Nuclear Plant Decommissioning: Host Community Engagement

December 9, 2015
11:00 a.m. – 12:00 pm
ET

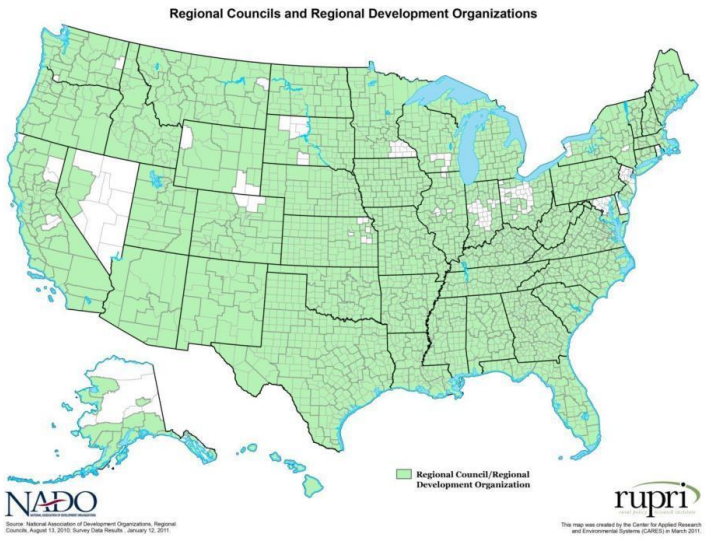
NADO
NATIONAL ASSOCIATION OF DEVELOPMENT ORGANIZATIONS

Our Mission

The National Association of Development Organizations (NADO)

To strengthen local governments, communities, and economies through the regional strategies, partnerships, and solutions of the nation's regional development organizations.

Our Membership



National membership organization for the network of over 520 **regional development organizations** (RDOs) throughout the U.S.

RDOs are also known as Councils of Government, Regional Planning Commissions, Economic Development Districts, and by other names.

They promote efforts that **strengthen local governments, communities, and economies through regional strategies** focusing on economic development, infrastructure, housing, transportation, and regional planning.

Today's Webinar

- **Joe McKinney**, Executive Director, NADO
- **Jennifer Stromsten**, Program Director, Institute for Nuclear Host Communities, Amherst, MA
- **Chris Campany**, Executive Director, Windham Regional Commission, Brattleboro, VT
- **Susan Howard**, Director of Government Relations and Legislative Affairs, NADO

Socioeconomic Impacts of Nuclear Plant Closures

ON LOCAL AND REGIONAL HOST COMMUNITIES

NATIONAL ASSOCIATION OF DEVELOPMENT ORGANIZATIONS WEBINAR 12/9/15

Institute for Nuclear Host Communities

MISSION

To provide the communities that host nuclear power plants with the knowledge and tools they need to shape their post-nuclear futures

Jeff Lewis - Windham County Post VY Impact Study
http://seveds.com/wp-content/uploads/2012/03/PostVY.pdf

Dr John Mullin UMass Amherst - Yankee Rowe Closure Study

http://scholarworks.umass.edu/larp_faculty_pubs/25/

Dr Paul Kostecki – Conferences & Publications

http://www.aehsfoundation.org/east-coast-conference.aspx

Jonathan Cooper – Plymouth Power Station Study

http://works.bepress.com/jonathan_cooper/4/

Socioeconomic Impacts

Assessment from host community perspective

Jobs:
- At the Nuclear Power Plant
- At firms that benefit from plant spending
- In businesses that benefit from worker spending

People:
- Plant workers who are reassigned or relocate to new positions
- Their families, including spouses who are part of local workforce
- Retirees leaving the workforce

Spending:
- Losing jobs and/or workers earning wages likely to be above area median
- Indirect and Induced losses over time – around VY estimated at $500 million total

Emergency Preparedness:
- Plant likely provides funding and/or resources in multiple municipalities / counties
- May be supporting critical baseline needs

Taxes & Fees:
- Local or county plant payments
- State - revenue based upon generation of power

Site:
- Transmission infrastructure
- Other buildings or assets
- Land reuse / redevelopment

Socioeconomic Impacts

Using assessment data to plan and secure resources for local and regional economic recovery

On August 31, 2015 $265,000 in Economic Development Administration Funding was announced in Brattleboro Vermont . The EDA grant will support cooperative efforts to recover from Vermont Yankee's closure and the loss of hundreds of high-paying jobs. It matches an award made through Vermont's Windham County Economic Development Program, funded with $10,000,000 secured through an MOU between the state and Entergy, VY's owner.

These new resources are being used to launch an "accelerator" designed to assist entrepreneurs; a study to boost the region's "green building" industry; and a regional planning economic development effort linking officials in Windham County with their neighbors in Massachusetts and New Hampshire.

INHC Staff with U.S. Senator Leahy at EDA Funding Announcement in Brattleboro

Southern Vermont's CEDS Incorporated VY Closure Losses and Mitigation into Regional Economic Development

Socioeconomic Impacts

Need to improve conditions for host communities to achieve successful post-closure outcomes

There are no dedicated programs or resources to help communities navigate closure, or to assess & mitigate socioeconomic losses

- Host communities need to initiate assessment and planning independently
- Several examples of mitigation funding negotiated with plant owner
- Seek existing economic development resources aggressively
- Rule-making = start of a conversation about ensuring targeted assistance for growing wave of nuclear closures

Closure is a challenge to local & regional 'bandwidth'

- Processes are entirely oriented to safety and environmental
- Closure is complex and demanding - tracking site activity, public hearings &education, coordinating changes as many more state and federal agencies get involved
- Activities drain resources that might be directed to socioeconomic response

NRC position: socioeconomic impacts are outside that agency's scope

- No targeted programs to help plan and respond to socioeconomic losses
- Adopting practices from other federal programs (brownfields & base closure) could better support host communities

Currently options to control or mitigate economic changes are very limited

- Communities have no influence over timing – job reductions, closure, or decommissoning activity
- Many options communities would like to pursue – deriving income from spent fuel or repurposing the site – are constrained
- Merchant sites = private land, often with public utility transmission infrastructure
- Cleanup standards geared to high level of safety, not economic activity or site reuse

Socioeconomic Impacts

NRC rulemaking and improving outcomes

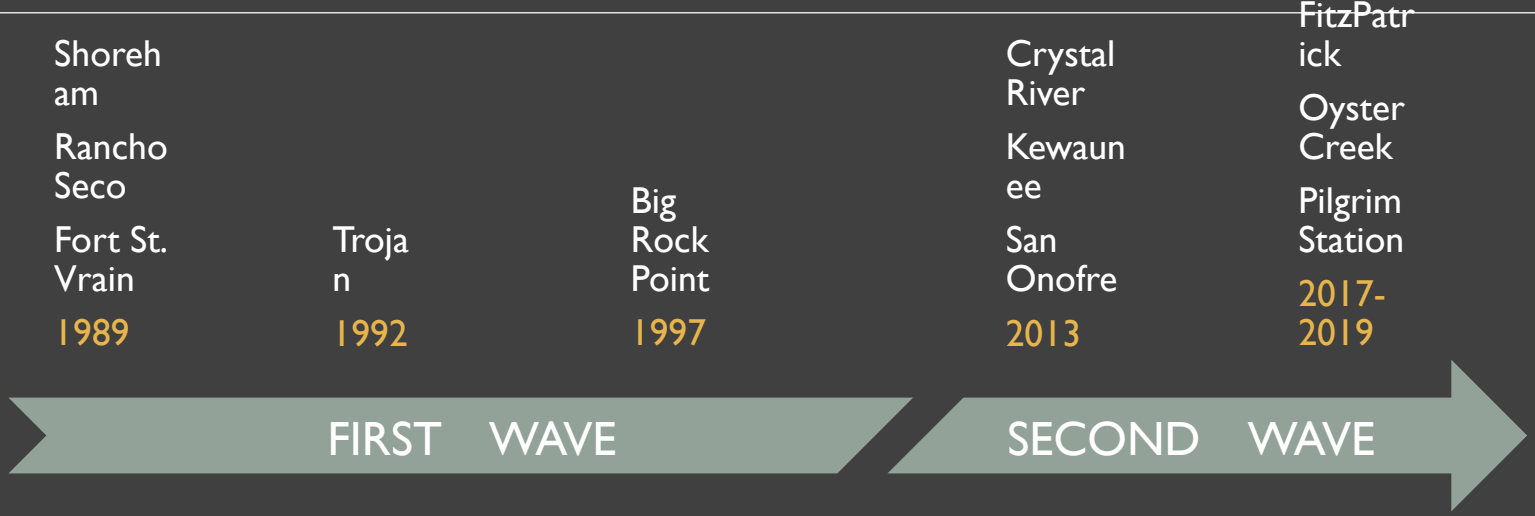
This NRC rulemaking provides an opportunity to

- Make decommissioning processes easier to navigate
- Give host communities a seat at the table
- Reduce practices that impede socioeconomic recovery
- Leverage points of control to facilitate economic recovery
- Draw attention to the need for greater resources to help host communities plan for and mitigate losses from NPP closure to improve socioeconomic outcomes

Closure, Past & Present

MOTIVES AND METHODS SINCE 1989

Closure Timeline: 1989 – 2019



Closure Motives

FIRST WAVE

YEAR	PLANT	AGE	MOTIVE
1989	Fort St. Vrain	10	Maintenance
	Rancho Seco	14	Public Process
	Shoreham	3	Public Process
1991	Yankee Rowe	30	Maintenance
1992	Trojan	16	Structural
1996	Conn. Yankee	28	Competition
	Maine Yankee	25	Maintenance
1997	Big Rock Point	34	Competition
1998	Zion	25	Maintenance

SECOND WAVE

YEAR	PLANT	AGE	MOTIVE
2013	Crystal River	36	Maintenance
	Kewaunee	39	Competition
	San Onofre	29	Structural
2014	Vermont Yankee	42	Competition
	FitzPatrick	42	Competition
2017-2019	Oyster Creek	50	Public Process
	Pilgrim Station	47	Competition

Closure Methods

FIRST WAVE

YEAR	PLANT	AGE	METHOD
1989	Fort St. Vrain	10	DECON
	Rancho Seco	14	MIX
	Shoreham	3	DECON
1991	Yankee Rowe	30	DECON
1992	Trojan	16	DECON
1996	Conn. Yankee	28	DECON
	Maine Yankee	25	DECON
1997	Big Rock Point	34	DECON
1998	Zion	25	MIX

SECOND WAVE

YEAR	PLANT	AGE	METHOD
2013	Crystal River	36	SAFSTOR
	Kewaunee	39	SAFSTOR
	San Onofre	29	DECON
2014	Vermont Yankee	42	SAFSTOR
	FitzPatrick	42	TBD
2017-2019	Oyster Creek	50	TBD
	Pilgrim Station	47	TBD

Wave One: 1989 – 1998

- Ownership
  - Public utilities
- Dismantlement
  - DECON – Immediate
- Factors
  - Market deregulation
  - Maintenance costs
  - Public opposition

Wave Two:
2013 – 2019

- Ownership
  - Investor-owned
- Dismantlement
  - SAFSTOR – Deferred
- Factors
  - Market competition
  - Reactor lifespan
  - Regulatory upgrades

Characterizing Nuclear

COMMUNITY, CONNECTIONS, CONTRIBUTIONS

Defining Characteristics

Output

Location

Workforce

Cleanup

Assistance

Spent Fuel

Defining Characteristics

Output

Location

Workforce

Cleanup

Assistance

Spent Fuel

Nuclear power in 2011

- 0.006 percent of all US generators
- 37 percent of industry workforce
- 42 percent of industry wages

IMPLICATIONS

- Significant plant valuation
- Creates sizable tax contribution
- Potential source of conflict between host community and plant
- Big numbers grab attention at closure

Defining Characteristics

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Spent Fuel

Out of sight, out of mind

- Distant from highways and other infrastructure
- Often found in rural communities
- Substantial zone of exclusion

IMPLICATIONS

- Limited access diminishes site reuse potential
- Rural communities have limited demographic and political influence
- Enhances focus on site reuse as a power plant

Defining Characteristics

Output

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Spent Fuel

Large, well-trained, well-compensated

- Average nuclear plant employs 950 people
- Average non-nuclear plant employs 70 people
- Enjoys wages and benefits well above community averages

IMPLICATIONS

- Substantial wage expenditures stay in-region
- Workforce is a major contributor to local economy
- Supports health care, food, financial, and real estate services

Defining Characteristics

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Lacking clarity, sowing confusion

- 1980 estimate: decommissioning = 10% of construction costs
- 2014 VY estimate: $1.24 billion
- 1972 VY construction cost ($217 million) adjusted to 2015 dollars: $1.237 billion
- Decommissioning standards vary by state and agency

IMPLICATIONS

- Public mistrusts decommissioning, overlooks closure
- NRC focuses on decommissioning, overlooks closure
- Higher standards = higher costs = more SAFSTOR

Defining Characteristics

Output

Location

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Spent Fuel

Who should we call?

- NRC focuses on decommissioning only
- Workforce retraining programs not attuned to nuclear industry
- Federal agencies do not claim responsibility

IMPLICATIONS

- Overwhelmed local officials
- No guidance for state, local, and plant officials to base conversations on
- Impacts last longer-term

Defining Characteristics

Output

Location

Workforce

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Assistance

Spent Fuel

There's nothing else like it

- No resolution in sight
- Policy failure for several decades
- Lives longer than decommissioning

IMPLICATIONS

- Creates tense holding pattern
- "We want to go out of business, but we can't."
- Poses exceptional challenges for site reuse

Closure Outcomes

YEAR	PLANT	REUSE
1989	Fort St. Vrain	Gas plant (1996)
	Rancho Seco	Gas, solar, preserve (2006)
	Shoreham	Oil peaking (2002)
1991	Yankee Rowe	Undetermined
1992	Trojan	Recreation
1996	Conn. Yankee	Attempted plant, preserve
	Maine Yankee	Attempted plant, preserve
1997	Big Rock Point	Attempted preserve
1998	Zion	Temporary condensers

Nuclear Decommissioning from a Regional Public Agency Perspective

Prepared for NADO Webinar on Nuclear Plant Decommissioning: Host Community Engagement

12.9.15

WINDHAM REGIONAL COMMISSION

The Windham Regional Commission

- Established in 1965.
- Serves 27 towns in Windham, Bennington and Windsor counties over a 920 square mile area of southeastern Vermont.
- Our mission is to assist towns to provide effective local government and work cooperatively with them to address regional issues.
- In the absence of county government, we provide the essential link between local, state and federal government.

WRC Neutral Position on Vermont Yankee Operation

The Commission has always taken a neutral position on whether or not the Vermont Yankee Nuclear Power Station should continue operation, and whether or not it should be issued a Certificate of Public Good by the Vermont Public Service Board.

This position was adopted in order to facilitate conversations among all parties on all sides of the issue.

Focus on Eventual Plant Closure, Impacts, and Decommissioning

Our primary focus in Vermont Public Service Board (PSB) dockets has been on what happens when the plant does eventually close, whenever that might be and for whatever reason that might occur.

In the dockets we have steered clear of health and safety issues – issues preempted by the Nuclear Regulatory Commission – and focused on the mitigation of closure impacts, and the orderly redevelopment of the site.

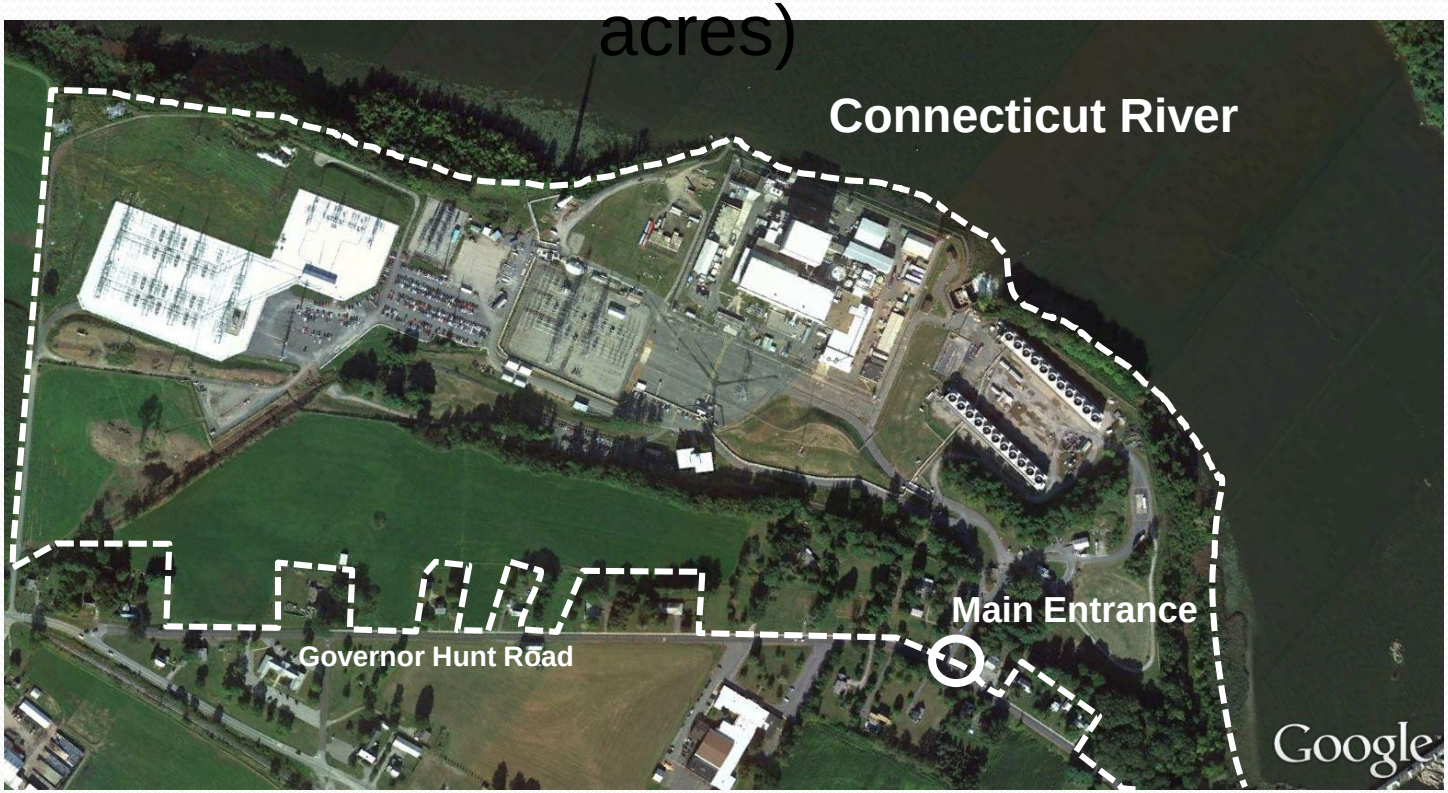
Issues where we felt we meaningfully represent the interests of the region in the PSB decision-making process.

Site Orientation

Vermont Yankee

- 620 megawatt boiling water reactor.
- The Vermont Yankee Nuclear Power Station began commercial operations in March 1972. Vermont Yankee Nuclear Power Corporation, a public utility, sold the Station to Entergy Nuclear Vermont Yankee, LLC collectively with Entergy Nuclear Operations, Inc. on July 31, 2002, thereby becoming a “merchant plant.”
- Merchant plant - An electric generator not owned and operated by an electric utility and that sells its output to wholesale and/or retail customers.

Vermont Yankee Property (~148 acres)



VY's Closure Plan

- Assumes 2015-2020 transition to SAFSTOR
- Assumes DOE Spent Fuel pick up by 2052.
- 2012-2075 Dormancy, Dismantlement & Decontamination and Site Restoration
- Updated Cost Estimate to decommission Vermont Yankee is $1.242 Billion in 2014 dollars for SAFSTOR.
  - Termination of the NRC Operating License - $817 Million
  - Site Restoration - $57 Million
  - Spent Fuel Management - $368 Million
- Nuclear Decommissioning Trust Fund was at $642.6 million as of 9/30/2014. $595.8 million as of 9/30/15.

Source: Entergy presentation to NDCAP 10/30/14 http://publicservice.vermont.gov/sites/psd/files/Entergy%20VY%20Site%20Assessment%20Study%20Presentation%20to%20NDCAP%20October%2030th%202014.pdf

Anticipated impacts of Vermont Yankee plant closure.

Employment impacts.

- Vermont Yankee employed roughly 620 workers in the tri-state area with a payroll of about $65.7 million.
- Accounted for approximately 2% of employment and 5% of compensation earned in Windham County.
- Contributed $300,000 to $400,000 in charitable contributions across approximately 100 organizations.
- Average employee annual income exceeded $100,000.
- Employee residence by state: Vermont – 238, New Hampshire 210, Massachusetts – 167.

Local impacts.

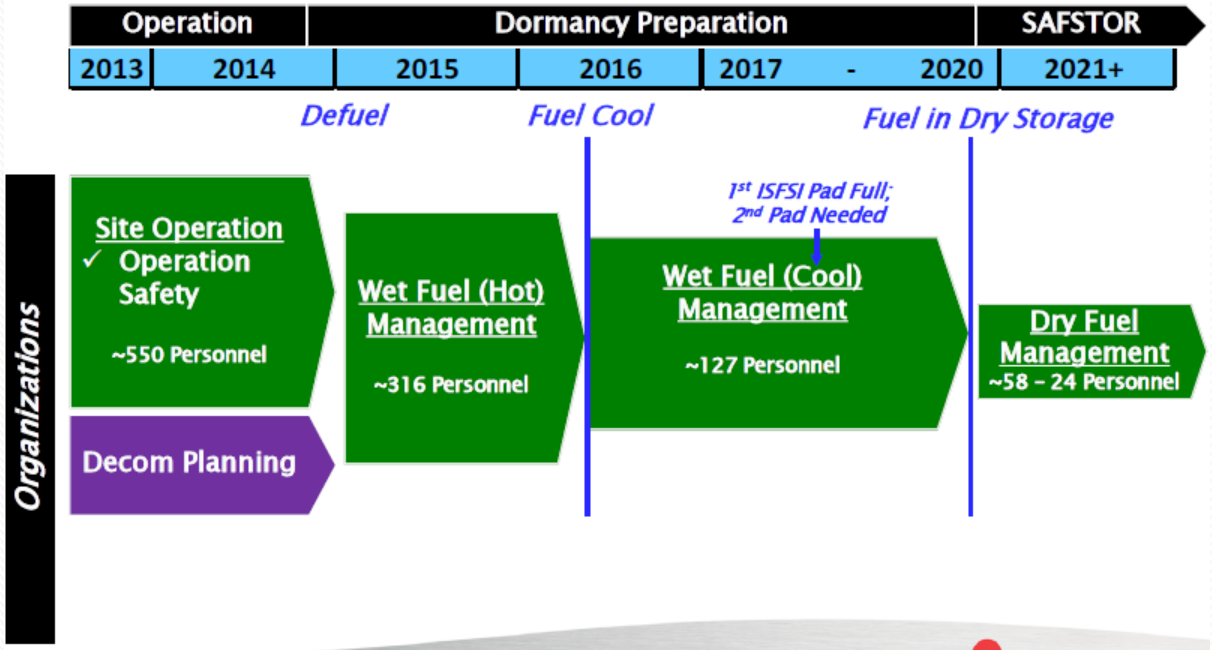
- Vernon will experience the most acute effects of the plant closure.
- Total number of employees residing in Vernon was 84, the number of spouses of these employees was 61, and the number of children was 129. These numbers together (employees and their spouses and children residing in Vernon) represent approximately 12.4 percent of the total population of the town.
- Number of contracted employees residing in Vernon was assumed by Vermont Yankee to be small.
- Town of Brattleboro is home to a similar number of employees, but its larger population and more diverse economic base should help the town be more resilient.
- Vermont Yankee paid a total of $1,147,399.96 in taxes to the Town of Vernon for the 2011-12 tax year, which constituted 48.5% of the total town tax receipts $2,364,334.22 for that year.

Umass Donohue Institute Study

Paid for by Franklin Regional Council of Governments. Completed December, 2015.

Nuclear Excellence
We Power Life

Staffing Transition to Decommissioning



Entergy
THE POWER OF PEOPLE

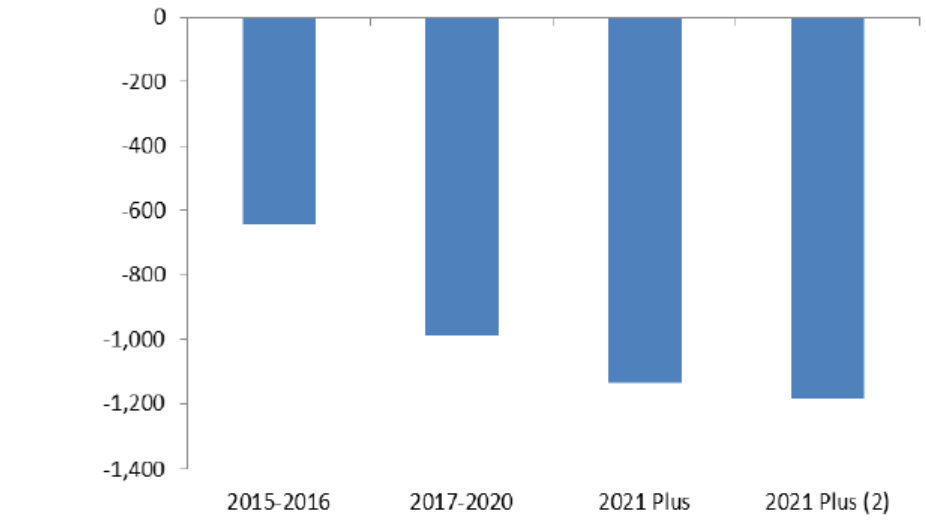
Economic Activity Levels of Vermont Yankee to the Tri-County Region Over Time

	Operational	2015-2016	2017-2020	2021 Plus	2021 Plus (2)
Direct					
Employment	550	318	126	58	24
Labor Income	$82,099,127	$38,564,486	$15,508,264	$2,675,750	$1,100,406
Value Added	$244,286,992	$66,121,377	$26,547,585	$7,849,919	$3,242,067
Output	$402,707,428	$81,769,337	$32,091,293	$10,573,188	$4,328,235
Indirect					
Employment	282	93	37	16	6
Labor Income	$10,425,325	$3,547,281	$1,426,498	$618,522	$246,311
Value Added	$31,131,267	$5,541,555	$2,224,922	$968,233	$386,153
Output	$47,691,302	$10,528,954	$4,227,352	$1,734,171	$692,314
Induced					
Employment	387	165	66	10	4
Labor Income	$14,377,220	$6,106,431	$2,455,631	$361,327	$148,855
Value Added	$26,575,152	$11,297,051	$4,535,741	$667,946	$275,168
Output	$43,008,077	$21,464,397	$8,617,908	$1,081,549	$445,562
Total*					
Employment	1,220	577	229	84	34
Labor Income	$106,901,672	$48,218,198	$19,390,393	$3,655,600	$1,495,572
Value Added	$301,993,411	$82,959,983	$33,308,248	$9,486,099	$3,903,388
Output	$493,406,806	$113,762,689	$44,936,552	$13,388,908	$5,466,111

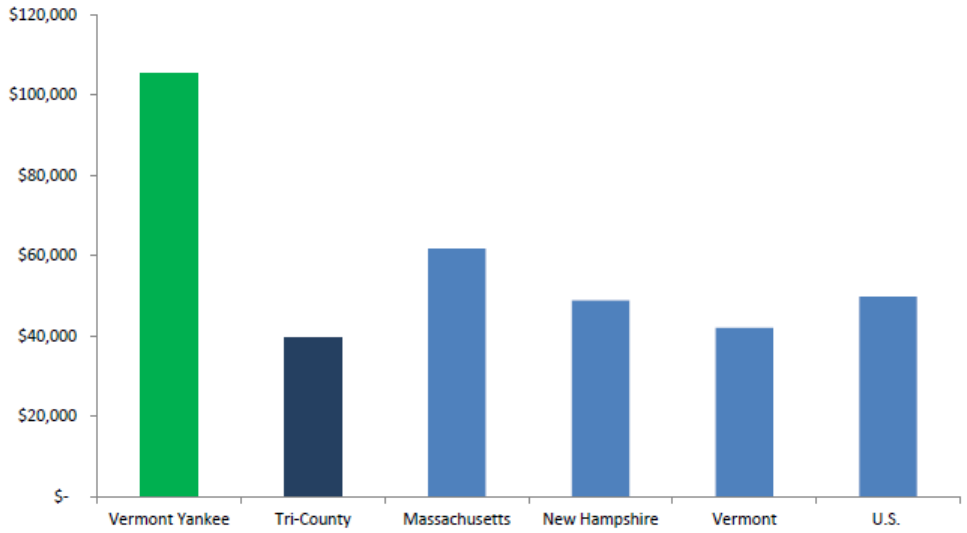
Source: Results are from IMPLAN

Total Job Impacts of the Vermont Yankee Decommissioning in the Tri-County Region

Net Loss In Jobs Compared to an Operational Vermont Yankee



Average Wage Per Employee, Vermont Yankee Compared to Region, States, and U.S.



Source: Vermont Yankee (2011); Bureau of Labor Statistics QCEW (2013)

WRC Positions

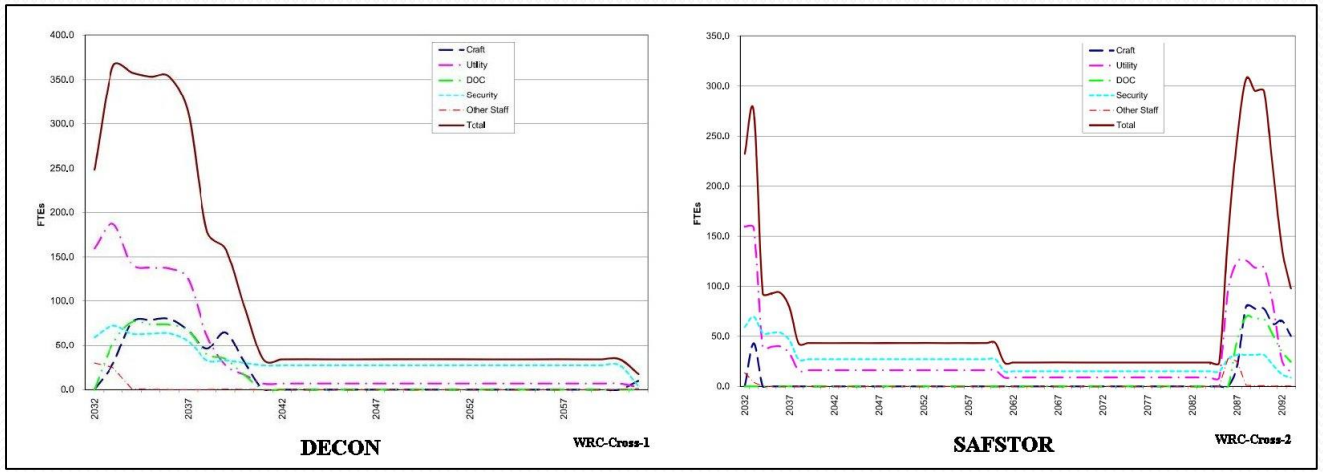
Basis for WRC positions.

- The positions we have taken in the current and past PSB dockets seek to mitigate, to the greatest extent possible, the economic, employment, cultural and social impacts of the closure on the region.
- We seek outcomes that will support the fiscal well-being of our towns, and which will lead to the restoration of the Vermont Yankee site to "greenfield" status as soon as possible so that it may be reused.
- Intergenerational responsibility.

Rate of change.

- When VY operations ceased in the fourth quarter of 2014 the regional economy began to enter a new phase and change will ensue. The WRC is necessarily concerned with the nature and rate of that change.
- The nature and rate of change affects more than jobs, the economy, the tax base, and the restoration of a site. Underlying the aforementioned numbers of employees, spouses and children are relationships.
- We feel it is in the best interest of the region to advocate for a decommissioning process that minimizes disruption to these relationships.

We want an approach to decommissioning that produces a more gradual slope rather than a precipitous drop.



Source: Docket 7862, A.WRC:EN.1-27.1 and A.WRC:EN.1-27.2, graphics provided by Entergy

Prefer DECON over SAFSTOR

Prompt Decommissioning (DECON) should be required rather than an extended period of SAFSTOR. Prompt Decommissioning:

- Provides greater certainty, both technically and financially.
- Provides a better economic and workforce profile and is necessary for the orderly development of the region.
- Provides access to a workforce with critical legacy knowledge because no one knows the plant better than those who work there at present.
- Is less expensive.
- Produces less radiological waste, or an equal volume of waste, and there is greater assurance of the availability of appropriate waste disposal and transportation infrastructure.
- Reduces regulatory costs.

Decommissioning Trust Fund

The fund must cover costs of decontaminating the site, managing the fuel (with some reimbursement from DOE), and restoring the site.

Example:
Shutdown in 2032, all fuel off site in 2082

	SAFSTOR	DECON
License Termination (DECON)	$566.7m	$622.5m
Spent Fuel Management	$365.3m	$397.2m
Site Restoration	$ 47.8m	$ 47.7m
Total Cost	$979.9m	$1.06b

Source: Decommissioning Cost Analysis, February 2012, scenarios 4/6, 2011 dollars, truncated
(Other SAFSTOR scenario maximums: Total $1.159b, Lic termination $653.1m, SF Mgt $502.9m)

Decommissioning Trust

- The fund must grow faster than inflation, and when in SAFSTOR it must grow faster than inflation plus the cost of site maintenance.
- Prompt decommissioning reduces market uncertainties associated with the Decommissioning Trust Fund, and the risk of inflation.
- The decommissioning trust fund has performed well in real terms and relative to inflation, but it may never be sufficient to fully restore the site.
- Unless additional funding sources are secured, any additional costs charged to the decommissioning fund will delay the point at which the site can be decommissioned and restored.

Merchant plant.

- Cannot shift cost burden to rate payers.
- Whatever comes out of that fund is not available for decommissioning costs, or reinvestment to further build the fund.
  - Spent fuel management?
  - Taxes?
  - Economic impact mitigation?
  - Monitoring?
  - Public engagement?
  - Emergency planning?

The Regional Engagement Challenge

Engaged, but to what end?

Historically participated as party in a state permitting process.

Not a party to settlement agreement and MOU between the state and Entergy Vermont Yankee.

VT Nuclear Decommissioning Citizens Advisory Panel – representation but efficacy unclear.

Virtually impossible to meaningfully engage in NRC decision making processes related to VY licensure (ongoing license exemptions and amendments) or in new policymaking.

Larger implications.

- VY, Kewaunee, Crystal River – setting precedents. Who is paying attention to larger policy implications?
- Use of decommissioning trust funds for spent fuel management, taxes, emergency planning, etc.
- NRC developing decommissioning policy. Need meaningful host community engagement similar to Nuclear Energy Institute (industry) engagement.
- NRC Waste Confidence Rule – waste can remain on site indefinitely.
- Site restoration after 60 years SAFSTOR? Radiological and non-radiological.
- Who pays if the decommissioning trusts are insufficient?

Resources

- Windham Regional Commission
  - www.windhamregional.org
- NRC Decommissioning of Nuclear Facilities
  - http://www.nrc.gov/waste/decommissioning.html
  - http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/decommissioning.html
- NRC Storage of Spent Fuel/Waste Confidence Rule
  - http://www.nrc.gov/waste/spent-fuel-storage/wcd.html
- GAO Report on NRC Oversight of Decommissioning Funds
  - http://www.gao.gov/products/GAO-12-258

NRC's Rulemaking Process on Regulatory Improvements for Decommissioning Power Reactors

Susan Howard, Director of Government Relations and Legislative Affairs, NADO

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Advanced Notice of Proposed Rulemaking

- Published in the Federal Register on November 19, 2015
- NRC seeks comments on the development of potential changes to the NRC's regulations for the decommissioning of nuclear power reactors
- Comment deadline is **January 4, 2016**
- Opportunity for host communities to weigh in on the importance of stakeholder engagement

Advanced Notice of Proposed Rulemaking

NADO has drafted sample comments for host communities to personalize with their own experiences. They will be emailed to you and available on nado.org. Highlights include:

- Request a 45-day extension of the comment period until **February 18, 2016**
- Highlight the impacts – direct and indirect – on host communities upon reactor closure
- Ask that in crafting new regulations, NRC take steps to expand engagement through the establishment of a host community decommissioning task force

Questions?

Please type your questions in the question box on the side panel of your screen.

Speakers:

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The recording of this webinar, along with the PowerPoint slides, will be available at www.nado.org.