



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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August 18, 2020

MEMORANDUM TO: John P. Segala, Chief
Advanced Reactor Policy Branch
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

FROM: Joseph Sebrosky, Senior Project Manager */RA/*
Advanced Reactor Policy Branch
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Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF JULY 30, 2020, PUBLIC MEETING TO DISCUSS
TECHNOLOGY INCLUSIVE CONTENT OF APPLICATION PROJECT

On July 30, 2020, the U.S. Nuclear Regulatory Commission (NRC) held a Category 2 public meeting with Southern Company (Southern) to discuss the industry-led technology inclusive content of application project (TICAP). The meeting notice is available in the NRC's Agencywide Documents Access and Management System (ADAMS) at Accession No. ML20210M308 and the presentation slides are available in ADAMS at Accession No. ML20210M083. This was a teleconference meeting, and an attempt was made to capture a list of the attendees as they called into the meeting. Enclosure 1 provides the attendees for the meeting as captured by the operator that helped to facilitate the meeting.

Topics for the meeting included:

- Brief overview of TICAP
- Responses to the NRC comments on TICAP from a June 11, 2020, public meeting on the topic (see meeting summary dated July 15, 2020 (ADAMS Accession No. ML20190A217)).
- Update on status of the development of a report mapping fundamental safety functions (FSFs)¹ to NRC regulations and General Design Criteria
- Nuclear Energy Institute (NEI) guidance document status
- Update on the final safety analysis report (FSAR) outline
- Tabletop exercise update

Southern began the meeting by providing an overview of its TICAP efforts. Southern stressed that the scope of the TICAP effort is governed by the licensing modernization project (LMP)²-based affirmative safety case. The LMP-based affirmative safety case was defined by Southern as a collection of scientific, technical, administrative and managerial evidence which documents the basis that the performance objectives of the technology inclusive FSFs are met by a design

¹ Fundamental Safety Functions are defined as: 1) limiting the release of radioactive material, 2) removing decay heat from the reactor and waste stores, and 3) controlling reactivity.

² The NRC's Advanced Reactor Website (<https://www.nrc.gov/reactors/new-reactors/advanced.html#modern>) provides background information regarding the LMP.

during specific anticipated operational occurrences, design basis events, beyond design basis events, and design basis accidents.

Industry TICAP representatives then discussed the NRC's comments on TICAP that were provided as a result of the June 11, 2020, public meeting on the topic. The NRC staff's comments are available in ADAMS at Accession No. ML20210M083. Industry stated that they found the NRC staff's comments were generally supportive of industry's TICAP vision and that the NRC staff's concepts would be considered as the TICAP guidance is developed.

Regarding the status of industry's mapping activity, industry stated that this work was being performed to demonstrate that an affirmative safety case (which is based on meeting the performance objectives of the FSFs) meets the underlying intent of the current requirements or regulations. In previous TICAP meetings industry introduced the concept of principle design criteria (PDC), and complimentary design criteria (CDC) as part of this mapping effort.

During the meeting industry provided a further explanation of PDC and CDC. The PDC support demonstration of FSFs, while the CDC are structures, systems, and components that provide additional means to perform required safety functions. Industry and the NRC staff agreed that further discussion is needed in this area and agreed that developing examples of PDC and CDC would be helpful. Southern indicated that the mapping report would be provided to the NRC following its completion in early August 2020.

Regarding the status of the development of the NEI guidance document associated with TICAP, industry stated that it is targeting providing the NRC staff a draft document in the Spring of 2021 and a final guidance document in the Fall of 2021. In response to an NRC staff question industry stated that it intended to develop the guidance needed to support a Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52 combined license application but the guidance would also include the information needed to support a 10 CFR Part 52 design certification application and a 10 CFR Part 50 construction permit application.

Industry stated that the FSAR outline was still in the development phase and provided an outline of an LMP-based FSAR that had nine chapters. The staff noted that the outline provided in the June 11, 2020, public meeting had eleven chapters. The NRC staff and industry agreed that continued engagement during the development of the LMP-based FSAR outline was appropriate and noted that the Idaho National Lab draft FSAR outline discussed during an April 22, 2020, meeting (see ADAMS Accession No. ML20107J565) would aid in this effort.

Regarding the status of tabletop exercises, industry stated that it was targeting such exercises in September of 2020 as part of TICAP guidance development. Designs that are being considered for the tabletop exercise include:

- GEH Prism liquid sodium reactor
- Westinghouse eVinci heat pipe microreactor
- Karios molten salt cooled pebble bed reactor
- X-energy helium cooled pebble bed reactor, and
- Terrapower molten liquid salt fueled reactor

The NRC staff expressed interest in observing the tabletop exercises and stated that having access to the draft guidance documents used to support the tabletop exercises would be

beneficial. Industry stated that it would work with the designers to determine if arrangements could be made for NRC observation of the exercises.

Enclosure:
Attendance List

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TECHNOLOGY INCLUSIVE CONTENT OF APPLICATION PROJECT
DATE: August 18, 2020

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***via e-mail**

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| OFFICE | NRO/DANU/UARP/PM | NRO/DANU/UARP/BC | NRO/DANU/UARP/PM |
| NAME | JSebrosky | JSegala | JSebrosky |
| DATE | 8/18/2020 | 8/18/2020 | 8/18/2020 |

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July 30, 2020, Public Meeting to Discuss Technology Inclusive Content of
Application Project Attendance List

| NAME | AFFILIATION | NAME | AFFILIATION |
|-------------------|---------------------------------|-------------------|---------------------------------|
| Amir Afzali | Southern Company | Marc Nichol | Nuclear Energy Institute (NEI) |
| Frank Akstulewicz | Industry Consultant - TICAP | Kati Austgen | NEI |
| Steven Nesbit | LMNT Consulting | Mike Tschiltz | NEI |
| Brandon Chisholm | Southern Company | Martin O'Neill | NEI |
| Carolyn Lauron | NRC/DNRL/NRLB | Cyril Draffin | US Nuclear Industry Council |
| Bill Reckley | NRC/DANU/UARP | Farshid Shahrokhi | Framatome |
| Amy Cabbage | NRC/DANU/UARP | Dennis Henneke | GE Hitachi |
| Joe Sebrosky | NRC/DANU/UARP | Martin Owens | GE Hitachi |
| Eric Oesterle | NRC/DANU/UARP | Margaret Ellenson | Kairos Power |
| Chris Van Wert | NRC/DANU/UART | Caroline Cochran | Oklo |
| | | Alex Runner | Oklo |
| Jim Kinsey | Idaho National Laboratory (INL) | Pete Gaillard | TerraPower |
| Tom Hicks | INL | Rick Paese | Westinghouse |
| Tom King | INL | Kurt Harris | FLIBE Energy |
| Wayne Moe | INL | Travis Chapman | X Energy |
| Brandon Waits | Southern Company | Joe Hoagland | TVA |
| Carl Flemming | Southern Company Consultant | Dave Grebasik | Argonne National Lab |
| Jason Redd | Southern Nuclear | Bill Horak | Brookhaven National Laboratory |
| Mo Shams | NRC/NRR/DANU | Stephen Burdick | INL |
| Brian Smith | NRC/NRR/DANU | Jason Andruf | INL |
| Jordan Hoellman | NRC/NRR/DANU/UARP | Alex Hunnig | Oak Ridge National Lab |
| Nan Valliere | NRC/NRR/DANU/UARP | John Alvis | Los Alamos National Lab |
| Arlon Costa | NRC/NRR/DANU/UARP | Joshua Hogancamp | Sandia National Lab (SNL) |
| Maryam Khan | NRC/NRR/DANU/UARP | Jamel Mohman | SNL |
| Michelle Hart | NRC/NRR/DANU/UART | Jay Jones | Department of Energy |
| Ian Jung | NRC/NRR/DANU/UART | Donald Helton | NASA |
| Alyssa Beasley | NRC/NRR/DANU/UART | Prasad Kadambi | Consultant |
| Stu Magruder | NRC/NRR/DNRL/UARL | Mark Jaeger | Structural Integrity Associates |
| Ismael Garcia | NRC/NRR/DEX | Nathan Hill | Southwest Research Institute |
| Nadim Khan | NRC/NRR/DEX/EENB | Alex Polanski | Morgan Lewis |
| Sunwoo Park | NRC/NRR/DRA/APLC | Paul Amico | Jensen Hughes |
| Shakur Walker | NRC/COMM/OCMDW | Rick Wachowiak | Jensen Hughes |
| Eric Bowman | NRC/COMM/OCMKS | Ed Wallace | GNBC Associates |

| NAME | AFFILIATION | NAME | AFFILIATION |
|-------------------|--------------------|----------------|--------------------|
| Michael Spencer | NRC/OGC | Jamel Hamond | Self |
| Marcia Carpentier | NRC/OGC | Ling Chen Mong | Self |
| Derek Widmayer | NRC/ACRS | | |