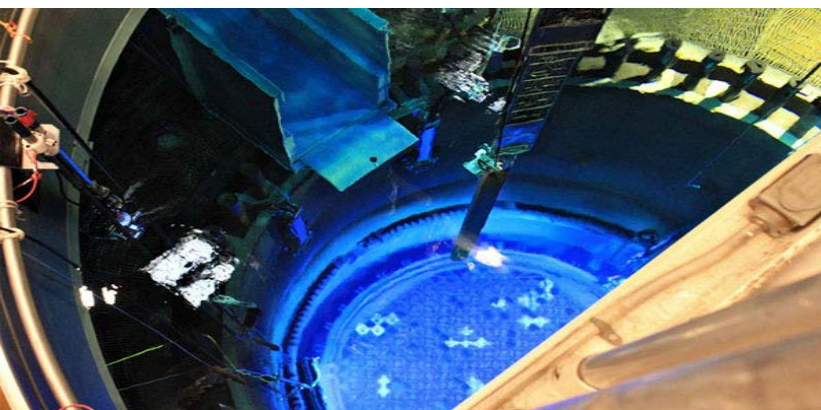




# Technology-Inclusive Content of Applications Project (TI-CAP)

NRR/DANU – Advanced Reactor Policy Branch  
US Nuclear Regulatory Commission

December 12, 2019



- Purpose

- Build on progress from licensing modernization project to provide more guidance on content of applications
- Coordinate activities with utility-led TI-CAP
- Solicit stakeholder feedback on draft outline for advanced reactor applications based on a technology-inclusive, risk-informed, performance based process
- Solicit stakeholder feedback on portions of the application outside the scope of a final safety analysis report (FSAR); with initial focus on technical specifications

# Agenda

- Background
- Draft outline of final safety analysis report (FSAR)
- Licensing documents outside the scope of an FSAR
  - Technical specification development
- Discussion
- Next steps
  - Process and timeline for providing comments

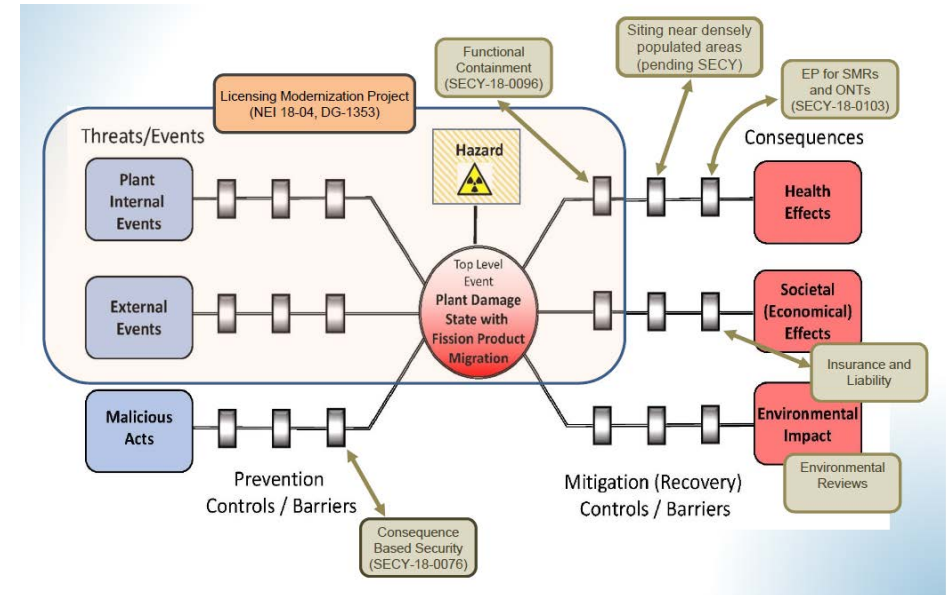
# Background – Integrated Approach

- **Advanced Reactor Policy Statement**

- ...Designs with some or all of these attributes are also likely to be more readily understood by the general public. Indeed, the number and nature of the regulatory requirements may depend on the extent to which an individual advanced reactor design incorporates general attributes such as those listed previously.

- **SRM-SECY-10-0121**

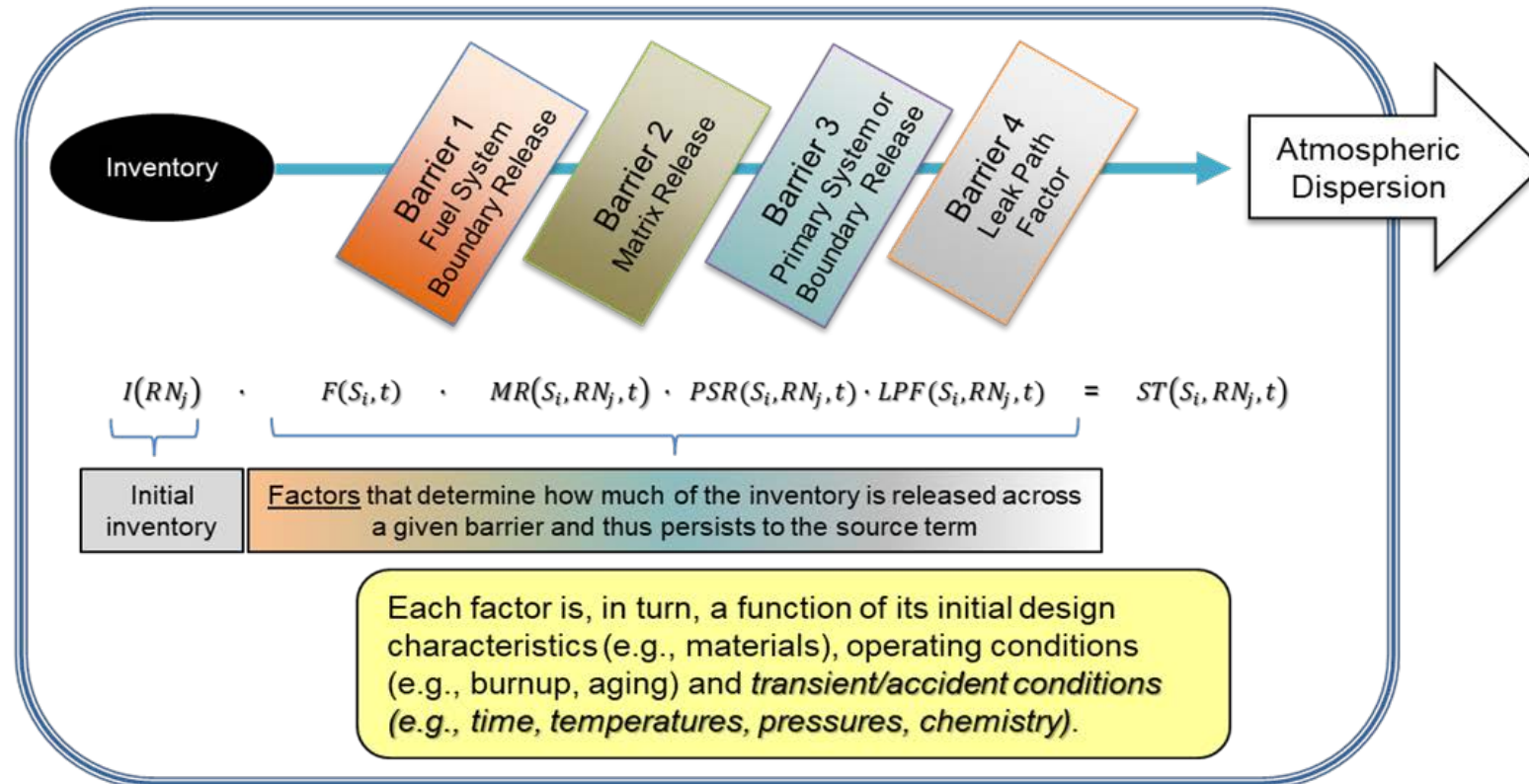
- ... New reactors with these enhanced margins and safety features should have greater operational flexibility than current reactors. This flexibility will provide for more efficient use of NRC resources and allow a fuller focus on issues of true safety significance.





# Return to first principles

Recent NRC activities related to advanced reactors (e.g., functional containment performance criteria, possible changes to emergency planning & security, and DG-1353) recognize the limitations of existing LWR-related guidance, which requires a return to first principles such as fundamental safety functions supporting the retention of radionuclides

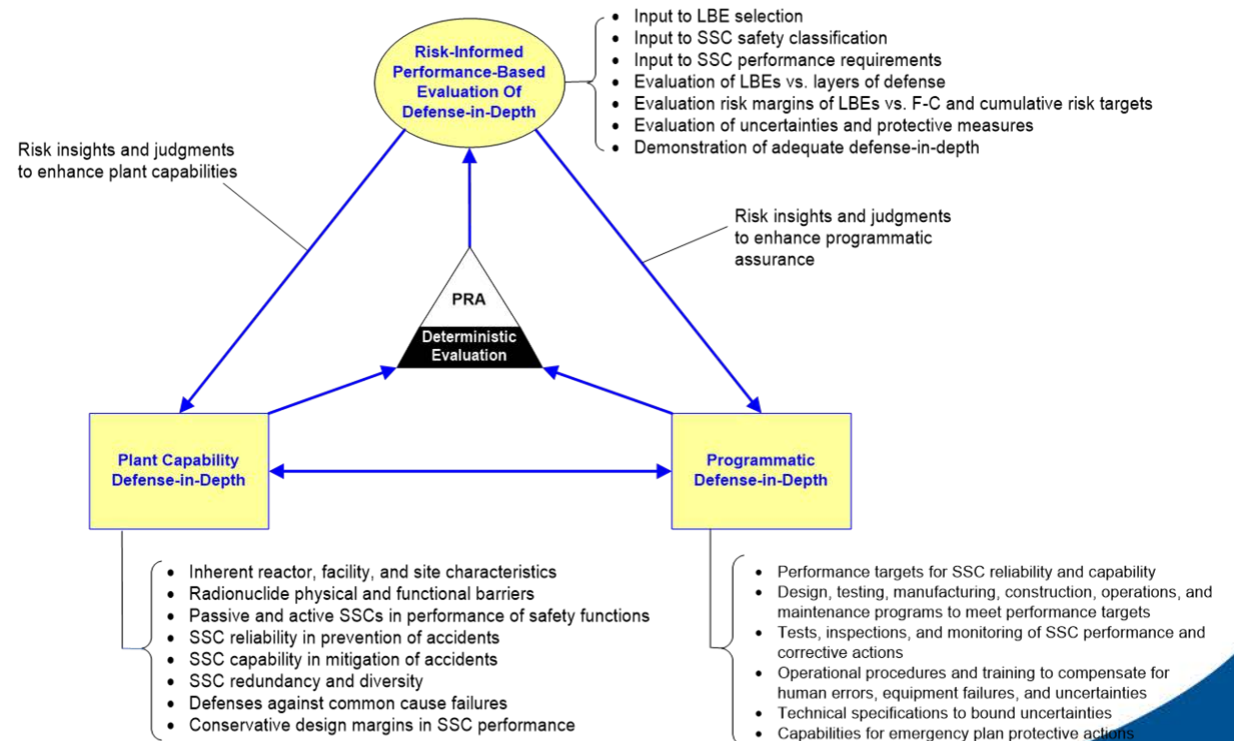
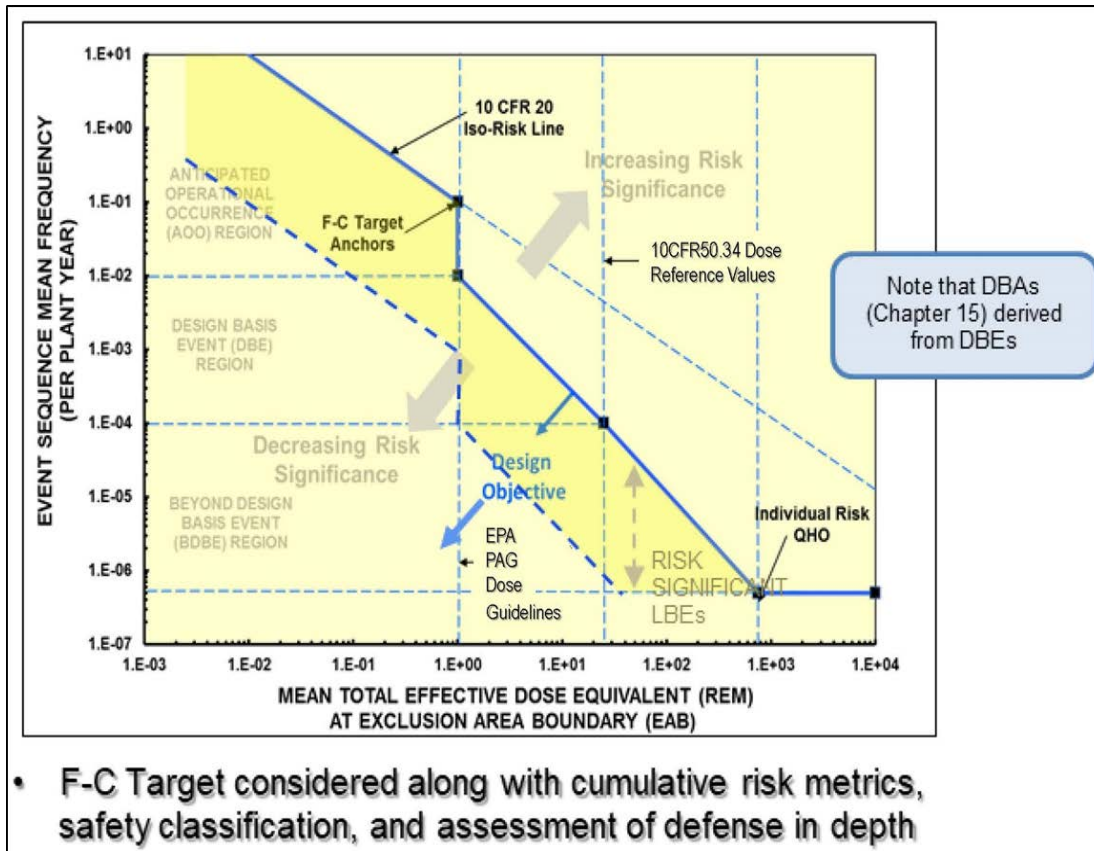


See SECY-18-0096, “Functional Containment Performance Criteria”

# Fundamental Safety Functions

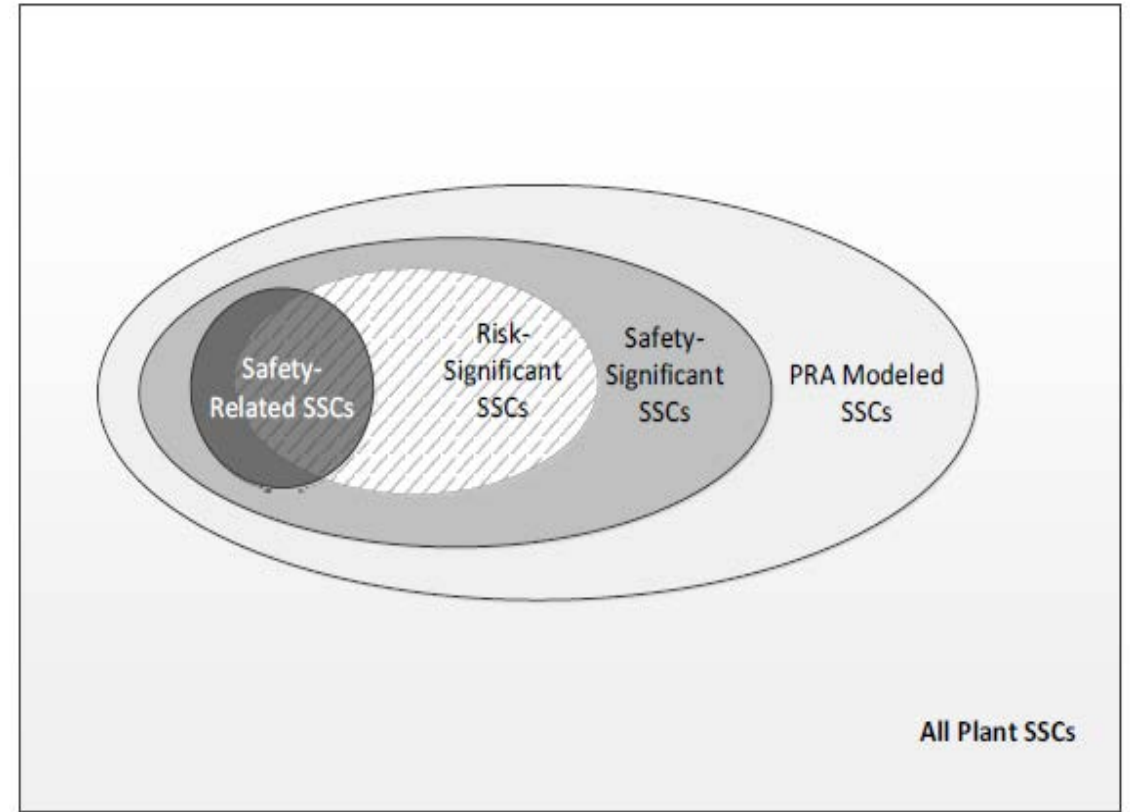
- General Design Criteria (light water reactors)
  - Protection and Reactivity Control Systems
  - Fluid Systems
  - Reactor Containment
  - Fuel and Radioactivity Control
- IAEA SSR 2/1, “Safety of Nuclear Power Plants: Design”
  - Fulfilment of the following fundamental safety functions for a nuclear power plant shall be ensured for all plant states: (i) control of reactivity; (ii) removal of heat from the reactor and from the fuel store; and (iii) confinement of radioactive material, shielding against radiation and control of planned radioactive releases, as well as limitation of accidental radioactive releases.
- SECY-18-0096, “Functional Containment Performance Criteria”
  - ... fundamental safety functions such as controlling reactivity and reactor power, removing heat, and limiting the release of radioactive materials from a reactor facility.
- Utility-led TI-CAP white paper on fundamental safety functions

# Starting Point is Licensing Modernization Project (NEI 18-04)



# SSC Classification and Level of Information in an Application

- Expectation is that FSAR portion of an application would be more detailed for safety-related structures, systems, and components (SSCs) and less detailed for other SSCs
- Level of information for non-safety related special treatment (NSRST) and non-safety related with no special treatment (NST) SSCs would be a function of its risk significance





# Informing Content of Applications

- NEI 18-04, “Risk-Informed Performance-Based Technology Inclusive Guidance for Non-Light Water Reactor Licensing Basis Development,” Revision 1 (ADAMS Accession No. ML19241A336) considered in developing draft outline sections 1 through 14
  - Staff’s draft outline differs from traditional organization of information (e.g., RG 1.70, RG 1.206)
  - Discussion on appropriate scope and level of detail might be helped by an early agreement on overall organization of information (format)
- Draft outline addresses full scope of a combined license but it could be adapted for other applications including:
  - Construction permit
  - Operating license
  - Design certification
  - Standard design approval
  - Manufacturing license

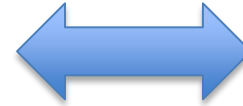
## Informing Content of Applications

- Staff's draft outline (with assistance from Idaho National Lab) found in ADAMS at Accession No. [ML19325C089](#)
- Staff's draft outline Sections 1 through 14
  - Final safety analysis report (FSAR) portion of application
- Draft outline includes proposal for other portions of an application
  - Technical specifications
    - Soliciting feedback on process to develop limited safety systems settings, and limiting conditions for operations or restructure technical specifications to support a more technology-inclusive approach

# Informing Content of Applications

## Outline (FSAR) with major LMP areas highlighted

1. General Information\*
2. Site Information
3. Licensing Basis Event (LBE) Analysis\*
4. Description and Classification of SSCs\*
5. Design Basis Accidents Analysis (10 CFR 50.34)\*
6. Integrated Plant Analysis\*
7. Defense in Depth (DID)\*
8. Control of Routine Plant Radioactive Effluents and Solid Waste
9. Control of Occupational Dose
10. Human Factors Analysis\*
11. Physical Security
12. Overview of PRA\*
13. Administrative Control Programs\* (*special treatment*)
14. Initial Startup Programs\* (*special treatment*)



## Additional Portions of Application

- Technical Specifications
- Technical Requirements Manual
- Quality Assurance Plan (design)
- Fire Protection Program (design)
- PRA
- Fuel qualification report
- Exemptions
- Quality Assurance Plan (construction and operations)
- Emergency Plan
- Physical Security Plan
- SNM (special nuclear materials) physical protection program
- SNM material control and accounting plan
- Cyber Security Plan
- New fuel shipping plan
- Fire Protection Program (operational)
- Radiation Protection Program
- Offsite Dose Calculation Manual
- Inservice inspection/Inservice testing (ISI/IST) Program
- Environmental Report
- Site Redress Plan
- Exemptions, Departures, and Variances

## Summary

- Discussion of staff's draft outline
- Discussion of development of technical specifications
- Next steps
  - Major focus of discussions in upcoming stakeholder meetings and/or dedicated meetings; coordination with industry-led TI-CAP
  - NRC will be interacting with Canadian Nuclear Safety Commission
  - Staff will revise draft outline as appropriate and provide updated draft outline in March 2020 time frame
  - Planned development of a regulatory guide