



**American Nuclear Society**



**American  
Nuclear  
Society**

# **Progress on ANS Areas of Interest**

**By George Flanagan**

**Past Chairman of the ANS Standards Board**

**Chairman of the Research and Advanced Reactor  
Consensus Committee**

**Presented to:**

**NRC Standards Forum**

**September 26, 2017**





American  
Nuclear  
Society

# Agenda

- Progress on the five areas on interest of ANS from the 2016 Standards Forum
  - Design Standards for High Temperature Gas Reactors
  - Design Standards for Liquid Metal Reactors (including Sodium Fluoride Reactors)
  - Methodology for Risk-Informed Strategies
  - Reactor Coolant Radiological Source Terms for Normal Operation
  - Emergency Planning Zone (EPZ) Size Evaluation



American  
Nuclear  
Society

## ANS Areas of Interest—Progress

- ANSI/ANS-53.1-2011 (R2016), “Nuclear Safety Design Process for Modular Helium-Cooled Reactor Plants” (current standard)
  - Reaffirmed 2016 (reapproved/no changes)
- ANS-54.1, “Nuclear Safety Criteria and Design Process for Sodium Fast Reactor Nuclear Power Plants” (historical revision of ANS-54.1-1989)
  - Draft standard reflects information in DG 1330-SFR DC plus risk-informed approach similar to that proposed in the joint DOE/Utility Licensing Framework Modernization Project currently underway.
  - Draft standard has been reviewed by subcommittee and is being submitted for RARCC ballot.



American  
Nuclear  
Society

## Other Advanced Reactor Standards in Development by ANS

- ANS has four additional standards on advanced reactors in development. Details of these standards will be discussed in this afternoon's session on advanced reactor standards.
  - ANS-20.1, "Nuclear Safety Design Criteria for Fluoride Salt-Cooled High-Temperature Reactor Nuclear Power Plants" (new standard under development)
  - ANS-20.2, "Nuclear Safety Design Criteria and Functional Performance Requirements for Liquid-Fuel Molten-Salt Reactor Nuclear Power Plants" (new standard under development)
  - ANS-30.1, "Integrating Risk and Performance Objectives into New Reactor Nuclear Safety Designs" (new standard under development)
  - ANS-30.2, "Categorization and Classification of Structures, Systems, and Components for New Nuclear Power Plants" (new standard under development)

# ANS Areas of Interest—Progress (Cont'd)



American  
Nuclear  
Society

- Methodology for Risk-Informed Strategies
  - This will be discussed by Prasad Kadambi in this afternoon's session on advanced reactor standards.
- Reactor Coolant Radiological Source Terms for Normal Operation
  - ANSI/ANS-18.1-2016 approved in 2016 (minor revision of ANSI/ANS-18.1-1999; W2009).
  - EPRI published a technical report: "Reactor Coolant Radiological Source Terms for Normal Operation-Public Version: Technical Bases for Updating the ANSI/ANS-18.1-1999 Standard to Incorporate Contemporary Best-Estimate Radiological Source Terms in Principal Fluid Streams of Light Water Reactors"
  - ANS-18.1 Working Group considering revisions to ANSI/ANS-18.1-2016.



American  
Nuclear  
Society

## ANS Areas of Interest—Progress (Cont'd)

- EPZ Size Evaluation small modular reactors
  - Being considered for a new standard based on NRC's ongoing activities on dose-based EPZ
  - Feedback requested