American Nuclear Society
Nuclear Criticality Safety Division

Executive Committee Meeting Agenda

1:00 – 2:00pm EDT, August 12, 2025

Member, position	Present?	Proxy
Officers		
Andy Prichard, chair	x	
Theresa Cutler, vice-chair	x	
Ben Martin, treasurer	x	
Kristan Wessels, secretary	x	
Dominic (Fred) Winstanley, past chair	x	
Christina Leggett, PDC Chair		
Katy Worrell, student member		
Executive Committee At large Through June 2026		
John Bess		
Mandy Bowles Tomaszewski	x	
Kristin Stolte		
Executive Committee At large Through June 2027		
Dallas Moser		
Shauntay Coleman		
Amy van der Vyver		
Executive Committee At large Through June 2028		
Alicia Salazar-Crockett	x	
Rae Moser		
James Cole		
Liaison roles		
Student liaison: Katy Worrell		
ANS Board liaison: Kelsey Amundson		

Specific Questions for The executive committee members (and others on the call)

1. *What do you want the NCS division to do that would make your life in criticality safety better.*
2. *What do you want to achieve as part of the expanded executive committee.*
3. *What will improve the value of NCSD for the division members: networking, standards, recent experiences, regulatory updates, code updates, cross-section updates, mentoring*
4. *How can we get more newer members to take on the leadership roles.*

****Fair warning I may ask you about these questions during the executive meetings.*

General themes:

1. *Keeping "adding value to the wider membership" at the forefront of everyone's mind.*

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2. How to engage with the membership and encourage "doers" to progress activity.

1. Welcome and roll call
    a. Apologies:
    b. Quorum and proxies
        A quorum is not present. No votes were scheduled.
2. Action responses
    No report.
3. Officer/ Liaison Reports
    a. Chair's Report (Andy Prichard)
    b. Vice Chair's Report (Theresa Cutler)
    c. Treasurer's Report (Ben Martin)
        i. NCSD proposed budget
            Ben presented budget. No comments other than the need to add the total amount for the Young Member social ($2173). Ben to send updated budget to Kristan for email vote.
        ii. Scholarship funding
    d. Secretary's Report (Kristan Wessels)
        July meeting minutes approved.
    e. PDC liaison (Andy Prichard)
        i. 1 page abstract discussion - Feedback to John Fabian
        ii. Feedback from PDC meetings
    f. Student liaison (Katy Worrell)
        i. Student conference feedback
    g. ANS-8 series standards (Doug Bowen)
        See attached. Lon discussed issue with resolving comments on ANS-8.22.
4. NCSD 2025 Topical (Theresa Cutler)
    One of the workshops was pulled at the trainer's request. The hotel block has been changed to eliminate Saturday night due to the UT football game. Sponsors are still needed. Everything else is going well.

5. <u>Committee Reports:</u>
    a. Program: Ben Martin
    b. Membership: Kristin Stolte
    c. Honors and Awards: James Cole
        i. 2025 award nominations
            The NCSD awards have been approved by the PDC. Nominations are due 8/31. Location of dinner is being worked. The Chair's award is being worked by Fred.
    d. Scholarship: Julie Ezold
    e. Communications: Katy Worrell

i. Newsletter - Riley Bulso / Katy Worrell
ii. Website – Ashley Raster
Need a younger reviewers

f. Education: Michael Fendler
Encourage a few specific tasks. The Webinar series is very good.
g. Bylaws and Rules: Brittany Williamson
h. Special Committee on Outreach to Military, Trades and Operations: Mackenzie Gorham
i. Young Members subcommittee: James Cole
i. NCSD 2025 Social/ funding
j. Nominating: F Dominic (Fred) Winstanley, past chair

6. NCSD Exec strategy/ actions/ opportunities
a. Look forward to 2025/26 (Andy Prichard)
b. Engaging newer members
c. Reaching out to NRC regulated organizations (see Action)
d. Future of ANS Summer meetings/ NCSD Topicals (Andy Prichard)
i. *Objective*: to establish a forum to develop NCSD-related proposals/ actions
ii. *Action to develop a special committee to stay current with BOD thoughts and have a pre-considered NCSD path forward. Look at a newer member from the topical to lead the effort. Potential members include: Theresa Cutler, Deb Hill , Find a few newer member to push this effort forward in preparation for 2029 activity.*

7. Old/New Business
a. Nuclear Science and Technology Open Research (NSTOR) (Deb Hill / Andy Prichard/ Theresa Cutler)
i. John Fabian has volunteered to talk through the platform at a meeting (to save for an on-line meeting with presentation capability) need to schedule a presentation at one of our meetings. Need to present a clear value for the division.
b. Committee membership
i. Committees with up to date details are: H&A, Young Members, Nominating, Scholarship
ii. Committee opportunities (see list below).

Actions

Action	Actionee	Date Raised	Date Due
Discuss potential ways to better advertise NCS scholarship with scholarship committee *Ethan is connecting on student conference. Student Committee is planning a scholarship application working session.*	Katy Worrell/Ethan Krammer	11/17/24	3/5/25

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Action	Actionee	Date Raised	Date Due
Work on getting in touch/making inroads with NRC Groups who would be good additions to the NCSD. Work with volunteers (Dallas Moser, James Kuropatwinski, Larry Wetzel, Deb Hill, Lon Paulson, Hannah Morbach) *Discuss with* Kristin Stolte and James Cole does this belong with membership or as a special committee This would be the third membership committee Need to send an email with potential contacts and plan to move forward.	Dallas Moser	3/11/25	
Evaluate the impact and value of lightning talks with papers – look at people giving lighting talks at topical to find a junior leader	Andy Prichard	7/8/25	
Develop a special committee to stay current with BOD thoughts and have a pre-considered NCSD path forward. Look at a newer member from the topical to lead the effort. Potential members include: Theresa Cutler, Deb Hill , Find a few newer members to push this effort forward in preparation for 2028 activity.	Andy Prichard	7/8/25	

Committee Opportunities

- Membership: Vice-chair
- Scholarship: New members
- Other: ?

Links

Home -- Nuclear Criticality Safety Division (ans.org) (NCSD website)

Topical meeting: https://www.ans.org/meetings/ncsd2025/

Others in attendance:

Doug Bowen, John Miller, Hannah Morbach, Lon Paulson, Tracy Stover, Brittany Williamson

OAK RIDGE National Laboratory

ANS-8 Subcommittee Meeting

Monday, June 23, 2025

Douglas G. Bowen

ANS-8 Subcommittee Chair

Oak Ridge National Laboratory

U.S. DEPARTMENT OF ENERGY

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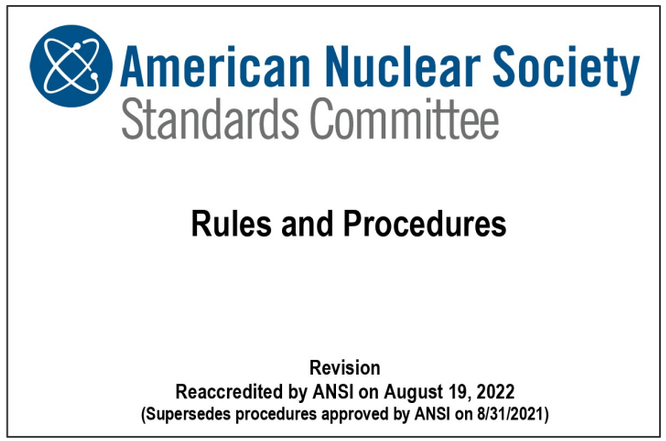
Agenda

- Membership of ANS-8 subcommittee (SC) and WGs
- ANS-8 SC and NCSCC ballots for ANS-8 standards since the last meeting
- ANS-8 business
- NCSCC business relevant to ANS-8 activities
- ISO TC85/SC5/WG8 September Meeting – quick summary
- Working Group Chair Reports
- ISO TC85/SC5/WG8 “Nuclear Criticality Safety” committee
- Standards Committee Strategic Plan
- How to volunteer/participate

ANS-8 Subcommittee Members

#	ANS-8 Subcommittee Members	Company
1	D. G. Bowen (+)	Oak Ridge National Laboratory
2	K. Reynolds (++)	Consolidated Nuclear Security, LLC
3	D. Hill (+++)	National Nuclear Laboratory (U.K.)
4	N. Brown	Paschal Solutions
5	M. Crouse	Consolidated Nuclear Security, LLC
6	D. Erickson	Savannah River Nuclear Services
7	C. Haught	Consolidated Nuclear Security, LLC
8	D. K. Hayes	Los Alamos National Laboratory
9	J. A. Morman	Argonne National Laboratory
10	L. E. Paulson	GE Hitachi Nuclear Energy
11	C. Percher	Lawrence Livermore National Laboratory
12	A. Prichard	Pacific Northwest National Laboratory
13	T. Stover	Savannah River Nuclear Solutions, LLC
14	D. Winstanley	Sellafield Sites (U.K.)
15	J. Hicks	CS Engineering
16	T. Cutler	Los Alamos National Laboratory
17	B. Lee	Oak Ridge National Laboratory
18	J. S. Baker	Spectra-Tech
19	M. Barnett	Savannah River Nuclear Solutions

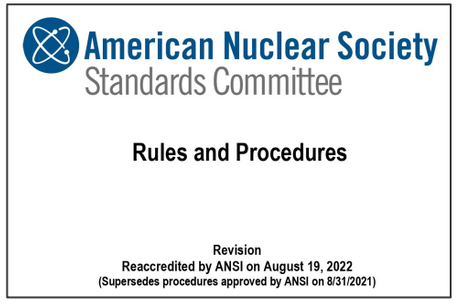
- + ANS-8 Chair; ++ ANS-8 Vice Chair; +++ ANS-8 Secretary



Subcommittees. Subcommittees may be established by each consensus committee to manage the activities of working groups and to perform technical reviews of all proposed and revised standards within their scopes of responsibility. Each subcommittee shall be assigned a specific area of technical responsibility and shall review proposed standards for technical need, relevance, and acceptability. *Subcommittees shall ensure that their standards are technically consistent with other related American National Standards.*

Current ANS-8 Working Group Chairs and Contact Information

ANS-8 Standard #	ANS-8 Standard Title	Working Group Chair
1	Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors	J. Marshall
3	Criticality Accident Alarm System	J. Hicks
6	Safety in Conducting Subcritical Neutron-Multiplication Measurements in Situ	T. Cutler
7	Nuclear Criticality Safety in the Storage of Fissile Materials	J. Kuropatwinski
10	Criteria for Nuclear Criticality Safety Controls in Operations with Shielding and Confinement	A. Prichard
12	Nuclear Criticality Control and Safety of Plutonium-Uranium Fuel Mixtures Outside Reactors	T. Stover
14	Use of Soluble Neutron Absorbers in Nuclear Facilities Outside Reactors	K. Wessels
15	Nuclear Criticality Control of Special Actinide Elements	C. Rombough
17	Criticality Safety Criteria for the Handling, Storage, and Transportation of LWR Fuel Outside Reactors	A. Lang E. Saylor
19	Administrative Practices for Nuclear Criticality Safety	J. Miller
20	Nuclear Criticality Safety Training	D. Hill
21	Use of Fixed Neutron Absorbers in Nuclear Facilities Outside Reactors	D. Erickson
22	Nuclear Criticality Safety Based on Limiting and Controlling Moderators	M. Crouse L. Paulson
23	Nuclear Criticality Accident Emergency Planning and Response	B. O'Donnell
24	Validation of Neutron Transport Methods for Nuclear Criticality Safety Calculations	L. Wetzel
26	Criticality Safety Engineer Training and Qualification Program	K. Reynolds
27	Burn-up Credit for LWR Fuel	B.J. Marshall J. Clarity
28	Administrative Practices for the Use of Non-Destructive Assay Measurements for Nuclear Criticality Safety	J. Chapman E. Elliott

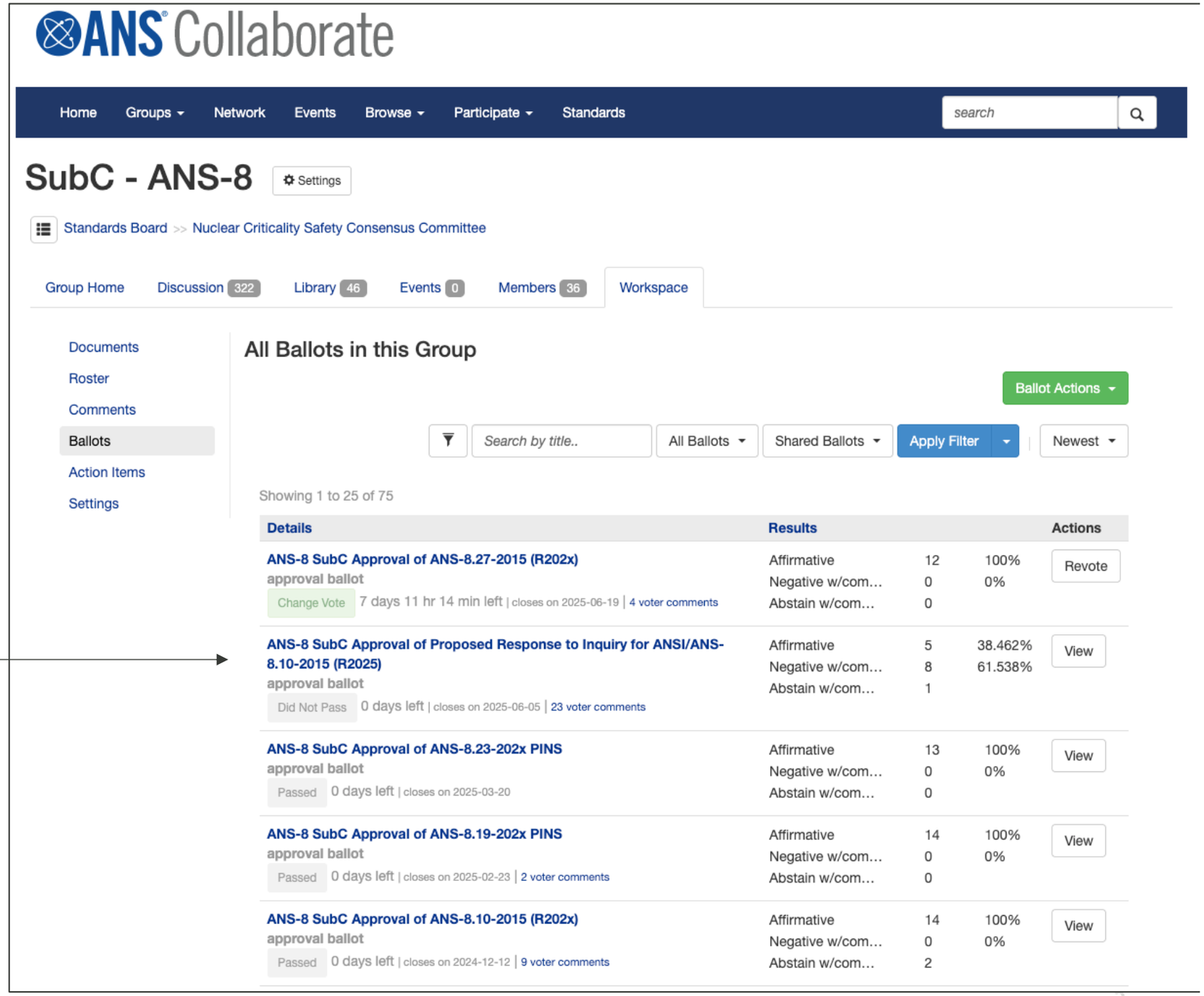


Working Groups. Subcommittees may establish working groups to develop proposed standards and maintain existing standards within their scopes of responsibility.

ANS-8 Ballots Since Last Meeting in November 2024

Request for clarification for ANS-8.10 requested earlier this year from a DOE site supporting advanced reactor work

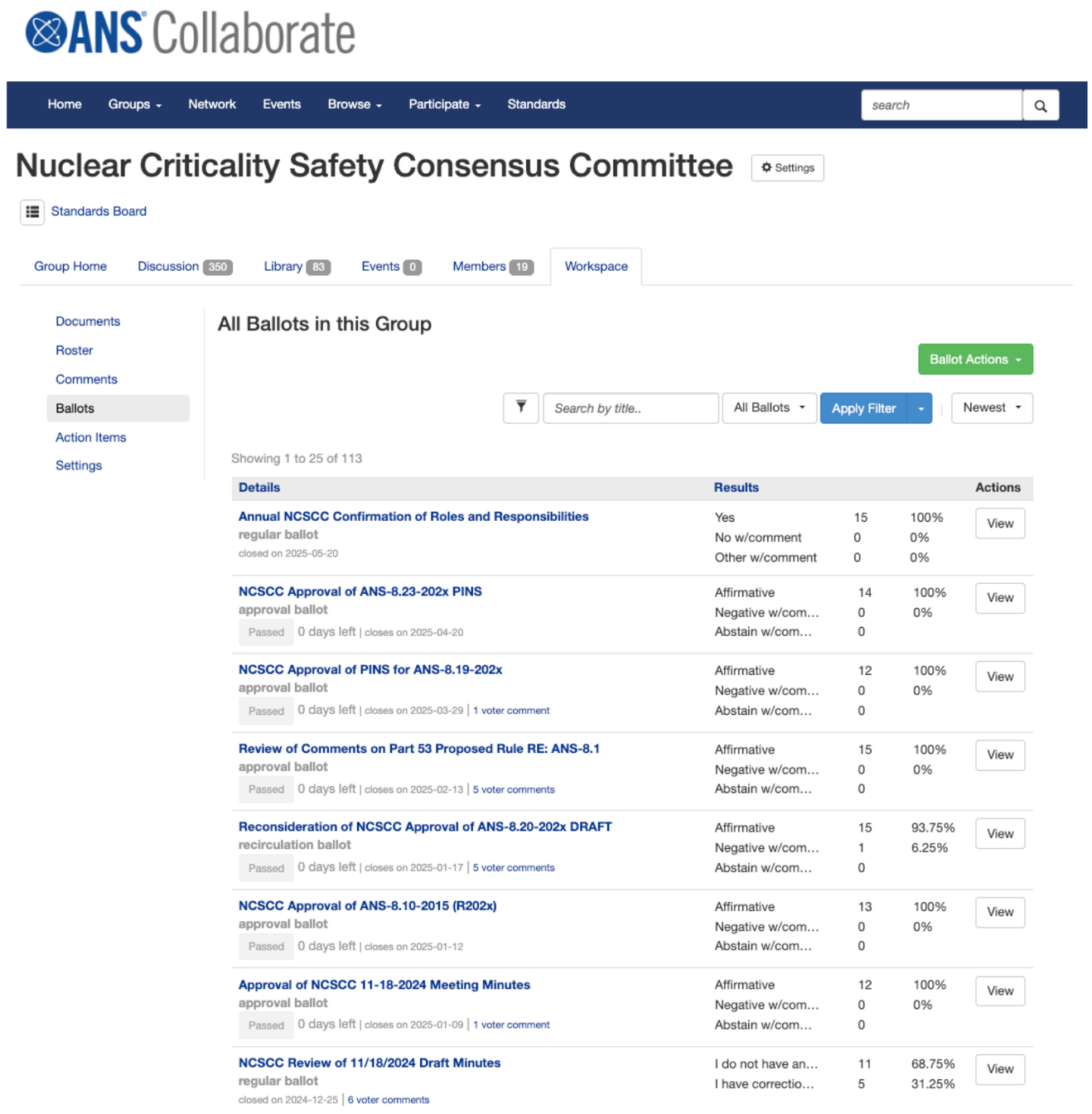
- Currently in ANS-8 ballot
- Resolution of ballot comments are in progress



NCSCC Ballots Since Last Meeting in June 2024

Standards Approved/Published in since last ANS-8 Meeting:

- ANSI/ANS-8.20-2025, “Nuclear Criticality Safety Training,” approved by ANSI on 3/25/2025.
- ANSI/ANS-8.26-2025, “Criticality Safety Engineer Training and Qualification Program,” approved by ANSI on 11/21/2024.



OAK RIDGE National Laboratory

ANS-8 Business

- WG chairs will host a meeting for ANS-8 SC to discuss revision scope prior to submitting a standard for ANS-8 ballot
    - Purpose is to have working groups summarize the changes in standard revisions prior to an ANS-8 ballot to obtain some context behind revision updates
- Working group level ballots will be conducted for new standard revisions in the future
    - Similar process to an ANS-8 or NCSCC ballot but at the working group level
    - Will demonstrate consensus at the working group level
        - Everyone has a voice and all concerns are to be addressed
- Basis statements
    - Review of the intent/basis of requirements and recommends provide
        - Training of new working group members
        - Seeking for improvements for future revisions
        - Documentation of the intent/basis statements benefits future working groups and support needed for requests for interpretations and clarifications in the future
- Subcritical limit revisions

ANS-8 Subcritical Limit Verification/Recalculation Efforts

ANS-8.1, ANS-8.7, ANS-8.12, & ANS-8.15 Contain Single and Multi-parameter Subcritical Limits

ANS-8.1 Subcritical Limits

- ORNL verified all single and multi-parameter subcritical limits in ANS-8.1 via funding from the DOE/NNSA Nuclear Safety Research and Development Program
- Results published in a Nuclear Science and Engineering journal article
  - Greene, T. M., & Bowen, D. G. (2021). Verification of Subcritical Limits in ANSI/ANS-8.1-2014. Nuclear Science and Engineering, 195(10), 1118–1129.
  - https://doi.org/10.1080/00295639.2021.1898921

ANS-8.7 Subcritical Limits

- Legacy subcritical limits based on the limiting surface density (LSD) hand calculation method
- Confirmatory calculations by ORNL have been recently completed via
  - LSD hand calculations
  - SCALE/KENO calculations with ENDF/B-VIII.1 cross sections
- Paper summary to be submitted for the Winter ANS meeting

ANS-8.12 Subcritical Limits

- Calculated critical and subcritical data for systems of mixed oxides of plutonium and uranium are presented for review and subsequent incorporation into a revision of ANSI/ANS 8.12
- Results published in a Nuclear Technology journal article
  - Stover, T. E., Mennerdahl, D., Winstanley, D. D., Tripp, C., Bunde, K., & Bowen, D. G. (2021). Calculated Critical and Subcritical Data for Revision of ANSI/ANS 8.12. Nuclear Technology, 208(4), 644–687.
  - https://doi.org/10.1080/00295450.2021.1938910

ANS-8 Subcommittee Goals – to be aligned with:

American Nuclear Society

STANDARDS COMMITTEE STRATEGIC PLAN

January 2025 through January 2030

Approved 11/19/24

Vision

The American Nuclear Society (ANS) Standards Committee is recognized as an industry leader in developing consensus standards and other approved standards-related products for the implementation of nuclear science and technology.

Mission

To develop and maintain high-quality, domestic, and international consensus standards and other approved standards-related products that meet the current and anticipated future needs of the nuclear industry[1] and to promote their broad acceptance, endorsement, and use.

ANS-8 Standards Status Report

ANS-8 Standards – ANS-8 Standards Recently Approved

Administrative	
ANSI/ANS-8.1	Nuclear Criticality Safety in Operations with Fissionable Material Outside of Reactors
ANSI/ANS-8.10	Criteria For Nuclear Criticality Safety Controls in Operations with Shielding and Confinement
ANSI/ANS-8.19	Administrative Practices For Nuclear Criticality Safety
ANSI/ANS-8.20	Nuclear Criticality Safety Training **(Approved by ANSI 3/25/2025)**
ANSI/ANS-8.24	Validation of Neutron Transport Methods For Nuclear Criticality Safety Calculations
ANSI/ANS-8.26	Criticality Safety Engineer Training and Qualification Program **(Approved by ANSI 11/21/2024)**
ANSI/ANS-8.28	Administrative Practices for the Use of Nondestructive Assay Measurements for Nuclear Criticality Safety **(Approved by ANSI 3/12/2024)**

Application	
ANSI/ANS-8.6	Safety in Conducting Subcritical Neutron Multiplication Measurements In-Situ
ANSI/ANS-8.7	Nuclear Criticality Safety in the Storage of Fissile Materials **(Approved by ANSI 5/6/2022)**
ANSI/ANS-8.12	Nuclear Criticality Control and Safety of Plutonium-Uranium Fuel Mixtures Outside of Reactors
ANSI/ANS-8.14	Use of Soluble Neutron Absorbers in Nuclear Facilities Outside Reactors
ANSI/ANS-8.15	Nuclear Criticality Safety Control of Selected Actinide Nuclides
ANSI/ANS-8.17	Criticality Safety Criteria For the Handling, Storage, and Transportation of LWR Fuel Outside of Reactors
ANSI/ANS-8.21	Use of Fixed Neutron Absorbers in Nuclear Facilities Outside of Reactors **(Approved by ANSI 6/20/2023)**

Application	
ANSI/ANS-8.22	Nuclear Criticality Safety Based on Limiting and Controlling Moderators
ANSI/ANS-8.27	Burnup Credit for LWR Fuel

Emergency Response	
ANSI/ANS-8.3	Criticality Accident Alarm System **(Approved by ANSI 9/9/2022)**
ANSI/ANS-8.23	Nuclear Criticality Accident Emergency Planning and Response

ANS-8 Standards – ANS-8 Standards in Maintenance Mode

Administrative	
ANSI/ANS-8.1	Nuclear Criticality Safety in Operations with Fissionable Material Outside of Reactors
ANSI/ANS-8.10	Criteria For Nuclear Criticality Safety Controls in Operations with Shielding and Confinement
ANSI/ANS-8.19	Administrative Practices For Nuclear Criticality Safety
ANSI/ANS-8.20	Nuclear Criticality Safety Training
ANSI/ANS-8.24	Validation of Neutron Transport Methods For Nuclear Criticality Safety Calculations **(Basis statements in progress)**
ANSI/ANS-8.26	Criticality Safety Engineer Training and Qualification Program
ANSI/ANS-8.28	Administrative Practices for the Use of Nondestructive Assay Measurements for Nuclear Criticality Safety

Application	
ANSI/ANS-8.6	Safety in Conducting Subcritical Neutron Multiplication Measurements In-Situ
ANSI/ANS-8.7	Nuclear Criticality Safety in the Storage of Fissile Materials
ANSI/ANS-8.12	Nuclear Criticality Control and Safety of Plutonium-Uranium Fuel Mixtures Outside of Reactors
ANSI/ANS-8.14	Use of Soluble Neutron Absorbers in Nuclear Facilities Outside Reactors
ANSI/ANS-8.15	Nuclear Criticality Safety Control of Selected Actinide Nuclides
ANSI/ANS-8.17	Criticality Safety Criteria For the Handling, Storage, and Transportation of LWR Fuel Outside of Reactors
ANSI/ANS-8.21	Use of Fixed Neutron Absorbers in Nuclear Facilities Outside of Reactors

Application	
ANSI/ANS-8.22	Nuclear Criticality Safety Based on Limiting and Controlling Moderators
ANSI/ANS-8.27	Burnup Credit for LWR Fuel

Emergency Response	
ANSI/ANS-8.3	Criticality Accident Alarm System
ANSI/ANS-8.23	Nuclear Criticality Accident Emergency Planning and Response

ANS-8 Standards – ANS-8 Standards Being Revised

Administrative	
ANSI/ANS-8.1	Nuclear Criticality Safety in Operations with Fissionable Material Outside of Reactors **(In revision since 2017)**
ANSI/ANS-8.10	Criteria For Nuclear Criticality Safety Controls in Operations with Shielding and Confinement **(PINS in development)**
ANSI/ANS-8.19	Administrative Practices For Nuclear Criticality Safety **(PINS Approved April 2025)**
ANSI/ANS-8.20	Nuclear Criticality Safety Training
ANSI/ANS-8.24	Validation of Neutron Transport Methods For Nuclear Criticality Safety Calculations **(PINS in development)**
ANSI/ANS-8.26	Criticality Safety Engineer Training and Qualification Program
ANSI/ANS-8.28	Administrative Practices for the Use of Nondestructive Assay Measurements for Nuclear Criticality Safety

Application	
ANSI/ANS-8.6	Safety in Conducting Subcritical Neutron Multiplication Measurements In-Situ
ANSI/ANS-8.7	Nuclear Criticality Safety in the Storage of Fissile Materials
ANSI/ANS-8.12	Nuclear Criticality Control and Safety of Plutonium-Uranium Fuel Mixtures Outside of Reactors **(In revision since 2007)**
ANSI/ANS-8.14	Use of Soluble Neutron Absorbers in Nuclear Facilities Outside Reactors
ANSI/ANS-8.15	Nuclear Criticality Safety Control of Selected Actinide Nuclides
ANSI/ANS-8.17	Criticality Safety Criteria For the Handling, Storage, and Transportation of LWR Fuel Outside of Reactors
ANSI/ANS-8.21	Use of Fixed Neutron Absorbers in Nuclear Facilities Outside of Reactors

Application	
ANSI/ANS-8.22	Nuclear Criticality Safety Based on Limiting and Controlling Moderators **(In revision since 2019 – currently in ANS-8 SC ballot process)**
ANSI/ANS-8.27	Burnup Credit for LWR Fuel **(PINS in development)**

Emergency Response	
ANSI/ANS-8.3	Criticality Accident Alarm System
ANSI/ANS-8.23	Nuclear Criticality Accident Emergency Planning and Response **(PINS Approved May 2025)**

Working Group Reports

- **8.1 chair report**
  - The working group has initiated a new chair while attempting to maintain efforts to complete editorial changes. When editorial changes are complete a test ballot will be submitted within the group. Updated calculations are expected to wrap up soon.
- **8.3 chair report – maintenance mode**
- **8.6 chair report – no activity – being allowed to expire. Searching for end-users.**
- **8.7 chair report – maintenance mode - basis statements next (met with WG at EFCOG in Feb.)**
- **8.10 chair report**
  - A formal inquiry to 8.10 was submitted. The initial response has been completed, and we are currently working on the resolution of comments from ANS 8 to the initial response. As expected, the relationship between the process analysis requirement in ANS 8.1 and 8.10 has generated a lot of comments. The chair has been actively working to clarify the requirements for ANS 8.10 in the new revision of ANS 8.1 over the last year or so. There is an idea of how to allow the use of an evacuation not to a criticality accident alarm system in lieu of shielding; we will see how the whole writing team responds to this. The process to develop the basis document and new revision has started. If the writing group has not received an email from Andy Prichard or you would like to join the writing group, please contact Andy Prichard at andrewwprichard@gmail.com .
- **8.12 Chair Report – In revision**
- **8.14 Chair Report – maintenance mode**
- **8.15 Chair Report – maintenance mode**
- **8.17 Chair Report – maintenance mode**

Working Group Reports

- **8.19 Chair Report**
  - The WG finalized our PINS shortly after the ANS Winter Meeting (balloted in the WG). The PINS was then sent through ANS-8 and NCSCC ballot process, where it received one comment that was quickly addressed. The final PINS was accepted and sent to ANSI on May 1st. The WG leadership is now in the process of developing a project implementation plan required for the revision process. WG members have been assigned sub-teams to work on various sections of the standard.
  - Overall, progress has been slow due to several factors- mainly the WG Chair finding/making sufficient time to put towards the effort (e.g., I need to review the plan that the other leadership has put together). However, the WG intends to refocus efforts and to finalize the plan in the next two months and increase efforts within the sub-teams over the next 6 months.
- **8.20 Chair Report – recently approved**
- **8.21 Chair Report – maintenance mode**
- **8.22 Chair Report – in 2nd round ANS-8 ballot comment resolution. A 3rd ballot is likely soon.**
- **8.23 Chair Report**
  - Chair Report – ANSI/ANS-8.23 – June 16, 2025; Through several WG meetings (since the spring of 2023), substantial progress has been made on identifying and dispositioning of potential action items, drafting of Basis Statements, and preparation of the PINS for revision. The WG has considered ~30 substantive action items to date, with the majority being agreed upon as to their disposition. The PINS was approved in May 2025 and has been submitted to ANSI. The next WG meeting is scheduled for August 7 – 8th in-person at the Spectra Tech, Inc. Oak Ridge office with a videoconference option. The primary objectives are to 1) review open action items and 2) start WG discussions on the Appendices.

Working Group Reports

- **8.24 Chair Report**
  - 8.24 has begun meeting. We are working on having several of the code developers to understand their perspective on use of S/U methodology for code validation. Once we have met a couple times to discuss our path forward, we will submit a PINS.
- **8.26 Chair Report - recently approved**
- **8.27 Chair Report**
  - William Marshall and Justin Clarity reviewed the 8.27 burnup credit standard and agreed it is still useful and viable for reaffirmation. Marshall filed the reaffirmation statement on May 20; it is out for ballot.
  - Once reaffirmation is complete, the chair will be changing from Marshall to Clarity. No specific developments are clearly needed at this time, but minor modifications to more explicitly include BWR burnup credit or as-loaded analyses in the standard might be useful. Generating basis statements is likely to be a more productive focus for activity in the writing group in the near future.
- **8.28 Chair Report**
  - The 8.28 working group has not been active since the standard was published in 2024. Plan to start again soon to collect comments and start toward reaffirmation/revision.

ANS-8 Standard Summary Report

Designation	Title	Working Group Chair	PINS Submitted	ANSI Approval	Action Needed By	Comments
ANS-8.1-2014 (R2023)	Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors	~~N. Brown~~ Josh Marshall	12/8/2017 R 11/29/2018 R 6/5/2023	6/5/23	11/29/23	Revision in progress.
ANS-8.3-2022	Criticality Accident Alarm System	J. Hicks	11/16/17	9/9/22	9/9/27	Maintenance mode.
ANS-8.6-1983 (R2022)	Safety in Conducting Subcritical Neutron-Multiplication Measurements in Situ	T. Cutler		9/9/22	9/9/27	Standard being allowed to expire.
ANS-8.7-2022	Nuclear Criticality Safety in the Storage of Fissile Materials	J. Kuropatwinski	10/18/2016 R 12/14/2017	5/6/22	5/6/27	Maintenance mode.
ANS-8.10-2015 (R2025)	Criteria for Nuclear Criticality Safety Controls in Operations with Shielding and Confinement	A. Prichard		3/5/25	3/5/30	Recently reaffirmed (Feb. 2025) Response to an inquiry at SubC approval.
ANS-8.12-1987 (R2021)	Nuclear Criticality Control and Safety of Plutonium-Uranium Fuel Mixtures Outside Reactors	C. Tripp	9/27/2007 R 5/16/2016 R 8/16/2021	8/16/21	8/15/26	Revision in progress.
ANS-8.14-2004 (R2021)	Use of Soluble Neutron Absorbers in Nuclear Facilities Outside Reactors	K. Wessels		8/5/21	8/5/26	Maintenance mode.
ANS-8.15-2014 (R2024)	Nuclear Criticality Control of Selected Actinide Nuclides	C. Rombough		7/8/24	7/8/29	Maintenance mode.

ANS-8 Standard Summary Report

Designation	Title	Working Group Chair	PINS Submitted	ANSI Approval	Action Needed By	Comments
ANS-8.17-2004 (R2024)	Criticality Safety Criteria for the Handling, Storage and Transportation of LWR Fuel Outside Reactors	E. Saylor A. Lang		9/12/24	9/12/29	Maintenance mode.
ANS-8.19-2014 (R2024)	Administrative Practices for Nuclear Criticality Safety	J. Miller		6/13/24	6/13/29	PINS approved April 2025 Revision in progress.
ANS-8.20-2025	Nuclear Criticality Safety Training	D. Hill	3/10/2011 R 5/15/2020	3/26/25	3/26/30	ANSI approved Rev. 3/25/2025.
ANS-8.21-2023	Use of Fixed Neutron Absorbers in Nuclear Facilities Outside Reactors	D. Erickson	2/12/2008 R 4/23/2019	6/20/23	6/20/28	Maintenance mode.
ANS-8.22-1997 (R2021)	Nuclear Criticality Safety Based on Limiting and Controlling Moderators	M. Crouse L. Paulson		12/7/21	12/7/26	Resolving SubC comments from 2022 ballot. Revision in progress.
ANS-8.23-2019 (R2024)	Nuclear Criticality Accident Emergency Planning and Response	B. O'Donnell	5/20/25	2/29/24	2/29/2029	PINS approved May 2025 Revision in progress.
ANS-8.24-2017 (R2023)	Validation of Neutron Transport Methods for Nuclear Criticality Safety Calculations	L. Wetzel	3/18/14	1/3/23	1/3/28	Maintenance mode.
ANS-8.26-2024	Criticality Safety Engineer Training and Qualification Program	K. Reynolds		11/21/24	11/21/29	ANSI approved Rev. 11/21/2024.
ANS-8.27-2015 (R2020)	Burnup Credit for LWR Fuel	D. Lancaster		8/7/20	8/7/25	Reaffirmation @ Subc ballot.
ANS-8.28-2024	Administrative Practices for the Use of Non-Destructive Assay Measurements for Nuclear Criticality Safety	J. Chapman E. Elliott	1/25/11	3/12/24	3/12/29	ANSI approved Rev. 3/24/2024.

How to Participate

Contact Information at ANS Headquarters to Volunteer for a Consensus Standard Working Group

American Nuclear Society
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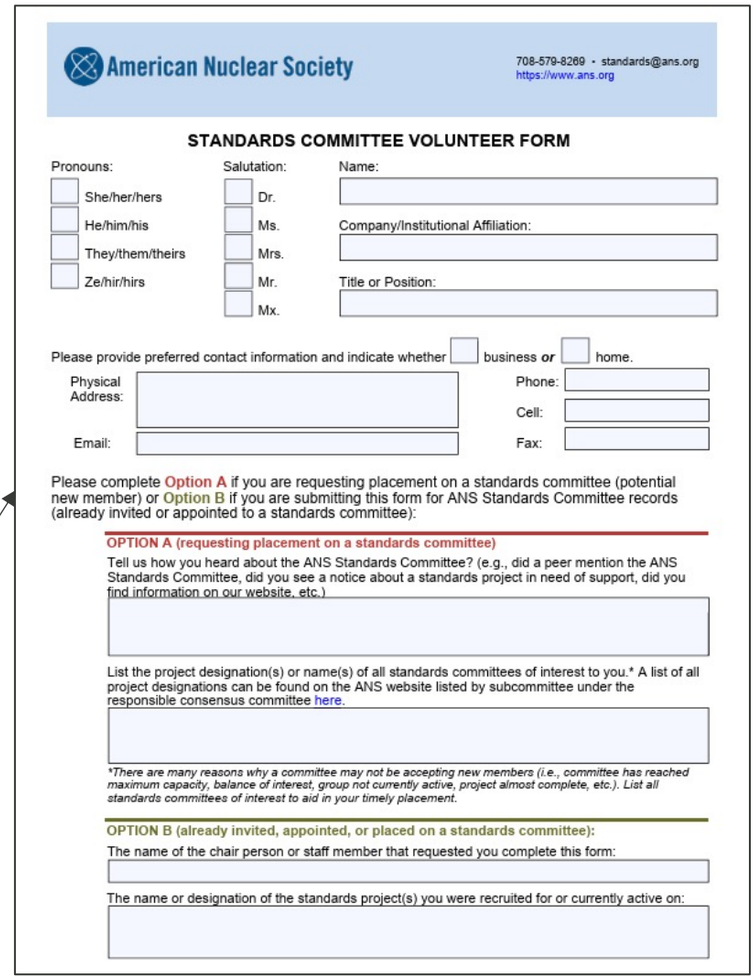
555 N. Kensington Avenue
LaGrange Park, IL 60526

Email: standards@ans.org
Fax: 708-579-8248

https://wx1.ans.org/standards/involved/voloppor/ncscc/fissionable/



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STANDARDS COMMITTEE VOLUNTEER FORM

Pronouns:
- She/her/hers
- He/him/his
- They/them/theirs
- Ze/hir/hirs

Salutation:
- Dr.
- Ms.
- Mrs.
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- Mx.

Name:
Company/Institutional Affiliation:
Title or Position:

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Please complete Option A if you are requesting placement on a standards committee (potential new member) or Option B if you are submitting this form for ANS Standards Committee records (already invited or appointed to a standards committee):

OPTION A (requesting placement on a standards committee)
Tell us how you heard about the ANS Standards Committee? (e.g., did a peer mention the ANS Standards Committee, did you see a notice about a standards project in need of support, did you find information on our website, etc.)

List the project designation(s) or name(s) of all standards committees of interest to you.* A list of all project designations can be found on the ANS website listed by subcommittee under the responsible consensus committee here.

**There are many reasons why a committee may not be accepting new members (i.e., committee has reached maximum capacity, balance of interest, group not currently active, project almost complete, etc.). List all standards committees of interest to aid in your timely placement.*

OPTION B (already invited, appointed, or placed on a standards committee):
The name of the chair person or staff member that requested you complete this form:
The name or designation of the standards project(s) you were recruited for or currently active on:

ISO Criticality Safety Standards – ISO TC85/SC5/WG8 Committee

ISO TC85/SC5/WG8 Virtual Meeting (April 9, 2025)
18th Meeting of ISO TC85/SC5/WG8
ISO TC 85/SC5/WG8, Nuclear Criticality Safety REPORT to ISO TC5/SC5

CONVENOR	Douglas BOWEN (US)
CO- CONVENOR	Gregory CAPLIN (FR)
NUMBER OF PARTICIPANTS:	17 Members representing 5 ISO Member Countries + 1 liaison (IAEA) + 1 Observer (see attached attendance list)
COUNTRIES REPRESENTED:	4-CA, 5-FR, 1-SE, 4-UK, 3-US + 1-IAEA + 1-CA
DOCUMENTS DISTRIBUTED	See attached agenda, ISO TC85/SC5/WG8 Final Meeting Agenda and final report for April 2025 virtual Microsoft Teams meeting.
DOCUMENTS DISCUSSED	See attached agenda, ISO TC85/SC5/WG8 Final Meeting Agenda and final report from the April 2025 Microsoft Teams meeting
WG MEETINGS SINCE THE LAST PLENARY (DATES AND PLACES)	WG8 held a 3-hour virtual meeting on April 9, 2025, via Microsoft Teams.
WORK ITEMS IN PROGRESS	• Work Item #1 – WG8 Business • Work Item #2 – Mass Control Standard • Work Item #3 – Proposed Risk Assessment Standard • Work Item #4 – Terms and Definitions N-document • Work Item #5 – Proposed revision to ISO 16117 “Estimation of the Number of Fissions of a Postulated Criticality Accident” • Work Item #6 – Future Revision to ISO 1709 “Principles of Criticality Safety in Storing, Handling and Processing” • Work Item #7 – CAAS Needs Assessment Proposed Standard • Work Item #8 – Proposed ISO Standard for Validation of Computational Methods • Work item #9 – Other Business • Work Item #10 – ISO 27468 Revision Proposal • Work Item #11 – Revision Proposal for ISO 11320
DIFFICULTIES MET	None

ISO Criticality Safety Standards – ISO TC85/SC5/WG8 Committee

- Mass control standard (UK)
- Risk assessment standard (CA)
- CAAS Needs assessment (UK)
- Validation of computational methods (US NRC/FR)

ISO TC85/SC5/WG8 Virtual Meeting (April 9, 2025)
18th Meeting of ISO TC85/SC5/WG8
ISO TC 85/SC5/WG8, Nuclear Criticality Safety REPORT to ISO TC5/SC5

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DIFFICULTIES MET	None

Backup Slides

ANS-8 Glossary – NCSCC Request to ANS-8 Subcommittee

Definition	ANSI/ANS Standard																		Grand Total
	1	3	5	6	7	10	12	14	15	17	20	21	22	23	24	26	27	28	
agitation			1																1
areal density	1						1												1
benchmark															1				1
benchmark applicability															1				1
benchmark experiment												1							1
Bias															1				1
bias uncertainty															1				1
burnable absorber																	1		1
burnable absorber credit																	1		1
burnup																	1		1
burnup credit																	1		1
calculational margin															1				1
calculational method	1														1				1
committed effective dose						1													1
computer code system															1				1
control Rasching rings (controlled sample)			1																1
controlled parameter	1						1			1									2
cooling time																	1		1
criticality accident	1	1		1		1	1				1								4
criticality safety staff																1			1
depletion analysis																	1		1
documented measurement plan																		1	1
drill														1					1
effective multiplication factor (keff)	1																		0
emergency coordinator														1					1
emergency response														1					1
excessive radiation dose		2																	0

Definition	ANSI/ANS Standard																		Grand Total
	1	3	5	6	7	10	12	14	15	17	20	21	22	23	24	26	27	28	
exercise														1					1
facility											1			1		1			3
fissile assembly (assembly)				1															1
fissile material					1														1
fissionable material impact personnel											1								1
fissionable material supervisor											1								1
fissionable material worker											1								1
fixed moderator												1							1
fixed neutron absorber												1							1
fuel rod										1									1
fuel unit										1									1
glass volume fraction			1																1
holdup																		1	1
immediate evacuation zone														1					1
in situ experiment (experiment)				1															1
in-service verification												1							1
independent assessment										1									1
irradiation																	1		1
learning objectives											1								1
margin of subcriticality															1				1
minimum accident for system design (MASD)		1																	0
minimum accident of concern		1																	0
moderation													1						1
moderator												1	1						2
moderator control area													1						1
moderator control engineered barrier													1						1
natural uranium							1												1
neutron absorber								1				1							2

Definition	ANSI/ANS Standard																		Grand Total
	1	3	5	6	7	10	12	14	15	17	20	21	22	23	24	26	27	28	
neutron absorber system												1							1
neutron multiplication (multiplication)				1															1
nondestructive assay (NDA)																		1	1
nuclear criticality safety	1						1	1	1		1	1				1			6
nuclear criticality safety evaluation (NCSE)																1			1
parameter	1																		0
process conditions	1					1													1
process evaluation													2						2
quality management system (QMS)																		1	1
Raschig Ring (ring)			1																1
reactivity				1															1
reactivity addition				1															1
restricted area						1													1
site														1					1
soluble neutron absorber								1											1
solution			1																1
sparging			1																1
storage array (array)					1														1
storage cell or "cell"					1														1
storage unit or "unit"					1														1
subcritical limit	1																		0
subcritical limit (limit)							1		1										2
technical staff														1					1
total effective dose						1													1
total measurement uncertainty (TMU)																		1	1
trending			1																1
upper subcritical limit (USL)															1				1
validated computation technique					1														1
validation	1							1				1			1				3
validation applicability															1				1
verification								1				1			1				3
vessel			1																1

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ANS-8 Glossary (1)

Term/Phrase	ANSI/ANS-8.XX Standard	Definition
areal density	1	The total mass of fissionable material per unit area projected perpendicularly onto a plane. (For an infinite, uniform slab, it is the product of the slab thickness and the density of fissionable material within the slab.)
	12	The total mass of fissionable material per unit area projected perpendicularly onto a plane. (For an infinite, uniform slab, it is the product of the slab thickness and the concentration of fissionable material within the slab.)
calculational method	1	The mathematical procedures, equations, approximations, assumptions, and associated numerical parameters (e.g., cross sections) that yield the calculated results.
	24	The mathematical procedures, equations, approximations, assumptions, and associated numerical parameters (e.g., cross sections) that yield the calculated results (k-effective). This is typically the code package and cross-section data.
controlled parameter	1	A parameter that is kept within specified limits.
	12	A parameter that is kept within specified limits.
	17	A parameter that is kept within specified limits.
criticality accident	1	The release of energy as a result of accidental production of a self- sustaining or divergent neutron chain reaction.
	10	The release of energy as a result of the accidental production of a selfsustaining or divergent neutron chain reaction.
	12	The release of energy as a result of accidentally producing a self-sustaining or divergent neutron chain reaction.
	20	The release of energy as a result of accidentally producing a self-sustaining or divergent neutron chain reaction.
	3	The release of energy as a result of accidental production of a self-sustaining or divergent neutron chain reaction.
	6	The release of energy as a result of accidentally producing a self-sustaining or divergent neutron chain reaction
	Paxton	The release of energy as a result of accidentally producing a self-sustaining or divergent fission chain reaction.
criticality safety	Paxton	Protection from the consequences of a criticality accident, preferably by prevention of the accident. Encompasses procedures, training, and other precautions in addition to physical protection.
excessive radiation dose	3	Acute doses of radiation of sufficient magnitude to be immediately dangerous to life and health. A maximum absorbed dose criterion between 0.5 and 1 Gy is recommended as an exposure that is considered immediately dangerous to life and health. Further guidance is given in ANSI/ANS 8.23 2019, Appendix D.
		Any dose to personnel corresponding to an absorbed dose from neutrons and gamma rays equal to or greater than 0.12 Gy (12 rad) in free air.

ANS-8 Glossary (2)

Term/Phrase	ANSI/ANS-8.XX Standard	Definition
facility	20	A defined area where fissionable material is located.
	23	A defined area where fissionable material is located.
	26	This word is used throughout the standard in a manner consistent with existing, operating facilities; however, it is also intended to apply to facilities that have ceased operations ~i.e., in the decommissioning phase!,facilities that have not yet been built ~i.e., in the design stage!, operations with fissionable materials outside structures ~e.g., below-grade storage and disposal sites!, and the movement of materials between on-site facilities.
fixed moderator	21	A moderator with an established geometric relationship to the locations occupied by the fixed neutron absorber and fissionable material.
moderator	21	A material that reduces the energy of neutrons by scattering them. (Neutron absorption is normally enhanced at lower neutron energies.)
	22	A material that reduces neutron energy by scattering without appreciable capture. Materials of prime concern are those containing light nuclei with larger scattering cross sections and relatively low absorption cross sections.
nuclear criticality safety	1	Protection against the consequences of a criticality accident, preferably by prevention of the accident
	12	Protection against the consequences of an inadvertent nuclear chain reaction, preferably by prevention of the reaction.
	14	Protection against the consequences of a criticality accident, preferably by prevention of the accident.
	15	Protection against the consequences of a criticality accident, preferably by prevention of the accident.
	20	Protection against the consequences of criticality accidents, preferably by prevention of the accident.
	21	Protection against the consequences of an inadvertent nuclear chain reaction, preferably by prevention of the reaction.
	26	Protection against the consequences of a criticality accident, preferably by prevention of the accident.
	Paxton	(criticality safety) Protection from the consequences of a criticality accident, preferably by prevention of the accident. Encompasses procedures, training, and other precautions in addition to physical protection.
process conditions	1	The identifying characteristics/properties of a process that have an effect on nuclear criticality safety (e.g., parameters, environment, and operations).
	10	The identifying characteristics of a process that have an effect on nuclear criti cality safety (e.g., parameters, environment, and operations).

ANS-8 Glossary (3)

Term/Phrase	ANSI/ANS-8.XX Standard	Definition
subcritical limit	1	The limiting value assigned to a controlled parameter that results in a subcritical system under specified conditions. The controlled parameter limit allows for uncertainties in the calculations and experimental data used in its derivation but not for contingencies, e.g., double batching or failure of analytical techniques to yield accurate values.
subcritical limit (limit)	12	The limiting value assigned to a controlled parameter that results ina subcritical system under specified conditions. The subcritical limit allows for uncertaintiesin the calculations and experimental data usedin its derivation but not for contingencies; e.g.,double batching or inaccuracies in analytical determinations.
	15	The limiting value assigned to a controlled parameter that results in a subcritical system under specified conditions. The parameter limit allows for uncertainties in the calculation and experimental data used in its derivation, but not for contingencies, e.g., double batching or failure of analytical techniques to yield accurate values.
validation	1	The process of quantifying (establishing the appropriate bias and bias uncertainty) the suitability of a calculational method for use in nuclear criticality safety analyses.
	14	A process to demonstrate that the analytical methods used to compute the effectiveness of the neutron absorber systems for criticality control meet predetermined requirements.
	21	A process to demonstrate that the analytical methods used to compute the effectiveness of the neutron absorber systems for criticality control meet predetermined requirements.
	24	The process of quantifying (e.g., establishing the appropriate bias and bias uncertainty) the suitability of a computer code system for use in nuclear criticality safety analyses by comparison with benchmark results.
verification	14	The establishment of confirmation of the truth or accuracy of a fact by investigation, comparison with a standard, or reference to the facts.
	21	The establishment or confirmation of the truth or accuracy of a fact by investigation, comparison with a standard, or reference to the facts.
	24	The process of confirming that the computer code system correctly performs intended numerical calculations.

Basis Statements – Example

Standard	Section	Requirement/Recommendation	Basis/Justification
ANSI/ANS8.1-2014	4.1.2	**Process Analysis** Before a new operation with fissionable material is begun or before an existing operation is changed, it shall be determined that the entire process will be subcritical under both normal and credible abnormal conditions.	• Requirement for subcriticality • Applies to both new operations or changes to existing operations • Still required even if DCP is used • "…Credible abnormal conditions…" is more encompassing than "…change in process conditions…" in that multiple changes in process conditions that can affect multiple parameters may occur with a single credible abnormal condition, which must remain subcritical • "credible" is not to be defined in the standard because it is a site dependent term • "abnormal" is not to be defined in the standard – dictionary is sufficient
ANSI/ANS-8.1-2014	4.2.2	**Double Contingency Principle** Process designs should incorporate sufficient factors of safety to require at least two unlikely, independent, and concurrent changes in process conditions before a criticality accident is possible.	• Recommended technical practice (1 of 7) to support meeting the process analysis requirement • Principle that considers human error interacting with a process • Reflects the concept of defense-in-depth "…sufficient factors of safety…" to reduce the risk to a level such that only an incredible abnormal condition can result in a potential criticality event • "unlikely" is not to be defined in the standard because the dictionary definition is sufficient • "at least two" is in the standard to ensure a single unlikely change in process conditions cannot result in a criticality accident. • "Independent and concurrent" is in the standard to ensure that the "two unlikely changes in process conditions" are not the result of a single credible abnormal condition, i.e., single point failures. If this is true, the result must be subcritical per 4.1.2.

Training for WG Chairs

- NCSCC Action for D. Bowen
  - Reach out to working group chairs to determine need for training for Workspace and RIPB for ANS-8 standards
    - Collaboration Training: https://collaborate.ans.org/communities/grouphome?CommunityKey=542cf6e5-cf8d-47cf-b977-ecafa8fbd0ee

The Standards Committee is a historical term that is used to identify professionals who participate in various committees allocated by the ANS Standards Board. The Standards Committee does not conduct itself as a committee. It does not meet nor act as a single body. It is simply a collection of qualified volunteers who participate in the development and maintenance of ANS consensus standards and related documents. The Standards Board is the top-level management body of the Standards Committee. It is charged with providing governance, direction, and guidance to all activities in the development and maintenance of ANS consensus standards, related documents and special committees. ANS may periodically refer to the collective Standards Committee in various communications.

The Standards Committee includes the following committees: ANS Standards Board (top-level committee); Special Committees,

Consensus Committees; Subcommittees; Working Groups

Documents Available on this Standards Committee Members Group Page

* Policy & Procedures (and other resources)
* Nuclear Standards News Issues: 2024, 2023, 2022, 2021, 2020, 2019, 2018, 2017
* Teleconference/Webconference Resources
* Annual Activities Reports
* Link to ANS Collaborate/Workspace Training Video
* Working Group Tool Kit
* Standards Training Presentations

What is the RIPB Methodology?

Table 1 – Key RIPB Objectives

Risk-Informed Objectives

R1. Use risk insights to define the scope of the standard.

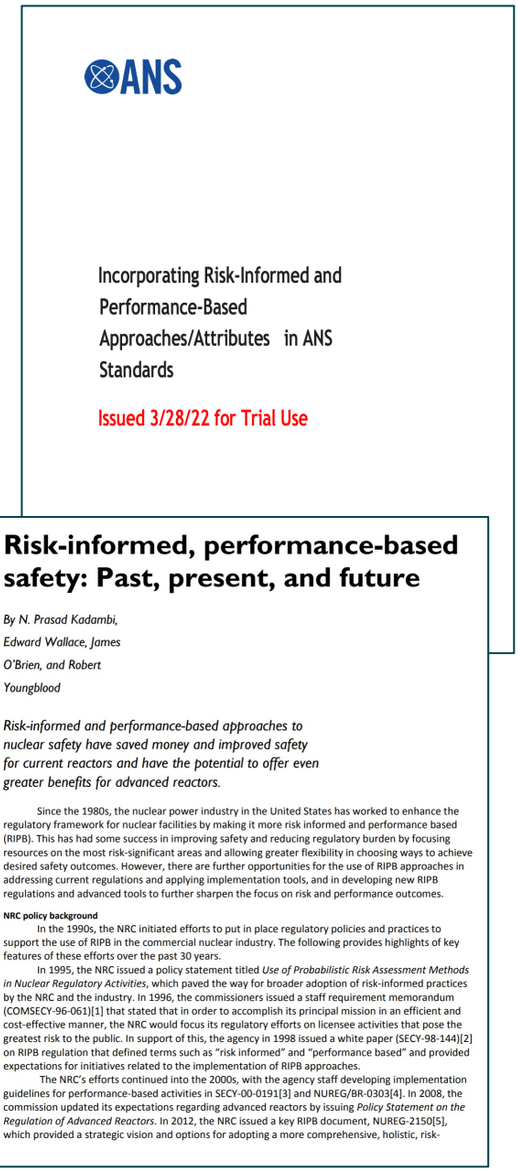
R2. Use risk insights (quantitative or qualitative) to define the level of prescription or rigor needed to achieve the outcome.

R3. Define the desired outcome in terms of quantitative or qualitative risk metrics.

Performance-Based Objectives

P1. Define the outcome in terms of performance parameters that are observable and measurable.

P2. Provide the appropriate level of prescription and flexibility (due to consideration of physical and temporal margins) to achieve the outcome (what to do; not detailed how to do it).



ANS

Incorporating Risk-Informed and Performance-Based Approaches/Attributes in ANS Standards

Issued 3/28/22 for Trial Use

Risk-informed, performance-based safety: Past, present, and future

By N. Prasad Kadambi, Edward Wallace, James O'Brien, and Robert Youngblood

Risk-informed and performance-based approaches to nuclear safety have saved money and improved safety for current reactors and have the potential to offer even greater benefits for advanced reactors.

Since the 1980s, the nuclear power industry in the United States has worked to enhance the regulatory framework for nuclear facilities by making it more risk informed and performance based (RIPB). This has had some success in improving safety and reducing regulatory burden by focusing resources on the most risk-significant areas and allowing greater flexibility in choosing ways to achieve desired safety outcomes. However, there are further opportunities for the use of RIPB approaches in addressing current regulations and applying implementation tools, and in developing new RIPB regulations and advanced tools to further sharpen the focus on risk and performance outcomes.

NRC policy background

In the 1990s, the NRC initiated efforts to put in place regulatory policies and practices to support the use of RIPB in the commercial nuclear industry. The following provides highlights of key features of these efforts over the past 30 years.

In 1995, the NRC issued a policy statement titled *Use of Probabilistic Risk Assessment Methods in Nuclear Regulatory Activities*, which paved the way for broader adoption of risk-informed practices by the NRC and the industry. In 1996, the commissioners issued a staff requirement memorandum (COMSECY-96-061)[1] that stated that in order to accomplish its principal mission in an efficient and cost-effective manner, the NRC would focus its regulatory efforts on licensee activities that pose the greatest risk to the public. In support of this, the agency in 1998 issued a white paper (SECY-98-144)[2] on RIPB regulation that defined terms such as "risk informed" and "performance based" and provided expectations for initiatives related to the implementation of RIPB approaches.

The NRC's efforts continued into the 2000s, with the agency staff developing implementation guidelines for performance-based activities in SECY-00-0191[3] and NUREG/BR-0303[4]. In 2008, the commission updated its expectations regarding advanced reactors by issuing *Policy Statement on the Regulation of Advanced Reactors*. In 2012, the NRC issued a key RIPB document, NUREG-2150[5], which provided a strategic vision and options for adopting a more comprehensive, holistic, risk-

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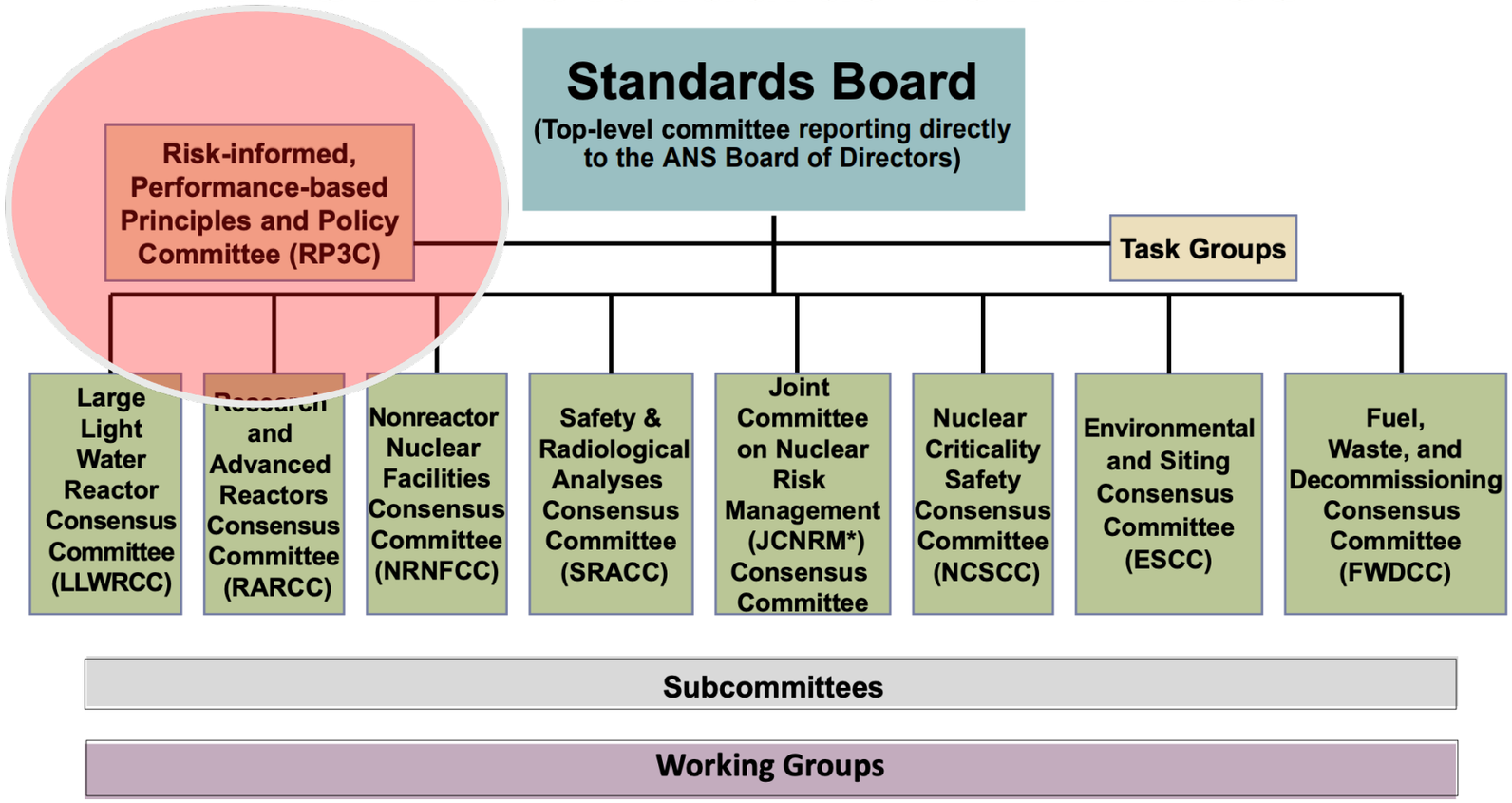
ANS Standards Organization Structure



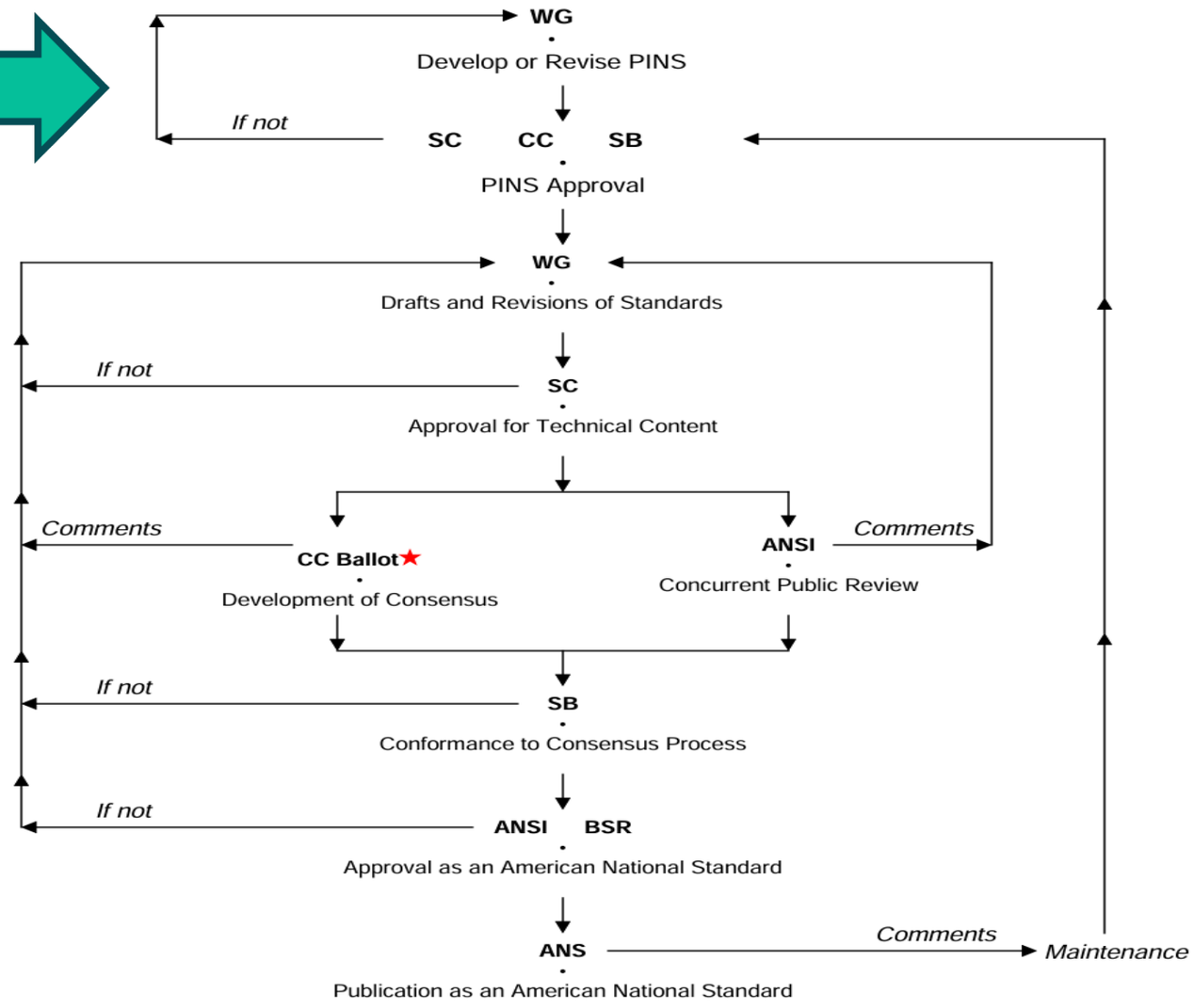
**The JCNRM is a joint ANS and ASME committee.*

If a new standard to utilize RIPB approaches is to be developed, the RP3C committee must be contacted during this process step.

Standard Development Process

The Nuclear Criticality Safety Consensus Committee is looking into the RIPB Methodology and how to apply it to the ANS-8 standards.

Figure 1 - Steps in the Development of a Standard

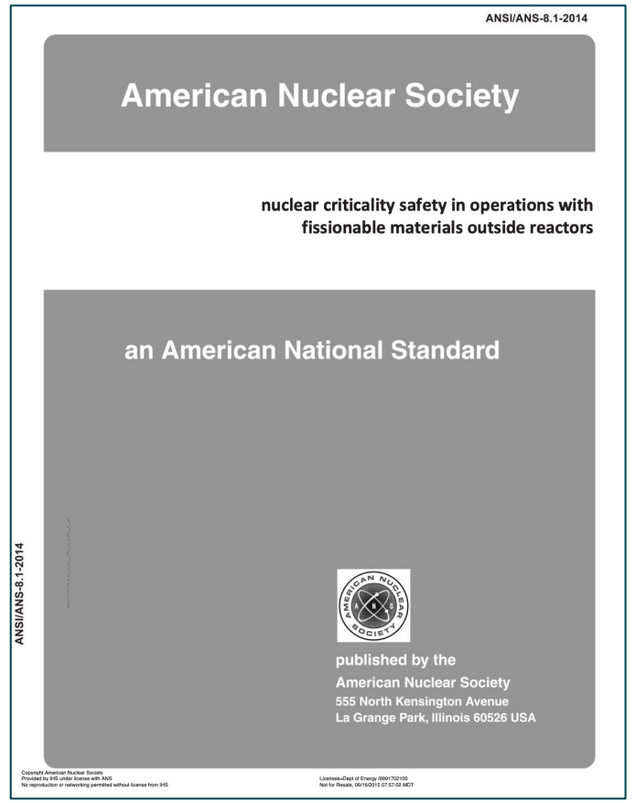


WG - Working Group
SC - Subcommittee
CC - Consensus Committee
SB - Standards Board
ANSI - American National Standards Institute
BSR - Board of Standards Review
ANS - American Nuclear Society

OAK RIDGE National Laboratory

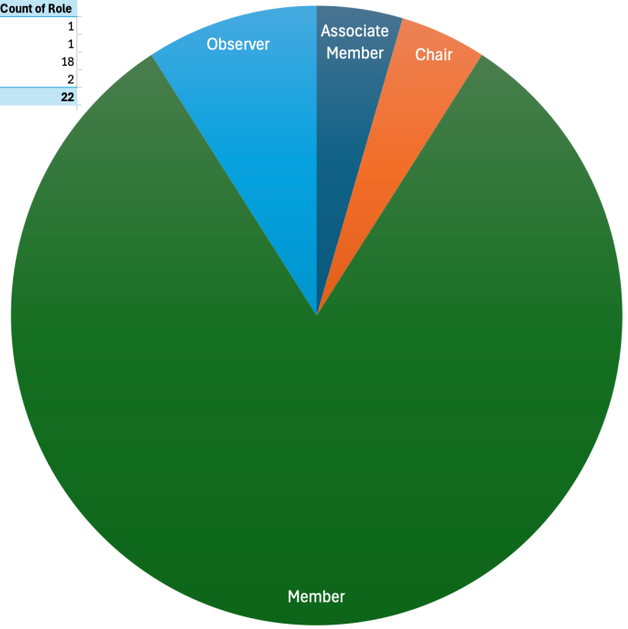
ANS-8 Standards Seem to be “Conventional”

- Thus, according to the criteria outlined by the RPC3 Committee’s guidance, the ANS-8 consensus standards for NCS are currently categorized as conventional standards—not as performance-based standards
  - According to the RP3C committee, conventional standards tend to use the words, “shall,” “should,” or “may.”
- The ANS-8 series standards use “shall” statements for requirements, “should” statements for recommendations, and “may” to denote permission for Nuclear Criticality Safety
  - Tend to focus on “what to do” instead of “how to do it” to allow sites to implement requirements and recommendations with a graded approach
  - They do not preclude the use of risk informed methods to achieve their goals
- Conventional standards can lead to inefficiencies because they require more stringent barriers to provide reasonable assurance of success than would be needed with a performance-based approach

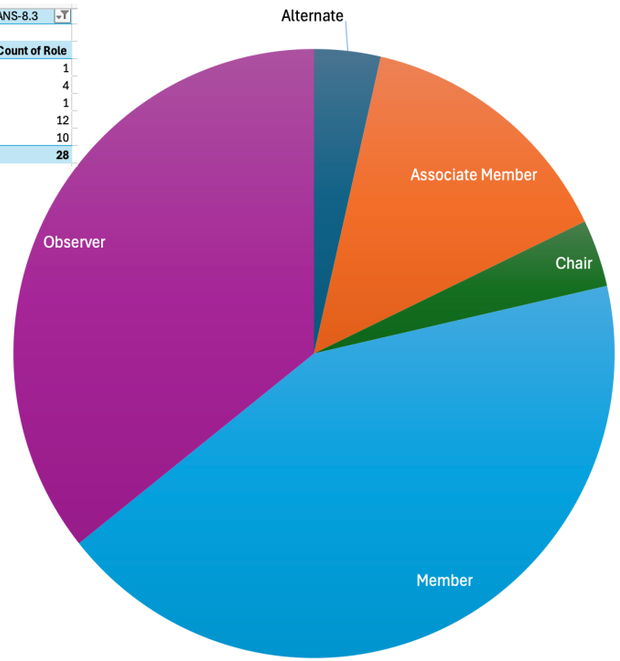


Membership on ANS-8 Standards – 8.1, 8.3, 8.6

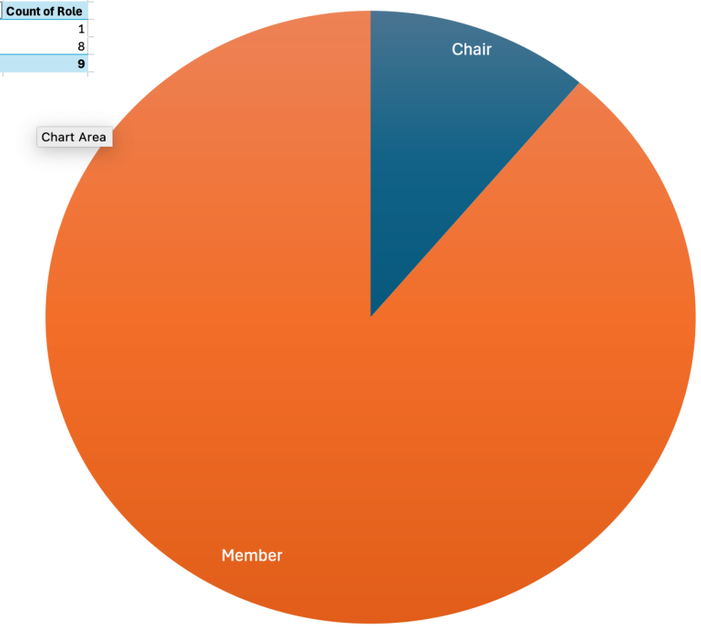
Committee	ANS-8.1
Row Labels	Count of Role
Associate Member	1
Chair	1
Member	18
Observer	2
Grand Total	22



Committee	ANS-8.3
Row Labels	Count of Role
Alternate	1
Associate Member	4
Chair	1
Member	12
Observer	10
Grand Total	28

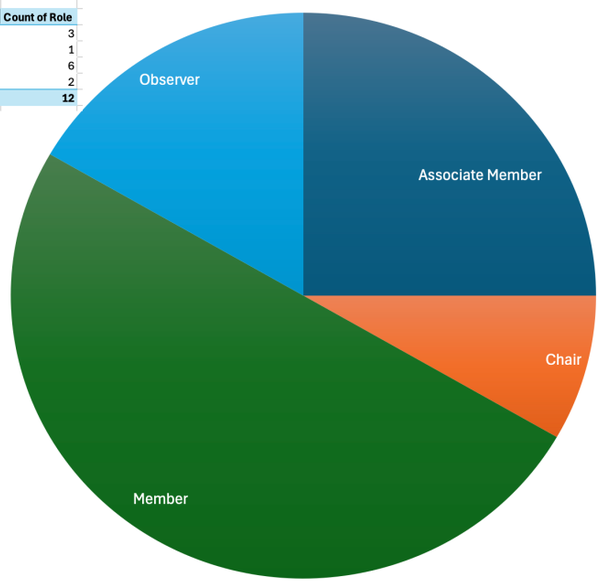


Committee	ANS-8.6
Row Labels	Count of Role
Chair	1
Member	8
Grand Total	9

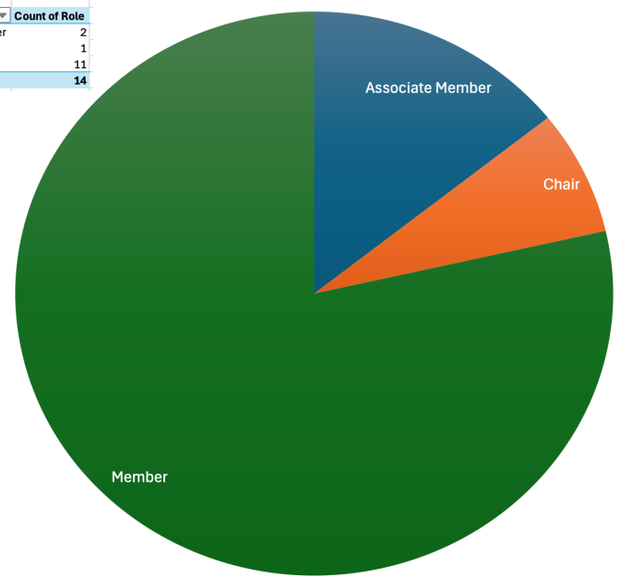


Membership on ANS-8 Standards – 8.7, 8.10, 8.12

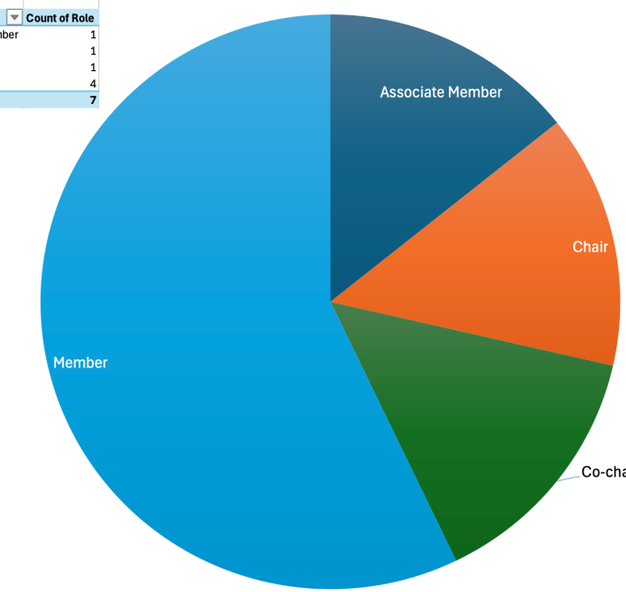
Committee	ANS-8.7
Row Labels	Count of Role
Associate Member	3
Chair	1
Member	6
Observer	2
Grand Total	12



Committee	ANS-8.10
Row Labels	Count of Role
Associate Member	2
Chair	1
Member	11
Grand Total	14

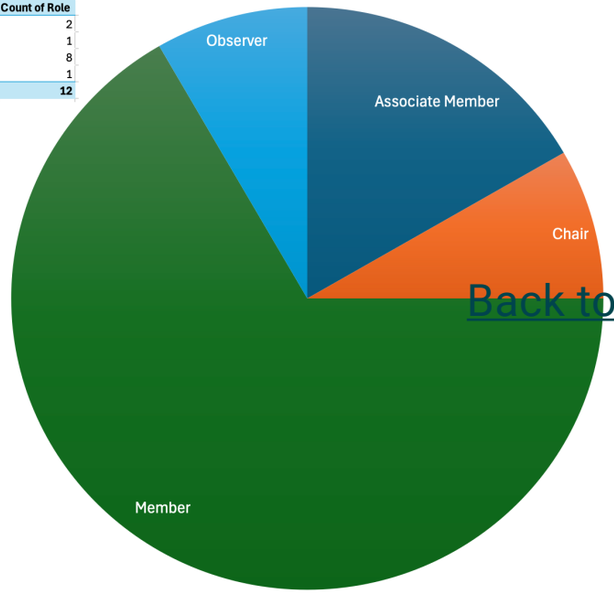


Committee	ANS-8.12
Row Labels	Count of Role
Associate Member	1
Chair	1
Co-chair	1
Member	4
Grand Total	7

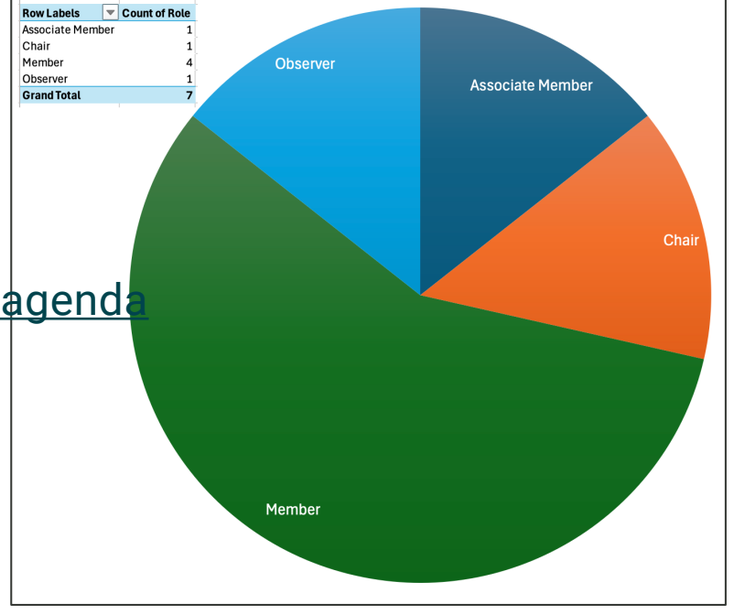


Membership on ANS-8 Standards – 8.14, 8.15, 8.17

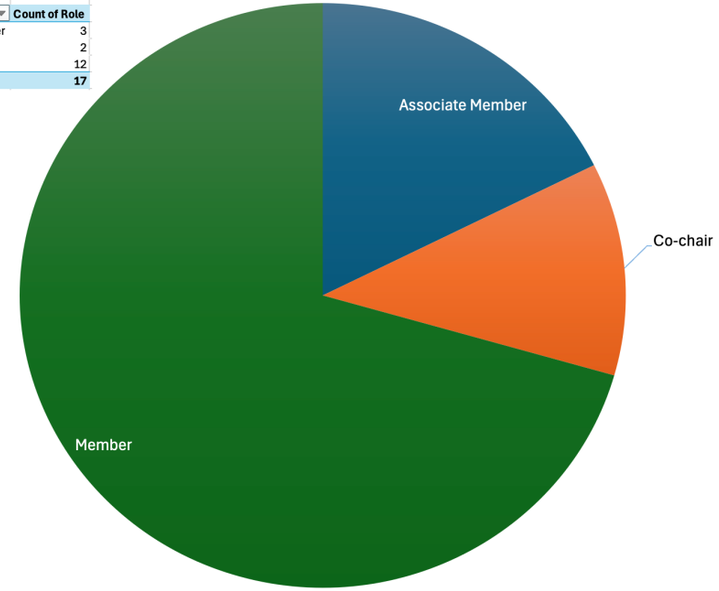
Committee	ANS-8.14
Row Labels	Count of Role
Associate Member	2
Chair	1
Member	8
Observer	1
Grand Total	12



Committee	ANS-8.15
Row Labels	Count of Role
Associate Member	1
Chair	1
Member	4
Observer	1
Grand Total	7



Committee	ANS-8.17
Row Labels	Count of Role
Associate Member	3
Co-chair	2
Member	12
Grand Total	17



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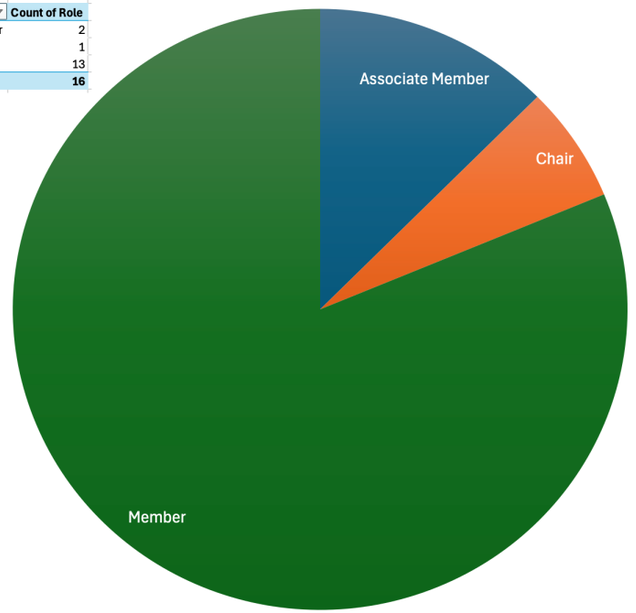
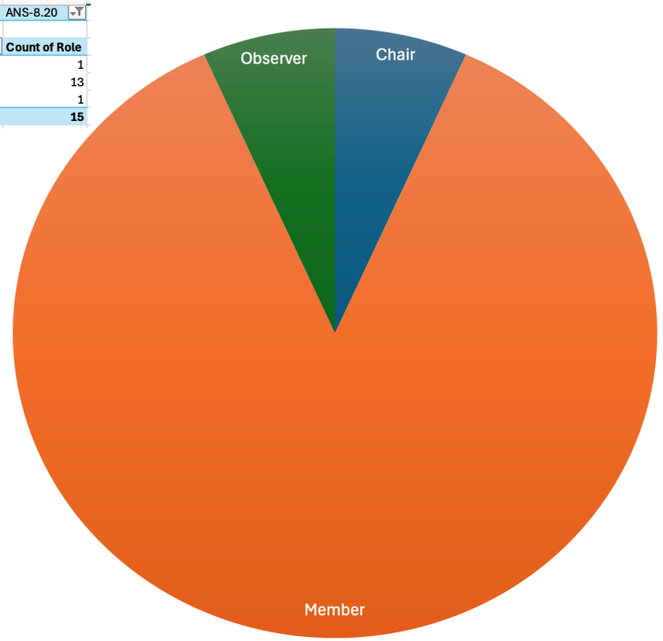
Membership on ANS-8 Standards – 8.19, 8.20, 8.21

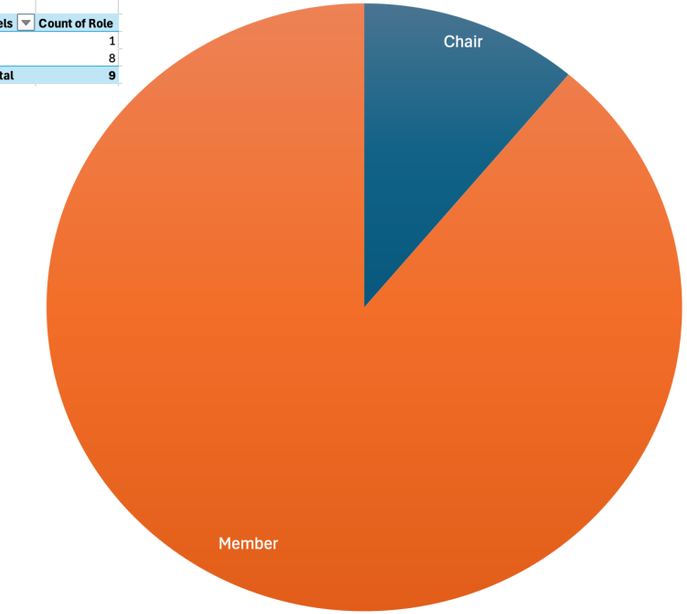
Committee	ANS-8.19
Row Labels	Count of Role
Associate Member	2
Chair	1
Member	13
Grand Total	16



Committee	ANS-8.20
Row Labels	Count of Role
Chair	1
Member	13
Observer	1
Grand Total	15

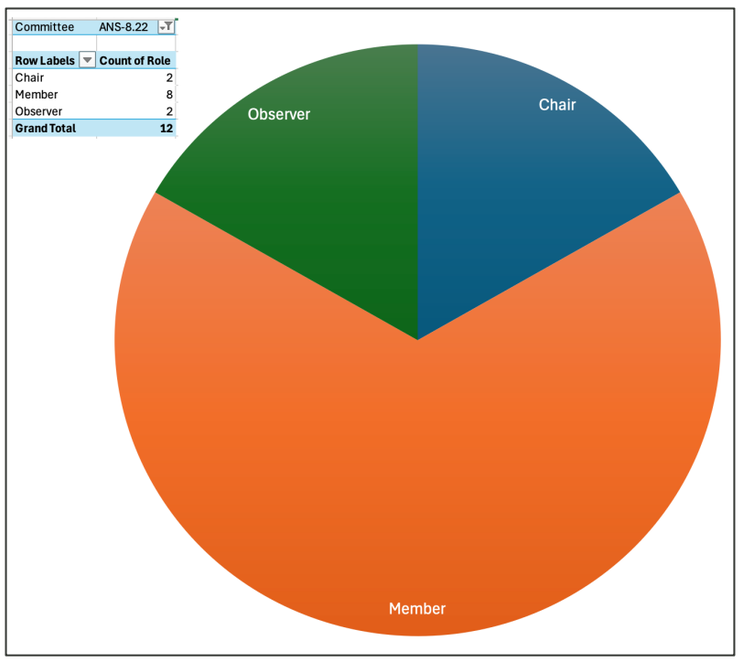


Committee	ANS-8.21
Row Labels	Count of Role
Chair	1
Member	8
Grand Total	9

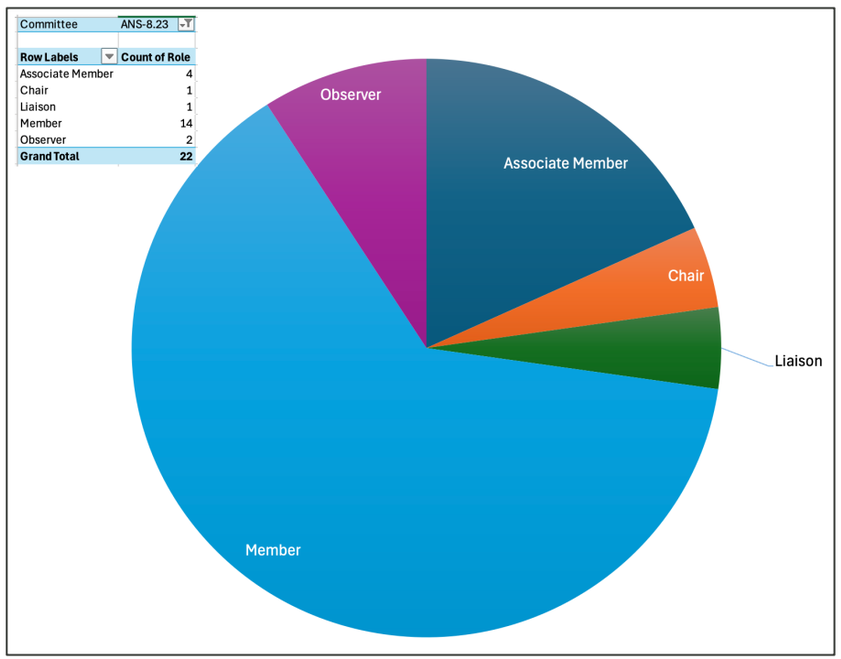


Membership on ANS-8 Standards – 8.22, 8.23, 8.24

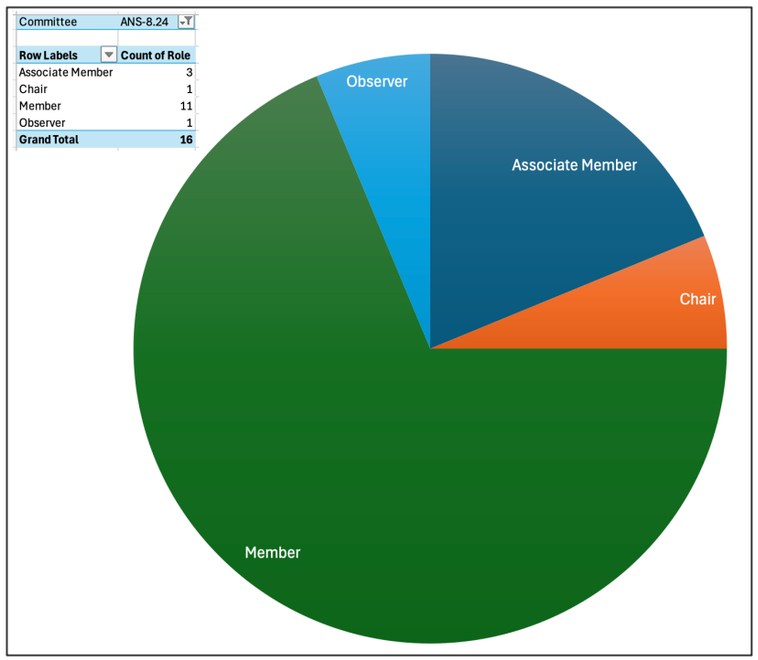
Committee	ANS-8.22
Row Labels	Count of Role
Chair	2
Member	8
Observer	2
Grand Total	12



Committee	ANS-8.23
Row Labels	Count of Role
Associate Member	4
Chair	1
Liaison	1
Member	14
Observer	2
Grand Total	22

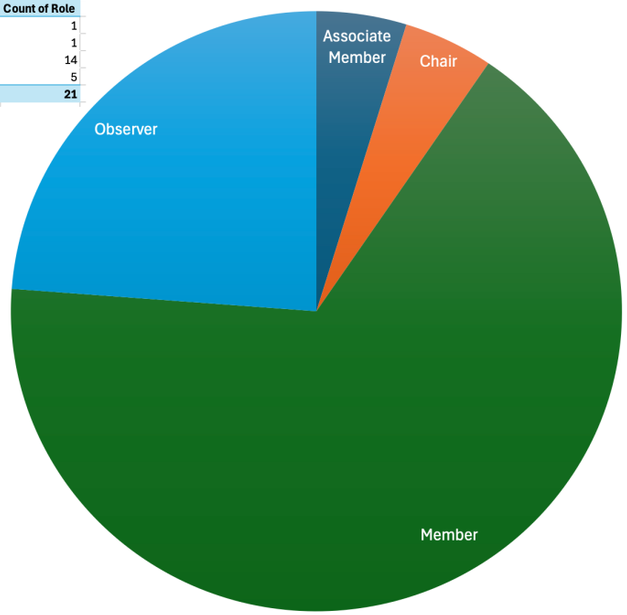


Committee	ANS-8.24
Row Labels	Count of Role
Associate Member	3
Chair	1
Member	11
Observer	1
Grand Total	16

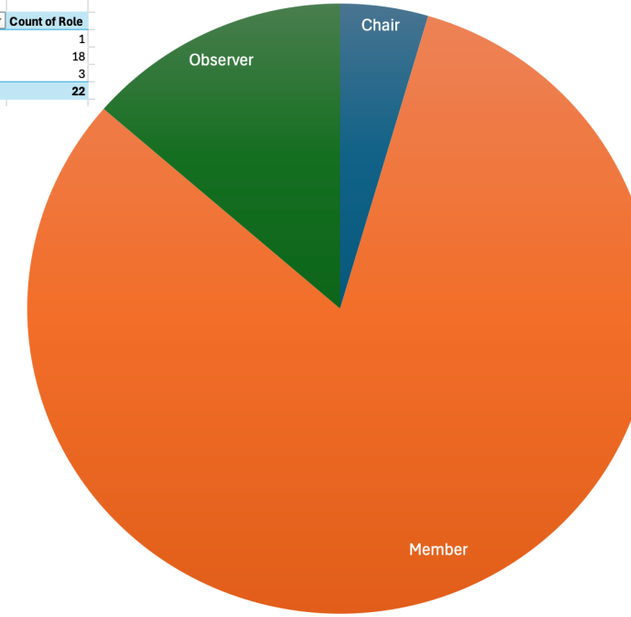


Membership on ANS-8 Standards – 8.26, 8.27, 8.28

Committee	ANS-8.26
Row Labels	Count of Role
Associate Member	1
Chair	1
Member	14
Observer	5
Grand Total	21



Committee	ANS-8.27
Row Labels	Count of Role
Chair	1
Member	18
Observer	3
Grand Total	22



Committee	ANS-8.28
Row Labels	Count of Role
Chair	2
Member	15
Observer	4
Grand Total	21