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Sent:	Thursday, November 5, 2020 4:30 PM
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Subject:	Info: Supporting Information for December 10, 2020, Technology Inclusive Content of Application Project and Advanced Reactor Content of Application Project Stakeholder Meeting
Attachments:	Draft ARCAP Chapter 2 11-5 version.docx; Draft Concept for Updated TICAP-ARCAP Combined Outline.docx; Comments on industry developed TICAP Annotated Outline.docx

To: Amir Afzali
Southern Company Services
Licensing and Policy Director – Next Generation Reactors

Kati Austgen
Sr. Project Manager, New Reactors
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Cyril Draffin
Senior Fellow, Advanced Nuclear
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Mr. Afzali, Ms. Austgen, and Mr. Draffin,

The purpose of this email is to provide you with the attached information to support the upcoming December 10, 2020, public meeting on the technology inclusive content of application project (TICAP) and the advanced reactor content of application project (ARCAP). 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.

Supporting Information for the TICAP/ARCAP Public Meeting

In preparations for the December 10, 2020, public meeting the NRC staff has developed the attached three documents. A brief description of the documents is as follows:

- The purpose of providing the document titled, "Comments on industry developed TICAP Annotated Outline," is to provide NRC staff comments on the TICAP outline discussed during an October 22, 2020, meeting (available at Agencywide Documents Access and Management System (ADAMS) Accession No. ML20294A382).

- The purpose of providing the document titled "Draft Concept for Updated TICAP-ARCAP Combined Outline," is to provide initial concepts for how the industry developed TICAP final safety analysis report (FSAR) outline discussed during an October 22, 2020, meeting (available at ADAMS Accession No. ML20294A382) could be merged with the NRC staff developed ARCAP

outline found at ADAMS Accession No. ML20107J565. The items in the blue font found in this document were extracted from the ARCAP outline and placed in what the NRC staff believes could be the appropriate place in the TICAP outline. The items at the end of the outline fall outside the scope of the final safety analysis report (FSAR). More information regarding the NRC staff's concepts for application information found outside the FSAR can be found in a document titled, "Proposal for Technology Inclusive Content of Application Project and Advanced Reactor Contents of Application Project Guidance Document Development," dated October 15, 2020 (ADAMS Accession No. ML20289B025).

- The staff has also developed the attached ARCAP draft Chapter 2, "Site Information." As discussed in previous TICAP/ARCAP meetings the staff stated that it was developing this document. This document includes a proposal to limit the amount of material in SAR Chapter 2 to that which is necessary for establishing safety significant design parameters and performing the safety analysis, along with its supporting bases.

We look forward to discussing the attached three documents during the upcoming public meeting. In the interim, please let me know if you have any questions.

Sincerely,

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

Hearing Identifier: NRR_DRMA
Email Number: 875

Mail Envelope Properties (MN2PR09MB5481AA2A8C9DFE152FEFB3D2F8EE0)

Subject: Info: Supporting Information for December 10, 2020, Technology Inclusive Content of Application Project and Advanced Reactor Content of Application Project Stakeholder Meeting
Sent Date: 11/5/2020 4:30:08 PM
Received Date: 11/5/2020 4:30:08 PM
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Files	**Size**	**Date & Time**	
MESSAGE	4880	11/5/2020 4:30:08 PM	
Draft ARCAP Chapter 2 11-5 version.docx	58238		
Draft Concept for Updated TICAP-ARCAP Combined Outline.docx			35688
Comments on industry developed TICAP Annotated Outline.docx			36146

Options
Priority: Normal
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:

2. Site Information[1]

Chapter 2 of the SAR should provide information on the geological and demography, seismological, hydrological, and meteorological characteristics of the site and the surrounding vicinity. Present and projected population distribution, land use and site activities and controls should also be discussed. The purpose of this information is to demonstrate compliance with 10 CFR 100, Subpart B, and the relevant parts of 10 CFR 50 and 52 that discuss site related issues and to describe the site characteristics used in the design and safety analysis where (i) a design basis external hazard level must be specified for each system, structure, or component (SSCs) designed to withstand this hazard with no adverse impact on their capability to perform their required safety function (RSF) or (ii) an SSC is relied upon to establish the adequacy of defense-in-depth and must be designed with special treatment to withstand a given hazard. Site characterization data (e.g., meteorological, regional seismic, hydrologic) need only be provided to the extent that it is needed to provide the bases for the external hazards considered in the design and safety analysis and the bases for excluding other external hazards.

The guidance in this chapter applies to non-LWRs, stationary micro reactors and small modular LWRs submitting applications for a CP or OL under 10 CFR 50, for a COL under 10 CFR 52 or for an Early Site Permit (ESP) under 10 CFR 52. The guidance specifies the factors to be considered when evaluating sites, including seismic and non-seismic parameters. The information provided in the SAR needs to describe the basis for the site parameters selected for the design and safety analysis. However, data documenting historical records, detailed geological exploration, data for use in environmental assessments or other data not directly related to the establishment of parameters used in the design or safety analysis need not be included in the SAR. If not included in the SAR, the information should be documented in a separate report available for audit by the NRC staff, and specifically referenced in the SAR.

For design certification (DC) applications (10 CFR 52.47(a)(1)), Standard Design Approval (SDA) applications (10 CFR 52.137(a)(1)), and COL applications referencing an ESP (10 CFR 52.79(b)(1) and (2)), the Chapter 2 SAR content should describe the site-related parameters postulated for the design. Specifically, this section should address the complete set of postulated site parameters that have been considered in the design, i.e., top-level bounding site parameters that have been used to define a site as suitable for the facility. Because the postulated site parameters are used in evaluations of the safety of the design, the actual site where the design is to be located must fall within the postulated site parameters assumed in the design and safety analysis. NEI 10-01, "Industry Guideline for Developing a Plant Envelope in Support of an Early Site Permit", dated

[1]Note that the language used throughout this document is consistent with Regulatory Guide 1.233, Revision 0, "Guidance for a Technology-Inclusive, Risk-Informed, and Performance-Based Methodology to Inform the Licensing Basis and Content of Applications for Licenses, Certifications, and Approvals for Non-Light-Water Reactors," dated June 2020 (ADAMS Accession No. ML20091L698). Terms defined in this regulatory guide are consistent with the licensing modernization project (LMP)-based philosophy. The terms such as "safety-related," and "design basis event," have different definitions in an LMP-based approach than the definitions for these terms found in 10 CFR Part 50. The reviewer should be cautious when applying this guidance to applications that are not based on an LMP approach.

March 2010, contains a comprehensive description of the site parameters that need to be defined to establish the site envelope.

For CP (10 CFR 50.33, 34 and 35), OL (10 CFR 50.33 and 34), ESP (10 CFR 52.17), COL (10 CFR 52.79(a)(1)(i) through (vi)), COL referencing a DC or an SDA (10 CFR 52.79) applications, this section of the SAR should demonstrate that the requirements of 10 CFR 100, Subpart B, and the site related parts of 10 CFR 50 or 52 are met and should describe the site parameters used in the design and safety analysis and their bases.

The descriptions in this chapter are based on the information that is expected to be provided in an FSAR. As described in 10 CFR 50.34(a), a PSAR should contain information sufficient to show that the site evaluation factors of 10 CFR 100 are met. This essentially means that the PSAR site information needs to reflect final site characterization data. However, in some cases additional confirmatory site characterization work may take place during the construction period, in which case the CP application needs to describe any commitments to further characterize the site.

For the assessment of external hazards in accordance with regulatory guide 1.233 a set of Design Basis External Hazard Levels (DBEHLs) will be selected to form an important part of the design and licensing basis. This will determine the design basis seismic events and other external events that the SR SSCs will be required to withstand. When supported by available methods, data, design, site information, and supporting guides and standards, these DBEHLs will be informed by a probabilistic external hazards analysis and will be included in the PRA after the design features that are incorporated to withstand these hazards are defined. Other external hazards not supported by a probabilistic hazard analysis will be covered by DBEHLs that are determined using traditional deterministic methods.

In many cases, it is expected that the initial selection of SR SSCs and selection of the DBAs will be based on a PRA that includes internal events but has not yet been expanded to address external hazards. With the understanding that SR SSCs are required to be capable of performing their required safety functions in response to external events within the DBEHL, there will be no new design basis accidents introduced by external hazards.

Some design basis external events such as external floods or seismic events may impact multiple reactor modules concurrently; therefore, a design objective would be to prevent a substantial release for such events. If an SSC is relied upon to establish the adequacy of defense-in-depth, analysis may require that the SSC be designed with special treatment to withstand a given hazard.

The following subsections describe the information expected to be included in the SAR for those applications that include a request for site approval (i.e. CP, OL, COL, ESP and COL referencing a DC or an SDA):

2.1 Site Characteristics and Site Parameters (Overview)

As required by 10 CFR 100.20(c), this subsection should provide an overview of the site location, the surrounding area, local and regional geological, seismological, hydrological, and meteorological characteristics. Current and projected area population distributions

surrounding the site should be identified as well as land use and access control to surrounding areas. The sections below provide additional descriptions of the information requested and the acceptance criteria applicable in each of these areas. In providing the information requested in the sections below, the regulatory guidance used by the applicant should be identified and justified as appropriate for use. Deviations from the regulatory guidance used should be explained and justified. Methods used as an alternative to regulatory guidance should be described and justified. Previous studies used to justify conclusions about the site should be referenced and made available for NRC staff audit.

In accordance with 10 CFR 100.20(a), 21(f) and 21(g), the application should confirm the site does not pose any significant impediments to the development of emergency plans, that adequate security measures can be developed and that the radiological risk to the public from potential accidents is low.

Acceptance Criteria

- The application provides and substantiates sufficient information to establish actual characteristics of the proposed site (for CP, OL, ESP and COL applications) or has postulated site parameters used in DC or SDA applications that will likely bound actual site parameters for sites that may be proposed for locating a DC or SDA design.

- The information provided is sufficient for the reviewer to determine that in the development of emergency plans, there are no constrictions to egress pathways and that there are multi-direction egress pathways that would support relocating members of the public to a safe location following or in anticipation of a release of radioactive material and, likewise, would support emergency responders ingress to the site.

- The application contains sufficient information to conclude that the site does not contain any geographical features that would give an attacker a tactical advantage or affect the establishment of effective security measures.

- Regarding the demonstration of low radiological risk to the public, the application shows that the requirements of 10 CFR 50.34(a)(1) are met when using site specific parameters.

- Regulatory guidance used is identified along with justification for its use. Alternatives to regulatory guidance or previous studies used are likewise identified and justified.

2.2 Geography and Demography

2.2.1 Site Location and Description

This subsection should include a suitably scaled map depicting the site area with explanatory text, as necessary. The application should specify the location of each reactor at the site by latitude and longitude to the nearest second and by Universal

Transverse Mercator Coordinates (zone number, northing, and easting, as found on topographical maps prepared by the U.S. Geological Survey (USGS)) to the nearest 100 meters (328 feet). The applicant should consult the USGS map index for specific names of the 7½-minute quadrangles that bracket the site area. This section should also identify the Federal, State and county (or other political subdivisions) in which the site is located, as well as the location of the site with respect to prominent natural features (such as rivers and lakes) and manmade features (such as industrial, military, and transportation facilities).

Acceptance Criteria

- The site map should describe highways, railroads, and waterways that traverse the exclusion area and provide a complete topographical description of the site and surrounding area out to 50 miles (80 kilometers).

- The site map should contain sufficient information to allow the reviewer to identify the types and locations of natural and manmade features and potential hazards on or near the site and the local, State or Federal jurisdictions associated with the site and its surrounding area.

2.2.2 Exclusion Area Authority and Control

This subsection should include descriptions of the exclusion area and the applicant's legal rights with respect to all areas that lie within the designated exclusion area. As specified by 10 CFR 100.21(a), this description should establish that the applicant has the authority to determine all activities, including control of traffic and exclusion and removal of personnel and property from the area. The discussion should also address the status of mineral rights and easements within this area.

If the applicant has not obtained ownership of all land within the exclusion area, it should use a scaled map of the exclusion area to clearly describe those parcels of land not owned within the area. The applicant should also clearly describe the status of the proceedings and the schedule to obtain ownership or the required authority over the land for the life of the facility. This section should give the minimum distance to and direction of the exclusion area boundary (EAB) for both present and proposed ownership. If the exclusion area extends into a body of water, the application should specifically address the bases upon which it has been determined that the applicant holds (or will hold) the authority over this portion of the exclusion area.

Activities that will be permitted within the exclusion zone or that are unrelated to facility operation (aside from transit through the area) should be described and should not pose a significant hazard to the public health and safety. Limitations and conditions imposed to control activities unrelated to facility operations including accidents associated with such activities, arrangements for traffic control, and abandonment or relocation of roads, should be discussed.

Acceptance Criteria

- The information provided by the applicant provides sufficient detail to enable the reviewer to evaluate the applicant's legal authority within the designated exclusion area.

- The information provided by the applicant confirms that any activities permitted within the exclusion area pose no hazard to the facility and there is reasonable assurance that persons engaged in such activities can be evacuated without receiving additional radiation doses in excess of the values given in 10 CFR 50.34(a)(1).

- The application confirms that the applicant has the authority to determine all activities within the exclusion area, including exclusion, traffic control, or removal of personnel or property from the area.

2.2.3 Population Distribution

In accordance with 10 CFR 100.3 and 21.(a), (b) and (h), population data, based on the latest census data, should be provided based on the projected year of facility approval and each decade thereafter out to the requested operating period of the facility not to exceed 40 years, using a geographical format as given in RG 1.70 , "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants." Specific location(s) of potentially affected populations surrounding the site should be identified and described. Discussion should include proposed exclusion area boundaries, local and surrounding area access control, activities, traffic, and transient and permanent population densities that may be influenced by the facility or surrounding recreational land use. Discussions should be at a level and extent commensurate with the potential vulnerabilities and risks associated with normal and off-normal facility operations. This section should describe information regarding:

- Population within the outer edge of the plume exposure pathway emergency planning zone

- Population information necessary to provide ingestion response planning

- Transient population

- Description of the low population zone (LPZ) – refer to Regulatory Guide 4.7, "General Site Suitability Criteria for Nuclear Power Stations."

- The nearest boundary of the closest population center containing 25,000 or more residents

- Population density out to 20 miles (32 km) from the proposed facility site

Acceptance Criteria

- The application confirms that the population data provided is based on the latest census and that the methods and sources used to make future population projections are described, reasonable and used to project population distribution at the year of facility approval and out to the requested operating period of the facility not to exceed 40 years.

- The application describes the timing, magnitude and rationale for any transient populations in the vicinity of the site.

- The application provides information that defines the LPZ and demonstrates protective measures can be taken for the population within the LPZ.

- The application shows that the nearest population center of 25,000 people or more is at least 1.33 times the distance to the outer edge of the LPZ so that the facility is located away from densely populated centers.

- Population density conforms to the guidelines in RG 4.7.

- When Commission direction is received on SECY-20-0045, "Population-Related Siting Considerations for Advanced Reactors", that direction will need to be factored into the acceptance criteria.

2.3 Nearby Industrial, Transportation, and Military Facilities

In accordance with 10 CFR 100.20(b) and 21(e), potential hazards associated with nearby transportation routes, industrial and military facilities, and civilian and military airports must be evaluated. The review focuses on potential external hazards or hazardous materials that are present, transported or may reasonably be expected to be present or transported during the projected lifetime of the proposed facility. The evaluation should cover the nature and extent of the nearby activities, including location, distance from the site, frequency of the activities, and the potential hazard they pose to the proposed facility.

The application should evaluate the industrial and military activities within 5 miles (8 km) from the facility site for hazardous activities with special attention to activities within 0.6 miles (1 km) from the site that can potentially damage the facility. Facilities and activities at distances greater than 5 miles (8 km) should also be considered if they have the potential for affecting facility safety-related features. The evaluation should be based on statistical data for each identified hazard. Each hazard that has the potential to result in an event sequence with an estimated frequency of occurrence greater than 5 in 10 million per year should be evaluated for its potential to affect the facility such that the 10 CFR 100 dose guidelines (i.e. 10 CFR 50.34(a)) could be exceeded. If the frequency of the hazard cannot be determined, it is

acceptable to use an initiating event frequency of one in one million per year, provided there is qualitative justification that the realistic frequency is lower. If the event sequence has the potential to exceed the 10 CFR 100 dose guidelines, the hazard shall be considered a licensing-basis event and the design parameters for the affected SSCs identified.

The assessment of each hazard for its potential to become a licensing-basis event for the proposed facility are described in NEI 18-04 and RG 1.233. The applicant should also determine whether bulk storage of hazardous materials is present at or near the site and assess the impact of explosions (see RG 1.91, "Evaluation of Explosions Postulated to Occur at Nearby Facilities and on Transportation Routes Near NPPs") and/or hazardous chemical releases on facility safety. The evaluation needs to show that there is no undue risk to the applicant's facility from these hazards because they are rare events, they have negligible consequences, or are considered in the facility safety design.

Additional explanation regarding the scope of the hazards to be considered can be found in Regulatory Guide 4.7, "General Site Suitability Criteria for Nuclear Power Stations."

Acceptance Criteria

- The information in the application provides a complete and current overview of the facilities, activities, and materials located and/or transported in or through the vicinity of the proposed site.

- The application describes the nature and extent of activities conducted at the site and in its vicinity, including the products and materials likely to be processed, stored, used, or transported and facilities nearby including their location and distance from the facility and the nature of the hazard they pose to the proposed facility.

- The application provides sufficient statistical data to establish the basis for evaluating each potential hazard to the facility at the proposed site.

- The application assessed each potential hazard at the site using appropriate methodology (recommended in NEI 18-04 Rev 1, or in justified alternative guidance) and data.

2.4 Regional Climatology, Local Meteorology, and Atmospheric Dispersion

In accordance with 10 CFR 100.21(c), this subsection of the application should describe meteorological characteristics at the site and the surrounding area, including sources for the meteorological hazards used as design parameters (note that more updated sources may be available). The general climate of the region should be described with respect to general airflow patterns (wind direction and speed), temperature and humidity, precipitation (rain, snow, sleet, and freezing rain), potential influences from regional topography, and relationships between synoptic-scale atmospheric processes and local (site) meteorological conditions.

Regional meteorological data should be based on climate summaries produced by the National Oceanographic and Atmosphere Administration (NOAA) and severe weather based on data from the National Weather Service (NWS), military or other recognized organization. Historical records should be examined with respect to temperatures, annual and seasonal (if available) frequencies of severe weather phenomena, including hurricanes, tornadoes and waterspouts, thunderstorms, severe wind events, lightning, hail (including probable maximum size), and high air pollution potential. Annual frequency of occurrence, amount, and time duration of freezing rain (ice storms) and dust (sand) storms should be provided where applicable.

RG 1.76, "Design-Basis Tornado and Tornado Missiles for Nuclear Power Plants," and RG 1.221, "Design-Basis Hurricane and Hurricane Missiles for Nuclear Power Plants," contain information on developing the design parameters for tornado and hurricane hazards, respectively. Sufficient data should be collected to support defining design basis wind velocities, precipitation (rain, snow, sleet, hail, and freezing rain), temperatures, tornados and tornado missiles, including their effect on the Ultimate Heat Sink (UHS) (see RG 1.27, "Ultimate Heat Sink for NPPs", for additional guidance).

In general, the 100-year return period should be used to select the extremes in rainfall, snowpack, wind speed, humidity and temperature. Data on severe weather phenomena should be based on standard meteorological records from nearby representative NWS, military, or other stations recognized as standard installations that have long periods of data on record. The applicability of these data to represent site conditions during the expected period of reactor operation should be substantiated.

As described in RG 1.23, atmospheric dispersion estimates for use in accident analysis should be based on at least 2 years of onsite meteorological data. Long-term atmospheric dispersion estimates for routine (normal) release should also be based on 2 years of onsite meteorological data and should provide estimates for special receptors out to 50 miles (80 km). If 2 years of onsite data are not available at the time the application is submitted, the applicant should provide at least one annual cycle of meteorological data collected on site with the application. The applicant should continue to monitor the data and submit the complete 2-year data set when it has been collected. RG 1.23 also provides additional options for collection of meteorological data for an ESP that an applicant can choose to follow.

If the historical information is not included in the application, it should be available in a separate report for NRC staff audit and to submit on the docket, if necessary. At a minimum, the application should summarize the basis for establishing the meteorological parameters and values selected for design.

An onsite meteorological measurement program may be required to support the analysis. If it is determined an on-site meteorology program is necessary, RG 1.23, "Meteorological Monitoring Program for Nuclear Power Plants," contains guidance for acceptable onsite meteorological programs; deviations from this guidance should be discussed and justified.

Sufficient information should be provided to enable estimation of: (1) Short-term atmospheric dispersion estimates during accident releases, and (2) Long-term atmospheric dispersion estimates for routine releases, during both normal and off-normal facility operating conditions. Guidance for determining the short-term atmospheric dispersion estimates is contained in RG 1.145, "Atmospheric Dispersion Models for Potential Accident Consequence Assessment at Nuclear Power Plants." Guidance for determining the long-term (routine-release) dispersion estimates is contained in RG 1.111, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water Cooled Reactors."

If a reactor design includes a control room that requires operator action to either accomplish required safety functions or to implement defense-in-depth measures, sufficient information should be provided to estimate atmospheric dispersion values in support of design basis control room radiological habitability assessments. RG 1.194, "Atmospheric Relative Concentrations for Control Room Radiological Habitability Assessments at Nuclear Power Plants," describes methods acceptable for estimating these values.

Acceptance Criteria

- The description in the application of the regional climate is based upon climatic summaries produced by NOAA or NRC guidance documents that cover specific design parameters.

- The application data on severe weather that may impact the facility is based on NOAA, NWS, military or other recognized organization data or NRC guidance documents that cover specific design parameters.

- Tornado parameters and associated missiles for the site described in the application are consistent with the latest revision to RG 1.76, "Design Basis Tornado and Tornado Missiles for Nuclear Power Plants."

- Hurricane wind and missiles parameters for the site described in the application are consistent with RG 1.221, "Design-Basis Hurricane and Hurricane Missiles for Nuclear Power Plants."

- Other local climate parameters (temperatures, humidity, rainfall, etc.) that are used in design or can affect the UHS are described and their effects on the UHS evaluated. The performance of UHS systems that rely on water sources to maintain SSCs should be determined following the guidance in the latest revision to RG 1.27, "Ultimate Heat Sink for Nuclear Power Plants."

- .Joint frequency distributions (see RG 1.23 for description) for use in the atmospheric dispersion models described in RG 1.145, "Atmospheric Dispersion Models for Potential Accident Consequence Assessment at NPPs," and RG 1.111, "Methods for

Estimating Atmospheric Transport and Dispersion Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors," are provided.

- If the reactor design includes a control room that requires operator action to either accomplish required safety functions or to implement defense-in-depth measures, hourly meteorological data from the onsite meteorological monitoring program (see RG 1.23, "Meteorological Monitoring Programs for Nuclear Power Plants") should be provided for use in the atmospheric dispersion model described in RG 1.194.

2.5 Hydrological Description

In accordance with 10 CFR 100.20 (c)(3) and 10 CFR 100.21(d), applications should describe all hydrologically related site characteristics (e.g. probable maximum flood, groundwater table, aquifers, etc.) and summarize the design bases for the site parameters and values selected for the design of safety related SSCs and analysis of the transport of radioactive material resulting from spills or leaks of liquid waste. Detailed hydrological information used to establish design parameters may be documented in a separate report that is made available for NRC staff audit.

Acceptance Criteria

- The application provides sufficient data to determine the surface water and groundwater uses in the vicinity of the facility that could affect the safety related water supply to the facility or could be pathways for carrying radioactive material offsite.

- The application provides sufficient data showing the interface of the facility with the flood plain for different size floods, including the possible causes of the floods.

2.5.1 Floods

For sites located in river valleys, on flood plains, or along coastlines where a potential for flooding exists, this subsection should describe the potential for floods and define the probable maximum flood (PMF). Regulatory Guide 4.7, "General Site Suitability Criteria for Nuclear Power Stations," and Regulatory Guide 1.59, "Design Basis Floods for Nuclear Power Plants," should be used to describe the potential for flooding. The level of analysis presented in this section may range from conservative, based on simplifying assumptions, to detailed analytical estimates.

The following phenomena or conditions should be considered:

- probable maximum precipitation, on site and on the contributing drainage area

- runoff floods for streams, reservoirs, adjacent drainage areas, and site drainage, and flood waves resulting from dam failures induced by runoff floods
- surges, seiches, and wave action
- tsunami
- non-runoff-induced flood waves attributable to dam failures or landslides, and floods attributable to failure of onsite or near-site water control structures
- ice jam flooding
- combinations of various flood types (e.g., riverine flood plus dam failure flood)
- dilution and dispersion of severe accidental releases to the hydrosphere relating to existing and potential future users of surface water and groundwater resources
- stream channel migration hazard related to flood and mud flows

Effects of blockage by natural events, low water and/or drought effects, channel migrations and diversions, and capacity requirements should be considered in addition to the items listed above for the required safety functions and defense-in-depth associated with cooling water sources.

Acceptance Criteria

- The application describes the Design Basis Flood proposed for the site and its basis consistent with the guidance in Regulatory Guide 1.59. Regulatory Guide 1.233, "Guidance for a Technology-Inclusive, Risk-Informed, and Performance-Based Methodology to Inform the Licensing Basis and Content of Applications for Licenses, Certifications and Approvals for Non-Light Water Reactors," provides guidance to determine design-basis external events (e.g., seismic or flood events) that the safety related SSCs will be required to withstand.
- The application describes the probable maximum precipitation at the site, the drainage paths and the potential for blockage of the drainage pathways.
- For coastal sites, the application describes the potential for tsunamis and/or seiches, including their sources and any past events in the vicinity.
- The application describes the potential for and effects of upstream and downstream dam failures.

- The application describes any other mechanisms that could cause the site to be flooded (e. g. ice dams) or result in low water situations, and their impact on the required safety functions or defense-in-depth associated with the design.

2.5.2 Flooding Protection

Site elevations as well as structures, exterior accesses, equipment, and systems that impact a required safety function or defense-in-depth function should be identified and described from the standpoint of flood hazard (both surface and subsurface). A topographic map of the site should be provided showing any proposed changes to natural drainage features. RG 1.102, "Flood Protection for Nuclear Power Plants," provides guidance on identifying and establishing the necessary protections for safety related SSCs that may be exposed to flooding and implementing appropriate protection measures. If an SSC is relied upon to establish the adequacy of defense-in-depth, then analysis is needed to determine whether it needs to be designed with special treatment to withstand a flooding hazard.

Descriptions of existing and proposed water control structures, both upstream and downstream, that may influence conditions at the site should be discussed. For these structures, the applicant should:

- tabulate contributing drainage areas
- describe types of structures, all appurtenances, ownership, seismic design criteria, and spillway design criteria
- provide elevation-area-storage relationships and short-term and long-term storage allocations for pertinent reservoirs

<u>Acceptance Criteria</u>

- The application describes the safety related SSCs exposed to flooding and the measures included in the design to protect them.
- If a temporary flood protection for the facility is needed, a sufficient time frame of executing the flood protection procedures prior to a forecasted severe storm or anticipated flooding event as well as the basis for establishing the time frame, is provided.

2.5.3 Groundwater

The location, size, shape, and other hydrologic characteristics of streams, lakes, shore regions, and groundwater environments in the vicinity of the site should be described.

A regional map showing major hydrologic features should be provided. The applicant should list the owner, location, and rate of use of surface and groundwater users whose intakes could be adversely affected by accidental release of contaminants.

Acceptance Criteria

- The application describes the local and regional groundwater usage.
- The application describes the effects of groundwater on foundations of safety related structures and other safety related SSCs.
- The application describes the protective measures taken to protect and prevent deterioration of safety related foundations and SSCs, resulting from groundwater effects.
- The application describes any measures (e. g. dewatering system) taken to keep groundwater within the design basis and its safety related.
- The application contains a regional map showing major hydrologic features, including the owner and rates of use of surface water and groundwater.

2.6 Geology, Seismology, and Geotechnical Engineering

In accordance with 10 CFR 100.21(d) and 23, the application should provide sufficient information regarding the seismic and geologic characteristics of the site and surrounding region to permit an evaluation of the proposed site for load bearing capability, seismic activity, including evaluations to develop the site-specific safe shutdown earthquake ground motion (SSE) response spectrum and to support analysis of the structures and seismic effects on SSCs at the proposed site. A summary of studies that include a brief description of the site, investigations performed, results of investigations, conclusions, and identification of who did the work, should be provided. Detailed geologic information should be documented in a separate report and made available for the NRC staff to audit.

2.6.1 Geologic Hazards

The geologic and seismic information that forms the basis for the seismic source characterization (SSC) model used for the probabilistic seismic hazard analysis (PSHA) for the site should be provided. For central and eastern US (CEUS) sites, the use of the model in NUREG-2115, “Central and Eastern US Seismic Source Characterizations for Nuclear Facilities”, is acceptable as a starting point for the SSC. Geologic investigations of potential seismic sources within the site region (200 miles (320 km)) that are not included in the NUREG-2115 CEUS SSC model should be conducted to determine if these features warrant inclusion in the final SSC model. ANS/ANSI 2.27-2020, “Criteria for Investigations of Nuclear Facility Sites for Seismic Hazard Assessments,” provides guidance for performing these geologic investigations. For western US (WUS) sites, the guidance in ANS/ANSI 2.27-2020 and ANS/ANSI 2.29-2020, “Probabilistic Seismic Hazard Analysis,” should be followed for development of the SSC model. Consistent with the guidance in NUREG-2213, “Updated Implementation Guidelines for SSHAC Hazard Studies,” the applicant should provide its evaluation of the data, models, and methods relevant to the development of the SSC model for the site, including an estimate of the uncertainty associated with each

of the hazard inputs used in the model. In addition to development of the SSC model, the applicant should evaluate whether there are any potential hazard conditions caused by human activities (e.g., impacts of mining, quarrying, fluid injection or withdrawal) that may influence the site suitability.

The geologic investigations should consider:

(1) Regional Geology - All geologic, seismic, tectonic, and nontectonic hazards within the site region. A review of the regional tectonics, with emphasis on the Quaternary period, structural geology, seismology, paleoseismology, physiography, geomorphology, stratigraphy, and geologic history within a distance of 200 miles (320 km) from the site (site region).

(2) Site Geology - The site-related geologic features, seismic conditions, and conditions caused by human activities, at appropriate levels of detail within areas approximately defined by radii of 25 miles (40 km), 5 miles (8 km), and 0.6 miles (1 km) around the site.

Acceptance Criteria

- The application describes the SSC model and its basis.

- The application describes its evaluation of the potential hazard conditions caused by human activities.

2.6.2 Vibratory Ground Motion

The application should describe the ground motion characterization (GMC) model and site response analysis used in the PSHA in order develop seismic hazard curves and the ground motion response spectrum (GMRS) for the site. Guidance regarding the development of the GMC model is provided in ANS/ANSI 2.29-2020. For CEUS sites, the Next Generation Attenuation-East GMC model should be used. For WUS sites, the South Western United States GMC model has been previously approved and may be suitable with regional adjustments to the model. The guidance provided in ANSI/ANS-2.29-2020 should be used to perform a site response evaluation and a PSHA. Criteria for selection of the appropriate seismic design category is provided in ANSI/ANS-2.26-2004, “Categorization of Nuclear Facility Structures, Systems, and Components for Seismic Design”, and the corresponding target risk-informed design factors used to determine the GMRS are provided in ASCE/SEI 43-05, “Seismic Design Criteria for Structures, Systems, and Components in Nuclear Facilities.” Using the GMRS, foundation input response spectra (FIRS) for each of the seismic Category I structures, the SSE and operating basis earthquake (OBE) should then be developed.

Acceptance Criteria

- The application describes the GMC model and its basis.

- The application describes the data, models, and methods used to develop the site amplification factors.

- The application describes the approach used to perform the PSHA for the site.

- The application provides the basis for the selected seismic design category, target risk design factor, GMRS and FIRS for the site.

- The applicant demonstrates that the SSE and OBE response spectra developed from the GMRS, meet the requirements of 10 CFR Part 50, Appendix S.

2.6.3 Surface Deformation

The application should provide information describing whether a potential exists for surface deformation that could affect the site. The surface and subsurface geological, seismological, geophysical, and geotechnical investigations performed around the site providing the basis for this information should be summarized. RG 1.208, "A Performance-Based Approach to Define the Site-Specific Earthquake Ground Motion ANS/ANSI 2.27-2020 provides guidance regarding acceptable methods for the investigation of surface deformation.

Acceptance Criteria

- The site investigations of surface deformation follow the guidance in RG 1.208 or alternate methods (e.g. ANS/ANSI 2.27-2020) are used, described and justified.

- The application contains sufficient information to conclude that the site does not have the potential for surface deformation.

2.6.4 Stability of Subsurface Materials and Foundations

The application should present information concerning properties and stability of all soils and rock layers that may affect the nuclear power plant facilities, under both static and dynamic conditions, including the vibratory ground motions associated with the GMRS. The guidance in RG 1.132, "Site Investigations for Foundations of NPPs," should be followed for investigating the soil and rock load bearing properties. Additional guidance from ANSI/ANS-2.27-2020 "American National Standard Criteria for Investigations of Nuclear Facility Sites for Seismic Hazard Assessments" may be used for a graded approach to site characterization for assessing the stability of the subsurface and foundations for a facility with lesser overall risk. The laboratory and field testing to estimate the properties of rock and layers in the subsurface underneath the facility is conducted following RG 1.138, "Laboratory Investigations of Soils and Rocks for Engineering Analysis and Design of Nuclear Power Plants." The application should describe the stability of these materials as they influence the safety of seismic Category I facilities and discuss the site conditions and geologic features

that may affect nuclear power plant structures or their foundations. The application should include information regarding excavations, backfill, and earthwork analyses where these activities involve seismic Category I facilities. The source, qualities, and quantities of backfill materials needed should be described. Compaction specification and procedures to be used are justified. Quality control methods for backfill compaction are discussed. The guidance in RG 1.198, "Procedures and Criteria for Assessing Seismic Soil Liquefaction at NPP Sites," should be followed for the investigation of the potential for liquefaction at the site.

Acceptance Criteria

- The proposed site has been investigated following the guidance given in RG 1.132 (or a justified alternative, such as ANSI/ANS-2.27-2020) for determining the geological, engineering, and hydrogeological characteristics of a prospective facility site.

- The subsurface soil and rock properties are estimated following the guidance in RG 1.138. The application contains sufficient data to demonstrate that the soil and rock properties used in the analysis of foundations for seismic Category I structures are justified.

- The foundations of seismic Category I structures have adequate bearing capacity and the predicted total and differential settlements of the foundations are within the design limits of the reactor system. If more than one reactor is placed in close proximity, the interactions between them should be adequately considered in the settlement analysis including any time delay in applying major structural load on the foundation.

- The availability of sufficient quantities and appropriate qualities of backfill are confirmed. The backfill will be compacted using an acceptable procedure and adequate quality control program would be exercised.

- The potential for liquefaction was investigated using the guidance in RG 1.198 (or a justified alternative) and the factor of safety against liquefaction potential is acceptable.

2.6.5 Stability of Slopes

The application should present information concerning the static and dynamic stability of all natural and manmade earth or rock slopes (such as cuts, fills, embankments, and dams) for which failure, under any of the conditions to which they could be exposed during the proposed life of the facility, could adversely affect the safety of the nuclear power plant facilities. A discussion of site conditions, geologic features including weak strata and/or the joints in the soil or rock layers, and the engineering properties of the materials comprising the slope and its foundation should be included. The evaluations

should be based on current practices, such as those used by the U.S. Army Corps of Engineers, 2003. EM1110-2-1902, "Slope Stability," and use conservative soil and rock geometric and material properties and conservative safety margins. Uncertainties in defining the boundaries between the soil/rock layers and their properties, failure surface corresponding to the minimum factor of safety, and the location of the water table should be appropriately accounted for. The results of the slope stability evaluations should be presented. For the stability evaluation of manmade slopes, summary data and a discussion of construction procedures, testing, and instrumentation monitoring to ensure high-quality earthwork should be included. Whenever possible, comparative field performance of similar slopes should be discussed.

Acceptance Criteria

- The application describes the methods used for analyzing the slope stability and confirms that appropriate soil and/or rock properties have been used in the analysis. The methods used to assess the stability of the slope are commensurate with the risk associated with the reactor type.

- The application describes the safety margins used in the analysis and confirms that these margins are consistent with state-of-the-art practice.

- The application describes the performance of similar slope designs and confirms their stability.

2.7 Summary of Design Basis External Hazards

Based on the results of the site characterization described in this chapter, the design basis external hazards identified for the design of the proposed facility should be summarized. These constitute the design basis seismic events and other external events that the safety-related SSCs are required to withstand with no adverse impact on their capability to perform their RSFs. Where supported by a probabilistic hazards analysis, these design basis external events should be included in the PRA after the features designed to withstand these hazards are defined. External hazards not supported by a probabilistic hazard analysis can be determined using traditional deterministic methods.

Updated TICAP/ARCAP Combined Outline

Note: The purpose of this outline is to provide initial concepts for how the industry developed technology-inclusive content of application project (TICAP) outline discussed during an October 22, 2020, meeting (available at Agencywide Documents Access and Management System (ADAMS) Accession No. ML20294A382) could be merged with the NRC staff developed advanced reactor content of application project (ARCAP) outline found at ADAMS Accession No. ML20107J565). The items in the blue font below were extracted from the ARCAP outline and placed in what the NRC staff believes could be the appropriate place in the TICAP outline. The items at the end of the outline fall outside the scope of the final safety analysis report (FSAR). More information regarding the NRC staff's concepts for application information found outside the FSAR can be found in a document titled, "Proposal for Technology Inclusive Content of Application Project and Advanced Reactor Contents of Application Project Guidance Document Development," dated October 15, 2020 (ADAMS Accession No. ML20289B025).

Chapter 1 - General Plant and Site Description and Overview of the Safety Case

- Overview of technology (size of the reactor and planned commercial application of the design—power production, industrial application, etc.)
- General description of the plant systems and roles that they play in normal and off-normal conditions, including refueling
    - **Baseline operating parameters**
- General site characteristics
    - **Introduction**
    - **Site Characteristics and Site Parameters**
    - **Geography and Demography**
    - **Nearby Industrial, Transportation, and Military Facilities**
    - **Regional Climatology, and Local Meteorology, and Atmospheric Dispersion (Basis for Section 2.3 below)**
    - **Hydrological Description**
    - **Geology, Seismology, and Geotechnical Engineering**
- Summary of Safety Case Findings
    - Overview of affirmative LMP-based safety case methodology, including reference to NEI 18-04 and any deviations from the approved methodology
    - Summary of FSFs
    - Summary of LBEs with focus on DBAs
    - Summary of radiological consequence assessment
    - Summary 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
    - Evaluation of DID capabilities

Chapter 2 - Generic Analyses

2.1 - Probabilistic Risk Assessment
- Overview of PRA
- Summary of Key PRA Findings

2.2 – Source Term

2.3 – Meteorology

2.4 – Other Generic Analyses

2.5 – External Hazards Evaluation

2.6 – Analyses of Systems, Components, and Materials Performance

2.7 – Analytical Codes

Chapter 3 - Licensing Basis Events

3.1 - Licensing Basis Event Selection Methodology
3.2 - Anticipated Operational Occurrences
3.3 - Design Basis Events
3.4 - Beyond Design Basis Events
3.5 - Design Basis Accidents

Chapter 4—Integrated Evaluations

4.1 - Evaluation of Integrated Plant Risk
4.2 - Defense-in-Depth
4.2.1 – Plant Capability DID
4.2.2 – Programmatic DID

Chapter 5 - Safety Functions, Design Criteria, and SSC Categorization

5.1 - Principal Design Criteria and Safety-Related SSCs
- Required Safety Functions
- Required Functional Design Criteria

5.2 - Complementary Design Criteria and Non-Safety-Related with Special Treatment SSCs
- Risk Significant Safety Functions

Chapter 6—Safety-Related SSC Criteria and Capabilities

- Safety-Related Design Criteria
- Special Treatments
- **Basis for Operability Requirements**

Chapter 7—NSRST SSC Criteria and Capabilities

- Special Treatments
- **Basis for Availability Controls**

Chapter 8—Plant Programs

- Human Factors
- Training
- Reliability Assurance
- **Maintenance**
- **Change Control**
- **Conduct of Operations**

Chapter 9 - Control of Routine Plant Radioactive Effluents, Contamination, and Solid Waste

9.1 - Liquid and Gaseous Effluents
9.2 – Contamination Control
9.3 – Solid Waste

Chapter 10 - Control of Occupational Dose

Chapter 11 – Organization

- 11.1 - Description/responsibilities of key management positions
- 11.2 - Educational, training and experience requirements for key management positions
- 11.3 - Interfaces with support groups (e.g. Technical Support Center, Corporate)
- 11.5 - Basis/number of operating shift crews, their staffing and responsibilities

Chapter 12 – Initial Startup Testing

- 12.1 - As-built verification program (ITAAC)
- 12.2 - Preoperational testing program
- 12.3 - Initial startup testing/operations program

Separate Licensing Documents

DC and COL Application (if not referencing a DC)

- Technical Specifications
- Technical Requirements Manual (or Availability Control Manual)
- Quality Assurance Plan (design)
- Fire Protection Program (design)
- PRA
- Fuel qualification report
- Exemptions
- Environmental Report

COL Application only

- 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
- ISI/IST Program
- Environmental Report
- Site Redress Plan
- Exemptions, Departures, and Variances
- Financial Qualification and Insurance and Liability

Comments on TICAP Annotated Outline[1]

Chapter 1 - Introduction

1. Section 1.2: Suggest the change below since TICAP does not address all portions of the SAR.

   NEI plans to submit this guidance document to NRC for review and endorsement as one acceptable approach for the development of ~~those~~ selected portions of the Safety Analysis Report required for a combined construction and operating license (COL), a reactor construction permit (CP) followed by an operating license (OL), or design certification (DC) that employs the LMP methodology endorsed by Regulatory Guide 1.233.

   Based on the statement: "The team issued intermediate products covering key aspects of the guidance and provided them for ARRTF and NRC review and comment." Please confirm that reference to these intermediate products will be removed in the final version of the document.

2. Section 1.3: Suggest the following changed wording:

   Scope of content to be included in an application (specifically, selected portions of the SAR)

Chapter 2 – Development of SAR Information

1. SAR Chapter 1 - General Plant and Site Description and Overview of the Safety Case
   a. Site description – Chapter 1 contains "general site characteristics." Is it expected that this section will provide the information needed to demonstrate that the site characteristics have been identified and used in the plant design and operating criteria? Will topics be included here such as such as geological, seismological, hydrological, and meteorological characteristics of the site and vicinity, in conjunction with present and projected population distribution and land use and site activities and controls?
   b. External hazards evaluation – According to 18-04, Rev 1, a set of Design Basis External Hazard Levels (DBEHLs) will determine the design basis seismic events and other external events that the SR SSCs will be required to withstand. When supported by available methods, data, design, site information, and supporting guides and standards, these DBEHLs will be informed by a probabilistic external hazards analysis and will be included in the PRA after the design features that are incorporated to withstand these hazards are defined. Other external hazards not supported by a probabilistic hazard analysis will be covered by DBEHLs that are determined using traditional deterministic

[1] Note that some comments refer to information that does not appear in the outline. We attempted to insert these comments in the appropriate chapter heading but recognize that the information may be appropriately located elsewhere

methods. Where will the SAR outline guidance discuss the need for this information? If in Chapter 1, can this information be "for information only"?

c. (Page 8) The last sentence in Chapter 1 states that the information in the chapter is not considered in 50.59-like change control evaluations. What is the basis for this position? In additional to important site characteristic information, the chapter is the only place that summarizes the safety case, key design attributes and DID. Why wouldn't the summary that ties all the pieces together be important enough to justify a 50.59-like evaluation?
    - Some site characteristics are important for demonstrating reasonable assurance, so it is not clear that "for information" is adequate.
d. How is the site information envisioned here related to the "ARCAP Chapter 2" content?
e. Chapter 1 of the outline describes the need for a general description of the plant systems and roles involved in normal and off-normal conditions, including refueling. What is the basis for not requiring 50.59 type evaluations for changes to this information? Doesn't this information form the starting point for event analysis?
f. "Overview of affirmative LMP-based safety case methodology, including reference to NEI 18-04 and any deviations from the approved methodology" Should this also include an overview of the justification for the deviations?

2. SAR Chapter 2 - Generic Analyses
    a. (Page 9) Section 2.3.2.1 (PRA) states that the summary PRA information in this chapter is not considered in change control evaluations even though it provides the key PRA findings. See comments on SAR Chapter 1 above.
    b. Section 2.3.2.1 (PRA), it states that the PRA information in SAR is only "for information." Some of the information such as commitments to the non-LWR standards, certain assumptions, reliability targets, etc should be part of the licensing basis as such information is relied on by the staff for the licensing decision (or to make the reasonable assurance of safety finding for the NRC) for non-LWR application using the LMP.
    c. (Page 9) Section 2.3.2.2 (Source Term) makes no mention of providing the basis for the mechanistic source terms used in the safety analysis. In designs that use TRISO fuel the source term is the foundation of the safety case. Therefore, experimental data and analysis applicable to the range of conditions (power density, temperature. fluence) the fuel will experience over its lifetime should be provided to justify the source terms used in the safety analysis. Other fuel types should be treated similarly. Additional guidance is needed regarding how a designer would establish an enveloping source term, since a mechanistic approach is reflected in LMP, and TICAP is described as LMP-centric. *"A designer may elect to use a conservative, enveloping source term or a mechanistic source term that is based on a more realistic evaluation of reactor operation and event progression.'*
    d. Discussion of normal operations
        - Baseline operating parameters – where will these be described?
        - Where will systems, components, and materials performance under normal operating, anticipated transient, and accident conditions be discussed? This information would inform the LBE analysis.

e. Section 2.3.2.4 states that the "applicant may provide information about additional generic analyses used in subsequent sections." And that these sections are optional. Would it be beneficial to list or provide examples of what these sections may include? It doesn't seem apparent to me that applicants would be driven to provide more information than the minimum required.
f. In Section 2.3.3.5, shouldn't the last sentence say "This section continues through all of the **DBA's**" (typo)

3. SAR Chapter 3 - Licensing Basis Events
    a. (Page 11) Section 2.3.3.5 (DBAs) does not require the basis for the DBAs selected to be provided. This would seem important due the role of the DBAs in the safety case. Also, this section requires a much more detailed description of the DBA analyses than is required for DBEs and BDBEs. Detailed descriptions of the analyses should be provided for DBEs and BDBEs as well since they are just as important to the safety case as DBAs.
    b. Aircraft impact (50.150) and LOLA (50.155) analysis – these topics will likely be outside of the LMP described LBE analysis and were not mentioned in the outline.

4. SAR Chapter 4 - Integrated Evaluations
    a. (Page 12) Section 2.3.4.2 (DID) states that only the results of the DID evaluation will be provided. I think it would be important to also have the evaluation criteria, a summary of how those criteria were applied in the evaluation and the SSCs considered to serve a DID function identified.
    b. Will the DID plant capability discussion in the SAR include:
        - Inherent reactor, facility, and site characteristics
        - Radionuclide physical and functional barriers
        - Passive and active SSCs in performance of safety functions
        - SSC reliability in prevention of events
        - SSC capability in mitigation of events
        - SSC redundancy and diversity
        - Defenses against common cause failures
        - Conservative design margins in SSC performance
    c. Will the defense-in-depth programmatic discussion in the SAR include:
        - Performance targets for SSC reliability and capability
        - Design, testing, manufacturing, construction, operations, and maintenance programs to meet performance targets
        - Tests, inspections, and monitoring of SSC performance and corrective actions
        - Operational procedures and training to compensate for human errors, equipment failures, and uncertainties
        - Technical specifications to bound uncertainties
        - Capabilities for emergency plan protective actions

5. SAR Chapter 5 - Safety Functions, Design Criteria, and SSC Categorization

a. (Page 12) The section Safety Functions, Design Criteria and SSC Categorization states that SR and NSRST operator actions will be identified. How will these be used in determining staffing levels, I&C safety categories, human factors analysis, training, etc?
b. Validation of equipment qualifications – where will the qualification of equipment (seismic, environmental) be addressed?
c. Nowhere does the outline require that a description of the analytical codes (TH, reactor physics, fuel performance) used in the safety analysis and how they were validated be provided. This is important in order to have confidence in the results of the analysis.

6. SAR Chapter 6 - Safety-Related SSC Criteria and Capabilities
    a. Basis for Tech Spec allowable outage times and proposed LCOs – where will the outline discuss the need to describe the basis for technical specification allowable outage times and proposed LCOs?
    b. This section includes a description of the Safety-Related Design Criteria. It's not clear how this set of criteria is related to the Principal Design Criteria and the Complementary Design Criteria reflected in SAR Chapter 5.

7. SAR Chapter 7 - NSRST SSC Criteria and Capabilities
    a. This section seems to be missing a reference to Complementary Design Criteria (Depending on how the earlier comment is resolved)

8. SAR Chapter 8 - Plant Programs
    a. Startup testing and ITAAC – where will the outline discuss the needed startup testing? Will the need for ITAAC or something similar be described in the outline?
    b. Plant organization and responsibilities – where will the outline discuss the plant organization, qualifications, and responsibilities?
    c. At the October 22nd meeting it was stated that the process ensures adequate interfacing with other facility programs (security, operations, EP). It might be useful to require the SAR describe this process so that NRC can audit if it is being done effectively.

9. General Comment - Acceptance criteria – industry provided a comment regarding the ARCAP guidance that NRC should include acceptance criteria so applicants can understand what is expected. Will TICAP chapters contain acceptance criteria or something similar?

10. General Comment – These comments are provided recognizing that there are unresolved topics in the NRC's "Proposal for Technology Inclusive Content of Application Project and Advanced Reactor Contents of Application Project Guidance Document Development," Table 1, "Preliminary ARCAP Roadmap." As these comments are resolved and the TICAP outline refined, the ARCAP Roadmap may similarly be refined.

11. General Comment – Terms such as "fundamental safety function" are referenced in the document. Please confirm that you are using this term as defined in the previous white paper you provided.

12. General Comment - Please discuss where the LBE comparison to the the F-C curve will be discussed in the annotated outline

13. General Comment – Please confirm where design parameters for the facility including SSCs would be found.