



UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D.C. 20555-0001

July 14, 2003

MEMORANDUM TO: ACRS Members

FROM:


Sam Duraiswamy, Technical Assistant

SUBJECT:

REVISED ACRS SUBCOMMITTEE STRUCTURE

Attached is a revised version of the ACRS Subcommittee Structure. A proposed revision to the ACRS Subcommittee Structure was provided to the members and the ACRS staff engineers during the April ACRS meeting, requesting comments by April 25, 2003. Comments received were incorporated into the current revision. Significant changes to the Subcommittee Structure include the following:

- Abolishment of Subcommittees
 - The **Plant Systems Subcommittee** has been abolished and the tasks of this Subcommittee have been assigned to Plant Operations and Human Factors Subcommittees.
 - The **Natural Phenomena Subcommittee** has been abolished and the tasks of this Subcommittee have been assigned to Regulatory Policies and Practices and Reliability and PRA Subcommittees.
- Chairmanship Changes
 - Dr. Powers, who has agreed to take the lead for preparing the 2004 ACRS report on the NRC Safety Research Program, becomes the Chairman of the Safety Research Program Subcommittee.
 - Mr. Rosen will become the Chairman of the Human Factors Subcommittee. Dr. Powers, current Chairman, will remain as a member of this Subcommittee.
- Ad Hoc Subcommittee

An Ad Hoc Subcommittee on MOX Fuel Fabrication Facility has been established. This Subcommittee will be chaired by Dr. Powers. Members of this Subcommittee are: Dr. Ford, Dr. Kress, and Mr. Rosen.

The Planning and Procedures Subcommittee continues to evaluate the assignments and workload distributions for the members. The full Committee will be kept informed of further changes to member assignments and workload distributions. The ACRS management has made assignments and workload distributions for the staff engineers that are reflected in this revision.

The revised Subcommittee Structure will become effective on August 1, 2003.

Attachment: As stated

cc: John T. Larkins
Sher Bahadur
Jenny Gallo
ACRS Staff

**ACRS Subcommittee Assignments for
Members (July 8, 2003)**

	GEA	MVB	FPF	TSK	GML	DAP	VR	SR	JDS	WJS	GBW
Fire Protection	x					x		X	x		x
Future Plant Designs	x			X		x	x			x	x
Human Factors	x	x				x		X			
Materials & Metallurgy			X			x			x	x	
Naval Reactors					x		x		X		x
Planning and Procedures		X						x			x
Plant License Renewal - I		X			x		x		x	x	
Plant License Renewal - II		x	x		X			x			x
Plant Operations.		x			x			x	X		
Reactor Fuels			x	x		X	x				
Reg. Policies and Practices				x	x		x			X	
Reliability and PRA	X	x	x	x				x		x	
Safety Research Program			x	x		X	x			x	x

**ACRS Subcommittee Assignments for
Members (July 8, 2003)**

	GEA	MVB	FPF	TSK	GML	DAP	VR	SR	JDS	WJS	GBW
Safeguards and Security	X	x			x	x		x	x	x	
T-H Phenomena			x	x			x		x		X
Joint ACRS/ ACNW Sub	x			X							
Ad Hoc Subc. On MOX FFF			x	x		X			x		
TOTAL	6	7	7	8	6	8	7	7	8	7	7

(BOLD) X - Chairman

x - Member

TABLE OF CONTENTS

	<u>PAGE</u>
Fire Protection (MDS/SLR)	1
Future Plant Designs (MME/TSK)	1
Human Factors (MME/SLR)	2
Materials & Metallurgy (BPJ/FPF/WJS)	2
Naval Reactors (RPS/JDS)	3
Planning and Procedures (RPS/MVB)	3
Plant License Renewal 1 (BPJ/MVB/GML)	4
Plant License Renewal 2 (MDS/GML/MVB)	5
Plant Operations (MWW/JDS/GML)	5
Reactor Fuels (RC/DAP)	6
Regulatory Policies and Practices (MRS/WJS)	7
Reliability and Probabilistic Risk Assessment (MRS/GEA)	8
Safety Research Program (SD/HN/DAP)	9
Safeguards and Security (RPS/RKM/GEA)	10
Thermal-Hydraulic Phenomena (RC/GBW/VHR)	10
ACRS/ACNW Joint Subcommittee (MRS/TSK/JG)	11
Ad Hoc Subcommittee on Mixed Oxide Fuel Fabrication Facility (MWW/DAP)	11

Cognizant ACRS Staff:

SD - Sam Duraiswamy
MME - Medhat M. El-Zeftawy
JTL - John T. Larkins
HN - Hossein Nourbakhsh
RKM - Richard K. Major

BPJ - Bhagwat P. Jain
RPS - Richard P. Savio
MRS - Michael R. Snodderly
MDS - Marvin D. Sykes
MWW - Maggalean W. Weston
RC - Ralph Caruso

ACRS Members:

GEA - George E. Apostolakis
MVB - Mario V. Bonaca
FPF - F. Peter Ford
TSK - Thomas S. Kress
GML - Graham M. Leitch
DAP - Dana A. Powers

VHR - Victor H. Ransom
SLR - Steve L. Rosen
JDS - Jack D. Sieber
WJS - William J. Shack
GBW - Graham B. Wallis

TOPICAL SUBCOMMITTEES

FIRE PROTECTION (MDS) **ROSEN**, Apostolakis,
Powers, Sieber, Wallis

- Review adequacy of fire protection requirements for operating plants.
- Review fire risk assessment methodology in coordination with the Reliability and Probabilistic Risk Assessment Subcommittee.
- Review the rulemaking to endorse National Fire Protection Association, NFPA-805 performance-based fire protection standard.
- Review the Boiling Water Reactor Owners Group (BWROG)/Nuclear Energy Institute (NEI) post-fire safe shutdown circuit analysis and associated NRC staff evaluation.
- Review the Significance Determination Process for findings of inspections dealing with fire protection
- Review fire risk assessment research program, including the models for circuit failure mode analysis and IEEE-383 rated cable fire frequency analysis.
- Review fire protection aspects of the proposed mixed oxide (MOX) Fuel Fabrication Facility, in coordination with the Reactor Fuels Subcommittee.
- Review fire protection aspects of the advanced reactor designs in coordination with the Future Plant Designs Subcommittee.

FUTURE PLANT DESIGNS (MME) **KRESS**, Apostolakis,
Powers, Ransom, Shack, Wallis

- Review Westinghouse application for certification of the AP1000 design and the associated NRC staff's SER.
- Review regulatory challenges associated with advanced reactor designs.
- Review technical and policy issues for the advanced reactor designs.
- Review draft final revisions to 10 CFR Part 52.
- Review advanced reactors research plan.
- Review NRC staff activities associated with early site permit and pre-application review of advanced reactor designs.
- Consider application of Severe Accident Policy to future plants.
- Review the seismic requirements for site permit applications for advanced reactors.

HUMAN FACTORS (MME) **ROSEN**, Apostolakis,
Bonaca, Powers

- Consider man-machine interaction, including design and arrangement of the control room and operator response under stress.
- Review control room habitability issues, including draft final regulatory guides and Generic Letter.
- Review Human Performance and Human Reliability Research activities.
- Review regulatory requirements for dealing with human factors issues.
- Review human/organizational factors issues associated with significant operating events in coordination with the Plant Operations Subcommittee.
- Review qualifications and training of personnel at nuclear facilities in coordination with the Plant Operations Subcommittee.
- Review proposed revisions to Standard Review Plan, Chapter 18, Human Factors Engineering.
- Review proposed revisions to 10 CFR Part 26, Fitness for Duty.
- Assess the importance of Safety Culture in the error forcing context and assess the need to include modeling of Safety Culture in PRAs.
- Follow-up on the NRC staff and industry activities related to digital instrumentation and control systems.
- Consider verification and validation of computer software used in control and protection systems.

MATERIALS AND METALLURGY (BPJ) **FORD**, Shack (Vice Chair.),
Sieber, Powers

- Review NRC program to evaluate plant aging of metal components (e.g., pressure vessel embrittlement, steam generator tube degradation, and thermal aging of cast stainless steel piping and components).
- Review the adequacy of nondestructive examination techniques in detecting and sizing flaws in metal components, piping systems, and steam generator tubes.
- Keep abreast of new developments associated with ASME Section III for pipe design criteria and Section XI, inservice inspection/pressure boundary integrity of operating nuclear plants.
- Review 1994 Addenda for Class 1, 2, and 3 piping systems to the ASME Code, Section III, and the resolution of the differences between the staff and the ASME.
- Review regulatory approach associated with the steam generator tube integrity, and the

staff's safety evaluation on industry proposed technical specifications for addressing steam generator tube integrity.

- Review causes, consequences, and preventive measures associated with the control rod drive mechanism penetration nozzle cracking and degradation of reactor pressure vessel head.
- Review NRC staff's Steam Generator Action Plan for resolving steam generator issues as well as the issues raised by the ACRS in NUREG-1740 associated with the Differing Professional Opinion (DPO) on steam generator tube integrity (Dr. Powers lead member on DPO issues)
- Review proposed revisions to 10 CFR 50.61, Fracture Toughness Requirements for Protection Against Pressurized Thermal Shock (PTS), in coordination with the Subcommittees on Thermal-Hydraulic Phenomena and on Reliability and Probabilistic Risk Assessment.
- Review proposed amendment to 10 CFR 50.55a regarding volumetric examination of the small-bore piping of the high pressure safety injection (HPSI) system.
- Review proposed revisions to Regulatory Guide 1.99 (irradiation embrittlement) and Regulatory Guide 1.154 (PTS).
- Consider plant water chemistry and quality control as related to corrosion control.
- Consider integrity of nuclear plant piping under earthquake-induced conditions.
- Consider integrity of degraded piping systems and components caused by erosion/corrosion phenomenon.
- Consider issues associated with license renewal for Independent Spent Fuel Storage Installations and the structural integrity of fuel shipping casks and adequacy of spent fuel encapsulators, as requested by the Advisory Committee on Nuclear Waste (ACNW).

NAVAL REACTORS (RPS) SIEBER, Leitch,
Ransom, Wallis

- Consider safety issues associated with the U.S. Naval reactor designs.
- Review proposed Naval reactor designs.
- Visit U.S. Naval reactor facilities, as needed, to gather information for use in reviewing proposed Naval reactor designs, training programs, etc.

PLANNING AND PROCEDURES (RPS) BONACA, Wallis, Rosen

(NOTE: This Subcommittee includes the ACRS Chairman, Vice Chairman, and one member-at-large elected each year at the same time as the Chairman and Vice Chairman, and is chaired by the ACRS Chairman.)

- Prioritize items proposed for each ACRS meeting for consideration by the Full Committee.
- Organize ACRS retreats to discuss and exchange views on safety philosophy and policy.
- Develop proposals for significant changes in ACRS policies, practices, and bylaws for consideration by the Full Committee. Consider especially changes mandated by revisions to the Federal Advisory Committee Act.
- Implement policies of ACRS in planning Full Committee activities, articulating priorities, allocating and controlling resources, and scheduling and monitoring activities of the Subcommittees.
- Perform annual review of the Subcommittee structure, tasks, and workload of members and recommend changes, as needed, for Full Committee consideration.
- Assume lead responsibility for the coordination of ACRS meeting with international organizations.
- Monitor the adequacy of implementation of the memorandum of understanding (MOU) between the ACRS and the EDO.
- Follow-up on the resolution and implementation of the commitments made at the annual ACRS retreats.
- Review self assessment of ACRS performance and provide to the Full Committee for consideration.

PLANT LICENSE RENEWAL -1 (BPJ) BONACA, Leitch (Vice Chair.),
Shack, Sieber, Ransom

- Review regulatory requirements related to plant license renewal.
- Review license renewal applications and associated NRC staff's Safety Evaluation Reports for:
 - Fort Calhoun
 - St. Lucie
 - Summer
- Consider the NRC program to evaluate plant aging except for those aspects being considered by the Materials and Metallurgy Subcommittee (e.g., pressure vessel embrittlement, steam generator tube degradation, and thermal aging of cast stainless steel piping and components).
- Review selected industry topical reports associated with license renewal of above plants.
- Review the resolution of differences between the staff and industry on generic license renewal issues.

- Review updates made to the Standard Review Plan, Generic Aging Lessons Learned (GALL) Report, and Regulatory Guidance associated with license renewal to reflect lessons learned from the review of license renewal applications.

**PLANT LICENSE RENEWAL -2 (MDS) LEITCH, Bonaca (Vice Chair.),
Ford, Rosen, Wallis**

- Review license renewal applications and the associated NRC staff's Safety Evaluation Reports for:
 - Ginna
 - Dresden and Quad Cities
 - Robinson 2
- Review selected industry topical reports and the staff's safety evaluations associated with the license renewal of the above plants.

**PLANT OPERATIONS (MWW) SIEBER, Leitch (Vice Chair.),
Bonaca, Rosen**

- Assume lead responsibility for activities related to plant operations and provide oversight and coordination of the review of plant operating experience by ensuring that events and reports needing review are covered by other ACRS Subcommittees, or assume responsibility for the review as appropriate.
- Consider regulatory guidance and issues associated with PWR containment sump strainer blockage in coordination with the Thermal-Hydraulic Phenomena Subcommittee.
- Review Augmented Inspection Team (AIT) and Special Inspection Team (SIT) reports associated with operating events, as appropriate, and recommend specific events for consideration by the Full Committee [G.M. Leitch is the lead member].
- Review the implementation of the NRC Performance Indicator Program and industry programs to provide voluntary performance information.
- Review restart of plants that have been shut down for an extended period (more than one year) and make recommendation to the Full Committee.
- Review, in coordination with the Reliability and PRA Subcommittee, initiatives related to risk-informed Technical Specifications.
- Review issues associated with the operation and maintenance of fuel cycle facilities and the adequacy of associated regulatory requirements.
- Monitor the activities of the NRC Regional Offices by holding annual meetings at different Regional Offices. Visit one plant per year in different Regions and obtain information on industry issues.
- Review, in coordination with the Reliability and PRA Subcommittee, the use of performance indicators (PIs) in the Revised Reactor Oversight Process to ensure that the PIs provide

meaningful insight into aspects of plant operation that are important to safety.

- Review enhancement to the Significance Determination Process in coordination with the Reliability and PRA Subcommittee.
- Review NRC staff and industry activities related to restructuring and economic deregulation of electric utility industry, and associated safety implications.
- Consider generic safety implications of the performance of systems not assigned to other Subcommittees (e.g., air powered systems, cleanup systems, and chilled water systems).
- Consider biological effects of ionizing radiation, standards for protection against radiation (10 CFR Part 20), and associated regulatory guidance.
- Review mechanical component operability assurance and reliability, including the functioning of valves under accident loading conditions.
- Review systems interaction issues and criteria, including consideration of functional interactions for existing and future plants.
- Consider the effects of harsh and adverse environment on the plant safety systems.
- Review reliability of AC/DC power systems in nuclear facilities, including the potential for disruption of offsite power sources and backup power systems.
- Review lightning protection provisions for operating and future plants.
- Provide oversight and coordination of the prioritization and resolution of generic safety issues, handling those items it is competent to deal with and assigning others to appropriate Subcommittees for review.

REACTOR FUELS (RC) **POWERS**, Ford, Kress,
Ransom

- Review technical issues and construction authorization application by Duke Cogema Stone & Webster associated with the proposed Mixed Oxide (MOX) Fuel Fabrication Facility.
- Assume lead responsibility for activities related to reactor fuel and review fuel-related issues, as necessary.
- Review NRC staff activities related to revising fuel design acceptance criteria for high burnup fuel and the use of Phenomena Identification and Ranking Table (PIRT) process for high burnup fuel.
- Review programs of industry Fuel Vendors and Owners Groups to address concerns associated with use of high burnup fuel.
- Consider fuel performance during normal and abnormal conditions, including fuel failure propagation.

- Review NRC and Industry fuel performance codes.
- Review reactor neutronics analytical methods.
- Review DOE Tritium Production Program using commercial nuclear power plants, including the applications for license amendments for lead test assemblies in McGuire and batch assemblies in Catawba and McGuire.
- Review the licensing of uranium enrichment facilities.
- Review safety issues associated with the use of MOX Fuel.
- Review research to characterize performance of fuel stored in spent fuel pool.
- Evaluate the design of spent fuel storage pools, including pool storage capability and provisions to preclude criticality and to cool the fuel under normal and abnormal conditions and following external events such as earthquakes.
- Review spent fuel pool accident risk for decommissioning and operating plants.
- Review safety issues associated with new and modified fuel designs.

REGULATORY POLICIES AND PRACTICES (MRS) **SHACK, Kress,
Leitch, Ransom**

- Examine the coherence and specific aspects of the NRC regulatory process, as appropriate, and consider changes in emphasis needed in safety-related NRC rules and regulatory practices.
- Identify important safety issues needing increased (or less) attention and/or resolution in the NRC regulatory process.
- Consider possible changes to General Design Criteria (GDC) and other criteria (e.g., single failure criterion) as needed, based on operating experience, advances in related technology, and research results.
- Review proposed NRC safety-related rules not assigned to specific ACRS Subcommittees.
- Review NRC staff and industry activities associated with control room habitability.
- Review the NRC staff's reevaluation of the effectiveness of those existing regulations which were not assigned to other Subcommittees.
- Review proposed resolution of GSI-189, "Susceptibility of Ice Condenser and Mark III Containments to Early Failure from Hydrogen Combustion During a Severe Accident."
- Consider activities associated with the NRC oversight of DOE facilities.
- Consider the use of defense-in-depth concept in the regulatory process.

- Consider the nature and characteristics of core-coolant interactions (e.g., steam explosions) and core-containment interactions (e.g., reactor with concrete and heating of structural elements).
- Consider severe accident chemistry (including effects of radiation on aerosols and post-accident hydrogen burning), codes for modeling such chemistry, and relation to the accident source term.
- Consider hydrogen control measures at nuclear power plants and associated regulatory requirements, including the need for requirements imposed following the TMI accident, such as the post accident sampling system.
- Review NRC research and information needs in the seismic area.
- Review NRC/industry seismic design margins evaluation program.

RELIABILITY AND PROBABILISTIC RISK ASSESSMENT (MRS) **APOSTOLAKIS**, Bonaca,
Ford, Kress, Rosen, Shack

- Review the risk-informed and performance-based regulatory approaches, including risk-informed revisions to 10 CFR Part 50 and to Appendices A and B.
- Review draft final 10 CFR 50.69 draft Guide DG-1121, and NEI 00-04, "Option 2 Implementation Guideline."
- Review periodic revisions to Regulatory Guide 1.174 and SRP Chapter 19.
- Consider application of risk insights in the regulatory process.
- Consider methods for incorporating human reliability in PRAs.
- Consider reliability studies of safety systems and the use of reliability and availability information in the regulatory process.
- Consider the Accident Sequence Precursor Program and the SPAR models as well as the application of the results of these in the regulatory process.
- Review updates to risk-informed regulation implementation plan.
- Consider the consistent and extended use of PRAs in the regulatory process and the associated NRC programs.
- Review proposed ANS Standard on low-power and shutdown risk.
- Gather information for developing recommendations to the Commission on the significance of low-power and shutdown operations risk and review the adequacy of the staff's analytical tools for independently assessing the risk significance of plant configurations during low-power and shutdown operations, especially during plant transitions.

- Review the cooperative research with Japan and others, especially the experimental investigations of structural responses to earthquakes.
- Review draft's final Regulatory Guide 1.92, "Combining Model Responses and Spatial Components in Seismic Response."
- Review risk-based performance indicators and the Significance Determination Process in coordination with the Plant Operations Subcommittee.
- Review the initiatives related to risk-informed Technical Specifications in coordination with the Plant Operations Subcommittee.
- Consider methods for assessing uncertainties and other issues related to risk-informed decisionmaking.
- Review coherence plan for risk-informed and performance-based activities.
- Review the impact of common-mode failures on the performance of plant safety systems.
- Review risk-informed analysis of reactor operating experience.
- Review the capabilities of the NRC line organizations for quantitative assessment of seismic and natural phenomena risk.
- Review the bases for the assumptions used in Probabilistic Seismic Hazard Analysis and its use in nuclear plant regulation.
- Review the staff activities to address the uncertainties in the treatment of soil liquefaction, which was identified by the IPEEE Program.

SAFETY RESEARCH PROGRAM (SD/HN) **POWERS**, Ford,
Kress, Ransom, Shack, Wallis

- Perform an annual review of the overall NRC Safety Research Program and prepare a report to the Commission on the quality, scope, and balance of the ongoing and proposed research activities, as well as on research priorities.
- Identify new areas of research that are essential for regulatory decisionmaking and research projects that are no longer cost effective and can be eliminated.
- Review the adequacy of the user office needs for research.
- Evaluate whether NRC research places proper emphasis on resolving important regulatory issues.
- Consider what research should be done by the NRC and the industry and cooperative research arrangements between NRC and other resent organizations.

SAFEGUARDS AND SECURITY (RPS/RKM) **APOSTOLAKIS**, Bonaca,
Leitch, Powers, Rosen, Shack, Sieber

- Keep Informed of the NRC activities in the area of safeguards and security, including the reevaluation of design basis threat and proposed activities to enhance the safeguards and security programs, and be prepared to advise the Commission and the staff as requested.
- Review RES-sponsored work related to vulnerability evaluations of nuclear facilities.
- Review PWR and BWR pilot plant studies.
- Review technical and risk-management issues associated with nuclear facility vulnerabilities,

including those related spent fuel pools and decommissioning plants.
- Review technical issues associated with the reevaluation of emergency planning.
- Review safeguards requirements for uranium enrichment facilities and MOX Fuel Fabrication Facility.
- Review proposed design features to mitigate the effects of sabotage and plant arrangements to enhance security.
- Review NRC staff's rulemaking activities associated with safeguards and security
- Consider material control and accounting of special nuclear material.

THERMAL-HYDRAULIC PHENOMENA (RC) **WALLIS**, Ransom (Vice Chair),
Ford, Kress, Sieber

- Review requests for core power level increases greater than 5%.
- Review draft final review standard for reviewing core power uprate application.
- Consider evaluation of emerging safety issues associated with thermal-hydraulic phenomena.
- Review thermal hydraulic issues associated with the development of revised PTS screening criterion.
- Review issues related to water hammer and corrective measures.
- Review RES thermal-hydraulic research program, including the program to upgrade the NRC thermal-hydraulic codes and RES experimental program related to subcooled boiling phenomena.
- Review issues associated with core reload analysis for plants seeking power uprates.

