



# Graded Approach in Review and Assessment

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## **Review and Assessment**

- Step 1- Determine the scope and depth of the review based on applicable requirements; resources to conduct the review and assessment
  - Standard Review Plans - communicate applicable requirements to be addressed in nuclear facility construction and operating license applications.

## **Review and Assessment**

- **Standard Review Plans**
  - NUREG-0800 - review of the safety analysis report (SAR) for nuclear power plants.
  - NUREG-1520 – fuel cycle facilities
  - NUREG-1537 – non-power reactors (research reactors)
  - NUREG-1567 - Spent Fuel Dry Storage Facilities

## **Review and Assessment**

- Step 2 - Determine which factors are applicable to the decision
  - type of facility
  - experience and knowledge
  - alternative approaches, and novel design features
  - urgency for need of licensing action

## **Review and Assessment**

- **Step 2 – Ranking factors**
  - Type of regulated facility (design complexity and relative risk)
  - Experience and knowledge – reviewer experience with similar technologies results in more efficient and timely reviews
  - Alternative approaches and novel designs – require additional resource effort to review due to lack of experience
  - Urgency – generally involve licensees who require an immediate change to their technical specifications to avoid unnecessarily shutting down the plant

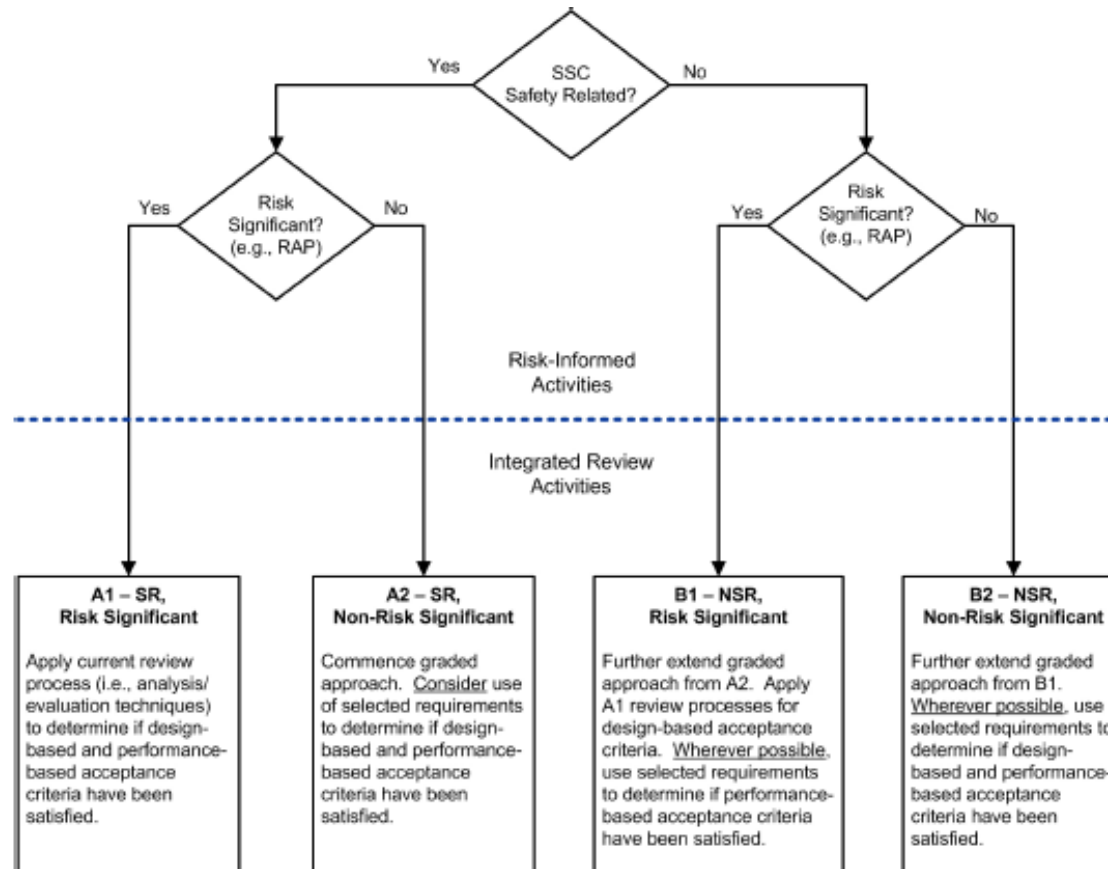
## **Review and Assessment**

- Step 3 - Integrate the applicable factors into determining the optimal resource effort required commensurate with the scope and depth necessary for the review and assessment.
  - Review and assessment of NPPs requires the greatest resource effort due to the regulatory requirements, the complexity of design, and the relative risk to the public.

## **Review and Assessment**

- **Small Modular Reactors Example**
  - NUREG-0800 revised to account for differences in new reactor designs, such as small modular reactors, specifically NuScale.
  - Risk-informed and integrated review framework utilizing a graded approach for R&A. Four review levels (labeled as A1 (safety-related, risk-significant), A2 (safety-related, non-risk-significant), B1 (non-safety-related, risk-significant), and B2 (non-safety-related, non-risk-significant) correlate to the safety classification and risk significance of the SSC under review.

# Review and Assessment





## **Review and Assessment**

- Timeliness goals - goals for completion times for different types of license applications
  - Design certification safety reviews for large light-water reactors – 42 months
  - SMRs – 39 months
  - License extension – 22 months (w/o hearing); 30 months (w/hearing)
  - License amendments – 12 months

## **Review and Assessment**

- **Factors affecting efficiency of reviews:**
  - staff resource management
  - work prioritization
  - support for hearings
  - review phase discipline
  - critical skills availability
  - budgetary limitations
  - computational tool availability for unique reactor designs
  - overall staff workload and capacity, and
  - resolution of policy issues that may require rulemaking.

## References

- NUREG-0800, “SRP for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition”
  - <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0800/>
- NUREG-1520, “Standard Review Plan for Fuel Cycle Facilities License Applications”
  - <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1520/>
- NUREG-1537, “Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors”
  - <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1537/>