Vermont Department of Health Experiences with the Decommissioning of Vermont Yankee

VERMONT
DEPARTMENT OF HEALTH

Presentation at Massachusetts NDCAP Meeting, 24 January 2018

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Introduction

- The Vermont Department of Health has conducted environmental surveillance around Vermont Yankee since the site was chosen for a nuclear power plant in the 1960s.
- Health has also provided nuclear emergency expertise, guidance and training in support of the Radiological Emergency Plan for most of the plant's history.
- The Health Department was represented on the original Vermont State Nuclear Advisory Panel while Vermont Yankee operated.
- The Health Department has served on the Vermont Nuclear Decommissioning Citizens Advisory Panel since it was formed after the announced shutdown of Vermont Yankee in 2013.
- This presentation is about VY decommissioning activities since 2013, and lessons the Health Department has learned along the way.

Timeline

- August 2013: Entergy announces it will cease operations at Vermont Yankee.
- September 2013: Interagency work group created to study and manage decommissioning. Studied experiences elsewhere in New England.
- December 2013: Memorandum of Understanding (MOU) with Entergy includes providing a preliminary site assessment prior to submittal of the NRC-required Post Shutdown Decommissioning Activities Report (PSDAR).
- January 2014: Vermont Yankee certified as permanently defueled.
- March 2014: Certificate of Public Good for continued operation beyond March 2012 from Vermont Public Service Board includes December 2013 MOU.

Lessons Learned

- Pulling agency representatives together promptly helps better manage rapidly developing issues.
  - Many of us are unaware of the significant, complex challenges of reactor decommissioning, and planning for them early helps navigate the inevitable twists and turns.
  - Decommissioning merchant plants is completely different from decommissioning utility-owned plants, the only previously shutdown plants.
- If you want something, put the issue on the table at the start. Do not put it off for later.
  - Health wanted financial support for environmental surveillance and continued split samples from the site in the 2013 MOU.
  - It was thought that putting this in another, later agreement would be better.
  - Two years of negotiations resulted in no new agreement.

Timeline

- August 2014: First meeting with Entergy technical experts and Vermont agencies to discuss the preliminary site assessment.
- October 2014: Preliminary Site Assessment Study published. It includes:
  - Spent Fuel Management Plan;
  - Draft PSDAR;
  - Radiological Historical Site Characterization;
  - Non-Radiological Historical Site Characterization;
  - Pollution Legal Liability Policies; and
  - Funding Strategy Financial Scenarios.
- December 2014: PSDAR published
  - SAFSTOR for 50 years followed by 10 years DECON and license termination in 2072.
  - VYNPS Site-Specific Cost Estimate – $1.25 billion. Nuclear Decommissioning Trust Fund had about $600 million at the time.

Lessons Learned

- The PSDAR is a document that looks almost the same from one reactor decommissioning to another.
- Do not expect much more in a PSDAR than that issued by other facilities.
- The site characterization desired by the States is not required by the NRC until just before major decommissioning activities (decontamination and demolition).
  - For Vermont Yankee, the site characterization will be submitted approximately in 2062 under the current Entergy PSDAR.
  - The Preliminary Site Assessment Study, though not a full site characterization, helps describe a lot of radiological and non-radiological environmental, health and safety issues.

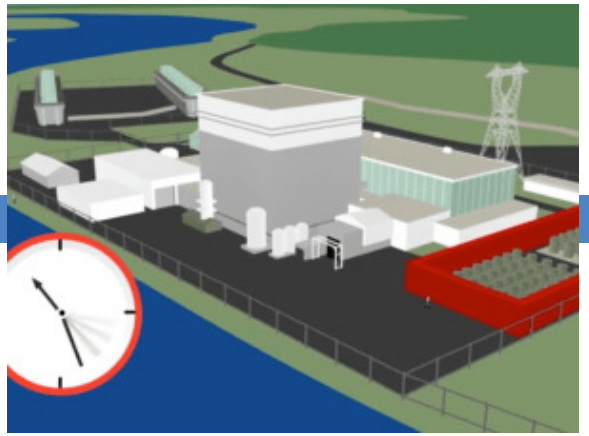
Timeline

- November 2014: Exemptions to Emergency Planning Requirements. Vermont contends the exemptions are not justifiable.
- 2015: Transition by Vermont Yankee, Vermont Emergency Management and the Emergency Planning Zone towns to Permanently Defueled Emergency Plan.
- February 2016: News reports about groundwater leakage into the turbine building basement. The State required Entergy to submit weekly, then monthly groundwater management reports, which continue still.
- March 2016: Vermont, Massachusetts, Connecticut and New York Comment on the NRC Advanced Notice of Proposed Rulemaking on decommissioning. Vermont among those arguing for more participation in decommissioning oversight, and stronger financial and environmental protection based on historical overruns for unanticipated contamination.

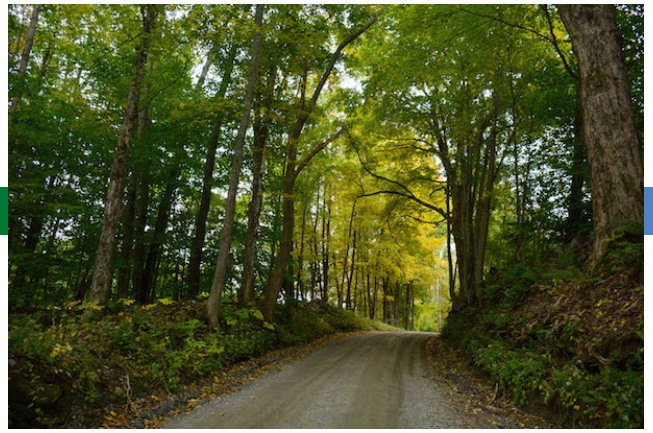
Lessons Learned

- Once the nuclear power plant no longer operated, Entergy support for radiological emergency preparedness was withdrawn. Prepare for it beforehand.
- Neither the NRC nor Entergy predicted the magnitude of groundwater intrusion that is not managed by sumps, waste water processing systems, and the evaporation heat-forced by an operating electrical generating station.
  - As of December 2017, 637,000 gallons of contaminated groundwater shipped to waste disposal facilities.
  - There has been extensive mitigation work to slow down intrusion by Vermont Yankee, but groundwater intrusion continues.
  - Entergy has not discharged liquid effluents to the river since a Chemistry Lab leak decades ago. The Health Department wants to preserve this policy.
- As part of multiple State interventions, the Health Department has worked with others in-State and out to help the NRC listen to requests for better regulation, not exemptions from operating regulations.

Timeline



- 2014 – 2016: Continuous negotiations with Entergy on what are called site restoration standards, and to support environmental and decommissioning surveillance. These ceased when Northstar purchase was announced.
- 2013 – present: Testimony in numerous cases before the Federal Courts and the Atomic Safety & Licensing Board.
- May 2016: Vermont legislature passes law allowing bill-back of Vermont Yankee owner for Health Department expenses necessary to monitor post-closure activities.



Lessons Learned

- Negotiations can stretch indefinitely.
- Legislative action for bill-back seen as a critical back-up to these negotiations.
- A new marketplace for decommissioning nuclear reactor facilities is evolving rapidly.
- The legal dilemmas arising during decommissioning have been complex and resource intensive.

Timeline

- November 2016: Entergy agrees to sell Vermont Yankee to Northstar.
  - Northstar Vermont Yankee is composed of a decommissioning company (Northstar), a waste disposal company (Waste Control Specialists of Texas), and a nuclear reactor engineering company (AREVA of France).
  - Their timeline and cost estimates for decommissioning are in their April 2017 PSDAR, and in the Table reproduced from it below.
- Currently: Hearings relative to the sale and license transfer are currently occurring in both the Vermont Public Utilities Commission and at the NRC.
- Vermont's goals for 15 millirem annual public dose limit appears to be preserved, and we hope Northstar will be a reasonable partner with the Department in the State should the license transfer and sale be approved.

Cost and Timelines from Northstar PSDAR

Decommissioning Comparison Schedule and Plant Status Summary*
(Thousands of 2016 dollars)

NorthStar Vermont Yankee Decommissioning DCE Comparison Chart												
	NorthStar VY Prompt DECON *(Cost estimate includes contingency)*						Entergy SAFSTOR - PSDAR *(Cost estimate includes contingency)*					
Decommissioning Period / Activity	**Start**	**End**	**Duration, years**	**License Termination**	**Spent Fuel Mgt.**	**Site Restoration**	**Start**	**End**	**Duration, years**	**License Termination**	**Spent Fuel Mgt.**	**Site Restoration**
Fuel Transfer Period	**2016**	**2018**	**3**				2068	2069	1.5			
VY Spend Plan 2016 – 2020				86,534	148,274					79,560		1,034
NS Pre-CLOSING Activities				30,620								
NS Pre-Turnover Activities												
Decommissioning	**2019**	**2026**	**7**				2069	2073	4.5			
Facility Management				83,494	40,828					70,108		4,934
Building D&D (Includes Lump Sums)				223,175		13,457				130,842		4,118
Large Component Removal				94,993						99,291		25
Soil Contamination & Remediation						11,815						
Project Management				93,335						60,668		11,833
License Termination (NS in D&D)										18,958		
Site Restoration (NS in D&D)							2073	2075	1.5	823		35,201
ISFSI Operations & Fuel Mgt.	**2027**	**2052**	**26**				2014	2067	53	356,972	368,347	
Facility Management					246,974							
ISFSI D&D				3,454								
Sub-Total Decommissioning Costs				**615,605**	**436,076**	**25,272**				817,222	368,347	57,145
Other Direct Costs (JJ)												
Total Costs						$ 1,076,952						$ 1,242,714

* Includes pre-closing costs such as spent fuel management that are funded separately by ENVY and not from the NDT.

Thank you.

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