

# Preliminary Results of Environmental Review

## Arkansas Nuclear One, Unit 1

Nuclear Regulatory Commission  
November 14, 2000



## Introduction

- ▶ Background and Purpose
- ▶ Statutory background
- ▶ National Environmental Policy Act
- ▶ Environmental Review
- ▶ Results
- ▶ Schedule
- ▶ Public comment



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## Background

- ▶ Arkansas Nuclear One, Unit 1 (ANO-1)
- ▶ Operating license expires in 2014
- ▶ Requests authorization to operate an additional 20 years
- ▶ Application includes Environmental Report

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## ANO-1 License Renewal Environmental Review Milestones

- ▶ Application received - 1/31/00
- ▶ Notice of Intent - 3/10/00
- ▶ Scoping meeting - 4/4/00
- ▶ Draft Supplement 3 to GEIS - 10/3/00
- ▶ Comment period - 10/20/00 - 1/4/01



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## Purpose of Today's Meeting

- ▶ Discuss NRC's mission and related statutory requirements
- ▶ Describe environmental review process
- ▶ Discuss results of our review
- ▶ Provide review schedule
- ▶ Receive any comments you may have today
- ▶ Describe how to submit comments

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## NRC Mission

- ▶ NRC governed by:
  - Atomic Energy Act
  - Energy Reorganization Act
  - National Environmental Policy Act (NEPA)
  - Other statutes

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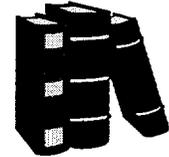
## NRC Mission (continued)

- ▶ Mission statement:
  - health and safety protection
  - environmental protection
  - common defense and security

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## What is License Renewal?

- ▶ Atomic Energy Act
  - Limits term of license
  - Allows for renewal
- ▶ 10 CFR Part 50



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## What is License Renewal? (continued)

- ▶ License Renewal (10 CFR Part 54)
  - Operate an additional 20 years beyond current license term
  - NRC review
  - Public participation
  - Commission decision

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## Purpose and Need

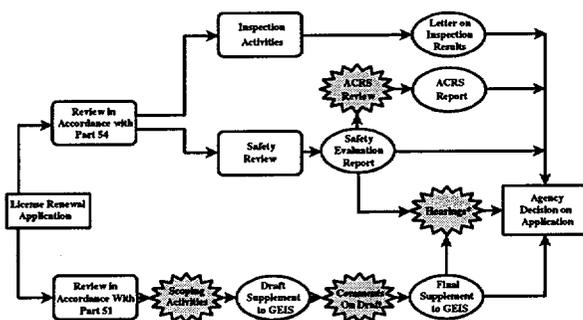
### Renewal of an operating license

“... to provide an option that allows for power generation capability beyond the term of a current nuclear power plant operating license to meet future system generating needs...”

Generic Environmental Impact Statement  
for License Renewal of Nuclear Plants  
NUREG-1437

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## License Renewal Process



Formal Public Participation

\* If a request for hearing is granted.

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## National Environmental Policy Act

- ▶ Requires Federal agencies to use a systematic approach to consider environmental impacts
- ▶ Environmental Impact Statement (EIS) required for major Federal actions significantly affecting the quality of the human environment
- ▶ License renewal is considered a major Federal action

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## Staff's Objective of Environmental Review

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To determine whether:

The adverse environmental impacts of license renewal for ANO Unit 1 are not so great that preserving the option of license renewal for energy planning decision makers would be unreasonable.

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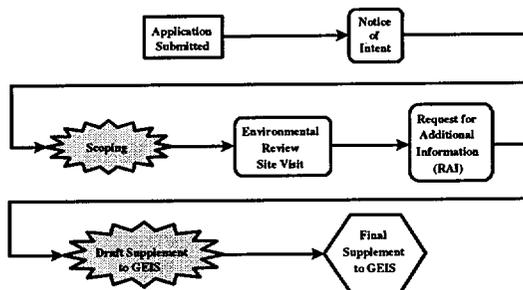
## How We Implement NEPA

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- ▶ Regulations
  - 10 CFR Part 51
  - Generic Environmental Impact Statement (GEIS)
- ▶ Regulatory Guidance
  - Environmental Standard Review Plan for License Renewal

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## Environmental License Renewal Process



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## NEPA Process

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- ▶ Notice of Intent - notifies public of NRC's plans to prepare an EIS
- ▶ Scoping Process - identifies scope of EIS and solicits public input
  - Public Meeting
  - Public Comment Period

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## NEPA Process (continued)

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- ▶ Review - evaluates environmental impacts, alternatives, & mitigation measures
- ▶ Issue draft SEIS for public comment
  - Public Meeting
  - Public Comment Period
- ▶ Issue final SEIS

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## Information Gathering Process

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- ▶ Reviewed Entergy's application
- ▶ Visited site and reviewed Entergy's process for identifying new information
- ▶ Evaluated input received through public scoping process
  - All comments received during the comment period were considered

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## Information Gathering Process (continued)

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- ▶ Visited county, regional, and State government environmental and resource regulators
- ▶ Visited information service agencies
- ▶ Verified environmental permits and requirements for continuing operations
- ▶ Discussed consequences of continued operation during renewal term with regulating agencies

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## Areas Reviewed

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- ▶ Surface water quality, hydrology, & use
- ▶ Aquatic ecology
- ▶ Ground-water use & quality
- ▶ Threatened or endangered species
- ▶ Air quality
- ▶ Land use
- ▶ Uranium fuel cycle & waste management



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## Areas Reviewed (continued)

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- ▶ Human health
- ▶ Socioeconomics
- ▶ Postulated accidents
- ▶ Decommissioning
- ▶ Environmental justice
- ▶ Alternatives to license renewal



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## Issues Not Considered In Environmental Review

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- ▶ Need for power
- ▶ Cost of power
- ▶ Spent fuel disposal (except for transportation)
- ▶ Safety-related issues

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## What Do We Look At?

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- ▶ Generic Environmental Impact Statement for License Renewal (GEIS, NUREG-1437)
  - Identified 92 issues of potential consequence
    - 69 issues resolved generically (Category 1)
    - 23 issues looked at on plant-specific basis (Category 2 or unassigned)
- ▶ Staff also looks for any significant new information not identified in GEIS

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## Category 1 Issues

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- ▶ Evaluated
  - Environmental Report
  - Public Concerns
  - Environmental Quality Standards and Regulations
- ▶ No significant new environmental information
- ▶ Staff relies on GEIS conclusions

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## Category 2 Issues

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- ▶ All 21 issues are considered
  - 5 issues are not applicable - plant design features
  - 4 issues are not applicable - refurbishment
  - 12 issues addressed - small significance
- ▶ 2 additional "non- categorized" issues
  - Environmental justice
  - Chronic exposure to EMF

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## Contents of ANO-1 Draft SEIS

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- ▶ Chapter 1 - Introduction
- ▶ Chapter 2 - Description of site and environment
  - Land use
  - Water use and quality
  - Air quality
  - Aquatic ecology
  - Terrestrial resources
  - Radiological impacts
  - Socioeconomic
  - Historic and archaeological



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## Contents of ANO-1 Draft SEIS (continued)

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- ▶ Chapter 3 - Refurbishment
- ▶ Chapter 4 - Operation during the renewal term
  - Cooling system
  - Transmission lines
  - Radiological impacts
  - Socioeconomic
  - Groundwater use and quality
  - Threatened and endangered species



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## Contents of ANO-1 Draft SEIS (continued)

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- ▶ Chapter 5 - Postulated Plant Accidents
- ▶ Chapter 6 - Uranium Fuel Cycle and Solid Waste Management
- ▶ Chapter 7 - Decommissioning
- ▶ Chapter 8 - Alternatives to License Renewal
- ▶ Chapter 9 - Summary and Conclusions

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## Highlights of Supplemental Environmental Impact Statement for ANO-1 License Renewal

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## Cooling System Effects

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- ▶ Fish and Aquatic Organisms
- ▶ Entrainment
  - Impact on population SMALL
- ▶ Impingement
  - Mostly threadfin shad (nonsport fish)
  - Impact on population SMALL



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## Cooling System Effects (continued)

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- ▶ Heat shock
  - Governed by NPDES permit
  - Impact of heat shock SMALL
- ▶ Microbiological organisms
  - Arkansas State Board of Health (ASH) indicated that the potential for adverse effects is low

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## Transmission Lines

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- ▶ 240 mile connected to transmission system
- ▶ Acute EMF Effects
- ▶ No new and significant information
- ▶ GEIS concluded impacts are SMALL
- ▶ Chronic ELF-EMF - not applicable

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## Radiological Impacts

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No anticipated increase in either public or occupational radiation dose during the license renewal term.

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## Socioeconomic Impacts

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- ▶ Housing impacts - SMALL
  - "Low" population area
  - No increase in staffing anticipated
- ▶ Public Utility impacts - SMALL
  - No significant impact to water supply



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## Socioeconomic Impacts (continued)

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- ▶ Offsite land use - SMALL
  - No plant-related, population-driven changes
  - Continued operation would provide significant continuing tax revenues to county
- ▶ Transportation impacts - SMALL
  - Possible congestion in future - population growth
  - Not directly related to plant activities

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## Socioeconomic Impacts (continued)

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- ▶ Historic and archaeological resources - SMALL
  - No plans for future area disturbances
  - Many potential archaeological sites
    - Native American
    - Euroamerican
  - No nationally registered historic places

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## Socioeconomic Impacts (continued)

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**Environmental Justice:** *Federal actions should not result in disproportionately high and adverse impacts on low-income or minority populations*

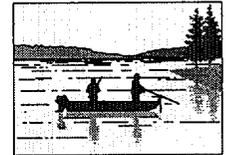
- ▶ Examined geographic distribution
- ▶ Minority populations are small, dispersed
- ▶ Hispanic population increasing
- ▶ Impact is SMALL

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## Water Use and Quality

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- ▶ ANO uses surface water from Lake Dardanelle
- ▶ No groundwater use issues
- ▶ Water quality regulated by Arkansas Department of Environmental Quality (ADEQ)



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## Threatened and Endangered Species

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- ▶ No protected species within ANO site boundary
- ▶ Endangered species in the area
  - Gray Bat - downstream
  - Interior Least Tern - breeding ground to the west
- ▶ Not affected by continued plant operation

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## Environmental Impacts of Uranium Fuel Cycle

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- ▶ No category 2 issues
- ▶ No new and significant information
- ▶ GEIS concluded impacts are SMALL

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## Environmental Impacts of Decommissioning

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- ▶ No category 2 issues
- ▶ No new and significant information
- ▶ GEIS concluded impacts are SMALL

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## Alternatives to License Renewal

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- ▶ Limited to those with “demonstrated capability and with sufficient generating capacity to replace plant power generation”
- ▶ Includes “No action” alternative
- ▶ Coal-fired power generation
- ▶ Gas-fired power generation

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## Alternatives to License Renewal (continued)

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- ▶ Coal
- ▶ Gas
- ▶ Imported
- ▶ Wind
- ▶ Solar
- ▶ Hydropower
- ▶ Geothermal
- ▶ Wood energy



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## Alternatives to License Renewal (continued)

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- ▶ Municipal solid waste
- ▶ Biomass-derived fuel
- ▶ Oil
- ▶ Nuclear Power
- ▶ Fuel cells
- ▶ Delayed retirement
- ▶ Conservation
- ▶ Combination

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## Alternatives to License Renewal - Conclusions

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- ▶ Alternative actions impact categories - **MODERATE** or **LARGE** significance
  - **MODERATE** - *sufficient to alter noticeably, but not destabilize important attributes of resource*
  - **LARGE** - *effect is clearly noticeable and sufficient to destabilize important attributes of resource.*

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## Preliminary Conclusion

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- ▶ The significance of the environmental effects of the license renewal of ANO-1 are **SMALL** for all impact categories
  - **SMALL**: *effect not detectable or too small to destabilize or noticeably alter any important attribute of the resource*

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## Postulated Plant Accidents

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- ▶ Design Basis Accidents
- ▶ Severe Accidents
  - Severe Accident Mitigation Alternatives (SAMAs)

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## Evaluation of Severe Accident Mitigation Alternatives (SAMAs)

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Purpose of Evaluation:

To ensure that plant changes (design or procedural) with the potential for improving severe accident safety performance are identified and evaluated.

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## Evaluation Approach

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- ▶ Characterize overall plant risk and lead contributors to risk
- ▶ Identify design improvements that can further reduce risk
- ▶ Quantify risk reduction potential and costs for each improvement

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## Evaluation Approach (continued)

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- ▶ Determine whether or not implementation of improvement is justified
  - Significant reduction in total risk, and
  - Favorable value/impact ratio, and
  - Risk reduction is associated with aging effects during period of extended operation

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## Results of SAMA Evaluation

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- ▶ One SAMA related to training determined to be cost-beneficial
- ▶ Entergy evaluating need to implement training enhancements
- ▶ Not related to managing the effects of aging
  - NRC will evaluate need for this SAMA in the context of continued operation under the current operating license.

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## Results of SAMA Evaluation (continued)

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- ▶ All remaining enhancements have either a negative net value or offer only minimal risk reduction.

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## Results of SAMA Evaluation (continued)

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### Overall Conclusion

Additional plant improvements to further mitigate severe accidents are not required at ANO-1 as part of license renewal pursuant to 10 CFR Part 54.

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## Environmental Findings From License Renewal Review

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- ▶ Supplement 3 to the GEIS (NUREG-1437)
- ▶ Preliminary Conclusions
- ▶ Overall license renewal decision
  - Safety review
  - Environmental review



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## Preliminary Conclusions and Recommendations

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Based on

- ▶ Analysis and finding of GEIS
- ▶ Entergy's Environmental Report
- ▶ Consultation with local, State, and Federal Agencies
- ▶ Staff's independent review, including results of scoping process

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## Staff's Overall Preliminary Conclusions

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The adverse environmental impacts of license renewal for ANO-1 are not so great that preserving the option of license renewal for energy planning decision makers would be unreasonable.

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## Public Comments

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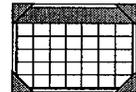
- ▶ Comment period ends on January 4, 2001
  - 75 day comment period
- ▶ All comments received during the comment period will be considered
- ▶ Comments not bearing on decision to renew license will be referred to appropriate NRC programs.

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- ▶ Comment Period - 10/20/00 - 1/4/01
- ▶ Final EIS issued - 7/01



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## Point of Contact

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- ▶ Agency point of contact:

Thomas J. Kenyon  
1 (800) 368-5642

- ▶ Application and Draft SEIS located at Pendergraft Library at Arkansas Tech University, and can be electronically viewed at:  
[www.nrc.gov/NRC/REACTOR/LR/ANO-1/index.html](http://www.nrc.gov/NRC/REACTOR/LR/ANO-1/index.html)
- ▶ Related documents can be viewed at NRC's Website ([www.nrc.gov](http://www.nrc.gov))

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## NRC Addresses

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- ▶ Provide comments to Chief, Rules and Directives Branch:
  - by mail to: Division of Administrative Services  
Mailstop T-6 D59  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001
  - in person to: One White Flint North  
11545 Rockville Pike  
Rockville, Maryland
  - e-mail to: [anoeis@nrc.gov](mailto:anoeis@nrc.gov)

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