# *Update on the Domestic Production of Molybdenum-99*

Nuclear Regulatory Commission
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September 22, 2010

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# Background: Molybdenum-99 (Mo-99)

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- Fission product that decays to Technicium-99 (Tc-99m)
- Tc-99m
  - Radiopharmaceutical used in ~35,000 medical procedures daily
  - Diagnostic tool used in cancer imaging and bone scans
- Medical Isotope Global Shortage
  - Chalk River, Canada (53 years); ~40% Global; 60% U.S.
    - Shutdown: May 2009 – July 2010 (14 Months)
    - License expires in 2016
  - HFR, The Netherlands (49 years); ~25% Global; 40% U.S.
    - Shutdown: Feb. 2010 – September 2010 (7 Months)
  - South Africa, Belgium, France: ~30%
  - Currently No Domestic Producers
    - Cintichem Decommissioned in 1989
    - 2 NRC Mo-99 staff members are former Cintichem employees

# Background: Molybdenum-99 (Mo-99)

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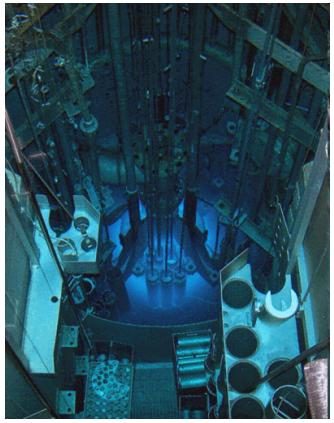
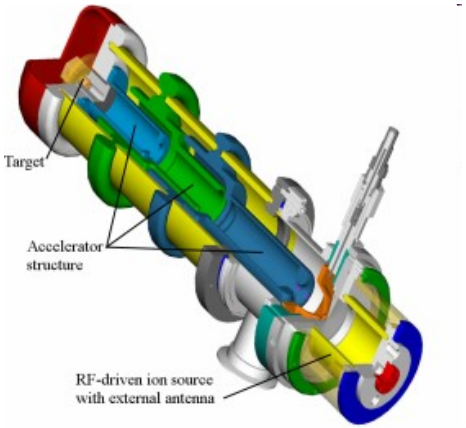
- 2 DOE Cooperative Agreements (CA) signed
  - Aqueous Homogeneous Reactor and Neutron Activation Technology
  - 2 more to be awarded soon
    - Conventional LEU Targets and Accelerator Technology





# How the NRC is Preparing – Internal Stakeholders

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- Organizationally, NRR/PRPB oversees all Mo-99 work
  - Part 50 and Part 70 items
- Program/Project Management Tool (EPM)
  - Updated Project Tracking
  - Efficient Team Collaboration
  - AHR Program Development
  - RTR Program Development

# How the NRC is Preparing – Internal Stakeholders

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## AHR Program Development

- Internal AHR training
- Project: Quality Assurance Plan Review
- Project: NUREG-1537 Interim Staff Guidance (ISG)
  - Expert panel composed of National Labs and NRC staff
  - Focusing on:
    - Ch. 4: Reactor Description
      - Especially Reactor Fuel section (Liquid)
    - Ch. 5: Reactor Coolant System
    - Ch 9.6: Cover Gas Control (Radiolytic gas management)
    - Ch: 13: Reactor Accident Analysis
    - Ch. 14: Technical Specifications
    - Looking over other chapters for other reactor needs
  - NRR collaborating with NMSS for NUREG-1520 ISG
    - Production Facility Side

# How the NRC is Preparing – Internal Stakeholders

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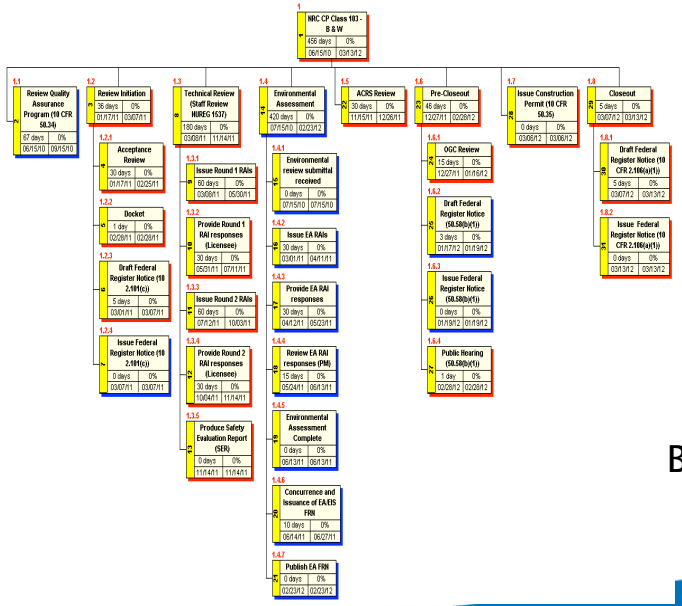
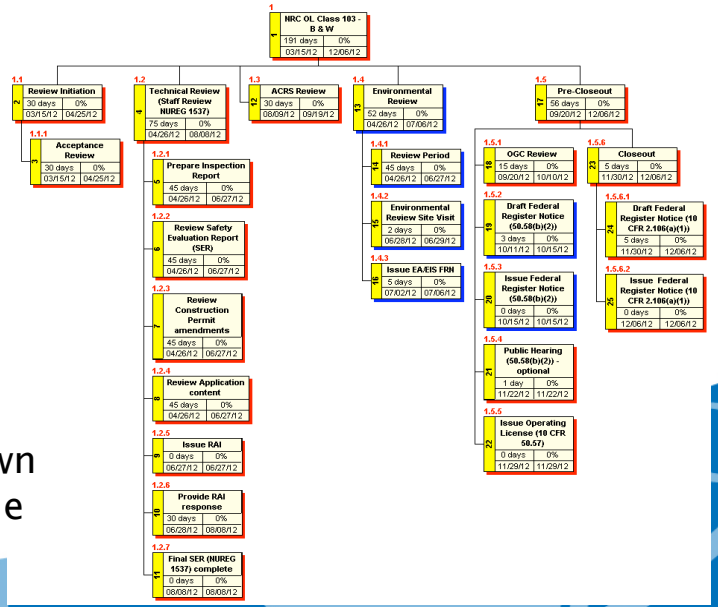
## ❑AHR Program Development

- Project: B&W Potential License Application Review
  - Project manager selecting working group members
  - Project Management Tool
    - Applicant must agree and stick to the schedule




Work Breakdown Schedule



# How the NRC is Preparing – Internal Stakeholders

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- RTR Program Development
  - Coqui
    - Internal Literature/Background Research
    - Project: Coqui Letter of Intent submitted
      - Project Manager's Working Group
      - Project Management Tool
        - Applicant must agree and stick to the schedule
  - Other RTR (MURR, etc.)
    - Project manager working group
    - Scheduling Tool

# How the NRC is Preparing – Internal Stakeholders

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- Neutron Activation Program Development
  - GE
    - Looking at potential licensing work
      - BWR may need a license amendment
      - RTR might be covered under current licensed activities
    - Environmental Assessment
      - Expected review type
      - Potential FONSI determination

# How the NRC is Preparing – Internal Stakeholders

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- A.M.I.C. Program Development
  - NMSS/FCSS – NRR collaboration
    - ISG for NUREG-1520 and NUREG-1537
    - Assuring Mo-99 separation processes proposed will be subject to equivalent safety reviews.
  - FCSS developing ISG for the safety review of potential reaction vessel, in which fission will be intentional.
    - Usual fuel cycle facility technical reviews are on preventing criticality through minimizing neutron interactions.

# How the NRC is Preparing – External Stakeholders

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- Monthly OSTP Meetings
  - Meet with other involved Federal agencies
  - OSTP Workshop (October 5)
- Schedule public meetings upon request
  - Coqui Public Meeting (October 6)

# Summary

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- Mo-99 global shortage has encouraged domestic production
- DOE promoting 4 technologies through CAs
- NRC preparing internally and maintaining communication with other agencies and the public

# THANK YOU

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