Enclosure 1

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE
OYSTER CREEK NUCLEAR GENERATING STATION

REPORT NO. 50-219/96-99

I. BACKGROUND

The Systematic Assessment of Licensee Performance (SALP) Board convened on December 12, 1996, to assess the nuclear safety performance of the Oyster Creek Nuclear Generating Station for the period from June 25, 1995, through November 30, 1996. The board was convened pursuant to U.S. Nuclear Regulatory Commission (NRC) Management Directive (MD) 8.6, "Systematic Assessment of Licensee Performance (SALP)" (see NRC Administrative Letter 93-02). The board members included Richard W. Cooper, II, (Board Chairman), Director, Division of Reactor Projects, NRC Region I (RI); A. Randolph Blough, Deputy Director, Division of Reactor Safety, NRC RI; and John F. Stolz, Director, Project Directorate 1-2, NRC Office of Nuclear Reactor Regulation. The board developed this assessment for approval by the Region I Administrator.

The performance category ratings and the assessment functional areas used below are defined and described in NRC MD 8.6.

II. PERFORMANCE ANALYSIS - OPERATIONS

Plant Operations was rated Category 1 in the previous SALP period. Operations management demonstrated an excellent overall safety perspective and strong management oversight and involvement. Operator performance during normal operations, transients, and the refueling outage was generally very good. The licensed operator training program continued to be a strength. Although several significant operator errors were identified, the number of human performance issues continued to decrease.

During this assessment period, management effectiveness in operations was mixed. Management demonstrated a strong, conservative safety focus as evidenced by remaining at reduced power to avoid the possibility of a plant transient when a loose component was discovered in the condensate system. The subsequent shutdown and retrieval of the component were performed effectively. Operations management also provided active support of operator training programs. Management demonstrated adequate oversight of operations activities. Some weaknesses in management oversight were revealed by a number of events that were associated with ineffective supervisory oversight or poor self-checking practices. In addition, management oversight of plant scram root cause determinations and corrective actions did not prevent the continuing occurrence of scrams.

Overall, operator performance was good. Control room activities were conducted in a safe, professional manner, and control room staffing levels were above those required by technical specifications. Operators generally responded well to off-normal and transient conditions. Specifically, operator responses to automatic reactor scrams in December 1995 and April 1996 and a manual scram in October 1996 were very good. Operators

also responded well to degraded plant conditions and prevented additional transients. For example, operators took timely actions for two events in February 1996 involving a condenser tube leak and high winds, both of which required load reductions. However, slow operator response in removing the isolation condenser from service following an automatic reactor scram in September 1996, resulted in a second reactor scram signal.

Management's focus on reducing the number of human performance issues was evident, but operator errors with significant consequences continued to occur. Although the frequency of operator errors had decreased early in the assessment period, this trend did not continue, as evidenced by some notable errors in the latter half of the period that demonstrated poor control of plant evolutions. These errors often occurred during routine activities and resulted in significant events, such as the unplanned release of 133,000 gallons of slightly radioactive water into the discharge canal. This event revealed a number of weaknesses in self-checking, procedure adherence, and overall control of plant evolutions. In other events, weak supervisory oversight was a contributing factor, particularly in errors associated with reactivity management. Examples included an inadvertent control rod movement during stall flow testing in December 1995, an automatic reactor scram due to low vessel level in April 1996, and a mispositioned rod by a newly licensed operator in July 1996. In addition, notwithstanding management's emphasis on the STAR (stop, think, act, review) process in the conduct of operations, several of the errors involved weaknesses in self-checking practices and attention to detail.

A number of problems associated with configuration control were also identified. These included multiple tagging process errors on the "A" recirculation pump motor generator set, a reactor building closed cooling water system alignment error, and deficiencies associated with use of fire protection procedures such that the safety impact of opening a fire door adjoining two redundant safety-related switchgear rooms was not documented in a safety evaluation.

The problem identification and corrective action processes were generally effective. Operations personnel routinely identified and documented problems at a low threshold, prior to challenges to plant safety systems. Trending of problems was also effectively accomplished. However, operations follow-up actions for some deficiencies were occasionally incomplete. Examples included the lack of appropriate compensatory measures for a failed stator temperature recorder, and incomplete actions taken in response to a mislabeled control room recorder channel. In addition, repetitive human performance issues associated with some instances of weak supervisory oversight or poor self-checking practices revealed that corrective actions in this area were not always effective. Additionally within the general area of corrective actions, the lack of a formal, rigorous, and well-understood operator workaround program contributed to the slow resolution of some degraded conditions of lower significance. Some major, long-term operator workarounds, though, were corrected, such as the replacement of two thermal dilution gates in the intake structure.

The operator training and licensed operator requalification programs were considered strengths. The requalification program was effectively implemented and received strong management support. All candidates for license examinations passed. Good instructor and facility management involvement in license examinations was also observed.

In summary, overall operations performance was good. Operations management's safety perspective continued to be strong. Operator training and requalification programs were excellent. Operator response to off-normal events and transients was also generally very good. However, despite management's emphasis on reducing the number of events attributed to human performance deficiencies, several operator errors occurred in the latter half of the assessment period that demonstrated poor control of plant evolutions. In addition, plant scram root cause determinations and corrective actions did not prevent the continuing occurrence of scrams. Mixed performance in management and supervisory oversight and continued operator errors detracted from the otherwise strong safety focus and effective response to off-normal and transient conditions.

The licensee's performance in the operations functional area is rated Category 2.

III. PERFORMANCE ANALYSIS - MAINTENANCE

Maintenance was rated Category 2 in the previous SALP period. Outage risk management was excellent. Significant improvements were observed in the surveillance program. However, there were several instances where communications failures, breakdowns in the control of maintenance, or weak supervisory oversight and technical support resulted in plant challenges.

During this assessment period, the area of maintenance was effectively managed. Most routine maintenance activities were conducted safely in accordance with station procedures. Good management oversight was evident, and maintenance personnel were knowledgeable of ongoing activities. Management demonstrated appropriate safety focus and made conservative decisions, such as when the plant remained shut down following a scram in December 1995, to perform repairs on the auxiliary flash tank large pump. However, several errors occurred while performing maintenance activities, due to poor work practices, inattention to detail and various other causes. For instance, inattention to detail during a maintenance activity resulted in a containment spray heat exchanger relief valve being inadvertently opened, allowing primary containment to communicate with secondary containment for over a day. Other examples included the deficient reassembly of a torus-to-drywell vacuum breaker valve cover, inadequate post maintenance testing of an average power range monitor trip flow bias circuit, and an improperly secured vital motor control center following maintenance.

The maintenance backlog was well-managed to ensure that outstanding work did not adversely affect plant operations. Maintenance planning was effective in developing work packages for maintenance activities. Maintenance programs, including the outage risk management and on-line maintenance programs were appropriately implemented to ensure that safety-related equipment was available to operate as designed. The inservice inspection (ISI) program was well-documented, controlled and implemented.

Plant material condition, with minor exceptions, remained good. A good questioning attitude by maintenance technicians resulted in the identification and correction of a number of equipment problems. Examples included the replacement of two differential transmitters associated with the reactor building-to-torus vacuum breakers, and the

correction of improperly installed cross pieces in bearing oilers on the augmented spent fuel pool cooling pumps. Additionally, there was a lack of significant repetitive equipment failures, indicating that degraded conditions were being effectively addressed.

Early in the assessment period, there were several instances of poor implementation of the foreign material controls program, which presented challenges to station personnel and plant equipment. Examples included metal debris in the discharge check valve of the "A" spent fuel pool cooling pump and multiple items in the suction line of the 1B high purity pump. The licensee established a working group to evaluate the problem and recommend corrective actions. Improvements in foreign material controls were apparent later in the assessment period.

The licensee continued to exhibit some weaknesses in implementation of the surveillance test program. For example, scheduling and oversight errors resulted in a missed scram discharge volume quarterly surveillance test. The licensee was proactive in identifying an adverse performance trend in this area and devoting resources to thoroughly evaluate the program and develop lasting corrective actions. No significant, recurring problems in this area were observed in the last six months of the assessment period; however, the long-term effectiveness of the corrective actions has yet to be determined.

Problems were appropriately identified for correction. Root cause analyses and corrective actions for identified problems were generally good, based in part on the low number of repetitive equipment problems. However, the resolution of personnel performance issues was less effective. Self-assessment initiatives were well-structured and effectively conducted. Maintenance personnel and management were receptive to self-assessment recommendations.

In summary, overall performance in the maintenance area improved as exhibited by a low threshold for problem identification and correction of problems by technicians and the low number of repetitive equipment problems. Maintenance planning, the corrective maintenance backlog, and self-assessment efforts were all well-managed. The resolution of hardware deficiencies was generally very good. However, instances of personnel performance errors continued to be noted, indicating that problems in this area have not been fully resolved. Deficiencies related to foreign material controls early in the assessment period were corrected. Short-term corrective actions for weaknesses in the implementation of the surveillance test program were also effective.

The licensee's performance in the maintenance functional area is rated Category 2.

IV. PERFORMANCE ANALYSIS - ENGINEERING

Safety performance of the engineering function was rated as Category 1 in the last SALP. Management involvement and oversight of the area resulted in high-quality engineering activities. Modifications were based on thorough calculations and analyses, and the evaluation of deficient equipment conditions was prompt and conducive to improved equipment reliability. In contrast to this overall strong performance in engineering were the significant weaknesses associated with the emergency diesel generator (EDG) modification.

However, those weaknesses were limited to that modification, and the licensee's corrective actions were thorough and effective.

During this SALP period, the licensee continued to provide effective management oversight, involvement and controls for engineering activities. System engineers were active in plant operation and problem resolution. The licensee's use of multi-disciplined teams, under the direction of the system engineer was effective for resolution of problems and for planning of engineering work. Engineering management oversight and involvement in plant operation and emerging engineering issues were strengths, as was coordination among departments. Examples of effective work on engineering issues included standby gas treatment system duct repairs, evaluation of feedwater heater level control problems, and efforts to reduce biofouling. One lapse of oversight and involvement occurred, wherein formal technical evaluation of increased vibration of emergency service water system piping was not completed until a year after the modification that had resulted in the increase.

Technical issues were properly evaluated, and engineering products were of high quality in nearly all cases. Design change and temporary design change control were well managed. Several modifications were implemented to remedy operator workarounds and reduce operator burden. Engineering backlog was well-controlled. The licensee used industry experience effectively to highlight potential problems and safety issues. However, the licensee technical staff were not always meticulous in the use of, and updating of, design information and the licensing basis. For example, licensee evaluations were either incomplete or undocumented for installation of a control rod drive (CRD) jockey pump and for application of AC fuses in DC circuits. Also, cable failures at a rate above nominal industry experience continue to occur at Oyster Creek, indicating the need for additional attention to technical evaluations and to the test program.

The licensee's root cause analysis and self-assessment programs were strong. Engineering evaluations were very good with thorough root cause analyses and corrective actions. For example, root cause analyses led to improvements in the recirculation system controls and the trunnion room ventilation system. Good engineering efforts were applied early in the SALP period to resolving issues identified by a previous NRC inspection of the Motor-Operated Valve (MOV) program; late in the period the licensee voluntarily initiated another (MOV) program review, based on issues found at TMI. The licensee also used TMI experience productively during its service water system review early in the SALP period.

In summary, the licensee's communications, planning, safety evaluations, technical resolutions of problems and interface among departments have been strengths. There was excellent use of industry experience for effective management of potential problems. Temporary modifications were effectively controlled. The root cause and MOV programs were managed effectively. Some problems exist concerning the constructive use and maintenance of design and licensing basis information. Cable failure problems are above industry norms and warrant additional attention.

The licensee's performance in the engineering functional area is rated Category 1.

V. PERFORMANCE ANALYSIS - PLANT SUPPORT

In the last SALP, the plant support functions effectively contributed to plant and worker safety, and overall performance was rated as Category 2. Performance in the radiation protection area was very good. Steady improvement was noted in exposure reduction; however, several problems with the control of shielding indicated a program weakness, and the high in-plant source term continued to be a challenge. Very good performance in the radiological effluent and environmental monitoring programs was also noted. There was excellent performance in the emergency preparedness area. Security program performance was good; however, repetitive lighting problems were identified. Plant housekeeping and material condition were excellent.

During this SALP period, the radiation protection program was generally effective in protecting the public and workers from radiation and was successful in the implementation of some ALARA initiatives that lowered radiation exposure to workers. A very good program for radioactive waste management was established and implemented. Radiation Protection staff members were highly qualified and received very good initial training and periodic refresher training. The self-identification and corrective action systems continued to improve the quality of the program. However, lapses existed in controls for high radiation areas and radiological informational postings in the drywell. Licensee response, followup and corrective actions were excellent for events and performance lapses. Although there has been some emphasis on efforts to make worker radiation exposures as low as is reasonably achievable (ALARA), and there have been reductions in the historically high in-plant radiation source term, significant opportunities still exist for reducing collective worker exposures.

The licensee maintained very good effluent control and environmental monitoring programs. The responsible individuals were knowledgeable with respect to the implementation of their programs, and effectively implemented the relevant procedures. The licensee continued to effectively manage and recycle liquid radioactive wastes so as to obviate any need for planned radioactive liquid releases. Liquid radioactivity was released inadvertently on two occasions, one of which involved a large volume of liquid, but no significant radiological consequences resulted. Performance weaknesses that led to the latter release are discussed in the Operations area. Licensee audits were of sufficient depth to assess program strengths and weaknesses.

The licensee maintained a good emergency preparedness (EP) program. The plan and procedures were current and effectively implemented. Emergency facilities were operationally ready. EP program audits satisfied NRC requirements. The licensee used semi-annual trending reports of EP action items to identify trends and to update priorities. Although the emergency response organization training and qualification were good and records were generally current, there were some training administration inconsistencies. Early in the period, there was a problem with repetitive failures to implement EP facility surveillances, but this was later corrected. EP exercise performance was good.

The security program benefitted from strong management support to improve security equipment. Weaknesses from the last SALP period involving training deficiencies and repetitive lighting problems were properly resolved. The security program had controls for

identifying, resolving and preventing security program problems. Audits were comprehensive and technically oriented. However, isolated lapses occurred in vehicle searches and in a compensatory measure during maintenance that affected a security barrier.

Fire Protection program implementation was very good and fire protection equipment was maintained in excellent condition. Plant housekeeping was typically good.

Overall, the plant support functions achieved good to very good performance during this period. Efforts to identify problems and to improve programs were evident in all areas. Some lapses occurred in in-plant radiological controls, EP program administration, and security measure implementation, but none of these lapses were extensive or had major impact. Despite licensee efforts that have produced some good results, significant opportunities still exist for reducing worker radiation exposures to levels that are ALARA.

The licensee's performance in the plant support functional area is rated Category 2.

Enclosure 2

12 MONTH INSPECTION PLAN FOR OYSTER CREEK NUCLEAR GENERATING STATION

IP - Inspection Procedure
TI - Temporary Instruction
CO - Core Inspection
SI - Safety Issue Inspection
RI - Regional Initiative Inspection

INSPECTION	TITLE/PROGRAM AREA	START DATE	TYPE OF INSPECTION COMMENTS
IP 37550	Engineering - Visit 1	3/31/97	CO
IP 62706	Maintenance Rule Inspection Team	4/7/97	Special Review on Maintenance Rule Program
IP 81700	Physical Security - Visit 1	4/28/97	CO
IP 62705	Electrical Maintenance (Components and Systems)	5/19/97	RI, Focus on problems with old cable design and installation
IP 84750	Effluent Controls	5/19/97	CO
IP 37550	Engineering, Visit 2	7/28/97	CO
IP 82302	Review EP exercise objectives and scenario	8/18/97	CO
IP 84750	Environmental Monitoring	9/8/97	CO
IP 82301	EP Exercise - Full Participation	10/20/97	CO
IP 37550	Engineering, Visit 3	1/5/98	CO
IP 61726	Surveillance Observations	TBD	RI, Review surveillance testing corrective actions
IP 83750	Occupational Radiation Exposure	TBD	CO
IP 86750	Solid Radwaste Management and Transportation	TBD	CO
IP 71001	Licensed Operator Requalification Program	TBD	CO
IP 73753	Inservice Inspection	TBD	CO