CARBON FREE
POWER PROJECT
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LO-124570

September 09, 2022 Docket No. 99902052

U.S. Nuclear Regulatory Commission
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SUBJECT: NuScale Power, LLC Submittal of Presentation Materials, Entitled "Carbon Free Power Project (CFPP) Combined License Application (COLA) Presentation Physical Security (Open Session)," PM-124569-NP, Revision 0

NuScale Power, LLC (NuScale) has requested a meeting with the NRC technical staff on September 20, 2022, to discuss the physical security protection strategy that is being considered for CFPP. NuScale requested both open and closed sessions for this meeting due to the proprietary nature of certain topics that will be discussed.

The purpose of this submittal is to provide presentation materials to the NRC for use during the open session of the Physical Security meeting.

Enclosure 1 is the nonproprietary presentation entitled "Carbon Free Power Project (CFPP) Combined License Application (COLA) Presentation Physical Security (Open Session)," PM-124569-NP, Revision 0.

This letter makes no regulatory commitments and no revisions to any existing regulatory commitments.

If you have any questions, please contact Susan Baughn at 541-452-7319 or at sbaughn@nuscalepower.com.

Sincerely,

John Volkoff
Manager, Combined License Applications
NuScale Power, LLC
COLA Support on behalf of CFPP, LLC

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Enclosure 1: "Carbon Free Power Project (CFPP) Combined License Application (COLA) Presentation Physical Security (Open Session)," PM-124569-NP, Revision 0

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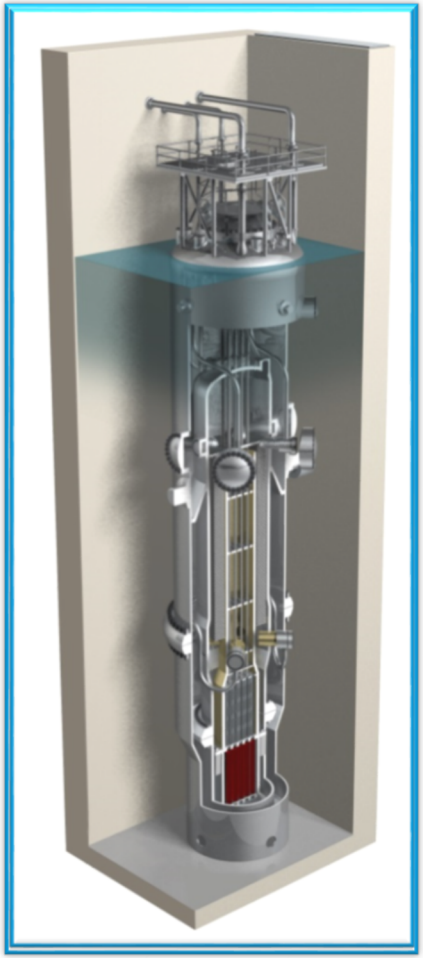
Enclosure 1:

"Carbon Free Power Project (CFPP) Combined License Application (COLA) Presentation Physical Security (Open Session)," PM-124569-NP, Revision 0

Carbon Free Power Project (CFPP) Combined License Application (COLA) Presentation



Physical Security (Open Session)

September 20, 2022

Presenters

Susan Baughn
Supervisor, Licensing

Kevin Deyette
Program Manager, Nuclear Security and Emergency Preparedness

Agenda

- Purpose / Objective
- Background
- CFPP Security Program Strategy
- Summary / Conclusion
- Next Steps
- Questions

Purpose / Objective

- Discuss proposed strategy for addressing physical security requirements specified by 10 CFR 73.55 for CFPP

- Provide NRC with an understanding of the proposed strategy to promote feedback and to minimize regulatory risk

Background

- Objective and basis of Physical Security regulations
  - Ensure special nuclear material is adequately protected from potential acts of radiological sabotage up to and including the design basis threat (DBT).
  - Basis in 10 CFR 73.55(b)(1) is to “provide high assurance that activities involving special nuclear material are not inimical to the common defense and security and do not constitute an unreasonable risk to the public health and safety.”
- Traditional Approach
  - Adequate protection of special nuclear material from the DBT is achieved by demonstrating that the physical protection program prevents significant core damage and spent fuel sabotage.

Background

- SECY-18-0076, “Options and Recommendation for Physical Security for Advanced Reactors”
  - Submitted to the Commission on August 1, 2018
  - Provided four alternatives to the existing physical security requirements for advanced reactors
  - Recommended that the Commission proceed with a limited-scope rulemaking

Background

- Commission issued a Staff Requirements Memorandum (SRM) on November 19, 2018, in response to SECY-18-0076
  - Commission approved the staff's recommendation to proceed with a limited scope rulemaking
  - Commission also approved the staff's plan to identify specific requirements within existing regulations that would play a diminished role in providing physical security for advanced reactors while at the same time contributing significantly to capital and operating costs.
  - Commission directed the NRC staff to employ the use of exemptions, as needed, until the final rule is implemented

Background

- SECY-22-0072, “Proposed Rule: Alternative Physical Security Requirements for Advanced Reactors”

  NRC staff considerations:

  – designs and behavior in response to transients and accidents of many advanced reactors are anticipated to differ significantly from those of large LWRs

  – some advanced reactor designs will include attributes that could result in smaller and slower releases of fission products following the loss of certain safety functions when compared to operating large LWRs

  – existing security regulations that contribute significantly to capital or operating costs may play a diminished role in providing physical security for SMRs and non-LWRs

Background

- SECY-22-0072 (cont.)

  Proposes an amendment to 10 CFR 73.55 that:

  – for advanced reactors, offers voluntary performance-based alternatives for meeting certain physical security requirements

  – would enable applicants and licensees that satisfy the proposed radiological consequence-based criteria to consider implementing alternative security requirements related to:

    - minimum number of onsite armed responders
    - reliance on law enforcement or offsite armed responders to fulfill interdiction and neutralization functions
    - use of means other than physical barriers to accomplish delay and access control functions
    - location of the secondary alarm station
    - designation of vital areas for the secondary alarm station and its secondary power supply

CFPP Security Program Strategy

- Different Approach Warranted for CFPP
  - NuScale US460 design is very unique when compared to power reactors that have previously been licensed by the NRC.
    - Security by Design
    - A much smaller reactor that has been designed to minimize design-basis and severe accident vulnerabilities
    - Does not require electrical power, additional water, or operator action during the first 72 hours after a Design Basis Event; or for safe shutdown or long term cooling
    - The radiological hazard is significantly reduced

CFPP Security Program Strategy

- A performance based physical protection program (consistent with SECY-22-0072) is being considered
  - Allows inherent safety of NuScale US460 design to be credited
  - Program will be designed to limit dose consequence
    - Guidance provided in DG-5072 to be considered for determining dose consequence
    - Maintain < 25 rem TEDE during any 2 hour period, as measured at the exclusion area (site) boundary
  - Request exemption(s) from subsections of 73.55 and propose alternative measures as deemed necessary
  - Allows substantial reductions in capital and operating costs while continuing to satisfy the goal and basis of NRC physical security requirements specified by 10 CFR 73.55

Summary / Conclusions

- NuScale US460 is inherently safer and the radiological hazard is very much reduced when compared to other power reactors that have been licensed by the NRC
- By using a performance based strategy for designing the physical protection program for CFPP:
  - The inherent safety provided by the NuScale US460 design can be credited
  - Substantial reductions in capital and operating costs can be achieved
  - The goal and basis of NRC physical security requirements specified by 10 CFR 73.55 will be maintained

Next Steps

- NuScale seeks feedback from the NRC on the proposed strategy of using a performance based approach for designing the physical protection program for CFPP consistent with SECY-22-0072 considerations

Questions?

Acronyms

ACR	Acronym
COLA	Combined License Application
CFPP	Carbon Free Power Project
DBT	Design Basis Threat
LWR	Light Water Reactor
NRC	Nuclear Regulatory Commission
PRA	Probabilistic Risk Analysis
rem	Roentgen equivalent man (unit of radiation dosage applied to humans)
SECY	Office of the Secretary (NRC Commission Staff Office)
SMR	Small Modular Reactor
SRM	Staff Requirements Memorandum
TEDE	Total Effective Dose Equivalent