



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 15, 2018

MEMORANDUM TO: John P. Segala, Chief
Advanced Reactor and Policy Branch
Division of Safety Systems, Risk Assessment and Advanced
Reactors
Office of New Reactors

FROM: Lucieann Vechioli, Project Manager /RA/
Advanced Reactor and Policy Branch
Division of Safety Systems, Risk Assessment and Advanced
Reactors
Office of New Reactors

SUBJECT: SUMMARY OF JULY 26, 2018, PUBLIC MEETING TO DISCUSS
REGULATORY IMPROVEMENTS FOR ADVANCED REACTORS

On July 26, 2018, the U.S. Nuclear Regulatory Commission (NRC) held a Category 2 public meeting with stakeholders, Department of Energy, national laboratories, and Nuclear Energy Institute (NEI), to discuss ongoing initiatives within the industry and NRC related to the development and licensing of non-light water reactors (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18199A176). Enclosure 1 contains a list of meeting attendees and participants who joined via webinar. Enclosure 2 has the meeting agenda. The slides and meeting handouts are available in ADAMS Accession No. ML18213A118.

Mr. William Reckley from the NRC staff reported progress made in several activities related to all six near-term implementation action plans strategies along with the status of some potential early movers and micro-reactors. The staff pointed out the interest to have more discussions about these topics and that priorities will adjust based on input received. Stakeholders expressed interest on having training in other technologies besides the molten salt reactor (MSR) training offered last year. NRC staff provided an update on the emergency preparedness rulemaking for small modular reactors and other new technologies. The next steps in the rulemaking process include making the proposed rulemaking package public to support the upcoming public meeting with the Advisory Committee on Reactor Safeguards that will be held in October 2018.

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Mr. Reckley also provided status on current and planned work that are supported by Office of Nuclear Regulatory Research and Office of New Reactors contracts. These efforts include initiatives related to fuel performance, severe accident phenomena, fuel qualification, and ASME Section III Division 5.

Mr. Jason Redd from Southern Company provided an update of the Licensing Modernization Project (LMP) guidance document. Mr. Redd provided a summary of the recent activities and milestones such as the NRC Public Workshop that will be held on August 21, 2018. This workshop will be focus in the resolution of previous comments received from NRC and Advisory Committee on Reactors Safeguards (ACRS). The draft guidance document should be provided to ACRS by September 30, 2018. The upcoming dates for industry and public participation opportunities were also discussed.

The MSR technology topic was led by Matthew Lish from Flibe Energy. Flibe Company is working on a liquid-fluoride thorium reactor that is a type of MSR. In this type of reactor, thorium, and uranium fluorides are combined into a salt mixture that is heated to a molten substance, which is then used to fuel the reactor.

Marc Nichol from NEI led the discussion about prioritization of issues considering operation and maintenance. Electric Power Research Institute report can be located at <https://www.epri.com/#/pages/product/000000003002007071/?lang=en>. The report presents the results of a range of staff functional areas to identify technologies with staffing impact. The project selected, evaluated, and documented 25 technologies that show significant potential to support staff optimization. The ranking process in the report provide a way to focus on which technologies and/or design details that when implemented would substantially reduce the staffing required for evolving small modular reactors plants.

The afternoon discussions focused on natural convection heat removal discussion.

- Jim Kinsey from Idaho National Laboratory led a presentation about regulatory framework for passive heat removal. The presentation summarized the fundamental safety functions for reactor technologies and associated designs.
- The reactor cavity cooling system presentation was led by Mathew Miller from Southern Company. Steam cycle high temperature gas reactor is being developed for a variety of process heat, electricity, and congregation markets. Industry is working with the national laboratories to develop testing and the associated test plans to support design validation.
- Darius Lisowski (via phone) from Argonne National Laboratory led a discussion about natural convection shutdown heat removal test facility (NSTF). The presentation provided a high level status of the NSTF program and its accomplishments such as a 33 month testing campaign duration, 27 conducted tests from which 16 were accepted, and 24 publications since inception.

The meeting ended with a discussion of other topics and future meetings. The date for the next meeting is tentatively scheduled for September 13, 2018. Meeting participants suggested a discussion of fuel qualification and X-Energy expressed their interest in presenting in an upcoming meeting. It was also noted that the frequency of the stakeholders meeting should be maintained every six weeks but not as full day meetings.

J. Segala

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Enclosures:

1. Meeting attendance
2. Agenda

SUMMARY OF JULY 26, 2018, PUBLIC MEETING TO DISCUSS TO DISCUSS
REGULATORY IMPROVEMENTS FOR ADVANCED REACTORS- DATED August 15, 2018

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ADAMS Accession No.: ML18221A411

***via Email**

NRO-002

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|---------------|-----------|----------|----------|
| OFFICE | NRO/DSRA | NRO/DSRA | NRO/DSRA |
| NAME | LVechioli | WReckley | JSegala |
| DATE | 08/09/18 | 08/13/18 | 08/15/18 |

OFFICIAL RECORD COPY

MEETING ATTENDANCE

Advanced Reactors Stakeholder Meeting

Nuclear Energy Institute
1201 F. Street NW, Suite 1100
Washington, DC

Thursday, July 26, 2018

| Name | | Organization |
|----------|---------------|------------------|
| Steven | Kline | Bechtel |
| Matthew | Miller | Framatome |
| Amir | Afzali | Southern Company |
| Hanh | Phan | NRC |
| Marilyn | Kray | Exelon |
| Jason | Redd | Southern Company |
| Brandon | Waites | Southern Company |
| Milan | Stika | Flibe Energy |
| Peter | Hastings | Kairos Power |
| Jackson | Breakell | Flibe Energy |
| Jeff | Merrifield | Pillsburg |
| Jim | Kinsey | DOE/INL |
| Herman | Van Antwerpen | X-Energy |
| Lucieann | Vechioli | NRC |
| Ganapati | Myneni | ADNA Corporation |
| Amy | Cubbage | NRC |
| Everett | Redmond | NEI |
| Kati | Austgen | NEI |
| N.P. | Kadambi | Self |
| Anne | Cottingham | NEI |
| Matthew | Lish | Flibe Energy |
| Jim | Gresham | Westinghouse |
| Marc | Nichol | NEI |

| Attendance List - Webinar Attendees | | |
|--|-------------|--------------------------|
| Name | | Organization |
| Jana | Bergman | Curtiss Wright |
| John | Bolin | GA |
| Rob | Burg | EPM |
| Marcia | Carpentier | NRC |
| Linda | Dolan | GE |
| Dayna | Dority | NRC |
| Ashley | Finan | NIA |
| Robert | Fitzpatrick | NRC |
| George | Flanagan | ORNL |
| Greg | Gibson | X-Energy |
| Mark | Holbrook | INL |
| Rui | Hu | ANL |
| Darius | Lisowski | ANL |
| Imtiaz | Madni | NRC |
| Lisa | Matis | TETRA TECH |
| Jan | Mazza | NRC |
| Nicholas | McMurray | NRC |
| Wayne | Moe | INL |
| Franco | Moi | BECHTEL |
| Alex | Pavlak | self |
| Mike | Poore | ORNL |
| Bill | Reckley | NRC |
| Stuart | Rubin | Numark Assoc. |
| Makuteswara | Srinivasan | NRC |
| Martin | Stutzke | NRC |
| George | Tartal | NRC |
| Boyce | Travis | NRC |
| Nanette | Valliere | NRC |
| Hanry | Wagage | NRC |
| Staci | Wheeler | Alpha Tech Research Corp |
| Derek | Widmayer | NRC |
| Joe | Williams | NRC |
| Jeff | Wood | NRC |
| Aaron | Wysocki | ORNL |
| Alex | Huning | X-Energy |
| Michael | Mayfield | self |
| JongSeuk | Park | self |
| Richard | Rogalski | self |

AGENDA

Advanced Reactors Stakeholder Meeting

**Nuclear Energy Institute
1201 F. Street NW, Suite 1100
Washington, DC**

Thursday, July 26, 2018

| TIME | TOPIC | LEAD |
|-----------------|---|----------------------|
| 9:00 – 9:15am | Introductions | NRC |
| 9:15 – 10:30am | Update on NRC activities (ongoing and planned) under current budget allocations | All |
| 10:30 – 10:45am | Break | All |
| 10:45 – 11:30pm | Licensing modernization – industry guidance and related regulatory guide | NRC/LMP/NEI |
| 11:30 – 12:00pm | Technology working group or other generic/technology specific issues | Kirk Sorenson, Flibe |
| 12:00 – 1:00pm | Lunch | All |
| 1:00 – 2:15pm | Prioritization of issues considering operations and maintenance | NEI |
| 2:15 – 2:30pm | Break | All |
| 2:30 – 4:00pm | Natural convection shutdown heat removal systems and related licensing issues | ANL/INL/Framatome |
| 4:00 – 4:15pm | Policy table discussions and future topics | All |
| 4:15 – 4:30pm | Other topics and public comments | All |