

**From:** Sebrosky, Joseph  
**Sent:** Thursday, February 18, 2021 9:59 AM  
**To:** Afzali, Amir; AUSTGEN, Kati; Cyril Draffin  
**Cc:** NICHOL, Marcus; TSCHILTZ, Michael; Shams, Mohamed; Smith - NRR, Brian; Sanfilippo, Nathan; Segala, John; Lauron, Carolyn  
**Subject:** Transmittal of Information Related to Technology Inclusive Content of Application Project (TICAP) and Advanced Reactor Content of Application Project (ARCAP) to Support Upcoming Public Meeting Scheduled for February 25, 2021  
**Attachments:** ARCAP ISG - Initial Startup - 2-18-21 version.pdf; ARCAP ISG - Organization- 2-18-21 version.pdf; ARCAP Chapter Crosswalk-2-17 version.pdf

Amir Afzali  
Southern Company Services  
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Mr. Afzali, Ms. Austgen, and Mr. Draffin,

The purpose of this email is to provide you with the attached files to support the upcoming February 25, 2021, public meeting on construction permit guidance, and advanced reactor stakeholder topics. These files include:

- Advanced Reactor Content of Application Project (ARCAP) draft interim staff guidance (ISG) for Chapter 11, “Organization”
- ARCAP draft ISG for Chapter 12, “Initial Startup Program”
- A file titled, “ARCAP Chapter Crosswalk 2-17 version,” that provides a table with the staff’s consideration for a proposed ARCAP structure. A version of this table was previously provided and discussed during a public meeting on October 22, 2020.

The attached files will be referenced in the NRC staff presentations during the February 25, 2021, public meeting. This email will be captured in ADAMS and the email will be made publicly available so that interested stakeholders will have access to the information prior to the meeting. The public meeting notice will be updated to provide a link to the attached documents once the documents are publicly available in ADAMS.

If you have questions regarding the attached documents please contact me.

Sincerely,

Joe Sebrosky

Senior Project Manager  
Advanced Reactor Policy Branch  
Office of Nuclear Reactor Regulation  
301-415-1132

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ARCAP ISG - Initial Startup - 2-18-21 version.pdf	362231	
ARCAP ISG - Organization- 2-18-21 version.pdf	412356	
ARCAP Chapter Crosswalk-2-17 version.pdf	158221	

**Options**

**Priority:** Normal

**Return Notification:** No

**Reply Requested:** No

**Sensitivity:** Normal

**Expiration Date:**

**This draft staff white paper has been prepared and is being released to support ongoing public discussions. The guidance found in this draft white paper uses an interim staff guidance (ISG) format. The staff is considering using the ISG format in the near future to provide guidance to facilitate the near-term review of advanced reactor applications.**

**This paper has not been subject to NRC management and legal reviews and approvals, and its contents are subject to change and should not be interpreted as official agency positions.**



**U.S. NRC**

UNITED STATES NUCLEAR REGULATORY COMMISSION

*Protecting People and the Environment*

**DANU [XX]-ISG-[YYYY-##]**

**Advanced Reactor Content of Application**

**“Initial Startup Program”**

**Interim Staff Guidance**

**February X, 2021**

**DANU [XX]-ISG-[YYYY-##]  
Advanced Reactor Content of  
Application  
“Initial Startup Program”  
Interim Staff Guidance**

ADAMS Accession No.: MLxxxxxxxx

TAC: xxxxxx

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**INTERIM STAFF GUIDANCE**  
**ADVANCED REACTOR CONTENT OF APPLICATION**  
**“INITIAL STARTUP PROGRAM”**  
**DANU-ISG-YYYY-##**

**PURPOSE**

The U.S. Nuclear Regulatory Commission (NRC, or Commission) staff is providing this interim staff guidance (ISG) to facilitate the review of advanced reactor content of application guidance that applies to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 53, “Licensing and Regulation of Advanced Nuclear Reactors.” Portions of the ISG can also be used to support non-light water reactors (non-LWRs), stationary micro reactors and small modular LWRs submitting applications for a construction permit (CP) or operating license (OL) under 10 CFR Part 50 or for a design certification (DC), combined license (COL), a standard design approval (SDA) or a manufacturing license (ML) under 10 CFR Part 52.

The guidance in this ISG supports the development of the portion of an advanced reactor application associated with the “Initial Startup Program”.

**BACKGROUND**

The goal of the 10 CFR Part 53 rulemaking effort is to develop the regulatory infrastructure to support the licensing of advanced nuclear reactors. The term “advanced nuclear reactor,” for purposes of this rulemaking, means a nuclear fission or fusion reactor with significant improvements compared to commercial nuclear reactors under construction as of January 2019. This rulemaking would revise the NRC’s regulations by adding a risk-informed, technology-inclusive regulatory framework for advanced nuclear reactors, in response to a growing interest in possible licensing and deployment of advanced nuclear reactors and the related requirements of the Nuclear Energy Innovation and Modernization Act (NEIMA; Public Law 115-439) as amended by the Energy Act of 2020. The rule language for 10 CFR Part 53 is under development and, as such, the guidance found in this document is subject to change based on the outcome of this rulemaking. Key documents related to the Part 53 rulemaking, including preliminary proposed rule language and stakeholder comments, can be found at [Regulations.gov](https://www.regulations.gov) under Docket ID NRC-2019-0062.

This edition of the ISG is based on the advanced reactor content of application project (ARCAP) whose purpose is to develop technology-inclusive, risk-informed and performance-based application guidance. The ARCAP is broader and encompasses the industry-led technology-inclusive content of application project (TICAP). The guidance found in this ISG supplements the guidance found in DANU-ISG-YYYY-##, “Advanced Reactor Content of Application Guidance”, which provides a roadmap for developing all portions of an application. The guidance in this ISG is limited to the portion of an advanced reactor application associated with the Initial Startup Program (ISP) of the reactor plant applicant.

As stated above, the Part 53 regulation is under development. As the 10 CFR Part 53 requirements are finalized, this ISG guidance will be supplemented, as necessary, to provide guidance reflecting any differences in requirements between Parts 50/52 and Part 53.

## **RATIONALE**

*Note – this section will be updated with additional stakeholder interactions – expected during the monthly ARCAP meetings.*

## **APPLICABILITY**

This ISG is applicable to non-light water reactors (non-LWRs), stationary micro reactors and small modular LWRs submitting applications for a construction permit (CP) or operating license (OL) under 10 CFR Part 50 or for a design certification (DC), combined license (COL), a manufacturing license (ML) or a Standard Design Approval (SDA) under 10 CFR Part 52.

## **GUIDANCE**

The ISP consists of preoperational testing (i.e., tests conducted following construction and construction related testing, but prior to initial fuel load) and initial startup testing (i.e., tests conducted during and after initial fuel load, up to and including initial power ascension). The primary objective of the ISP is to demonstrate, to the extent possible, that the safety-related (SR), safety-significant (SS) SSCs operate in accordance with the design and as described in the safety analysis report. Additional objectives of the ISP include:

- Providing assurance that the facility exhibits the performance and associated safety margins that are described in the design.
- Satisfying any license conditions (e.g., ITAAC) associated with the ISP.
- Obtaining data to validate the analytical models.
- Familiarizing the plant's operating and technical staff with operation of the facility.
- Verifying the adequacy of the plant operating and emergency procedures

The applicant's plans for the ISP are required by 10 CFR 30.53(c) for radiation detection and monitoring instruments, 10 CFR 50.34(b)(6)(iii) for plants applying for an Operating License (OL) under 10 CFR Part 50 and 10 CFR 52.79(a)(28) for plants applying for a Combined License (COL) under 10 CFR 52.79. For plants applying for a COL via 10 CFR 52.79, but referencing a certified design (DC) under 10 CFR 52.47, a Standard Design Approval (SDA) under 10 CFR 52.137 or a design with a Manufacturing License (ML) under 10 CFR 52.157, the ISP includes the inspections, tests, analysis and acceptance criteria (ITAAC) associated with the DC, SDA or ML (see 10 CFR 52.47(b)(1) and 52.158(a), respectively).

The detailed description of the ISP can be included in the FSAR or in a separate document referenced in the FSAR. For a Construction Permit (CP) application, the information described in Phase 1 below should be provided with a commitment to provide the Phase 2 information at the OL stage. For a COL, DC, SDA and ML the information described in Phases 1 and 2 should be provided. The reviewer should review the completeness of the ISP information provided with respect to the license being requested and the guidance provided below.

The ISP is generally divided into two phases – the preoperational phase (prior to initial fuel loading) and initial startup testing (initial fuel loading and initial power ascension). If the application is for a CP, the ISP description can be limited to the Phase 1 testing along with a description of the scope, objectives and programmatic controls associated with the test program. For OL, DC, COL, SDA and ML applications, the application should include a description of the Phase 1 and 2 test programs along with a description of the scope, objectives and programmatic controls associated with the test programs.

### Phase 1 - Preoperational Testing

- Reactivity Control Functions:
  - > Reactivity control system performance
- Heat Removal Functions:
  - Pressure boundary integrity
  - Normal heat removal and control system performance
  - Residual heat removal system integrity and performance
- Containment of Radioactive Material:
  - Functional containment performance
  - Radiation and criticality monitoring system performance
  - Radioactive waste processing, handling and storage system performance
- Testing required by consensus design codes and standards applied in the design (e.g., ASME, IEEE) for items such as pumps, valves, dynamic restraints, electrical equipment, as applicable.
- Flow induced system vibration and thermal expansion tests.
- Electrical system performance for normal and emergency power.
- Equipment identified as necessary for defense-in-depth.
- Instrumentation and control systems relied upon in the safety analysis to perform SR or SS functions.
- Fuel handling and storage system performance.
- Support system performance for SR and SS equipment (e.g. cooling).

### Phase 2 - Initial Startup Testing

- Initial fuel loading and reactor physics tests:
  - Initial criticality
  - Shutdown margin
  - Reactivity control system performance
  - Shutdown time
  - Manual scram function
  - Neutron monitoring instrumentation operation and calibration
- Low power testing:
  - Reactivity control system worth
  - Neutron monitoring instrumentation operation and calibration
  - Neutron flux distribution
  - Neutron and gamma radiation surveys
  - Operability of alarms and low power protective features
  - Reactivity control system performance



- Shutdown time
- Power ascension testing:
  - Reactivity coefficients and power to flow characteristics
  - Neutron flux and power distribution
  - Reactivity control system influence on power distribution and core design limits
  - Reactivity control system performance
  - Shutdown time
  - Reactor coolant system performance
  - Flow induced vibration monitoring
  - Neutron and gamma radiation surveys
  - Neutron monitoring instrumentation and calibration
  - Operability of alarms and full power protective features
  - Plant response to various AOOs (e.g. turbine trip, loss of normal power)
- Performance of residual heat removal system.
- Performance of liquid and gaseous waste systems.
- Performance of first-of-a-kind, inherent or passive safety features.
- Flow induced vibration and thermal expansion within design limits.

The ISP should be planned and conducted in an orderly fashion. Accordingly, the description of the ISP in the application should address the following programmatic items related to the development and conduct of the ISP:

- The ISP objectives, including the objectives of each phase of the program.
- The scope of each phase of the ISP.
- The organization and responsibilities for conduct and control of the testing program.
- A general schedule and sequence for conducting the tests, including established hold points.
- The extent to which the test program will use plant operating, emergency and surveillance procedures and technical specifications
- The plan for interfacing with other ongoing activities so as to coordinate and avoid interferences.
- The prerequisites which must be in place prior to conducting each test, including implementation of the technical specifications.
- The information to be measured during each test.
- The acceptance criteria for each test and the conditions which would cause the test to be terminated prematurely.
- The review process and documentation to be applied for each test, including verification that any retesting has been satisfactorily completed.
- The review process and bases for concluding the ISP test results support safe operation of the plant.

In addition, the application should include a general description for each test, or group of similar tests (i.e., test abstract), to be conducted. The focus of the test descriptions should be on providing the bases for the tests and test conditions selected, instrumentation to be used, and a description of how the tests will confirm the performance of the SSCs. Each test

description should include the acceptance criteria that define the performance, physical condition or analysis results that must be demonstrated to confirm the design characteristics and features perform consistent with the design. The ISP development should also take into consideration ISP experience at other facilities and include measures to avoid problems they have had.

In general, each test should directly, or indirectly through analysis, confirm SSC performance over the full range of operating conditions (normal operation, AOOs, DBEs, DBAs and BDDE conditions) over the plant lifetime. In addition, the performance of other SSCs containing radioactive material (e. g., spent fuel storage) should be confirmed in the ISP. Risk insights from the plant's PRA and safety analysis should be used to identify the specific systems and components, test objectives, test conditions and test parameters selected so as to test the risk significant equipment and conditions. Thus, a graded approach to testing can be applied provided the test program provides reasonable assurance the SR and SS SSCs will perform satisfactorily. In addition, the test program should be sequenced and structured so that plant safety is never entirely dependent upon untested SSCs or temporary plant equipment.

The application should describe the responsibilities and guidelines for conduct of the ISP. In general, the applicant is responsible for all aspects of the ISP, although other parties (e.g., vendors) may conduct some of the testing. The applicant's responsibilities include:

- Defining the qualifications of the personnel managing, conducting and reviewing the test program results.
- Using contractor or vendor personnel, as appropriate.
- Providing training as necessary to ensure that personnel are ready to perform their functions.
- Developing the testing objectives, schedule, sequence, prerequisites, procedures safety precautions and acceptance criteria.
- Managing, controlling and approving key aspects (e.g., prerequisites, procedures) of the test program.
- Establishing a plant review committee to review, evaluate and disposition the test results.
- Coordination with other elements of the plant organization (e.g. engineering, design, operations), as necessary, in planning, conducting and reviewing test results.
- Preparation, approval and retention of test reports.

The guidelines to be followed in conducting the ISP include:

- The tests should be conducted using detailed procedures approved by managers in the applicant's ISP organization.
- The staff conducting the tests (including contractors, vendors or others) should have the appropriate training, experience and education determined necessary by management.
- The tests should not be run until there is verification that all prerequisites for the test have been completed or are in place.
- The test sequence should be established to ensure that testing is completed and operability confirmed on systems and equipment needed to support future testing.
- Where modifications have been made to SSCs, retesting should be conducted.

In reviewing the application, the reviewer needs to have reasonable assurance that the requirements to conduct an ISP, as stated in 10 CFR 30.53(c), 10 CFR 50.34(b)(6)(iii), and 10 CFR 52.79(a)(28) are met for the design and technology under review. This determination should be based on whether the information provided in the application is sufficient to conclude:

1. The Phase 1 test program includes all SR and SS SSCs that can reasonably be tested at the preoperational stage.
2. The Phase 2 test program includes all SR and SS SSCs that were not tested in Phase 1.
3. The applicant's responsibilities are clearly described.
4. The description in the application covers all of the overarching items listed previously for developing the ISP, or deviations are justified.
5. Risk insights have been used to select the most important parameters to be measured.
6. First-of-a-kind SSCs and inherent/passive safety features are identified and included in the test program.
7. For applications that use a COL, DC, SDA or ML, the ITAAC associated with these licenses are included in the ISP.
8. The parameters to be measured in the test program are sufficient to determine, directly or through analysis, the SSC performs as designed.
9. Information sufficient to validate the analytical codes has been collected.
10. The applicant's process for reviewing test results and determining the acceptability of the results, or requiring a modification and retest, are clearly described and reasonable.

With positive answers to the above items, it can be concluded that the performance of each SR and SS feature of the design has been demonstrated and sufficient data exists to assess the analytical tools used in the safety analysis. Thus, there is reasonable assurance that the ISP is in compliance with the applicable regulations for a CP, COL, DC, SDA or ML.

## **IMPLEMENTATION**

The staff will use the information discussed in this ISG in performing safety evaluations of license applications submitted under 10 CFR 50, 52 or 53.

[Identify how the information will facilitate staff review of license amendments, license renewal applications, etc.]

## **BACKFITTING AND ISSUE FINALITY DISCUSSION**

[OGC provides this discussion, but the staff can propose text for OGC consideration].

Example: The NRC staff issuance of this ISG is not considered backfitting as defined in 10 CFR 50.109(a)(1), nor is it deemed to be in conflict with any of the issue finality provisions in 10 CFR Part 52.

## **CONGRESSIONAL REVIEW ACT**

[OGC provides this discussion to support issuance of the final ISG. However, the staff can propose text for OGC consideration].

Example: This ISG is a rule as defined in the Congressional Review Act (5 U.S.C. §§ 801-808). However, the Office of Management and Budget has not found it to be a major rule as defined in the Congressional Review Act.

## **FINAL RESOLUTION**

By [insert date], this information will be transitioned into [identify the appropriate regulatory process (Standard Review Plan (SRP), Regulatory Guide (RG))]. Following the transition of this guidance to the [SRP, RG], this ISG will be closed. .

## **APPENDIX**

- A. Resolution of Public Comments

## APPENDIX A

### Resolution of Public Comments

A notice of opportunity for public comment on this Interim Staff Guidance (ISG) was published in the *Federal Register* (insert FR Citation #) on [date] for a 30-60 day comment period. [Insert number of commenters] provided comments which were considered before issuance of this ISG in final form.

Comments on this ISG are available electronically at the NRC's electronic Reading Room at <http://www.nrc.gov/reading-rm/adams.html>. From this page, the public can gain entry into ADAMS, which provides text and image files of NRC's public documents. Comments were received from the following individuals or groups:

Letter No.	ADAMS No.	Commenter Affiliation	Commenter Name	Abbreviation
1				
2				
3				
4				
5				

The comments and the staff responses are provided below.

Comment 1: [Each comment summary must clearly identify the entity that submitted the comment and the comment itself].

NRC Response: Comment responses should begin with a direct statement of the NRC staff's position on a comment, e.g., "the NRC staff agrees with the comment" or the "NRC staff disagrees with the comment".

- If the NRC staff agrees, explain why and provide a clear statement as to how the relevant language was revised or supplemented to address the comment. Include the following language at the end of the comment response: "The final ISG was changed by <describe the change; if necessary by quoting the newly revised language>."
- If the NRC disagrees with a comment and no change was made to the generic communication, then explain why and provide the following language at the end of the comment response: "No change was made to the final ISG as a result of this comment."

## APPENDIX B

### References

DRAFT

This draft staff white paper has been prepared and is being released to support ongoing public discussions. This draft white paper uses an interim staff guidance (ISG) format because the staff is considering using this format to provide staff guidance in the near future to support the review of advanced reactor applications.

This paper has not been subject to NRC management and legal reviews and approvals, and its contents are subject to change and should not be interpreted as official agency positions.



DANU [XX]-ISG-[YYYY-##]

Advanced Reactor Content of Application

“Organization”

Interim Staff Guidance

February X, 2021

**DANU [XX]-ISG-[YYYY-##]  
Advanced Reactor Content of  
Application  
“Organization”  
Interim Staff Guidance**



ADAMS Accession No.: MLxxxxxxxx

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<b>NAME</b>				
<b>DATE</b>				

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**INTERIM STAFF GUIDANCE**  
**ADVANCED REACTOR CONTENT OF APPLICATION**

**“ORGANIZATION”**

**DANU-ISG-YYYY-##**

**PURPOSE**

The U.S. Nuclear Regulatory Commission (NRC, or Commission) staff is providing this interim staff guidance (ISG) to facilitate the review of advanced reactor content of application guidance that applies to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 53, “Licensing and Regulation of Advanced Nuclear Reactors.” Portions of the ISG can also be used to support non-light water reactors (non-LWRs), stationary micro reactors and small modular LWRs submitting applications for a construction permit (CP) or operating license (OL) under 10 CFR Part 50, for a combined license under 10 CFR Part 52 or for a design certification (DC) under 10 CFR Part 52.

The guidance found in this ISG supports the development of the portion of an advanced reactor application associated with an applicant’s “Organization.”

**BACKGROUND**

The goal of the 10 CFR Part 53 rulemaking effort is to develop the regulatory infrastructure to support the licensing of advanced nuclear reactors. The term “advanced nuclear reactor,” for purposes of this rulemaking, means a nuclear fission or fusion reactor with significant improvements compared to commercial nuclear reactors operating on the date of enactment of the Energy Act of 2020” or under construction as of January 2019. This rulemaking would revise the NRC’s regulations by adding a risk-informed, technology-inclusive regulatory framework for advanced nuclear reactors, in response to a growing interest in possible licensing and deployment of advanced nuclear reactors and the related requirements of the Nuclear Energy Innovation and Modernization Act (NEIMA; Public Law 115-439) as amended by the Energy Act of 2020. The rule language for 10 CFR Part 53 is under development and as such the guidance found in this document is subject to change based on the outcome of this rulemaking. Key documents related to the Part 53 rulemaking, including preliminary proposed rule language and stakeholder comments, can be found at Regulations.gov under Docket ID NRC-2019-0062.

This edition of the ISG is based on the advanced reactor content of application project (ARCAP) whose purpose is to develop technology-inclusive, risk-informed and performance-based application guidance. The ARCAP is broader and encompasses the industry-led technology-inclusive content of application project (TICAP). The guidance found in this ISG supplements the guidance found in DANU-ISG-YYYY-##, “Advanced Reactor Content of Application Guidance,” which provides a roadmap for developing all portions of an application. The guidance in this ISG is limited to the portion of an advanced reactor application associated with the organization of the nuclear reactor plant applicant. Guidance regarding operational programs, conduct of operations, and procedures is not within the scope of this ISG but rather is addressed in *TICAP ISG -21-XX*, Chapter 8, “Programs.”

The Part 53 regulation is under development and as such the guidance found in this document is subject to change based on the outcome of this rulemaking. As the 10 CFR Part 53 requirements are finalized this ISG guidance will be supplemented, as necessary, to provide guidance in the organizational and training areas to reflect any differences in requirements between Part 50/52 and Part 53. Key documents related to the Part 53 rulemaking, including preliminary proposed rule language and stakeholder comments, can be found at Regulations.gov under Docket ID NRC-2019-0062.

## **RATIONALE**

*Note – this section will be updated with additional stakeholder interactions – expected during the monthly ARCAP meetings.*

## **APPLICABILITY**

All holders of and applicants for a power reactor construction permit and operating license under 10 CFR Part 53. This ISG can also be used to support light water reactors (LWRs), non-LWRs, stationary micro reactors and small modular LWRs submitting applications for a construction permit (CP) or operating license (OL) under 10 CFR Part 50, for a combined license (COL) or a design certification (DC) or standard design approval (SDA) under 10 CFR Part 52 or for an Early Site Permit (ESP) under 10 CFR Part 52.

## **GUIDANCE**

### **Design, Construction, Operating Organization – Key Management Positions**

An applicant should provide descriptions of the organizational structure and key management positions within the design, construction and operating organizations that are responsible for facility design, design review, design approval, construction management, testing, and operation of the plant. Acceptance criteria are based on meeting the relevant requirements of the following Commission regulations<sup>1</sup>:

- 10 CFR Part 50, Appendix B
- 10 CFR 50.34(a)(6) and (9)
- 10 CFR 50.34(b)(6)(i)
- 10 CFR 50.34(f)(3)(vii)
- 10 CFR 50.40(b)
- 10 CFR 50.48(a)(1)(ii)
- 10 CFR 50.71

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<sup>1</sup> As the 10 CFR Part 53 requirements are finalized this ISG guidance will be supplemented, as necessary, to provide guidance in the organizational and training areas to reflect any differences in requirements between Part 50/52 and Part 53.

- 10 CFR 52.47(a)(7)
- 10 CFR 52.79(26), (27), (28), and (29)(i)

The applicant for a CP/OL or COL should provide the following information:

- Organizational charts of the applicant's corporate-level management, technical support, and operations organizations, including organizational and management structure responsible for direction and support of design and construction of the proposed plant,
- A general staffing plan for construction, startup testing,
- Details of the interaction of design and construction within the applicant's organization and the manner by which the applicant will ensure close integration of the architect engineer (AE) and the nuclear reactor vendor,
- Plans (preliminary for CP applicants) for the applicant's operations organization, including a general staffing plan for operations (OL and COL),
- The relationship of the nuclear-oriented part of the organization to the rest of the corporate organization,
- A description of the provisions for technical support for operations including interfaces between corporate, operations and the Technical Support Center (if applicable) (OL and COL),

For a DC or SDA application, the information provided should focus on the corporate level management and technical support organizations of the design organization.

For the design, construction and preoperational period (DC, SDA, CP/OL or COL), key management responsibilities in the following areas should be described:

- Principal site-related engineering studies of the meteorology, geology, seismology, hydrology, demography, and environmental effects,
- Design of safety-significant (i.e., safety-related and non-safety-related with special treatment) SSCs,
- Review and approval of safety-related and safety-significant SSC design features,
- Development of probabilistic risk assessment (PRA), defense-in-depth, and license basis event analysis,
- Material and component specification review and approval,
- Procurement of materials and equipment,
- Management of construction activities,
- Quality assurance activities for design and construction.

For the operational period (OL or COL), key management responsibilities in the following areas should be described

- Nuclear, PRA, mechanical, structural, electrical, thermal-hydraulic, metallurgy and materials, and instrumentation and controls engineering (design and technical support)
- Plant chemistry

- Health physics
- Fueling and refueling operations support
- Maintenance support
- Operations support
- Fire protection
- Quality assurance
- Training
- Safety review
- Startup testing
- Emergency planning
- Security

If the application is for more than one module/unit, the applicant should provide information addressing staffing plans that take into account the staggered timelines for additional modules/units scheduled to come on-line with respect to preoperational testing, fuel load, startup, and power ascension testing of each new module/unit. The applicant should describe the organizational arrangement and functions to meet the needs of the multiple modules/units. The applicant should include in this discussion the extent to which the organizational arrangement and functions are shared between or among the modules/units addressed in the application and describe the organizational arrangement and functional divisions or controls that have been established to preserve integrity between individual modules/units and/or programs.

For plant sites with existing, operating nuclear modules/units, the applicant should include in this discussion the extent to which the organizational arrangement and functions are shared between the new and existing modules/units. In addition, the applicant should include a discussion of the organizational arrangement and functional divisions or controls that have been established to preserve integrity between the new and existing operational modules/units and/or programs.

NRC guidance regarding the operating organization is described in Regulatory Guide (RG) 1.33, "Quality Assurance Program Requirements (Operation)," which references the guidance in ANSI/ANS 3.2-2012, "Managerial, Administrative and Quality Assurance Controls for the Operational Phase of Nuclear Power Plants."

#### **Educational and Experience Requirements for Key Management Personnel**

The application should describe the educational and experience requirements for each key management position described above.

For a CP or COL application, the information should describe the applicant's past experience in the design and construction of nuclear power plants or relevant non-power reactor design and construction experience with similar attributes to those found in the application. Experience in activities of similar scope and complexity should also be described.

The CP or COL applications should include information that demonstrates the ability of the technical staff to support or perform the safety-related activities specified in the application, as

applicable. The applicant should describe the level of risk analysis experience available to perform necessary probabilistic risk assessments.

The reviewer should compare the education and experience of key personnel described above with the qualifications and experience guidance endorsed by RG 1.8, "Applicable experience," i.e., work performed in a nuclear-fueled electric power production plant (commercial or military) during preoperational, startup-testing, or operational activities. Individual experience which may not be entirely applicable should be weighed against the requirements of the position.

### **Training for Plant Staff**

The NRC regulations listed below provide information pertaining to the training of nuclear power plant personnel. The OL/COL applicant should describe the training programs that are to be developed to meet these regulations. In describing compliance to these regulations, the applicant may reference in this section material discussed elsewhere in the application (i.e., external to the safety analysis report).<sup>2</sup>

- 10 CFR 19.12, "Instruction to Workers"
- 10 CFR 26.29, "Training"
- 10 CFR 50.34(a)(6) and (9)
- 10 CFR 50.34(b)(6)(i), (ii), (iii), and (iv)
- 10 CFR 50.40(b)
- 10 CFR 50.48, "Fire Protection"
- 10 CFR 50.120, "Training and Qualification of Nuclear Power Plant Personnel"
- 10 CFR Part 50, "Licensing of Production and Utilization Facilities," Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants"
- 10 CFR Part 50, Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities"
- 10 CFR 52.47(a)(7)
- 10 CFR 52.79(a)(21), (33), (35), (39), (40) and (44)

CP applicants should provide commitments to provide the information requested below in the OL application.

With respect to nuclear plant worker training, NRC guidance includes RG 1.8, "Qualification and Training of Personnel for Nuclear Power Plants." RG 1.8 endorses ANSI/ANS-3.1-1993, "Selection, Qualification, and Training of Personnel for Nuclear Power Plants." The application should indicate the extent to which the applicable portions of this guidance is used and should justify any exceptions.

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<sup>2</sup> As the 10 CFR Part 53 requirements are finalized this ISG guidance will be supplemented, as necessary, to provide guidance in the organizational and training areas to reflect any differences in requirements between Part 50/52 and Part 53.

The training programs should focus on those tasks that are important to plant operation with regard to nuclear safety, defense-in-depth, or that are risk significant using a systems (or systematic) approach to training (SAT) as defined by 10 CFR 55.4.

The program description addressing the applicable sections of 10 CFR Part 26, "Fitness for Duty Programs," should be provided in a CP/OL/COL application document separate from the safety analysis report.

#### Licensed Operator Training

OL and COL application should provide a description and schedule of the training programs for reactor operators and senior reactor operators that meet the requirements in 10 CFR 55 with milestones for implementation during construction. Also describe the licensed operator requalification programs as required in 10 CFR 50.54(i-1) and 10 CFR 55.59, "Requalification." Describe the time when the operator requalification program will be in effect.

The licensed operator training program description should address the use of a simulator. NRC RG 1.149, "Nuclear Power Plant Simulation Facilities for Use in Operator Training and License Examinations," is an acceptable approach for utilizing simulation facilities.

As an option to addressing the licensed operator training criterion, the applicant may provide a commitment to meet the guidelines of Nuclear Energy Institute (NEI) 06-13A, "Template for an Industry Training Program Description," for its licensed operator training program.

#### Non-licensed Personnel Training

For OL and COL applicants, describe the training program for non-licensed nuclear plant personnel that meets the requirements of 10 CFR 50.120(b)(2) and (b)(3). Describe how the training program is derived from a systems approach to training as defined in 10 CFR 55.

The non-licensed plant staff training program should include, in addition to the technical training that is required for each non-licensed plant staff position, training in the following areas: physical security, emergency protection, radiological emergency, administrative procedures, radiation protection, fire protection, quality assurance, and fitness for duty (addressed in a separate application document).

The application should describe a program to periodically evaluate the non-licensed plant staff training programs by individuals other than those directly responsible for the training. This evaluation should include an assessment of program effectiveness in developing the trainees' ability to meet performance requirements of the job. The program should be periodically revised and updated, to reflect the result of program evaluations, industry experience, and changes to the facility, procedures, regulations, and quality requirements.

The program descriptions should include the initial training, periodic retraining, and qualification that are required for non-licensed plant staff. These programs are to be established, implemented, and maintained 18 months prior to the scheduled date for initial fuel load.

As an option to addressing the non-licensed plant staff training criterion, the applicant may provide a commitment to meet the guidelines of Nuclear Energy Institute (NEI) 06-13A, "Template for an Industry Training Program Description," for its non-licensed plant staff training program.

### **Basis/number of operating shift crews, their staffing and responsibilities**<sup>3</sup>

Operator staffing requirements are addressed in:

- 10 CFR 50.54(m), addressing minimum requirements per shift for on-site staffing of nuclear power modules/units by operators and senior operators licensed under 10 CFR Part 55.

Describe the functions, responsibilities, and authorities of the following plant positions (OL or COL):

- operations supervisors,
- operating shift supervisors/managers,
- shift technical advisors,
- reactor operators and senior operators,
- non-licensed operators.

For each position listed above, describe the interfaces with offsite personnel or key management positions. Such interfaces include defined lines of reporting responsibilities (e.g., from the plant manager to the immediate superior), lines of authority, communication channels, and roles in risk-informed evaluations and decision making. Provide a description of the authority that may be granted to operations supervisors; to operating crew shift supervisors/managers, including the authority to issue standing or special orders; and to reactor operators and senior operators.

The application should describe the shift position titles, applicable operator licensing requirements for each, and the minimum numbers of personnel planned for each shift for all combinations of modules/units proposed to be at the station in either operating or safe shutdown mode. The applicant should also describe shift crew staffing plans unique to refueling operations. In addition, the application should describe the proposed means of assigning shift responsibility for implementing the radiation protection and fire protection programs on a round-the-clock basis where appropriate.

If the station contains, or there are plans that it contains, power generating facilities other than those specified in the application (e.g., fossil-fueled units), the applicant should describe interfaces with the organizations operating the other facilities. The description should include any proposed sharing of personnel between the units, a description of the duties of the shared personnel, and the proportion of the time these shared personnel will be assigned to the nonnuclear units.

For CP applicants, plans for staffing the operating organization may not be fully developed and staffed. It is acceptable if these plans are not fully developed, provided that the applicant either makes commitments or includes a license condition to ensure that the staffing plans are included in the OL application.

If an exemption is necessary from the licensed operator staffing requirements described in 10 CFR 50.54(m), the applicant should provide a basis for this exemption utilizing the guidance

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<sup>3</sup> As the 10 CFR Part 53 requirements are finalized this ISG guidance will be supplemented, as necessary, to provide guidance in the organizational and training areas to reflect any differences in requirements between Part 50/52 and Part 53.

contained in NUREG-1791, "Guidance for Assessing Exemption Requests from the Nuclear Power Plant Licensed Operator Staffing Requirements Specified in 10 CFR 50.54(m)." However, there are practical and prescriptive limitations in NUREG-1791 that prevent it from addressing certain considerations associated with advanced reactor designs. Notably, NUREG-1791 does not address reducing licensed operator staffing levels to zero, such as might be the case for a fully autonomous advanced reactor plant design. For fully autonomous plant, extensive preapplication activities are paramount.

#### Acceptance Criteria<sup>4</sup>

1. The applicant has described the assignment of plant operating responsibilities; the reporting chain up through the chief executive officer of the applicant; the proposed size of the regular plant staff; the functions and responsibilities of each major plant staff group; the proposed shift crew complement for single-module/unit or multiple-module/unit operation; the qualification requirements for key members of its plant staff.
2. The applicant is technically qualified, as specified in 10 CFR 50.34, 10 CFR 50.40, 10 CFR 50.48, and 10 CFR Part 50 or Part 52 (as applicable).
3. The key positions for ensuring the safe operation of the plant are in the operating organization. On-shift personnel are able to provide initial facility response in the event of an emergency.
4. The applicant has adequately described the groups and key positions responsible for implementing the initial test program and providing technical support for the operation of the facility.
5. The applicant has committed that the experience and qualifications of key members of the management and technical support organizations meet or exceed those endorsed by RG 1.8, or justified exceptions.
6. The applicant's organizational requirements conform to the guidance of RG 1.33, "Quality Assurance Program Requirements (Operation)" or has provided justified exceptions.
7. An adequate number of licensed operators will be available at all required times to satisfy the minimum staffing requirements of 10 CFR 50.54(j), (m), or the applicant has provided adequate justification for an exemption. Compliance with 10 CFR 50.54(i), (j), (k), (l), and (m) requires the applicant to demonstrate/describe how the operating organization satisfies minimum requirements for operator supervision and the availability of licensed senior operators and licensed operators during specific reactor conditions and modes of operation. Any requests for exemptions from the licensed operator staffing requirements specified in 10 CFR 50.54(m) should be justified using the guidance set forth in NUREG-1791, "Guidance for Assessing Exemption Requests from the Nuclear Power Plant Licensed Operator Staffing Requirements Specified in 10 CFR 50.54(m)."

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<sup>4</sup> As the 10 CFR Part 53 requirements are finalized this ISG guidance will be supplemented to provide guidance in the organizational and training areas to reflect any differences in requirements between Part 50/52 and Part 53.



8. Engineering expertise on shift should be consistent with the Commission's Policy Statement on Engineering Expertise on Shift and the guidelines of Three Mile Island (TMI) Action Plan Item I.A.1.1 of NUREG-0737.
9. The applicant has described the role and function of the AE and the NSSS vendors during design and construction and has described organizational controls over the project-related activities of the AE and nuclear reactor vendors including preservation of documentation.
10. The applicant has identified and described the reporting responsibilities and authorities in the functional areas of radiation protection/health physics, quality assurance, and training. The reporting responsibilities and authorities ensure independence from normal operating pressures.
11. The applicant has defined the responsibilities of the operating organization related to activities important to the safe operation and maintenance of the facility. Functional areas, (e.g., maintenance, operations, training, etc.), are separately supervised and/or managed.
12. Sufficient managerial depth is available to provide qualified backup for overall station operation in the event of unexpected contingencies of a temporary nature.
13. The number of licensed and non-licensed personnel for onsite shift operating crews should be sufficient to avoid the routine use of overtime.
14. The training program for licensed operators meets the requirements of 10 CFR 55.
15. The training program for non-licensed nuclear plant personnel meets the requirements of 10 CFR 50.120(b)(2) and (b)(3).

## **IMPLEMENTATION**

The staff will use the information discussed in this ISG to determine the following:

[Identify how the information will facilitate staff review of license amendments, license renewal applications, etc.]

## **BACKFITTING AND ISSUE FINALITY DISCUSSION**

[OGC provides this discussion, but the staff can propose text for OGC consideration].

Example: The NRC staff issuance of this ISG is not considered backfitting as defined in 10 CFR 50.109(a)(1), nor is it deemed to be in conflict with any of the issue finality provisions in 10 CFR Part 52.

## **CONGRESSIONAL REVIEW ACT**

[OGC provides this discussion to support issuance of the final ISG. However, the staff can propose text for OGC consideration].

Example: This ISG is a rule as defined in the Congressional Review Act (5 U.S.C. §§ 801-808). However, the Office of Management and Budget has not found it to be a major rule as defined in the Congressional Review Act.

## **FINAL RESOLUTION**

By [insert date], this information will be transitioned into [identify the appropriate regulatory process (Standard Review Plan (SRP), Regulatory Guide (RG))]. Following the transition of this guidance to the [SRP, RG], this ISG will be closed.

## **APPENDIX**

- A. Resolution of Public Comments

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## APPENDIX A

### Resolution of Public Comments

A notice of opportunity for public comment on this Interim Staff Guidance (ISG) was published in the *Federal Register* (insert FR Citation #) on [date] for a 30-60 day comment period. [Insert number of commenters] provided comments which were considered before issuance of this ISG in final form.

Comments on this ISG are available electronically at the NRC's electronic Reading Room at <http://www.nrc.gov/reading-rm/adams.html>. From this page, the public can gain entry into ADAMS, which provides text and image files of NRC's public documents. Comments were received from the following individuals or groups:

Letter No.	ADAMS No.	Commenter Affiliation	Commenter Name	Abbreviation
1				
2				
3				
4				
5				

The comments and the staff responses are provided below.

Comment 1: [Each comment summary must clearly identify the entity that submitted the comment and the comment itself].

NRC Response: Comment responses should begin with a direct statement of the NRC staff's position on a comment, e.g., "the NRC staff agrees with the comment" or the "NRC staff disagrees with the comment".

- If the NRC staff agrees, explain why and provide a clear statement as to how the relevant language was revised or supplemented to address the comment. Include the following language at the end of the comment response: "The final ISG was changed by <describe the change; if necessary by quoting the newly revised language>."
- If the NRC disagrees with a comment and no change was made to the generic communication, then explain why and provide the following language at the end of the comment response: "No change was made to the final ISG as a result of this comment."

## APPENDIX B

### References

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### Proposed ARCAP Document Structure

**Legend**

- Primary portions derived from TICAP
- Primary portions derived from separate ongoing regulatory activities
- Combination of new TICAP and ARCAP
- New ARCAP guidance being developed

\* Guidance referenced in the developed column is provided for consideration and may not always be applicable for a given design.  
 \*\*For more information on "additional activities," please see: <https://www.nrc.gov/reactors/new-reactors/advanced.html#advsumISRA>

Item #	Description	Content Breakdown (NEI 21-xx, RG, ISGs)		Clarifications Needed	ARCAP Disposition	Associated Guidance		Additional Comments
		TICAP (Industry-led)	TICAP/ARCAP (NRC-led)			Developed*	Additional Activities**	
1	Proposed FSAR Chapters	<ul style="list-style-type: none"> <li>-Overview of technology (size of the reactor and planned commercial application of the design—power production, industrial application, etc.)</li> <li>-General description of the plant systems and roles that they play in normal and off-normal conditions, including refueling</li> </ul>	<ul style="list-style-type: none"> <li>-General description of the plant systems (Baseline operating parameters).</li> <li>-General site characteristics</li> <li>oIntroduction</li> <li>oSite Characteristics and Site Parameters</li> <li>oGeography and Demography</li> <li>oNearby Industrial, Transportation, and Military Facilities</li> <li>oRegional Climatology, and Local Meteorology, and Atmospheric Dispersion (Basis for Section 2.3 below)</li> <li>oHydrological Description</li> <li>oGeology, Seismology, and Geotechnical Engineering</li> </ul>	<p>Will this chapter include general site characteristics typically described for sites (i.e. ARCAP Ch. 2)?</p> <p>Industry would prefer to see general site information in Chapter 1 but not the detailed information supporting the Design Basis External Hazard Levels. That could potentially go in Chapter 2.</p> <p>Industry notes that NRC ARCAP is working on reducing the level of detail in the SAR related to the site (which is generally acknowledged to be too detailed).</p>	<p>ARCAP Disposition</p>	<ul style="list-style-type: none"> <li>-NEI 18-04</li> <li>-RG 1.233 and RG 1.232</li> <li>-Commission's 2008 "Policy Statement on Adv. Reactors"</li> <li>-TMI Requirements 10 CFR 50.34(f)</li> <li>-NUREG-0933 GSIs and USIs</li> </ul>	<ul style="list-style-type: none"> <li>-TICAP</li> <li>-ARCAP developing various subsections</li> </ul>	<ul style="list-style-type: none"> <li>-Includes generic description of safety case for design.</li> <li>-Commission statement can be found at FRN Vol. 73, No. 199, 10/14/2008</li> <li>-NEI 18-04, RG 1.232 and RG 1.233 are only mentioned once but are applicable to all proposed ARCAP dispositions colored green and blue.</li> </ul>

<p>2</p>	<p>Ch. 1 - General Plant Information, Site Description, and Overview of the Safety Case</p>	<p>•Summary of Safety Case Findings  oOverview of affirmative LMP-based safety case methodology, including reference to NEI 18-04 and any deviations from the approved methodology  oSummary of FSFs  oSummary of LBEs with focus on DBAs  oSummary of radiological consequence assessment  oSummary of how the design provides that FSFs are met—key plant attributes and design features that provide reasonable assurance of adequate protection of public health and safety  oEvaluation of DID capabilities  Industry considers that the detailed information should be provided in subsequent chapters. An LBE by LBE discussion is not intended, for example; that is provided in Chapter 3.</p>	<p>RG 1.170 for geographical format  - RG 4.7 (awaiting Commission direction on SECY-20-0045)  - RG 1.191  - RG 1.176  - RG 1.221  - RG 1.27  - RG 1.23  - RG 1.145  - RG 1.111  - RG 1.194  - RG 1.159  - RG 1.102  - NUREG-2115  - ANS/ANSI 2.27 - 2020  - ANS/ANSI 2.29 - 2020  - NUREG 2213  - ANS/ANS 2.26-2004  - ASCE/SEI 43-05  - RG 1.132  - RG 1.138  - USACE EM1110-2-1902  - RG 1.198</p>	<p>-SECY-20-0045  "Population Related Siting Considerations for Adv. Rxs"  -DG-4028 "Volcanic Hazards Assessments for Proposed NPPs"  -RES Guidance on RIPB Approach to Seismic Safety  -Non-LWR MELCOR Demonstration Project  - RG 1.59 in the process of being updated. In addition staff developing RG associated with dam safety reviews</p>	<p>This used to be the "PRA Overview" Section 12 in the previous version, it is now Ch. 2</p>
<p>Ch. 2 - Generic Analyses</p>	<p>2.1 - Probabilistic Risk Assessment  oOverview of PRA  oSummary of Key PRA Findings  2.2 - Source Term  2.3 - Meteorology  2.4 - Other Generic Analyses</p>	<p>2.5 - External Hazards Evaluation  Industry notes that NRC ARCAP is working on reducing the level of detail in the SAR related to the site (which is generally acknowledged to be too detailed).  2.6 - Analyses of Systems, Components, and Materials Performance  Needs additional discussion. Industry notes that SSC-specific information is proposed to be provided in Chapters 6 and 7.  2.7 - Analytical Codes  Needs additional discussion. To the extent codes need to be discussed in the SAR, this can be done in the LBE section (Chapter 3) or via reference to a topical report. To the extent a computer code is a key analytical tool for several analyses, it might be appropriate to address it in this chapter.</p>	<p>Chapter 2 states the "applicant may provide information about additional generic analysis used in subsequent subsections." What does this mean? Provide examples to clarify the types of analysis and potential subsections.  Beyond those examples already provided (e.g., source term), examples would likely be technology-specific. See computer code example under Section 2.7.</p>	<p>-RG 1.200  - RG endorsing non-LWR PRA Standard  -TCAP Ch. 2 and ARCAP Ch. 12</p>	<p>-RG 1.200  -TCAP Ch. 2 and ARCAP Ch. 12</p>

3	Ch. 3 – License Basis Event Analysis	<p>3.1 –Licensing Basis Event Selection Methodology</p> <p>3.2 –Anticipated Operational Occurrences</p> <p>3.3 –Design Basis Events</p> <p>3.4 –Beyond Design Basis Events</p> <p>3.5 –Design Basis Accidents</p>	<p>Where will the aircraft and loss of large area analysis be described? Needs additional discussion. The issue for this chapter appears to be the inclusion - or not - of those events for which assessments are required but which do not evolve from the LMP process. Specifically, aircraft impact (50.150) and loss of large area (LOLA) (50.155). If these assessments are included in Chapter 3, they should be in a specific section outside of the LMP-derived events. Industry considering a new Section 3.6 entitled "Special Event Analyses."</p>	<p>-SECY-16-0012, "Accident Source Terms and Siting For Small Modular Reactors And Non-Light Water Reactors." -RG 1.217 -NEI 07-13, "Methodology for Performing Aircraft Impact Assessments for New Plant Designs" -RG 1.203</p>	<p>-TICAP Strategy 2 Code Assessment support -TICAP Ch. 2 and 3 -Non-LWR MELCOR Demonstration Project -TICAP Ch. 3</p>	<p>This Chapter now incorporates DBA Analysis, which was previously Ch.6</p>
4	Ch. 4 – Integrated Evaluations	<p>4.1 –Evaluation of Integrated Plant Risk</p> <p>4.2 –Defense-in-Depth</p>	<p>4.2 –Defense-in-Depth 4.2.1 –Plant Capability DID 4.2.2 –Programmatic DID</p>	<p>Industry is considering developing the necessary guidance for both 4.1 and 4.2. It is suggested that ARCAP comment on that guidance when provided rather than developing it independently.</p>	<p>-RG 1.145</p>	<p>-TICAP Ch. 4</p> <p>This Chapter now incorporates "Defense in Depth" which was previously Ch 7 on the Table</p>
5	Ch. 5 – Safety Functions, Design Criteria, and SSC Categorization	<p>5.1 –Principal Design Criteria and Safety-Related SSCs</p> <ul style="list-style-type: none"> <li>• Required Safety Functions</li> <li>• Required Functional Design Criteria</li> </ul> <p>5.2 –Complementary Design Criteria and Non-Safety-Related with Special Treatment SSCs</p> <ul style="list-style-type: none"> <li>• Risk Significant Safety Functions</li> </ul>	<ul style="list-style-type: none"> <li>• SR and NSRST operator actions – input to determining staffing levels, I&amp;C safety categories; human factors analysis, training, etc</li> <li>• Validation of equipment qualifications – where will the qualification of equipment (seismic, environmental) be addressed?</li> </ul> <p>Industry notes that Equipment qualification is a special treatment associated with SSCs - see Chapters 6 and 7.</p> <ul style="list-style-type: none"> <li>• Description of the analytical codes (TH, reactor physics, fuel performance) used in the safety analysis and how they were validated be provided.</li> </ul> <p>Industry considers that to the extent information on computer codes is needed in the SAR, it would be provided in Chapter 3 with the associated LBE or in Chapter 2, if a cross-cutting tool.</p>	<p>Chapter 5 states that SR and NSRST operator actions will be identified. What is to be done with these? Industry considering linking to supporting plant programs that provide reasonable assurance that the actions will be accomplished.</p>	<p>-SECY-18-0096 "Functional Containment Performance Criteria for non-LWRs" -RG 1.201 -RG 1.129 -RG 1.100 -NUREG-0800 (SRP) Sec. 4.2 -ATF-ISG-2020-01</p>	<p>- TICAP Ch. 5, 6, and 7 - RG endorsing ASME Sec III, Div 5 "High Temp Materials" -RG endorsing ASME Sec XI, Div 2 "Reliability Integrity Management" -Fuel Qualification Guidance (white paper and subsequent NUREG) -Topical Report on TRISO fuel -DRG for I&amp;C Reviews -MSR Fuel Qualification Guidance</p>







21	Emergency Plan							-NUREG-0396 -NUREG-0654 -RG 1.101	-SECY-18-0103 related to EP for SMRs and other technologies -SECY-18-0075 related to Consequence Based Security	EP rulemaking expected to develop guidance in this area Physical security rulemaking expected to develop guidance in this area
22	Physical Security Plan									
23	SNM physical protection plan									MC&A is an issue that has identified as needing to have guidance developed for some of the non-lwrs. A pebble-bed MC&A application standard and review standard has been developed by ORNL. MC&A for liquid fueled molten salt reactors will be a particular challenge. Does NUREG-2159 apply?
24	SNM material control and accounting plan									
25	Fire Protection Program (Operational)						-RG 1.189			Results of TICAP developed affirmative safety case expected to influence fire protection program No special guidance is planned as part of Industry-developed TICAP.
26	Radiation Protection Program									Relates to ARCAP Chapter 9 above - more specific guidance being considered.
27	Offsite Dose Calculation Manual									Relates to ARCAP Chapter 9 above - more specific guidance being considered.
28	Inservice Inspection/Inservice testing (ISI/IST)						-RG 1.17 -RG 1.178			TICAP outcomes expected to heavily influence ISI/IST. In addition ASME Section XI Section 2 guidance identified as needing to be developed. The link to industry-developed TICAP is through special treatment requirements. Industry-developed TICAP does not intend to develop guidance on documenting ISI/IST programs.
29	Environmental Report and Site Redress Plan						-RG 4.2 -NUREG-1555 -COL/ESP-IG-026 -COL/ESP-IG-027			
30	Financial Qualification and Insurance and Liability									Report under development to address issues
31	Cyber Security Plan						-RG 5.71			Unclear at this point how much TICAP guidance will be provided in this area Industry-led TICAP is not planning to develop cyber security-specific guidance (subset of security guidance).