

CERTIFIED

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MAY 3-6, 1989

ACRS-2645
PDR 10/11/90

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MAY 3-6, 1989

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574-6/89

April 19, 1989.

Yvonne M. Sabine,

*Director, Council and Panel Operations,
National Endowment for the Arts.*

[FR Doc. 89-0817 Filed 4-24-89; 8:45 am]

BILLING CODE 7537-01-05

Design Arts Advisory Panel; Meeting

Pursuant to section 10(a)(2) of the Federal Advisory Committee Act (Pub. L. 92-463), as amended, notice is hereby given that a meeting of the Design Arts Advisory Panel (Design Advancement/Individuals Section) to the National Council on the Arts will be held on May 17-18, 1989, from 9:00 a.m.-5:30 p.m. and May 19, 1989, from 9:00 a.m.-5:00 p.m. in Room 730 at the Nancy Hanks Center, 1100 Pennsylvania Avenue, NW., Washington, DC 20506.

A portion of this meeting will be open to the public on May 19, 1989 from 2:30 p.m.-5:00 p.m. The topics for discussion will be policy issues.

The remaining portion of this meeting on May 17-18, 1989 from 9:00 a.m.-5:30 p.m. and May 19, 1989, from 9:00 a.m.-2:30 p.m. is for the purpose of Panel review, discussion, evaluation, and recommendation on applications for financial assistance under the National Foundation on the Arts and the Humanities Act of 1965, as amended, including information given in confidence to the agency by grant applicants. In accordance with the determination of the Chairman published in the Federal Register of February 13, 1980, these sessions will be closed to the public pursuant to subsection (c) (4), (6) and (9)(B) of section 552b of Title 5, United States Code.

If you need special accommodations due to a disability, please contact the Office for Special Constituencies, National Endowment for the Arts, 1100 Pennsylvania Avenue, NW., Washington, DC 20506, 202/682-5532, TTY 202/682-5496 at least seven (7) days prior to the meeting.

Further information with reference to this meeting can be obtained from Ms. Yvonne M. Sabine, Advisory Committee Management Officer, National Endowment for the Arts, Washington, DC 20506, or call 202/682-5433.

April 19, 1989.

Yvonne M. Sabine,

*Director, Council and Panel Operations,
National Endowment for the Arts.*

[FR Doc. 89-0815 Filed 4-24-89; 8:45 am]

BILLING CODE 7537-01-05

Music Advisory Panel; Meeting

Pursuant to section 10(a)(2) of the Federal Advisory Committee Act (Pub. L. 92-463), as amended, notice is hereby given that a meeting of the Music Advisory Panel (Composers Fellowships Section) to the National Council on the Arts will be held on May 16-18, 1989, from 9:00 a.m.-5:30 p.m. in Room M-14 at the Nancy Hanks Center, 1100 Pennsylvania Avenue, NW., Washington, DC 20506.

A portion of this meeting will be open to the public on May 18, 1989 from 4:00 p.m.-5:30 p.m. The topics for discussion will be policy issues and guidelines.

The remaining portion of this meeting on May 16-17, 1989 from 9:00 a.m.-5:30 p.m. and May 18, 1989, from 9:00 a.m.-4:00 p.m. is for the purpose of Panel review, discussion, evaluation, and recommendation on applications for financial assistance under the National Foundation on the Arts and the Humanities Act of 1965, as amended, including information given in confidence to the agency by grant applicants. In accordance with the determination of the Chairman published in the Federal Register of February 13, 1980, these sessions will be closed to the public pursuant to subsection (c)(4), (6) and (9)(B) of section 552b of Title 5, United States Code.

If you need special accommodations due to a disability, please contact the Office for Special Constituencies, National Endowment for the Arts, 1100 Pennsylvania Avenue, NW., Washington, DC 20506, 202/682-5532, TTY 202/682-5496 at least seven (7) days prior to the meeting.

Further information with reference to this meeting can be obtained from Ms. Yvonne M. Sabine, Advisory Committee Management Officer, National Endowment for the Arts, Washington, DC 20506, or call 202/682-5433.

April 19, 1989.

Yvonne M. Sabine,

*Director, Council and Panel Operations,
National Endowment for the Arts.*

[FR Doc. 89-0816 Filed 4-24-89; 8:45 am]

BILLING CODE 7537-01-05

**NATIONAL TRANSPORTATION
SAFETY BOARD****Public Hearing in Anchorage, Alaska,
on Marine Accident**

In connection with its investigation of the accident involving the Grounding of the Tankship EXXON VALDEZ in Prince William Sound, Alaska, on March 24,

1989, the National Transportation Safety Board will convene a public hearing at 9:00 a.m. (local time), on Tuesday, May 16, 1989, in the Discovery Ball Room, Hotel Captain Cook, 939 West 5th Avenue, Anchorage, Alaska. For more information contact Durcella Andersen, Office of Government and Public Affairs, National Transportation Safety Board, 800 Independence Avenue, SW., Washington, DC 20594, telephone (202) 382-6803.

Boe Hardesty,

Federal Register Liaison Officer.

April 19, 1989.

[FR Doc. 89-0840 Filed 4-24-89; 8:45]

BILLING CODE 7530-01-05

**Public Hearing in Kansas City,
Missouri, on Series of KPL Pipeline
Accidents**

In connection with the investigation of a series of KPL Pipeline Accidents in Kansas and Missouri, the National Transportation Safety Board will convene a public hearing at 1:00 p.m. (local time), on Wednesday May 3, 1989, in the Summit Ballroom of the Embassy on the Park Hotel, 1215 Wyandotte, Kansas City, Missouri. For more information contact Ted Lopatkiewicz, Office of Government and Public Affairs, National Transportation Safety Board, 800 Independence Avenue, SW., Washington, DC 20594, telephone (202) 382-6805.

April 19, 1989.

Boe Hardesty,

Federal Register Liaison Officer.

[FR Doc. 89-0841 Filed 4-24-89; 8:45 am]

BILLING CODE 7530-01-05

**NUCLEAR REGULATORY
COMMISSION****Advisory Committee on Reactor
Safeguards; Meeting Agenda**

In accordance with the purposes of sections 29 and 182b of the Atomic Energy Act (42 U.S.C. 2039, 2232b), the Advisory Committee on Reactor Safeguards will hold a meeting on May 3-6, in Room P-110, 7820 Norfolk Avenue, Bethesda, MD and One White Flint North, Rockville, Maryland. Notice of this meeting was published in the Federal Register on March 21, 1989.

Wednesday, May 3, 1989, Room P-110,
7820 Norfolk Avenue, Bethesda, MD

12:00 Noon-1:30 p.m.: Preparation for
Meeting with NRC Commissioners
(Open)—The Committee will discuss

ACRS reports to NRC regarding Generic Issue 99, Improved Reliability of Residual Heat Removal Capability in PWRs (reports dated September 14, 1988 and February 16, 1989); Unresolved Safety Issue A-45, Shutdown Decay Heat Removal Requirements (report dated September 14, 1988); and Further ACRS Comments on Implementation of the Safety Goal Policy (report dated February 16, 1989).

Commissioners Conference Room (Lobby), One White Flint North, Rockville, Maryland

2:00 p.m.-3:30 p.m.: Meeting with NRC Commissioners (Open)—The Committee will meet with the NRC Commissioners to discuss the reports noted above.

Thursday, May 4, 1989, Room P-118, 7920 Norfolk Avenue, Bethesda, MD

8:30 a.m.-8:45 a.m.: Comments by ACRS Chairman (Open)—The ACRS Chairman will report on items of current interest.

8:45 a.m.-10:30 a.m.: Limerick Nuclear Station, Unit 2 (Open/Closed)—The Committee will review and comment regarding proposed operation of this nuclear power plant.

Portions of this session will be closed as necessary to discuss safeguards and security information regarding this facility.

10:45 a.m.-12:00 Noon: Evaluation of Operating Experience at Nuclear Plants (Open)—The Committee will be briefed by representatives of the NRC staff regarding reports evaluating reactor operating experience, including loss of decay heat removal capability, inadequate NPSH in high pressure safety systems, and deficiencies in control room ventilation systems in nuclear power plants.

1:00 p.m.-3:00 p.m.: Reactor Risk Reference Document (Open)—The Committee will review and comment on the proposed uses and content of NUREG-1150, "Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants," Second Draft.

3:15 p.m.-4:45 p.m.: Radiobiological Exposure Criteria (Open)—The Committee will review and comment on the proposed NRC generic letter on evaluation of radiation exposure/dose from "hot particles."

4:45 p.m.-8:15 p.m.: Performance Indicator Program (Open)—The Committee will be briefed regarding development and use of performance indicators for evaluation of operations at nuclear power plants.

Friday, May 5, 1989, Room P-118, 7920 Norfolk Avenue, Bethesda, MD

8:30 a.m.-10:30 a.m.: Valve Surveillance and Testing (Open)—The Committee will meet with the NRC Staff and also hold a discussion of proposed ACRS comments regarding proposed NRC testing and surveillance requirements for motor-operated valves in nuclear power plants.

10:45 a.m.-12:00 Noon and 1:00 p.m.-2:30 p.m.: Human Factors (Open)—The Committee will review and comment on the proposed NRC research program plan on human factors and related NRC initiatives.

2:45 p.m.-3:15 p.m.: Future ACRS Activities (Open)—The Committee will discuss anticipated ACRS subcommittee activities and matters proposed for consideration by the full committee.

3:15 p.m.-5:45 p.m.: Emergency Planning (Open)—A briefing will be given by representatives of the NRC Staff and industry regarding the status of emergency planning and preparedness for nuclear power plants.

Saturday, May 6, 1989, Room P-118, 7920 Norfolk Avenue, Bethesda, MD

8:30 a.m.-12:00 Noon and 1:00 p.m.-2:00 p.m.: Preparation of ACRS Reports (Open)—The Committee will discuss proposed reports to NRC regarding items considered during this meeting.

2:00 p.m.-3:00 p.m.: ACRS Subcommittee Activities (Open)—The Committee will hear and discuss reports of the status of ACRS subcommittee activities regarding designated areas including the status of implementation of ATWS and scope of ACRS activities.

3:00 p.m.-3:15 p.m.: Appointment of ACRS Members (Open/Closed)—The Committee will hear a status report regarding appointment of ACRS members.

Portions of this session will be closed as necessary to discuss information the release of which would represent a clearly unwarranted invasion of personal privacy.

Procedures for the conduct of and participation in ACRS meetings were published in the Federal Register on October 27, 1988 (53 FR 43487). In accordance with these procedures, oral or written statements may be presented by members of the public, recordings will be permitted only during those portions of the meeting when a transcript is being kept, and questions may be asked only by members of the Committee, its consultants, and Staff. Persons desiring to make oral statements should notify the ACRS Executive Director as far in advance as practicable so that appropriate

arrangements can be made to allow the necessary time during the meeting for such statements. Use of still, motion picture and television cameras during this meeting may be limited to selected portions of the meeting as determined by the Chairman. Information regarding the time to be set aside for this purpose may be obtained by a prepaid telephone call to the ACRS Executive Director, Mr. Raymond F. Fraley, prior to the meeting. In view of the possibility that the schedule for ACRS meetings may be adjusted by the Chairman as necessary to facilitate the conduct of the meeting, persons planning to attend should check with the ACRS Executive Director if such rescheduling would result in major inconvenience.

I have determined in accordance with subsection 10(d) Pub. L. 92-463 that it is necessary to close portions of this meeting as noted above to discuss information the release of which would represent a clearly unwarranted invasion of personal privacy (5 U.S.C. 552b(c)(6)) and to discuss safeguards information (5 U.S.C. 552b(c)(3)).

Further information regarding topics to be discussed, whether the meeting has been cancelled or rescheduled, the Chairman's ruling on requests for the opportunity to present oral statements and the time allotted can be obtained by a prepaid telephone call to the ACRS Executive Director, Mr. Raymond F. Fraley (telephone 301/493-8088), between 8:15 a.m. and 5:00 p.m.

Date: April 18, 1989.

John C. Hoyle,
Advisory Committee Management Officer.
[FR Doc. 89-8787 Filed 4-23-89; 8:45 am]
BILLING CODE 7990-01-0

[Docket No. 88-20449; ASLBP No. 89-588-01-8P]

Rodger W. Ellingwood, Senior Operator License for Catawba Nuclear Station; Designation of Presiding Officer

Pursuant to delegation by the Commission dated December 29, 1972, published in the Federal Register, 37 FR 28710 (1972) and §§ 2.105, 2.700, 2.702, 2.714, 2.714a, 2.717 and 2.721 of the Commission's Regulations, all as amended, a presiding officer is designated in the following proceeding:

Rodger W. Ellingwood, Senior Operator License for Catawba Nuclear Station

By letter dated December 7, 1988, Rodger W. Ellingwood, an applicant for a senior operator license for the Catawba Nuclear Station, was informed



UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20585

Revised: May 2, 1989

SCHEDULE AND OUTLINE FOR DISCUSSION
349TH ACRS MEETING
MAY 3-6, 1989
BETHESDA, MARYLAND

Wednesday, May 3, 1989 - Room P-110, 7920 Norfolk Avenue, Bethesda, Md.

- 1) 12:00 Noon - 12:30 P.M. Chairman's Comments (Open)
1.1) Opening Remarks by ACRS Chairman
(FJR/RFF)
- 2) 12:30 - 1:30 P.M. Preparation for Meeting with NRC Commis-
sioners (Open)
2.1) Discuss ACRS reports to the NRC
regarding:
2.1-1) Further ACRS Comments on the
NRC Safety Goal Implementation
Plan (ACRS report dated
February 16, 1989) (DAW/MDH)
2.1-2) Proposed NRC Maintenance Rule
(CM/HA) - Proposed Final Rule-
making Related to Maintenance
of Nuclear Power Plants (ACRS
report dated 4/11/89)
2.1-3) NUREG-1150, Severe Accident
Risks: An Assessment for Five
U.S. Nuclear Power Plants
(WK/MDH) (ACRS report
dated 1/23/89 and 8/16/88)
2.1-4) Integrated Approach to Regula-
tory Matters (HWL/GRQ) (ACRS
Report dated 4/17/89)
2.1-5) Containment Design Requirements
Respond to questions as appro-
priate regarding the ACRS
report on Containment Design
Criteria dated 3/15/89
(DAW/CPS/MDH/EGI)
- 1:30 - 1:50 P.M. Travel to One White Flint North, Rockville
Commissioners Conference Room (Lobby), One White Flint North, Rockville, Md.
- 3) 2:00 - 3:30 P.M. Meeting with NRC Commissioners (Open)
3.1) Discuss items noted above (FJR/DAW/
et al.)
- 3:40 - 4:00 P.M. Return to 7920 Norfolk Avenue, Bethesda

Thursday, May 4, 1989, Room P-110, 7920 Norfolk Avenue, Bethesda, Md.

- 4) 8:30 - 8:40 A.M. Chairman's Comments (Open)
 - 4.1) Opening remarks (FJR)
 - 4.2) Items of current interest (FJR/RFF)

- 5) 8:40 - 10:30⁵⁵ A.M. Radiobiological Exposure Criteria (Open)
 - 5.1) Report of ACRS subcommittee chairman regarding generic letter on evaluation of radiation exposure/dose from "hot particles" (JCC/EGI)
 - 5.2) Meeting with representatives of the NRC staff and the industry, as appropriate

- 10:30⁵⁵ - 10:45^{11:15} A.M. BREAK

- 6) 10:45 - 12:00^{11:5} Noon Evaluation of Operating Experience (Open)
 - 6.1) Briefing and discussion by representatives of the NRC Staff (AEOD) regarding evaluation of nuclear power plant operations (HML/HA)

17:20
TAB 6-----

- 12:00 - 1:00 P.M. LUNCH

- 7) 1:00 - 3:00^{2:45} P.M. NUREG-1150, "Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants"
 - 7.1) Comments by ACRS subcommittee chairman regarding proposed interim use of NUREG-1150 (WK/MDH)
 - 7.2) Meeting with representatives of the NRC staff

TAB 7-----

- 3:00 - 3:15 P.M. BREAK

- 8) 3:15 - 5:30 P.M. Limerick Nuclear Power Station, Unit 2 (Open/Closed)
 - 8.1) Report of ACRS subcommittee chairman regarding proposed full power operation of this facility (WK/GRQ)
 - 8.2) Meeting with representatives of the NRC Staff and the applicant

TAB 8-----

(Note: Portions of this session will be closed as necessary to discuss security and safeguards information applicable to this facility.)

9) 5:30 - 6:15 P.M.

ACRS Subcommittee Activities (Open)
 9.1) Report of ACRS Planning and Procedures Subcommittee meeting on May 3, 1989 (FJR/RFF)

Friday, May 5, 1989, Room P-110, 7920 Norfolk Avenue, Bethesda, Md.

10) 8:30 - 10:30 A.M.

Nuclear Power Plant Valve Testing and Surveillance (Open)
 10.1) Comments by ACRS subcommittee chairman regarding proposed ACRS report to NRC regarding proposed NRC requirements for testing and surveillance of motor operated valves in nuclear power plants (CM/EGI)
 10.2) Meeting with representatives of the NRC staff and the nuclear industry, as appropriate
 10.3) Discuss proposed ACRS report to NRC as time permits

10:30 - 10:45 A.M.

BREAK

11) 10:45 - 12:00 Noon

TAB 11-----

Human Factors (Open)
 11.1) Report of ACRS subcommittee chairman regarding the proposed NRC research program on human factors and related NRC regulatory initiatives (FJR/HA)
 11.2) Meeting with representatives of the NRC Staff

12:00 - 1:00 P.M.

LUNCH

12) 1:00 - 2:30 P.M.

Human Factors (Open)
 12.1) Continue meeting noted above (FJR/HA)

2:30 - 2:45 P.M.

BREAK

13) 2:45 - 3:15 P.M.

TAB-----

TAB-----

Future ACRS Activities (Open)
 13.1) Discuss anticipated subcommittee activity (GRQ/RFF)
 13.2) Discuss items proposed for consideration by the full Committee. (FJR/RFF)

14) 3:15 - 6:15 P.M.

Emergency Planning (Open)
 14.1) Briefing by representatives of the NRC staff and industry regarding the status of emergency planning and preparedness for nuclear power plants (JCC/EGI)

Saturday, May 6, 1989, Room P-110, 7920 Norfolk Avenue, Bethesda, Md.

- 15) 8:30 - 9:00 A.M. ACRS Subcommittee Activities (Open)
15.1) Report of ACRS subcommittee on Instrumentation & Control Systems regarding the status of ATWS implementation (subcommittee meeting on 4/21/89) (WK/MME)
- 16) 9:00 - 12:30 P.M.
& 1:30 - 2:30 P.M. Preparation of ACRS Reports to NRC (Open)
16.1) Discuss proposed ACRS reports to NRC regarding:
16.1-1) Limerick Nuclear Station (operating license) (WK/GRQ)
16.1-2) Human Factors - NRC research program and related initiatives (FJR/MA)
16.1-3) MOV Testing and Surveillance (CM/EGI)
16.1-4) NUREG-1150, Severe Accident Risk (WK/MDH)
16.1-5) Radiobiological Exposure Criteria regarding "hot particles" (JCC/EGI)
16.1-6) Scope of ACRS Activities (FJR/RFF)
- 17) 2:30 - 2:45 P.M. Appointment of ACRS Member (Open/Closed)
17.1) Discuss the status of appointment of ACRS members (CM/MFL)
(Portions of this session will be closed as required to discuss information the release of which would represent a clearly unwarranted invasion of personal privacy.)

CERTIFIED

MINUTES OF THE
349TH ACRS MEETING
MAY 3-6, 1989

The 349th meeting of the Advisory Committee on Reactor Safeguards was held at 7920 Norfolk Ave., Bethesda, Md., on May 3-6, 1989. The purpose of this meeting was to conduct the discussions and perform the actions described in the attached agenda. The meeting was chaired by Dr. Remick.

All of the discussions were held in open session.

A transcript of selected portions of the meeting was kept and is available in the NRC Public Document Room. [Copies of the transcript are also available for purchase from the Heritage Reporting Corporation, 1220 L St., N.W., Washington, D.C. 20005.]

I. Chairman's Report/Comments (Open)

[Note: Mr. R. F. Fraley was the Designated Federal Official for this portion of the meeting.]

Dr. Remick began the meeting of May 3, 1989 with a brief summary of the planned agenda and the procedures under which the meeting discussions were being conducted. He noted that a special session had been scheduled so that the Committee could attend a Commission meeting on May 3, 1989.

II. Preparation for Meeting with NRC Commissioners (Open)

[Note: Mr. H. Alderman, Mr. M. D. Houston, Mr. E. Jone, and Mr. G. Quittschreiber were the the Designated Federal Officials for this portion of the meeting.]

The Committee met in open session and discussed its preparation for attendance at the May 3, 1989 Commission meeting. The following topics had been scheduled for discussion:

- 1) Implementation of the NRC's Safety Goal Policy, as discussed in the February 16, 1989 ACRS report entitled "ACRS Comments on Implementation of the Safety Goal Policy."
- 2) Proposal for the NRC's issuance of a maintenance rule and the April 11, 1989 ACRS report entitled "Proposed Rulemaking Related to Maintenance of Nuclear Power Plants."
- 3) Interim use of the revised version of NUREG-1150.
- 4) Mark I Containment Performance Improvement Program.
- 5) The April 17, 1989 ACRS report on "Integrated Approach on Regulatory Matters."

The Committee reviewed its assignment of spokesmen for these topics and subsequently met with the Commission to discuss these subjects. (See Section III.)

III. Meeting with the Commissioners (Open)

[Note: These discussions were carried out during a public meeting with the Commission in the Commissioner's Conference Room at One White Flint North, Rockville, Md.]

The Committee met with the Commission on May 3, 1989 between 2:00 p.m. and 3:30 p.m. Commissioner Carr and Dr. Shewmon did not attend. Chairman Zech, Commissioner Roberts, Commissioner Rogers, Commissioner Curtiss, and the remainder of the ACRS members were in attendance. The topics discussed were as described in Section II.

[In accordance with Memorandum for W. Parler from S. Chilk, June 9, 1989, regarding Staff Requirements, a transcript was provided to the ACNW by the Office of the Secretary of the Commission as the record for this portion of the meeting. The transcript is contained in Appendix V.]

IV. Chairman's Report (Open)

[Note: Mr. R. F. Fraley was the Designated Federal Official for this portion of the meeting.]

Dr. Remick began this portion of the meeting with a review of the planned agenda and the procedures under which the meeting discussions were being conducted. He noted that Shoreham had been issued a full power Operating License and that the Pilgrim and Peach Bottom licensees had been given permission to restart these reactors.

V. Radiobiological Exposure Criteria (Open)

[Note: Mr. E. Igne was the Designated Federal Official for this portion of the meeting.]

Mr. F. Congel, NRR, discussed the generic letter on Interim Standard on Occupational Dose of the Skin to Radiation from Small Radioactive Particles (Hot Particles). The interim standard's main purpose is to provide guidance and a mechanism for regulating implementation of this guidance until a planned revision of 10 CFR 20 is completed. The major features of the interim standard are as follows:

- ° The interim standard applies to occupational exposure of skin from hot particles of any size or activity on body or clothing, and is for single exposure in a calendar quarter.
- ° The interim standard provides for an enforcement limit of 50 rad averaged over 1cm² and no notice of violation for single exposure below 50 rad.
- ° The interim standard provides for a possible notice of violation for more than one exposure per quarter above current 10 CFR Part 20 limits.

The interim standard is less stringent than current 10 CFR Part 20 limits, but is more restrictive than the recommendations given in the NCRP's draft report on this subject. Mr. Congel stated that the NCRP-recommended limits do not, from NRC's perception, include a safety factor or estimate of uncertainty. In reply to a question, Mr. Congel said that the final NCRP report is not yet available and could be significantly different from the draft. (The NCRP representative subsequently stated that it was unlikely that the final report would differ substantially from the draft.) Further, he stated that NCRP limits could allow visible nonstochastic effects from hot particle exposure. Mr. Congel believes that ongoing research should provide useful data before the planned revision to 10 CFR 20 is promulgated in about two years.

Ms. P. Robinson, EPRI, discussed work which had been performed on the health effects associated with "hot particles." These "hot particles" are typically either Co-60 particles (resulting from the activation of reactor materials) emitting low energy beta rays and fuel fragments emitting high energy beta rays. These particles are usually less than 100 μ M and over 90% of skin dose is caused by the beta rays. EPRI believes that guidance on the regulation of hot particles should balance the risk associated with this type of exposure with risk from whole body exposure and protect workers from ulceration from hot particles. The industry believes that the radiation protection controls proposed by the NRC to control hot particle exposures will significantly reduce worker productivity and, as a result, will increase whole body exposure. Ms. Robinson then discussed ongoing EPRI research work which uses pigs (biological effects produced on the skin of pigs is believed to be similar to those produced on human skin) to determine the ulceration threshold associated with hot particle exposure. The low- and high-energy exposures performed to date have not resulted in ulceration to the skin of the pigs. Based on these tests EPRI would judge that the NCRP limit of 75 μ CI-hr# is extremely conservative for Co-60 particles and that industry radiation protection practices based on a two-level approach (Co-60 and fuel sources) may be justified.

Mr. M. Williams, Union Electric, discussed the industry concerns regarding the proposed regulations on hot particle exposure. He stated that the NCRP recommendations are believed to be conservative and that an acute Co-60 exposure will not produce ulceration virtually regardless of dose. He stated that the more stringent limit (50 rad) proposed by NRC is not scientifically based and does not reflect what is known as to the actual risk. The use of these proposed NRC limits will require frequent monitoring and will increase whole body dose by disrupting the work process. He recommends that an interim standard be based on NCRP's limit of 75 μ CI-hrs be adopted and that the final rule should reflect what is known as a result of new experimental data.

The Committee decided to report to the Commission on this subject. This report is discussed in Section XIII.

VI. AEOD Evaluation of Operating Experience (Open)

[Note: Mr. H. Alderman was the Designated Federal Official for this portion of the meeting.]

Mr. J. Rosenthal, AEOD, made the opening presentation on the AEOD program for evaluating operating experience. He noted that virtually every one of the AEOD studies has resulted in a generic letter or an information notice which led to some needed industry action. The generic letter on air systems is an example of AEOD work product in this area.

Mr. Michelson and Mr. Rosenthal discussed the AEOD tracking system. Mr. Rosenthal noted that AEOD tracked actions on outstanding AEOD recommendations and reported the status on a periodic basis.

Mr. Rosenthal listed some ongoing studies:

- Air-systems-related failures of solenoid valves.
- Common mode failures of the emergency diesel generator systems.
- Lube oil system common mode failures.
- Availability of redundant safety-related equipment during shutdown conditions.
- Flooding of areas containing safety-related equipment.
- Electrical bus failures.
- Maintenance related LERs.

Control Room Emergency Ventilation Systems

Mr. S. Israel, AEOD, discussed emergency ventilation systems for the control room. He noted that the control room is pressurized relative to its environment when the emergency ventilation system is in operation to prevent leakage of toxic materials into the control room.

Mr. Israel discussed some events involving failures which would have prevented the pressurized mode of control room operation. One event involved a single air-limit damper which if it had failed closed would prevent pressurization of the control room. Another event involved a situation where the normal ventilation for the rest of the building continued to operate with the control room in the emergency ventilation mode and, as a result, the pressure in the rooms surrounding the control room was higher than the pressure in the control room. This would have resulted in leakage of unfiltered air into the control room.

A third event involved check valves in the bottled gas system. The dampers that control the air system are air-operated. The air systems were not safety

grade, and had a bottled gas backup supply with a check valve in the line to isolate this backup supply from the normal air system. In this case, the check valves were not properly designed and did not provide isolation. In a fourth situation, all of the "redundant" dampers were on the same power supply so that loss of a single power supply would prevent operation of all of the dampers.

There were several instances of mispositioned dampers which would prevent pressurization of the control room because of the damper arrangement. He noted that one of these dampers was mispositioned such that if the exhaust fan in the rest room continued to operate the control room would end up at a negative pressure relative to the surrounding areas of the plant.

Mr. Israel noted that NRR is completing its evaluation of this class of events and is in the process of writing a generic letter dealing with emergency ventilation systems for control rooms. The generic letter will instruct the utilities to confirm that the control room ventilation systems will satisfy the conditions specified in the FSAR.

NPSH for High Pressure Safety Injection Systems During Recirculation

Mr. Israel discussed the AEOD evaluation of adequate NPSH for HPSI systems. AEOD's concern is that the controls over the design and operation may not have assured adequate NPSH. He noted that one utility had discovered, when reconstituting their safety analysis, that they were not sure the containment spray pumps and the high pressure injection pumps would have adequate NPSH. The reason was that there were throttle valves in the discharge of the RHR lines, the positioning of which was not adequately controlled. In addition, the as-installed suction pipe was longer than assumed in the FSAR calculations and the piping size had been changed from 6 inches to 3 inches. As a result, pressure drops were larger than calculated in the FSAR.

Another LER dealt with a throttle valve in the line to the high pressure injection pump that was throttled to 30 percent. It was not clear that the NPSH would be adequate with this valve positioning. Recalculation proved that there was adequate NPSH.

Large Openings in Containment

Mr. T. Cintula, AEOD, discussed experience with control of openings which could seriously compromise containment integrity. The source of information for this study was LERs for events which occurred between 1980 to 1987.

There were three types of events reported in the LERs which resulted in large openings in the containment:

- ° Both doors of an airlock being open simultaneously.
- ° Large leakages discovered as the result of a leak rate measurement.
- ° Failure or mispositioning of containment isolation valves.

Mr. Cintala noted that AEOD had discovered 34 events involving both doors of airlock being open and that 8 of these events occurred during power operations. The doors were not usually left open for long periods of time. In 15 events the time was less than one minute, and for 14 events the time was less than 15 minutes. The longest event involved both containment doors being left open for 21½ hours. This event was at San Onofre Unit 1 in 1985. The plant was shut down during this event. A non-licensed technician was told to unlock the containment doors and subsequently opened both doors after unlocking them. The failure mode was usually latching mechanism failures or personnel errors.

AEOD used statistical analysis of these events to estimate a probability of both doors being open (when the Technical Specifications require them to be closed) of 10^{-5} /r.yr. This is believed to be consistent with previous assumptions. Experience with leakage rate tests suggests that the probability of the leakage rate being larger than about 10 percent/day is about 10^{-3} /r.yr.

Mr. Cintala stated that his conclusion from performing this study was that licensees were maintaining containment integrity to the degree that failures were not presenting an undue or unexpected risk.

Pump Damage Caused by Low Flow Operation

Mr. C. Hsif, AEOD, discussed the problem of damage caused to pumps by low flow operation. A number of events were reported which involved manufacturer approved flow rates that were, in fact, too low, resulting in cavitation and vibration that damaged pumps. The problem appears to be sustained operation at low flow and a lack of awareness of the potential problems.

VII. NUREG-1150, "Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants" (Open)

[Note: Mr. M. D. Houston was the Designated Federal Official for this portion of the meeting.]

Dr. Kerr, Chairman of the Severe Accident Subcommittee, discussed the historical development of NUREG-1150 and the previous ACRS review of this subject. He stated that the current draft of NUREG-1150 had only been received within the past two weeks and that this draft was to be subjected to peer review. The Commission has asked the Committee to comment on the appropriate uses of this draft during the period prior to completion of peer review. Dr. Kerr stated that a review of this document would be planned through the normal subcommittee process and requested that the NRC staff address mainly the differences between the first and second drafts of NUREG-1150 in their presentation.

Dr. D. Ross, RES, outlined the staff's presentation and gave a status report on the preparation of the second draft for publication. He indicated that an extensive QA review would be performed at Sandia National Laboratories during the next week. He hoped to have the report ready for the initial meeting of the new Peer Review Group on July 10, 1989. He also indicated that the

American Nuclear Society would perform a review of this report which would be similar in scope to their review of the first draft.

Dr. Ross discussed the NUREG-1150 study of external events for Surry and Peach Bottom. He indicated that some difficulties were being encountered in the analyses of low-probability, high-intensity earthquakes. The problem was mostly associated with the calculation of nonnuclear consequences and the impact on emergency procedures. The studies were only performed up through core damage frequency and containment performance and not to offsite consequences. He referenced a recent National Research Council/FEMA report entitled "Estimating Losses from Future Earthquakes," and indicated that the ACRS might want to discuss it.

Dr. Ross stated the supporting reports which serve as the documentation for NUREG-1150 are expected to be issued over the next few months.

Dr. Catton expressed a concern that most of the peer review group appeared to be "big picture" people. Dr. Lewis inquired about the level of administrative support to be provided this group.

Mr. Mark Cunningham, RES, discussed the differences in methods and differences in results between the first and second draft. The basic methodology had not changed significantly. The process for expert elicitation had been greatly improved and is believed to be a major change. As an illustration, he described in some detail the expert opinion process for the molten core-containment interaction panel. In addition, he presented seismic hazard curves (EPRI and LLNL) for Peach Bottom and discussed how the higher values resulting from the LLNL evaluation were being driven by the input of one of five experts. It was suggested by members of the Committee that it was not known if this one particular individual may have understood reality more correctly than the other four. NRR and EPRI have been discussing the differences between the two methodologies and are resolving their differences. It would appear that NRR is willing to accept the EPRI methodology with some revision. He also discussed the offsite protective action assumptions used in NUREG-1150. An evacuation of 99.5% of the population within the 10-mile emergency planning zone is assumed. No sheltering was considered.

Mr. Cunningham presented a series of figures which showed the calculated values for core damage frequencies, containment performance, and risk for each of the plants as reported in the two drafts of NUREG-1150 and from WASH-1400 for Surry and Peach Bottom. The differences were attributed to methodology, plant modifications, and revision of operating procedures. The results for all plants met the goals put forth by the NRC Safety Goal.

Dr. Siess asked if it has been possible, over the years, to validate expert elicitation processes which dealt with specific issues. The staff was unable to point to any examples. Dr. Lewis discussed the expert elicitation process and pointed out the problem of giving equal weight to each person's opinion. He noted that the German approach of asking experts to rate each other's expertise was an alternate method.

Dr. Kerr asked if the staff still concludes that one can not obtain information on the performance of other plants not included in this study from the results of the five plants studied. Mr. J. Murphy, RES, indicated that the results are highly plant-specific. He did acknowledge that there are some general insights which could be used.

Dr. Ross discussed the intended interim and long-term uses for NUREG-1150 as given in Chapter 13 of the NUREG-1150 report. Dr. Kerr questioned whether this report would be any more useful than other well-done PRAs. Dr. Ross indicated that the NUREG-1150 analysis would reflect the latest severe accident phenomena methodology. Dr. Kerr asked whether the way the source term was calculated was still somewhat arbitrary. Dr. Ross said he thought that the methods used represented the state-of-the-art.

VIII. Limerick Generating Station, Unit 2, Operating License Review (Open)

[Note: Mr. Gary Quittschreiber was the Designated Federal Official for this portion of the meeting.]

Chairman's Report

Dr. William Kerr provided some background information, noting that the ACRS had reported on the Limerick 1 Operating License in a report dated November 1984. At that time the Committee chose not to comment on Limerick 2 because it felt that the schedule for construction and operation was uncertain. Limerick 2 is now being considered for operating license approval.

Dr. Kerr noted that the Limerick 2 Subcommittee toured the site on the morning of April 25, 1989 and met in the afternoon to review Philadelphia Electric Company's application for a license to operate Limerick 2. The Subcommittee observed that the NRC Staff has completed a SALP rating for Limerick 2 and has given them an unusually high rating. The Subcommittee found no reason to question this rating.

Dr. Kerr stated that the licensee appears to be using insights from PRA in design, equipment, testing, training, and maintenance program planning. He felt that the plant and the organization have been reviewed and re-reviewed, and the conclusion seems to be that the plant is ready for startup.

Status of NRC Staff's Review, Open Items, Outstanding Issues, and Recommendations

Mr. R. Clark, NRR Project Manager for Limerick 2, discussed the schedule for the licensing process and the status of the review. He noted that the review has not been completed for some residual issues. No significant disagreements have developed and resolution is expected prior to licensing. The construction for Unit 2 was resumed in February 1986. In a little over three years the plant has gone from about 30% complete to a nearly finished condition. He discussed the Readiness Assessment Program noting that, based on many NRC reviews and inspections, there is high confidence that the plant is ready for

safe operation and that the quality of Limerick 2 construction is judged to be among the best of the U.S. nuclear power plants.

Mr. Clark stated that the Limerick Station has exceptional site management and supervision which provide strong leadership and are expected to support continued performance with good morale and a strong safety perspective. He added that the performance of the site organization has demonstrated that they are capable and qualified to safely operate Limerick 2.

Mr. Clark stated that subject to the satisfactory resolution of the few issues still pending the staff has concluded that Limerick 2 can be operated safely by PECO and without any undue risk to the health and safety of the public.

Mr. W. Butler, NRR, stated he believed that the Appeals Court decision on the Ecology Action versus the NRC would not have any impact on the issuance of the low-power license for Limerick 2. The staff is awaiting guidance from the Commission on dealing with severe accidents. Mr. McNeill, PECO, added that the Supreme Court reached a decision this past week on a Department of Transportation finding that under the National Environmental Policy Act one need not consider all low probability events in the mitigation of accidents that might result from that low probability event.

Region I Inspections and Conclusions Regarding Readiness for Startup

Mr. J. Linville, NRC Region I, discussed the Region I inspection history at Limerick noting that their inspection activity is in line with other comparable well designed plants and that they find the construction program quality at Limerick to be effective. Region I believes that this review does provide the confidence that PECO, its architectural engineer/constructor (Bechtel), and subcontractors are committed to and capable of building a quality nuclear plant.

Mr. Linville noted that the most recent Limerick 2 SALP (December of 1988) December of 1988 did have "1" ratings for all categories. The reason is that many of the construction areas have been completed such that it was possible for several high-rated areas to have been lumped into one single category.

Dr. Remick commented that, during the plant tour on April 25, 1989, the Subcommittee was impressed by the human engineering considerations given with regard to marking of pipes, valve indications of flow directions, and the painting of components to differentiate between Limerick 1 and Limerick 2.

Dr. Kerr reminded the Committee that each member was given a copy of the transcript of the April 25, 1989 Subcommittee meeting during which members of the public made their statements.

Introduction and Corporate Readiness - PECO

Mr. C. McNeill, Executive Vice President at PECO, provided an overview of and discussed the nuclear organization structure at PECO for the Limerick station.

Unlike Peach Bottom, Limerick 2 developed in a culture of engineering and research rather than electric production. Limerick 2 is a newer plant and had benefited from the transfer of key Peach Bottom personnel to Limerick. Limerick has had strong site management and PECO's best people have been assigned to Limerick. This has produced quality results in the operation of Limerick 2. In addition, Limerick was developed in the post-TMI era where the increased demands and standards are well understood and have been implemented as a part of the licensing process for the plant.

Limerick 2 Pre-Op/Startup Power Ascension Test Status - PECO

Mr. T. Ullrich, Startup Manager at PECO, provided Limerick 2 design information and listed the major shared systems with Limerick 1. The units are duplicate plants and were constructed as similar as possible. Because the design continued after the construction of Limerick 2 was halted, the design was relatively complete when construction was restarted. He noted that all of the management controls put in place during the delay in construction resulted in a more efficient construction process and almost no rework. Craft productivity was about 30% higher than on Limerick 1. Limerick 2 construction is about eight months ahead of schedule. The few significant design differences between Unit 1 and Unit 2 included changes due to the snubber and hanger optimization program and reduction of pipe restraints due to revisions in intermediate break criteria. Some 566 snubbers were eliminated in Limerick 2. Stellite was also removed from the control rod blades in Limerick 2. There were numerous minor operating procedure changes due to physical layout and different equipment and valving. The most significant of these is that Limerick 2 has its own independent process computer which includes all of the SPDS functions.

Mr. Ullrich described several design features of Limerick 2. The plant was described as being a little beyond a BRW 4 and with a Mark II containment and being similar to the Hope Creek Plant. There are 4 diesel generators per unit. Major shared systems with Limerick 1 include the control room and control room ventilation system and the radwaste system.

The power ascension test program is currently under way and is proceeding well, with the hardware to support the program installed and with NRC Region 1 review of procedures about two-thirds complete. The present schedule for testing and commercial operation is still ahead of the schedule developed at the time construction was restarted in 1986.

In response to questions from Dr. Shewmon concerning the population density in the vicinity of the plant, Mr. McNeill noted that the site has the second highest population density of any plant in the country. There are 3½ million people within a 25-mile radius of the plant. Pottstown, which is 5 miles from the site, is the nearest population center and has 40,000 to 50,000 people.

In response to questions from the Committee members concerning containment venting capability, Mr. McNeill noted that Units 1 and 2 are equipped with a

6-inch vent line but that it is not a hardened vent. The line vents to the diesel generator building corridor, with procedures that specify that the corridor doors be opened to provide a direct path to the atmosphere. Mr. McNeill added that PECO does not believe it is wise to invest even relatively small amounts of money when the regulators have not taken a position and may require changes a short time later.

PECO will move quickly to implement the required modifications when the venting issue is resolved.

Limerick 1 Operating History and Limerick 1 and Peach Bottom Lessons-Learned

Mr. G. Leitch, Vice President at Limerick, said that PECO's goal is to be the "leader in the nuclear power industry" and its mission is to provide "safe, economical, reliable power." Mr. Leitch believes that PECO has demonstrated its ability to manage Limerick at or better than INPO's best quartile with regard to radiological control, safety, safety system performance, forced outage rate (19 months without a forced outage and none in 1988), and number of scrams. Mr. McNeill added that their goal is to improve operations to the extent that NRC decides to use extended inspection cycles similar to some of the other top plants.

Mr. Graham discussed the fuel performance problem at Limerick 1 noting that the initial core and reload 1 fuel were found to be susceptible to "crud-induced localized corrosion" (CILC). The contributing factors which led to this problem have been corrected for the short term and long-term preventative measures are being implemented.

Mr. Graham discussed the three previous SALP Reports for Limerick 1 operations and the general direction of the improvements. He cited as the major problem at Peach Bottom which led to shutdown the lack of leadership at site. He noted that a major basic difference between Peach Bottom and Limerick was that Peach Bottom required the shift managers to have an educational degree but only required limited experience. The policy at Limerick has been not to require a degree but to require extensive experience. The shift superintendents have been at Limerick for a minimum of 8 years and some as have as much as 20 years of power plant experience. Limerick does require the Shift Technical Advisor to be a degreed engineer and to receive special training in accident management and the mitigation of core damage.

Mr. Graham discussed the operator staffing problem at Peach Bottom which caused a shortage of operators. Limerick has staffing for six shift teams for two-unit operation such that scheduled overtime is not required over the short term. Entry-level requirements at Limerick have increased to require a two-year college degree or navy nuclear experience. There are now enough personnel in training and placement to provide for an adequate number of off-shift assignments in the future.

Mr. Graham discussed the cultural enhancement at Limerick (a site newsletter, frequent meetings, face-to-face performance evaluation, self-assessment of

personnel practices with regard to professionalism). He feels that Limerick has good intergroup communications and has a commitment to excellence in nuclear operations.

Limerick 2 Self-Assessment

Mr. D. Helwig, General Manager and Nuclear Quality Assurance Manager, noted that they have ended up with a three-level process of assessment comprised of a Readiness Program Assessment, an Organizational Readiness Assessment, and a Readiness Verification Program. In addition, the Independent Design and Construction Appraisal has been conducted by Stone and Webster. After over 100,000 man-hours of effort by Stone and Webster and Bechtel (with additional support from PECO personnel), and with over 45,000 specific checks and verifications of hardware attributes and design features, no rework items were required in order to assure a safety function. Stone and Webster and the NRC staff concluded that the construction quality had been extremely good. The design appraisal resulted in similar conclusions.

Status of PRA and Related Issues

Mr. A. Marie, Probabilistic Risk Assessment Branch Head, discussed the PRA program at PECO. The group is made up of several full-time personnel. The group's work is supported by a Technical Advisory Panel comprised of three industry PRA experts which provides technical reviews and advice to assure that PRA activities utilize up-to-date methods and information and reviews PRA activities at the request of the PRA Branch.

The present PRA Program at PECO was developed in 1988 by a task force representing all organizations in the nuclear group. The objective of the PRA program is to develop and maintain models for nuclear stations and apply models to provide insights on ways to improve performance. The dissemination of PRA information and PRA training is provided by this program.

The Limerick Generating Station PRA was developed in 1980 through 1983. The PRA was updated in 1986 through 1988 and will be updated to support the IPE and to include external events. The estimate of total core damage frequency in the original PRA was $1.4E-5/r.yr.$ The estimate resulting from the latest (1988) revision is $6.7E-6/r.yr.$

In response to a question from Mr. Michelson concerning the vintage of the fire risk analysis, Mr. Marie said the analysis was done in the 1982-1983 time frame and will be updated for the upcoming IPE.

Insights gained during the update confirmed the earlier analyses that risk is very low and no design vulnerabilities were discovered. The PRA insights led to many procedure enhancements. PECO does have planned model updates in conjunction with Generic Letter 88-20 (which provides the IPE requirements) and the IPE external events requirements that will be provided by the NRC in the future.

Mr. Marie noted that the original PRA did influence the final Limerick design in the areas of the standby liquid control, the MSIV and ADS air supplies, and the fire propagation barriers. PRA insights are also being used to prioritize modifications.

Status of Licensing

Mr. D. Honan, Limerick 2 PECO Licensing Branch Head, discussed the licensing activities remaining for Limerick 2 and discussed the PECO actions taken with regard to ACRS recommendations in previous letters. These recommendations were in the areas of severe accident mitigation features, systems interactions, and seismic risk. Limerick has installed a 6-inch-diameter pipe containment vent and the operators are trained in the use of this vent. In addition Limerick has the ability to inject water into the vessel independent of AC power by using diesel-powered pumps via the reactor water clean up system. PECO is also in the process of upgrading their procedures to Revision 4 of the BWR Operating Guidelines.

In response to questions from the Committee concerning the assessment of operating experience, Mr. Hunter said that they receive operating experience reports directly from the NRC, INPO, and others and send them directly to their technical superintendents at both the Peach Bottom and the Limerick Stations. The technical superintendents at each will then initiate technical reviews of these reports to determine applicability. With regard to seismic risk, PECO has worked as part of the Owners Group formed to assess the impact of the 1886 Charleston earthquake. The conclusion of the Group was that the issues associated with the Charleston earthquake do not result in any significant change in the Group's perception of the seismic risk for the Limerick site.

Concluding Remarks

In response to questions from Dr. Remick concerning past concerns regarding assuring back-up raw coolant water supply, Mr. McNeill noted that the problem is still not completely resolved. The project is scheduled to be completed later this summer but there are still some problems with getting some of the permits. There is also a legal case under review by an Environmental Quality Board. If approval is not obtained, PECO does have the option of operating at reduced power during hot weather until adequate water supply is provided.

The Committee decided to report to the Commission on this subject. The report is discussed in Section XIII.

IX. Nuclear Power Plant In-Situ Testing and Surveillance of Motor-Operated Valves (Open)

[Note: Mr. E. Igne was the Designated Federal Official for this portion of the meeting.]

Mr. C. Callaway, NUMARC, discussed the industry's views on the NRC staff's proposed generic letter on motor-operated valves (MOVs). Two concerns are the

scope of the generic letter and the costs associated with implementation. The generic letter extends the scope of the valve testing and surveillance program to include all safety-related MOVs. Industry feels that the generic letter should only address valves significantly affecting core melt frequency. In response to questions by Committee members, Mr. R. Elstrom, Consumers Power, stated that he has no problem with the generic letter. He stated that it has enough flexibility so that utilities should be able to cope with it. New cost analysis by the industry and by NRC staff have reduced the differences between the industry and NRC staff estimates of the program cost.

Mr. R. Baer, NRR, presented the staff's position on the generic letter and discussed the staff's updated cost analysis. Differences between the staff and the industry are being identified and resolved.

The Committee decided to report to the Commission on this subject. This report is discussed in Section XIII.

X. NRC Human Factors Programs and Initiatives (Open)

[Note: Mr. H. Alderman was the Designated Federal Official for this portion of the meeting.]

Dr. Remick noted that the staff had presented Draft Revision 1 of the Human Factors Regulatory Research Program Plan to the ACRS Human Factors Subcommittee on January 26, 1989. The Subcommittee concluded at that time that the matter was not yet ready to go to the full Committee. The Subcommittee suggested that the scope of the Human Factors Program Plan should be broader than just the research program plan for human factors. The staff has revised the program plan such that it now includes the initiatives in the various offices. The staff met with the Human Factors Subcommittee on April 19, 1989 and discussed the changes in the program plan. The Subcommittee, at that time, concluded that the matter was ready for review by the full Committee.

Mr. B. Sheron, RES, discussed the background of the program and its objectives. He noted that the staff prepared a human factors research program and sent it to the Commission in May 1988. The Commission requested the staff to update the plan to include NRC human factors initiatives and to better define the issues being addressed by the plan. In October 1988, the staff presented the revised plan to the Commission and in January 1989 met with the Human Factors Subcommittee. During the same time, the EDO requested the staff to prepare an agencywide program plan. This plan was presented to the Human Factors Subcommittee in April 1989. Dr. Remick noted that the staff will present the program plan to the ACRS today and, following ACRS comments, will present the plan to the Commission.

Human Factors Programs in NRR

Ms. C. Goodman, NRR, discussed the initiatives that NRR is undertaking to continue to investigate the root cause of personnel errors at nuclear power plants. This program will be coordinated with AEOD and RES. She noted also

that there currently is an Emergency Operating Procedures (EOP) Inspection Program. NUREG-1368 gives the lessons learned from the special EOP inspections. She also stated that two important human factors initiatives were control room design review and the Safety Parameter Display System (SPDS). A generic letter and NUREG-1342 regarding the SPDS have been sent to licensees. NUREG-1342 describes the methods that have been shown to be an acceptable method for implementing SPDS.

Ms. Goodman noted that NRR has developed a new approach to inspection. This new approach was developed using a working group from the Regions (which included resident inspectors) and was reviewed by Region personnel. In addition to this, NRR and RES have a project to develop additional criteria and methods to measure training effectiveness. The requalification program has been revised to be more operationally oriented and performance-based.

AEOD and NRR have requested that research be performed on the human factors aspects of organization and management. The Division of Radiation Protection and Emergency Preparedness has work under way which is directed to understanding the sensitivity of risk to human error rates. The objective of this project is to identify and characterize risks associated with the various types of human action. RES is also developing a method to understand and evaluate the impact of organization and management influences on risk.

Human Factors Efforts in AEOD

Mr. G. Lanik, AEOD, noted that the LER system provides information on human errors and events. AEOD is looking into ways of improving human factors information provided in this data base. The performance indicator program is also being studied to see if this program can be used to identify problems associated with human performance. AEOD and RES are working on ways to obtain human factors insights from the incident investigation programs and diagnostic evaluation programs. AEOD has worked with the Training Center to use simulators for developing ways of examining human performance in the control room.

Human Factors Programs in NMSS

Mr. D. Serig, NMSS, noted that the human factors efforts in NMSS have been under way for about a year. He discussed the relative risk to an individual from reactor activities versus medical use. He noted that experience shows that a misadministration in the medical field might occur about once in every 10,000 treatments. He was not able to compare this to the risk to an individual from a reactor accident.

Mr. Serig stated that there is ongoing work involving a survey to determine what QA practices exist in medical facilities. In addition, he noted that NMSS was working to raise the licensees' awareness to human factors issues. He noted the work on development of remote "after loading" devices. Without the use of this equipment, a surgeon would physically implant radioactive sources within a patient in an operating room. As a result, the occupational exposures to operating room personnel were higher than desired. With this new hardware a

device is inserted into the person which permits the remote insertion of the radioactive material. Occupational overexposure of industrial radiographers has also been a problem over the years. Efforts have been under way to reduce some of the human errors that are occurring and to improve control over the use of these sources.

Mr. Serig also noted that the high-level waste repository presents the possibility of human errors leading to accidents that could affect the public health and safety. This issue is being addressed in the licensing of the repository.

Human Factors Regulatory Research Program, RES

Mr. F. Coffman, RES, noted that the research program was designed to provide the technological basis for regulatory actions. It includes basic research on anticipated human performance issues that are potentially significant. He noted that it also includes work associated with incorporating human reliability analyses into probabilistic risk assessments.

Mr. Coffman listed some of the activities included in the research program:

- Personnel performance measurement. This work is an activity focused on the need to develop a means for measuring human performance and to acquire human performance data. This data would subsequently be analyzed.
- Human Systems Interface. This work is focused on the basis for criterion for equipment design, work space layout, habitability, and performance aids.
- Organization and management. This work is directed toward developing models and measures of organizational and management influences.
- Data acquisition and quantification. This is focused primarily on obtaining data that can be used to obtain information on human performance.
- Data management systems. This work is focused on the means for storing and analyzing the data.
- Human reliability analysis and probabilistic risk assessment integration. This is focused on the tools for bringing a balanced assessment of both humans and hardware into the PRAs.
- Human Factors Issues. These are already-identified Generic Issues which address human factors issues.
- Chernobyl follow-up items. Portions of the Chernobyl follow-up work are designed to explore the human factors issues associated with the accident.
- Providing support for NMSS human factors activities. RES will provide support to the NMSS work.

Personnel Performance Measurement, Personnel Subsystems, and Human Systems Interactions

Dr. J. Persensky, RES, discussed personnel performance measurement, personnel subsystems, and human systems interaction. Dr. Persensky stated that the cause analysis for about 50 percent of the LERs indicate that human error is involved. He noted that the LER usually does not provide much information as to why the human made the error or the nature of the root cause. He said the purpose of this element is to provide a standardized structure for gathering data related to human error. Dr. Persensky noted they are trying to expand the information provided by LERs to develop better information, better data, and more categories of human error.

The first project under this element is the development of a standardized tool to investigate events that involve human errors. Usually it is found that there are multiple causes, not a single cause.

About four years ago the staff developed the incident investigation program. The staff is looking for means to evaluate its effectiveness either through a contract or during some future investigation.

Personnel subsystems involve the evaluation of training, personnel qualifications, and the effect of stress, fatigue, and distractions on human performance. The objective is to develop better guidance in these areas.

He discussed some specific examples of the work being performed in the training area. The INPO accreditation program is used as the basis for approval of training programs. As long as a utility has a standard or systems approach to training which INPO has accredited, the NRC will approve that training program.

In the qualifications or staffing qualifications area most of the effort has been on the licensed operator. Little research has been performed regarding other operations personnel. Mr. Persensky noted there was some possibility that the staff would be involved with the development of guidance for training for materials licensees at a later date.

Human factors aspects of shift scheduling and shift rotation are being studied. One project is studying a 12-hour versus 8-hour shift. Another project involves collecting information on working hours from nonnuclear industries and try to relate that data to the nuclear industry.

Human-Systems Interface

This research is directed toward understanding the human factors relationship between the person operating the machine and the process of gathering information from the machine. This includes not only the hardware interface but also the effectiveness of job performance aids such as instruction manuals and procedures.

Some of the specific areas being studied are:

- ° The impact of advanced controls and instrumentation - There seems to be a movement away from analog controls in the control rooms toward digital systems. Guidance is needed for these advanced digital systems.
- ° New human factors problems associated with unique design features of advanced reactors - These systems may present new problems. The staff wants to be in a position to recognize and evaluate any changes.
- ° Evaluation of the implications of job performance aids - This area needs to be understood and guidance and criteria developed.
- ° Symptom-based operating procedures - Symptom-based emergency operating procedures are currently in use. The staff is looking at other types of procedures to determine whether these procedures should also be changed.

Dr. Remick pointed out that improved graphics and flow diagrams have been developed for use in training. He asked if any attention had been given to operational procedures regarding the use of better graphics and flow charts. Dr. Persensky replied that he did not know of any effort in that area. Dr. Remick suggested that this should be given consideration.

Dr. Remick asked if there was any research activity attempting to improve the selection of resident inspectors. Dr. Persensky replied that they do not have a user request in that area at this time. Mr. Sheron added that an appropriate action would be up to NRR to look at their resident inspector program and to see if there were areas that would be amenable to research.

Mr. Michelson asked if there were any studies under way to develop a better understanding of human performance under stressful situations such as would occur during a severe earthquake or fire. Dr. Persensky replied that this might be covered under the accident management program.

Overview of the Organization and Management and Reliability Assessment of the Human Factors Research Plan

Dr. T. Ryan, RES, noted that the premise for the organization and management element is basically that the operation of any complex system including a nuclear power plant under normal or emergency conditions is basically a group, or team, process. Human performance would be influenced by the type of organization and characteristics of management personnel.

The organization and management element is divided into three topic areas:

- ° Techniques for characterizing the organization

- ° Methods for gathering information on the organization
- ° Establishment of ways for indexing the information to answer regulatory questions regarding organization management or team performance.

Dr. Ryan noted that work for the organization and management area was being performed on the following topics:

- ° A methodology for characterizing the nuclear power plant under normal operations
- ° Work on trying to deal with the transition period between normal operation and an emergency or accident situation
- ° Data-gathering systems for performance measurement
- ° Relationship between the individual and the organization
- ° Maintenance program indicators
- ° Training program indicators
- ° Management indicators
- ° Chernobyl follow-up studies.

Under the reliability assessment area, Dr. Ryan noted that work was being performed on the following topics:

- ° Acquiring probabilistic data
- ° Developing probability estimates on single-task actions
- ° Developing automated data base for this information
- ° Analyzing human data performance and combining it with hardware considerations
- ° Developing a method for fully integrating human factors expertise and engineering expertise within the context of the PRA process
- ° Analyzing human data information and bringing it together with hardware considerations
- ° Documentation of the analysis.

In response to Dr. Kerr's question as to how the staff decides that a plant is a problem plant, Mr. D. Persinko, NRR said that there are no written criteria. Identification of problem plants have been the result of a collegial decision between the regional administrator and the senior management of the various NRC

offices. Periodic meetings of senior management are scheduled during which plant information is reviewed and decisions are made. The senior management decides when a plant is a problem plant and, conversely, decides when it should be removed from the problem plant list.

The Committee decided to report to the Commission on this subject. The report is discussed in Section XIII.

XI. Tutorial on Emergency Preparedness (Open)

[Mr. E. Igne was the Designated Federal Official for this portion of the meeting.]

At the March 1989 ACRS meeting, the Committee decided that a 2-3 hour tutorial on emergency preparedness be presented to the full Committee based on presentations at the March 1-2, 1989 meeting of the Subcommittee on Occupational and Environmental Protection Systems. Onsite/offsite and emergency action drills were discussed by Mr. T. Tipton and Mr. A. Nelson of NUMARC, and graded response was discussed by Mr. H. Specter, New York Power Authority (NYPA). Mr. R. Gardner, Stone & Webster (S&W), discussed a S&W study on the Emergency Planning in Europe. Emergency preparedness and emergency response were discussed by Mr. W. Travers, NRR, and Mr. G. Zech, AEOD, respectively.

A. Nelson, NUMARC, discussed factors affecting emergency evacuations made necessary by severe natural events or industrial accidents. This NUMARC study reviewed a number of major evacuations and the lessons learned. In one case 700,000 people were evacuated with 4 injuries and no deaths. From the 50 case studies, it was determined that nuclear facilities and their neighboring communities do much more in the way of emergency preparedness than most of the communities studied.

Mr. H. Specter, NYPA, discussed the results of a NUMARC study on graded response. He stated that the graded response strategy consists of prompt evacuation of an inner zone (having a 2-mile radius and encompassing about 1 percent of the EPZ population), sheltering the outer zone (having a 10-mile radius) as appropriate, and using relocation when warranted. This strategy implements the conclusions of an independent DOE site analysis that determined the following:

- ° early fatality risks decrease very rapidly with distance,
- ° sheltering offers good protection, and
- ° prompt evacuation near the plant is very effective.

NRC site-specific analysis also indicated that graded response results in a very low potential for early fatalities even with very large releases at highly populated sites, and that graded response strategy is much more effective than a massive evacuation.

Mr. R. Gardner, S&W, briefly discussed international emergency preparedness and response after Chernobyl. The objectives of the study were to provide descriptions of emergency response plans and provisions (ERPP) in each European country in order to compare the various features and highlight any changes which have been adopted or are under consideration as a result of the Chernobyl accident.

The study indicates that, in general, no major revisions of nuclear power plant ERPP were made as a result of the Chernobyl accident in the countries visited. Much activity is taking place to improve ERPP in the post-Chernobyl period, but the activities differ from country to country and may be described as evolutionary changes, many of which were under consideration before the Chernobyl accident but were accelerated as a result of the accident. There is a tendency toward more, rather than less, centralization of basic decision-making.

Mr. W. Travers, NRR, presented a report on emergency preparedness at nuclear power plants. He outlined the responsibilities of emergency preparedness and response at NRC headquarters and discussed the functions of AEOD's Incident Response Branch, NRR's Emergency Preparedness Branch, and NMSS' Operations Branch.

Offsite aspects of onsite plans for low-power operation were discussed, using the Seabrook plant as a case study. The following are highlights of the rule regarding low-power operation:

- Arrangements for offsite assistance onsite are defined.
- Utilities should be in constant communications with state and local officials.
- Offsite monitoring systems and equipment are available onsite.
- Training is available for offsite people regarding onsite emergencies.

The realism rule and policy implementation were highlighted. NRC believes that in an actual emergency State and local governments will exercise their best efforts and in doing so they will generally follow the licensee's emergency plans. He further stated that a license may be issued in spite of noncompliance with the standards if:

- nonparticipation by State or local governments is the cause,
- utility makes good faith effort to obtain State and local participation, and
- the emergency plan provides reasonable assurance that the health and safety of the public will be protected.

Mr. Travers stated that the NRC relies on FEMA in the evaluation of the offsite aspects of emergency planning, and relies on State and local participation in emergency planning and the required biennial exercises. Regarding the

exercises, he stated that recent offsite and onsite exercises have generally been well executed.

Mr. G. Zech, AEOD, discussed NRC's rule during an emergency at a nuclear power plant. Briefly stated, NRC's role is to monitor, assist, and inform. Intervention in even a limited fashion to direct the licensee's onsite response is very rare. During an emergency NRC does have the authority to direct, or make recommendations to, a licensee through a legal order from the Chairman of the Commission.

XII. ATWS Rule Implementation Status (Open)

[Note: Dr. M. El-Zeftawy was the Designated Federal Official for this portion of the meeting.]

Dr. Kerr, Chairman, Instrumentation and Control Systems Subcommittee, briefed the full Committee regarding the ATWS rule implementation status. He stated that the Subcommittee met with members of the NRC staff and representatives of industry on April 21, 1989 to review the progress being made regarding this issue.

Dr. Kerr indicated that reasonable progress has been made, especially in light of some of the difficulties that have arisen in the interpretation and application of the ATWS rule. Dr. Kerr indicated that two issues which arose as a result of the Subcommittee's discussion deserve further attention. The first issue is the significance of, and application of, diversity in systems which use redundancy to achieve high levels of reliability. The ATWS rule requires that diversity be used in an effort to further improve reliability "where reasonable and practicable." The staff interprets the rule to require diversity even if, in a particular application, there is no evidence that its use increases reliability, and possibly even in situations where diversity appears to be undesirable. Dr. Kerr commented that this approach seems to be contrary to the spirit of the rule which is aimed at increasing the overall reliability of the rapid shutdown system.

The second issue deals with the possible influence of aging on the occurrence of common-mode failures. The staff believes that diversity during the first forty years of plant life could avoid development of common-mode failures due to "wear out." Dr. Kerr commented that, while it is true that "wear out" of components does cluster around some "mean-time-to-wear-out," this time should be well known from testing and experience, and components should be replaced early enough to avoid it and, on this basis, aging should not be a contributor to common-mode failures.

The Committee did not complete its discussion on a proposed ACRS report regarding the staff's effort in implementing the ATWS rule. The Committee will continue its discussion during the June 8-10, 1989 meeting.

XIII. Executive Sessions (Open)A. Subcommittee Reports (Open)1. Planning and Procedures Subcommittee

The ACRS Planning and Procedures Subcommittee reported to the Committee on the May 3, 1989 Subcommittee meeting. The Committee decided to take the following actions as a result of these discussions:

- (a) The Committee agreed to attend the quadripartite meeting between the ACRS, GPR, RSK, and Japan to be scheduled between April and June 1990. The meeting is to be held in Strasbourg. The Committee proposed that discussions on containment requirements for future reactors be on the agenda. Dr. Lewis suggested a discussion of emergency planning for nuclear facilities near international borders. Mr. Fraley will contact the GPR/RSK regarding more details on the content of the agenda.
- (b) The Committee agreed to write a report to Chairman Zech explaining the Committee's views on an appropriate split of responsibility between the ACRS and ACNW (see Item 7 in the Reports section of this memo).
- (c) The Committee did not object to the use of NRC staff for rotating assignments into the ACRS office and the employment of summer students to make use of unused FTEs allocated for Fellows and staff engineers.

B. Reports, Letters, and Memoranda (Open)1. NUREG-1150, "Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants" (Report to Chairman Zech dated May 9, 1989)

The Committee stated that since the second draft of NUREG-1150 had been available for only a short time, it did not have an opportunity for a detailed review of this document. But, on the basis of a cursory examination, the Committee recommended that if the NUREG-1150 conclusions are used, they should be examined very carefully in light of the criticism leveled at the initial draft. The Committee noted that the criticism of the initial draft focused, for the most part, on the Level II portion of the PRA and, on that basis, that more credence can be given to the Level I insights. The Committee stated that some segments of the NRC staff which will be responsible for using the results of NUREG-1150 during discussions with the Committee, had expressed reservations as to the robustness of PRA/NUREG-1150 results. The Committee suggested that comments be solicited from these parts of the NRC staff.

2. Operating License Application for Limerick Generating Station, Unit 2
(Report to Chairman Zech dated May 11, 1989)

The Committee concluded that, subject to satisfactory completion of construction and preoperational testing, there is reasonable assurance that the Limerick Generating Station, Unit 2 can be operated at power levels up to 3293 Mwt without undue risk to the health and safety of the public. The Committee noted that for the past several years it has been standard NRC practice to require extended periods of plant operation at very low power before approving operation at full power. The Committee suggested that if this practice is to be continued, some systematic investigation be made to determine if there were any possible adverse effects associated with such practice.

3. Draft Generic Letter Related to Occupational Radiation Exposure of Skin from Hot Particles (Report to Chairman Zech dated May 9, 1989)

The Committee did not endorse issuing the NRC staff's generic letter and interim standard in the form proposed by the NRC staff and made recommendations to be applied to the resolution of this issue.

4. Generic Letter on Safety-Related Motor-Operated Valve Testing and Surveillance (Report to Chairman Zech dated May 9, 1989)

The Committee concurred in the need for, and scope of, the NRC staff's proposed generic letter as a mechanism for formalizing a program to deal with the testing and surveillance of motor-operated valves. The Committee made a number of recommendations for revisions to the proposed generic letter.

5. NRC's Human Factors Programs and Initiatives (Report to Chairman Zech dated May 9, 1989)

The Committee recommended that the NRC proceed with the proposed human factors research program and initiatives and made specific recommendations. The Committee asked to be kept informed on the results of the research and any proposed implementation into the regulatory process.

6. Division of Responsibility Between the ACRS and the ACNW

The Committee did not complete its discussions on a proposed ACRS report on the ACRS views on an appropriate division of responsibility between the ACRS and the ACNW. The Committee will continue its discussions during the June 8-10, 1989 ACRS meeting.

C. Other Conclusions (Open)1. ACRS Review of the SALP Process

The Committee discussed the use of the SALP process by the NRC staff in the regulation of operating plants and whether this should be reviewed by the ACRS. The need for, and nature of, the ACRS review of this matter will be discussed by the Planning and Procedures Subcommittee during its next meeting. Dr. Siess asked that the ACRS staff provide a summary of the SALP ratings for the "problem plants."

2. Schedule for ACRS Continued Review of NUREG-1150 to be Developed

Dr. Kerr will develop a schedule for the Committee's continued review of NUREG-1150 based on discussions with Dr. Ross (RES).

3. Use of ACRS/NRC Staff Memorandum of Understanding

The Committee discussed the use of the ACRS/NRC staff memorandum of understanding (MOU). Mr. Persinko, NRR, has committed to propose some changes to the MOU to include generic letters, information notices, etc. The ACRS staff and the NRC staff will continue to work to develop improved guidance as to the specific matters that the Committee desires an opportunity to review.

D. Future Activities (Open)1. Future Agenda

The Committee agreed to the tentative agenda as shown in Appendix II.

2. Future Activities

A schedule of future subcommittee activities was distributed to members (Appendix III).

The 349th ACRS meeting was adjourned at 1:30 p.m., Saturday, May 6, 1989.

APPENDICES
MINUTES OF THE 349TH ACRS MEETING
MAY 3-6, 1989

- I. Attendees
- II. Future Agenda
- III. Future Subcommittee Activities
- IV. Other Documents Received
- V. Transcript of Portion of May 3, 1989 Open Meeting of
U.S. Nuclear Regular Commission Covering Periodic Briefing
by Advisory Committee on Reactor Safeguards

APPENDIX I
349TH ACRS MEETING MINUTES
MAY 3-6, 1989

WEDNESDAY, May 3, 1989, ACRS Members met with the Commissioners.

THURSDAY, MAY 4, 1989

Public Attendees

C. K. Lewe, NUS
S. Sharron, SERCH
W. M. Beckner, NCRP
Lynne Fairbent, NUMARC
Tom Tipton, NUMARC
Gil Brown, NUMARC
Michael C. Williams, Union Electric Co.
Wm. R. Sangrey, IBM
L. E. Jordan, IBM
G. W. Thompson, IBM
J. McPherson, IBM
W. F. Pasedag, DOE
M. E.L. Evans, NUS
E. R. Schmidt, NUS
A. J. Machieu, EPRI
John Fuoto, ERCE
Melanie A. Miller, TENERA (PECO)
J. Martore, TENERA, PECO
Junius W. Millard, GE-NE
D. R. Helwig, PECO
Robert J. Lees, PECO
Rod Krich, PECO
Corbin A. McNeill, PECO
Wm. J. Brady, PECO
Graham M. Leitch, PECO
H. David Honan, PECO
A. J. Marie, PECO
M. J. McCormick, Jr., PECO
C. J. McDermott, PECO
J. Doering, PECO
S. J. Kowalski, PECO
George A. Hunger, Jr., PECO
John Kraus, PECO
Jim Muntz, PECO
W. Ted Ullrich, PECO
J. Monaghan, PECO
Edward Evans, PECO
J. L. Phillabaum, PECO

NRC Attendees

T. C. Elsasser, OCM/KC
John Buchanan, NRR
Jim Wigginton, NRR
Tom Essig, NRR
L. J. Cunningham, NRR
Frank Congel, NRR
Alan K. Roecklein, RES
Jack M. Bell, RES
V. Benaroya, AEOD
J. E. Rosenthal, AEOD
Peter Lam, AEOD
J. Heltemes, AEOD
M. Chiramal, AEOD
Chuck Heon, AEOD
R. Persensky, RES
D. Persinko, NRR
Dick Clark, NRR
Walt Butler, NRR
Steven Stein, NRR
Robert Gramm, NRR
Leon Reiter, NRR
H. Li, NRR

Friday, May 5, 1989

Public Attendees

Charles R. Jones, TENERA Engr. Services
L. Connon, SAIC
E. Fotopoulos, SERCH Licensing, Bechtel
Clare Callway, NUMARC
Claudia Guild, Nubarg, Bishop Cook
Purcell & Reynolds
C. K. Lewe, NUS
Anthony P. Moffa, Liberty Tech. Ctr.
Warren J. Hall, NUMARC
Bill Pearce, Consultant
Alan Nelson, NUMARC
J. P. McGranery, Jr., Dow, Lonnes &
Albertson
Herschel Specter, NYPA
John Fuoto, ERCE
Dick Gardner, Stone & Webster
John Gaunt, ERCE
Tom Tipton, NUMARC
Richard Stark, DOE

NRC Attendees

Owen Rothberg, RES
Richard J. Kiessel, NRR
Thomas Scarbrough, NRR
G. H. Weidenhamer, RES
J. C. Higgins, BrookhavenNL
R. L. Baer, RES
J. J. Kramer, RES
A. Ramey-Smith, RES
F. D. Coffman, RES
Clare Goodman, NRR
Dennis Serig, NMSS
D. J. Persensky, RES
G. Lanik, AEOD
H. Faulkner, GPA/IP
D. Persinko, NRR
G. Zech, AEOD
J. Jolicoeur, AEOD
R. L. Neal, NRR
Ed Podolak, NRR
William D. Travers, NRR
Jack Heltemes, AECD

SCHEDULE FOR THE JUNE 8-10, 1989 ACRS MEETING

Implementation of ATWS Rule - Discuss a proposed ACRS report to the NRC regarding the status of the implementation of the NRC rule on Anticipated Transients Without Scram.

Scope of ACRS Responsibilities - Discuss the scope of ACRS responsibilities and related allocation of resources.

Education Requirements for Senior Operators and Supervisors at Nuclear Power Plants - Review and report on proposed NRC rules (10 CFR 50 and 55) on Education Requirements for Senior Operators and Supervisors at Nuclear Power Plants.

Thermal Hydraulic Research Program Plan - Review and report on the status and plans of the NRC research program related to thermal hydraulic research as detailed in NUREG-1252 and a proposed SECY paper to the Commission.

USI A-47, Safety Implications of Control Systems - Review and report on proposed final resolution of this unresolved safety issue.

BWR Thermal Hydraulic Instability - Review and report regarding the status of work related to BWR thermal hydraulic instability as evidenced by the core power oscillation event which occurred at the LaSalle nuclear power plant.

USI A-17, Systems Interactions - Review and report on the proposed final resolution of this unresolved safety issue.

Performance Indicator Program - Briefing by NRC staff regarding the development and implementation of new performance indicators for operating nuclear power plants.

Service Water Systems - Review and report on the proposed generic letter regarding the impact of service water systems failures and degradations on safety-related equipment.

GE Advanced Boiling Water Reactor - Comments by ACRS Subcommittee regarding design features of this standardized reactor to address severe accident policy considerations.

ACRS/ACNW COMMITTEE & SUBCOMMITTEE MEETINGS

Joint Thermal Hydraulic Phenomena/Core Performance, May 23, 1989, 7920 Norfolk Avenue, Bethesda, MD (Boehnert/Houston), 8:30 a.m., Room P-110. The Subcommittees will discuss: (1) the NRC-RES thermal hydraulic research program plan as documented in both NUREG-1252, and a proposed SECY paper, and (2) the status of the ongoing effort to address the implications of the core power oscillation event at LaSalle Unit 2. Attendance by the following is anticipated, and reservations have been made at the hotels indicated for the night of May 22:

Mr. Ward	HOLIDAY INN	Dr. Plesset	HOLIDAY INN
Mr. Wylie	HOLIDAY INN	Dr. Schrock	HOLIDAY INN
Dr. Catton	HOLIDAY INN	Dr. Lipinski	NONE
Dr. Kerr	NONE	Dr. Lee	HOLIDAY INN

Regulatory Policies and Practices, May 24, 1989 - Deferred to June/July.

Auxiliary and Secondary Systems, May 24, 1989, 7920 Norfolk Avenue, Bethesda, MD (Duraismamy), 8:30 a.m. - 1:00 p.m., Room P-110. The Subcommittee will discuss the proposed Generic Letter on Service Water System Problems Affecting Safety-Related Equipment, Biofouling problems at nuclear power plants, and other related matters. Attendance by the following is anticipated, and reservations have been made at the hotels indicated for the night of May 23:

Mr. Michelson	DAYS INN (CONGR.)	Mr. Wylie	HOLIDAY INN
Mr. Ward	HOLIDAY INN		

AC/DC Power Systems Reliability, June 7, 1989, 7920 Norfolk Avenue, Bethesda, MD (ET-Zeftawy), 8:30 a.m., Room P-110. The Subcommittee will review the proposed resolution of Generic Issue 128, "Electrical Power Reliability." Attendance by the following is anticipated, and reservations have been made at the hotels indicated for the night of June 6:

Mr. Wylie	HOLIDAY INN	Dr. Lewis	EMBASSY SUITES
Mr. Carroll	HOLIDAY INN	Mr. Davis	NONE
Dr. Kerr	NONE	Dr. Lee	NONE

Human Factors, June 7, 1989, 7920 Norfolk Avenue, Bethesda, MD (Alderman), 1:00 p.m., Room P-110. The Subcommittee will be briefed by RES staff on Chernobyl spin off study on the nature, frequency and severity of procedural violations at U.S. nuclear plants. Attendance by the following is anticipated, and reservations have been made at the hotels indicated for the night of June 6:

Dr. Remick (AR 6/7)	HOLIDAY INN	Mr. Michelson	DAYS INN (CONGR.)
Mr. Carroll	HOLIDAY INN	Mr. Ward	HOLIDAY INN
Dr. Kerr	NONE	Mr. Wylie	HOLIDAY INN

350th ACRS Meeting, June 8-10, 1989, Bethesda, MD, Room P-110.

11th ACNW Meeting, June 13, 1989, Bethesda, MD, Room P-110.

Materials and Metallurgy, June 20, 1989, 7920 Norfolk Avenue, Bethesda, MD (Igne), 8:30 a.m., Room P-110. The Subcommittee will review low upper shelf energy concerns of reactor pressure vessels. Attendance by the following is anticipated, and reservations have been made at the hotels indicated for the night of June 19:

Dr. Shewmon	NONE	Mr. Etherington	NONE
Mr. Ward	HOLIDAY INN	Dr. Hutchinson	NONE

Mechanical Components, June 21, 1989, 7920 Norfolk Avenue, Bethesda, MD (Igne), 8:30 a.m., Room P-110. The Subcommittee will review and discuss: (1) Bechtel/KWU Alliance Program on MOV operability, (2) concerns on the reliability of check valves, and (3) other related matters. Attendance by the following is anticipated, and reservations have been made at the hotels indicated for the night of June 20:

Mr. Michelson	DAYS INN (CONGR.)	Dr. Siess	HOLIDAY INN
Mr. Carroll	HOLIDAY INN	Mr. Wylie	HOLIDAY INN

Extreme External Phenomena, June 23, 1989 (tentative), 7920 Norfolk Avenue, Bethesda, MD (Igne), 8:30 a.m., Room P-110. The Subcommittee will review GI-40, "Seismic Design Criteria." Attendance by the following is anticipated, and reservations have been made at the hotels indicated for the night of June 22:

Dr. Siess	HOLIDAY INN	Dr. Trifunac(tent.)	NONE
Dr. Lewis	EMBASSY SUITES	Dr. Scavuzzo(tent.)	NONE
Mr. Wylie	HOLIDAY INN		

12th ACNW Meeting, June 28-30, 1989, Bethesda, MD, Room P-110.

Generic Items, July 12, 1989, 7920 Norfolk Avenue, Bethesda, MD (Duraiswamy), 8:30 a.m., Room P-110. The Subcommittee will discuss the Multiple Systems Response Program (MSRP). Lodging will be announced later. Attendance by the following is anticipated:

Dr. Siess	Dr. Remick
Dr. Kerr	Mr. Ward
Mr. Michelson	Mr. Wylie

351st ACRS Meeting, July 13-15, 1989, Bethesda, MD, Room P-110.

13th ACNW Meeting, July 26-27, 1989, Bethesda, MD, Room P-110.

Joint Regulatory Activities and Containment Systems, August 9, 1989, 7920 Norfolk Avenue, Bethesda, MD (Duraiswamy/Houston), 8:30 a.m., Room P-110. The Subcommittees will review the proposed final revision to Appendix J to 10 CFR Part 50, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors." Lodging will be announced later. Attendance by the following is anticipated:

Dr. Siess
Mr. Ward
Mr. Carroll
Dr. Catton

Dr. Kerr
Mr. Michelson
Mr. Wylie

Planning and Procedures, August 9, 1989, 7920 Norfolk Avenue, Bethesda, MD (Frale), 4:00 p.m. - 5:30 p.m. (time to be adjusted depending on ending of joint Subcommittees meeting on Regulatory Activities and Containment Systems), Room P-422. The Subcommittee will discuss proposed changes in ACRS-NRC MOU to clarify areas of ACRS interest. Lodging will be announced later. Attendance by the following is anticipated:

Dr. Remick
Mr. Michelson

Mr. Ward

352nd ACRS Meeting, August 10-12, 1989, Bethesda, MD, Room P-110.

Thermal-Hydraulic Phenomena, Date to be determined (June), Bethesda, MD (Boehnert). The Subcommittee will review the proposed experimental program designed to investigate specific thermal hydraulic phenomena of the B&W OTSG. Attendance by the following is anticipated:

Mr. Ward
Dr. Catton
Dr. Kerr
Mr. Wylie

Dr. Plesset
Mr. Schrock
Dr. Sullivan
Dr. Tien

Auxiliary and Secondary Systems, To be determined (June/July), Bethesda, MD (Duraismwamy). The Subcommittee will review the adequacy of the staff's proposed plans to implement the recommendations resulting from the Fire Risk Scoping Study and other matters related to fire protection systems. Lodging will be announced later. Attendance by the following is anticipated:

Mr. Michelson	Dr. Siess
Mr. Carroll	Mr. Wylie
Dr. Catton	

B&W Reactor Plants (Rancho Seco), Date to be determined (late June/early July), Sacramento, CA (Igne). The Subcommittee will discuss the lessons learned from the approximately 2-year shutdown of Rancho Seco. Attendance by the following is anticipated:

Mr. Wylie	Mr. Michelson
Mr. Carroll	Mr. Ward
Dr. Kerr	Mr. Barton

Thermal Hydraulic Phenomena, Date to be determined (July), Bethesda, MD (Boehnert). The subcommittee will review the NRC staff's proposed resolution of Generic Issue 84, "CE PORVs." Attendance by the following is anticipated:

Mr. Ward	Dr. Plesset
Dr. Catton	Mr. Schrock
Dr. Kerr	Dr. Sullivan
Mr. Wylie	Dr. Tien

Plant Operating Procedures, To be determined (July), Bethesda, MD (Igne). The Subcommittee will review the status of the NRC program on Technical Specification Improvement. Attendance by the following is anticipated:

Mr. Carroll	Mr. Ward
Dr. Remick	Mr. Wylie

Advanced Pressurized Water Reactors, Date to be determined (July/August), Bethesda, MD (El-Zeftawy). The Subcommittee will review the licensing review bases document being developed by the Staff for Combustion Engineering's Standard Safety Analysis Report-Design Certification (CESSAR-DC). Attendance by the following is anticipated:

Mr. Carroll	Dr. Remick
Dr. Kerr	Dr. Shewmon
Mr. Michelson	Mr. Wylie

Advanced Pressurized Water Reactors, Date to be determined (July/August), Bethesda, MD (El-Zeftawy). The Subcommittee will discuss the comparison of WAPWR (RESAR SP/90) design with other modern plants (in U.S. and abroad). Attendance by the following is anticipated:

Mr. Carroll	Dr. Remick
Dr. Kerr	Dr. Shewmon
Mr. Michelson	Mr. Wylie

Severe Accidents, Date to be determined (July/August), Bethesda, MD (Houston). The Subcommittee will discuss the NRC Severe Accident Research Program (SARP) plan. Attendance by the following is anticipated:

Dr. Kerr	Mr. Ward
Dr. Catton	Mr. Davis
Dr. Shewmon	Dr. Lee
Dr. Siess	

Severe Accidents, Date to be determined (July/August), Bethesda, MD (Houston). The Subcommittee will discuss the NUMARC Accident Management guideline document and the NRC research program in the accident management area. Attendance by the following is anticipated:

Dr. Kerr	Mr. Ward
Dr. Catton	Dr. Corradini
Dr. Shewmon	Mr. Davis
Dr. Siess	Dr. Lee

Joint Severe Accidents and Probabilistic Risk Assessment, Date to be determined (July/August), Location to be determined (Houston). The Subcommittees will discuss the second draft of NUREG-1150, "Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants." Attendance by the following is anticipated:

Dr. Kerr	Dr. Siess
Dr. Lewis	Mr. Ward
Dr. Catton	Mr. Davis
Mr. Michelson	Dr. Lee
Dr. Remick	Dr. Saunders
Dr. Shewmon	

Decay Heat Removal Systems, Date to be determined (July/August), Bethesda, MD (Boehnert). The Subcommittee will continue its review of the proposed resolution of Generic Issue 23, "RCP Seal Failures." Attendance by the following is anticipated:

Mr. Ward	Mr. Michelson (tent.)
Dr. Catton	Mr. Wylie
Dr. Kerr	Mr. Davis

Joint Containment Systems and Structural Engineering, Date to be determined (July/August), San Francisco, CA area (Houston/Igne). The Subcommittees will discuss containment design criteria for future plants with invited speakers from industry. Attendance by the following is anticipated:

Mr. Ward	Dr. Kerr
Dr. Siess	Dr. Shewmon
Mr. Carroll	Mr. Wylie
Dr. Catton	Dr. Corradini

Joint Thermal Hydraulic Phenomena and Core Performance, Date to be determined (September), Bethesda, MD (Boehnert/Houston). The Subcommittees will continue their review of the implications of the core power oscillation event at LaSalle, Unit 2. Attendance by the following is anticipated:

Dr. Kerr	Dr. Lee
Mr. Ward	Dr. Lipinski
Dr. Catton	Dr. Plesset
Mr. Michelson	Mr. Schrock
Dr. Shewmon	Dr. Sullivan
Mr. Wylie	Dr. Tien

Decay Heat Removal Systems, Date to be determined, Bethesda, MD (Boehnert). The Subcommittee will explore the issue of the use of feed and bleed for decay heat removal in PWRs. Attendance by the following is anticipated:

Mr. Ward	Mr. Michelson (tent.)
Dr. Catton	Mr. Wylie
Dr. Kerr	Mr. Davis

Thermal Hydraulic Phenomena, Date to be determined, Bethesda, MD (Boehnert). The Subcommittee will discuss the status of Industry best-estimate ECCS model submittals for use with the revised ECCS Rule. Attendance by the following is anticipated:

Mr. Ward	Dr. Plesset
Dr. Catton	Mr. Schrock
Dr. Kerr	Dr. Sullivan
Mr. Michelson	Dr. Tien
Mr. Wylie	

Auxiliary and Secondary Systems, Date to be determined, Bethesda, MD (Duraiswamy). The Subcommittee will discuss the: (1) criteria being used by utilities to design Chilled Water Systems, (2) regulatory requirements for Chilled Water Systems design, and (3) criteria being used by the NRC staff to review the Chilled Water Systems design. Attendance by the following is anticipated:

Mr. Michelson	Mr. Wylie
Mr. Carroll	

Extreme External Phenomena, Date to be determined, Bethesda, MD (Igne). The Subcommittee will review planning documents on external events. Attendance by the following is anticipated:

Dr. Siess
Dr. Kerr
Dr. Lewis

Mr. Michelson
Mr. Wylie

Reliability Assurance, Date to be determined, Bethesda, MD (Duraiswamy). The Subcommittee will discuss the status of implementation of the resolution of USI A-46, "Seismic Qualification of Equipment in Operating Plants," and other related matters. Attendance by the following is anticipated:

Mr. Wylie
Mr. Carroll

Mr. Michelson
Dr. Siess

APPENDIX IV
OTHER DOCUMENTS RECEIVED
349TH ACRS MEETING
MAY 3-6, 1989

MEETING
NOTEBOOK
ITEM

- 2 PREPARATION FOR MEETING WITH COMMISSIONERS MAY 3, 1989
INTERNAL COMMITTEE USE ONLY material here.
- 3 MEETING WITH COMMISSIONERS DURING PUBLIC COMMISSION MEETING, MAY 3, 1989
(Portion of Commission Meeting Transcript pertaining to this meeting is
in Appendix V to 349th ACRS Meeting Minutes).
- 5 INTERIM STANDARD FOR OCCUPATIONAL EXPOSURE OF SKIN TO RADIATION FROM SMALL
RADIOACTIVE PARTICLES ("HOT PARTICLES")
- Slides used by the speaker during the presentation
- 6 EVALUATION OF OPERATING EXPERIENCE
- Slides used by the speaker during the presentation
- Tentative Schedule
- Memo for H. Lewis from H. Alderman, Subject: Status Report for Evaluation
of Operating Experience, dated April 25, 1989.
- AEOD Engineering Evaluation Report AEOD/E802, DESIGN AND OPERATING
DEFICIENCIES IN CONTROL ROOM EMERGENCY VENTILATION SYSTEMS, dated
April 1988
- AEOD Engineering Evaluation Report AEOD/E806, LOSS OF DECAY HEAT REMOVAL
CAPABILITY DUE TO RAPID REFUELING CAVITY PUMPDOWN, dated Oct. 1988
- AEOD Engineering Evaluation Report AEOD/#808, SUBJECT; OPERATIONAL
EXPERIENCE REVIEW OF POTENTIAL LARGE OPENINGS IN CONTAINMENT, dated
December 23, 1988
- AEOD Engineering Evaluation Report AEOD/E807, dated Oct. 16, 1988
SUBJECT; PUMP DAMAGE DUE TO LOW FLOW CAVITATION, Susquehanna 1
- 7 NUREG-1150: REACTOR RISK DOCUMENT
- Slides used by the speaker during the presentation
1. Table of Contents
 2. Tentative Agenda

- 3. Status Report with Attachments:
 ACRS Letter to Chairman Zech from W. Kerr, Subject: ACRS Comments on Draft NUREG-1150, "Reactor Risk Reference Document," dated July 15, 1987.
 Memorandum for V. Stello, Jr. from S. Chilk, SECY, Subject: SECY-88-337 - Plans for Future Review of NUREG-1150
 SECY-89-121, Transmittal of NUREG-1150, Second Draft for Peer Review (INTERNAL COMMITTEE USE ONLY).

Letter for R. Fraley from D. Ross, RES enclosing copy of Second Draft for Peer Review, Vol. 1, NUREG-1150, dated April 17, 1989 (INTERNAL COMMITTEE USE ONLY)

8 LIMERICK NUCLEAR POWER STATION, UNIT 2

- Slides used by the speaker during the presentation
- Table of Contents
- Tentative Agenda
- Project Status Report

ACRS letter, dated August 10, 1971, Report on Limerick Generating Station Units 1 and 2 Construction Permit Review for Limerick Units 1 and 2

ACRS letter, dated October 18, 1983, ACRS Interim Report Related to the Operating License Application for the Limerick Generating Station, Units 1 and 2

ACRS letter, dated November 6, 1984, ACRS Report on the Limerick Generating Station

ACRS letter, dated March 14, 1989, Review of the Peach Bottom Atomic Power Station Restart

Public comments received at the April 25th Subcommittee Meeting:

- a. Marvin I. Lewis - Limerick Ecology Action
- b. Richard Myers - Citizens League for Energy Awareness and Resources, (CLEAR)
- c. Ruth Miner - Citizens for Environmental Rights
- d. Emanuel Mendelson - Citizens for Environmental Rights
- e. Phyllis Gilbert - Sierra Club
- f. Margaret Dardis - Concerned Member of the Public

SALP Report Number 50-353/87-99, for the period of August 87 through December 1988

10 MOTOR-OPERATED VALVES

Slides used by the speaker during the presentation

11 NRC HUMAN FACTORS PROGRAMS AND INITIATIVES

and

12

Slides used by the speaker during the presentation

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Schedule

Status Report

PREDECISIONAL DRAFT of Commission Information Paper on NRC'S Human Factors Programs and Initiatives (INTERNAL COMMITTEE USE).

13.1 LIST OF FUTURE ACRS SUBCOMMITTEE ACTIVITIES

14 EMERGENCY PLANNING AND PREPAREDNESS

Slides used by the speaker during the presentation

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HANDOUTS

No. Agenda
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2 13 Memorandum to ACRS Members from R. Fraley, Subject: ACRS Meeting with NRC Commissioners on May 3, 1989, dated May 2, 1989

5 5.1 GENERIC LETTER AND INTERIM STANDARD CONCERNING HOT PARTICLE EXPOSURE OF SKIN

Slides used by the speaker during the presentation

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Status Report

Proposed Generic Letter and Interim Standard Concerning Hot Particle Exposure of Skin (INTERNAL COMMITTEE USE).

Working Copy of Minutes of ACRS Subcommittee Meeting on Occupational and Environmental Protection Systems, held April 20, 1989 (INTERNAL COMMITTEE USE).

ACRS Invited Expert Dade Moeller's Comments on subject standard, dated April 22, 1989 (INTERNAL COMMITTEE USE).

ACRS Consultant Melvin Carter's Comments on subject standard, dated April 25, 1989 (INTERNAL COMMITTEE USE).

Letter from T. Tipton, NUMARC, to Mr. James Carroll, ACRS Subcommittee Chairman re "hot particles", dated April 28, 1989 (INTERNAL COMMITTEE USE).

- 8 8 Portions of Transcript of Limerick-2 Subcommittee Meeting held April 25, 1989 covering oral public statements at subject meeting:
pp. 146 through 148, pp. 125 through 124, p. 145.
- 9 9.1 Summary of MAY 3, 1989 meeting of ACRS Planning and Procedures Subcommittee, dated May 4, 1989 (INTERNAL COMMITTEE USE).
- 10 10.1 GENERIC LETTER ON MOVs

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Status Report
Highlights of May 2, 1989 Meeting of ACRS Subcommittee on Mechanical Components

Letter to T. Murley from E. Beckjord, Subject: Transmittal of General Letter on Motor-Operated Valve Testing and Surveillance with Enclosures 1, 2, and 3
Memorandum for C. Michelson from M. Stella, ACRS Senior Fellow, Subject: Survey of Motor-Operated Valve Unreliability Data, dated April 26, 1989 (INTERNAL COMMITTEE USE ONLY).
- 13 13.2 Memorandum to ACRS Members from R. Fraley, Subject: Future ACRS Activities - 350th ACRS Meeting - June 8-10, 1989, dated May 3, 1989
- 14 14.1 TUTORIAL SESSION ON EMERGENCY PLANNING

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Status Report
Certified Minutes of the March 1-2, 1989 Meeting of the ACRS Subcommittee on Occupational and Environmental Protection
- 15 15.1 Working Copy of Minutes of April 21, 1989 Meeting of the Instrumentation and Control Systems Subcommittee Regarding ATWS Rule Implementation, dated 4/28/89 (INTERNAL COMMITTEE USE)

**UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION**

Title: PERIODIC BRIEFING BY ADVISORY COMMITTEE ON
REACTOR SAFEGUARDS

Location: ROCKVILLE, MARYLAND

Date: MAY 3, 1989

Pages: 71 PAGES

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APPENDIX V
349th ACRS Minutes

DISCLAIMER

This is an unofficial transcript of a meeting of the United States Nuclear Regulatory Commission held on May 3, 1989 in the Commission's office at One White Flint North, Rockville, Maryland. The meeting was open to public attendance and observation. This transcript has not been reviewed, corrected or edited, and it may contain inaccuracies.

The transcript is intended solely for general informational purposes. As provided by 10 CFR 9.103, it is not part of the formal or informal record of decision of the matters discussed. Expressions of opinion in this transcript do not necessarily reflect final determination or beliefs. No pleading or other paper may be filed with the Commission in any proceeding as the result of, or addressed to, any statement or argument contained herein, except as the Commission may authorize.

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

- - - -

PERIODIC BRIEFING BY
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS (ACRS)

- - - -

PUBLIC MEETING

Nuclear Regulatory Commission
One White Flint North
Rockville, Maryland

Wednesday, May 3, 1989

The Commission met in open session, pursuant to notice, at 2:00 a.m., Lando W. Zech, Jr., Chairman, presiding.

COMMISSIONERS PRESENT:

Lando W. Zech, Jr., Chairman of the Commission
Thomas M. Roberts, Commissioner
Kenneth C. Rogers, Commissioner
James R. Curtiss, Commissioner

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STAFF SEATED AT THE COMMISSION TABLE:

- Dr. Forrest J. Benick, Chairman, ACRS
- Pauline Michelson, Vice Chairman, ACRS
- Dr. Chester F. Siess, ACRS
- Dr. Harold W. Lewis, ACRS
- Dr. William Ferr, ACRS
- David A. Ward, ACRS
- Charles G. Wylie, ACRS
- James C. Carroll, ACRS
- Dr. Ivan Catton, ACRS

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P-R-O-C-E-E-D-I-N-G-S

2:04 p.m.

CHAIRMAN DECH: Good afternoon, ladies and gentlemen.

Commissioner Carr will not be joining us today.

The purpose of today's meeting is for the Advisory Committee on Reactor Safeguards to bring the Commission up to date concerning the results of its review of four specific matters. First, the intended uses of WWPB-1150, while the report is undergoing peer review. Second, implementation plan for the Safety Goal Policy. Third, the proposed final rulemaking related to maintenance of nuclear power plants. Finally, the Commission has specifically requested the ACRS to discuss its letter of April 17th, 1989 regarding an integrated approach on regulatory matters.

All of these important matters are under Commission consideration at this time. Copies of the ACRS letters relating to these topics are available at the entrance of the room.

Do any of my fellow Commissioners have any opening comments to make?

If not, Doctor Remick, I want to welcome you

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and the other members of the Committee. On behalf of myself and all the Commissioners, the work you perform is very important to us. Your views are highly regarded, highly respected, as you know, by the Commission.

You may proceed.

DOCTOR REMICK: Thank you, Chairman Zech, Commissioners. It's a pleasure for the ACRS to meet with you again today. The last time that we were here about a month ago I guess, there were only three of us that could make it. But I'm pleased to point out that all of us are here today except for Doctor Shawna, who could not be here.

I'd like to also take a moment to welcome Ivan Catton, our most recent member to the Committee, sitting down at the end, and indicate that we appreciate that he's been appointed to the Committee. He's a long-time consultant and is familiar with our activities, but it's a fine addition to our effort and we appreciate it.

CHAIRMAN ZECH: We too would like to welcome you, Doctor Catton, and recognize that you're taking on a big responsibility for not only the Advisory Committee but also for the Commission and for our country. We greatly appreciate your willingness to

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1 serve your country. We're grateful to have you on the
2 committee and we know you'll make a contribution. You
3 have in the past and we welcome you very much to the
4 Board, sir.

5 DOCTOR CATTON: Thank you.

6 DOCTOR REMICK: Chairman Zech, did you want
7 us to proceed in the order in which you identified the
8 topics?

9 CHAIRMAN ZECH: No, any order you'd like to
10 proceed.

11 DOCTOR REMICK: All right. Fine. We had
12 intended to cover the safety goal first.

13 CHAIRMAN ZECH: Fine. I think that's
14 appropriate too.

15 DOCTOR REMICK: All right. I might make a
16 few introductory comments before turning it over to
17 the appropriate subcommittee chairman.

18 I'd like to point out that the ACRS has been
19 a long-time supporter of safety goals, as I believe
20 you know, because we felt that it could help answer
21 the question of how safe is safe enough from the
22 standpoint of regulation of nuclear power plants. We
23 thought it might help truncate the endless search for
24 a zero risk technology, which we know does not exist.
25 We thought that it might help bring some stability and

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availability to the regulatory process.

We sincerely applaud the Commission's efforts to issue the safety goal as you've done. I personally feel that there's general acceptance of that safety goal as has been issued, and I find that it has helped me in talking to the public, in describing the qualitative goals and the quantitative health objectives.

What I tell them, the members of the public, that if you live near a nuclear power plant, it's anticipated that your risk would be no greater than 1/1000th of the risk of being killed in an accident compared to all other risks that you might have of being killed in an accident, or your chances are no greater than one in a thousand that you'll see fatal cancer or suffer fatal cancer, one-thousands of that compared to cancer from all other causes. The public has an understanding, I think, of that. They don't understand 10^{-6} and 10^{-6} and those type of numbers, but I think there has been general acceptance and some understanding.

Now, there are those who would continue to endlessly search for goals that are more to their individual liking. There's no question about that. I can remember a time when the industry said that the

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1 proposed safety goals were far too stringent. I can
 2 remember when the staff said that they weren't
 3 stringent enough. Well, we think that the time has
 4 come now for the Commission to decide, and although
 5 the safety goals are being used within the Commission
 6 staff in numerous ways that I'm sure you're aware of,
 7 we think it's time for the Commission to decide the
 8 ways that you want it to be implemented.

9 We've written you many letters containing
 10 our advice on how to do that and we came today, at
 11 your request, to discuss those views with you, but to
 12 reiterate that our letters represent our collegial
 13 consensus on those views.

14 At this point then, I'd like to turn it over
 15 to David Ward, who is Chairman of our Subcommittee on
 16 Safety Philosophy, Technology and Criteria, to
 17 summarize our letter of 16 February.

18 Dave?

19 MR. WARD: Thank you, Forrest.

20 Our letter of this past February was
 21 actually the third in a series of letters that we've
 22 written with our ideas of how you and the staff might
 23 implement the Safety Goal Policy. The first was
 24 written in '87, then '88 and now this most recent
 25 letter. So, the Committee has given a lot of thought

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1 to this. I hope our letters have been useful to you.

2 At the beginning we had some rather sharp
3 differences with the proposals that the staff was
4 developing and we think we've come together to a great
5 extent on those over the last two years. There are
6 still a couple of differences between what we suggest
7 in our letter of February and what the staff is
8 presently proposing and I'll talk about those.

9 But first, what I thought I'd do is just
10 summarize briefly where we agree with the staff
11 proposal, because you've heard that and read that
12 recently, and then talk a little bit about the several
13 remaining differences.

14 First, we agree with the present planned
15 proposal of the staff that the Safety Goal Policy
16 should be used to judge the adequacy of the
17 Commission's regulations and not the adequacy of the
18 design and operation of a particular, specific plant.
19 I think this is probably the most important concept
20 for the implementation of the Safety Goal Policy.
21 It's one in which I think there was disagreement
22 between the Committee and the staff two years ago, and
23 I think we now agree that this is the proper use of
24 the Safety Goal Policy, as a tool for evaluating the
25 regulations, not for evaluating the details and making

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specifically -- well, as we said, narrowly differentiated decisions about particular plants. So that's very important.

The second area of agreement we have is that the several objectives, quantitative objectives that were stated in the Safety Goal Policy could be laid out in kind of a hierarchical logical arrangement, going from abstract to fairly concrete at the bottom of the hierarchy.

And the intent there was to, at the uppermost level to have a couple really fairly general statements, but statements which mean something are expressing the Commission's philosophy about reactor safety regulation in a way that's I think clearly understandable to the public and to general policy makers. But then as you go down the hierarchy, you develop goals that can be more specifically applied by the engineers, by designers and operators of the organizations that are operating nuclear power plants.

And so we agree with the staff in the development and use of that sort of hierarchy. And in fact, we're in precise agreement on the definition of the first two levels in that hierarchy. We have some difference in the definitions that might be used in

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...and fourth levels, and I'll talk about those
in a minute. And finally, we agree with the staff
that it would be useful to incorporate certain parts
of their implementation plan into the policy itself,
so that they have standing and can have a clear
standing for the Agency and for the industry in being
used.

Okay, now the differences. First, in one of
the -- I think we called it Level Three of the safety
goal is the proposal that plants -- that the
probability of an accidental large release from any
nuclear power plant should be no more probable than
once in a million reactor years of operation. We
agree with that, with the once in a million reactor
years with the staff's proposal, but we still have
some disagreement on exactly what is meant by a large
release. We asked the staff to develop a proposal in
terms of perhaps a fraction of the core inventory of
radioactivity or perhaps in terms of curies, but
something that was truly and understandable as a
release itself.

The staff has proposed that instead they
would use a definition which is the release that would
cause a single fatality at the plant boundary at this
frequency level once in a million reactor years.

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Our problem with that is that we lose the advantage of this hierarchical arrangement. As I said, the hierarchical arrangement is to go from the abstract to a more concrete definition of a goal. In going from a higher to a lower level, the intent was to provide for some simplification so that there were concrete numbers that could be used by engineers, but also not to introduce so much conservatism in going from a higher level to a lower level, that there was a de facto new Safety Goal Policy being introduced. But rather that the conservatism introduced should be just enough to accommodate the simplification.

Well, we think that the staff's definition of large release in terms of a single fatality at the plant boundary fails that test and is, in essence, too conservative. In fact, it's redundant with the health effect safety goal, but much, much more restrictive.

In what we call the Level Four, we have a disagreement in that we wanted to provide in Level Four a means of balancing or providing some sort of honor in the defense-in-depth concept by providing a quantitative goal, not only for the probability of core melt or threat to a containment system, but also in parallel to provide a conditional probability of failure of goal for the actual performance of the

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containment system.

We felt that with this sort of a safety goal, that this would assure that the regulations were always providing for defense-in-depth in the form of both a containment or mitigation capability and prevention capability in terms of keeping the probability of core melt sufficiently low.

The staff does not have in its proposal this balance which we think is necessary. We think it's important. We think that's a rather important difference that needs to be maintained so that the real defense-in-depth or this balance between prevention and mitigation is fundamentally part of the -- and will be maintained as part of the Agency's regulatory system.

We also had some difference in opinion on the quantitative goal that would be assigned to the core damage probability. A number of once in 10,000 reactor years has been proposed for existing plants and I think the staff is proposing once in 100,000 reactor years, 10^{-5} for future plants. The Committee sees no real reason to make a difference between existing plants and future plants, although within the industry there is some movement to provide design goals for future plants that might have a core damage

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probability as low as 10^{-6} . We think that's perfectly sensible, acceptable if that's the industry's choice. But as far as regulating for public health and safety, if 10^{-4} is good enough, and we believe it is, it's good enough for future plants as well as existing plants.

One other thing. The probabilistic risk assessments which are necessary for the evaluation of plants or sample plants against the safety goal are limited in their ability to model what I might call the human and organizational performance of the plant. They're quite good at modeling the machine and failures in the machine, but they're limited, they're incomplete in modeling the performance of the humans and organizations in that plant. We know from observation and, I guess, common sense that the performance of humans and organizations is extremely important to the safety of the nuclear power plants you're regulating.

So, we suggested that the staff should attempt to come up with some sort of a goal, quantitative, or at least some sort of objectively stated goal for performance of the human and organization component in a nuclear power plant. They weren't able to. We weren't surprised. Frankly, I

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1 guess we really didn't expect them to. What we really
2 wanted to do was wave a flag here and point out that
3 the probabilistic risk assessments that are being done
4 are really incomplete in that they're not able to deal
5 in a very comprehensive way quantitatively with the
6 risk contribution from the failures of humans and
7 human organizations.

8 All we're suggesting is that that needs to
9 be called out by -- we suggested some sort of a
10 pertinent caveat in the Safety Goal Policy that the
11 evaluation is essentially incomplete in that respect.

12 I think we agree that it's really not
13 practical at this stage, perhaps it never will be, to
14 put any sort of a quantitative goal on organization
15 and human performance. Perhaps some kind of a more
16 objective statement about what the goal might be
17 possible in the future. We're really not ready with
18 that. But we do think that a caveat of some sort in
19 the policy is needed.

20 Of course, that summarizes really the major
21 agreements and differences and perhaps it would be
22 more useful now to take a little time for other
23 members to say something or to respond to comments or
24 questions from the Commissioners.

25 CHAIRMAN ZECH: Why don't we see if you have

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members that would like to comment.

DOCTOR REMICK: All right. I see none.

CHAIRMAN ZECH: All right. It's very good to think that the ACRS can be that together on their recommendations. I commend you for that.

COMMISSIONER ROGERS: Is this the way all your meetings run?

DOCTOR REMICK: No, I can assure you not.

CHAIRMAN ZECH: I wish the Commission could always be that sure.

DOCTOR REMICK: I think it will fall down as well as today.

CHAIRMAN ZECH: Yes.

DOCTOR LEWIS: You corrupt us at noontime.

DOCTOR REMICK: As I say, we've been working on this for two years. We've had a lot of discussions about it.

CHAIRMAN ZECH: Well, I'm sure you have and I appreciate it very much.

Well, before we move on then, let me see if there are questions from my fellow Commissioners.

Commissioner Roberts?

COMMISSIONER ROBERTS: No.

CHAIRMAN ZECH: Commissioner Rogers?

COMMISSIONER ROGERS: Just how you think

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1 incorporating guidelines into the policy. You
2 didn't say very much about that in your letter of
3 February 16th. You did touch on it. But I wonder
4 what your -- if you could say just a little bit what
5 your thinking is.

6 MR. WARD: We really didn't consider it that
7 much. The staff had suggested that by amendment to
8 the policy statement that some of the parts of this
9 implementation plan that kind of flush it out, make it
10 more of a whole should actually be put into the policy
11 statement. I think we don't -- we think that would be
12 a good idea. We don't have any problem with it, but
13 we don't really have a lot of comments about it.

14 COMMISSIONER ROGERS: Well, I noticed in
15 your letter of February 16th that you -- in talking
16 about a definition of adequate protection, you said
17 that you "believe the safety goals should be used to
18 judge the adequacy of the regulations from the
19 standpoint of whether those regulations result in
20 classes of nuclear power plants which can be and are
21 operated in such a way as to meet the safety goals and
22 thus provide adequate protection to the public."

23 I wonder whether that word "classes" had
24 some significance, particular significance. When I
25 noted your comment on the incorporation of guidelines

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1 from the policy, whether there was some connection
2 there between --

3 DOCTOR REMICK: I don't think there was a
4 connection between the two.

5 COMMISSIONER ROGERS: You saw something
6 there.

7 DOCTOR REMICK: But classes, we generally
8 talk about the population of plants, but realizing
9 what you say that there are such differences as Fort
10 St. Main that might be different than a Mark I BWR
11 and so forth. So, whether you could take all 109 or
12 11 plants as a population or whether you need to take
13 several subsets of those because of different designs,
14 and that's where I think we use the word "class."

15 Hal, do you want to answer that?

16 DOCTOR LEWIS: No, I think you're right. I
17 think it's an important point because the history
18 is that there's a tendency on the part of the staff to
19 want to have guidelines for regulation and regulation
20 inevitable occurs at the small number level, either
21 individual small groups of plants.

22 When we first heard about one of the early
23 briefings about the safety goal, the staff was taking
24 the position that there was nothing to be learned from
25 a group of five FRAs that could be extended throughout

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1 the community. I think the term "class," in addition
2 to taking into account that there are different groups
3 of class, as Forrest said, is meant to be a little bit
4 fuzzy but to say, you can learn something for five
5 plants about all of them. You don't have to have a
6 PRA on every plant in order to learn about the group
7 of plants, but you have to use some judgment, just as
8 you do in any sampling procedure.

9 A reasonable example is two and a half times
10 as many as went into watch 1400 but it's not the whole
11 collection. So you can judge the adequacy of the
12 regulatory cluster by looking at -- of course you get
13 more information if you looked at ten, and even more
14 if you looked at 30, but there's room for judgment in
15 there in dealing with groups of plants. The trick is
16 to not do it on each plant.

17 MR. WARD: I don't know if that explains it.
18 There are two different questions here. Our point was
19 that if we have some PRA results from a group of Mark
20 X containment plants and let's say we've done PRAs on
21 a couple of these plants, and we have some reason to
22 believe that some characteristic of those plants that
23 might be common to all of them is causing the risk to
24 be somewhat higher than would seem to be acceptable
25 under the safety goal. What we're suggesting is that

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the staff should look at its regulations by which these plants were designed and licensed and find what's inadequate in these regulations. Should the regulations have required another system here or something. That's the approach.

Rather than look at an individual plant and say, "Hey, you've got to put in another system of a certain kind," the staff should back off and say, "We've been telling people that if they built plants to our regulations, they'll be adequately safe." What we want is to look at those regulations, when and find out why this class of plants isn't coming out, if that question has arisen.

COMMISSIONER ROGERS: I wonder if you could just enlarge a little bit on this question of the use of the safety goals in judging the adequacy of regulation. We've heard from the staff and its point of view on this. I'd like to just have you review that very briefly again, if you would, from your point of view as to what that really means, how one uses the safety goals to judge the adequacy of regulation.

DOCTOR REMICK: I think the staff has misunderstood what we're saying here. When I read I think what they have written in the SECY document ending in 102, I guess it's 89-102 or 88-102, and

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1 reading some of the transcripts from our meeting with
2 you. They have the opinion we're saying you have a top
3 down, force fit of safety goals on individual
4 regulations. See if they meet the safety goal. That
5 is not what we're saying.

6 I think Dave has just indicated what we had
7 in mind, and that is that from our perspective, and of
8 course we like to act like lawyers, we think that
9 adequate protection is compliance with the
10 Commission's regulations. But how do you know that
11 the regulations are providing plants that are
12 safe from the public health standpoint? We
13 say, "Well, if you find using the safety goal that a
14 preponderance of the population of plants out there
15 meets that safety goal, what you say is safe enough,
16 then presumably the regulations must be adequate."

17 But suppose you find that that population of
18 plants is generally not meeting the safety goal. Then
19 you have to ask yourself the question, "What is it
20 about our regulations? Are there additional systems
21 for decay heat removal or what is it that we must do?
22 Must we improve training and so forth so that we do
23 increase the safety of that class of plants?"

24 So, that's how we're saying you would use
25 the safety goal to judge whether those regulations are

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Doing the job that you think they're doing.

COMMISSIONER ROGERS: It's some kind of a sense of a mean then?

DOCTOR REMICK: Yes. I'll look to our statistician if that's a proper use of mean in that case.

DOCTOR LEWIS: The point is, I think, we're all in agreement on this general point, but we have different emphases. The way I try to keep it straight in my own head, not very successfully of course, is that the safety goal I think of as more a tool for the Commission than a tool for the Commission staff. That is, the Commission staff is involved in a regulatory process which is necessarily a deterministic process. They can't look at everything they do and ask, "Well, does the bottom line mean meet \$1,000.00 a man REM or doesn't it?" We've had people stand up in front of us and say, "This one loses because it's ten percent over," and of course that's no way to regulate an industry because those numbers are good to a factor of ten anyway.

But for the Commission to look at the way in which the -- not only the written regulations but the implementation of the regulations as applied to the industry and how it provides an industry which is

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1 reasonably safety. that's what the safety goal, in my
2 mind is for.

3 The problem is that the Commission doesn't
4 have the resources, except through the staff, to do
5 this job. And therefore, the staff has this double
6 job of evaluating itself on behalf of the Commission,
7 but also doing its job. They mix them up and I'm not
8 surprised. I would too if I were in that job.

9 that's, I think, the confusion we're
10 starting with around here.

11 CHAIRMAN ZECH: Well, that's why we call on
12 you for your views, of course, to try to give the
13 balance to that --

14 DOCTOR LEWIS: Gee, I thought you had to.

15 COMMISSIONER CURTISS: But on that point, I
16 guess I understood the staff's discussion a little bit
17 differently. When you say the safety goal would be
18 used as a mechanism for defining the mean or it would
19 be used against some benchmark. As I understood the
20 staff, their concern with that was that the safety
21 goal in the ACRS' vision would be applied to define
22 adequate protection or the benchmark or mean that you
23 would use would be the statutory standard. Whereas I
24 understood them to say that it would be used as an
25 adjunct to the back-fitting process. That leaves the

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question of how you define adequate protection.

But is there a difference between the two of you on that point?

MR. WARD: Here's what we said in the letter. "We believe that the safety goals should play an important but indirect role in defining adequate protection. Ideally, compliance with the Commission's regulations is a suitable surrogate for defining adequate protection of the public. However, we believe that the adequacy of regulations should be judged from the viewpoint of whether nuclear power plants of a class, licensed under those regulations, meet the safety goals."

It's just saying the same thing again.

DOCTOR REMICK: That isn't what the staff says we're saying, as I interpret what they're saying we said but that's what we mean. It's an indirect use to judge the effectiveness of the regulations.

COMMISSIONER ROGERS: I think they are saying that now. I think that is very close. That's why I wanted to hear from you because I think that's what I did hear from the staff the last time.

DOCTOR SIESS: I think the biggest difference between the staff and the ACRS on the issue of adequate protection is that the staff has lawyers

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1 and we don't

2 CHAIRMAN ZECH: That the staff what?

3 DOCTOR REMICK: Has lawyers.

4 DOCTOR LEWIS: Of course we've asked for
5 them, but we've been denied them.

6 COMMISSIONER ROBERTS: You don't know when
7 you're well off.

8 CHAIRMAN ZECH: In defense of the lawyers,
9 I'd just say that sometimes the lawyers make a very
10 valuable contribution to this Commission. So, we
11 appreciate your thoughts, but they do help us.

12 DOCTOR REMICK: Incidentally, you remind me
13 of something too. We say the staff and we differ with
14 them, but the last year or so, Wayne Houston from the
15 staff has been heading up the efforts and he has
16 interacted exceedingly well with the Committee. He's
17 spent hours and hours with us, and which at times it
18 gets testy and so forth, but he's taken it and he's
19 been very receptive and he's tried.

20 CHAIRMAN ZECH: Good.

21 DOCTOR REMICK: Of course he isn't the
22 entire staff, but really, I respect the effort he did
23 with the Committee.

24 CHAIRMAN ZECH: I'm pleased to hear that.

25 Commissioner Rogers, anything else?

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1 COMMISSIONER ROGERS: No, that's fine.

2 CHAIRMAN ZECH: Commissioner Curtiss?

3 COMMISSIONER CURTISS: Just one other
4 question. Would you read the large release in the
5 core damage guidelines that the staff has proposed as
6 implying a containment performance standard or is
7 there still a shortcoming in that regard?

8 MR. WARD: No, I don't think it does because
9 that -- conceptually you could have a plant that would
10 meet that requirement without having a containment.

11 DOCTOR REMICK: That's right.

12 MR. WARD: That's a problem with those
13 things.

14 DOCTOR LEWIS: I should mention the other
15 agency. This came up at another agency and produced a
16 mistake because if you define a large release in
17 terms of a prompt fatality at the plant boundary,
18 Chernobyl was not a large release and I don't know
19 anybody who believes Chernobyl was not a large
20 release.

21 So, it doesn't help to put the definition of
22 a large release several layers down. Why not define
23 the large release as a large release? It makes a kind
24 of simplistic sense.

25 COMMISSIONER CURTISS: I guess I -- go

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1
2
3 MR. CARROLL: It also -- which is something
4 that you really want to get away from.

5 COMMISSIONER ROGERS: If you do it in terms
6 of fatalities.

7 MR. CARROLL: Yes, right.

8 COMMISSIONER CURTISS: One other question on
9 the issue of distinguishing between existing and
10 future plants. A number of initiatives going on
11 around here that make exactly that distinction, and
12 based upon what I think is a fact that the level of
13 safety is increasing, that we've discovered new ways
14 to do things. There's kind of a logic to that, to say
15 that the safety goals for existing plants might
16 inherently be different given the state of the art
17 that's developing for future plants.

18 What's behind your statement on that?

19 DOCTOR REMICK: That goes to the question of
20 -- the Commission has said they have expressed what
21 they think is safe enough, and I don't think that is
22 conditioned upon it's this type of reactor or today's
23 reactor or the reactor ten years from now. I think
24 the Commission has spoken of what they think from a
25 public health and safety standpoint is safe enough,
and you've expressed that.

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Why would it be conditioned that you would lower that in the future, unless you felt that that was inadequate health and safety for the public? I don't think you believe that. So what's the reason for changing the answer of how safe you think is safe enough from a regulatory standpoint for future plants.

COMMISSIONER CURTISS: That may go to the distinction that the staff drew at the meeting where I'm sure they would define how safe is safe enough in terms that align it as closely with adequate protection that all the plants existing in future will meet that standard. But as we learn new things and develop new designs, that inherently these new plants will be safer without saying that existing plants don't meet the statutory standard.

DOCTOR BENICK: I think that the future plants will be safer. But the question is, just because they can be safer, do you regulate that lowest level all the time or do you answer what we think is safe enough and then let economic considerations and other things enter in to individual licensee's decisions on how far they go beyond those.

But I think there is a natural reaction out in industry. Every time they improve something, the Commission comes in and wanting them to regulate

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1 that. We've seen that in the accreditation process,
2 in maintenance and so forth. The natural tendency as
3 things improve to want to come in and place a limit,
4 sometimes that kills the incentive to try to improve.

5 So, I think it boils down to the question,
6 do you think that the safety goals express adequately
7 how safe is safe enough from the standpoint of nuclear
8 power plants in this country? If you don't, then
9 maybe it should be lower in future years.

10 CHAIRMAN ZECH: The Commission consistently
11 opposed the inclusion of averted on-site cost and cost
12 benefit analysis and it's been debated for some time,
13 that issue. Do I understand correctly that the ACRS
14 supports the inclusion of on-site costs if a safety
15 cost benefit analysis is done?

16 MR. WARD: Yes.

17 Do you want to elaborate on it?

18 DOCTOR REMICK: Basically, we're saying that
19 giving credit for averted on-site costs against the
20 other costs is economically acceptable type of thing
21 in a cost benefit analysis, if you do a cost benefit
22 analysis. We're separating that from safety goal, but
23 saying if you do cost benefit analyses, whether it's
24 under DPA or whether it's under --

25 CHAIRMAN ZECH: Yes, I see.

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DOCTOR REMICK: -- rule or whatever, we do not differ with the staff's view, and apparently OGC's view, that basically subtracting that from the total costs of the proposed modifications, we think that's acceptable.

CHAIRMAN BECH: In a cost benefit analysis situation, but you do differ from the safety goal itself as far as that's concerned. You're not considering that?

DOCTOR REMICK: We've associated a cost benefit analysis --

CHAIRMAN BECH: Yes.

DOCTOR REMICK: -- as a part of a safety goal.

CHAIRMAN BECH: Right. Okay. I understand.

Well, let me just say that this has been a long considered subject, I know. I have, frankly, felt that your consistent stance that the safety goal should be a judge of our regulations rather than a plant specific measure is proper. I think I've also felt rather consistently that the safety goal is just that, it's a goal. It's a goal. The struggle that we've had and the staff has had, I know, that you have helped us with is how do you implement a goal. It's

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1 been very difficult. But I think your contribution
2 and your collective thinking on this has been very
3 helpful to try to at least temper the effort on the
4 part of the staff, which you're absolutely correct, to
5 try to define things. I would do the same thing if I
6 was on the staff, as Doctor Lewis points out, he would
7 too, because you want to know what specifically do I
8 have before me and what are the specific guidelines?

9 The safety goal doesn't lend itself
10 completely to that type of a formula. Therefore--
11 and I don't think it properly should. I think that's
12 an appropriate position too.

13 So, I do feel that the goal is a goal. I
14 think it's a commendable achievement on the part of
15 the Commission with the help of the ACRS and the staff
16 and taking the next step as to how we should implement
17 it is indeed worth the time we've spent on it, I
18 think, because it is before the Commission. We'll
19 hopefully make the best decision that we possibly can.
20 Your input will be greatly respected and reviewed by
21 all of us, I'm sure, again carefully.

22 We appreciate all the letters that you've
23 given to us, all the time you've spent on this very
24 important subject. I think it's, frankly, been worth
25 the time. I appreciate your willingness to work and

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1 review the staff's effort. The staff, I think, has
2 done a commendable job too. They are indeed coming at
3 it from a little different approach. Again, that's
4 understandable.

5 But I think we have come together to the
6 point where perhaps the Commission can feel reasonably
7 confident to make a decision on how best to implement
8 this very important safety goal.

9 So, let us just move onto the next subject.
10 But before we do, I can't help but say how much the
11 Commission appreciates the careful thought, the honest
12 thought, and I know some of the differences that you've
13 had amongst yourselves in order to come to the
14 recommendations that you've brought to the Commission.
15 And we appreciate very much your contribution in this
16 important area.

17 DOCTOR REMICK: Thank you, Mr. Chairman.

18 The next item then is the maintenance rule
19 that we had planned to discuss. As you know, we have
20 provided the Commission with two letters on the
21 proposed maintenance rule.

22 We were made aware this morning of your memo
23 of 26 April to the other Commissioners and that places
24 a little different color on what we had planned. We
25 had planned to ask Carlyle Michelson, the Chairman of

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1 Subcommittee on Maintenance Practices and
2 Procedures, to summarize our letter to you of 11
3 April. But I'm not sure if that's the appropriate way
4 to proceed or if you would prefer us to go ahead in
5 that mode, or if you just want to open it up for
6 questions that you might have.

7 CHAIRMAN ZECH: No, I think we ought to ask
8 Carl if he wouldn't mind summarizing the approach. We
9 recognize we've given you a little different way to
10 do it now. But perhaps you could weave that into
11 the thoughts you have and I think we'd benefit from
12 your thoughts.

13 MR. MICHELSON: Well, first, I would like to
14 just go back and refresh your memory on the two memos
15 that we did send to you on the subject of maintenance.
16 The first one was sent in September of 1988.

17 In that letter, we stated, I think quite
18 clearly, that we did not support the proposal to
19 establish a maintenance rule and gave two particular
20 reasons. The first reason was that the -- we asked
21 two important questions and those were the reasons for
22 our conclusion. The first question was, does the
23 maintenance rule of nuclear power plants as now
24 performed pose a significant risk on public health and
25 safety? The second one, would the existence of a

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1 maintenance rule reduce that risk? Those were the two
2 things that we were groping with.

3 On the first question, we felt that there
4 was some indication that poor maintenance had
5 contributed to plant unavailability and in some cases
6 to the existence of plant states that could be
7 interpreted as possible accident precursors. However,
8 we did not see any evidence to support the idea that
9 the existence of a maintenance rule would reduce this
10 risk, nor did we see any evidence that the existence
11 of a rule would make things any worse.

12 It appeared to us that the maintenance
13 practices in the industry were improving and that the
14 rule might be disruptive to the substantial industry
15 initiatives that had been developed to accomplish this
16 purpose. So, at that time we indicated we felt that
17 it was not necessary to have a maintenance rule.

18 On April 11th, we sent you a second letter,
19 this time concerning the draft Commission paper
20 related to final rulemaking. In that letter we
21 indicated that our position remained essentially the
22 same. We still believe that good maintenance is a
23 necessary ingredient in any operational program that
24 seeks to insure reliable and safe plant operation, but
25 we felt that that was really not the issue. We

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1 believe the issue was how to obtain good maintenance.

2 As we see it, the industry's aggressive
3 emphasis on the development of effective maintenance
4 programs over the past several years has resulted in
5 marked improvements in maintenance programs and
6 significant progress towards reaching the industry's
7 objectives.

8 Further, the staff has told us that their
9 evaluation of a sample of maintenance programs
10 indicated that only a few percent of the total
11 population of U.S. operating plants may have poor
12 maintenance programs. That conclusion was based on
13 examining about 25 percent of the total plants.

14 Given an environment in which there is
15 already a scarcity of industry and NRC resources, we
16 believe that it is more cost effective to seek
17 improvements applicable to the few plants with poor
18 maintenance programs by means of existing regulations
19 rather than burdening all plants with a costly program
20 of unproven efficacy.

21 The scope of the proposed final rule is also
22 a concern to us. The rule, and its accompanying
23 regulatory guide, appeared to be very broad in scope.
24 So broad that almost every facet of plant operation
25 might conceivably be under the scrutiny of the NRC on

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1 on the basis of its effect on maintenance. Such a broad
2 scope could be counter productive.

3 Because everyone involved believed that
4 maintenance programs are improving and because the
5 industry is committed to additional improvements, we
6 recommended that the staff continue to monitor the
7 industry's progress and not to intervene at this time.
8 That was the bottom line of our second letter and
9 that's where we're at now.

10 CHAIRMAN ZECH: All right. Thank you very
11 much.

12 Are there any other comments from the group,
13 Committee? Thank you.

14 Commissioner Roberts?

15 Commissioner Rogers?

16 COMMISSIONER ROGERS: Do you think that the
17 industry efforts, which indeed have been significant
18 in the last few years and have made very important
19 differences in a number of plants, and are being taken
20 up by most of the licensees in some form or another,
21 do you think those efforts would have come on at the
22 pace and intensity that they have if there had not
23 been an NRC initiative towards a maintenance rule?

24 MR. MICHELSON: You're asking me my personal
25 view because we did not entertain that as a Committee

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1 Question

2 COMMISSIONER ROGERS: I think some of
3 your -- yes, I guess -- anybody can answer.

4 MR. MICHELSON: I will indicate my own views
5 and then the other members can indicate their views.

6 I believe that a lot of the activity
7 associated with improved maintenance had been going on
8 before the real push for a maintenance rule. The
9 question then is would that level -- I think INPO was
10 one of the prime movers of trying to get some of the
11 maintenance going because maintenance clearly was
12 showing up in LERs as a significant contributor to
13 events of concern.

14 The industry was picking through INPO. Now,
15 the question is, would they have continued to build
16 the momentum that I think they are now building if the
17 NRC hadn't come through with a similar thrust from
18 their direction? My own opinion is I doubt that it
19 would have proceeded to the level that it is now
20 without some additional impetus from the NRC. But
21 clearly, there were significant programs underway.
22 It's a question of whether you could keep them up over
23 the long term.

24 DOCTOR REMICK: I agree with what Carl is
25 saying. Several of us -- I don't know how many years

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1 it was now, but several of us in ACRS accompanied
2 the NRC staff on a bilateral visit to Japan. Harold
3 Denton headed up that effort and I know we were so
4 impressed with what we saw in Japan and saying now,
5 "What do we do with this information?" I think all of
6 us felt if we could somehow get U.S. utilities to go
7 and see the maintenance practices and see the effects.
8 I think back then people started, they did, and some
9 utilities worked out relationship with individual
10 utilities in Japan.

11 I then later on had an opportunity go along
12 with the INPO visit with Dennis Wilkinson and my
13 accrediting board activities, looking at training and
14 so forth. Once again, we were sincerely impressed.
15 So, INPO came back and put the pressure on for more of
16 this. Then I think the whole accreditation process
17 where maintenance programs now must be accredited so
18 that utilities have established formal programs and
19 have laboratories and they're looking at the qualities
20 of personnel and so forth, I think all of that has
21 helped. But, like Carl, I think the interest of the
22 Commission and perhaps the threat of a rulemaking and
23 so forth probably has pushed that along faster than it
24 otherwise would. But I think it started some years
25 ago.

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COMMISSIONER ROBERTS: Well, that may be.
How long ago was it you went on that trip to Japan
with INPO? That's been --

DOCTOR REMICK: It's probably four years
ago.

COMMISSIONER ROBERTS: Yes.

DOCTOR REMICK: And the NRC visit was before
then. It was about two years before then. So, I
would guess the NRC visit was '82, '83. There were
several others went along. But I think that helps --

COMMISSIONER ROBERTS: When did the notion
of working on maintenance arise?

DOCTOR REMICK: That I can't answer.

MR. WYLIE: I think it's at least three
years ago.

MR. WARD: About four years ago, I think.

MR. WYLIE: I recall when it first came up.
There were meetings with the staff and industry at
that time. That's at least three years ago.

MR. WARD: I think there's no doubt in this
and other areas, the threat of rulemaking has
sometimes spurred industry, concentration of industry
action. I don't know that I like all the conclusion
one draws from that, but I think it's true.

DOCTOR REMICK: I think you have to point

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one side to all of that too. Just the threat of rulemaking has diverted some industry resources to try to counter that. On the other hand, coming from industry a few years ago, I would comment that actually improving maintenance, at least in my perspective, was one of the first initiatives industry or INPO came up with along with training. I think they've been pushing that for a long time.

DOCTOR KERR: I'm reminded of one occasion in which Mark Twain said, "I was glad to be able to answer that question promptly and I did, I said I didn't know."

DOCTOR LEWIS: Could I just add one little bit to this? I think, if I remember correctly, that one of the things that impressed people on the Japan episode was a fundamental difference in terms of frequency of maintenance and depth of maintenance. There's a tradeoff about how often you test and maintain things against how deeply you go into them. There's something to be said for frequent observation and something to be said for shutting everything down every six years and taking it apart and putting it back together. Of course, when you do that, that's the riskiest part of the operation, when you start it up again. You know that from your overhauls at Naval

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shippers. I've been through that too.

One thing I always emphasize, and I would feel derelict if I didn't at this point on this, is that there is a real well developed academic body of information that addresses this question, called the theory of reliability. There are professors of reliability. There are books about that, that deal with the general issue of how you determine what prop. levels are.

We say that if you look at LERs, there are many incidents that are caused by maintenance. There are also many incidents caused by testing, by excessive testing where maintenance is not necessary. The trade there is one that cannot be made by sitting around a table. You have to apply some reasonably good doctrine. There exists such doctrine and I don't mean this as a slap at the staff, but I have a feeling that it is better known outside the NRC than it is inside the NRC. This is just an admonition to use the best of the art out there in dictating this matter. So, it's not just a matter of a maintenance rule, it's what rule it is.

COMMISSIONER ROGERS: I know in one of your letters you've commented on the -- that the proposed rule really got into what amounts to management

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1 questions and you were sensitive to that. I'll just
2 ask the question in general. Doesn't all regulation
3 intrude on management? I don't think that you can
4 have regulation without its being in some way partly a
5 management function because those are the kinds of
6 things that a good management does.

7 So, I'm not sure that there is a clear line
8 of demarcation between regulation and management.
9 We'd all like to think there could be and that we can
10 always stay on one side of it, but I don't believe
11 there is a sharp line, that there's always a fuzzy
12 boundary there and that regulation is always going to
13 be intrusive on management prerogatives because it
14 sets a different set of priorities than the management
15 might necessarily have.

16 So, I don't think you can totally divorce
17 regulation from management. We can't have that clean
18 a separation. It's a question of how far is far
19 enough and no further.

20 DOCTOR KERR: But I think it's very
21 important that one keep the two responsibilities
22 clearly in mind because otherwise the regulators who
23 are generally not responsible for management take all
24 that responsibility.

25 COMMISSIONER ROBERTS: As usual, I agree

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DOCTOR KERR: So, although I agree with you the boundary may be fuzzy, when you get far away from the boundary, which one can do occasionally, that is not always so fuzzy.

COMMISSIONER ROGERS: But I think it's just not quite so simple, that it is a very sharp line there. The very fact that you have regulation is intrusive and it sets constraints on management that management might not give the same priority to without regulation in any industry. But it is true that management should not attempt to manage because it can't do it. It doesn't have the tools, it doesn't have the responsibility. So, there is a clear difference in those two sectors, but there's an overlap there as well.

DOCTOR KERR: It's for reasons like that that one has an astute and wise Commission to make decisions of this kind.

CHAIRMAN ZECH: We hope so.

Anything else?

COMMISSIONER ROGERS: No, that's fine.

CHAIRMAN ZECH: Commissioner Curtiss?

COMMISSIONER CURTISS: I do have one quick question.

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1 We've got the first batch of results in from
2 the maintenance team inspections and the staff briefed
3 us yesterday on those. I guess the thing that jumped
4 out at me is that the utilities do a pretty good job
5 of putting maintenance programs together. Of the 20
6 sites that were surveyed in the first batch, we had
7 pretty positive results on the formulation of
8 programs, but there was a clear break between the
9 formulation of the program and its implementation. I
10 don't think I'm telling you anything new that you
11 probably haven't heard or seen in this country at
12 1988.

13 Given what you've seen, do you have the same
14 high degree of confidence on the implementation side
15 and would you counsel the same sort of "wait and see,
16 let the industry pursue it" as you've alluded to in
17 your two letters?

18 MR. MICHELSON: I think the first thing you
19 have to recall, of course, is that we have mechanisms
20 for monitoring the quality of maintenance, the SALP
21 process in particular. This is, I think, a very
22 strong process, very effective, and it's keeping up
23 with the on-site maintenance, with or without a big
24 paper program behind it.

25 So, I would not personally have a concern

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1 the poor maintenance is going to go on even though
2 maintenance programs look good, because I believe the
3 SALP process, the resident inspector process, there
4 are several checks and balances that assure that we're
5 still watching how maintenance is being done. It's
6 just a question of the formality of the program and
7 it's in its basis and regulation that we're really --

8 MR. CARROLL: One of the things that the
9 staff presented to us at our request, I don't know if
10 they showed it to you, was an attempt to correlate how
11 well they viewed the maintenance programs through the
12 eye of the inspections with SALP, engineering,
13 maintenance, surveillance and also performance
14 indicators that you might intuitively think have
15 something to do with how good a maintenance program
16 one has. I guess my reaction to that was that the
17 correlations weren't very good.

18 COMMISSIONER CURTISS: Actually, the
19 question came up yesterday and we asked them what kind
20 of correlation they had with the SALPs in the first 20
21 or 30 that they've done and the answer, I think, was
22 that there seemed to be a high degree of correlation,
23 at least with the SALPs. I don't recall the answer on
24 the performance indicators.

25 COMMISSIONER ROGERS: SALPs, on the other

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1 the other indicator is not so good. There seemed
2 to be a mixed answer there, just as we --

3 MR. MICHELSON: I think most of the -- see,
4 their statement was based on these management
5 inspection team results which I think are only now
6 coming in. That's a fairly recent process. So,
7 perhaps that wasn't reflected in some of their
8 observations -- conventional performance indicators and
9 so forth, although we did discuss SALP as well.

10 DOCTOR KERR: I have not seen the report to
11 which you refer. Perhaps it's been looked at by one
12 of our subcommittees. I would want to look at it in
13 detail before drawing any conclusions. I think your
14 question is certainly well taken.

15 For example, one could say that the
16 implementation of the maintenance program is not very
17 good by looking at the details of the program itself
18 and going through detail by detail and finding that
19 some of the details are not being carried out.

20 On the other hand, one could look at plant
21 performance and see if it is improving. I don't know
22 what criteria were used in making a decision that the
23 implementation is not very good. I think measuring
24 implementation is difficult and a number of criteria
25 could be used. I certainly think it is an area to

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1 which the staff needs to give continuing attention.
2
3 But I would say this early, the measures for
4 determining --

5 COMMISSIONER ROGERS: Well, one of the areas
6 that stood out was the poor engineering support for
7 maintenance programs, that somewhere between 25 and 30
8 percent of the programs that they've looked at had
9 maintenance overall programs, had a program but the
10 implementation of that was inadequate. That was one
11 of the areas.

12 DOCTOR KERR: Well, I don't know. I just--
13 with all due respect to our staff, which I think is
14 competent, I'm not sure how many of them have a lot of
15 experience in running maintenance programs. Well,
16 I've said enough. I think the question you ask ought
17 to be examined continually.

18 COMMISSIONER CURTISS: It's a fair question
19 of what you look at to measure maintenance with
20 respect to the staff's approach. They did say, and I
21 think it's a credit to the approach that they've taken
22 with the tree that they formulated, but it covers many
23 of the same things, maybe from a different
24 perspective, but many of the same things that the INPO
25 evaluations cover. So, there does seem to be a
consensus at least between the NRC staff and INPO as

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1 to the things that are critical to look at it. They
2 seem to be looking at the right things, I think.

3 MR. MICHELSON: Well, it's encouraging that
4 the SALP process, at least, is kind of fitting with
5 the --

6 COMMISSIONER CURTISS: Yes. I was very
7 pleased to hear that because it calibrates both the
8 SALP process --

9 MR. MICHELSON: That was one of the
10 questions that apparently has now been settled.

11 DOCTOR SIESS: You know -- may I?

12 CHAIRMAN RECH: Please.

13 DOCTOR SIESS: It seems to me that the
14 evaluation of maintenance programs is not all that
15 much different from the evaluation of a QA program.
16 One thing you can do as a measure is to say, "Did you
17 do what you said you were going to do?" That's fairly
18 easy for somebody to check up on. It might be if we
19 had a maintenance rule, "Did you do what we told you
20 to do."

21 The other measure would be how reliably
22 and/or how safely the plant is operating because the
23 objective of maintenance is to provide a safe and
24 reliable plant. The objective is not simply to carry
25 out all the steps in a plant. Now, if the

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relationship between that and a QA program isn't obvious, I'll explain it some other time.

COMMISSIONER CURTISS: I think that's a fair point. They do have some very gross measures of plant performance. But one of the things that we found yesterday was that there's very little viability trending on key systems and components. The utilities have the paperwork, but they really haven't looked at trending that information.

DOCTOR SIESS: Like QA.

COMMISSIONER ROGERS: Well, just on that point though, you're absolutely right that if the plant starts to show all kinds of evidence of problems that one could trace back to maintenance, then you've got a sure indicator that you've had a bad maintenance program, but you've also got a problem on your hands. The idea would be to try to avoid getting to the point where poor safety performance of the plant is the indicator that tells you you've got a bad maintenance program.

MR. WYLIE: Before we leave that, let me make one comment. Carl spoke to it in regard to the scope of the proposed maintenance rule and the reg. guide. One thing that disturbed us was the broad scope of both. The definition of what was to be

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1 included in the program was anything that could cause
2 a transient that would challenge the plant's safety.
3 With that broad a definition, there was just no limits
4 to the bounds of that rule or the reg. guide.

5 You could take it so far as to mean the
6 transmission lines that come into the plant would fall
7 under that definition.

8 DOCTOR SIESS: Of course one of the biggest
9 classes of plant transients is maintenance.

10 COMMISSIONER ROGERS: Surveillance. On line
11 surveillances.

12 CHAIRMAN ZECH: Well, let me just say, from
13 my standpoint, I believe we need a maintenance rule,
14 but we need a good one. We need the time to make a
15 good one. But I'm convinced that we need one. But
16 I'm not trying to get a maintenance rule in place
17 between now and the next two months while I'm here. I
18 think it's very important that we have a good
19 maintenance rule, but I do feel we need the time to
20 make it right.

21 We need, I think, as perhaps Doctor Lewis
22 pointed out, what rule it is. I agree with that. A
23 good rule is very difficult to make a maintenance
24 rule. Yes, it does have management connotations. I
25 agree with Doctor Siess also when he says quality

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assurance because it does have a lot of the same kind of thinking that goes into quality assurance. There's judgment in that.

So, professional judgment is a big part of it. We need a good maintenance rule. I remember when I first started looking at the plants. One of my first comments on the Commission to the chairman was at that time that it seems to me we ought to hear from the industry on their maintenance program, and they did. They came and made a presentation to the Commission. The essence of their presentation was that "maintenance is excellent. You regulators ought to stay out of it. We know what we're doing in the industry and maintenance is in very good shape."

I listened carefully to that. I didn't seem to have such support at the time for any interest in maintenance, but I thought about it a lot. I kept looking at the plants and wondering about it. But I was not impressed. Yes, I think industry was at that time even starting to focus on maintenance and I give INPC a great deal of credit for the efforts they've made in that regard. But it's taken a long time for the industry, in my judgment, to focus on maintenance.

I was disappointed in that first presentation. I will say that I think maintenance is

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1 I've seen it improve. I've heard about it
2 improve from you and from our staff and from the
3 industry. I've seen it myself. It has improved. But
4 I still think it has a ways to go. I don't think it's
5 as good as it ought to be.

6 I think there are good maintenance programs
7 out there. I think in some cases there are excellent
8 maintenance programs out there. But I think there are
9 some companies that don't have a maintenance program
10 that could meet the standard that I would want if I
11 were a utility executive. I can't say they don't meet
12 the standard at the moment or we'd take some severe
13 action to counter that. But it seems to me that
14 maintenance plays a very important role in safety.
15 Safety is our business. I think we have a right to
16 demand that -- an obligation to insure that
17 maintenance has improved.

18 I think our staff has done an excellent job
19 in trying to come up with a maintenance rule with very
20 little support or help from the industry. It's been a
21 big disappointment to me. I really do believe that if
22 the industry had helped us and the utilities had
23 helped us, we'd have a better maintenance rule than
24 the proposed rule we have.

25 Yes, you can ask questions like, "Did you do

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1 what we told you to do in maintenance and is that
2 satisfactory?" That's one approach, of course. You
3 can also say, "How are they performing out there? Is
4 it safe? Is maintenance contributing to safety or
5 not?"

6 There are many things that could have
7 happened that have not happened in my judgment in
8 helping us come up with a maintenance rule. So, I'm
9 not completely satisfied we have a maintenance rule
10 that is good enough. I hope in due time we would have
11 one though and I'd hope that the industry would help
12 us come up with that.

13 Just a couple more points on my views on
14 maintenance. The plants out there now that are
15 conducting good maintenance programs in my judgment
16 doesn't mean they're always going to have good
17 maintenance programs. We've seen plants change.
18 We've seen plants go from operating very well to
19 declining. We've seen it go the other way. We need a
20 standard, it seems to me, for maintenance as well as
21 we do for operations. If maintenance contributes as
22 much to safety as I believe it does, sometimes as much
23 or sometimes more than operations, then I think we
24 need some kind of a standard.

25 I think the proposed rule is probably too

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1 I think I agree with the ACRS comment in that
2 regard and that's one reason I think it should be a
3 better rule and a stronger rule.

4 Yes, we do not have here on the NRC all the
5 expertise in the world on maintenance. That's a fair
6 comment. But we asked for help and we didn't get it
7 and that's disappointing. We may have to get
8 consultants to help us. I would hope we would do that
9 in the future if the industry doesn't help anymore
10 than they have.

11 I think maintenance is improving. No
12 question about it. But I think it needs to improve
13 more. Maintenance does, yes, testing contributes. So
14 does surveillance. Mistakes are made. Maintenance
15 needs to be upgraded, in my judgment. It could be
16 perhaps the most significant operational safety
17 improvement that can be made. We have improved
18 operators. We have improved training significantly.
19 We need to do the same in maintenance, in my judgment.

20 When you talk about management and
21 maintenance and how they interface as far as
22 regulatory responsibility is concerned, I agree. But
23 I think management needs to get more involved in
24 maintenance. Those who are involved in it, in my
25 judgment, are running our better plants. Those who

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are not giving the attention to maintenance are not, in my judgment, carrying out their proper responsibilities.

I would prefer to see the industry do it all for themselves, but we've been waiting a long time for that. It seems to me that a standard would be helpful to the industry. I am convinced that at least two-third or maybe more of our plants, if we had a maintenance rule would already be meeting whatever maintenance rule we might have out there. It wouldn't be any real problem to them. But it would help those plants that are not perhaps running as good a maintenance program as they should.

It might even help them when they go their BUDs and help the CEO, the chief executive officer, make his case for maintenance funds that he needs if he is not getting perhaps the funds he thinks he needs. I think some of our CEOs are experts at that and can defend themselves extremely well. But perhaps there are some who would be strengthened by a rule.

In any case, I hope we do move towards a rule. I think we need one, but I don't think, in my judgment, that we're ready at this time for one. I would hope though that the ACRS would continue thinking about this. If my colleagues would agree

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1 ... something on this, we will, at least for the
2 ... being, have a strong policy statement and
3 ... continue to develop -- have a rule in place, but
4 ... continue to perhaps strengthen it and modify it. I
5 ... would hope that the ACRS as well as the industry would
6 ... at least help us try to improve the maintenance in
7 ... nuclear power plants in our country.

8 ... These are my thoughts. If anyone wants to
9 ... comment, I'd appreciate hearing it. If not, we'll
10 ... move on to the next subject.

11 ... DOCTOR REMICK: If not, the fourth subject
12 ... mentioned was NUREG-1150, the severe accident
13 ... risk assessment for five U.S. nuclear power plants.
14 ... I'm not sure how much advice we can provide you today
15 ... on that. It's our understanding that the Commission
16 ... wishes ACRS to provide views on whether the revised
17 ... version of NUREG-1150 is suitable for use during the
18 ... time that a peer review takes place. And in
19 ... particular, could it be used as part of the IPE
20 ... process.

21 ... We only recently received the revised
22 ... version. We have not had sufficient time to hold a
23 ... subcommittee. Usually something of this depth we hold
24 ... a subcommittee meeting first. But we have scheduled
25 ... two hours of discussion of the full Committee tomorrow

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1 take up this topic. We're hoping that perhaps
2 after that two hours and then with other thought, that
3 perhaps we can provide you some views on interim use
4 in this meeting, but we cannot guarantee it.

5 CHAIRMAN ZECH: Why don't we plan on doing
6 that now and then we look forward to hearing your
7 views on that. We would appreciate them very much.
8 That's the key question we're asking you to address.

9 DOCTOR REMICK: All right.

10 CHAIRMAN ZECH: So, if you're going to
11 address that tomorrow, we'd appreciate hearing from
12 you when you can on that matter.

13 DOCTOR REMICK: All right. Fine.

14 CHAIRMAN ZECH: Then we ask you to address
15 one last matter too, I think, the integrated --

16 DOCTOR REMICK: Oh, yes. You're right.

17 CHAIRMAN ZECH: -- approach.

18 DOCTOR REMICK: Yes.

19 CHAIRMAN ZECH: Please go ahead.

20 COMMISSIONER ROGERS: Would you care to
21 comment on your opinions of the peer review process
22 that 1150 is being subject to?

23 DOCTOR REMICK: I look to our Chairman of
24 our Subcommittee if he has any comments. I cannot add
25 any at this time.

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1 DOCTOR LEWIS: I don't have any comment.
2 It's a fine list of people. I don't know whether
3 they've all agreed to serve, but I think it's
4 delightful that we're having a peer review, I think.
5 I don't think that the report has been improved as
6 much as the staff does, but I also defer to the peer
7 review.

8 CHAIRMAN ZECH: Well, the Commission also
9 looks forward to the peer review group and I'm sure
10 they will make a contribution to 1150.

11 DOCTOR LEWIS: No, our position was simply
12 that it shouldn't be used until that is done.

13 CHAIRMAN ZECH: Right.

14 DOCTOR REMICK: I'll address myself to the
15 fourth item, the integrated approach to regulatory
16 matters.

17 CHAIRMAN ZECH: Yes. Thank you.

18 DOCTOR REMICK: The letter we wrote on April
19 17th, a fairly short letter. I'd like to say that
20 we're aware that the Commission has worked hard to get
21 a hold on where this Agency is headed and to establish
22 priorities in order to bring some semblance of order
23 in the aftermath of TMI-2.

24 However, we still see many cases of items
25 which seem to crop up and which, regardless of their

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1 risk significance, sometimes get pushed to the
2 forefront of Agency priorities. We feel that this
3 places considerable burden on the licensees. What
4 ongoing activity do they drop to undertake the latest
5 regulation? What is the relative priority of that
6 matter compared to others?

7 We think that from the licensee's
8 perspective, and certainly at times from our
9 perspective, it appears that the Commission's efforts
10 to establish regulatory stability are not working
11 completely. As your safety advisors, we felt
12 compelled to express those views to you, so we sent
13 that brief letter to you indicating that we have some
14 concerns about things. It just seems like this office
15 pops up this issue and this office pops up that issue
16 and we're not sure that anybody's weighing the
17 relative risk priorities of those various things and
18 so that there's some semblance of order of what goes
19 out of the Agency.

20 So that's the general background. I look to
21 my fellow members to see if they want to add anything
22 to that.

23 Hal?

24 DOCTOR LEWIS: No, I think you've said it
25 very well. This isn't a criticism of the Commission,

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1 simply an expression of a state of affairs which
2 is not uncommon among agencies, in which each element
3 of the agency does what it honestly thinks is best.
4 You know it somehow doesn't add up to the best for the
5 whole society. We've seen so many cases of it and we
6 don't want to belabor each one. You've seen it too.
7 We think -- there's something wrong. Cures are
8 another matter.

9 CHAIRMAN ZECH: Right. Well, has the staff
10 discussed their approach to the integrated programs
11 with the ACES? Have you heard --

12 DOCTOR KERR: The staff gave a presentation
13 on the SECY paper.

14 CHAIRMAN ZECH: Yes.

15 DOCTOR KERR: I would characterize the paper
16 as a very good description of those programs that
17 needed to be integrated. I have not seen anything
18 that tells how they're going to be integrated.

19 CHAIRMAN ZECH: Well --

20 DOCTOR SIESS: Just the opposite.

21 CHAIRMAN ZECH: Yes, I think --

22 DOCTOR SIESS: Mark I containment was
23 deintegrated.

24 COMMISSIONER ROGERS: Say that again,
25 please?

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DOCTOR SIESS: Mark I containments was
delegated.

COMMISSIONER ROBERTS: Well, I wouldn't
presume to put words in your mouth, but in your letter
you specifically mention the maintenance rule. Would
you put charging off with the Mark I so-called
improvements and simultaneously doing the IPE program
as an example of what you refer to in this letter?

DOCTOR REMICK: Yes.

COMMISSIONER ROBERTS: Thank you. So would

I.

MR. WARD: In fact, we wrote a letter
specifically on that.

COMMISSIONER ROBERTS: Thank you.

CHAIRMAN ZECH: Well, let me just make a
comment and then I'll ask for other comments from my
colleagues.

I certainly agree that integrating our many
different programs is extremely important. I've
mentioned this to the staff before and asked them to
take on this project to make sure that we start with a
safety goal perhaps and integrate the severe accident
policies, the Mark I containment, all the other very
important issues that bear on plant safety and that we
do integrate, that we make sure we have a thread of

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1 consistency flowing through them. I think
2 conceptually, that's what we'd all like, we'd all want
3 to have.

4 Again, it's true that parts of the staff,
5 I'm sure well meaning, are going after their own
6 particular program and doing it very professionally
7 and that's not a criticism of them either. But it is
8 important that at a higher level somewhere that we do
9 integrate these programs. It's the same view I had
10 when I first started thinking about the necessity of a
11 back-fit rule.

12 I think perhaps after Three Mile Island, the
13 Commission, the staff, all of us or all of those who
14 were here, well meaning and taking issue after issue
15 and addressing it and issuing regulations and so
16 forth, probably every one by itself can be justified.
17 But integrating those things over a whole -- and
18 making them consistent, bring them together, seems to
19 me very necessary. That's why I thought some kind of
20 discipline to our system, such as the back-fit rule,
21 was important, so that we look carefully and with some
22 kind of an analytical process before we go ahead and
23 make some regulation that by itself may improve safety
24 in this area but may detract perhaps in this area.

25 So, I think an integrated approach to all

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1 our regulatory matters is extremely important. It is
2 a big issue. I appreciate your letter. I appreciate
3 your views on it. I think they're very consistent
4 with the Commission's views.

5 On the other hand, what we've asked the
6 staff to come up with is a pretty tough problem, I
7 suppose. But I do think it's worth a fair amount of
8 thought. It's worth the Commission involvement, I
9 think, in attempting to get integrated programs
10 because they simply must contribute one to the other
11 and they must be brought together at some level.

12 I would hope that perhaps -- the staff,
13 I know, is trying to do this and it may be an
14 impossible task we've given them. We'll have to think
15 about that. But I do feel that if the ACRS, in your
16 good judgment and your experience, can assist us in
17 some way and perhaps assist the staff in taking a more
18 detached view than maybe they're able to take, it
19 might be very helpful to the Commission.

20 So, my approach would be to ask the staff to
21 look at your letter and to see what they can come back
22 to us with. On the other hand, I think if the ACRS
23 could, in due time, because I think this is another
24 difficult issue to wrestle with and we wouldn't expect
25 you to try to help us solve it overnight, but if you

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could take this on and see if there's some way from
a different viewpoint that you might be able to
help us with looking at an integrated approach, even
for a systematic or a philosophical approach, might
be a good starting point, because I do think the
effort to integrate these programs is very important.

Commissioner Roberts has a good point
because -- and I think we all look at it the same way.
We recognize these various programs that we're
addressing. We don't want to address them in
isolation. There is a tendency, I think, to do that
because you look at the logic and the good sense to
the program and such. But how does it integrate with
other programs? I think it's important. Perhaps the
AFSS can help us in that regard. I, for one, would
ask you to take on that issue.

DOCTOR REMICK: There's several of us on the
Committee, of course, that work for licensees to the
NRC and have to read issuances from the Commission.
Some of us have to face students and talk to them
about the NRC and the regulations and so forth. It's
surprising trying to explain sometime the thread of
continuity and consistency that exists in the
regulations and what is going on.

CHAIRMAN ZECH: That's a very important

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1 undertaking. It really is. It's a very, very big
2 issue as far as I'm concerned. I think you recognize
3 that as well as we recognize it. It's a very
4 important issue. But if you could take that on one
5 and think about it some more, I think it would be very
6 helpful to the Commission.

7 Commissioner Roberts?

8 DOCTOR LEWIS: I wonder if I --

9 CHAIRMAN ZECH: Yes, please, go ahead.

10 DOCTOR LEWIS: I just wanted to jump in
11 where I'm not wanted. Coordination in an agency, you
12 know, you wouldn't run a ship by committee. If the
13 ships are down, somebody has to --

14 CHAIRMAN ZECH: Yes, you can say that again.

15 COMMISSIONER ROBERTS: You wouldn't run this
16 agency with a commission, would you?

17 CHAIRMAN ZECH: One of the reasons I favored
18 a single administrator as I'm sure you know.

19 DOCTOR LEWIS: And besides, I've also been
20 on a ship. But anyway, you wouldn't. You just can't
21 do it. In that sense, the trouble of coordination of
22 an integrated approach, you can't go a step below the
23 Committee that runs this Agency, which is you folks.
24 It's a little complicated. You can't go from there
25 down the line to get an integrated policy.

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1 CHAIRMAN ZECH: Yes. Yes.

2 DOCTOR LEWIS: In fact, in most
3 organizations, the integrated policy comes from the
4 chief executive officer.

5 CHAIRMAN ZECH: Okay.

6 DOCTOR LEWIS: You know, you hire him and
7 fire him according to whether he can accomplish that.
8 Still less can you get an integrated policy from the
9 advisory committee to the committee that runs the
10 agency.

11 CHAIRMAN ZECH: Well, I don't know if I
12 agree with that. I agree that giving it to the staff
13 is very difficult. On the other hand, I think it's
14 fair to let them hear their views on it because,
15 you're right, we have to make the decision. No
16 question about it. But it's helpful to have their
17 views, I think.

18 DOCTOR LEWIS: Oh, yes.

19 CHAIRMAN ZECH: And also, by the same token,
20 I think that the ACRS, we have to make the decision.
21 It's our responsibility and we will make it. You can
22 count on that, I'm sure. But we want to make the best
23 decision we can. I really do believe that you and
24 your collective experience can at least give your
25 thoughts to us and we will make the decision and we'll

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1 take the responsibility for making it.

2 But I think in our arriving at that
3 important decision to integrate the programs, it's a
4 little bit in a sense like the safety goal and trying
5 to implement the safety goal. I think you have
6 something to offer.

7 DOCTOR LEWIS: Yes. It's just that in this
8 subject there is no enemy. There's nobody against
9 integration.

10 CHAIRMAN ZECH: No. Exactly.

11 DOCTOR LEWIS: That's what makes it so much

12 CHAIRMAN ZECH: I agree. I agree exactly.

13 DOCTOR REMICK: We are in a somewhat unique
14 position. Other than the Commission, ACRS and a
15 couple of your senior staff members, many other people
16 don't see what is going on --

17 CHAIRMAN ZECH: Exactly.

18 DOCTOR REMICK: -- the breadth of the
19 Agency. We see that breadth, not as much as you do--

20 CHAIRMAN ZECH: But you do see that.

21 DOCTOR REMICK: -- so we are able to
22 compare.

23 CHAIRMAN ZECH: Yes.

24 DOCTOR REMICK: Sometimes when we work with

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1 staff from one office, they're not at all where a
2 related program in another office.

3 CHAIRMAN ZECH: Certainly.

4 DOCTOR REMICK: We see this type of thing.
5 We are in a position sometimes where we --

6 CHAIRMAN ZECH: Yes, I think you can make
7 a -- you can help us. We have to make the decision, I
8 agree --

9 Commissioner Roberts?

10 COMMISSIONER ROBERTS: Are we completing the
11 meeting? Have we finished the last topic?

12 CHAIRMAN ZECH: This is the last topic and
13 we've asking colleagues questions on the last topic.

14 COMMISSIONER ROBERTS: I have no questions
15 on that, but --

16 CHAIRMAN ZECH: We'll come back to you then.

17 COMMISSIONER ROBERTS: All right. Thank
18 you.

19 CHAIRMAN ZECH: Commissioner Rogers?

20 COMMISSIONER ROGERS: Well, just that I
21 wanted to say that you do have that vantage point
22 that's rather unique and I think you are in a special
23 position to be able to see where things seem to be
24 disconnected and not properly integrated.

25 I'd also ask you to think, if you could,

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1 about perhaps where there might be some problems due
2 to a lack of knowledge, that the things aren't being
3 integrated because there is some question someplace
4 that someone feels they need an answer to that they
5 don't have that sets an improper priority on the work
6 in some way. I think you would also be in a very
7 special position to be able to point out to us where
8 there are roadblocks to integration because of a lack
9 of knowledge, important knowledge.

10 DOCTOR KERR: I'm sure you are as aware, as
11 those of us who come from academic backgrounds, of the
12 compartmentalization that takes place within
13 universities. I think things are equally
14 compartmentalized in this organization, for good or
15 ill.

16 CHAIRMAN ZECH: Commissioner Curtiss?

17 COMMISSIONER CURTISS: No comments.

18 CHAIRMAN ZECH: Commissioner Roberts, you
19 had a comment to make?

20 COMMISSIONER ROBERTS: Well, I don't want to
21 get into an argument over semantics with my colleague,
22 Commissioner Rogers. But I'll just tell you from my
23 point of view, it is certainly -- back to our earlier
24 discussion about management and regulation. Certainly
25 the imposition of regulations can affect management,

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1 In my view they are clearly separable and when
2 they do tend to get fuzzy, we have a compelling
3 obligation to make them as separable as possible
4 because I think regulation and management are two
5 different entities.

6 That's all I have to say.

7 CHAIRMAN ZECH: All right. Thank you.

8 COMMISSIONER ROGERS: I won't rise to that

9
10 CHAIRMAN ZECH: All right. Fine.

11 Well, let me thank the ACRS again for
12 another fine presentation. When will you come
13 back to the Commission again? Do we have another
14 meeting scheduled?

15 DOCTOR REMICK: No, none scheduled at the

16
17 CHAIRMAN ZECH: Well, it may not get back
18 before I leave. If that does take place and you don't
19 appear before us again, I would like to take this
20 opportunity, Doctor Catton, to welcome you again --

21 DOCTOR CATTON: Thank you.

22 CHAIRMAN ZECH: -- to the Committee and I
23 would also like to welcome the other new member who
24 hasn't been here too long to the table, Mr. Carroll.
25 It's a pleasure to have you with us.

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1 To all of you who I've gotten to know so
2 much better than the new members perhaps, and to all
3 of you, I would like to offer you my own personal
4 gratitude for your competence, your intellect and your
5 willingness to share your views and your time, your
6 energy with this Commission.

7 I can't tell you how much it means to me to
8 have had the benefit of your views. I think I can
9 speak for all my colleagues in this regard, but
10 certainly speaking for myself, I want you to know how
11 much I appreciate working with you and I'll be
12 eternally grateful for the way that you have assisted
13 me as Chairman in particular and assisted all my
14 colleagues in coming to these important decisions that
15 we have to make.

16 We do make the decisions. We are the
17 Commission. We make the final decisions. We make the
18 best ones we can. We have a lot of good advice from
19 the staff, a very competent dedicated staff who does
20 their best to give us the good advice. But I can
21 assure you that as far as I'm concerned the Advisory
22 Committee on Reactor Safeguards has in the past, over
23 the many years, and continues to make a very real
24 contribution to this Commission. I, for one, wish to
25 thank everyone of you for the time you give and for

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1 great contribution to our Agency and to our
2 country

3 DOCTOR REMICK: Mr. Chairman, we wanted also
4 to express our pleasure for the opportunity to work
5 with you during these past five years. You've openly
6 and repeatedly expressed appreciation of our effort
7 and that's made us feel very good, of course. But it
8 also spurred us on to try to do the best possible job
9 that we can in giving advice to the Commission.

10 You've been very receptive and attentive to
11 our letters. We know that. Some of the
12 recommendations you accept, some you reject, but we
13 understand that fully. We just provide advice, you
14 must make the decisions. But we want you to know that
15 we've been extremely proud to have been part of the
16 Agency under your Chairmanship. We wish you very well
17 for the future.

18 CHAIRMAN ZECH: Thank you very much for
19 those kind remarks.

20 Thank you very much, gentlemen. We stand
21 adjourned.

22 (Whereupon, at 3:36 p.m., the hearing was
23 concluded.)

24
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DATE OF MEETING: MAY 3, 1989

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