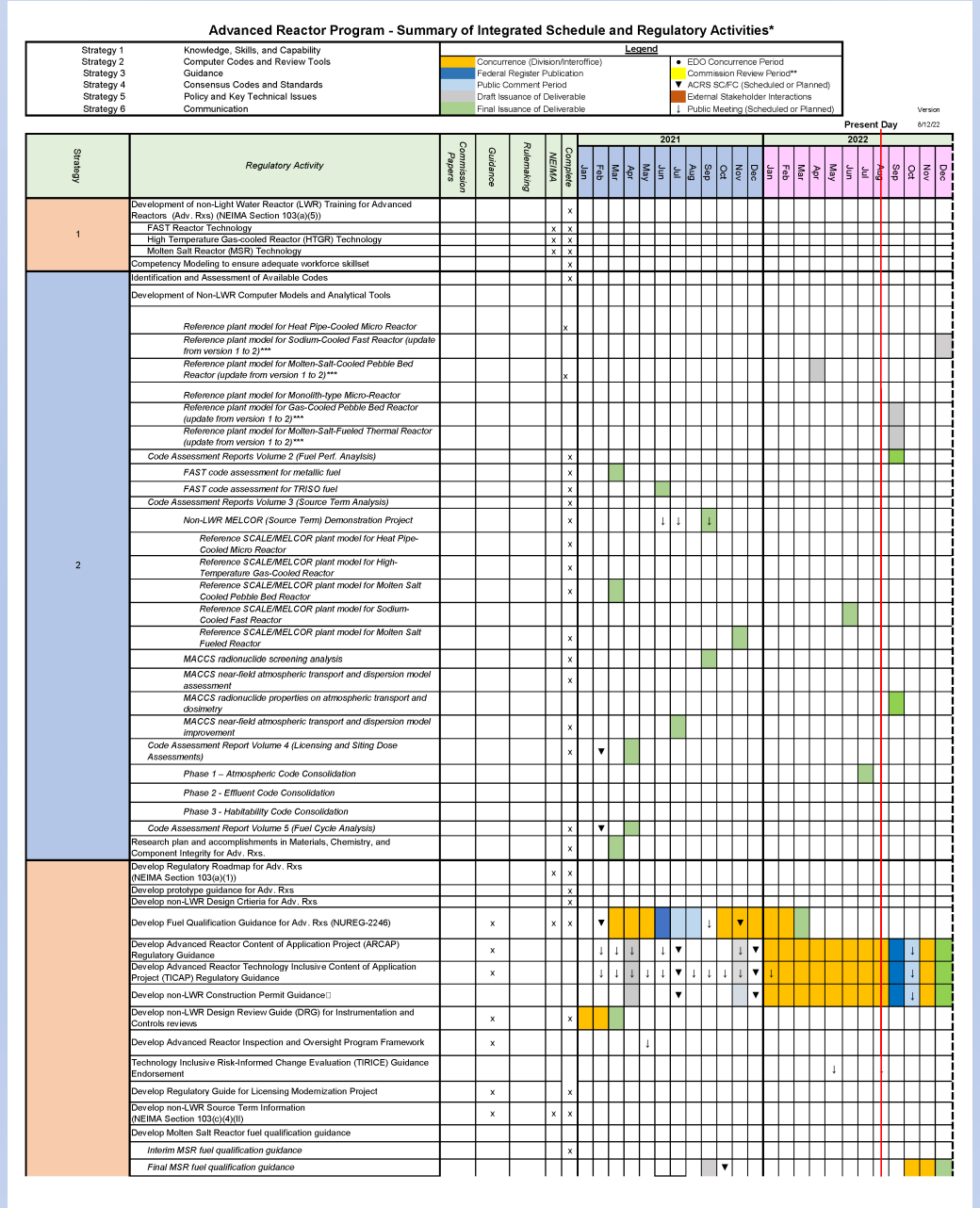
U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Advanced Reactor Stakeholder Public Meeting

August 18, 2022

Microsoft Teams Meeting
Bridgeline: 301-576-2978
Conference ID: 951 216 02#

Time	Agenda	Speaker
10:00 – 10:15 am	Opening Remarks/ Adv. Rx Integrated Schedule (Shelley Pitter - Logistics, Steve Lynch)	NRC
10:15 – 10:30 am	Population-Related Siting Considerations for Advanced Reactors (next steps, including NRC path forward, role(s) for stakeholders) (Steve Lynch)	NRC
10:30 – 11:00 am	Part 53 Update: Status and Path Forward (Steve Lynch)	NRC
11:00 am – 12:00 pm	Part 53 - Stakeholder Perspectives (TBD)	Stakeholders
12:00 – 1:00 pm	**Lunch Break**	All
1:00 – 1:45 pm	IAEA Safeguards, the Additional Protocol, and its reporting requirements (Eduardo Sastre Fuente)	NRC
1:45 – 2:30 pm	Technology Inclusive Risk Informed Change Evaluation (TIRICE) Guidance (Michael Tschiltz)	Southern Company
2:30 – 2:35 pm	Future Meeting Planning and Concluding Remarks	All



https://www.nrc.gov/reactors/new-reactors/advanced/integrated-review-schedule.html

Population-Related Siting Considerations for Advanced Reactors (next steps, including NRC path forward, role(s) for stakeholders) (Steven Lynch)

Population-Related Siting Considerations

Steven Lynch, Chief
Advanced Reactor Policy Branch

Commission Direction

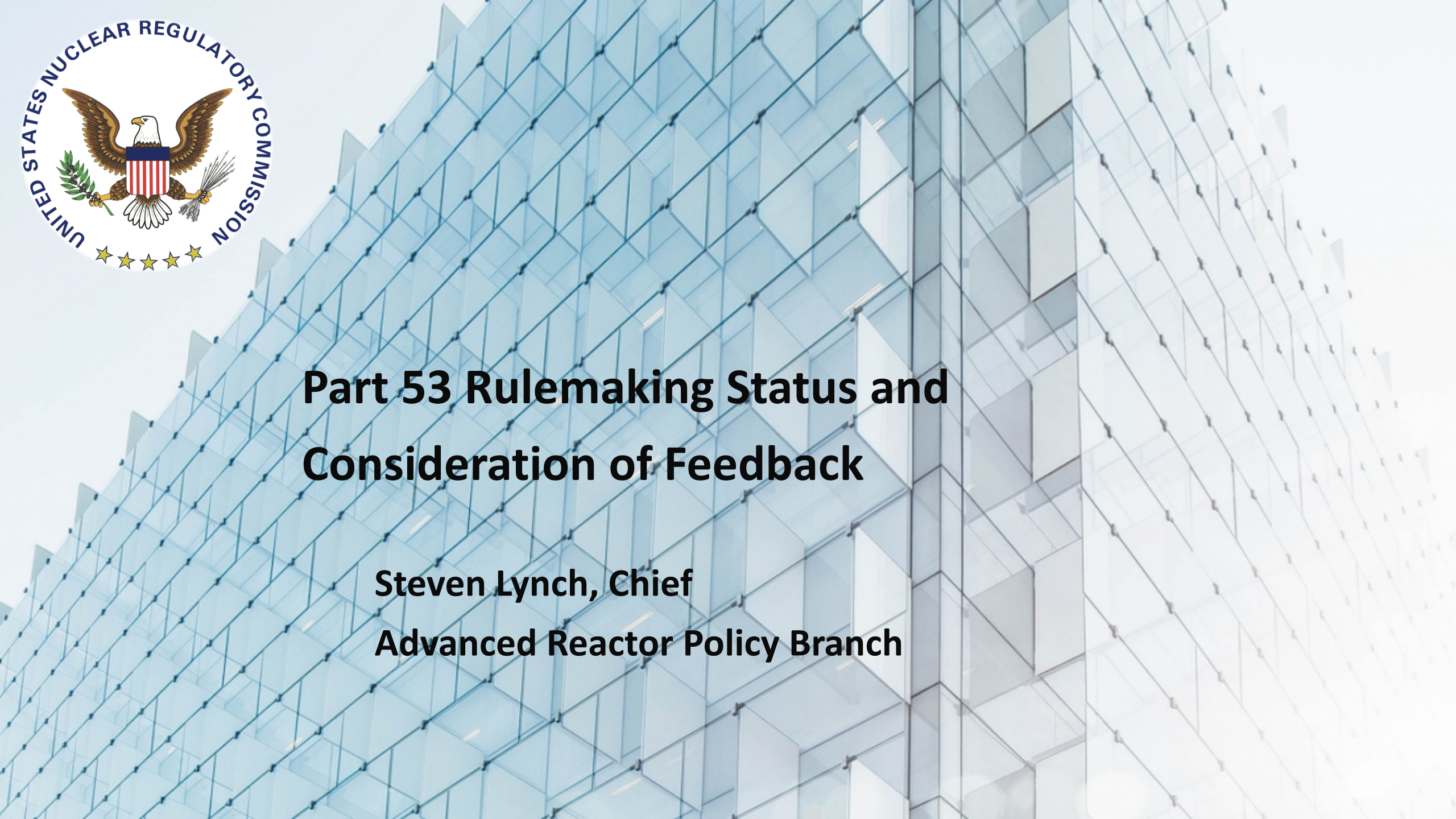
- In Staff Requirements Memorandum (SRM)-SECY-20-0045, the Commission approved the staff's recommendation to revise the guidance in Regulatory Guide (RG) 4.7, "General Site Suitability Criteria for Nuclear Power Stations" related to implementation of Title 10 of the *Code of Federal Regulations* Part 100, Section 100.21(h).

  - The SRM also states: "With respect to the traditional dose assessment approach, the staff should provide appropriate guidance on assessing defense-in-depth adequacy and establishing hypothetical major accidents to evaluate."

Proposed Path Forward

- The NRC staff are working on an update to RG 4.7 to include guidance for:
  - assessing population density out to a distance equal to twice the distance at which a hypothetical individual could receive a calculated dose of 1 rem over a period of 1 month from the release of radionuclides following postulated accidents, and
  - design approaches using the Licensing Modernization Project approach, as well as others following more traditional analysis approaches
- The NRC staff are planning to complete the updated guidance by February 2024

Part 53 Update: Status and Path Forward (Steven Lynch)



Part 53 Rulemaking Status and Consideration of Feedback

Steven Lynch, Chief
Advanced Reactor Policy Branch

RULEMAKING STATUS

Rule Language

- 2021: definitions (A), safety criteria (B), design and analyses (C), siting (D), construction/manufacturing (E), operations and programs (F), decommissioning (G), licensing processes (H), maintenance of the licensing basis (I), reporting (J), security, access authorization, FFD, traditional alternatives.
- 2022: consolidated rule package (Feb.), 2nd iteration Framework A (May, June), 1st iteration Framework B (June), updated consolidated rule package with statements of consideration (September)

Industry Input

- Over 1500 public comments received

Stakeholder Engagement

- 21 public meetings, 2 Commission Meetings, and 18 ACRS meetings
- Recent: 5/25 public meeting on Framework A, 6/11 public meeting on Framework B, 6/30 stakeholder meeting on stakeholder feedback and Subpart F, 7/28 public meeting on Framework B and key technical topics
- Future: October ACRS Subcommittee Meeting on integrated rulemaking, November ACRS Full Committee Meeting

Focus Areas

- Finalize rule language
- Develop rule package (SOCs, regulatory analysis, etc.)
- Develop guidance

CURRENT PART 53 TIMELINE

Oct 2020-Aug 2022
Public Outreach, ACRS Interactions and Generation of Proposed Rule Package

Feb 2023
Draft Proposed Rule to Commission

Jun 2023
Publish Proposed Rule and Draft Key Guidance

Oct 2023
Public Comment Period – 60 days

Nov 2023-Nov 2024
Public Outreach and Generation of Final Rule Package

Dec 2024
Draft Final Rule to Commission

Apr 2025-Jun 2025
Office of Management and Budget and Office of the Federal Register Processing

Jul 2025
Publish Final Rule and Key Guidance

Continued Consideration of Stakeholder Feedback on Part 53 Framework B

Safety functions from Framework A should be employed in Framework B.
Framework B should have its own set of siting requirements and should not rely on Part 100
Framework B should incorporate a RIPB alternative for seismic design requirements.
The draft requirements for fire protection in Framework B need to be more performance-based.
Referencing 10 CFR 50.155 (mitigation of beyond design-basis events (BDBE)) could be a challenge in Framework B because these requirements are not technology-inclusive.
Use of Generally Licensed Reactor Operators (GLROs) should be permitted in Framework B.
Linked probabilistic risk assessment requirements in 10 CFR 50.44 (combustible gas control) could be a challenge for an Alternative Evaluation of Risk Insights (AERI).
The proposed requirements in 10 CFR 53.4730(a)(12) [from the Three Mile Island requirements in 10 CFR 50.34(f)] are not technology-inclusive.

IAEA Safeguards, the Additional Protocol, and its reporting requirements (Eduardo Sastre Fuente)

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Implementation of IAEA Safeguards within the United States

Material Control and Accounting Branch
U.S. Nuclear Regulatory Commission (NRC)

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History

- The Treaty on the Non-Proliferation of Nuclear Weapons (NPT) requires non-nuclear weapon states to accept IAEA safeguards on *all* source and special nuclear material in all peaceful nuclear activities
  - The United States, as one of five nuclear-weapon states, or P5, was *not obligated* to conclude a safeguards agreement with the IAEA
- Since the early 1960's the U.S. has permitted the application of IAEA safeguards on a variety of nuclear facilities

NPT Signing, 1968

NPT RevCon, 2010

Overview of U.S.-IAEA Agreements

- U.S. – IAEA Safeguards Agreement (INFCIRC/288)
  - **"The U.S. Voluntary Offer Agreement"**
  - Entry Into Force 1980

- Protocol to the U.S. – IAEA Safeguards Agreement (INFCIRC/288)
  - **"The Reporting Protocol"**
  - Entry Into Force 1980

- Protocol Additional to the U.S. – IAEA Safeguards Agreement (INFCIRC/288 Add.1)
  - **"The Additional Protocol"**
  - Entry Into Force 2009

- **U.S.-IAEA Caribbean Territories Safeguards Agreement** (INFCIRC/366)
  - Includes a Small Quantities Protocol
  - Entry Into Force 1989
  - Modified Small Quantities Protocol - Entry Into Force 2018

Applicable U.S. Laws and Regulations

- Atomic Energy Act of 1954, as amended
  - –Primary U. S. law on nuclear energy to ". . . promote world peace, improve the general welfare, increase the standard of living and strengthen free competition in private enterprise."
- Energy Reorganization Act of 1974
  - –Established the United States Nuclear Regulatory Commission and Energy Research and Development Administration (eventually the Department of Energy)
- Nuclear Nonproliferation Action of 1978
  - –Establish a more effective framework for international cooperation on peaceful nuclear activities
  - –Codifies support to the IAEA
- Title 10 of the Code of Federal Regulations Part 75
  - –Requires NRC licensees to comply with U.S. obligations to the IAEA

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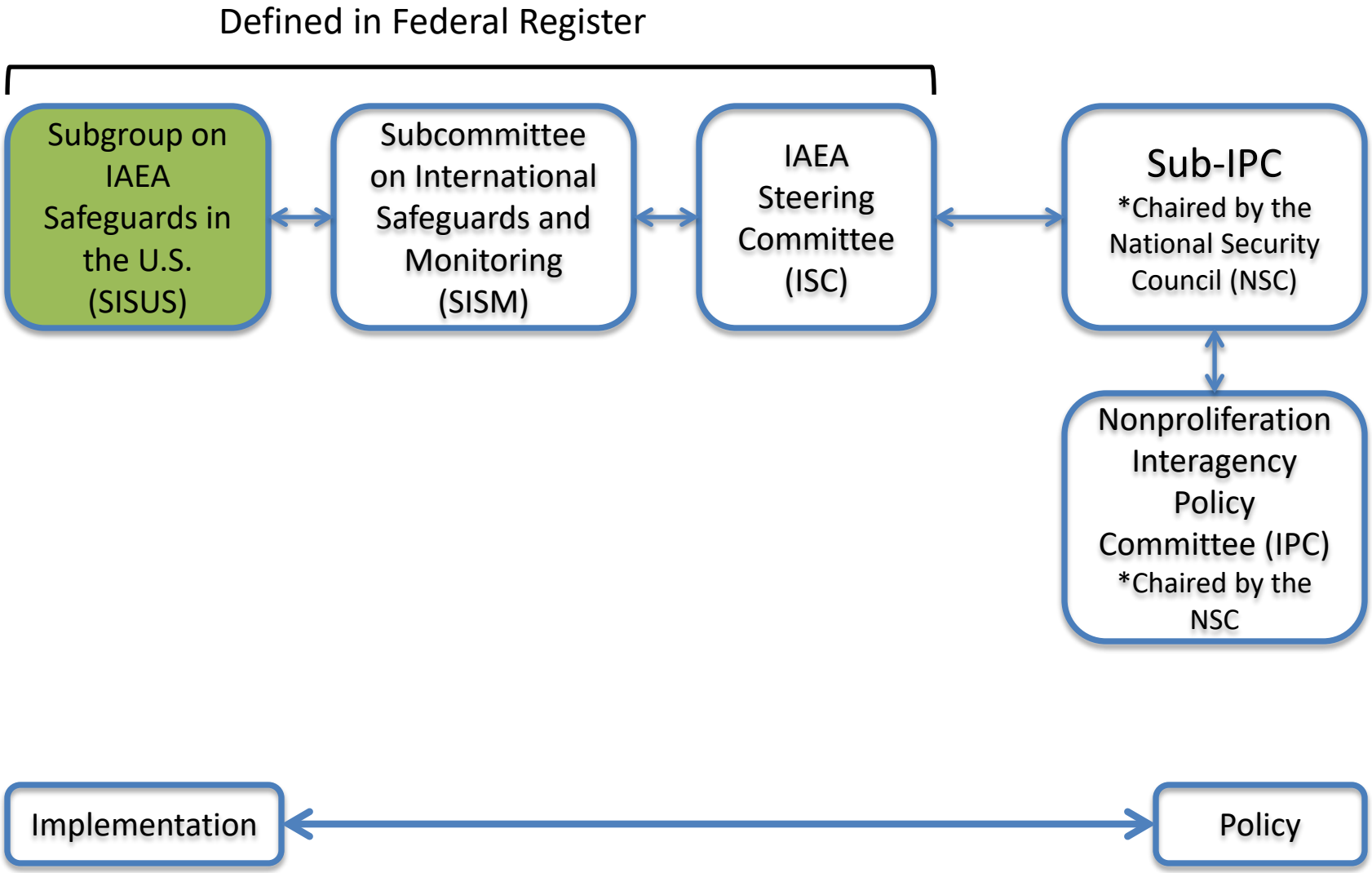
U.S. Government Oversight



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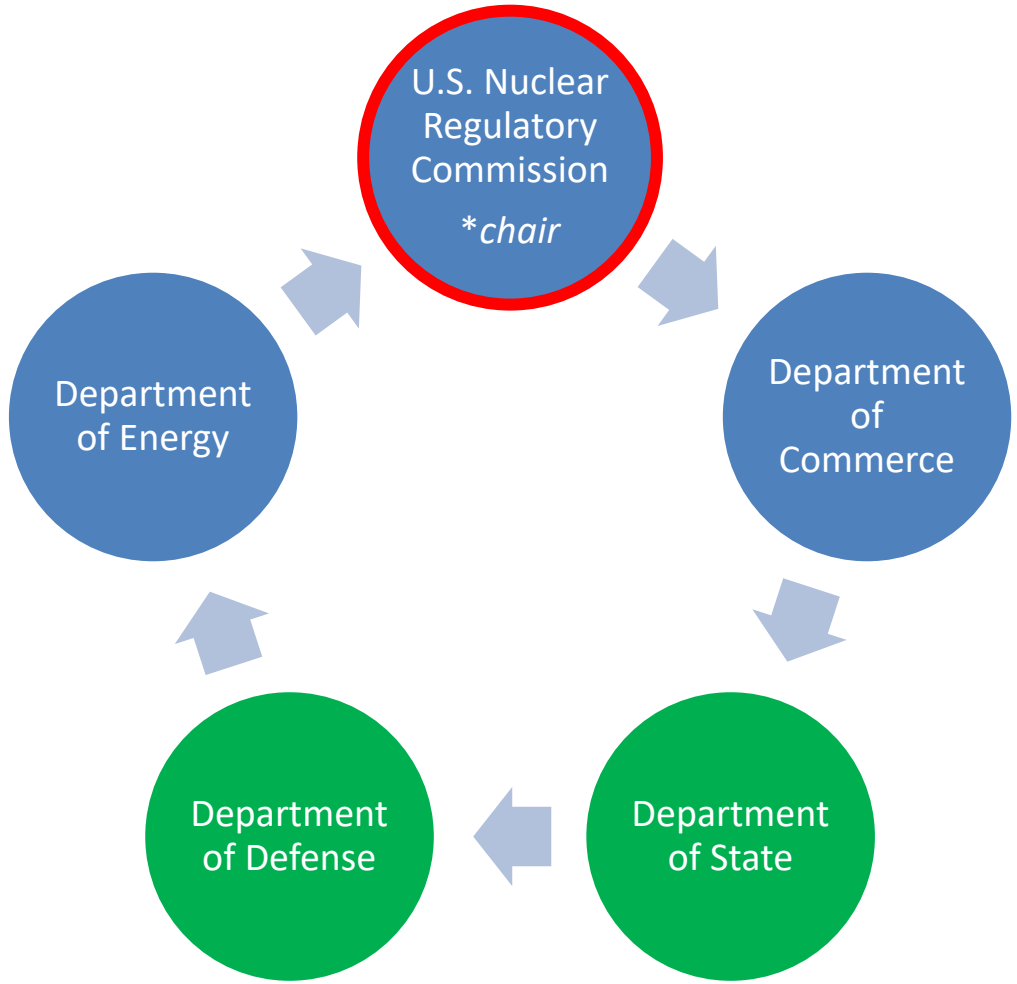
Who Implements in the U.S.? Who are the Players?

SISUS Committee



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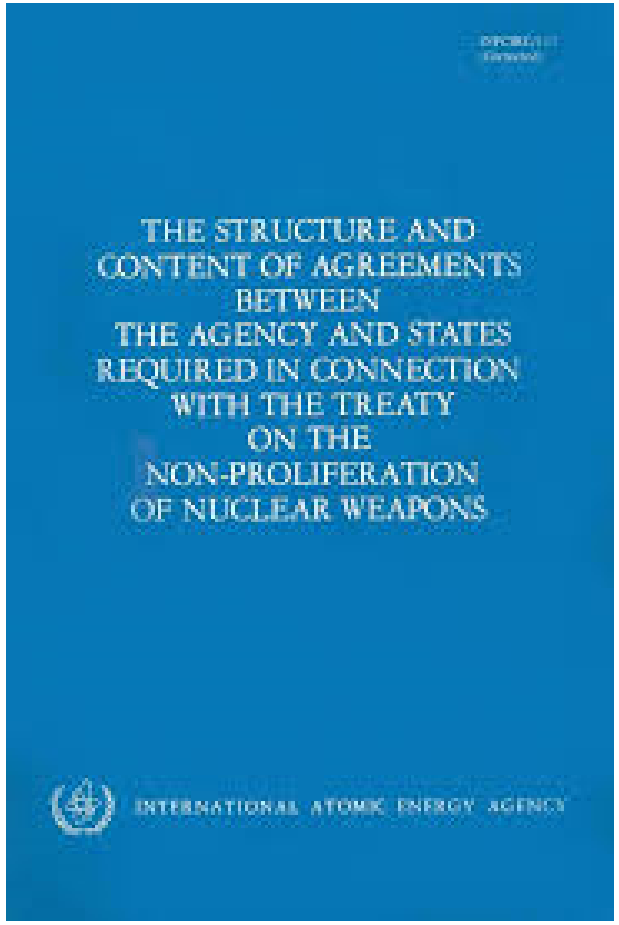
U.S. Voluntary Offer Agreement

- Based on INFCIRC/153
- Selection-based approach to safeguards
  - Eligible Facilities List (EFL)
- National Security Exclusion
- Includes all typical safeguards activities including inspections, completion of Design Information Questionnaire (DIQ) and Design Information Verification (DIV), sampling, technical visits, etc…
- Allows for the application of safeguards in a manner similar to that of non-nuclear weapon states (NNWS)



U.S. Voluntary Offer Agreement (VOA) – Reporting Protocol

- Allows for limited safeguards activities to be performed at facilities with minimal cost to the IAEA
  - Unique to the United States
- Includes activities such as completion of DIQs and DIVs
- Monthly and annual material accountancy reports (e.g., Physical Inventory Listing (PIL), Inventory Change Report (ICR), etc…)
- 4 sites (all NRC licensees) currently selected under this 'Protocol'
- **NO INSPECTIONS**

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U.S. VOA or Comprehensive Safeguards Agreement (CSA)

U.S. VOA	Comprehensive Safeguards
Selection-based approach based on the Eligible Facilities List	Safeguards are applied on all nuclear material in the territory (all facilities)
Completion of Design Information Questionnaire and Design Information Verification	Completion of Design Information Questionnaire and Design Information Verification
Monthly and annual material accountancy reports (e.g., Physical Inventory Listing (PIL), Inventory Change Report (ICR), etc.)	Monthly and annual material accountancy reports (e.g., Physical Inventory Listing (PIL), Inventory Change Report (ICR), etc.)
Inspections at selected facilities under full scope safeguards (one in the U.S.)	Inspections at all facilities
National Security Exclusion	No Exclusions

Eligible Facilities List (EFL)

- Two portions of the U.S. EFL
  - DOE facilities (non-public)
  - NRC facilities (public)
    - http://www.nrc.gov/about-nrc/ip/intl-safeguards.html
- ~300 facilities on EFL
  - *"Facility"* is formally defined by the IAEA
  - Facilities removed when "decommissioned" (per IAEA's definition)
  - Locations Outside Facilities (LOFs) not included on EFL
- Updated annually
- Updates are vetted through the U.S. Government
  - Security evaluation to remove anything of "direct national security significance"

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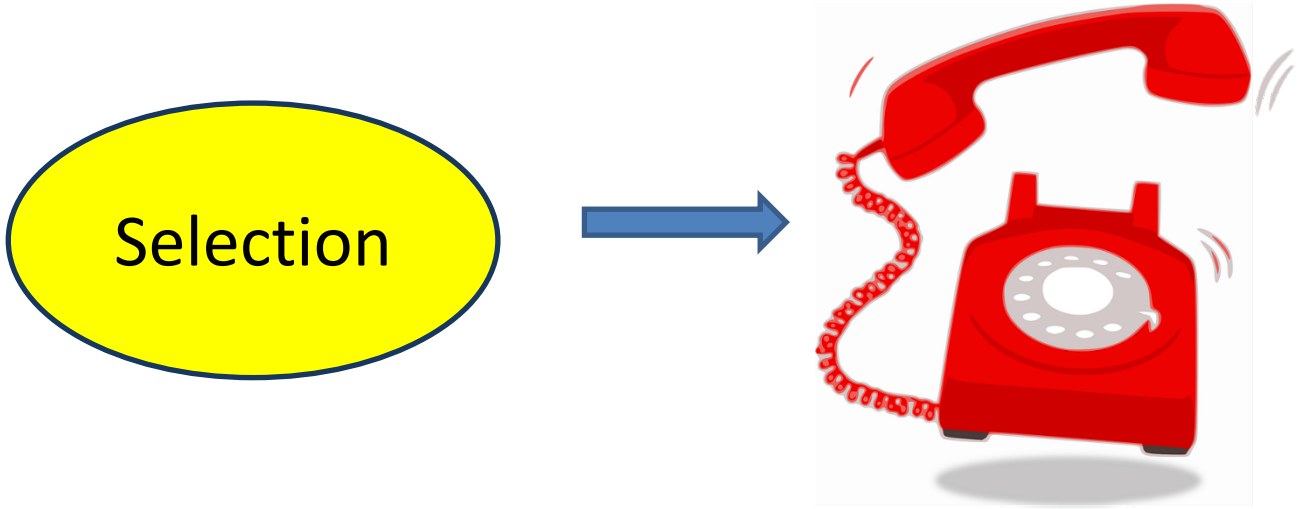
Implementation Contd.



- After the facility has been notified of selection, the following documents are completed:
  - Design Information Questionnaire (DIQ)
  - Facility Attachment
- U.S. and IAEA negotiate terms of implementation

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Present

- K-Area Material Storage (KAMS) at Savannah River Site (SRS)
  - Only facility currently under routine inspections by the IAEA
  - Incorporates remote monitoring
  - Allow for installation of IAEA equipment
  - Reporting
- Westinghouse Fuel Fab. Facility (Columbia, SC)
- Framatome Fuel Fab. Facility (Richland, WA)
- Global Nuclear Fuel – Americas Fuel Fab. Facility (Wilmington, NC)
- URENCO USA Gas Centrifuge Enrichment Plant (Eunice, NM)

Reporting AND Inspections

Reporting ONLY, NO INSPECTIONS

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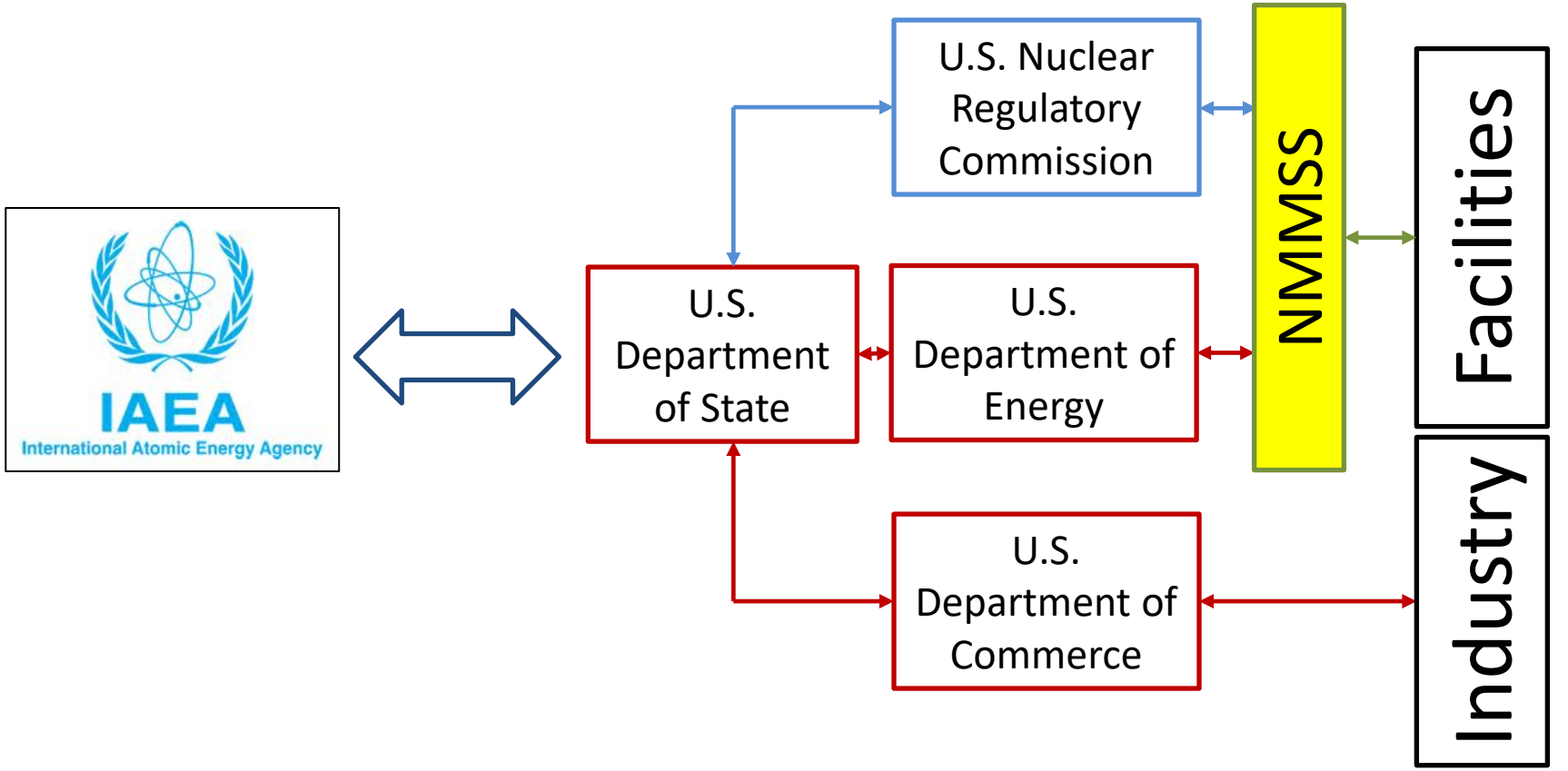
Flow of Information through NMMSS
(Nuclear Materials Management & Safeguards System)



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U.S. Additional Protocol (AP) 2009 - Present

- Signed in 1998, entry into force 2009
- Provides the IAEA with additional information and access rights on nuclear fuel cycle related activities
- Contains a national security exclusion
- "Locations" and "Sites" must submit:
  - Annual updates
  - Quarterly export reports
- The U.S. AP applies to everyone within the U.S.
  - Excluding anything of national security significance
  - No "selection" is required

www.AP.gov

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Reporting Requirements

- Annual reporting requirements (10 CFR 75.6)
  - (2.a.i) Nuclear fuel cycle research and development (15 CFR 781)
    - Approximately 75% of the total number of U.S. declarations are 2.a.i. declarations
  - (2.a.iii) Site declaration including description of activities
    - Only relevant for facilities that are currently or have previously been selected for IAEA safeguards
    - Not applicable to a vast majority of the industry
  - (2.a.iv) Nuclear fuel cycle related manufacturing and assembly (15 CFR 781)
    - Annex I items from the U.S. Additional Protocol
  - (2.a.v) Uranium and thorium mines, mills, and concentration plants
  - (2.a.vi) Possession of large quantities of impure source material (15 CFR 781)
    - Source material that is not yet suitable for fuel fabrication or enrichment
  - (2.a.x) Ten year plan
    - Input is not requested from the industry
- Quarterly reporting requirements [10 CFR 110.54(a)(1)]
  - (2.a.ix) Exports of Annex II items

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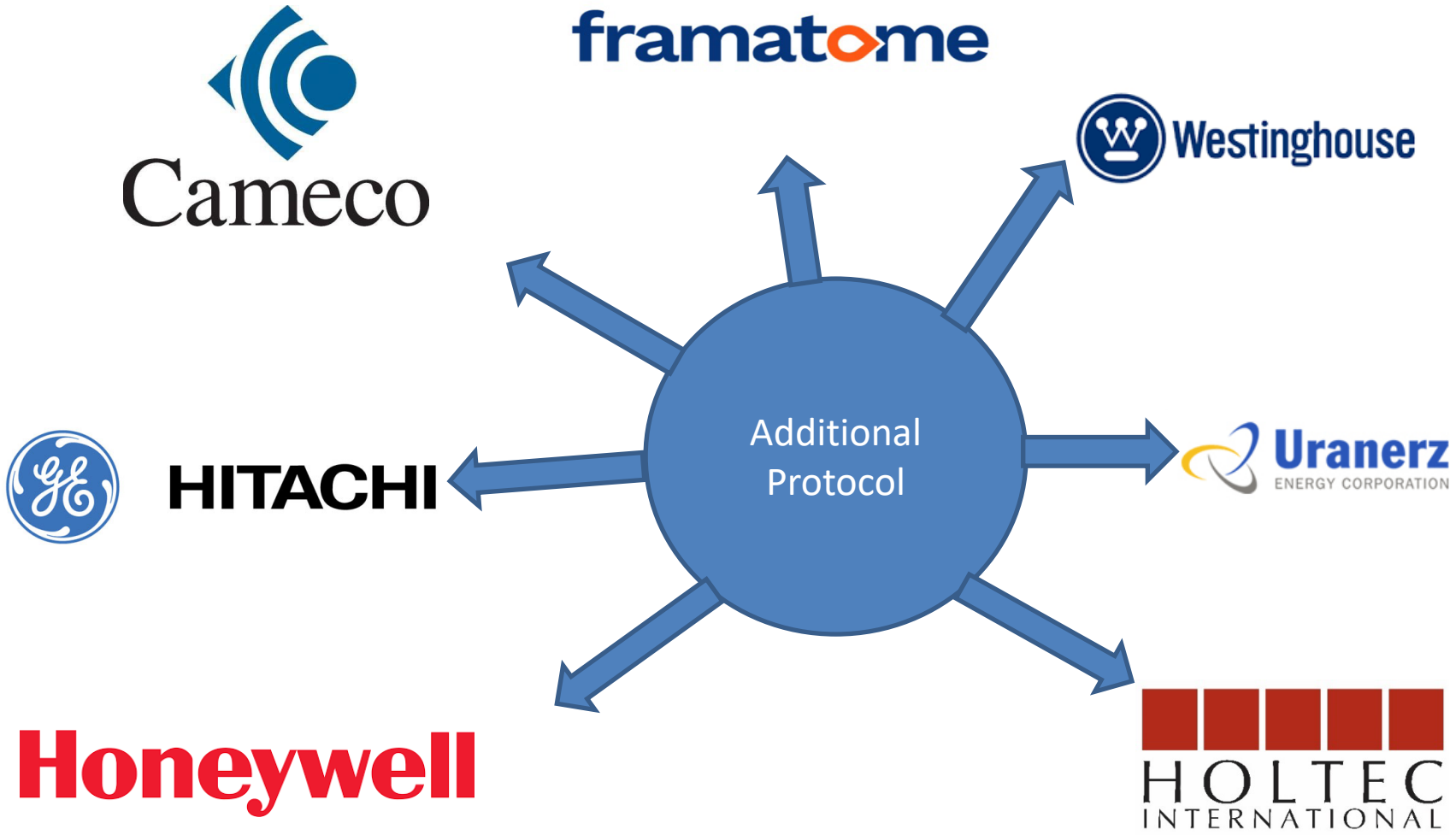
Nuclear Fuel Cycle Research and Development

- **The R&D activities captured by AP are those are funded either by the U.S. Government or privately. (15 CFR 783.1(a)(1))**

- Reportable privately funded R&D activities:
  - Enrichment,
  - Reprocessing of nuclear fuel or
  - Processing of intermediate or high-level waste containing plutonium, high enriched uranium or uranium-233

- Reportable U.S. Government funded R&D specifically related to:
  - Conversion of nuclear material
  - Enrichment of nuclear material
  - Nuclear fuel fabrication
  - Reactors
  - Critical facilities
  - Reprocessing of nuclear fuel
  - Processing of intermediate or high level waste containing plutonium and/or high enriched uranium.

Snapshot of Licensees Who Report Under the U.S. AP…and many more!



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Quarterly Export Reports Explained (2.a.ix)

- For licensees using NRC general or specific license authorizations for exports of specified equipment and non-nuclear material as listed in Annex II of the Additional Protocol
  - This reporting requirement is also reflected in 10 CFR Part 110.54(a)(1) for Agreement State licensees.
- Most NRC licensees should report as a "location" using AP-13 found on www.AP.gov, to report directly to Department of Commerce, Bureau of Industry and Security (BIS) every quarter (forms are joint DOC/NRC forms).
- Quarterly deadlines to BIS are: January 15, April 15, July 15, and October 15 of each year
- Exporters shall follow 10 CFR 110.54(c) for reporting items exported under Part 110.26 (General License)

Additional Protocol Reporting Process

- Information is sent to DOC by Jan 31st
  - Can be sent via facsimile, mail, or email
- NRC receives licensee's forms from DOC and performs a review
- NRC compiles data and submits a report to DOC for inclusion in the overall U.S. Government declaration
- U.S. declaration must sit before Congress for a 60 day review period (for annual report only)

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Additional Protocol Webpage

- The Department of Commerce manages a webpage that contains the handbooks and forms for the U.S. Additional Protocol
  - Handbooks and forms are joint use for both DOC and NRC
  - The majority of companies use the "Report Handbook for Locations."
- Assistance in determining your obligations (15 CFR 782.4)
  - apdr@bis.doc.gov
  - Santiago.Aguilar@nrc.gov

http://www.AP.gov

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Additional Protocol Webpage

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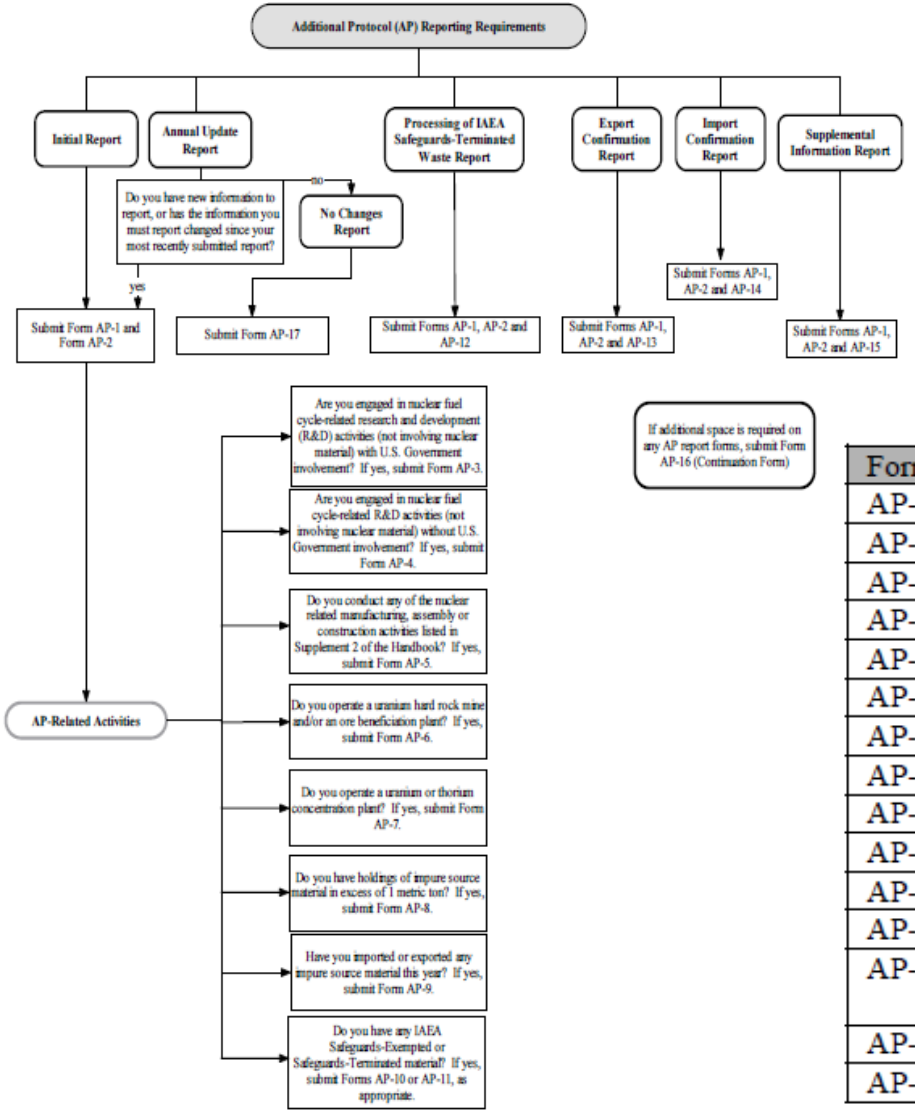
Additional Protocol Webpage



Form	Reportable Activities
AP-2	Contact Information
AP-3	R&D with U.S. Government Involvement
AP-4	R&D without U.S. Government Involvement
AP-5	Manufacturing, Assembly, Construction Activities
AP-6	Uranium Hard Rock Mine & Beneficiation Operations
AP-7	Concentration Plant Operations
AP-8	Holdings of Impure Source Materials
AP-9	Imports and Exports of Impure Source Materials
AP-10	Holdings of IAEA Safeguards-Exempted Material
AP-11	Location of IAEA Safeguards-Terminated Waste Material
AP-12	Processing of IAEA Safeguards-Terminated Waste Material
AP-13	Export of Equipment & Non-Nuclear Materials Report
AP-14	Import of Equipment & Non-Nuclear Materials Confirmation Report
AP-15	Supplemental Information Report
AP-16	Continuation Form

Complementary Access (CA)

- Complementary access is an essential aspect of the IAEA's expanded authorities
- Complementary access allows the IAEA to:
  - Verify the absence of undeclared nuclear materials and activities
  - Resolve a question or inconsistency
- Access for IAEA with 24 hours advance notice
  - 2 hours if IAEA is already onsite
- CAs are rare in the U.S.
- Only 2 CAs have been conducted in the U.S. (2010)
  - AREVA Inc., Fuel Fabrication Facility (Lynchburg, VA)
  - Global Advanced Metals (Boyertown, PA)

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NRC Points of Contact

- Please ask questions early and often!
  - NRC - Office of Nuclear Material Safety and Safeguards (NMSS); Material Control and Accounting Branch (MCAB)
    - Eduardo Sastre Eduardo.Sastre@nrc.gov
    - Santiago Aguilar Santiago.Aguilar@nrc.gov
    - Oleg Bukharin Oleg.Bukharin@nrc.gov
    - James Rubenstone James.Rubenstone@nrc.gov
  - Department of Commerce, Treaty Compliance Division, Bureau of Industry and Security, U.S. Department of Commerce
    - Hung Ly Hung.Ly@bis.doc.gov
- Additional resource:
  - http://www.nrc.gov/about-nrc/ip/intl-safeguards.html

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Questions?

Technology Inclusive Risk Informed Change Evaluation (TIRICE) Guidance
(Michael Tschiltz)

Technology-Inclusive Risk-Informed Change Evaluation (TIRICE) for Facilities Utilizing NEI 18-04 (Methodology) and NEI 21-07 (Content of Application) guidance

NRC Advanced Reactor Stakeholder Meeting

August 18, 2022

Mike Tschiltz
Consultant to Southern Company

Southern Company

Topics

- Project Overview
- Objectives
- Schedule
- Questions

Project Overview, Objectives and Schedule

- The TIRICE project builds upon the work accomplished by LMP(NEI 18-04) and TICAP (NEI 21-07) to create guidance for evaluating changes to the facility as described in the UFSAR for those licensees that have used these guidance documents.
- Advanced non-LWRs may elect to follow NEI 18-04 for selection of licensing basis events; safety classification of structures, systems, and components and associated special treatments; and determination of Defense-in-Depth (DID) adequacy.
- The resulting LMP-based affirmative safety case is substantially different from the traditional deterministic, compliance-based safety cases in place for LWRs licensed by the NRC.
- During development of TICAP guidance it became clear that there is a need to develop technology-inclusive, risk-informed, performance-based guidance for evaluating changes to a facility as described in the Updated Final Safety Analysis Report (UFSAR) (10 CFR 50.59).
- The attributes of the LMP-based affirmative safety case require additional guidance for efficient application of an alternative change evaluation process.
- The proposed change evaluation process would be invoked through a license condition in combination with an exemption to 10 CFR 50.59.

Project Overview, Objectives and Schedule

The project will develop guidance for a change evaluation process for reactors that are licensed under 10 CFR Part 50 or 52 that utilize NEI 18-04 to develop safety case and NEI 21-07 guidance to determine application content.

The objectives of the guidance are to:

- Establish a process and criteria for evaluating changes to the facility as described in the final safety analysis report and determine which changes can be implemented without prior NRC approval
- Ensure that the changes that require NRC prior approval are properly identified
- Minimize the unnecessary burden to the regulator and operators

Project Overview, Objectives and Schedule

- **Overall project schedule**
  - Develop Draft Guidance document to be provided for the NRC for review in August 22
  - NRC review and endorsement FY23

- **Develop Project Plan and establish Project Team** (Dec 21-Jan 22) complete

- **Develop Scope and Process papers** (Feb-Mar 22) complete
  - Utilized as inputs to white paper

- **Develop White Paper** (Apr-July 22) complete
  - Identify specific steps to be performed during the change evaluation process
  - Summarize efforts to date and obtain ARRTF feedback
  - Provide draft white paper to NRC for review
  - Meeting with NRC to obtain staff feedback
  - Revise white paper in support of Table Top exercises
  - Utilize white paper in performing Table Top exercises

- **Develop Table Top Guidelines and Objectives (Apr-June 22) complete**
  - To improve the efficacy of the proposed process, some elements of the recommended guidance will be subjected to trial use tests.

Project Overview, Objectives and Schedule

- **Develop Annotated Outline for Guidance** (Apr - Jul) complete
- **Conduct Tabletop Exercises** (Jun - Jul) complete
  - Conduct Table Tops with 2 Advanced Reactor Developers
  - Obtain NRC observations from Table Tops
  - Develop Lessons Learned and incorporate into Draft Guidance document
- **Develop Southern Co. Draft Guidance document** (Jul – Aug) ongoing
  - ARRTF review of Draft Guidance
  - Address ARRTF comments provide revised Draft Guidance to ARRTF
  - NRC review of Draft Guidance
  - Revise Draft Guidance to address NRC comments and provide to ARRTF and NRC
- **Convert to NEI document and submit for NRC review/endorsement** (Sep 22- FY23)
  - ARRTF review of draft NEI guidance
  - Address ARRTF comments and finalize for formal submittal for NRC review/endorsement

Questions

Thank you for your time and attention