



RIPB Methodology and the ANS-8 Nuclear Criticality Safety Standards

ANS RP3C CoP Meeting
Friday, February 27, 2026

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NCSCC Chair; Past ANS-8 SC Chair
ORNL NCS Program Director
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Oak Ridge National Laboratory



U.S. DEPARTMENT OF
ENERGY

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Discussion points

- What is a criticality accident and the field of nuclear criticality safety (NCS)
- Consequences of a criticality accident
- Background on ANS-8 NCS consensus standards
- Applicability discussion of the RP3C Risk Informed, Performance-based Principles and Policy Committee (RP3C) guidance on ANS-8 standards
- Guidance provided from the NCS Consensus Committee regarding ANS-8 standards with respect to whether they are RIPB standards



What is Nuclear Criticality Safety?

What is Nuclear Criticality Safety?



Definition

- Nuclear criticality safety is the **prevention of accidental criticality** – meaning, preventing a self-sustaining nuclear chain reaction from occurring outside of a reactor where it's not intended or controlled.
- In simple terms: it's about making sure that when handling fissile materials (like uranium-235 or plutonium-239), they **cannot accidentally reach the conditions** (amount, geometry, moderation, reflection) that would cause them to go critical.

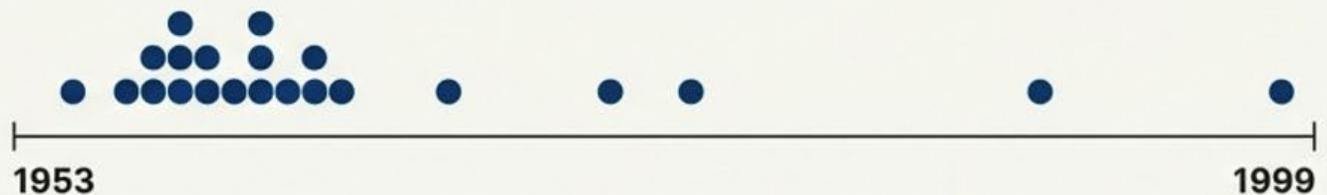
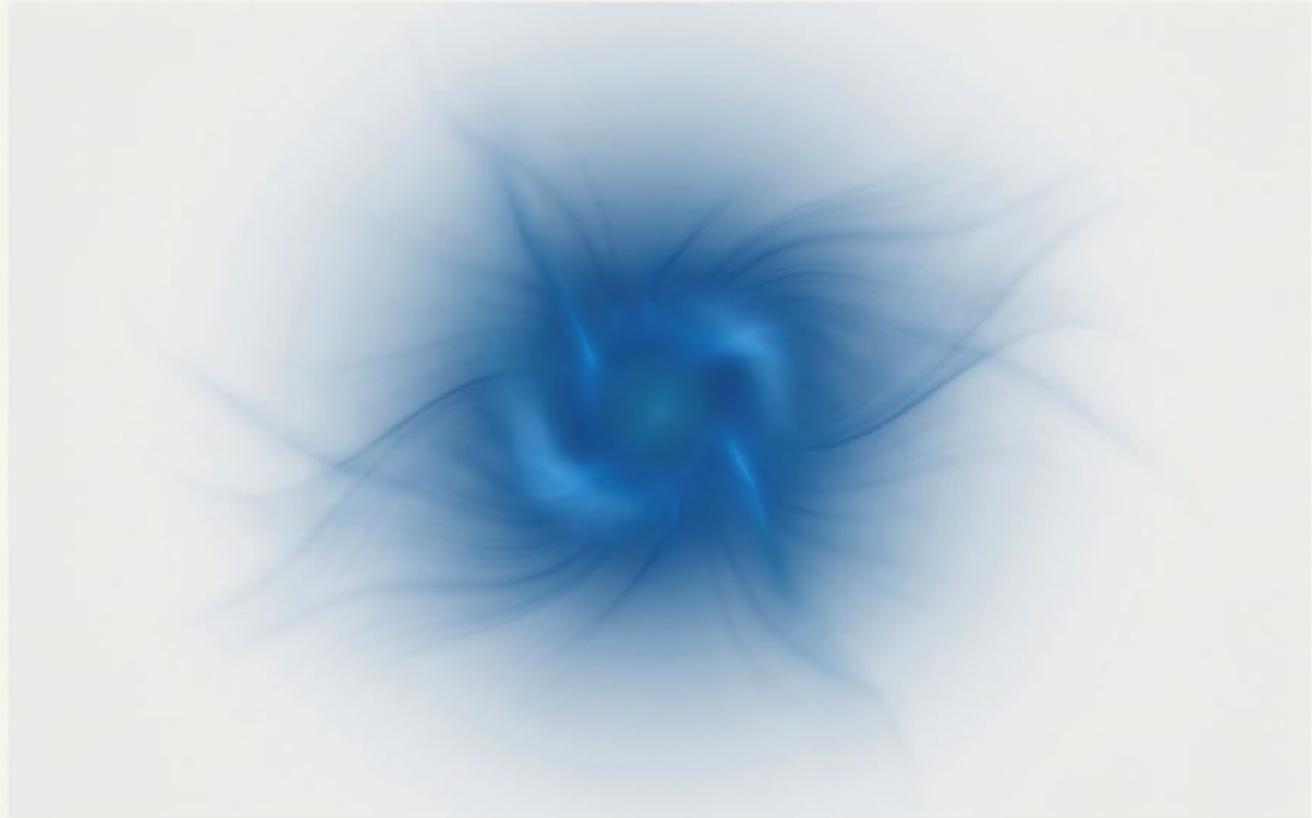
Maintaining safety ensures that nuclear materials can be processed, transported, and stored without risk of inadvertent criticality.

Primary purpose of Nuclear Criticality Safety is to protect workers and the public of this unique radiological hazard handling fissile material outside of a nuclear reactor

Criticality accidents are sudden, intense bursts of radiation, often signaled by a “blue flash.”

A process criticality accident occurs when an unintentional, self-sustaining nuclear chain reaction is initiated in fissile material outside of a reactor. These events are characterized by a rapid release of neutron and gamma radiation, sometimes accompanied by Cherenkov radiation visible as a “blue flash.”

From 1953 to 1999, 22 such accidents occurred in processing facilities in the US, Russian Federation, UK, and Japan.



Anatomy of a Criticality Accident: Lessons from 22 Events

The Profile of 22 Process Accidents (1953-1999)



21 of 22 accidents involved liquids.

Fissile material in solutions or slurries was the primary medium for accidental criticality.



No accidents occurred during transport or storage.

All events happened during active process operations like dissolution, transfer, or purification.



9 fatalities resulted from these events.

Eighteen of the accidents occurred in manned, unshielded facilities, leading to serious exposures.



Critical Lessons Learned



Human error was the root cause in every case.

All 22 accidents had multiple causes, but equipment failure was never a primary factor.



Procedural violations were a universal contributor.

Operators often used unapproved equipment or improvised procedures to save time and effort.



Use of unfavorable geometry vessels created the risk.

Many accidents occurred when fissile material was moved into large, improperly shaped containers.

Unfavorable geometry turns a routine transfer into an unacceptable risk.

Y-12 Plant, Oak Ridge, 16 June 1958

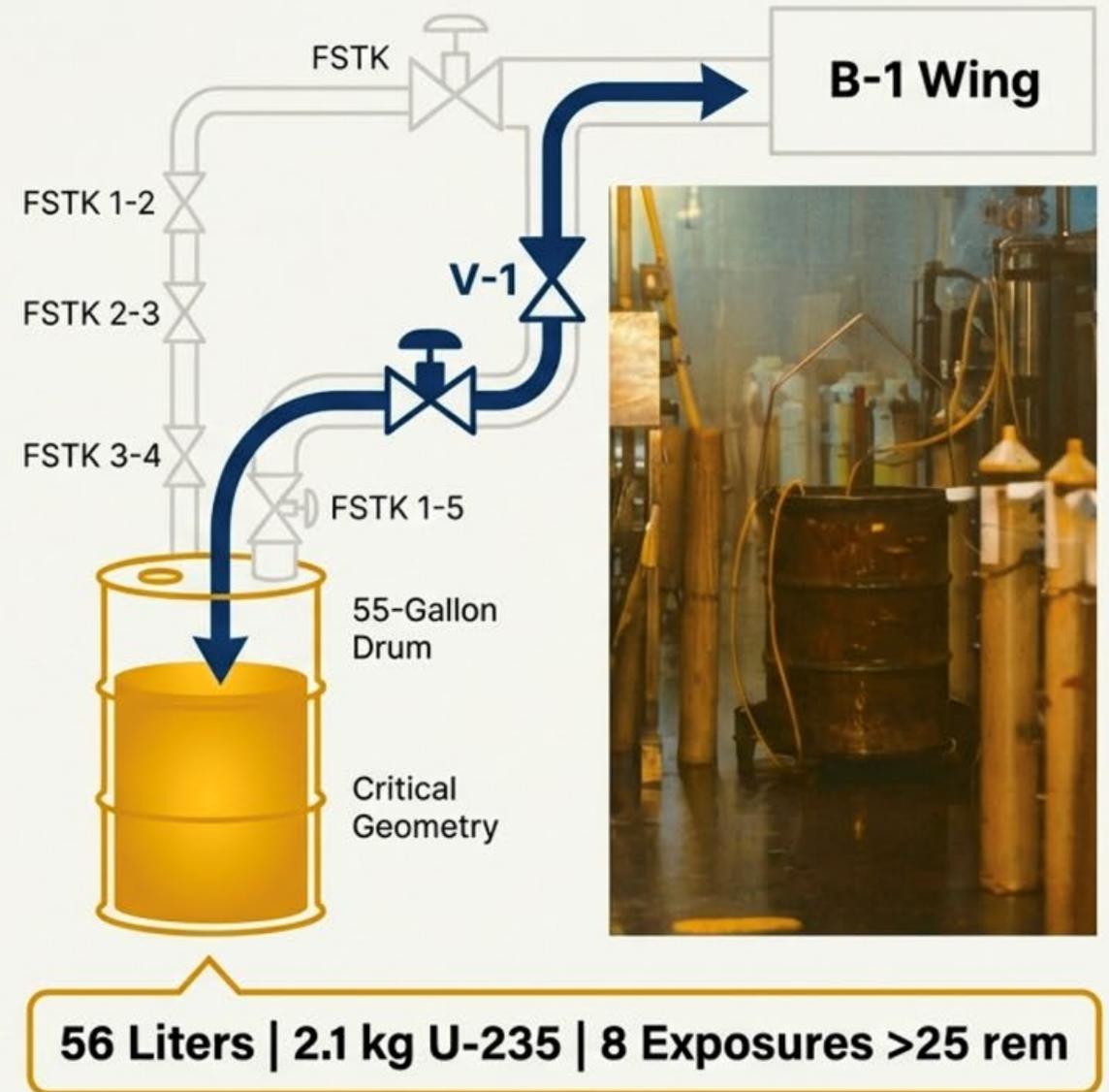
Setup: During a facility shutdown for inventory, operators were leak-checking a series of connected, favorable-geometry 5-inch pipes with water.

Failure

An improperly closed valve (V-1) allowed highly enriched uranyl nitrate solution from an adjacent, operational wing of the plant to leak into the pipes. When operators opened drain valves to empty the test water, the accumulated uranium solution drained first into a standard 55-gallon (208 L) drum.

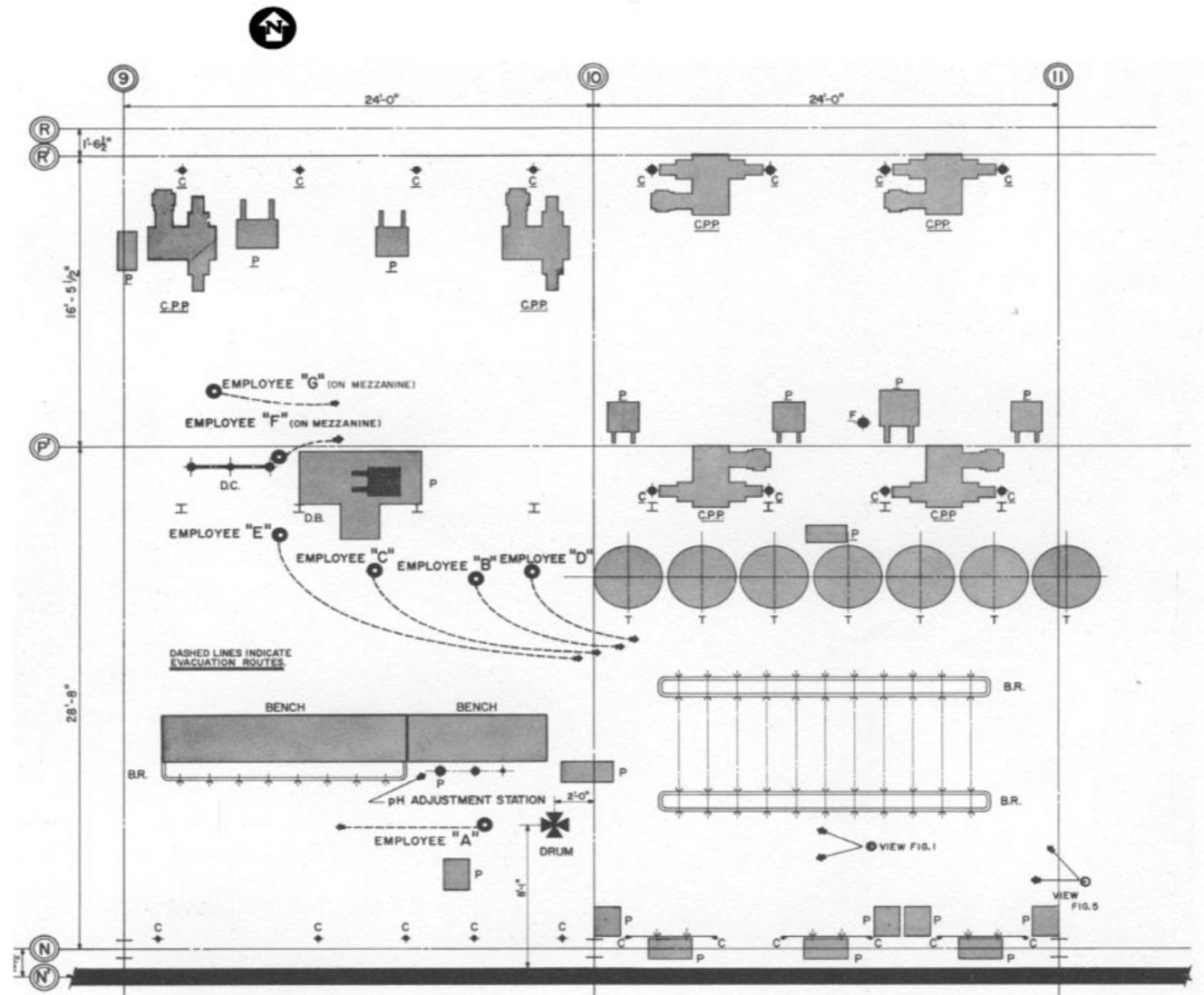
Consequence

The wide diameter of the drum created a critical geometry. The system became critical and underwent multiple excursions over 20 minutes, exposing eight people to significant radiation.



Process Criticality Accident Consequences

- Critical Experiment Accident – June 16, 1958 (Y-12)
 - Another example of the worker consequences
 - Uranium solution in a 55-gallon drum
 - No fatalities; 5 significant exposures
 - Criticality alarm activated and workers evacuated
 - Employees B-E evacuated past the drum – 15'-22' away
 - Employee A was adjacent to the drum and evacuated away from the drum – 6' away
 - This accident illustrates the importance of an alarm system and emergency planning for worker safety following an accident



Key Principles

- **Control of Mass:** Limit the amount of fissile material in any location or container.
- **Geometry:** Use shapes (e.g., thin slabs, narrow pipes) that make criticality impossible.
- **Moderation Control:** Prevent the addition of moderators (like water or hydrogenous materials) that could slow neutrons and increase reactivity.
- **Spacing & Reflection:** Keep fissile material units separated and avoid reflecting surfaces that could bounce neutrons back.
- **Administrative Controls:** Procedures, training, double-checking, and independent verification are essential to maintain safety.

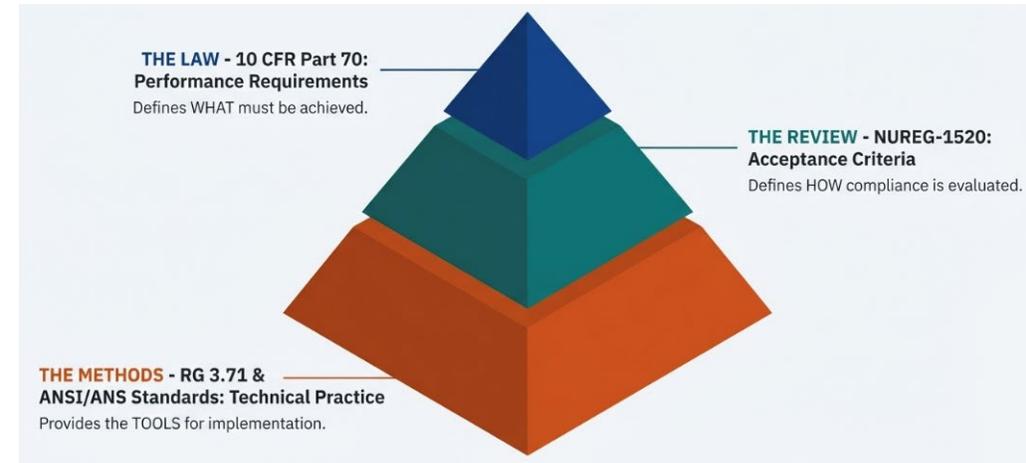
Application Areas

- **Fuel fabrication:** Handling and assembling reactor fuel.
- **Research labs:** Working with fissile material samples in experiments.
- **Isotope production:** Facilities like ORNL's REDC must maintain strict NCS.
- **Nuclear waste repository management:** Ensuring spent fuel or contaminated material cannot accumulate into a critical configuration.
- **Defense production facilities:** Process significant quantities of fissile materials handled, stored or processed during production activities
- **Spent nuclear fuel** activities outside of nuclear reactors
- **Transportation** of fissionable materials

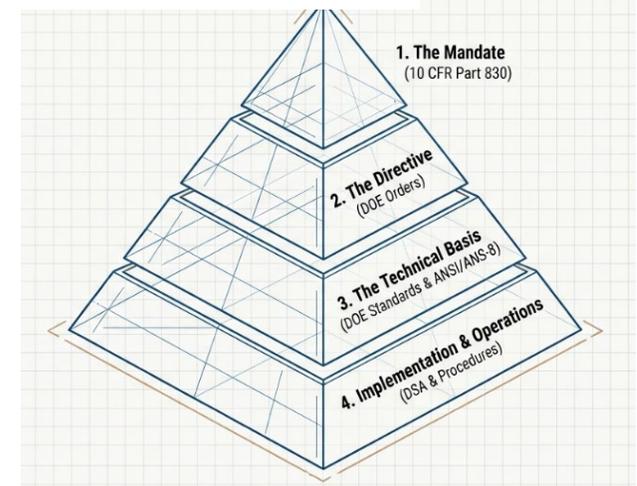
Regulation & Oversight

- Standards bodies like **ANSI/ANS-8 series** provide detailed guidance on methods and limits.
- In the U.S., **DOE, NRC, and defense standards** define nuclear criticality safety requirements.
- At ORNL and other DOE labs, NCS is a dedicated professional discipline, with specialists who evaluate operations, design experiments, and approve procedures.

NRC REG STRUCTURE



DOE REG STRUCTURE



American Nuclear Society

nuclear criticality safety in operations with
fissionable materials outside reactor

an American National Standard



published by the
American Nuclear Society
555 North Kensington Avenue
La Grange Park, Illinois 60526 USA

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.²⁾ In some cases it may be necessary or desirable to resort to in situ neutron multiplication measurements to confirm the subcriticality of proposed configurations. Guidance for safety in performing such measurements is contained in ANSI/ANS-8.6-1983 (R2010) [8].

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.³⁾

Brief Status of ANS-8 Series Standards for Nuclear Criticality Safety

Nuclear Criticality Safety Consensus Committee (NCSCC) Members

#	Members	Company
1	Roger Bartholomay	C.S. Engineering, Inc.
2	Lawrence Berg	U.S. Department of Energy
3	Douglas Bowen	Oak Ridge National Laboratory
4	Kermit Bunde	U.S. Department of Energy
5	Robert Busch	University of New Mexico
6	William Doane	Framatome Inc.
7	Ernest Elliott	BWX Technologies, Inc.
8	Calvin Hopper	Individual
9	Kevin Kimball	Individual
10	Ronald Knief	INMM Rep.
11	John Miller	Sandia National Laboratories
12	Jeremy Munson	U.S. Nuclear Regulatory Commission
13	Scott Murray	HPS Rep.
14	Randy Shackelford	Paschal Solutions, Inc.
15	Larry Wetzel	Individual
16	Robert Wilson	Individual
17	Catherine Percher	Lawrence Livermore National Laboratory
18	Ellen Saylor	Boston Government Services



Consensus Committees. The SB shall establish consensus committees to develop consensus for the approval of proposed standards and to manage the development and maintenance of standards within their assigned scopes of responsibility. Each consensus committee shall be responsible for establishing and managing the activities of those subcommittees and working groups needed to develop proposed standards within its scope of responsibility.

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	D. K. Hayes	Los Alamos National Laboratory
8	J. A. Morman	Argonne National Laboratory
9	L. E. Paulson	GE Hitachi Nuclear Energy
10	A. Prichard	Pacific Northwest National Laboratory
11	T. Stover	Savannah River Nuclear Solutions, LLC
12	D. Winstanley	Sellafield Sites (U.K.)
13	J. Hicks	CS Engineering
14	T. Cutler	Los Alamos National Laboratory
15	B. Lee	Oak Ridge National Laboratory
16	J. S. Baker	Spectra-Tech
17	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 Standards and Working Group Chairs

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	Vacant
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

ANS-8 Standard #	ANS-8 Standard Title	Working Group Chair
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	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.

Summary of Important ANS-8 Business

- **Succession Planning** – Ensure we have sufficient resources to support ANS-8 standards to include working group members and leadership
- **Revision/Clarification Timescales** – Timeframe of revisions and clarification requests take too long
- **NRC Involvement in ANS-8 Standards** – Concerned that the NRC had been actively participating in ISO standard development but not ANS standards.
- **Education Need Associated with ANS-8.3 and 8.28 Standards** to support implementation at DOE sites
- **Basis Statements** – Intent of basis statements was to (i) train new WG members, (ii) seek improvements for future revisions, and (iii) support future requests for interpretations and clarifications.
- **Sub-Critical Limits** – Significant subcritical limit work is in progress across ANS-8.1, ANS-8.7 and ANS-8.12. Perhaps ANS-8.15 updates will be proposed in the future for special actinides.
- **International Criticality LFE Database** – There is a new “International Criticality LFE Database” (<https://ncsp.llnl.gov/information-preservation/lfe-database>) for use by the community to learn from past abnormal conditions.
- **“Risk-Informed Guidance for Standards”** – Awareness of RIPB methodologies for ANS-8 standards

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

Administrative	
ANS-8.1	Nuclear Criticality Safety in Operations with Fissionable Material Outside of Reactors (In revision since 2017)
ANS-8.10	Criteria For Nuclear Criticality Safety Controls in Operations with Shielding and Confinement (PINS in development Clarification request in NCSCC ballot)
ANS-8.19	Administrative Practices For Nuclear Criticality Safety
ANS-8.20	Nuclear Criticality Safety Training (Approved by ANSI 3/25/2025)
ANS-8.24	Validation of Neutron Transport Methods For Nuclear Criticality Safety Calculations (Basis statements in progress & PINS in development)
ANS-8.26	Criticality Safety Engineer Training and Qualification Program (Approved by ANSI 11/21/2024)
ANS-8.28	Administrative Practices for the Use of Nondestructive Assay Measurements for Nuclear Criticality Safety (Approved by ANSI 3/12/2024)

Application	
ANS-8.6	Safety in Conducting Subcritical Neutron Multiplication Measurements In-Situ
ANS-8.7	Nuclear Criticality Safety in the Storage of Fissile Materials
ANS-8.12	Nuclear Criticality Control and Safety of Plutonium-Uranium Fuel Mixtures Outside of Reactors (In ANS-8 Ballot)
ANS-8.14	Use of Soluble Neutron Absorbers in Nuclear Facilities Outside Reactors
ANS-8.15	Nuclear Criticality Safety Control of Selected Actinide Nuclides
ANS-8.17	Criticality Safety Criteria For the Handling, Storage, and Transportation of LWR Fuel Outside of Reactors
ANS-8.21	Use of Fixed Neutron Absorbers in Nuclear Facilities Outside of Reactors

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

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

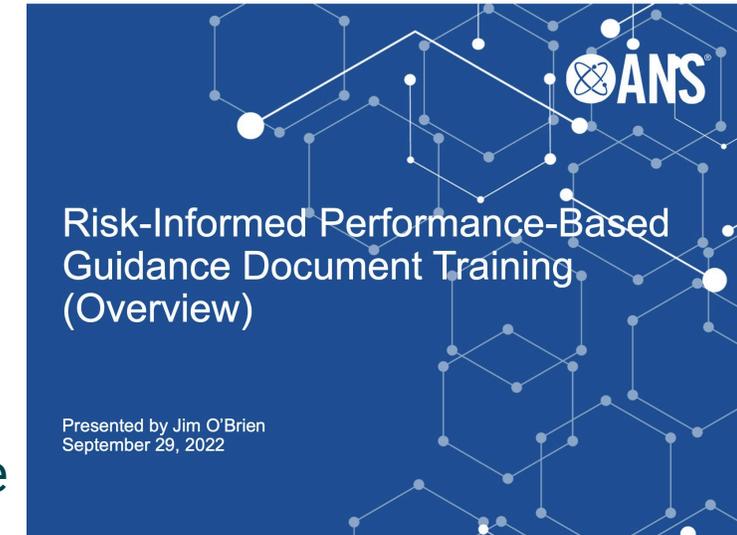
Guidance Standard	
ANS-GS-8.0 (Proposed)	Glossary of Terms for ANS-8 Standards (PINS in Development)

ANS-8 Nuclear Criticality Safety Standards – Are They Risk Informed, Performance Based?

Based on a 2024 Presentation at the Orlando, FL, ANS Meeting

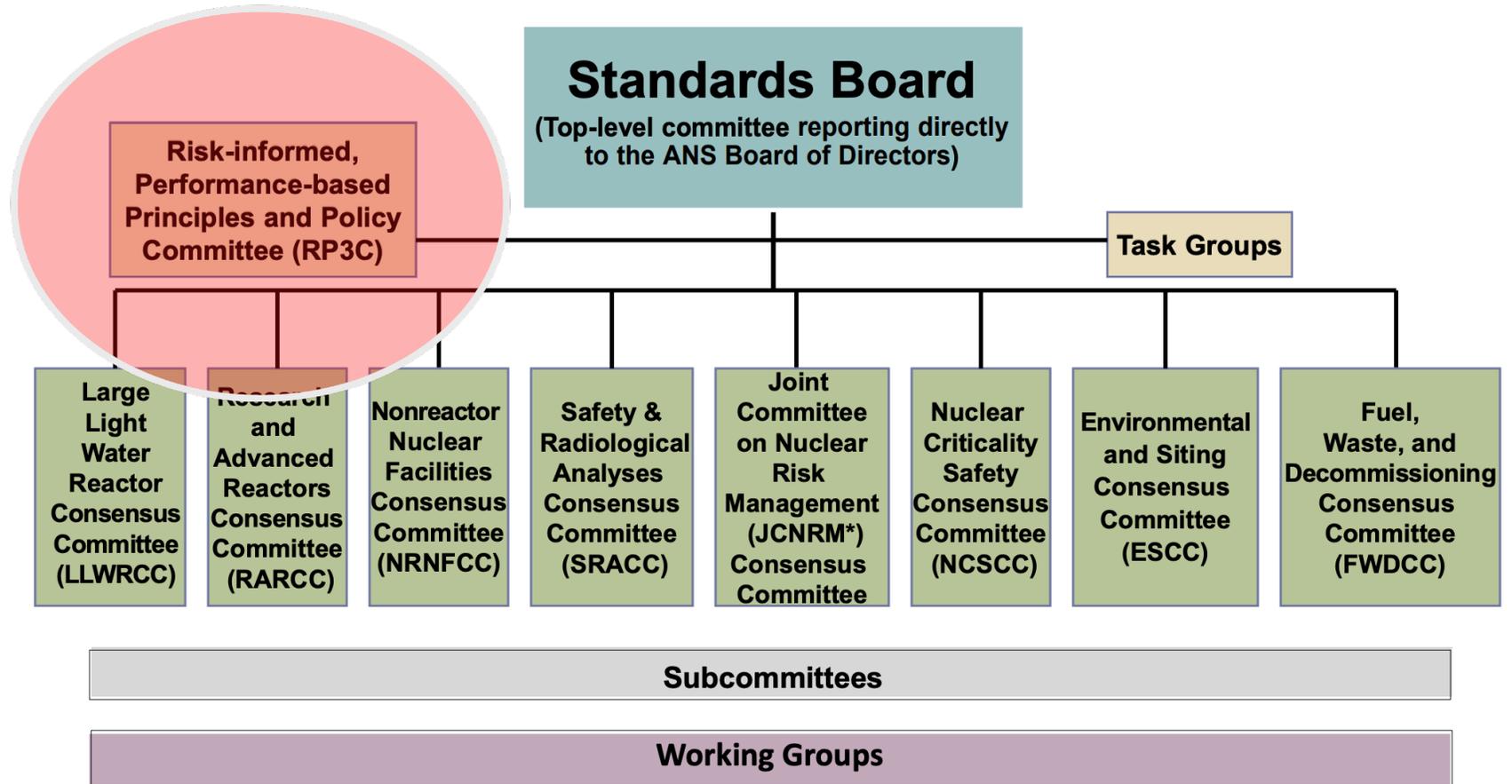
ANS Standards

- Why write a standard?
 - To establish requirements – “shall” statements – that drive a standard user to accomplish one or more outcomes
 - Should statements deliver recommendations and additional guidance (not requirements) to the standard user
 - The standard user (and regulators/authorities) will have a high level of confidence that the outcomes will be accomplished if the shall statements are met
- Clear Outcome
 - The clear statement of the ultimate outcomes called for in a standard is a critical step
 - RIPB methodologies were derived from NRC policies to improve and modernize ANS standards



According to the RP3C committee, RIPB standards can achieve these outcomes more efficiently.

The ANS Standards Committee



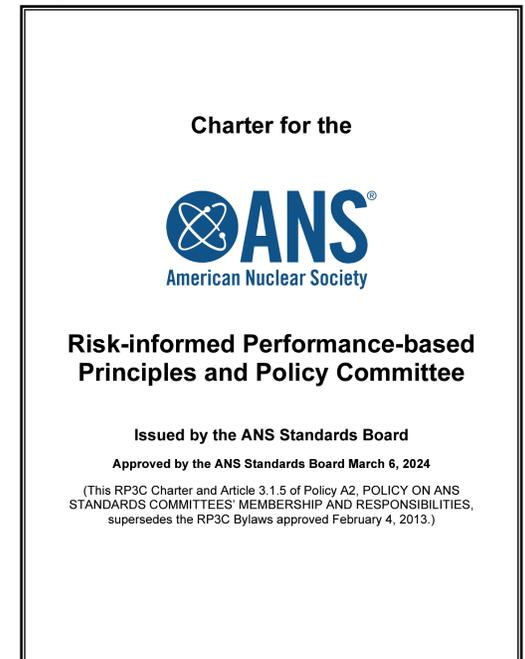
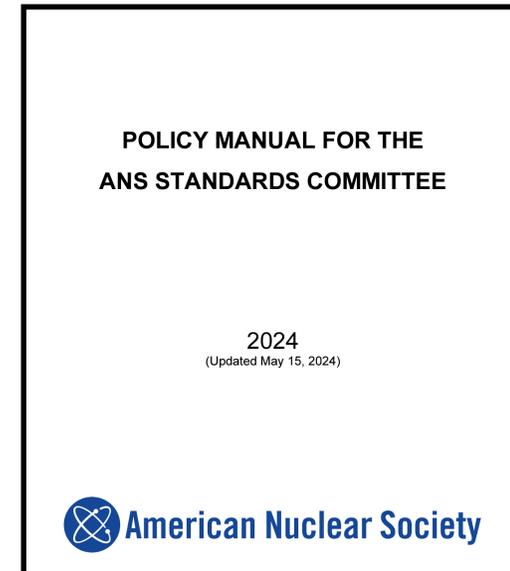
*The JCNRM is a joint ANS and ASME committee.

ANS-8 Standards and RIPB Methodology

- The American Nuclear Society (ANS) Standards Board, through the Risk-informed, Performance-based (RIPB) Principles and Policy Committee (RP3C), has been generating guidance to influence the development of new American National Standards into a risk-informed, performance-based (RIPB) methodology
- As a result, for several years now, there has been confusion in the nuclear criticality safety (NCS) community about whether ANS-8 NCS standards are commensurate with the intent of the RP3C guidance or whether new or revised NCS standards must incorporate the RIPB methodology
- A presentation was made at the Orlando ANS meeting in 2024 to initiate more conversation about the RIPB methodology and decide whether there are benefits for the ANS-8 series standards for Nuclear Criticality Safety

RP3C Committee – Relationship with WG's

- The SB has established the RP3C as an advisory committee that reports directly to the SB and operates in accordance with the ANS Standards Committee Rules and Procedures and the RP3C Charter
 - The purpose is to assist ANS committees, working groups, and task groups in establishing approaches, priorities, responsibilities, and schedules for implementation of RIPB principles in ANS standards, guidance standards, guidance documents, and technical reports
 - The RP3C shall develop documented guidance and associated training...
 - The RP3C is also responsible for reviewing ANS internal standards, guidance standards, guidance documents, and technical reports and other standards development organizations' standards when requested on related topics that may be developed, and as assigned by the SB, to ensure industry consistency.
 - Any formal balloting shall be conducted at the direction of the SB as deemed necessary.
- The RP3C is not authorized to develop ANS consensus standards but may develop documents that facilitate modernizing of standards
 - RP3C guidance is not mandated but suggested to improve the effectiveness of the standards



Problems – Why do we care about RIPB Methodologies?

Date:

- There is confusion about what these Reaffirmation and PINS form statements mean
 - PINS form:
 - Will this product use risk-informed insights, performance-based requirements, and/or a quality assurance graded approach
 - Reaffirmation form:
 - Risk Informed/Performance Based – The standard includes risk-informed and/or performance-based methods

PINS: PROJECT INITIATION NOTIFICATION SYSTEM FORM (Rev. 2/4/2024)

1. Designation of Proposed Product:	ANS-8.1
2. Type of Product: (i.e., American National Standard, Guidance Standard, Guidance Document, Trial-Use Standard, Technical Report)	
3. Title of Product:	
4. Product Intent: (Check the applicable box below):	Supersedes or Affects: (Specify designation of approved products affected or superseded.)
Create new product	
Revise current product	
Revise and redesignate current product	
Revise, redesignate and consolidate current product	
Revise and partition current product	
Supplement to a current product	
Withdraw current product	
5. Includes text from ISO, IEC, or ISO/IEC standard.	Check here if this product includes excerpted text from an ISO, IEC, ISO/IEC standard but is not an identical or modified adoption.
6. Abstract of Product (previously called "scope summary"): Provide a one paragraph description of the product. The information should clearly indicate what is covered by the product in order to differentiate it from similar products or products on file at ANSI. <small>***NOTE: 650 character limit including spaces.***</small>	<i>This [add: product type] [add: provides or establishes] ...</i>

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).

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.

What are the attributes of RI and PB?

Risk Informed Attributes



Performance Based Attributes

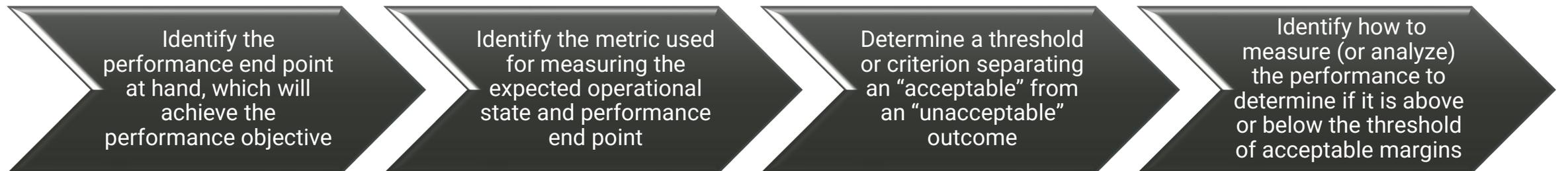
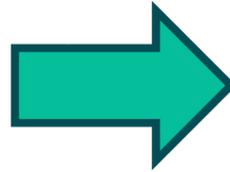
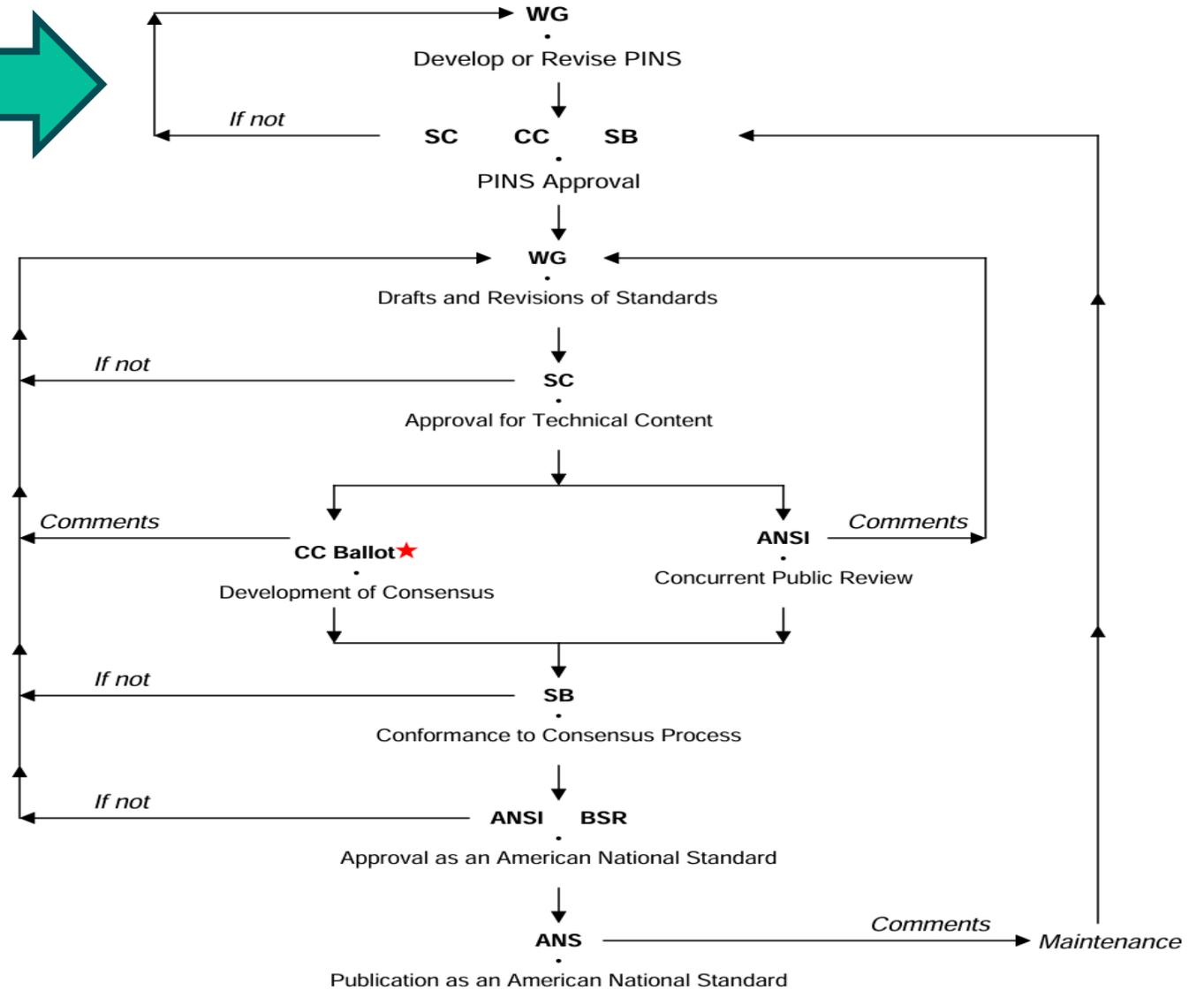


Figure 1 - Steps in the Development of a Standard

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



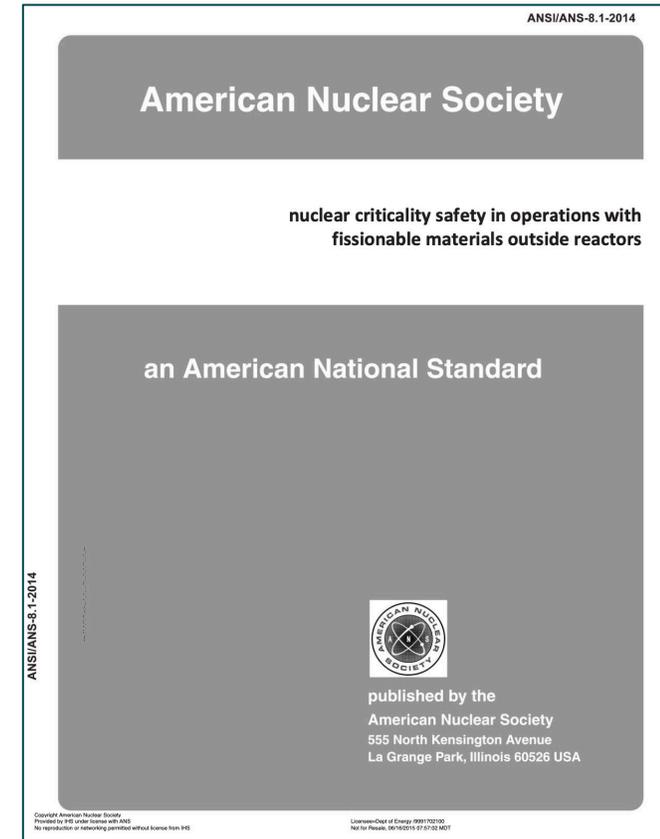
The Nuclear Criticality Safety Consensus Committee is looking into the RIPB Methodology and how to apply it to the ANS-8 standards.



- 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

ANS-8 Standards Seem to be “Conventional”

- Thus, according to the criteria outlined by the RP3C 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.”
 - RP3C guidance could describe ANS-8 standards as prescriptive standards because they dictate the exact materials, designs, and step-by-step procedures that must be followed to meet safety or operational requirements.
- 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



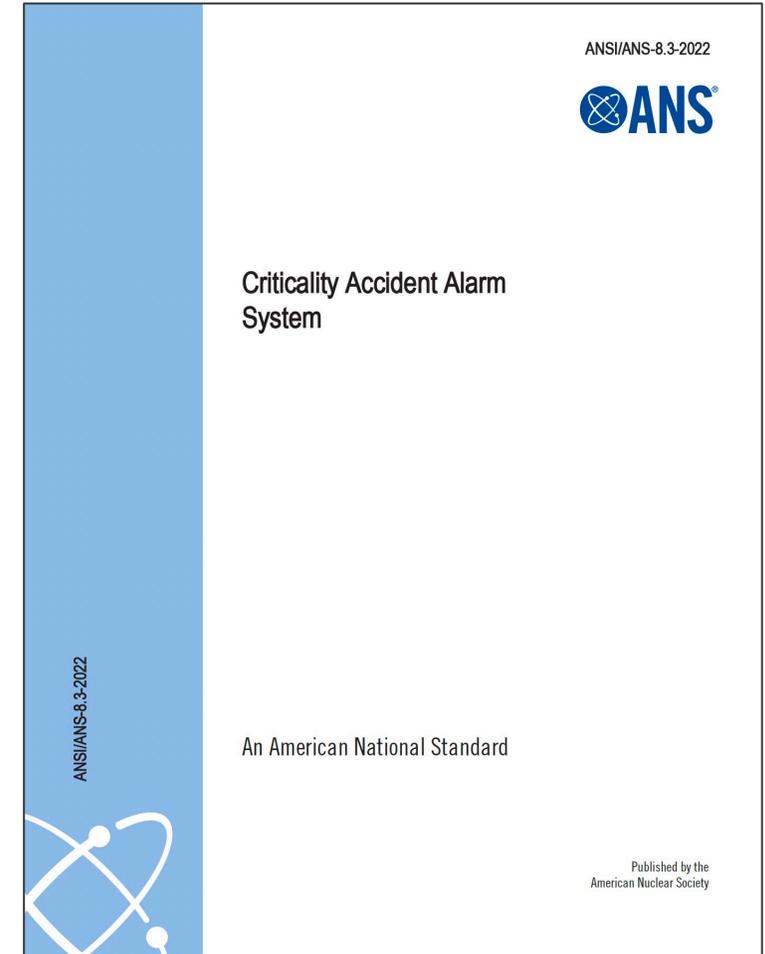
ANS-8 Standards – RIPB Standards?

Standard	Title	RI	PB
8.1-2014	Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors	Yellow	Yellow
8.3-2022	Criticality Accident Alarm System	Green	Green
8.6-1983	Safety in Conducting Subcritical Neutron-Multiplication Measurements In Situ	Red	Red
8.7-2022	Nuclear Criticality Safety in the Storage of Fissile Materials	Yellow	Yellow
8.10-2015	Criteria for Nuclear Criticality Safety Controls in Operations with Shielding and Confinement	Yellow	Yellow
8.12-202X	Nuclear Criticality Control and Safety of Plutonium-Uranium Fuel Mixtures Outside Reactors	Yellow	Yellow
8.14-2004	use of soluble neutron absorbers in nuclear facilities outside reactors	Red	Red
8.15-2014	Nuclear Criticality Safety Control of Selected Actinide Nuclides	Yellow	Yellow
8.17-2004	Criticality Safety Criteria for the Handling, Storage, and Transportation of LWR Fuel Outside Reactors	Red	Red
8.19-2014	Administrative Practices for Nuclear Criticality Safety	Yellow	Yellow
8.20-2025	Nuclear Criticality Safety Training for Fissionable Material Operations Outside Reactors	Yellow	Yellow
8.21-2023	Use of Fixed Neutron Absorbers in Nuclear Facilities Outside Reactors	Yellow	Yellow
8.22-202x	Nuclear Criticality Safety Based on Limiting and Controlling Moderators	Yellow	Yellow
8.23-2019	Nuclear Criticality Accident Emergency Planning and Response	Red	Red
8.24-2007	Validation of Neutron Transport Methods for Nuclear Criticality Safety Calculations	Red	Red
8.26-2024	Criticality Safety Engineer Training and Qualification Program	Yellow	Yellow
8.27-2015	Burnup Credit for LWR Fuel	Red	Red
8.28-2024	Administrative Practices for the Use of Nondestructive Assay Measurements for Nuclear Criticality Safety	Yellow	Yellow

Legend	
Green	Applicable
Yellow	Not Applicable
Red	Not Stated

Concern Raised at the Savannah River Site

- ANSI/ANS-8.3-2022 “Criticality Accident Alarm System”
- Forward:
 - *This standard incorporates the concepts of generating risk-informed insights and gives performance-based requirements. The user is advised to apply appropriate quality assurance criteria.*
 - This is causing significant consternation at a DOE site attempting to implement this standard
 - DOE regulators have proposed implementation of this standard using Risk Informed methods (Probabilistic Risk Assessment) solely because of the words in the forward of the standard
 - A regulator involved had utilized NRC risk-informed methodologies in the past
 - DOE has no experience in employing these methods significantly to support NCS programs
- The chair of ANS-8.3 stated that he perceived RI and PB methodologies were applicable and could be used, but the methodologies were not meant to be mandatory



NCSCC is looking into this more...

- **The NCSCC has formal tasks to learn more and to ensure the ANS-8 subcommittee and standards are utilizing the RP3C guidance**

**RIPB actions
from the Nov.
2023 NCSCC
Meeting:**



ACTION ITEM 11/2023-01: Kathy Murdoch to send the link for RIPB Guidance Document to NCSCC members. **COMPLETED**

John Miller discussed the need for NCSCC to have clear statements to clarify if ANS-8 standards are risk informed and/or performance based. Not having a statement could affect how they are treated by regulators.

ACTION ITEM 11/2023-02: John Miller, Jeremy Munson, Robert Busch to review RIPB guidance document to ensure ANS-8 standards are or will be following guidance.
Due Date: June 1, 2024

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The NCSCC has since decided that the RP3C guidance **is not applicable** to ANS-8 series consensus standards due to the nature of their purpose. This information has been promulgated to the ANS-8 subcommittee and Working Groups as they fill out PINS forms and reaffirmation paperwork.

NCSCC Discussion – Closure of Discussion

- Risk-Informed, Performance-Based Methods in and ANS-8 Standards.
 - Until there is clarity on the expectation for application of RIPB, any ANS-8 working group that initiates a PINS that invokes the use or potential use of RIPB is expected to follow the RIPB guidance, which means to have sought guidance from the RP3C chair and to include one or more professionals with experience in RIPB approaches to be a part of the WG.
 - Action Items from the NCSCC:

1/2023-02	John Miller, Jeremy Munson, Robert Busch to review RIPB guidance document to ensure ANS-8 standards are or will be following guidance. Due Date: June 1, 2024	J. Miller J. Munson R. Busch	CLOSED Discussed, no RIPB to be included.
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Conclusions

- This paper examines the Standards Board/RP3C guidance and their goal to modernize ANS Standards development to employ RIPB methodologies, if applicable.
- Based on a review of the RIPB methodologies presented by the RP3C, the ANS-8 standards for NCS tend to be compatible with the risk-informed methodologies discussed
 - For example, PRA to support process analysis in ANSI/ANS-8.1 and examination of residual criticality risk to the worker/public for implementing a criticality accident alarm system in a facility
- The ANS-8 series standards would be called “conventional” in a comparison with the RIPB approach and are not performance-based due to the extensive use of “shall,” “should,” or “may”
- The Nuclear Criticality Safety Consensus Committee are discussing the RIPB guidance from the RP3C committee to better understand how these approaches can benefit ANS-8 standards for NCS applications
 - **The NCSCC has since decided that the RP3C guidance is not applicable to ANS-8 series consensus standards**
 - **ANS-8 working group chairs with standards in development that have an approved PINS to address Item 2 of the supplemental information regarding the use of RIPB methods in the proposed draft. If RIPB was proposed to be used, the working group should confirm it will or will not be used in the draft.**

Questions and Discussion