



REACTOR DECOMMISSIONING PROGRAM STATUS

March 17, 1999

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PRESENTATION OVERVIEW

- **New management team**
- **Safety and risk issue changes**
- **Recent licensing and rulemaking**
- **Future actions**

REGULATORY ISSUES FOR DECOMMISSIONING

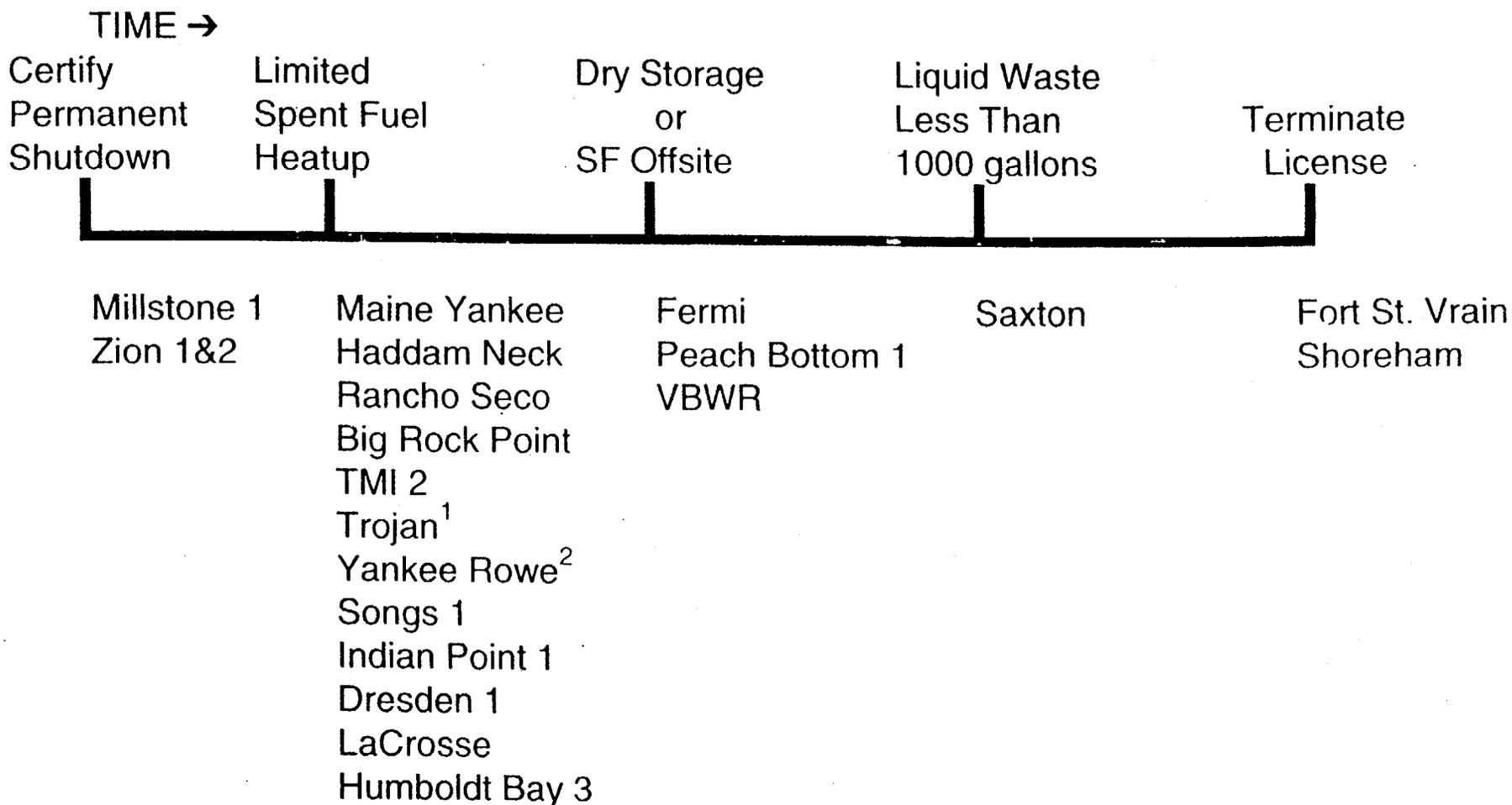
- **Operation risk reduced**
- **Risk decreases with decay and removal of material**
- **Significant risk reduction when dose consequences within EPA Protective Action Guides (PAG)**

REGULATORY ISSUES FOR DECOMMISSIONING (cont.)

- **Change in operating risk justifies TS changes in**
 - Staffing reductions**
 - Scope of quality assurance**
 - Maintenance programs**

- **Risk associated with fuel storage justifies changes in**
 - Emergency planning**
 - Onsite and offsite insurance**
 - Safeguards**

DOSE CONSEQUENCE REDUCTIONS DURING DECOMMISSIONING



- Notes:
1. Primary dismantled, dry storage & reactor vessel disposal in 2000
 2. Primary dismantled, reactor vessel disposed

“PAST” REGULATORY PRACTICE

- **Basis for approving exemptions has varied for
Emergency preparedness
Safeguards
Insurance**
- **Thus, no identical exemptions**
- **SRM on SECY-93-127, offsite financial protection**
- **SECY-93-127, zircaloy fire “reasonably credible”**
- **Preclusion of zircaloy fire evolved into acceptance
criteria for licensing actions and rulemaking**

CURRENT VIEW

- **Zircaloy fire analyses are complicated and time-consuming**
- **Regulatory predictability questioned**

GOING FORWARD

- **New integrated approach will address concerns**
- **Integrated reevaluation of rulemakings to be initiated**
- **Risk-informed approach considered**
- **Time dependent risk factors considered**
- **NRC Working Group (two months)**
- **Output is plan and schedule**

RULEMAKING STATUS

- **Financial Protection (Insurance)**
- **Emergency Planning**
- **Physical Security/Safeguards**
- **Shift Staffing**
- **Financial Assurance (Site-Specific Cost Estimates)**

OTHER DECOMMISSIONING ISSUES

- **Implementation of the license termination rule**
- **Spent fuel storage and transportation**
- **Low-level waste disposal**
- **Greater-than-Class C waste storage**
- **Free release of contaminated materials**
- **Entombment (time period for completion)**
- **Decommissioning financial assurance**

Summary

- **Valuable insights gained from rulemakings**
- **Reassess issues**
- **Ensure integrated approach**
- **Ensure stakeholder input**
- **Reduce unnecessary regulatory burden**

Commission Briefing

Decommissioning

March 17, 1999

NEI Decommissioning Working Group

Mike Meisner, Maine Yankee

Safety Significance

- Deterministic (for Maine Yankee, 1/1/99)
 - Time to boil: 85 hrs. (3.5 days)
 - Time to boildown: 432 hrs. (18 days)
 - Limiting DBA: 110 mrem TEDE
- Probabilistic - zirc fire (generic)
 - $2E-6$ /RY (NUREG 1353, 4/89)
 - $4E-7$ /RY - based on current LLNL seismic hazards curves

Licensee Constraints

- Fixed costs
- Safety/cost analysis - zirc fire

	Conse- quences (person-rem)	x \$2000/ person-rem (\$)	x 2E-6/R Y (\$)
At shutdown	2,600,000	5.2E9	10,400
After one year	4	8,000	.016

- Total solutions are needed
- Only one chance to do it right

Problem Statement

- Regulations didn't anticipate decommissioning; contain holes
- In filling holes, Staff does not apply appropriate safety significance.

Solution

- Industry and NRR management in agreement:
 - Risk inform 10CFR50 for decommissioning
 - Provide consistent safety basis for all requirements
- Can be done quickly with significant benefit for NRR and industry

Backfit Rule

- All parties should embrace the Backfit Rule as the preferred means to ensure regulatory balance
- Risk inform Part 50 for decommissioning with a safety/backfit analysis as the basis

DRAFT

Commission Briefing

Decommissioning

Introduction

On behalf of NEI's Decommissioning Working Group, I appreciate the opportunity...

Decommissioning Safety Significance

It's appropriate to begin my discussion by reviewing safety and risk significance at a decommissioning facility.

When you walk around a plant that is ready for decommissioning, you're struck by its simplicity. At Maine Yankee, spent fuel is managed in a self-contained "nuclear island", isolated electrically and mechanically from the remainder of the facility, which is in a "cold and dark" (that is, deenergized and drained) condition. There are few moving parts and lots of time for operators to react to any condition.

Let's take a deterministic analytic look at MY safety. Time to boil for the spent fuel pool is x00 hours, and it would take an additional x00 hours to boil down to the top of active fuel – plenty of time for operators to use a number of different proceduralized means to restore water. Given these long time periods, it is not surprising that the limiting decommissioning design basis accident for MY has nothing to do with the spent fuel. It is a LLW resin spill that results in offsite dose consequences of 110 mrem TEDE – nearly four orders of magnitude lower than the operating DBA consequences, and well below the one rem EPA protective action guideline that would lead to offsite emergency action.

A probabilistic look provides additional confidence in the minimal safety significance of decommissioning. Remember that in these simple machines, there's little opportunity for human error to introduce significant failure modes. We rely, for the most part, on passive components and long times to failure. In fact, the only event that comes close to the radar screen beyond the design basis is the notorious zircalloy fire event which requires, as its initiating event, a catastrophic seismic event that drains the spent fuel pool. This is an event that has been wrapped up in quite significant conservatisms and still can't rise above a probability of 2E-6. That probability was calculated by NRC contractors some years ago. When you take into account more recent Lawrence Livermore and EPRI seismic hazard curves you obtain at least an additional fivefold reduction in event probability. And, for facilities like Maine Yankee, which are in quite low seismic environments, it's obvious by inspection that we can put a zircalloy fire in the same bin as an airplane strike.

In fact, the real risk in decommissioning is occupational – radiation and hazardous waste exposure to the workers.

Decommissioning Constraints

Now, let me talk about some of the constraints licensees face in decommissioning their facility.

Cost

The major issue with cost is that it is fixed. It is usually capped by ratemakers, and it is effectively capped by 10CFR50.82. Fixed prices lead to problems when licensees must spend large amounts of their budget unnecessarily, early in decommissioning.

How does this come about?

It's largely as a result of delay in granting timely regulatory relief. As a rule of thumb, the difference between operating plant and decommissioning plant costs for emergency planning and security are on the order of \$1M per year each. Insurance runs about \$2.5M. Significant other costs are associated with operator licensing and training requirements, technical specifications and the like.

We can quantify the level of unnecessary expense using NRC's NUREG 1353. Ignoring probabilities, the NUREG provides a quantitative analysis of the potential radiological impact of releases to the environs from a burning fuel versus the number of days fuel has been stored. The impact of radioactivity releases decreases from 2,600,000 to 4 person-rem (whole body dose) over a 1 year period. That's 2.6E6 down to 4 person-rem. So, at the end of that one year period, using the traditional \$2,000 per person-rem averted measure, I am justified in spending \$8,000 to completely eliminate the zirc fire risk.

Now, consider that for Maine Yankee, it took us nearly 2 years after fuel offload to obtain staff approval for the emergency planning exemptions, over 2 years for insurance exemptions, and over a year and a half for security exemptions. Those 4 person-rem didn't cost Maine Yankee \$8,000, rather they cost about \$4M – a million dollars per person-rem.

Total Solution

Decommissioning licensees can't fulfill their responsibilities without total solutions. It may be obvious, but we cannot leave a single bundle in the spent fuel pool just

because it is high burnup or has some other unique characteristic. We need the timely support from NMSS to provide all our fuel a home in a dry cask. We have begun working with NMSS towards that end.

Similarly, we can't eliminate our Part 50 license only to find that EPA site clearance standards apply. We recognize that a Congressional solution is necessary and that industry has the lead. We would be interested in your views on various legislative options as they are developed.

One Chance

Thirdly, on constraints, decommissioning licensees don't go through fuel cycles like operating plants – we only have one opportunity to correctly decommission our facility. Every dollar wasted up front is unavailable for use in ALARA or return to our ratepayer later.

What's the Problem?

With all this as a backdrop, what's the real problem?

I believe the answer is two-fold. First, in large measure the regulations did not anticipate or provide for decommissioning. While 10CFR50.82 was a good step forward, it left a number of holes that still need to be filled. Secondly, in dealing with the holes, the regulatory staff, up to this point, has not applied the appropriate safety significance to their decisions. In that respect, let me quote from a recent staff report – the Maine Yankee Backfit Review Panel addressing the zirc fire issue: "...the Panel believes that the staff sought to develop an absolute safety finding rather than a risk-informed reasonable assurance finding." In other words, that staff was attempting to make their decisions without considering event probabilities and doing so by regulating to a zero risk standard. That's why Maine Yankee was forced to spend \$4m to achieve a 4 person-rem reduction.

What's the Solution?

I think today, NRR and the industry are in agreement on the solution.

[Level of detail below depends upon how much John Zwolinski gets into during his presentation.]

We need to use our combined deterministic and probabilistic knowledge to risk-inform Part 50 for decommissioning.

This would involve an integrated, holistic resolution across Part 50 using a consistent safety basis. It would address emergency planning, security, insurance, operator licensing/training – and seemingly trivial issues such as station blackout. We can also

deal with what happens to inapplicable items contained in license conditions, confirmatory action letters, orders and the like.

There's really no new safety issue in decommissioning. We have enough technical information developed over the years by NRC and the industry to answer any decommissioning question. It's only a matter of sufficient resolve to get on with it.

I think today we have that resolve. The pending organization changes at NRR, and the willingness of management to pursue a holistic solution will benefit the staff and the industry.

What can we achieve? As I discussed at the Regulatory Information Conference, we can have regulations and staff decisions that accurately reflect decommissioning safety risk, and licensees can receive automatic regulatory relief during the transition to decommissioning.

How long will this take? Not long. You have before you a staff proposal on decommissioning security rulemaking – SECY-99-008. In there, the staff is budgeting 2.4 FTE over a two year period to complete just the security rulemaking. I'm confident that if NRR would commit the right staff at a level of about 1 FTE over a two month period that together we can provide an integrated solution across Part 50.

Based on what I know the staff has budgeted for decommissioning guidance and rulemakings down the road, I wouldn't be surprised if an integrated approach didn't result in a yearly savings of in excess of 10 FTEs. What a win-win situation – NRC can direct valuable people away from decommissioning (an area with very little safety significance) to focus on issues important to safety and of importance to the Commission.

Backfit

Finally, a few words on the Backfit Rule.

All industry desires are regulations and staff decisions that accurately reflect safety significance. There's no benefit to be spending \$1M per person-rem. In fact, it sends a very counter-productive message to the public – that zero risk is valuable and achievable.

But, absolute safety and zero risk are unachievable. So, what do we put in their place? Simply put, we need a test that balances safety benefit with cost impact while ensuring that immediate safety issues are addressed.

That's all the backfit rule does.

I think the industry, staff and Commission should embrace the rule as the preferred means to ensure regulatory balance for operating and decommissioning plants. Instead, I'm afraid, the staff has gotten into a habit of avoiding its application at every

step. This leads to a very cynical outlook on backfit by industry people. The SECY 99-008 on decommissioning security that I mentioned earlier is a good example.

If someone had evaluated imposition of the zirc fire event a year and a half ago to determine if its safety benefit was comparable to its cost, I firmly believe that your staff and my staff would have saved thousands of scarce man-hours, much of it management time, and set the stage for a rigorous decommissioning safety basis.

I hope you'll agree that now is the time to embrace the intent of the backfit rule: as a time saving tool that risk informs our decisions and focuses our attention on what is important to safety.

I also hope that you'll agree that now is the time, in conjunction with the industry, to take an integrated approach to risk informing Part 50 for decommissioning by developing, in short order, a rulemaking package with a safety/backfit analysis as its basis.

Thank you for your attention. May I answer any questions?