Decommissioning: The Future of the Nuclear Industry

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Key Points

• Economics and poor performance are making it harder for existing nuclear units to compete in competitive wholesale electricity markets (about ½ of all plants)

• There are only two new plants under construction

→ Decommissioning will become the dominant issue for the nuclear power industry in the United States in the next decade, unless --
  • Second life extension becomes viable (very unlikely)
  • Something dramatically changes the major trends around the macro electricity industry (always possible)
Key Issues for Decommissioning

• Plant Cleanup itself
• Disposition of Spent Fuel
• (What happens to the safety of the existing fleet as the top power generation talent shifts to other fields – leads to more and earlier plant decommissioning?)
Plant Cleanup

• By regulation all plants must have funds set aside for nuclear decommissioning as determined by an NRC formula
  • Deregulated plants have the full** amount set aside at all times
  • Regulated plants can continue to charge ratepayers for necessary funds
    • Key Issue: Are funds sufficient to conduct cleanup (probably)
    • Key Issue: What happens if funds run out?

• Most plants choose to pursue SAFSTOR, which allows up to 60 years to complete plant cleanup
  • Allows growth in decommissioning funds
  • Allows reduced radiation impacts to workers
    • Key issue: 60 years is a long time for plants to sit and land to be unuseable for other purposes
Market Reaction

• Large decommissioning funds combined with strong community interest in earlier decommissioning has led to a number of plant sales to companies to perform decommissioning
  • Most decommissioning funds were established primarily with ratepayer money and excesses to be returned upon completion
  • New entrants promise earlier cleanup in exchange for a portion of the remaining funds after cleanup completed
    • Key Issue – Can the cleanup be performed earlier with less money than plant (skeptical)
    • Key Issue – Are the new owners sufficiently capitalized and knowledgeable to deal with the hazardous, but straightforward task of decommissioning (Likely**)
    • Key Issue – Should excess funds be returned to ratepayers?
Spent Fuel

• In the best scenario, it will be several decades before a geological repository could be opened. Therefore spent fuel will be managed in interim sites

• Two approaches
  • At reactors themselves: either at the reactor that made the fuel or at other company owned site
  • Consolidated Interim Storage
On-site Reactor Storage

• Viable (and de facto) solution for most plants with risk largely driven by long term environmental contamination problems, which can be mitigated with enough money and management focus

  • Key Issue: Are the new decommissioning entrants capable of providing this long term support
Consolidated Interim Storage

• Consolidated Interim Storage means moving spent fuel to one or a few storage facilities throughout the country for storage

• This is essentially permanent storage, because once fuel moves it will be hard to move it back.
  • Key Issues: Do previous owners maintain title? Do they need to reserve space for returned fuel? Does DOE take title?

• Finding interim site mean finding a permanent site because from a practical perspective there is no such thing as interim storage
  • Key Issue: Back to the challenges of finding a permanent place to store fuel

• By law an interim site cannot be a permanent repository, so using interim storage requires moving fuel twice: plant to interim, interim to permanent
  • Key Issue: Introduces additional transportation policy and technical challenges over direct move to permanent repository