U. S NUCLEAR REGULATORY COMMISSION
REGION I

VERMONT YANKEE NUCLEAR POWER CORPORATION

TRAINING PROGRAM INSPECTION

Report No. 50-271/91-81

Docket No. 50-271

License No. DPR-28

Licensee: Vermont Yankee Nuclear Power Corporation
RD 5, Box 169
Ferry Road
Brattleboro, Vermont 05301

Facility Name: Vermont Yankee Nuclear Power Station

Inspection At: Brattleboro, Vermont

Inspection Conducted: October 21 through October 25, 1991

Inspectors: Dr. Jason C. Jang, Sr. Radiation Specialist
Samuel L. Hansell, Operations Engineer
James S. Stewart, Operations Engineer
Richard M. Pelton, Training Specialist, NRR
Bryan Brett, Training Specialist, Consultant

Team Leader: _____ 1/4/92
Julian H. Williams date
Senior Operations Engineer
BWR Section, Operations Branch
Division of Reactor Safety

Reviewed By: _____ 1/6/92
Richard J. Conte, Chief date
BWR Section, Operations Branch
Division of Reactor Safety

Approved by: _____ 1/15/92
Lee H. Bettenhausen, Chief date
Operations Branch
Division of Reactor Safety

Training Program Inspection, Vermont Yankee (Inspection Report 50-271/91-81)

EXECUTIVE SUMMARY

A special announced training program inspection was performed at the Vermont Yankee Nuclear Power Corporation facilities in Brattleboro, Vermont, from October 21 to October 25, 1991. The inspection focused on several of Vermont Yankee's Systems Approach to Training (SAT) based training programs. The specific training programs inspected were: licensed operator, nonlicensed operator, shift engineer (STA), and chemistry technician training. The inspection team reviewed training program directives, training materials, training records, qualification standards and other applicable documents, observed classroom and simulator training, and interviewed operators, engineers, technicians, instructors, supervisors and managers. The team reviewed the licensed operators requalification (LOR) program corrective actions taken as a result of the unsatisfactory program determination earlier this year. The team also reviewed a concern dealing with onshift training.

The team concluded that the training programs were SAT-based, but that licensee management had not sustained the resources to maintain a SAT program. Deficiencies were identified in four of the five critical elements considered necessary for a SAT program in each training program reviewed. Deficiencies included the following: the job task analysis was not kept current as job requirements changed, the training program description for shift engineers was incomplete, some training records were lost, responsibilities and authorities for training are not always clearly stated, each learning objective is not tested, and no systematic method for evaluating training was in place. (Summary listing, Section 3). The training programs appear to have been effective in the past because of the dedicated staff in spite of the shortcomings in the SAT process implementation.

Actions described in licensee and NRC correspondence to correct problems identified with the licensed operator requalification program have been taken, with the exception of long term correction items (UNR 271/91-02-01, Section 2.6). Training while onshift and "at the controls" was considered unresolved (Section 2.7).

DETAILS

1.0 Background and Scope of Inspection

In Section 306 of the Nuclear Waste Policy Act of 1982, the NRC was directed to promulgate regulations, or other guidance for training and qualifications of civilian nuclear power plant operators, supervisors, technicians and other operating personnel. The Commission policy statement issued in March 1985 and amended in November 1988 states that the NRC will conduct inspections as deemed necessary and take appropriate enforcement action when regulatory requirements are not met. The Nuclear Regulatory Commission considers effective training of nuclear power plant personnel to be an important part of safe plant operations.

This inspection was conducted using the guidance of NRC Inspection Manual Procedure 41500, "Training and Qualification Effectiveness" and NUREG-1220, "Training Review Criteria and Procedures." This guidance is used to assess whether INPO accredited utility training programs include five critical elements of a Systems Approach to Training (SAT) based program. These elements are described below along with the scope of the team's review.

A. Systematic analysis of jobs

- A systematic method is used for identifying and selecting tasks for training.
- Tasks for continuing and initial training are differentiated.
- The analysis is adequate for development of learning objectives.
- The analysis is kept current as job performance requirements change.

B. Learning objectives derived from analysis which describe desired performance

- Learning objectives are related to knowledge, skills, and abilities.
- Learning objectives contain actions, conditions, and standards.
- Procedures are available to modify learning objectives as needed.

C. Training design and implementation based on the learning objectives

- The goals, objectives, responsibilities, and authority of training and staff are clearly stated.

- Qualifications and training requirements for training staff address both appropriate subject matter and instructional skills.
- Training is organized, sequenced, and the instructional setting is appropriate.
- Lesson plans provide for consistent delivery.
- Instructional materials have been evaluated based on training needs.
- Training is conducted in an adequate manner and records are maintained.

D. Evaluation of Trainee Mastery of Objectives During Training

- Exemptions from training are objectively determined.
- Trainee performance is regularly evaluated using job performance measures and objectives.
- Weak performers are given remedial training and/or removed from the job.
- Precautions are in place to prevent test compromise.

E. Program Evaluation and Revision Based On Performance In The Job Setting

- Methods are in place to evaluate training programs and revise them as needed.
- Feedback from trainee tests, on job performance, and supervisors is used in program evaluations.
- Instructor and trainee critiques are used in the program evaluation.
- Internal and external program audits are used for evaluation.
- Training staff is routinely and objectively evaluated.

The specific training programs inspected were licensed operator (RO and SRO), nonlicensed operator (NO), shift engineer (SE), and chemistry technician (CT).

The inspection included a review of training program procedures, training materials, records, qualification standards and other applicable documents, observations of classroom and simulator training, interviews

with operators, shift engineers, chemistry technicians, instructors, supervisors, and managers.

A deficiency was noted in the licensee's training program if the specific criterion from Inspection Procedure 41500 or NUREG-1220 identified for a SAT-based program was not satisfied. The team characterized poor practices as weaknesses.

The inspection began in the Regional Office with a review of job tasks lists for each training program. Specific tasks were selected to be followed through the five elements of a SAT program. Training Department Directives (TDD) were also reviewed in preparation for the on-site inspection.

This inspection had two additional objectives besides evaluation of the SAT-based programs. The team reviewed the licensee's corrective actions associated with the unsatisfactory licensed operator requalification (LOR) program. The practice of onshift EOP training as observed by the Senior Resident Inspector was evaluated also.

2.0 Findings and Conclusions

2.1 Systematic Analyses of Jobs

The team reviewed the selected tasks (identified in Attachment 1) and the licensee's methods for task analysis to determine if a systematic method was used for identifying and selecting tasks for training and to determine if tasks for continuing and initial training are differentiated. The team sought to determine if the task analysis was adequate for development of learning objectives. The team also sought to determine if the analysis is kept current as job performance requirements change.

Initial job/task analyses (done in 1984) were based on a site-specific evaluation and modification of the generic INPO task lists. Subject matter experts (SMEs), licensee staff and managers, and instructional analysts conducted the evaluation. Tasks were added or deleted as necessary. The method used by the licensee for identifying tasks was systematic in its approach. The task lists appear to be complete. However, the task lists in their present form contain all INPO developed tasks, including those tasks not applicable for training at Vermont Yankee. This makes it difficult to identify those tasks selected for initial or continuing training. For example, one RO task selected by the team for review was questioned by the licensee as not applying to the RO position. The team noted that the task was on their list. The task was number 2620090201, "Perform Emergency AC Load Sequencing and 4 KV Emergency System Volt Relays Instrument Functional Test." The chemistry technician task list was validated and verified earlier this year. However, records of this validation were not available for review.

The status of the task-to-training matrix (TTM) made it difficult for the team to verify that all tasks and objectives were contained in the training programs. The TTM for the chemistry technician is in the process of being updated. The TTMs were incomplete and contained many errors. The revision to the TTM for the chemistry technician will relate plant procedures, tasks, learning objectives, and on-the-job (OJT) training to each other.

In spite of the difficulties described regarding the task lists and TTMs, those workers interviewed felt that they had received training on all tasks that were difficult to perform, had safety significant consequences of inadequate performance, or were required for satisfactory job performance.

The task analyses are not kept current. It appears that a conscious management decision has been made not to maintain the task analysis data base. This raises a concern about how changes to jobs in the plant are tracked, analyzed, and integrated into the training program. Examples are noted below. The team considered this a deficiency in the program (271/91-81-1).

Procedure TDD-3, "Training Program Analysis and Design," Rev. 2, dated August 1991, governing task analysis was reviewed and is considered vague. There are no explicit requirements for such things as:

- data items to be collected
- methods to be used
- criteria for decision making
- management and QA of the process

This directive, as well as all of the Training Department Directives, was recently revised to eliminate many specific requirements and detailed guidance. The previous revision of TDD-3 addressed all of the above areas. Steps to be performed in analyzing a task were described. Roles and responsibilities of personnel were defined. Specific forms which described data items to be collected were provided. Revision 2 of TDD-3 removed these details.

The team could find no formal mechanism for tracking job changes in the plant and updating the task analysis data base. The process described in TDD-17, "Training Changes and Requests," should catch many changes in the plant, but there is no requirement to analyze changes to the task level.

There is no requirement for a periodic review of task data to ensure the job environment is completely understood and reflected in the training environment.

For example, the task "Respond to Recirculation Pump Trip" was analyzed in 1984. Industry events (LaSalle) have provided more knowledge on how to perform this task. Knowledge and abilities associated with monitoring and correcting BWR power and flow oscillations as well as determining if the reactor is operating in an unstable region of the power/flow map should be included in the task. The task analysis was not updated to reflect these changes. The knowledge and skills that support task performance should be fully identified and reflected in the learning objectives. Maintenance of this knowledge base in the task data has not been occurring. The team noted, however, that licensed operators received training in the procedure changes dealing with power/flow instabilities.

2.2 Learning Objectives Derived From Analysis Which Describe Desired Performance

For each task selected by the team, an instructor guide (IG) in which the task was addressed and the associated learning objectives were reviewed. The team determined that in many cases the learning objectives were clearly stated with performance based conditions and standards identified. In other cases, conditions and standards were not clearly stated.

The team found LOT-09-005, Rev. 4, "Operational Transients II," provided very general learning objectives for the Supervisory Control Room Operator (SCRO). For example, one SCRO learning objectives is; given the procedure, describe the proper method of making verbal reports to immediate supervision or other supervisors. The procedure is not identified. The learning objectives for the SCRO are not clearly identified or covered in the lesson plan. Many of the shift engineer's (SE) learning objectives are not covered in the lesson plan either.

LOR 906-108, "RPS," was also found to describe an SCRO learning objective which was not identified in the body of the lesson plan.

The team concluded that the variation in the quality of the learning objectives stem from the lack of following the specific guidance in the Training Department Directives. These directives apply to all training programs.

2.3 Design and Implementation

Lesson plans or Instructor Guides (IGs) were reviewed to evaluate selection of methods and media, sequencing of learning objectives, and support for consistent delivery. Most of the lesson plans were

found to be adequate. Knowledge-based objectives were trained in the classroom. Skill-based objectives were trained in the laboratory, simulator, plant and on-the-job. Most of the classroom instruction was delivered by an instructor using transparencies; however, when other media (e.g. video tapes, films, slide presentations, etc.) were available they were employed as well. The mix of media showed an effort to find presentation formats that trained objectives as effectively as possible. Classroom and in-plant training was staggered to provide a continued mix of the two types of training.

The organization of the IGs was good. Sequencing of objectives was logical and care was taken that prerequisite knowledge preceded the topics it supported. Lesson plan outlines were detailed and objectives, media, aids, and reference material were cross referenced to the outline. The level of detail provided along with the cross reference of objectives, media, etc., should be sufficient to ensure consistent delivery of instruction by different instructors. However, in an effort to reduce repetitive training in the chemistry technician area an attempt should be made to combine certain basic lessons with the appropriate lessons from the applied portion of the training program. The IGs reviewed in the chemistry technician area are listed in Attachment 2.

The recent revision to TDD-13, "Instructor and Staff Training," is an improvement over the previous revision in that it references a specific training program. The team noted that new instructors were sometimes placed in the classroom prior to receiving instructor training. The team considered this to be a weakness.

Interviews with job incumbents indicated that the technical training group succeeds in presenting job relevant and responsive training. Those interviewed indicated that they viewed the instructional staff, both licensee and contractor, as dedicated, knowledgeable, and effective professionals. Operations personnel felt that licensed operator requalification (LOR) training instructors lacked plant operating experience. The team noted that three LOR training instructors did not meet the 8 hours on shift per quarter statement of TDD-13, "Instructor and Staff Training," during the previous quarter. The instructors noted that they work from forty to eighty hours of overtime each month to satisfy priority job requirements.

The team observed the Mechanical Hydraulic Control System (MHC) classroom presentation for LOR. The instructor was knowledgeable about the MHC system and was well prepared for the class. Past MHC problems encountered at the plant were reviewed. The MHC classroom lecture was effectively complemented by simulator training in the afternoon.

An operating crew was observed during a dynamic simulator scenario evaluation. All critical tasks were performed satisfactorily. The

shift supervisor exhibited positive command and control during the entire scenario. Crew communication was effective. The shift engineer maintained the "Big Picture" during the entire event and provided the shift supervisor with pertinent plant information. The crew performance showed the positive effects of the licensee's corrective actions from the February 1991 NRC requalification examination and program failure. The instructor conducted an excellent scenario critique with the shift crew. Crew members participated in the critique and discussed alternatives to improve their performance. Operations management observed and evaluated crew performance in the simulator.

The team noted that the shift engineer training program description did not include training in Emergency Plan implementation, Emergency Operating Procedures implementation, or use of Emergency Response Facility Instrumentation System (ERFIS). The team noted, however, that SEs were given training in these areas. Knowledge and skills in these areas are significant parts of the shift engineer duties as an advisor to the shift supervisor during emergencies. Competence in these areas is required for successful job performance. The incomplete program description is considered a deficiency (271/91-81-02).

Interviews with plant workers and training personnel indicated that communications and working relationships have improved recently. The team detected a stressed relationship between Training and Operations. In some cases, there appears to be a lack of respect of the other person's role. Operators and training personnel believed that communications have improved between the two departments within the last year. Communications are handled on an informal basis with the understanding that formality will be used as necessary. However, in the chemistry area the relationship appeared strong and healthy. This strong working relationship in the chemistry technician area is evident where contractors are revising IGs and relying on Chemistry Assistants for job specific content reviews.

Chemistry technician OJT is conducted at the plant and is dependent upon the availability of equipment and technicians although a chemistry laboratory is available for use at the training facility. The chemistry laboratory at the training facility is not functional (i.e., ventilation, gas lines, and drain lines not installed or connected) and has yet to be used for either initial or continuing training. The team was told that plans are underway to bring the lab up to a functional level during the next calendar year. The nonfunctioning laboratory is a weakness in the technical training group's ability to provide, maintain, and improve, through timely reinforcement of classroom based training, skills necessary for satisfactory job performance. This weakness could impact chemistry technician performance.

A review of individual chemistry technician qualification packages indicated the training had been completed; however, this was not evident based on a review of the training records maintained by the training department. The team was informed that the individual involved is being evaluated to ensure the presence of appropriate and necessary job knowledge and to determine the root cause for the loss of records. Records of training for other position categories did not reveal a similar problem. The loss of chemistry technician training completion data was identified during an internal audit by the licensee and confirmed by the team. This indicates a deficiency in the administration of individual training records (271/91-81-03).

The team noted that goals, objectives, responsibilities and authority of personnel are not always clearly stated in recently revised TDDs. For example, TDD-8, "Evaluation" states that instructors will be evaluated at least annually by the cognizant Training Department Supervisor or Training Analyst in the applicable instructional settings. TDD-13, "Instructor and Staff Training" states that all training department instructors shall be evaluated annually in all appropriate settings by any of the following personnel: Training Manager, Cognizant Supervisor, Senior Instructors, or Training Analyst. The previous revision of TDD-8 had stated explicitly that both the Training Analyst and the department supervisor must observe each instructor in the classroom and laboratory, if necessary, at least once annually. The Training Department backed off from a practice to maintain instructor quality by not requiring those most qualified, the department supervisor and Training Analyst both to evaluate instructor performance. The lack of clearly defined responsibilities and authority of personnel in the TDDs is considered a deficiency (271/91-81-04).

Persons qualified as evaluators to sign chemistry technician OJT cards at a minimum, have bachelors degrees. Formal education levels of persons in the Chemistry Department range from high school through the PhD level. During interviews, it was noted that the training instructors for the last two initial classes infrequently participated in OJT and relied on lab personnel to conduct the OJT.

Chemistry department management felt that two days of continuing training for chemistry technicians were adequate although four days were available. If additional training was determined to be necessary, management expressed a willingness to provide or support this training.

The team's review of training attendance records indicated that training was generally conducted when scheduled and attended as planned. Missed training was made up promptly. During interviews, chemistry technicians indicated that training is sometimes postponed as a result of the instructor not being ready for that day's training. When the instructor was not ready to teach, the students would

conduct OJT training at the plant.

The team reviewed the chemistry technician training conducted in February, March, and April of 1991. This training was communicator training performed by adjunct instructors on a one-on-one basis. Chemistry technicians were recently assigned the role of communicators to replace the shift engineer. The communicator position at Vermont Yankee, for Emergency Plan events, is a short term position that will be relieved within 15-30 minutes after declaration of the emergency. When initially assigned the communicator role, the chemistry technicians were uncomfortable with the responsibility. They now participate in simulator training, during their requalification training, with the operations shift. They are feeling more comfortable in their role as experience is gained. Inspection Report No. 50-271/91-26 for the emergency drill conducted on November 4, 1991, notes that there is continued need for improvement in this area.

Interviews with chemistry technicians indicated that instructors do not always provide the relationship of the training to the job and occasionally go beyond what is perceived to be needed. Most of the training, however, was considered pertinent to the job.

2.4 Trainee Evaluation of Objectives

The team reviewed the methods utilized for evaluation of trainee performance. The team sought to determine if the evaluations were based on job performance requirements and identified learning objectives; if objective performance feedback was provided; and, if remediation was provided, to correct identified performance deficiencies.

The written examination materials were derived from, and traceable to, specific learning objectives. The OJT cards clearly designate the task that is to be trained and evaluated and utilize the procedure that the task was derived from as the performance standard. OJT signoffs can only be made by individuals qualified for conducting OJT. Final task qualification signoffs can only be made by the appropriate Assistants or Department Head.

Trainee performance during initial training is evaluated regularly by means of written examinations, graded laboratory sessions, simulator evaluations, and OJT qualification. The exam bank questions for those tasks selected for followup were reviewed by the team and found to be appropriate to determine that the technical aspects of the learning objectives has been mastered. Examinations are frequently administered during the training period to provide prompt indication of trainee performance. Performance feedback is provided promptly and students indicated that the instructors are

readily available to provide assistance. During licensed operator requalification training, short quizzes are used to evaluate knowledge, provide feedback, and adjust the subsequent training emphasis. Instructors provide one-on-one remediation to students with identified training deficiencies. Laboratory sessions are evaluated immediately and the student notified of the results of the evaluation. No examples of trainee exemptions from training were found.

The exam bank for training conducted at Vermont Yankee is maintained on two sole use computers. One computer is dedicated to the operations exam bank. The second computer contains all technical training questions. The exam banks are maintained on the hard drives and utilize a tape backup. Instructors may have exam bank questions in their possession, but exam security is maintained in accordance with TDD-5, "Examination Development, Administration, and Control." Tape backups are in the custody of the Training Department Administrative Assistant. All training department personnel have access to the exam computers; however, keys for the hard drives are retained by the administrative assistant, the head records clerk, and the operations exam bank coordinator. The LOk exam bank is of sufficient size that the bank has been released for operator study.

The exam banks are comprised of individual questions stored by learning objective or system. Instructors identify those questions desired for an exam and present the list of questions to the administrative assistant. The administrative assistant then obtains a printout of the desired questions, makes the necessary number of copies, and provides the instructor with the exams. Unused copies of the exam are shredded.

The LOR exam bank coordinator maintains a historical file of questions. This is not done in the chemistry training area. Past chemistry exams are maintained in the training administration files. Exams are not reused in their entirety. Selected questions may be reused, but not an entire exam. At least 25-30% of each exam is new material. Test item analysis is performed if less than 70% of the people answer a test item correctly.

The team noted that once in the recent past, an exam was left unattended. This was discovered by the Training Manager. Immediate training of Training Department staff was conducted on exam security practices.

While a separate room is not used for the exam banks, the lockable drive sole use computers are adequate for exam security.

Exam bank questions evaluated tested student knowledge to an appropriate technical depth. Current methods in chemistry training result in the deletion, from the exam bank, of questions used on

exams. Apparently, due to the deletion of questions from the bank for exam development, certain objectives do not have any associated questions. Contractor revision of IGs will increase size of the exam bank based on the development of new questions and the entry of questions used on prior exams. The IGs revised in 1991 appear to be quality material. As of the date of this inspection, 50% of the chemistry IG's still need to be completed and are scheduled for completion by December 31, 1991. All revised IG's were dated 1991.

For the licensed operation training program, the exam bank did not appear to include questions for each learning objective. The previous revision of TDD-5 required at least two questions for each learning objective. This requirement was dropped from the current TDD-5. This is another example of where training program requirements have been recently relaxed and appear to reduce the effectiveness of the program. Training Department personnel are organizing the LOR exam bank by plant system designators. This should improve the ability to cross reference written exam questions to specific learning objectives. The team considers the lack of test items for each learning objective to be a deficiency (271/91-81-05).

Evaluation of licensed operators simulator performance is conducted using well defined criteria. Evaluation of shift engineer performance on the simulator is open ended. There are no predefined questions or evaluation criteria for the shift engineer. The lack of predefined evaluation criteria for SEs performance in simulator training is considered a deficiency (271/91-81-06).

Procedures exist and appear to be used to remove operators from licensed duties if examination results are unsatisfactory. The team noted that one licensed operator was removed from shift because of performance on the 1990 annual requalification examination. Remedial training given to individuals who failed the 1989 or 1990 annual requalification exam was reviewed. The training was adequate and given prior to operators returning to licensed duties.

The team noted that theoretical knowledge varies widely among chemistry technicians. Generally, chemistry technicians qualified prior to the implementation of the initial chemistry technician training program were weaker in theoretical knowledge. Licensee management has identified these weaknesses. During interviews, plans were described that would increase the basic theoretical knowledge level of the "older" technicians. The technicians that were identified as having limited theoretical knowledge perform their job in an adequate manner.

2.5 Program Evaluation

The team reviewed the methods utilized by the licensee to evaluate training program effectiveness. The team sought to determine if the

programs are systematically evaluated and revised based upon meaningful performance feedback.

Provisions for the evaluation of the effectiveness of the training programs have been established. These provisions include immediate feedback from the students following the completion of a course, 90-day post-training feedback, and management evaluations of the instructor. Training Coordinators also submit a report to the Training Analyst describing the current status, including strengths and weaknesses, of the program under their responsibility.

The team noted that these annual program evaluations included recommendations for improvement. However, the recommendations are not prioritized or tracked to completion. The annual evaluations were highly variable in detail. The lack of a systematic method for generating and using the program evaluations is considered a deficiency (271/91-81-07).

Students indicated that their opinions and recommendations are actively solicited and used in the evaluation and modification of the training program.

2.6 Requalification Program Corrective Actions (Unresolved Item 271/91-02-01)

The team reviewed the actions taken by the licensee to correct the cause of the unsatisfactory requalification program. A review was also made of licensee activities directed at correcting weaknesses identified in NRC Examination Report 50-271/91-02(OL). In addition, the licensee's actions to correct a noncited violation dealing with responsibility for reporting licensed operator medical changes was reviewed. Actions taken to correct the noncited violation were adequate. Actions to correct LOR program problems are identified in Vermont Yankee letters to the NRC dated March 8, 1991 (2 letters), April 30, 1991, and June 28, 1991. Facility commitments described in NRC Confirmatory Action Letter, 1-91-007, were given close attention. Two activities of the licensee are still in progress. First, management observation of each crew's performance continues until February 1992. Secondly, revisions to training materials such as simulator scenarios and JPM's are still being made. Except for these two items, the team found that the licensee had taken the actions described in their correspondence to NRC. The unresolved item remains open until completion and inspection of the long term corrective actions.

2.7 Training on Shift

The team evaluated onshift training in Emergency Operating Procedures (EOP). A concern over the appropriateness of this training was expressed by the Senior Resident Inspector. The EOP training was

conducted using a 52-page IG. The training was given in two segments of approximately two hours each to all licensed operators in the control room. This training was a preview of formal training scheduled for later this year. This training was of no immediate use and had the potential to distract the shift supervisor and the operator at the controls from their normal duties. It should have been conducted in a more favorable training environment. The team noted that NRC has provided clear guidance in circulars and information notices that training activities should not compromise operator attentiveness. Regulatory Guide 1.114, Revision 2, states that the operators attention must be given to the condition of the unit at all times. The Commission Policy Statement on the conduct of Nuclear Power Plant Operations (effective 1/24/89) states that the operator at the controls, and the immediate supervisor must be continuously alert to plant conditions and ongoing activities affecting plant operators. The team expressed concern over the training and its impact on operator attentiveness. The appropriateness of this onshift training is unresolved (UNR 271/91-81-08).

3.0 Summary of Conclusions

3.1 Systematic analysis of Jobs

A systematic method was used for identifying and selecting tasks for training when the "SAT" approach was initiated in the early 1980's.

Tasks for continuing and initial training are differentiated.

The analysis was adequate for the development of learning objectives; however, the analysis has not been kept current as job performance requirements change (Deficiency 271/91-81-01). There is no formal mechanism for insuring that job changes get factored into the task analysis data base.

Task lists were a mixture of tasks which included tasks that did not apply at Vermont Yankee. This makes the list difficult to work with.

The training department directive (TDD-3) covering program development and revision is weak and vague. It was recently changed to eliminate many requirements that are considered important.

3.2 Learning Objectives Derived from Analysis which Describe Desired Performance

In general, learning objectives were found to be related to knowledge, skills, and abilities and contain actions, conditions and standards.

Within the limited sample of lesson plans reviewed, there were several cases of learning objectives not covered in the lesson plans.

The variations in the quality of the learning objectives stem from the lack of following the specific clear guidance in the Training Department Directives.

3.3 Design and Implementation

Qualifications and training requirements for instructors address both appropriate subject matter and instructional skills. However, it was found that some instructors taught classes before they took the required training for instructors.

Training was found to be organized, sequenced, and the instructional setting appropriate.

Lesson plans provide for consistent delivery.

In the case of chemistry technician training, it appears that OJT is relied on much more than planned.

The chemistry laboratory in the training department is a missed opportunity to provide, maintain, and improve training.

Training instructors are working a lot of overtime and still cannot meet all of their requirements.

The training program description for the shift engineer was found to be missing some key training needs. This incomplete program description is a deficiency (271/91-81-02).

Training that was observed was conducted in an outstanding manner.

In general, records of training are being maintained. The loss of chemistry technician training records is considered a deficiency (271/91-81-03).

The interface and relationship between training and operators has improved over the past year, but there needs to be continued improvement.

The responsibility and authority of training and staff are not always clearly stated. This is a deficiency (271/91-81-04).

3.4 Trainee Evaluation of Objectives

Exemptions from training are very rare.

Some learning objectives did not appear to have test items associated with them. This raises the question of whether these objectives are evaluated. The lack of test items for each learning objective is a deficiency (271/91-81-05).

Trainee performance is regularly evaluated using job performance measures and objectives. However, there is no formal requirement for evaluation of shift engineers on the simulator. This is a deficiency (271/91-81-06).

Weak performers are given remedial training and/or removed from the job.

Precautions are in place and followed to prevent test compromise.

3.5 Program Evaluation

Feedback from trainee tests, critiques on job performance, and supervisor evaluations is used in program evaluations. However, the annual program evaluations are highly variable in detail and quality, and there is no systematic method for handling recommendations from these evaluations. The lack of a systematic method for generating and using the program evaluations is considered a deficiency (271/91-81-07).

The effectiveness of program audits (internal and external) for improving training programs is questionable.

The philosophy for revisions to training department directives appears to be to eliminate requirements that are difficult to meet rather than obtain resources to meet the requirements. Experience indicates that this philosophy will lead to future problems.

The team concluded the training program is as good as it is because of the dedicated people in the training organization and at the plant, not because of the systems approach to training methodology. More resources appear to be needed to maintain the systems approach to training at Vermont Yankee.

3.6 LOR Program Corrective Actions (Unresolved Item 271/91-02-01)

Except for the two ongoing longer term corrective actions the licensee has taken the actions described in their correspondence to NRC. The unresolved item remains open pending completion and inspection of the long term corrective actions.

3.7 Training on Shift

The EOP training conducted on shift appeared to be inappropriate and a compromise to operator attentiveness (see Section 2.7). This item is unresolved (UNR 271/91-81-08).

4.0 Exit Meeting Summary

The training program inspection was announced to the licensee in a letter from the Regional Office dated August 8, 1991. Licensee management was informed of the purpose and scope of the inspection at the entrance meeting on October 21, 1991. The NRC team leader discussed inspection findings with licensee management periodically throughout the inspection. Inspection findings were summarized at the exit meeting on October 25, 1991. Attendees at the entrance and exit meetings are noted in Attachment 3 of this report.

Attachments:
1. Tasks Selected for Review by the Team
2. Chemistry Technician
3. Persons Contacted

ATTACHMENT 1

Tasks Selected for Review by the Team

Chemistry Technicians

- Collect gaseous radwaste samples
- Prepare standard for zinc analysis
- Perform iodine analysis on gaseous samples
- Calibrate gaseous radiation process monitor
- Conduct OJT Training (as trainer)
- Obtain and analyze PASS of reactor coolant

Auxiliary Operator

- Charge a CRD accumulator
- Manually start RCIC
- CRD accumulator trouble
- Respond to loss of component cooling
- Operate service water strainers

Shift Engineer

- Mitigate consequences of core damage
- Independent review of ASME data
- Perform manual heat balance calculation

Senior Reactor Operator

- Supervise fuel movement
- Authorize temporary changes to plant procedures
- Determine cause of unexplained power excursion
- Authorize deviations from technical specification on procedures during an emergency

Reactor Operator

- Respond to one recirculation pump trip
- Perform boron injection using RWCU (Appendix D)
- Control scoop tube position locally (in manual)
- Shift control modes (mechanical and electrical) of the Reactor/Turbine Pressure Regulating System

ATTACHMENT 2

Chemistry Technician Instructor Guides (IG's) Reviewed by the Team

CCH-02, Nuclear Physics (6 lessons)
CCH-05, Basic Chemistry (9 lessons)
CCH-07, Radiation Detection Techniques (10 lessons)
CCH-08, Gamma Ray Spectroscopy (6 lessons)
CCH-09, Statistics Fundamentals (2 lessons)
CCH-11, Quality Control (3 lessons)
CCH-13, Radiation Monitoring Systems (13 lessons)
ACH-01, Applied Chemistry (8 lessons)
ACH-03, Sampling Techniques and Equipment (14 lessons)
ACH-05, Analytical Method I, Laboratory Sessions (7 lessons)
ACH-06, Analytical Method II (4 lessons)
ACH-13, Plant Chemistry (5 lessons)
ACH-14, Response to Emergency/Abnormal Events (6 lessons)

ATTACHMENT 3

Persons Contacted

Vermont Yankee Nuclear Power Corporation

#*W. Murphy, Senior Vice President, Operations
#*A. Chesley, Acting Training Manager
#*R. Wanczyk, Operations Superintendent
#*J. Herron, Operations Supervisor
#*L. Tkaczyk, Training Analyst
#*E. Harms, Operations Training Supervisor
#*D. Stafford, Technical Training Supervisor
#*S. Skibniowsky, Chemistry Supervisor
#M. Gosekamp, Operations Training Instructor
#R. Pagodin, Technical Services Superintendent
#J. Meyer, Project Engineer

The inspectors also held discussions with shift engineers, licensed operators, chemistry technicians, auxiliary operators, instructors, and other supervisors and managers.

New York Power Authority (James A. Fitzpatrick)

#F. Catella, Manager of Nuclear Training

U. S. Nuclear Regulatory Commission

#L. Bettenhausen, Chief, Operation Branch, DRS
#H. Eichenholz, Senior Resident Inspector

* Denotes those present for entrance meeting on October 21, 1991
# Denotes those present for exit meeting on October 25, 1991