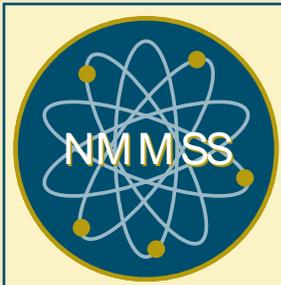


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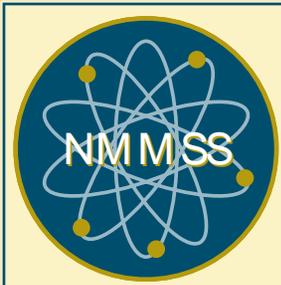
MC&A at Power Reactors

Observations from Material
Control & Accounting Inspections
at Power Reactors



Background

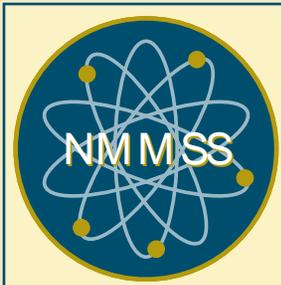
- Millstone Unit 1
 - Loss of 2 rods identified
- Temporary Instruction 2515/154
 - 3 phase inspection of power reactor MC&A programs
 - Phases I and II, collect general information on MC&A practices
 - Phase III, detailed inspection of MC&A program at a minimum of 12 sites



Background, continued

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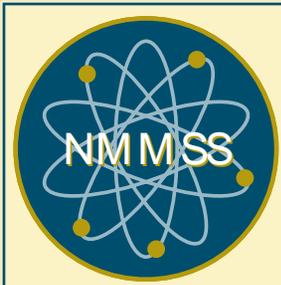
- Vermont Yankee
 - Missing rod pieces
 - Identified during TI-2515/154, Phase II
 - Rod pieces found in another location in spent fuel pool
- Information Notice
- Humboldt Bay
 - Loss of rod segments identified



Background, continued

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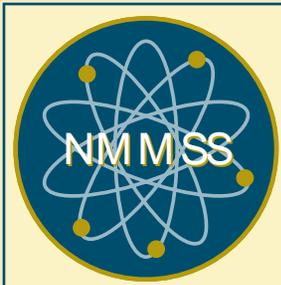
- Bulletin 2005-01
- Phase III of TI 2515/154
 - 10 sites selected for Phase III
 - Basis for selection
 - Results of Phases I and II of the TI
 - Response to Bulletin 2005-01
 - Issues identified by licensee
 - Request by Region



Typical Phase III Inspection

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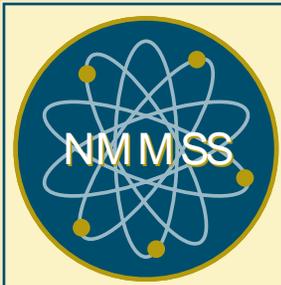
- Review selection of MC&A records
- Review all records involving rods separated from their parent assembly
- Review written MC&A procedures
- Comparison of accounting records with NMMSS reports
- Review of self-assessments



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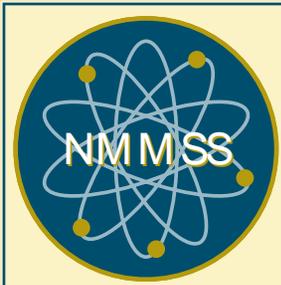
Typical Inspection, continued

- Visual verification of a sample of intact assemblies
- Visual verification of 100% of orphan rods and pieces
- Review of physical inventory practices and results



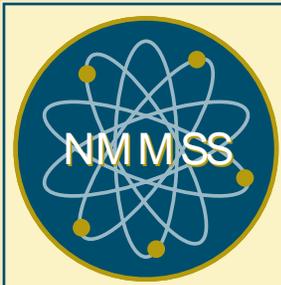
General Observations

- Containers used to store rods and pieces vary from site to site
- Most inventories did not include visual verification of rods and pieces
 - Periodic visual verification could have prevented Vermont Yankee problem
- Few licensees checked assembly ID's
 - Recommended by ANSI N15.8-1974



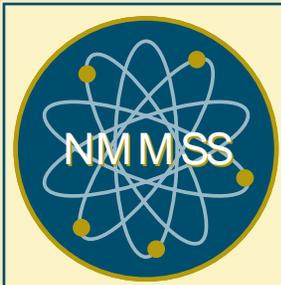
General Observations, cont

- Some licensees had problems with record-keeping
 - Comparison of book records with physical inventory results could have prevented the Millstone Unit 1 problem
 - Complete shipping records could have resolved the Humboldt Bay issues



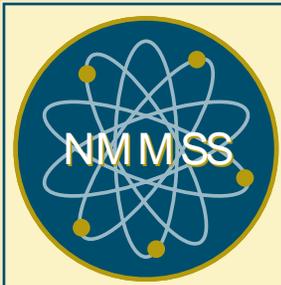
General Observations, cont

- Some licensees did not exercise control over contractors and their records
- Some licensees failed to recognize that record-keeping and physical inventory are separate requirements
 - Complete records do not substitute for annual physical inventory



General Observations, cont

- Fuel failure and reconstitution did not imply that control over rods and pieces would be lost
- Some licensees had adequately accounted for and controlled all fuel
- MC&A problems are more widespread than originally thought



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Path Forward

- NRC plans to participate with industry in revising ANSI N15.8
- NRC plans to revise the Reg Guides
- NRC plans to conduct baseline MC&A inspections at all power reactors
- NRC plans to reinstate periodic MC&A inspections at reactors