

Subcommittee ¹ (SC)	Ballinger	Bier	Dimitrijevic	Halnon	Kirchner ²	Martin	March-Leuba	Petti	Roberts	Sunseri	New Members M1/M2	Total SC
Design-Centered Reviews ³	M <i>APR-1400 Shine</i>	C GA FMR	M	C Terrestrial ACU SMR 160	C NuScale OKLO	C X-Energy UIUC	C BWRX-300 ESBWR	C Kairos Hermes 1&2	C TerraPower eVinci	C AP-300 Navy	M1/M2	ALL
Accident Analysis	M					C (Lead for T-H)	M	M (Lead for Severe Accidents)	M		M2	6
Digital Instrumentation & Control (DI&C) and Electrical Systems (Artificial Intelligence)		M (Lead on AI)	M	M			M		C		M2	6
Fuels, Materials, and Structures (Source Term)	C					M	M	M	M		M1	6
Human Factors, Reliability, and PRA		M	C			M				M	M2	5
Plant Operations and License Amendments/Renewals (Rad Waste)	M (Lead for Rad Waste)			C	M					M (Lead for License Renewals)	M1	5
Regulatory Rulemaking, Policies, and Practices		C	M	M				M (Lead on Part 53)		M	M1	6
Safety Research ⁴	M	M	M	M	M	M	M	C	M	M	M	ALL
Planning and Procedures				M	C			M				3
Total SCs (Chair)	3(1)	3(2)	3(1)	4(2)	2(2)	3(2)	3(1)	4(2) ⁴	3(3)	3(2)	M1-3(0) M2-3(0)	

C = Chair of Subcommittee, M= Member of Subcommittee

April 22, 2024

¹ Target – Membership on ≤ 4 SCs (not including Design-Centered Reviews and Safety Research) and SCs with ≤ 6 members.

² Chair of ACRS, at large SC involvement.

³ Gray italics denotes an inactive or informational Design-Centered Review. Not included in SC totals except for Design-Centered Review Chair duties.

⁴ Triennial review as assigned by the ACRS Leadership. Not included in SC totals except for Safety Research Chair duties.

ACRS SUBCOMMITTEE STRUCTURE

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The Advisory Committee on Reactor Safeguards (ACRS) subcommittee structure is organized around design-centered reviews, six core technical subcommittees, a research review subcommittee, and a planning and procedures subcommittee. The subcommittees' purpose and function are to obtain, analyze, and organize information for consideration by the full committee. All members support the design-centered and safety research reviews. Below is a list of the current subcommittees (SCs) and a general scope of activities associated with each (recognizing that many of these activities are crosscutting and overlapping).

Design-Centered Reviews:

- Review new reactor applications with a focus on their novel and unique, safety-significant, design aspects
- Review safety-significant topical reports referenced in or related to new reactor applications in coordination with cognizant SCs (note that this could occur in the pre-application phase)
- Review Design Acceptance Criteria (DAC) and Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) issues associated with new reactor designs
- Review individual Early Site Permit (ESP) and first-of-a-kind Combined License (COL) applications
- Review applicable guidance and review standards for applications under Title 10 of the *Code of Federal Regulations* (10 CFR) Parts 50 and 52 (CP, OL, ESP, DC, SDA, and COL) with the Regulatory Rulemaking SC

Accident Analysis

- Review safety issues associated with accident, reactor physics, thermal hydraulic, and chemical phenomena, including associated staff activities with Nuclear Regulatory Commission (NRC) confirmatory analysis codes (e.g., TRACE, PARCS, PATHS, and MELCOR, and the CRAB suite of codes for non-LWRs)
- Review related issues associated with existing plant and new plant designs in coordination with cognizant SCs
- Review NRC and industry activities associated with the development and introduction of Accident Tolerant Fuel (ATF) and Increased Enrichment (IE) in coordination with the Fuels SC
- Review issues associated with the use of industry or Department of Energy (DOE) developed accident analysis codes
- Review topical reports for generic accident analysis methodologies
- Review extended power uprate applications and other licensing amendments, as necessary, in support of Plant Operations SC

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Digital Instrumentation and Control (DI&C) and Electrical Systems (Artificial Intelligence)

- Review related issues associated with upgrades and new plant DI&C and electrical designs in coordination with cognizant SCs
- Review regulatory requirements and guidance associated with DI&C and electrical systems
- Review information developed by the staff on the inventory and classification (e.g., by function or other characteristics) of the various types of digital hardware and software systems that are being used and are likely to be used in nuclear power plants
- Review staff evaluation of operating experience with digital systems in the nuclear and other industries to obtain insights regarding potential failures modes
- Review methods for evaluating digital system reliability
- Review NRC staff and industry activities associated with cyber security
- Review cyber security design principles in new designs and facility preparedness with respect to cyber security in coordination with the Plant Operations SC
- Review relevant Artificial Intelligence (AI) research and assess readiness and safety implications of potential deployment in nuclear power plants

Fuels, Materials, and Structures (Source Term)

- Review new fuel, coolant, and material applications for existing and advanced reactor designs
- Review source term methodologies and associated regulatory matters
- Review NRC and industry activities associated with the development and introduction of ATF and IE in coordination with the Accident Analysis SC
- Review NRC and industry activities associated with aging of reactor plant systems, structures, and components (SSCs) due to flow accelerated corrosion, stress corrosion cracking, irradiation embrittlement, general corrosion, and other forms of metal and material degradation
- Review nondestructive examination techniques used in the detection and sizing of flaws in metallic structures and components such as pressure vessels, piping systems, and steam generator tubes
- Review metallurgical and reactor fuels issues associated with plant life extension, power uprates, and new plant designs in coordination with the cognizant SCs
- Review NRC and industry activities related to the introduction of new reactor core materials and components (including fuel and control rod designs, solid moderators, and coolants) and supporting design and performance codes and standards
- Review reactor core and fuel performance and regulatory issues associated with normal and accident conditions in coordination with the cognizant SCs
- Review reactor design analytical methods in coordination with the cognizant SCs

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- Review NRC and industry activities associated with seismic and structural analyses of reactor plant systems, structures, and components (e.g., steam dryer vibration, structural responses to seismic events, fragility assessments, and the aging and degradation of concrete) in coordination with cognizant SCs

Human Factors, Reliability, and Probabilistic Risk Assessment (PRA)

- Review the staff's risk-informed regulatory activities and the application of risk insights in the regulatory process
- Review the use of PRAs in the regulatory process and associated NRC programs
- Review regulatory guidance associated with the development and use of PRAs, including the performance of sensitivity and uncertainty analyses of PRA results, for risk-informed activities
- Review probabilistic seismic hazard and fire analyses and use in nuclear plant regulation in coordination with the cognizant SCs
- Review staff's Level 3 PRAs for reference plants
- Review the impact of common-cause, common-mode failures on the performance of plant safety systems
- Review NRC staff activities associated with development and application of consequence analysis codes (MAACS)
- Review the Accident Sequence Precursor Program and the development of Standardized Plant Analysis Risk (SPAR) models
- Review man-machine interactions, including design and arrangement of the control room and operator response in coordination of the Plant Operations SC
- Review methods and research for evaluating the effects of automation on human reliability, in coordination with the DI&C and Electrical SC
- Monitor regulatory approaches for dealing with the effects of automation on human reliability and resilience in other safety-critical industries (e.g., aviation, self-driving cars, medicine, etc.)
- Assess reliance on automation versus humans in new licensing submittals
- Review control room habitability issues in coordination of the Plant Operations SC
- Review regulatory requirements and guidance on human factors issues

Plant Operations, License Amendments/Renewals, and Rad Waste

- Review significant operating events at nuclear power plants and radioactive waste handling/disposal/transportation

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- Review regulatory requirements and guidance associated with protection against ionizing radiation (10 CFR Part 20)
- Provide a briefing to Full Committee on significant operating experience (as needed)
- Coordinate periodic meetings with NRC Regional Offices and visits to NRC-licensed facilities
- Review the NRC's reactor oversight process and its application to the operating fleet
- Review risk-informed plant operations and reactor oversight regulatory activities in coordination with the Human Factors, Reliability & PRA Subcommittee
- Review effects of harsh and adverse environment on plant safety systems
- Coordinate the prioritization and resolution of generic safety issues, either directly handling those items or assigning to appropriate SCs
- Review regulatory requirements and guidance for fire protection at nuclear power plants
- Review facility preparedness with respect to cyber security in coordination with the Digital I&C Subcommittee
- Review license renewal activities, including subsequent license renewals, and significant licensing amendments
- In conjunction with the Regulatory Rulemaking SC, review regulatory requirements and guidance associated with the renewal of operating licenses for nuclear power plants (10 CFR Part 54) and revisions to the Generic Aging Lessons Learned (GALL) Report or GALL-SLR Report
- Review regulatory requirements and guidance associated with licensing of source material (10 CFR Part 40)
- Review regulatory requirements and guidance associated with the following: disposal of high-level radioactive wastes in geologic repositories (10 CFR Part 60); land disposal of radioactive waste (10 CFR Part 61); licensing of special nuclear material (10 CFR Part 70); packaging and transportation of radioactive material (10 CFR Part 71); independent storage of spent nuclear fuel and high-level radioactive waste and reactor related greater than Class C waste (10 CFR Part 72); and fuel cycle facility oversight
- Evaluate the design, integrity, and safety of reactor fuels, cores, and spent fuel (and casks) for transport and storage (as well as spent fuel pools and dry cask storage)
- Review technical and risk-management issues associated with decommissioning

Regulatory Rulemaking, Policies and Practices

- Review proposed regulatory requirements and guidance, and relevant staff and industry activities (e.g., licensing modernization project and proposed 10 CFR 53 rulemaking, etc.) in coordination with cognizant SCs
- 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

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- Identify important safety issues needing increased (or less) attention and/or resolution in the NRC regulatory process
- Review NRC staff's reevaluation of the effectiveness of existing regulations which were not assigned to other SCs
- Review activities associated with the hazards of DOE facilities, when requested, in coordination with cognizant SCs
- Review use of defense-in-depth concept in the regulatory process
- Review technical issues associated with emergency planning with the Plant Operations SC
- Review regulatory requirements and guidance associated with safeguards and security issues, including those associated with losing large areas of a plant due to explosions or fire (10 CFR 50.54 (hh)(2) and 10 CFR 52.80(d))
- Review changes in existing and new regulatory requirements and associated guidance (10 CFR Parts 50, 52, 53, 54, and 60) in conjunction with other cognizant SCs
- Interact with working group to consider adequacy of safety goals

Safety Research

- Coordinate research reviews (including briefings by RES Divisions: DSA, DRA, and DE) and preparation of the triennial report to the Commission on the overall NRC Safety Research Program
- Evaluate the RES research portfolio in terms of: quality of research and technical breadth across divisions; balance of near-term user needs versus long-term research; how well it leverages research with other agencies and entities through cooperative agreements; and how well it supports the NRC's mission.

Planning and Procedures

- Implement ACRS Bylaws, policies, and practices in planning Full Committee activities, articulating priorities, and scheduling and monitoring activities of the ACRS Subcommittees
- Prioritize topics and coordinate schedules to be considered by the ACRS
- Organize and implement commitments made at ACRS retreats
- Develop proposed changes to ACRS Bylaws, policies, and practices for consideration by the Full Committee
- Review Subcommittee structure, tasks, and workload of members and recommend changes, as needed, for Full Committee consideration

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- Coordinate ACRS meetings with international organizations or other government agencies (including international outreach activity with advisory committees supporting other regulators)
- Monitor the adequacy of implementation of the memorandum of understanding between the ACRS and the Executive Director for Operations
- Support on-boarding and mentoring of new members
- Candidate Recruitment: Identify specific technical disciplines needed by the ACRS, based on existing membership and the Committee's anticipated workload; develop a diverse and highly-qualified pool of candidates; and work with ACRS Executive Director on candidate selection to ensure an adequate roster of Commission-appointed members to execute the ACRS's mission.

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ACRONYMS

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
ACRS	Advisory Committee on Reactor Safeguards
ACU	Abilene Christian University
AI	Artificial Intelligence
ATF	Accident Tolerant Fuel
COL	Combined License
CP	Construction Permit
DAC	Design Acceptance Criteria
DC	Design Certification
DE	Division of Engineering
DI&C	Digital Instrumentation and Control
DOE	Department of Energy
DRA	Division of Risk Analysis
DSA	Division of System Analysis
ESBWR	Economic Simplified Boiling Water Reactor
ESP	Early Site Permit
FMR	Fast Modular Reactor
GA	General Atomics
GALL	Generic Aging Lessons Learned
IE	Increased Enrichment
ITAAC	Inspections, Tests, Analyses, and Acceptance Criteria
MAACS	MELCOR Accident Consequence Code System
NRC	Nuclear Regulatory Commission
OL	Operating License
PRA	Probabilistic Risk Assessment
RES	Office of Research
SC	Subcommittee
SDA	Standard Design Approval
SMR	Small Modular Reactor
SPAR	Standardized Plant Analysis Risk
SSC	Systems, Structures and Components
UIUC	University of Illinois Champagne-Urbana