceptable passing grade.

Detailed instructions for proctoring responsibilities are given. The proctor must insure that:

- o student work surfaces are clear of unauthorized materials;
- o seating assures maximum workspace for each individual; students are separated as much as possible;
- o a check of the room to insure that no unauthorized information is available, e.g., from blackboards or wall charts;
- o authorized reference materials are free of any unauthorized markings;
- o a seating chart is made for selected examinations;
- o examination cover sheets are reviewed with the students.

At least one proctor is to be present at all times and student movement is minimized.

Detailed instructions are given to the students regarding their conduct in the exam and the students must also sign a statement that indicates their understanding of the examination instructions, part of which is that the work on the examination is their own. Specific instructions are provided to those grading the exams and Category 1 examinations are graded in accordance with approved answer keys. A plus or minus two

percentage points variation from the passing score is appropriately reviewed by supervision and the Operating Training Manager. Examinations are also graded in a manner that provides specific attention to detecting suspicious parallelisms among various examinations. All instances of suspicious parallelism are investigated thoroughly within one week by persons designated by the Manager of Plant Training who receives a written report of the investigation. The Manager of Plant Training then reviews the matter with the Director of Training and Education.

Since the control of examination procedure has been implemented there have been no known incidents of cheating or the need to pursue further initial investigations for suspicious parallelism in licensed operator training at TMI. The entire control of examinations procedure is an area of major emphasis in the GPUN Instructor Qualification and Development Programs.

In addition to exam security, T&E is equally committed in its efforts to properly design, construct and implement examinations. When a major comprehensive exam is planned, detailed instructions are issued by the Operator Training Manager on how this process is to be conducted. An exam coordinator is appointed by the Operator Training Manager and the coordinator's responsibilities are:

- o Aid in categorization of questions;
- o Insure correct formatting and exam coding summary during assembly of exam;

- Serve as liason between operator training and administrative sections;
- Maintain exam security; and
- Provide quality check of exam questions.

The Supervisor Licensed Operator Training, with the approval of the Operator Training Manager, appoints individuals to serve as an exam writer. The exam writer's responsibilities are:

- Review requalification year objectives;
- Assign point value to question and provide point breakdown to answer key;
- Insure breakdown of question areas are within Operator Training Manager guidance;
- Review exam bank for useable questions - draft new questions as appropriate;
- Maintain exam security; and
- Code each exam question.

Two technical reviewers, appointed by the Operator Training Manager, are responsible for ensuring:

- Questions are properly worded and technically correct;
- Answers keys are technically correct; and
- Exam security.

Because of the sensitivity of the positions of exam coordinator, writer and technical reviewer, these individuals are exempt from taking the examination.

As the examination is being developed, each question is coded by substantive content, and skill/ability. The coding is used in the design of the exam and is accomplished by detailing percentages for each of the categories and skill/ability codes within the exam. Once the content for topic selection has been determined, the questions are further coded to determine the thought process needed. The category codes are:

- Recall;
- Comprehension;
- Application of rules and principles;
- Analysis and deduction; and
- Synthesis and evaluation.

Once this step is completed, the exam coordinator develops a coding summary which insures that the exam construction properly reflects the program content.

Exam security throughout this process is constantly maintained and only those people designated by the Operator Training Manager have access to the exam or any part of it. After the examination has been successfully administered, the Supervisor of Licensed Operator Training, with approval of the Operator Training Manager, appoints exam graders who use strict grading criteria in the completion of their assignment. Once the grading process is complete, the Supervisor of Licensed Operator Training submits to the Operator Training Manager a report outlining the analysis of the exam matrix, the result of exam reviews and any required upgrading. Information about the

examination is not released until all grades are finalized and issued by the Training Department.

In describing GPU Nuclear's response to cheating, it should be noted that no one currently serving in a supervisory or management capacity at the TMI-1 Licensed Operator Training Program was involved in or implicated by the cheating incidents that occurred. The entire training organization is deeply committed to the control of examination process and the other mechanisms in place that are designed to assure that all individuals associated with the licensed operator training process appreciate and share the proper attitude about training at TMI.

In discussing the Company's response to cheating, one should not ignore the fact that many substantive changes have been made to the operator training program at TMI-1 in the past several years. These improvements are discussed in detail in Mr. Newton, Mr. Leonard and Mr. Ross' testimony.

III. ADEQUACY OF CURRENT MANAGEMENT RESPONSIBLE FOR LICENSED OPERATOR TRAINING (BY DR. LONG)

A. Overall Management Response

The Nuclear Assurance Division of GPUN is one of six divisions which provides support to the two GPUN operable plants -- TMI-1 and Oyster Creek -- and to the recovery activities at TMI-2. Figure 1 shows the organization of NAD, which has been headed by Dr. Robert L. Long since April 1, 1982.

The Training and Education (T&E) Department is one of four NAD Departments. Since March 14, 1983 it has been headed by Dr. Richard P. Coe. The Department organization is shown in Figure 2. The TMI Plant Training Section, whose organization is shown in Figure 3, is one of four Sections reporting to the Director-T&E, Dr. Coe. Samuel L. Newton has been Manager, Plant Training TMI since June 1, 1983. The Operator Training Subsection headed by the Operator Training Manager, Bruce P. Leonard, is divided into two groups of instructors which are headed respectively by Ronald H. Maag, Supervisor-Licensed Operator Training and Frank A. Kacinko, Supervisor-Non-Licensed Operator Training. In the Simulator Training Subsection, Dennis J. Boltz, Supervisor, Simulator Instruction reports to Carlos A. Irizarry, Simulator Development Manager, who in turn reports to Mr. Newton. The Licensed Operator Training and Simulator Training organizations both provide training to the TMI-1 licensed operators. In addition, the Educational Development Section, under Mr. Herbert Lapp, Manager-Education Development, provides instructor training and program development guidance.

B. Qualifications of Management Personnel

1. Robert L. Long, Vice President and Director-Nuclear Assurance Division

Effective April 1, 1982, I was elected to the position of Vice President-Nuclear Assurance. I have over twenty years experience in a variety of aspects of nuclear energy, reactor operations and education and training. I hold the degree of B. S. in Electrical Engineering from Bucknell University (1958) and M.S.E. and Ph.D in Nuclear Engineering from Purdue University (1959 and 1962 respectively). I began my reactor operating experience as a graduate student at Argonne National Laboratory. I have also been supervisor of both a research and a training reactor facility. From 1965 to 1978, I was on the faculty of the University of New Mexico, advancing from Assistant Professor to Professor and Chairman of the Department of Chemical and Nuclear Engineering. I also served for two years (1972-74) as Assistant Dean of Engineering. On three separate one-year leaves from the University, I served respectively as a Senior Reactor Physicist at a United Kingdom Atomic Energy Authority research reactor, the Associate Reactor Engineer at Consolidated Edison Company's Indian Point One Nuclear Power Station, and Project Engineer at the Electric Power Research Institute. While with GPUN, I have completed the Edison Electric Institute four-week Executive Management Program (1982) and Emergency Support Director training for both TMI and Oyster Creek.

In June 1978, I began employment with GPU as Manager-Generation Productivity Department of the GPU Service Corporation. This Department provided technical guidance to all GPU operating companies and was particularly focused on improvements in the performance of the large fossil-fueled plants operated by the Pennsylvania Electric Company. My contact with the GPU Nuclear power plants was minimal until March 1979 when I was made a member of the GPU response team to the TMI-2 accident.

Since then, I have held several positions with the TMI Generation and GPU Nuclear Groups and, subsequently, GPU Nuclear Corporation. In each assignment I have drawn from my extensive experience in reactor operations, nuclear safety, reliability and quality assurance, and nuclear engineering education.

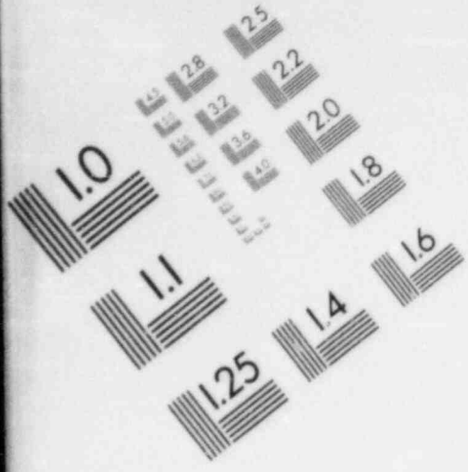
From February 1980 to March 1983, I served as Director of Training & Education. During a significant part of that time, I also served as Acting Director of the Nuclear Assurance Division (February to September 1980) and as Vice President and Director of NAD (from April 1982 to March 1983). I also served full-time for approximately three months in early 1982 as head of the Failure Analysis Task Force for the TMI-1 Steam Generator Repair Project. I have had responsibility for major changes in organization, staff and function of the diverse areas of Nuclear Safety Assessment, Emergency Preparedness, Training & Education, Quality Assurance, and the Systems

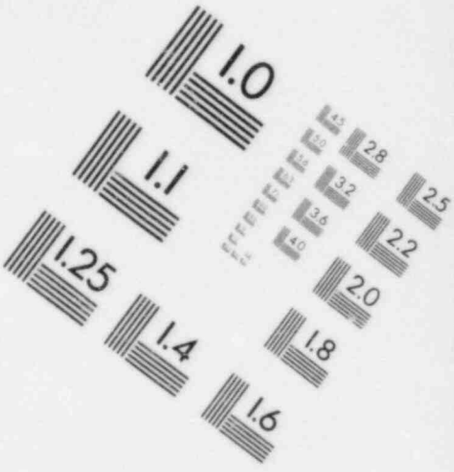
Laboratory. While serving as Director of T&E, much of my effort was directed at the development of facilities, the hiring and training of staff, and the evaluation and development of requirements for the TMI simulator training program, leading to the purchase of the basic principles and replica simulators. As I have already indicated as Director of T&E, I bore responsibility for the cheating incidents which occurred. This fact had to be and was carefully considered by the GPUN Board of Directors. I believe my selection as Vice President was and is considered very appropriate by GPU Nuclear. I should note that, subsequent to my assignment as Vice President, NAD, my selection was reaffirmed in reports by Admiral Rickover and the Reconstituted OARP Review Committee. I believe that I am well-qualified to serve as Vice President, NAD, and have the commitment to quality and excellence that is necessary for an individual serving in this position.

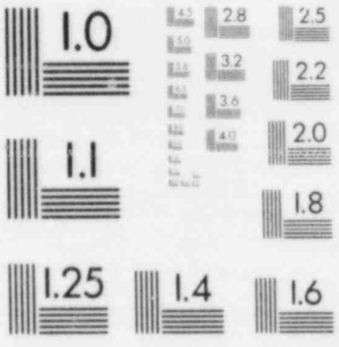
2. Richard P. Coe, Director-Training & Education Department

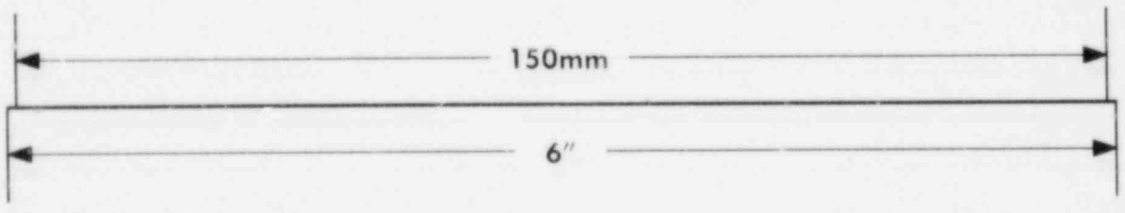
Dr. Richard P. Coe began serving as Director-Training & Education for GPU Nuclear on March 14, 1983. He has over twenty years of experience in a variety of educational settings, including public school, university and industrial education and training. He holds the degrees of B.A. and M.A in Industrial Education from Trenton State College (1961 and 1969 respectively) and Ph.D in Educational Administration-Labor Relations from the University of Pittsburgh (1977). From 1961

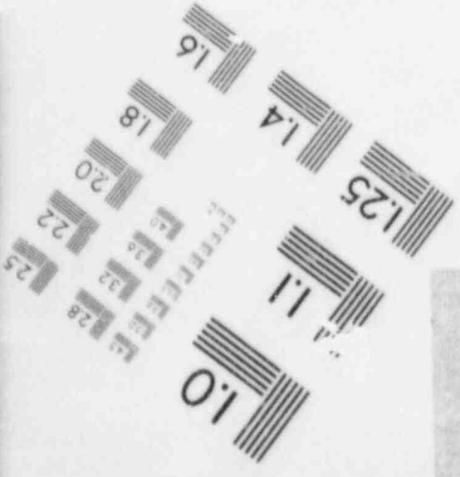
IMAGE EVALUATION TEST TARGET (MT-3)

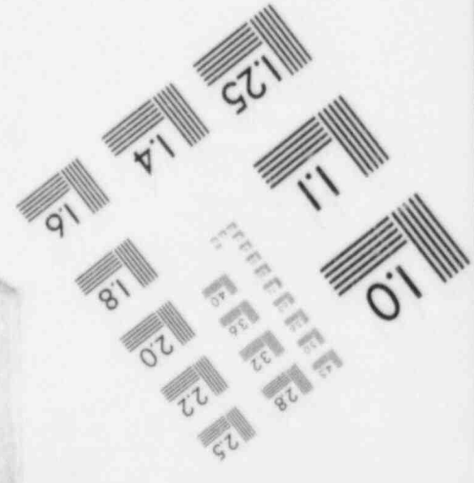












to 1975, Dr. Coe was on the staff of the Mainland Regional High School in New Jersey, advancing from industrial education teacher through department head to assistant principal of a staff of 110 professional and 40 support personnel. Following completion of his Ph.D degree, he worked as an industrial training manager and consultant in training and development with ITT Continental Baking Company, International Management Institute, Pitney Bowes, Inc. and Arcata Graphics Corporation. He also served as an Assistant Professor at the University of Pittsburgh (1976-77) and an Associate Professor at Sacred Heart University (1982-83), teaching MBA courses in organizational development and management.

While at the University of Pittsburgh, Dr. Coe was extensively involved in the development and certification of vocational training instructors in the Western Pennsylvania Region. He was actively involved in the development of the Competency Based Teacher Education Program (CBTE), a nationwide program centered at Ohio State University. As a secondary school administrator, Dr. Coe was involved in the accreditation of high school programs and served as an accreditation peer evaluator. He also possesses professional certification as Chief School Officer in the states of Pennsylvania and New Jersey and Director of Vocational Education in Pennsylvania.

As a management consultant, Dr. Coe was involved in the design, development and delivery of programs for Fortune 500 Companies such as Revlon, McCormick, ITT, Nabisco, The Hartford

Insurance Company and Pitney Bowes Canada, LTD. Prior to joining GPU Nuclear, Dr. Coe completed professional development programs in Decision Analysis (Kepner-Tragoe), Budgeting and Costs Control, Performance Management, Executive Development and Management of Human Resources. Since joining GPU, Dr. Coe has completed the six-day Management Development Program.

In early January 1983, Dr. Coe was identified as a candidate for the position of Director of Training and Education. Although we recognized immediately Dr. Coe's non-nuclear background, his experience in industrial education, needs assessments, performance-based training, behavioral learning objectives, and training of instructors encouraged GPUN to initiate the employment interview process. The interviews and reference checks indicated that Dr. Coe was an excellent classroom teacher and had very effective interpersonal and management skills.

It also was recognized that Dr. Coe's lack of technical nuclear background would be complemented and supported by the strong nuclear experience of Dr. Long and the managers of plant training at TMI, Oyster Creek, and Corporate Headquarters. After carefully reviewing and evaluating Dr. Coe's qualifications and the need for strong managerial and educational leadership of the T&E Department, Dr. Long recommended making an offer of employment to Dr. Coe. This recommendation was considered, and concurrence with it given by Mr. Robert Arnold, then President of GPU Nuclear Corporation, and Mr. Phillip Clark, then Executive Vice President and currently President-GPU Nuclear Corporation.

Dr. Coe has served very effectively as Director of T&E, and has provided strong leadership in the development of instructors, management and supervisory training, and preparation for accreditation of the licensed operator (and other) training programs by the Institute of Nuclear Power Operations. His appointment is considered by GPU Nuclear to be very appropriate, and has been reaffirmed in reports by Admiral Rickover and the Reconstituted OARP Review Committee.

3. Samuel L. Newton, Manager-Plant Training

Mr. Samuel L. Newton, Manager-Plant Training, was promoted to this position effective June 1, 1983. Mr. Newton has nearly twelve years of duty in the Nuclear Navy and approximately 4 1/2 years in the TMI Training Department. He has a bachelor's degree in political science and economics from the U.S. Naval Academy (1968), and a master's degree in Management from the U.S. Naval Postgraduate School (1969). His Navy training and experience include the one-year Naval Nuclear Power Training School; the one-half year Advanced Course-Naval Submarine School; completion of the qualifications prerequisite to becoming Chief Engineer and Command of Submarines; a two-year tour as Company Officer, United States Naval Academy; and almost eight years of operating and training management experience on assignments to two nuclear submarines. Since joining GPUN, Mr. Newton has completed several short courses, e.g., Instructor Training, Testing and Evaluation, EOF Operations, B&W Simulator Training and Performance Appraisal Training.

In April 1980, Mr. Newton began his employment with GPU Nuclear as the Supervisor of Licensed Operator Training at TMI. He was promoted to Operator Training Manager in September 1980. In these positions, Mr. Newton was responsible initially for supervision of the licensed operator training instructors and subsequently, as Operator Training Manager, for supervision of licensed and non-licensed operator and shift technical advisor (STA) instructors. He was actively involved in developing training programs and procedures that were responsive to the numerous post-TMI-2 accident training reviews and recommendations. Mr. Newton, who was Operator Training Manager at the time the cheating incidents occurred, acknowledges that he had not focused his attention on procedures to prevent or detect cheating. His contributing responsibility for failings of the training program which led to the cheating incidents was reviewed with him by Dr. Long, Dr. Knief, and Mr. Hukill in a number of discussions over the past several years. In the company's judgment, Mr. Newton fully appreciates the ways in which the operator training program and personnel bear some of the responsibility for the cheating that has occurred.

Mr. Newton's promotion to the position of Manager-Plant Training was based on the effectiveness of his response to the cheating incidents and his job performance throughout his entire employment period with GPU Nuclear. Mr. Newton also had served effectively as Acting Manager of Plant Training on several occasions. Based on the recommendation of Drs. Coe and

Knief, and with the concurrence of Messrs. Arnold, Clark, Hukill and Long, Mr. Newton became Manager-Plant Training in June 1983. He has served very effectively in this position, e.g., in managing the installation and integration into the operator training program of the Basic Principles Simulator, and the company's preparations for INPO accreditation of portions of the TMI training program. His appointment is considered very appropriate, as evidenced by Mr. Newton's endorsement by Admiral Rickover and the Reconstituted OARP Review Committee.

4. Bruce P. Leonard, Operator Training Manager

Mr. Bruce P. Leonard, Operating Training Manager was promoted to this position effective June 1, 1983. He has approximately six years experience with the Nuclear Navy and two years in the TMI Training Department. He holds the degree of B.S. in Engineering - Naval Architecture from the U.S. Naval Academy (1976). His Navy training and experience includes the one-year Naval Nuclear Power Training School; completion of qualifications as Chief Engineer; a variety of short programs (e.g., Quality Assurance, Water Chemistry Control and Instructor Training); and operating and training management experience on assignments to a nuclear submarine and the S3G Prototype. At the S3G prototype Mr. Leonard was Staff Training Officer and had responsibility for the initial and continuing training of approximately one hundred and fifty Navy Staff instructors. Since joining GPUN, Mr. Leonard has completed the six-day

Management Development Program and short courses in Instructor Development and Decision Analysis.

In November 1982, Mr. Leonard began his employment with GPUN as Technical Program Specialist in the TMI Operator Training Subsection. His assignments included work on the review, evaluation, and revision of training programs for licensed and non-licensed operators and STAs.

Consistent with the recommendation of Admiral Rickover, as well as GPU Nuclear's own view as to a desirable qualification for the job of Operator Training Manager, this year Mr. Leonard began working toward obtaining an SRO license on TMI-1. He has completed four months of an approximately six-month training program for the TMI-1 SRO license, including extensive training on TMI-1 systems and on-shift operations. In late August 1984, the decision was made to withdraw Mr. Leonard from the SRO training program to allow him to devote full-time attention to his Operating Training Manager position. This decision was particularly necessary in view of the impact of ALAB-772 and NUREG-0680, Supp. 5 on workload and the assignment of supervisors in the Operator Training Subsection. Plans are for Mr. Leonard to resume his SRO training by the second quarter of 1985. In the meantime, GPU Nuclear has every confidence that Mr. Leonard has the requisite technical knowledge and management/supervisory skills to manage and direct the activities of the Operator Training Subsection. His performance before and after his promotion has been outstanding. His selection as

Operating Training Manager is considered very appropriate and has been reaffirmed in reports by Admiral Rickover and the Reconstituted OARP Committee.

5. Ronald H. Maag, Supervisor-Licensed Operator Training

Mr. Ronald H. Maag, Supervisor-Licensed Operator Training, began in this position as Acting Supervisor on July 30, 1984, and was promoted to the position effective November 1, 1984. He has approximately eight and one-half years experience in the Navy, about three years in the TMI-1 Operations Department and about a half year in the Operator Training subsection. Mr. Maag holds an Associate in Science degree (1981). His Navy training and experience includes the Machinist Mate A School; the one-year Navy Nuclear Power School; about two and one-half years as a staff instructor; a variety of short programs (e.g., Instructor, Training, Quality Assurance, and Machine Tool Operator); and about four years operational and maintenance experience on a nuclear-submarine. Since joining GPUN, Mr. Maag has completed the RO and SRO license training programs, as well as the short courses given in Supervisory Development and Decision Analysis.

Mr. Maag began his employment with GPUN in January, 1982 in the TMI-1 control room operator license training program. He received his NRC Reactor Operator License in May, 1983 and his NRC Senior Reactor Operator License in May, 1984. He performed the duties of a licensed TMI-1 shift foreman for about

two months prior to joining the Training Department as a licensed operator instructor in July, 1984. Based on his Navy and TMI-1 experience, Mr. Maag has the requisite technical knowledge and supervisory skills to supervise and direct the activities of the TMI-1 licensed operator instructors.

6. Carlos A. Irizarry, Simulator Development Manager

Mr. Carlos A. Irizarry, Simulator Development Manager, has served in this position since its creation in April 1982. He has twenty years of navy experience, about four and one-half years teaching as a lead instructor at Trident Technical College, and about four and one-half years in the TMI Training Department. Mr. Irizarry holds a bachelor's degree in occupational education (1977), and a master's degree in education (1978). While with GPUN, Mr. Irizarry has completed the six-day Management Development Program and the company's short courses in Instructor Development and Basic Supervisor Development.

Mr. Irizzary began his employment with GPUN in 1980 as Supervisor-Training & Education Development. He was promoted to Simulator Development Manager in April, 1982. In the former position, he was responsible for developing programs for instructor, supervisor, and management training. In his present position, Mr. Irizarry is responsible for the coordination and management of simulator activities for the Basic Principles Training Simulator and the TMI-1 Replica Simulator. Based on

his education, as well as his Navy and TMI experience, Mr. Irizarry has the requisite qualifications to manage and direct the activities of the Simulator Development Subsection.

7. Dennis J. Boltz, Supervisor - Simulator Instruction

Mr. Dennis J. Boltz, Supervisor, Simulation Instruction, began in this position on April 1, 1982. He has approximately eight years experience in the TMI-1 Operations Department and almost eight years in the T&E Department as an Instructor and Supervisor. His experience includes six years as a TMI Control Room Operator and 18 months as a TMI Operations Shift Foreman.

Since joining Met Ed/GPUN in October 1969, Mr. Boltz has completed the Reactor Operator and Senior Reactor Operator license training programs, as well as a variety of short programs (e.g., Instructor Development, GE Turbine Course, and Simulator Training). He received his TMI-1 Operator License in August 1974 and Senior Reactor Operator License in August 1976. He has maintained his SRO license continually since that time. He was intimately involved with the specification, design, acceptance testing and instructor training for the Basic Principles Training Simulator, including approximately nine months spent in essentially full-time residence at the simulator manufacturer.

Based on his extensive TMI-1 operating and training experiences, Mr. Boltz has the requisite technical knowledge and experience to supervise and direct the activities of simulator instructors.

8. Herbert J. Lapp, Jr., Manager-Educational Development

Mr. Herbert J. Lapp, began serving as Manager of Educational Development for GPU Nuclear on October 1, 1984. He has approximately fifteen years experience in public school and industrial education and training. He holds the degrees of B.S. in Physics from St. Joseph's College (1969) and M.A. in Secondary Education from Glassboro State College (1976). From 1969 to 1980 he served as a high school science instructor, advancing to department chairman in science and math. From 1980 until joining GPU Nuclear, he served in training supervisory positions with Commonwealth Edison's nuclear plant training programs.

Mr. Lapp brings to GPUN considerable experience in developing performance-based training and instructor development programs. He has also served as a peer evaluator on an INPO Accreditation Team.

Based on his teaching and administrative experience, Mr. Lapp has the requisite technical and educational knowledge and supervisory skills to supervise and direct the Educational Development Section.

IV. THE CRITERIA FOR AND DEVELOPMENT OF TMI-1 LICENSED OPERATOR INSTRUCTORS (DR. COE)

There is a detailed qualification process for licensed operator training instructors which clearly identifies the requirements from selection through certification. An operator

training instructor qualification card must be completed and signed by several levels of training management. The process begins with an in-depth briefing of the instructor on the qualification procedure and a setting of the schedule for required general employee and radiation protection training. The instructor is required to read and understand key internal documents and external documents and this process must be verified in writing by the supervisor. After completing the orientation and indoctrination requirements the new instructor is required to participate in a program which is designed to assure that all instructors possess the technical and instructional competence needed for them to effectively conduct their assigned duties. The program begins on the date of assignment and continues throughout the incumbent's tenure as an instructor. The overall program has three major components dealing with:

- o technical skills
- o instructional skills
- o instructor performance

Technical skills are addressed by a rigid qualification procedure.

Instructional skills are addressed in an Instructor Development Program covering these topics:

- o developing learning objectives;
- o developing lesson plans;
- o the role of the instructor;

- o instructional methods and techniques;
- o testing and evaluation;
- o principles of instruction;
- o instructional media;
- o classroom arrangements;
- o training systems development (TSD);
- o communications;
- o counselling/coaching;
- o presenting classroom instruction; and
- o maintaining records and documentation.

The Instructor Development Program focuses on a variety of needed instructional skills but places heavy emphasis on the proper use of behavioral learning objectives, effective instructional techniques, testing and evaluation and the control of examinations process.

The ongoing and advanced instructor development programs deal with skills training in training systems designs, examination preparation, and instructional methods. The programs also provide an opportunity for instructors to observe other instructors and participate in special educational assignments to broaden individual skills.

A formal instructor evaluation program is used to assure the ongoing monitoring of the on-the-job performance where both technical and instructional skills are evaluated. These evaluations emphasize subject-matter proficiency, teaching proficiency and examination administration. The evaluations,

documented on a detailed Instructor Evaluation Form, are performed by the instructor's supervisor, the instructor's section head, the Educational Development Department, and the Manager of Plant Training. Additional evaluations can be generated by user group management, the Director of Training and Education and the Vice President of Nuclear Assurance. In addition, the Manager of Plant Training and training section heads are required to evaluate the administration of at least one examination each quarter and document the results on a detailed examination administration evaluation form.

The present Operator Training group is staffed by highly competent, dedicated professionals who are committed to delivering the highest quality of instruction to the TMI-1 operators. Nine of the eleven instructors possess college degrees and all have nuclear experience in the commercial and/or nuclear navy area. They are supported by an equally competent and dedicated Simulated Training group and effective training programs conducted at the B&W Simulator in Lynchburg, Virginia. The Director of Training and Education has approved and implemented a program to qualify all operator training instructors as SRO-certified personnel. The Operator Training group receives feedback from operators via weekly meetings and course critiques. Yearly reviews of operator training programs are jointly conducted by Training and Operations to assure that the programs are current, job related and meet the high standards set by GPUN.

As a result of the qualification process we have in place, and the additional attention given to developing the educational skills of our instructors, we believe that the TMI-1 licensed operator instructors and the simulator training personnel at TMI are competent, dedicated professionals who are committed to delivering the highest quality instruction to the TMI-1 operators.

V. COMPANY GOALS FOR THE TMI-1 LICENSED OPERATOR TRAINING PROGRAMS (DR. COE)

GPUN is presently seeking accreditation by INPO of its license operator training programs. The programs are being assessed against accepted industry-wide criteria. The accreditation, when received, will be for a period of four years, requiring an interim two year review and update. It is the goal of Training and Education to maintain the accreditation of its programs.

Another goal of T&E is to formally license or certify all instructors in the operator training area by 1985. This will include the licensing of the Operator Training Manager in accordance with Admiral Rickover's recommendation. Each instructor will participate in the annual requalification process to maintain his/her license.

Efforts will continue to formalize the process whereby key experienced operations personnel are the main source of candidates for replacement operator training instructors.

With the delivery in late 1985 of its full scope replica simulator, coupled with the BPTS and upgraded control room mockup, GPUN Training and Education will train licensed personnel with some of the most advanced technology available for the development and maintenance of skills needed to safely run TMI-1.

VI. CONCLUSIONS

We believe that the facts make clear that the answers to the five important questions we initially posed in the introduction to our testimony is "Yes." In summary,

(1) GPU Nuclear management, particularly within the training organization, understands and accepts its responsibility for the cheating revealed in the 1981 reopened hearings.

(2) GPU Nuclear has responded properly to the cheating that occurred, insofar as its' response relates to the TMI-1 licensed operator training program.

(3) There are appropriate individuals managing the current TMI-1 licensed operator training program.

(4) The current licensed operator training instructors are subject to the appropriate qualification requirements and educational development.

(5) GPU Nuclear has appropriate goals for its TMI-1 licensed operator training program.

REVISED 2/16/83

R E S U M E

of

ROBERT L. LONG

1. Date of birth: September 9, 1936

2. Position 4/82 - Present:

   Vice President - Nuclear Assurance Division, GPU Nuclear Corporation,
   100 Interpace Parkway, New Jersey 07054.

3. Degrees:

   B.S., Electrical Engineering, Bucknell University, 1958
   M.S., Nuclear Engineering, Purdue University, 1959
   Ph.D., Nuclear Engineering, Purdue University, 1962

4. University of New Mexico Service: 13 years

   1965-1968: Assistant Professor of Nuclear Engineering
   1968-1973: Associate Professor of Nuclear Engineering
   1973-1978: Professor of Nuclear Engineering
   1972-1974: Assistant Dean, College of Engineering
   1974-1975: Acting Chairman, Chemical & Nuclear Engineering Department
   1975-1978: Chairman, Chemical & Nuclear Engineering Department

5. Other work experience - research, industrial, etc.:

   1982-Present: Vice President - Nuclear Assurance Div., GPU Nuclear Corp.
   1980-1982: Director - Training & Education, GPU Nuclear Corp.
   1979-1980: Director - Reliability Engineering, GPU Service Corp., Parsippany, N.J.
   1978-1979: Manager - Generation Productivity Department, GPU Service Corp., Parsippany, N.J.
   1976-1977: Sabbatical leave - Project Engineer, Electric Power Research Institute
   1970-1971: ASEE - Ford Foundation Resident Fellow, Associate Reactor Engineer, Indian Point Nuclear Power Station, Con Edison of New York, Inc.
   1965-1968: Research Participant in the field of fast burst reactor

reflector effects and high yield burst reactors, one-half time at Sandia Corporation
1966-1967: Leave of absence from UNM - Research Associate, Nuclear Research Division, Atomic Weapons Research Establishment, Aldermaston, Berkshire, England
1964-1965: GS-14, Civil Service, Reactor Specialist, Nuclear Effects Branch, White Sands Missile Range, New Mexico
1962-1964: 1st Lt., U.S. Army, Nuclear Effects Engineer, Reactor Specialist, Nuclear Effects Branch, White Sands Missile Range, New Mexico
1960-1962: Student Research Associate, Argonne National Laboratory, Argonne, Illinois
Summer, 1960: Instructor and technical reader, Purdue University, Lafayette, Indiana

6. Consulting:

1981-1984: Argonne Universities Association Review Committee for Division of Educational Programs at Argonne National Laboratory
1981: National Research Council, Assembly of Engineering, Nuclear Manpower Committee
1979-1980: National Science Foundation Review Committee for Engineering Chemistry and Energetics
1977-1979: Consultant to Nuclear Engineering & Operations Department, Electric Power Research Institute, Palo Alto, California
1976: Lecturer overseas (Southeast Asia) for U. S. Information Agency
1973-1978: Consultant to U. S. Department of Energy (formerly ERDA and USAEC) on Citizen's Workshops on Energy and the Environment.
1971-1978: Occasional consultant for utilities and other universities on public education aspects of nuclear energy.
1971-1973: Consultant on Power Reactor Operator Training to General Physics Corporation, Columbia, Maryland
1965-1973: Part-time consultant to Fast Burst Reactor Facility, White Sands Missile Range, New Mexico

7. Scientific and professional societies of which a member:

American Nuclear Society (have held numerous responsibilities on national and division committees)
Sigma Xi
Atomic Industrial Forum
American Association for the Advancement of Science

8. Honors and awards:

1958-1959: USAEC Nuclear Engineering Fellowship
1974-1975: Chairman, Education Division, American Nuclear Society
1975-1976: Chairman, Nuclear Engineering Department Heads Committee

9. Description of professional experience:

a. April 1982 - Present

Effective April 1, 1982 I was elected Vice President and Director of the Nuclear Assurance Division which includes the Quality Assurance Department, the Nuclear Safety Assessment Department, Training & Education Directorate, and the Emergency Preparedness Department. I also served as Acting Director of this Division from February - September 1980.

b. February 1980 - March 1982

Director - Training & Education, GPU Nuclear Corporation, Parsippany, N.J. I had responsibility for the direction of Corporate, TMI-1, TMI-2, and Oyster Creek Training Departments, and the System Laboratory.

c. August 1979 - January 1980

Director - Reliability Engineering, GPU Service Corporation, Parsippany, N. J. I was responsible for the direction of five functions providing technical support to the TMI Generation Group and the three GPU operating companies. These functions included Quality Assurance Department, the System Laboratory, the Information Management Department, the Nuclear Safety Assessment Department, and the Generation Operations Support staff.

d. April 1979 - July 1979

Member of TMI-2 Recovery Team. Arriving on site March 29, 1979, I had varied responsibilities including organization of the Data Reduction and Management Group, head of the Accident Assessment Documentation Team and Supervisor of the Technical Planning Group. I also was appointed to the GPU Accident Investigation Task Force.

e. June 1978 - March 1979

Manager-Generation Productivity, GPU Service Corporation, Parsippany, N. J. I was responsible for the staffing and program development of the newly formed Generation Productivity Department. Activities included the development of an availability improvement program for implementation throughout the GPU System. The program was concerned with total plant performance for all fossil and nuclear units and included:

1) Developing an integrated generating unit reliability program.

2) Developing a reliability/availability/maintainability data system.

3) Developing a failure root cause analysis system and procedures.

4) Identifying critical controllable factors and developing procedures for a thermal performance improvement program.

5) Developing a generating unit performance testing program.

6) Developing procedures and management accounting methods for instrumentation maintenance, major outage work management, and preventive maintenance programs.

f. 1965-1978

Faculty member, Nuclear Engineering Department, University of New Mexico. Except for the two leaves-of-absences in 1966-67 and 1970-71, and a sabbatical leave in 1976-77. I was actively engaged in teaching and research, primarily in experimental reactor physics. During 1965-66 I was engaged in half-time research at Sandia Laboratories and served as Project Engineer for the design of the SPR-II, fast burst reactor. During 1967-69, again half-time, I participated in the design and carrying out of experiments to characterize the dynamic behavior of SPR-II. During 1969-70 I directed a campus fast reactor physics experimental facility and directed the Ph.D. thesis of C. C. Price on reflector effects on fast burst reactors.

I was a licensed Senior Reactor Operator on the UNM AGN-201M training reactor, 1967-1978, and served as Chief Reactor Supervisor

1968-70 and 1973-76. In 1969-70 I supervised the move of the reactor into a new laboratory, the complete redesign and assembly of the nuclear instrumentation and control system, and an increase in maximum operating level from 0.1 to 5 watt. I served as Director of the Nuclear Engineering Laboratories, 1971-76.

During 1972-74 I served as Assistant Dean (half-time) of the College of Engineering. During that time period I also served as principal investigator for a contract with Consolidated Edison Company of New York to analyze axial xenon redistribution and power shaping in large pressurized water reactors. Under contract with the USAEC, I also developed two "neighborhood TV short courses" on nuclear energy and energy and the environment for use in public education efforts.

Effective July 1, 1974 I was appointed Acting Chairman of the Department of Chemical and Nuclear Engineering and in February 1975 I was appointed to a four-year term as Department Chairman to begin July 1, 1975.

From 1974-76 I supervised the design, development and on-campus installation of a fossil power plant simulator (Ph.D. dissertation for R. Busch) under sponsorship of the New Mexico Energy Resources Board and Public Service Company of New Mexico.

From 1977-78 I served as principal investigator on a project, sponsored by the New Mexico Energy Institute, to determine generally accepted pre-activity background levels for radon in the very active uranium mining and milling Grants/Ambrosia Lake area of New Mexico.

Together with M. J. Ohanian, University of Florida, I worked as a representative of the Nuclear Engineering Department Heads Committee to increase the support of government sponsored energy R&D in university engineering colleges. This activity included successful introduction through the U. S. Senate of education support amendments to the 1974 ERDA and 1977 DOE Authorization Acts. It also included organization of university/government exchange meetings with USAEC, ERDA, and NRC, and an EPRI/University exchange meeting.

My teaching was centered around the development and presentation of effective laboratory courses, while also periodically teaching the following lecture courses: Introduction to Nuclear Engineering, Applications of Nuclear Energy for Non-Engineers, Reactor Kinetics and Control, Nuclear Systems Design.

g. 1976-77

On sabbatical leave with the Electric Power Research Institute, Palo Alto, California. During my twelve-month sabbatical I worked as a project engineer in the Nuclear Engineering and Operations Department with responsibility for managing projects in availability engineering and development of an "optimized" utility power systems data base. I also supervised and worked with an EPRI contractor to complete a PWR steam-generator performance survey. These various projects provided an opportunity to visit and closely interact with many utility, manufacturer, and government agency personnel.

h. 1977-1979

Consultant, EPRI. Upon return to the UNM campus, I continued, as an EPRI consultant, to monitor reliability data base and records management projects. I also coordinated the conduct of an EPRI Availability Engineering Workshop held in Albuquerque, October, 1977. While with GPUSC I have continued as consultant to EPRI on avail ability engineering programs.

i. 1971-72

Consultant, General Physics Corporation. I rewrote the Reactor Engineering Volume of the General Physics Corporation "Academic Program for Nuclear Plant Personnel."

j. 1970-71

ASEE-Ford Foundation Resident Fellow, serving as Associate Reactor Engineer with Con Edison of New York, Inc. During my thirteen-month assignment, I was involved primarily in the coordination and planning of the repairs to the Indian Point Unit No. 1 primary coolant system. I also performed various tasks of the Unit No. 1 reactor engineer. I was principal co-author with R. B. Hayman of the Company's initial Quality Assurance Program report for Unit No. 1. On a few occasions, I also assisted in the training program for the Unit No. 2 operators and in the preparation of Unit No. 2 procedures.

j. 1966-67

Temporary Research Associate, Nuclear Research Division, Atomic Weapons Research Establishment. During my fourteen-month assignment I prepared the commissioning schedule for VIPER, Mark I, a fast burst reactor, assisted in the safety analysis and evaluation of the reactor and served as a senior reactor physicist and shift

supervisor during the initial startup. I also planned the training program and presented some of the lectures for the initial startup staff.

l. 1962-65

Reactor Specialist (GS-14), WSMR Fast Burst Reactor Facility. I served as the facility supervisor during the final design, construction, startup, and first year of operation of the FBRF, a fast burst reactor. This included responsibility for training of the staff, monitoring of contractor performance, preparation of the Final Safety Analysis Report, preparation of the startup and operating procedures, and analysis of the reactor physics operational data.

m. 1960-62

Student Research Associate, Argonne National Laboratory. I was trained and certified as a co-operator, operator, and supervisor on the Argonne Thermal Source Reactor (ATSR) while performing my doctoral dissertation research. I designed and built a reactivity measuring system for determination of neutron absorption resonance integrals. I also assisted in the training of replacement operators for the ATSR.

10. Principal publications:

- "An Electrical Analogy of Nuclear Reactor Neutron Flux," with J. R. Eaton, Nuclear Science and Engineering, 12, 82-90 (1962).
- "Precision Limitations in the Measurement of Small Reactivity Changes," with E. F. Bennett, Nuclear Science and Engineering, 17, 425-432 (1963).
- "Operational Characteristics of the WSMR Fast Burst Reactor," Neutron Dynamics and Control, AEC Symposium Series, 7, CONF-650413 (May, 1966).
- "Measurements of the Physics Characteristics of the Fast Pulsed Reactor, VIPER," with M. H. Taggart et al., IAEA Symposium Series, Fast Reactor Physics and Related Safety Problem, Karlsruhe, Germany, November 1967.
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- Numerous technical reports on research design and development projects.

11. References:

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G. A. Whan, College of Engineering, University of New Mexico, Albuquerque, New Mexico 87131

W. A. Gross, College of Engineering, University of New Mexico, Albuquerque, New Mexico 87131

12. Personal:

Family: Wife - Ann
Daughter - Beth (Age 20)
Son - Jeff (Age 18)
Son - Mark (Age 14)

Other interests: Church school teaching and choir, woodworking, athletics (spectator and participant), reading

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RICHARD P. COE

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Home: 201-234-9531
Business: 201-299-2424

CAREER OBJECTIVE

An executive level position in Administration, Employee Relations or Human Resource Development

EDUCATION

Trenton State College, Trenton, New Jersey
B.A., 1961 - Industrial Education
M.A., 1969 - Industrial Education

University of Pittsburgh, Pittsburgh, Pennsylvania
Ph.D., 1977 - Educational Administration - Labor Relations

PROFESSIONAL EXPERIENCE

- Succession Planning
- Executive Selection and Recruitment
- Career Pathing
- Executive Development Programs
- Personnel Policy Development
- Labor Relations
- Organizational Development
- Training Accreditation
- Job/Task Analysis
- Training Consultant
- Training Systems Development
- Supervisor/Middle Management Development Programs
- Manpower Planning
- Train the Trainer Programs
- Media Development/Videotape
- Corporate/University Teaching
- Instructor Development

MAJOR ACCOMPLISHMENTS

- Developed, administered and tracked executive management development program.
- Directed development and installation of corporate-wide performance appraisal program.
- Designed and directed individual development programs at executive level.
- Conducted needs assessments and directed the updating of existing management development programs.
- Conducted executive level programs - Interviewing and Performance Management.
- Conducted "Train the Trainer" sessions for corporate training programs.
- Directed development and design of programs in Strategic Planning and Finance.
- Developed organization structure of Corporate Groups.
- Developed executive selection criteria.
- Directed corporate recruitment and staffing.
- Developed and administered executive development program for Japanese subsidiary.
- Directed corporate personnel policy development.

RICHARD P. COE

MAJOR ACCOMPLISHMENTS (Continued)

- Supervised consultant programs in subsidiaries and operating units.
- Directed videotaping and media development for management training programs.
- Coordinated purchase and installation of supervisory training program.
- Associate Professor - MBA Program.
- Directed Licensed, Non-Licensed, Technical, Professional and Management Training of nuclear station personnel.

PROFESSIONAL CAREER

- Director - Training and Education
  GPU NUCLEAR CORPORATION — Parsippany, New Jersey

- Associate Professor - Business Management
  SACRED HEART UNIVERSITY — Fairfield, Connecticut

- Manager - Organization/Management Development
  ARCATA GRAPHICS CORPORATION — Norwalk, Connecticut

- Manager - Corporate Training and Development
  PITNEY-BOWES, INC. — Stamford, Connecticut

- Senior Associate - Management Development
  INTERNATIONAL MANAGEMENT INSTITUTE — New Canaan, Connecticut

- Manager - Management Development
  ITT CONTINENTAL BAKING COMPANY — Rye, New York

- Assistant Professor
  UNIVERSITY OF PITTSBURGH — Pittsburgh, Pennsylvania
  Teacher - Assistant Principal
  MAINLAND REGIONAL HIGH SCHOOL — Linwood, New Jersey

CERTIFICATION

- Chief School Officer - PA, NJ
- Principal - PA, NJ
- Director, Vocational Education - PA

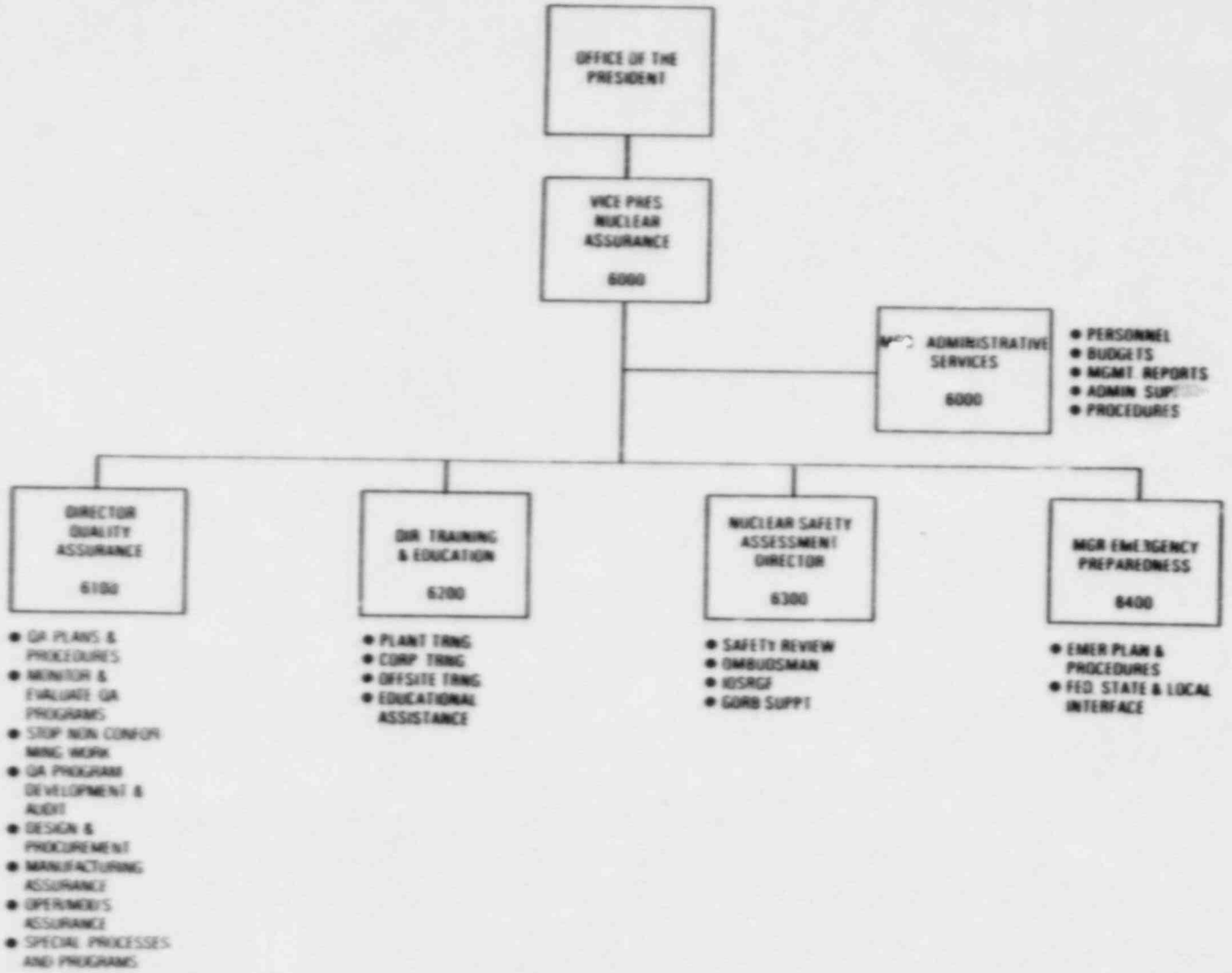
PUBLICATIONS

- DCA Technical Publications, Philadelphia, Pennsylvania
- Industrial Education Center - Ohio State University

PROFESSIONAL ASSOCIATIONS

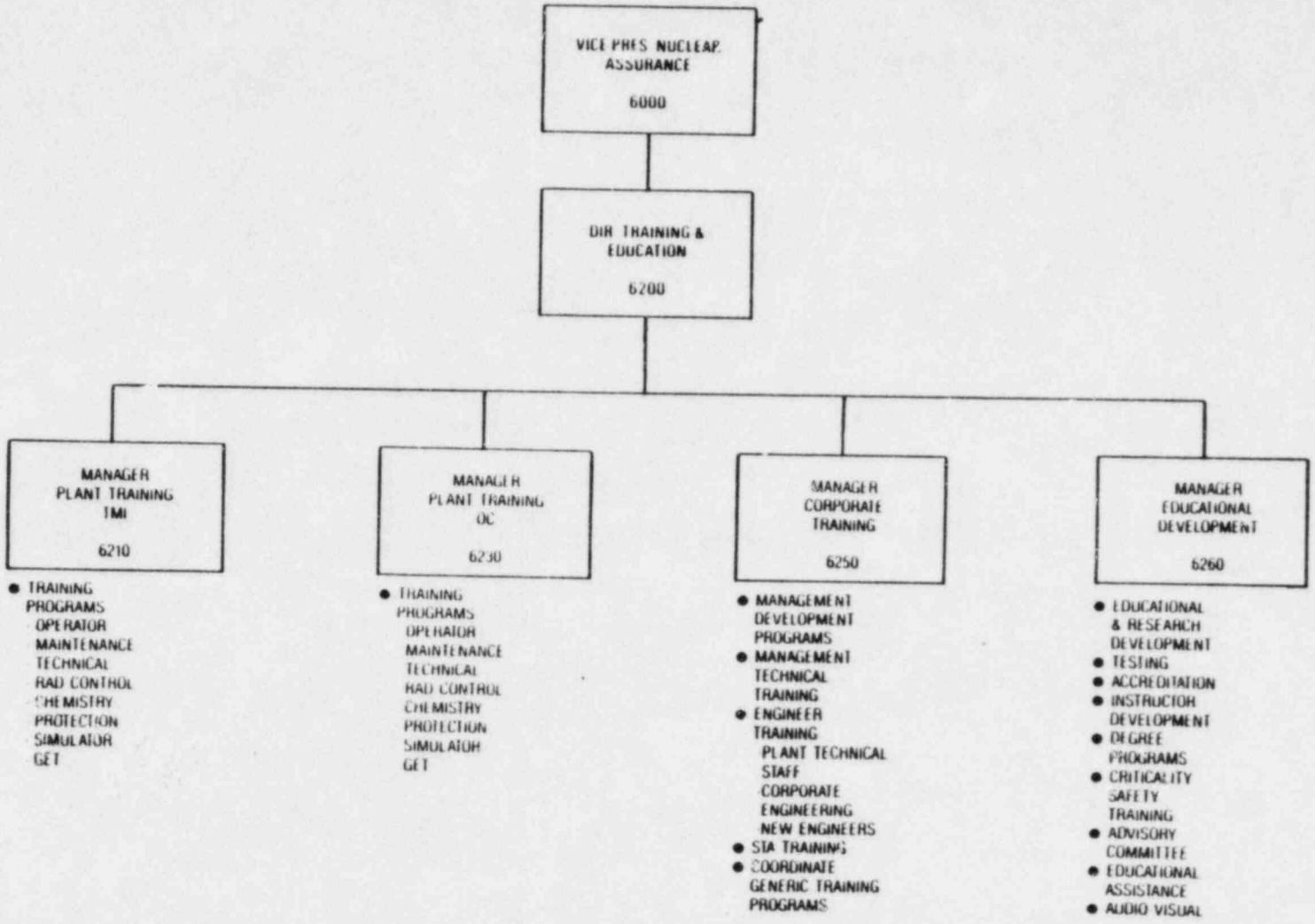
- American Society of Training and Development
- American Nuclear Society

NUCLEAR ASSURANCE DIVISION



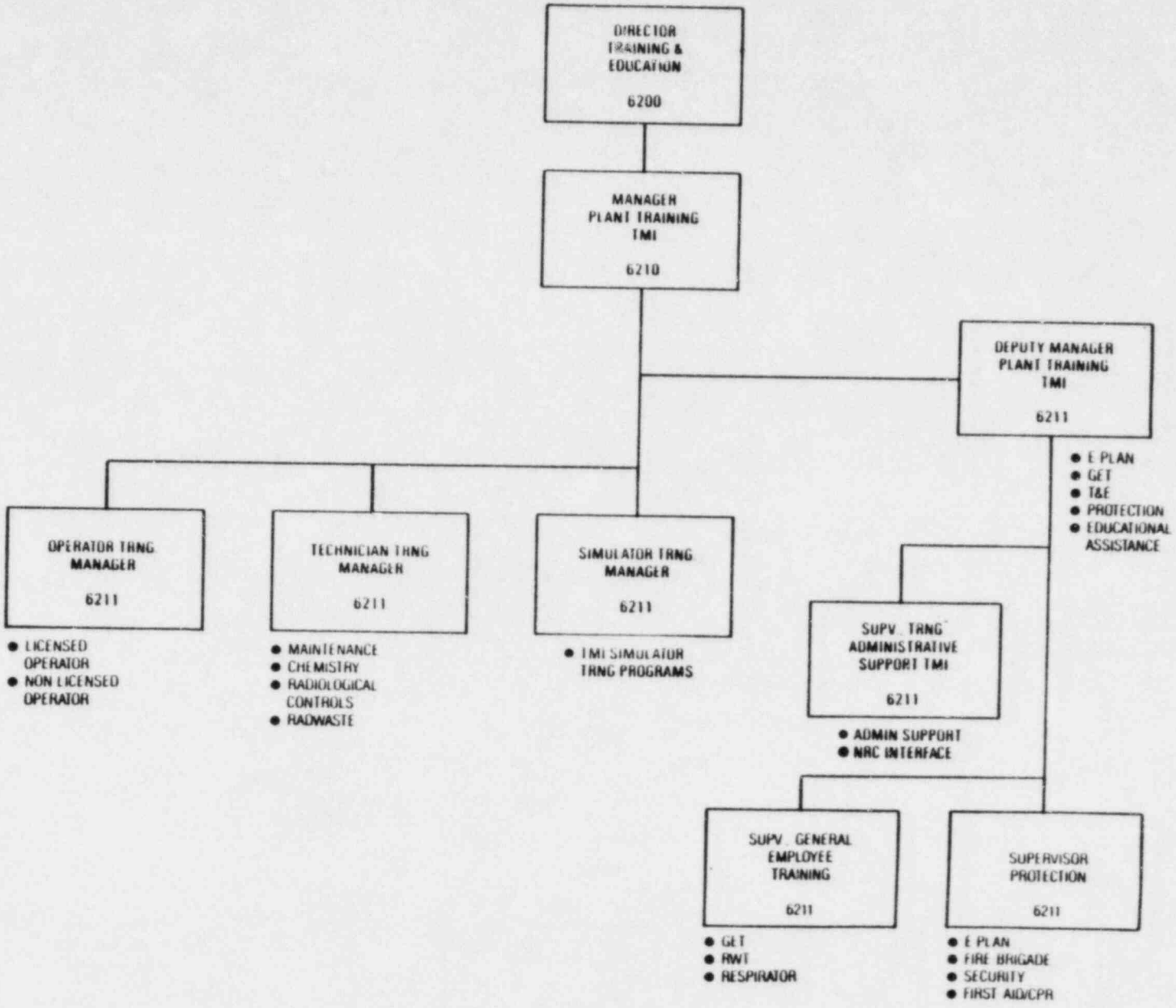
Attachment 3

TRAINING AND EDUCATION DEPARTMENT



Attachment 4

TMI TRAINING SECTION



Attachment 5

10/01/84