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Supplement to a presentation by Michael Meisner

**Minimizing NPP Long-Term Liability Through Decommissioning**

**I. Introduction**

NPP operators manage their resources and schedule their time based on safety and risk measures. Decommissioning issues are neither risk-significant nor imminent, thus they seldom rise to the attention of senior nuclear management.

This leads to the curious condition that the NPP operator is unaware that it doesn't understand the fundamental nature of the decommissioning process and its relationship to the operator's long-term liabilities. Through the lens of an operating plant culture, decommissioning resembles a large radioactive waste disposal project.

The reality is operating experience does not prepare a nuclear professional to understand or be successful in a decommissioning setting. Operating experience creates habits and expectations that can be counterproductive to a decommissioning project and the best interests of the owners and operators.

If this claim is obvious to you, you've probably had management experience at a decommissioning project. For the rest of the readers, this paper tries to portray some of the fundamental challenges that underlie this claim – aspects of decommissioning that are likely to be unfamiliar to most nuclear operating staff.

First, a couple of preliminary points will set the tone for what follows.

**A. Narrow the focus – the “hard” tasks of decommissioning**

Let's start with a critical distinction – there are two sets of decommissioning tasks. Successful decommissioning requires expertise in both.

The first set of tasks are the physical work necessary to decontaminate and dismantle the facility – sometimes referred to as D&D. There is no doubt that D&D work is meticulous and operationally challenging. But the necessary technologies are well-understood; decommissioning conferences are devoted to these topics. Acquiring competency in D&D is open to anyone wishing to consult the literature. Because otherwise knowledgeable nuclear professionals believe that D&D is the entirety of decommissioning, it's not surprising that a nuclear operator views decommissioning as a low priority, low risk, “radioactive waste disposal project”.

Here is where the industry's failure to understand the fundamental nature of decommissioning comes into play. Once you've mastered D&D, you've only mastered the “easy” part of decommissioning.

This paper and this conference address the second set of tasks - the “hard” tasks of decommissioning. These tasks start with an objective evaluation of the owner / operator long-term liabilities followed by development of a plan to reduce and/or eliminate those liabilities through the decommissioning process. One of the hard lessons learned is that significant long-term liability reduction can only be accomplished through engagement with outside stakeholders. The outcomes of the decommissioning project (quality,

cost and schedule) are a direct function of how well the “hard” tasks are addressed. More to the point, failing at the “hard” tasks increases long-term owner liability and extends it well beyond the end of decommissioning.

## **B. Finality depends on agreement**

When an NPP is ready for final decommissioning, the basic roles and best interests of the NPP and their external stakeholders undergo a radical shift from the operating phase. Owners and operators that recognize this shift and act upon their decommissioning roles are in a strong position to conduct cost-effective and timely D&D projects. Most do not.

On the other hand, the Community can't fail to recognize the shift in their interests. In their new decommissioning role, the Community realizes that the benefits they've experienced from hosting an NPP are coming to an end. Of primary concern are the liabilities left behind. The Community must live with the final site condition but may have no voice in how safe it is or what it looks like. Failing to recognize and address their legitimate interest in the site end-state is a powerful motivation for a community to pursue an active agenda in opposition to the owner's efforts.

Community opposition may not be anything new in the NPP's history, and may even be factored into the NPP's planning. But, if the operator recognizes its decommissioning role, it understands another hard lesson of decommissioning - it is not an ending. Owners may have satisfied some regulatory requirements by completing D&D, but their liability for deficient work, or newly discovered contamination isn't eliminated by D&D.<sup>1</sup>The irony of decommissioning is that it's not final until the Community and Owner agree that it's final – finality is a matter of social contract.

A fresh review of the owner's role should recognize that the owner's interests are largely indifferent to the final site state. Instead the owner is best served through elimination of long-term liability. Honoring the social contract is one of the few ways to do so.

More broadly, understanding the roles and interests of the major decommissioning stakeholders is the first step towards solving the “hard” decommissioning tasks.

## **II. Roles and interests**

The primary participants in NPP decommissioning in the U.S. comprise three groups: the NPP, the Community and the Regulator. The NPP consists of the NPP Owner(s) and the NPP Operator(s). Community includes the local Town, the Ratepayers (who fund the decommissioning) and the Activists who represent the safety concerns of the Community. Regulator refers to a multitude of federal and state regulatory bodies, represented by the Nuclear Regulatory Commission (NRC).

In the U.S. the cost of decommissioning a nuclear facility is not the responsibility of the NPP owner. Rather all the consumers of the facility's electricity over the years (the ratepayers) have paid a small monthly fee for decommissioning costs. The Owner is responsible for the prudent use of that funding for site D&D.

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<sup>1</sup>When the Nuclear Regulatory Agency eliminates an owner's license responsibilities at the end of decommissioning, it does so based on their review of the owner's cleanup records and on-site inspections. If the records are later found to be lacking or different sources of contamination are discovered, the owner's obligation to clean up the site still exists..

## A. NPP

### 1. NPP Owner

Upon permanent shutdown of the NPP, the Owner interests and motivations change drastically. The NPP is now a non-productive liability. The plant and equipment are aged; they are difficult and costly to maintain. Staff must be paid. Delays in decommissioning the site expose the Owner to future unpredictable liabilities such as increased regulatory requirements, closure of low level radioactive waste facilities, and loss of knowledgeable personnel. In these circumstances, Owners' interests dictate prompt decommissioning, and other steps to reduce or eliminate future liability.

Of particular note:

- The Owner is not a nuclear or operations expert, and
- The Owner is now indifferent to the end-state of the site.

### 2. NPP Operator

The NPP Owner delegates planning for and operation of the NPP to the Operator – the management staff of the NPP.<sup>2</sup> The Operator<sup>3</sup> is expected to have the necessary expertise to translate the Owner's interests ("reduce or eliminate future liability") into an efficient decommissioning plan.

## B. Community

### 1. Ratepayers

Ratepayers are any members of the public who consumed electricity from the NPP. The Ratepayer efforts are significant in determining the rate of return allowed on the Owners' investment in the NPP. Otherwise, as a group, they represent no other continuing interest in the process of decommissioning.

### 2. Town

The local Town concerns are varied. However, the overriding issue for Maine Yankee was taxation. At Maine Yankee, the Owner/Operator paid over \$13,000,000 per year in property taxes to the town, based on the assessed value of the NPP. A closed NPP has no value. After shutdown, the NPP's tax payments were roughly cut in half each year reaching a level of about \$700,000 in 2012. The final tax level will reflect the town's assessed value of the dry cask spent fuel storage facility that remained on the site following nuclear decommissioning. The townspeople experienced a sharp rise in taxes over a short period of time. The negative effect on the townspeople was amplified by the abrupt nature of the plant shutdown. The Town's long-term interests focus on generating new business investment to replace the property tax revenue from Maine Yankee's operating years.

### 3. Activist

Activists represent the long-term safety interests of the broader Community. In Maine Yankee's case, that role fell to the 'Friends of the Coast' (FOC) and their executive director, Ray Shadis. The Activist

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<sup>2</sup> If the Owner's organization also includes the operating staff, for purposes of this paper, the Operator is the Owner's operating staff.

<sup>3</sup> This paper is written by an operator.

role, in general, seeks to minimize adverse radiation effects on public health and safety. To do so usually leads to opposing NPP construction and advocating for NPP shutdown during the operating phase. In the decommissioning phase, Activists play a major role in shaping the end state of the site. But, it is the nature of the Operator's engagement with the Activists that determines if the Activist's role increases or decreases the decommissioning cost and schedule. In Maine Yankee's case, FOC came to be a trusted ally.<sup>4</sup> Only the Nuclear Regulatory Commission was a more frequent (but less constructive) participant in end-state discussions and negotiations than FOC.

#### **4. Regulator**

In the U.S. the federal Nuclear Regulatory Commission (NRC), has exclusive authority over nuclear decommissioning of NPPs. Other regulators, such as the Environmental Protection Agency (EPA), have a role only in the non-nuclear chemical remediation of the site.

The NRC regulations governing decommissioning in 1997 were poorly conceived and written. Decommissioning was virtually impossible without requesting and receiving hundreds of exemptions and other changes to the NPPs license. Few improvements have been made since.

The Operator must have a thorough understanding of the safety bases underlying decommissioning coupled with an aggressive approach to managing the regulatory interface in order to support an efficient decommissioning schedule. Failure to do so inevitably leads to loss of schedule control since the regulator becomes critical path. The details of how to manage this interface are not the subject of this paper.

### **III. Setting the Stage**

In general, when an NPP decides to shut down, several actions occur in quick succession. The most productive NPP employees leave for more challenging opportunities. The Owner makes plans to withdraw from the site. The Operator is delegated the task of eliminating the owner's long-term liability. And a small group of specialist in D&D is brought in to replace hundreds of departing operating staff.

The Community observes that the Owner has no long-term commitment to the site. Most of the familiar faces on the Operator's staff have left. And the new group of specialists is intent on completing their cleanup job and leaving. Neither the Owner nor the Operator seem willing or able to satisfactorily address the Community's most significant concerns about the final state of the site.

In these circumstances, the Community draws the rational conclusion that their interests (e.g., the quality and degree of site cleanup) are not those of the Owner/Operator. To safeguard their interests, the Community may have no alternative but to challenge the Owner/Operator in whatever forums are available.

### **IV. Engage the Community**

The alternative for NPP Owners/Operators is to engage with the Community.

Oddly, Owner/Operator reaction to the idea of open dialogue with the Community ranges from fear to denial. Their career experience has taught them that engagement is unpredictable, uncontrollable and seldom worthwhile. Perhaps so if the dialogue is with a group opposed to construction of your NPP. The decommissioning

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<sup>4</sup>A personal view.

phase, however, exposes a number of issues on which the Community and the Owner/Operator have common cause. By failing to consider Community engagement Owners/Operators miss a major opportunity to enhance the decommissioning process and outcomesthrough mutually beneficial agreements with external stakeholders.

Some of the Owner and Operator reluctance to engage the community is due to the “slippery slope” theory – once you make a concession the demand for more will never end. But, the reality is much different - engagement isn’t open-ended. The Community’s vision of the site end-state reflects the critical importance they placed on being in a position to assure their residents that the area is safe and appropriate for beneficial re-use. Their list at Maine Yankee was short, and probably typical of the rational concerns any community would experience in the same circumstances. The phrases in quotes describe the Community’s characterization of the concern.

- “cleaner is better” – can the Operator adopt radiological clean-up standards that go beyond the NRC’s requirements as added assurance of safety for future generations,
- “beneficial re-use” – during D&D can the Operator restore a portion of the site in a manner suitable for [fill in the blank],
- “nuclear contamination can move; sampling could miss contamination” – are there confirmatory actions such as groundwater monitoring for a period of time post-decommissioning that can support the theoretical prediction that the effects of radionuclide transportation on the site and statistical “hot spots” have been adequately considered,
- “the NPP was allowed to discharge low levels of radioactive material to the air and water offsite; what if that material concentrated over time to unsafe levels” – since NRC cleanup requirements only pertain to the licensed site, can the Operator assist in addressing the Community’s concerns about regions of concentrated activity in public use areas near the site (for example, the mud flats exposed at low tide that about the site are a public source for clams and fishing bait), and
- “can the Owner / Operator identify decommissioning actions that could serve as incentives for new businesses to move into the Community so as to replace some of the property taxes formerly paid by Maine Yankee” – similar to beneficial re-use but focused on attracting outside interest.

Maine Yankee engaged with the Community in each of these areas, finding common cause that led to mutually beneficial and cost-effective solutions to each.

An example is helpful.

In what follows Maine Yankee and FOC reach an agreement (later accepted by most stakeholders and formalized in state law) in which Maine Yankee commits to a stricter cleanup standard than required by the NRC. In return, FOC agrees to support Maine Yankee’s position that building foundations can safely remain in place after radiological remediation.

### **Reduced cleanup standard vs. leaving foundations in place**

In Maine, the operator committed to adopt a cleanup standard well below that required by the federal nuclear regulator. Rather than the federal standard<sup>5</sup> of 25 mrem ALARA with no more than 10 mrem

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<sup>5</sup> The US Nuclear Regulatory Commission cleanup standard requires remediation of residual radioactive materials to a level such that a farmer and family, resident on the site for a year, consuming produce and animals raised on the site, and consuming the site water supply, will each receive no more than 25 millirem exposure per year with no more than 10 millirem attributed to groundwater exposure. The standard furthermore notes that the 25/10 standard is a ceiling. Remediation below the ceiling is required if it is cost-beneficial (i.e., ALARA – “as low as reasonably achievable”).

attributable to groundwater, we implemented a standard of 10 mrem ALARA with no more than 4 mrem due to groundwater. The reasons were many and varied. The major considerations follow.

The primary concern for the operator had to do with building foundations. Although we could remediate the interior of the foundations to required levels, there was an interest in the Community and amongst some of the state regulators in the complete removal of the foundations. Maine Yankee investigated the feasibility of doing so. The level of effort and cost was so extensive that it would have more than doubled the project cost from about \$550,000,000 to over \$1,200,000,000. But, the reduction in radiation dose achieved by the foundation removal would have been low to nil.<sup>6</sup>

Before describing the final resolution, a little background is necessary.

This issue arose early in decommissioning. At the time, we were gaining experience with remediating radioactive contamination within the structures, and running into problems with the planned approach. The problems were due to missing elements in our remediation assumptions.

Waste disposal costs are a major factor in guiding decommissioning planning. In particular, there is a wide gap in cost between disposal of radiologically clean concrete and radiologically contaminated concrete. The clean waste can go to a local landfill whereas the contaminated waste must be shipped cross country to a low level radioactive waste disposal site – major cost differences for both transportation and disposal fees. To minimize the volume of contaminated waste, we initially adopted a “surgical” approach to remediation. Conceptually, a thin layer of surface material would be removed, the exposed area would then be surveyed. The process would be repeated until the survey results indicated that the cleanup standard had been achieved. It was successful in minimizing radioactive waste volume; unfortunately the approach also maximized personnel time. The largest single cost of decommissioning is personnel. In this case, the “surgical” approach was so slow that personnel costs exceeded the savings due to reducing radioactive waste volume.

After some investigation and spreadsheet modeling, we reversed our approach to remediation. Surgical “shaving” was replaced by bulk removal techniques. The idea was to remediate once. Remove whatever volume of material is necessary to ensure a successful survey the first time. Consequently, there was a marked increase in radioactive waste shipments and cost, and an offsetting decrease in personnel costs. This came to be known as “rip and ship” and one of the key lessons-learned that contributed to Maine Yankee’s positive decommissioning outcomes.

To ensure a successful survey the first time, the specific cleanup standard is largely irrelevant. “Rip and ship” is cost-effective provided that you only “rip” once from each location. So, sufficient bulk is removed with the idea of capturing all radioactive material in one “rip”. This lesson learned and approach was later adopted by most U.S. decommissioning projects.

For the Owner and Operator, this is a key element of a cost-effective D&D project. As important, it’s an example of how Owner interests and Community interests converge in the decommissioning phase. The Owner adopts “rip and ship” because it is the most costs-effective approach. But, wherever remediation is done with the “rip and ship” approach, the remaining structure is left at a zero dose level to ensure a successful survey the first time.

The Community’s interests include a preference for a cleanup standard below that required by the Regulator. While Maine Yankee did not share the Community’s belief that “lower is safer”, Maine Yankee

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<sup>6</sup> There were other complicating side issues. For instance, the amount of concrete to be removed was extensive. Although it would be largely uncontaminated material, the state of Maine would not allow its disposal in the state without additional costly testing.

did recognize that the Community had a legitimate interest in assuring their members that the site was safe. Furthermore, the Owner's interests in eliminating long-term liability were directly served through recognizing and supporting the Community's valid interests.

Now, back to the issue of removing foundations. Relying on the lesson learned in remediation we reached an agreement with Friends of the Coast. The agreement required the Operator to adopt the 10/4 cleanup standard which had long been advocated by FOC. In return, and based upon the remediation work and data to that time, the FOC agreed that the negative effect of any residual radiation associated with the foundations remaining in place would be more than offset by the large reduction in the cleanup standard.

This agreement required major concessions on the part of Maine Yankee and FOC, unprecedented in U.S. decommissioning. Each party trusted that the other would hold to the agreement.

Such agreements don't occur by chance.

## **V. Engage the Community – Part 2**

Fundamentally, the Operator has no choice but to engage with the Community. If the goal is to reduce or eliminate the Owner's long-term liability, then it's part of the Operator's job description to engage the sources of liability.

From an Owner's perspective, a long-term liability "nightmare" is discovery, after completion of decommissioning, of a site condition serious enough to require the Owner to re-perform substantial portions of D&D.

The Operator need judge if a nightmare is credible at each site – an important decision with substantial negative consequences if incorrect.

Consider this scenario.

Decommissioning is complete. The Community had no substantive involvement. The Owner and Operator have left the site. Community officials are being asked by concerned residents to assure them that the NPP site is safe for new uses. The Community retains an expert to assist. The expert takes samples and finds some radioactivity levels in excess of the NPP's cleanup standard. The Community is alarmed and seeks outside authorities (regulatory, legal, legislative, public opinion) to pressure the Owner/Operator back to the site to redo D&D.

The Owner cannot wait for the opposition to mature. It must understand the extent of its potential liability in order to minimize future adverse effects of the opposition. At a minimum, the operator must take and analyze fresh environmental samples; initiate a range of safety and risk assessments; and identify, examine and rank potential options based on the analysis results.[And a good deal more.]

Thus begins a movement that may or may not be successful in forcing the Owner back to the site.

Is this or something similar a plausible scenario? It is in the U.S.,<sup>7</sup> and is one of the reasons for Maine Yankee's community engagement.

Constructive engagement is the Operator's primary tool to eliminate the source of this scenario.

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<sup>7</sup> However, in practice, no major decommissioning project was ever completed without substantive community involvement.

## A. Getting started

Engagement begins with information. To effectively deliver information about decommissioning Maine Yankee created the Community Advisory Panel (CAP) made up of members from diverse groups within the Community.<sup>8</sup> The CAP's first meeting occurred within a month of the decision to shut down Maine Yankee.

The CAP met monthly for about 3-4 hours during the first four years of decommissioning. As the project neared its end, CAP meeting frequency decreased.

A typical CAP meeting was preceded by a field tour of current decommissioning activities and dinner. A presentation by the Operator on events and issues occurring since the last meeting was the first agenda item. The NRC attended most meetings. They had the second agenda item - a short discussion of their assessment of Operator performance since the last meeting. Much of the first year was spent educating the CAP members. Usually an hour of each meeting was reserved for training on topics like radiation detection and measurement, the process of decontamination, nuclear accident analysis of decommissioning scenarios, spent fuel accident analysis, dry cask storage design and operation, and a number of other topics. The meeting always ended with a public question and comment period open to anyone in attendance. The remainder of the agenda (after training and before the public comment session) was usually up to the CAP to determine. In some cases, the CAP members brought forward issues raised by their constituency, which the Operator investigated, resolved and reported back on. Other times, the CAP debated amongst themselves.

The CAP held a yearly retreat to plan their major activities for the following year. It was obvious to Maine Yankee management that the more knowledgeable the CAP members became, the more mutual trust with the Operator was enhanced. Consequently, CAP members were offered opportunities, at the Operator's expense, to attend decommissioning conferences, tour Yucca Mountain (the then proposed high level nuclear waste repository), and meet with counterparts at other decommissioning facilities.

Finally, it's worth mentioning the CAP's level of authority. The Owner and Operator have certain responsibilities by virtue of their license from the NRC. They cannot delegate those responsibilities to anyone else, including a community group. Thus, the CAP charter allows for the CAP to advise the Operator, but cannot bind the Operator.

Initially, this was a concern shared by the Operator and a few members - the lack of authority might suggest that the CAP was "for show". FOC had a related concern - would their participation be seen by their peers as "selling out" to the Operator? In fact, the Operator was fully committed to addressing all CAP feedback, and never failed to do so. The FOC executive director remained as independent as ever. And, within a few CAP meetings, the openness and exchange of detailed information and planning was enough to put the hidden agenda concerns to rest.

## B. Building on the CAP

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<sup>8</sup>CAP members included a representative from the Governor of Maine, local state legislators (the CAP was chaired by the region's state senator), and the local town. Members also included the president of an environmental education group, a science teacher, a retired US Air Force nuclear security expert, a retired military doctor specializing in radiation medicine, the executive director of Friends of the Coast and a Maine Yankee representative.



In short order the CAP becomes a team, setting their own priorities and agenda. The site end-state naturally becomes a CAP priority. The Operator need only listen to understand the critical importance the Community places on restoring their site to a safe, healthy and productive asset. And the CAP need only listen to understand the Operator's need for finality.

Inevitably it becomes apparent to all participants that the Operator's decommissioning interests and the Community's decommissioning interests are the opposite sides of the same coin. It's then but a small step to the mutual realization that these former opponents share common cause and a common responsibility. Neither can achieve their goals without the help and support of the other.

From this beginning emerged what was to become the common sense approach for resolving differences with stakeholders. The major elements, which were never written down, include the following:

- In frank discussions understand the needs of each party; identify those that are critically important and those that allow a flexible outcome.
- If common ground is not apparent, narrow the issue until common ground is identified or shown to be unlikely.
- Where common ground has been identified (which is usually the case) the affected parties work together to create a mutually beneficial plan to meet their individual end-state obligations.
- Finally, the agreement is documented in an appropriate forum, providing each party with the closure they need through the public acknowledgement that each recognizes and supports the other's positions.

As noted earlier, completion of D&D is not an ending. Contrary to common belief, completion affords the Owner and Operator no reason to claim that their long-term liability has been reduced. On the other hand, mutually beneficial agreements do.

If the Owner's primary interest is long-term liability elimination only constructive engagement with stakeholders has been shown to be effective.

## **VI. Some benefits**

Below are a couple of brief examples of the many agreements between Maine Yankee and its stakeholders.

### **A. Offsite survey**

In the U.S., operating nuclear facilities release gaseous and liquid effluents containing very low levels of radioactive material. Provided the discharges remain below levels prescribed by the NRC, such discharges are permitted by the facility's license. Because off-site discharges are determined safe for the public at the time of discharge, NPP's are not responsible for off-site remediation of discharges allowed under the license.

Nonetheless FOC and some members of state government were concerned that licensed discharges could concentrate in the environment to an unsafe level. The off-shore mud flats near Maine Yankee's liquid discharge points were of particular concern because of public access and use.

To address Community concerns, Maine Yankee reached an agreement with Friends of the Coast to conduct a mud flats survey near the discharge points. The cost of the survey was \$30,000.

The survey protocol was developed jointly by a key member of Maine Yankee staff and the head of Friends of the Coast, to be implemented by a contractor chosen by Friends of the Coast<sup>9</sup>.

The survey results, when implemented near the end of decommissioning, showed with a minor exception that there were no concentrating effects of Maine Yankee effluents during decommissioning.

## **B. Offsite structures**

While the notion of restoring a site to its original condition sounds good as a general principle, in practice it is not achievable because environmental considerations may dictate otherwise.

Consider, for example, off-site marine installations associated with intake/discharge. Over time a flourishing marine ecosystem can evolve around those structures, as occurred in Maine. The damage to the marine environment caused by removing the structures in this case far outweighed any consequence<sup>10</sup> of leaving the structures/piping in place.

These two examples are from a “package” of agreements with FOC and other stakeholders, arising from discussions concerning Maine Yankee’s license termination plan (LTP). The LTP contains the detailed cleanup criteria and steps needed to achieve a cleanup standard. This document is reviewed and approved by the NRC and forms the basis on which the NRC will inspect the results of decommissioning and approve license termination.

Of note, each individual agreement does not “balance” the benefit equally among the parties to the agreement. Multiple agreements may be necessary to do so. For instance, example A, above, primarily benefited the Community, whereas example B mainly favored the Owner.

## **VII. Getting serious**

The “hard” tasks of decommissioning are hard primarily because they require skills that are outside the experience and comfort level of the typical nuclear professional. This again highlights a central theme – in general the nuclear operating industry does not understand the nature of decommissioning.

But the Operator can convert “hard” tasks to “easy”.

The first order of business is to confirm the premises of this paper. Convene a high priority, focused examination of the non-D&D aspects of decommissioning.<sup>11</sup> Staff the effort with a small number of trusted senior personnel who share the ability to think creatively and outside the confines of an operating plant culture, and who are comfortable speaking truth to authority. Then believe their findings.

Hard tasks start to become easy when nuclear management acknowledges their existence. A simple endorsement of the Community’s legitimate interest in the site’s end-state provides the permission that their operating

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<sup>9</sup> Maine Yankee had veto authority over the contractor.

<sup>10</sup> 'Consequences' in this case are non-radiological such as adverse effects of abandoned structures on the biology of marine life, or their effect as obstructions to marine ships.

<sup>11</sup> This study is needed and valuable regardless of the reasons that prompted it.

personnel need to develop the skills and technical expertise to routinely solve the “hard” tasks of decommissioning.

## **VIII. Notes**

1.

Mr. Meisner is retired, having spent his career working for Entergy Nuclear Services in the United States. Throughout, Mike has focused on the value of nuclear safety analysis in his role as the primary interface with regulatory authorities. He has exercised that role in executive positions at each stage of a nuclear power plant's lifetime: construction and startup at the Waterford 3 Nuclear Station outside of New Orleans, Louisiana (1981 - 1988), operations at the Grand Gulf Nuclear Station in Mississippi (1988 - 1997), and decommissioning at Maine Yankee Atomic Power Company in Wiscasset, Maine (1997 - 2005).

Mr. Meisner has also been active in nuclear industry organizations including the Combustion Engineering and General Electric Owner's Groups. He has been a member of multiple Nuclear Energy Institute Working Groups, and served as the chairman of the industry's Decommissioning Working Group from 1998 - 2005. In that capacity he represented and negotiated industry positions on emerging decommissioning issues with the Commissioners and senior management of the Nuclear Regulatory Commission.

2.

The views presented in this paper are based on Mr. Meisner's decommissioning experience at Maine Yankee Atomic Power Company, combined with seven years as the chairman of the industry's Decommissioning Working Group. Opinions presented are his alone.

3.

Decommissioning is a broad subject. The following significant topics are not covered:

- Decontamination and dismantlement (D&D)

- Spent nuclear fuel alternatives / Dry cask storage

- Non-nuclear remediation of chemical contaminants