UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:
Sheldon J. Wolfe, Chairman
Emmeth A. Luebke
Dr. Jerry Harbour

In the Matter of	)	
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE, ET AL. (Seabrook Station, Units 1 and 2)	)	Docket No.(s) 50-443/444-OL-1 On-site EP September 16, 1988

AFFIDAVIT OF ROBERT D. POLLARD

I, Robert D. Pollard do make oath and say:

1. My name is Robert D. Pollard. Since February 1976, I have been employed as a nuclear safety engineer by the Union of Concerned Scientists. My business address is 1616 P Street, N.W. Washington, D.C. 20036. Previously, I was employed by the United States Nuclear Regulatory Commission as a Licensing Project Manager for commercial nuclear power plants.

2. In May 1959, I enlisted in the United States Navy and was selected to serve as an electronics technician in the nuclear power program. After completing the required training, I became an instructor responsible for teaching naval personnel

both the theoretical and practical aspects of operation, maintenance and repair for nuclear propulsion plants. From February 1964 to April 1965, I served as the senior reactor operator, supervising the reactor control division aboard the U.S.S. Sargo, a nuclear-powered submarine. In May 1965, I was honorably discharged from the U.S. Navy and attended Syracuse University, where I received the degree of Bachelor of Science magna cum laude in electrical engineering of June 1969.

3. In July 1969, I was hired by the United States Atomic Energy Commission (AEC) and continued as a technical expert with the AEC and its successor, the United States Nuclear Regulatory Commission (NRC) until February 1976. After joining the AEC, I completed a year of graduate studies in advanced electrical and nuclear engineering at the Graduate School of the University of New Mexico in Albuquerque. I subsequently advanced to the positions of Reactor Engineer (Instrumentation) and Project Manager with AEC/NRC. As a Reactor Engineer, I was primarily responsible for performing detailed technical reviews analyzing and evaluating the adequacy of the design of reactor protection systems, control systems and emergency electrical power systems in proposed nuclear facilities. In September 1974, I was promoted to the position of Project Manager and became responsible for planning and coordinating all aspects of the design and safety reviews of applications for licenses to construct and operate several commercial nuclear power plants.

4. In the course of my six and a half years with the AEC and NRC, I performed technical reviews, analyses and evaluations of designs of systems and components necessary for safe operation of reactor facilities under normal, abnormal and emergency conditions for the purpose of determining whether such systems complied with NRC rules and provided an acceptable level of safety for the public. In particular, I was assigned to the agency's safety review of the operating license applications for Indian Point Units 2 and 3 which, like the Seabrook plant, were designed by Westinghouse.

5. For the past twelve years, I, along with other members of the UCS's professional staff, have conducted numerous studies pertaining to the safety and reliability of nuclear power plants, both on a generic and plant-specific basis. I have provided technical analysis for UCS's participation in rulemaking proceedings before the Nuclear Regulatory Commission and for UCS's litigation against the NRC for failure to fulfill its responsibilities under the Atomic Energy Act. I testified before the President's Commission on the Accident at Three Mile Island which investigated that 1979 accident. I participated as an expert witness in the NRC's adjudicatory proceeding on the restart of Three Mile Island Unit 1. I have also testified on matters pertaining to reactor safety before numerous committees of the United States Congress and various other state and local legislative and administrative bodies. Thus,

my 18 years of professional experience on the technical staffs of the AEC, NRC, and USC gives me a first-hand knowledge of NRC regulations and how they are developed, administered and interpreted.

6. On June 27 - 29, 1988 Seabrook Station conducted a FEMA/NRC graded exercise. In that graded exercise, objectives were defined for the Seabrook Station, the New Hampshire Yankee Offsite Response Organization and the States of Maine and New Hampshire. FEMA/NRC Graded Exercise, Chapter 2, Sections 2.2 -2.5. Classed under the Seabrook Station personnel who participated in this exercise are the Control Room/Simulator - Control Room, the Technical Support Center ("TSC") and the Emergency Operations Facility ("EOF") (hereafter referred to as licensee onsite emergency response personnel or onsite emergency staff, notwithstanding the offsite location of the EOF.) During an emergency, the EOF and TSC are responsible for, inter alia, making recommendations for protective actions that are carried out onsite. Thus, in assessing the adequacy of onsite emergency preparedness, the NRC evaluates actions taken by the TSC and the EOF.

7. Among the established objectives for the licensee's onsite Seabrook Station emergency plan was the following: "Demonstrate the ability to analyze station conditions, parameter trends and develop potential solutions for placing the unit in a safe, stable condition. The Control

Room, T[echnical] S[upport] C[enter] and E[mergency] O[perations] F[acility] will demonstrate this objective." 1988 FEMA/NRC Graded Exercise at 2.2-2. One of the major objectives of an emergency response plan is to minimize the release of radioactive materials outside the plant. Thus, the emergency plan must provide for training and qualifying personnel on the emergency tasks for which they are responsible as specified in the plan. Among the most important functions for which trained qualified personnel are needed is to assess the plant condition to develop appropriate strategies for coping with the accident and to prioritize the various potential solutions to the accident.

8. The personnel responsible for assessing plant conditions must have adequate understanding of the plant's design, the identified design basis accidents and the effectiveness of each of the plant's discrete safety systems as they relate to the mitigation of those specific accidents. Without that understanding those personnel would be unable or unlikely to develop appropriate solutions and take the appropriate actions in response to a particular accident.

9. For example, the emergency feedwater system is one of Seabrook's engineered safety feature systems. This system was designed to assist in mitigating some Seabrook design basis accidents such as loss of main feedwater and <u>small</u> break LOCA. However, the emergency feedwater system would have little or no

potential for mitigating a large break LOCA. Such knowledge of the benefits and limitations of each safety system in mitigating the effects of a particular design basis accident is one of the most fundamental criteria for accurately judging whether the TSC and EOF staff have been properly trained and qualified to carry out the onsite emergency plan.

10. An exercise scenerio was developed to test the objectives established for the NRC and FEMA graded exercise with regard to the state of the licensee's onsite preparedness. This accident scenario is described in Chapter 5 and in more detail in Chapter 6 of the document entitled 1988 FEMA/NRC Graded Exercise. The pertinent aspects of this scenario with respect to the emergency feedwater system are as follows:

a) The initial conditions of the scenario were that the plant is at 100% power and one of the emergency feedwater pumps is out of service;

b) During a controlled shutdown of the reactor at 20% per hour another emergency feedwater pump is disabled;

c) At this point the controlled shutdown is stopped and attempts to restore to operability one of the EFW pumps begin.

d) A large break LOCA occurs.

11. The scenario called for a halt in the controlled shutdown when the second EFW pump was disabled apparently because continued shutdown of the plant could create the need for operation of the emergency feedwater system. Thus, in my view, halting the shutdown and trying to repair the EFW pump would be the correct actions under those circumstances. However, as soon as the licensee's onsite emergency planning staff in the TSC and EOF recognized that a large break LOCA had occurred, they should have then recognized that any further efforts to repair the emergency feedwater system were of little or no value in bringing the reactor to a safe stable condition and reducing the radiation release to the environment and the public. In fact "efforts continued to restore the Emergency Feedwater Pump after a large break LOCA." Inspection Report 50-443/88-09 at 5. (Attached as Exhibit A hereto.) This ineffectual action is one example cited by the NRC staff in support of its conclusion that:

> "The Technical Support Center (TSC) and Emergency Operations Facility (EOF) staff displayed questionable engineering judgement . . . ." (Exhibit A at 5)

12. As noted earlier, the exercise objective was to demonstrate the onsite staff's ability to analyze plant conditions, analyze parameter trends and develop potential solutions. The NRC Staff classed as an exercise strength that "[p]lant conditions were quickly recognized and classified"

(Exhibit A at 4), i.e. apparently the onsite emergency staff recognized from plant parameters that a large break LOCA had occurred. The NRC labelled as an exercise weakness the questionable engineering judgment displayed by the onsite staff's continued efforts to restore the EFW pump to operability despite having identified the accident as a large break LOCA. In my view, a more fundamental flaw or deficiency is revealed by these actions than simply "questionable engineering judgment." The fundamental deficiency is that the exercise established that the licensee's onsite staff did not demonstrate an ability to develop potential solutions for placing the reactor in a safe stable condition. In this scenario the reactor was in the midst of a major accident with the potential for enormous offsite radiation doses but the onsite emergency personnel occupied themselves with activities that had little or no potential for preventing or mitigating such releases. Thus, rather than simply revealing questionable judgment such actions indicate a seriously deficient level of competency in developing "potential solutions for placing the unit in a safe stable condition". 1988 FEMA/NRC Graded Exercise at 2.2-2. No doubt the NRC Staff's finding that "the Licensee's performance demonstrated that they could implement their Emergency Plan and Emergency Plan Implementing Procedures in a manner which would adequately provide protective measures for the health and safety of the public" was based on the fact

that the inappropriate efforts to restore the EFW pump did not complicate the accident or exacerbate the consequences. However, under other accident scenarios the onsite staff's incapacity to "develop potential solutions" could complicate the accident and exacerbate the consequences. In this instance an inadequately trained onsite response staff did no additional harm, but there is no basis for concluding that the actions of an inadequately trained staff would be of no negative consequences for the public in all accidents.

13. Another indication of the lack of adequate onsite staff training was that "[n]o effort was noted to blowdown Steam Generators to lessen the heat load in containment" (Exhibit A at 5). The NRC Staff labelled this observation an "exercise weakness." One of the goals of the emergency reponse to an accident is to rapidly reduce containment temperature and pressure following a LOCA thereby lessening the magnitude of any radiological release. One of the sources of heat for the containment is the heat stored in the Steam Generators. In this particular accident scenario, blowdown of the Steam Generators would contribute to reducing the containment heat load thereby assisting in achieving the goal of rapid reduction in containment temperature and pressure. In my view, the failure to blowdown the Steam Generators stems from the same basic deficiency that resulted in the continued efforts to restore the EFW pump, i.e., the onsite emergency response personnel do

not have a sufficient level of knowledge of the potential solutions available to mitigate the onsite and offsite rediological consequences of an accident. In the case of the attempt to restore the EFW pump, the emergency response personnel were expending effort which, even if successful, had little or no potential for placing the reactor in a safe, stable condition or reducing the radioactive release. In the case of the steam generator blowdown, the emergency response personnel made no effort to take action, which if successful, would have contributed to reducing the radioactive release.

14. A related aspect of the onsite staff's inability to develop potential solutions for placing the reactor in a safe stable condition is the NRC Staff's conclusion that "[a] questionable fix for the Containment Building Spray system" (Exhibit A at 5) was used. In this particular case, the onsite emergency staff was taking action that had the potential for mitigating the radiological consequences, but the nature of those efforts give rise to questions, as the Staff found, about the engineering judgment of the personnel responsible for implementing the onsite emergency plan.

15. In summary, onsite emergency response personnel failed to take an appropriate action (Steam Generator Blowdown), expended efforts on inappropriate actions (continued efforts to restore the EFW pump) and implemented appropriate action with a "questionable fix" (Containment Building Spray System). Thus,

contrary to the objective of the exercise, the onsite emergency response staff did not demonstrate an "ability to analyze station conditions, parameter trends and develop potential solutions for placing the unit in a safe, stable condition."

16. Two distinct objectives of the licensee onsite emergency plan are: 1) to recommend the appropriate offsite actions to mitigate the consequences which result from the amount of radioactive material being released; and 2) to take actions onsite to reduce or terminate the release of radioactive material. Adequate onsite emergency preparedness requires the capability to accomplish both objectives.

17. In this case, the NRC staff classed as an exercise strength its conclusion that that "Protective Action Recommendations (PARS) were prompt and conservative," and as an exercise weakness the onsite staff's "lack of effort to locate and isolate the release path." (Exhibit A at 5). The first step in attempting to reduce or terminate releases from the plant is to identify the location or path by which the radioactive material is escaping. The failure of the onsite staff to expend any effort in this regard is a fundamental deficiency that is not and can not be counterbalanced by a capacity to recommend the appropriate offsite measures. Whether the failure to attempt to locate and isolate the release path was due to inadequate training, inadequate numbers of personnel or some other factor, it remains a significant and

fundamental deficiency in the state of onsite emergency preparedness.

18. In addition, with respect to the issuance of a low power license, the failure to attempt to locate and isolate the release path is of particular importance since low power operation does not require adequate offsite emergency planning. In short, the critical aspect of an onsite radiological emergency plan during low power operation is the capacity of the onsite staff to prevent any release that would require offsite emergency measures. Thus, the NRC Staff's claim that the offsite PARS were "prompt and conservative" is of no relevence to the issuance of a low power license.

19. The NRC staff classified the failure of both the EOF and TSC staff to question "a release of greater then 7000 curies per second with only clad damage and no core uncovery" as an exercise weakness in that the onsite emergency preparedness personnel "did not recognize or address technical concerns." (Exhibit A at 5). This failure of both the TSC and EOF staff is an indication that the onsite emergency response personnel's knowledge of the relationship between the magnitude and rate of a radioactive release and the amount of core damage is seriously deficient.

20. During an emergency such as a major accident, the onsite emergency response staff faces an unusual, complex set of circumstances with limited information and the potential for

some information to be erroneous due to equipment failures. In attempting to analyze station conditions, the licensee's staff may be confronted with indications of a large radioactive release and little core damage or a small release with major core damage. Without a sound knowledge of the magnitude of releases possible under varying degrees of core damage, the emergency response staff may not recognize that their analysis of plant conditions is incorrect, leading them to take incorrect protective actions or fail to take the correct protective actions.

Signed under the pains and penalties of perjury this 16th day of September 1988.

Robert D. Poilard

Exhibit A

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-443/88-09

Docket No. 50-443

License No. CPPR-135 Priority _____ Category C

Licensee: Public Service Company of New Hampshire
P. O. Box 330
Manchester, New Hampshire 03105

Facility Name: Seabrook Nuclear Power Station

Inspection At: Seabrook, New Hampshire

Inspection Conducted: June 27-29, 1988

Inspectors: _____ July 6 1988
E. Fox, Senior Emergency Preparedness Specialist, DRSS — date

C. Amato, EPS
C. Gordon, EPS
S. Peleschat, EPS
D. Ruscitto, RI, Seabrook
D. Perrotti, NRR
J. Jamison, PNL

Approved By: _____ 7/6/88
W. J. Lazarus, Chief, EPS, FRSSB, DRSS — date

Inspection Summary: Inspection on June 27-29, 1988 (Report No. 50-443/88-09)

Areas Inspected: Routine, announced emergency preparedness inspection and observation of the licensee's annual full-participation emergency exercise performed on June 28-29, 1988. The inspection was performed by a team of seven NRC Region I, headquarters and contractor personnel.

Results: No violations were identified. Emergency response actions were adequate to provide protective measures for the health and safety of the public.

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DETAILS

1.0 Persons Contacted

The following licensee representatives attended the exit meeting held on June 29, 1988.

E. Brown, President and Chief Executive Officer
D. Bovino, Exercise Coordinator
P. Casey, Senior Emergency Planner
T. Feigenbaum, Vice President Engineering/Quality
G. Gram, Executive Director, Emergency Preparedness and Community Affairs
T. Harpster, Director, Emergency Preparedness Licensing
D. Moody, Station Manager
P. Stroup, Director, Emergency Implementation and Response
G. Thomas, Vice President, Nuclear Production
J. MacDonald, Radiological Assessment Manager

The team observed and interviewed several licensee emergency response personnel, controllers and observers as they performed their assigned functions during the exercise.

2.0 Emergency Exercise

The Seabrook Nuclear Power Station full-participation exercise was conducted on June 28, 1988 from 9:00 AM to 7:00 PM. The State of New Hampshire, 11 local towns and the State of Maine participated. The Commonwealth of Massachusetts and 6 local towns in New Hampshire did not participate. The State of New Hampshire compensated for the local non-participants. The New Hampshire Yankee Offsite Response Organization (NHY ORO) compensated for the Commonwealth non-participants. The licensee, New Hampshire, Maine and NHY ORO conducted field monitoring activities, an ingestion pathway exercise and recovery and reentry activities on June 29, 1988. The Federal Emergency Management Agency (FEMA) observed all off-site activities.

2.1 Pre-exercise Activities

Prior to the emergency exercise, NRC Region I and FEMA representatives held meetings and had telephone discussions with licensee representatives to discuss objectives, scope and content of the exercise scenario. As a result, minor changes were made in order to clarify certain objectives, revise certain portions of the scenario and ensure that the scenario provided the opportunity for the licensee to demonstrate the stated objectives as well as those areas previously identified by NRC and FEMA as in need of corrective action.

NRC observers attended a licensee briefing on June 27, 1988, and participated in the discussion of emergency response actions expected during the various phases of the scenario. The licensee stated that controllers would intercede in exercise activities to prevent scenario deviation or disruption of normal plant operations.

The exercise scenario included the following events:

- Fuel damaged by loose parts;
- Damage to a turbine driven emergency feedwater pump;
- Large break Loss of Coolant Accident (LOCA) due to a total weld failure;
- Venting of the containment into the containment enclosure building with a subsequent elevated, filtered release to the atmosphere;
- Declaration of Alert, Site Area Emergency and General Emergency Classifications;
- Calculation of offsite dose consequences; and
- Recommendation of protective actions to off-site officials.

2.2 Activities Observed

During the conduct of the licensee's exercise, seven NRC team members made detailed observations of the activation and augmentation of the emergency organization, activation of emergency response facilities, and actions of emergency response personnel during the operation of the emergency response facilities. The following activities were observed:

1. Detection, classification, and assessment of scenario events;
2. Direction and coordination of the emergency response;
3. Augmentation of the emergency organization and response facility activation;
4. Notification of licensee personnel and offsite agencies of pertinent plant status information;
5. Communications/information flow, and record keeping;

6. Assessment and projection of offsite radiological dose and consideration of protective actions;

7. Provisions for inplant radiation protection;

8. Performance of offsite and inplant radiological surveys;

9. Maintenance of site security and access control;

10. Performance of technical support, repair and corrective actions;

11. Assembly, accountability and evacuation of personnel;

12. Preparation of information for dissemination at the Emergency News Center; and

13. Management of recovery and reentry operations.

3.0 Exercise Observations

3.1 Exercise Strengths

The NRC team noted that the licensee's activation and augmentation of the emergency organization, activation of the emergency response facilities, and use of the facilities were generally consistent with their emergency response plan and implementing procedures. The team also noted the following actions that provided strong positive indication of their ability to cope with abnormal plant conditions:

1. Very good command and control of all emergency response facilities (ERF's) was demonstrated;

2. Plant conditions were quickly recognized and classified;

3. Shift turnover was accomplished smoothly and with no apparent loss of control of the situation;

4. The ERF's were activated in a timely manner; and

5. Protective Action Recommendations (PAR's) were prompt and conservative. Evacuation time estimates were effectively utilized in determining the PAR's.

3.1 Exercise Weaknesses

The NRC identified the following exercise weaknesses which needs to be evaluated and corrected by the licensee. The licensee conducted an adequate self critique of the exercise that also identified these areas.

1. The Technical Support Center (TSC) and Emergency Operations Facility (EOF) staff displayed questionable engineering judgement and/or did not recognize or address technical concerns (50-443/88-08-01). For example:

   - Neither the EOF or TSC staff questioned a release of greater than 7000 curies per second with only clad damage and no core uncovery;

   - Efforts continued to restore the Emergency Feedwater Pump after a large break LOCA;

   - A questionable fix for the Containment Building Spray system;

   - A lack of effort to locate and isolate the release path; and

   - No effort was noted to blowdown Steam Generators to lessen the heat load in containment.

2. The TSC and Operational Support Center (OSC) have multiple entrances and exits that are not controlled. As a result, contamination controls were ineffective at times as personnel entered without frisking and it couldn't be determined if continuous accountability was, or could be, maintained (50-443/88-09-02).

3. No apparent consideration was given to the departing first shift to account for possible dose when leaving the plant during the release, as they were not given dosimetry (50-443/88-09-03).

4. The response to some questions in the Media Center were not adequate such as: the NRC's role in an emergency; and why a reactor trip wasn't performed earlier (50-443/88-09-04).

4.0 Licensee Actions on Previously Identified Items

The following items were identified during a previous inspection (Inspection Report No. 50-443/87-25). Based upon observations made by the NRC team during the exercise the following opens item were acceptably demonstrated and are closed:

(CLOSED) 87-25-01 IFI: The simulator Shift Supervisor did not use classification procedures and failed to recognize the loss of both Radiation Monitoring Systems trains as an Unusual Event.

(CLOSED) 87-25-02 IFI: Lack of a Post Accident Containment air sample prevented dose assessment personnel from estimating the containment atmosphere iodine concentration.

5.0 Licensee Critique

The NRC team attended the licensee's post-exercise critique on June 29, 1988, during which the key licensee controllers discussed observations of the exercise. The licensee indicated these observations would be evaluated and appropriate corrective actions taken.

6.0 Exit Meeting and NRC Critique

The NRC team met with the licensee representatives listed in Section 1 of this report at the end of the inspection. The team leader summarized the observations made during the exercise.

The licensee was informed that previously identified items were adequately addressed and no violations were observed. Although there were areas identified for corrective action, the NRC team determined that within the scope and limitations of the scenario, the licensee's performance demonstrated that they could implement their Emergency Plan and Emergency Plan Implementing Procedures in a manner which would adequately provide protective measures for the health and safety of the public.

Licensee management acknowledged the findings and indicated that appropriate action would be taken regarding the identified open items.

At no time during this inspection did the inspectors provide any written information to the licensee.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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In the Matter of	)	
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE, ET AL. (Seabrook Station, Units 1 and 2)	)	Docket No.(s) 50-443/444-OL-1

CERTIFICATE OF SERVICE

I, John Traficonte hereby certify that on September 16, 1988, I made service of the within Notice of Appearance and Motion to Admit Exercise Contention or, in the Alternative, to Reopen the Record, by first class mail, or by Federal Express as indicated by [*], or by hand delivery as indicated by [**], to:

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Dated: September 16, 1987