The Status of the Nuclear Waste Program:
(Mike McBride, VanNess Feldman LLC)

The meeting began with a presentation by Mike McBride, former external counsel to the Blue Ribbon Commission. Mike reviewed the status of three key cases in the D.C. Circuit Court—the “waste confidence”, “fee”, and “mandamus” cases. While the D.C. Circuit has ruled in each case, in none are the issues fully resolved:

- In the “waste confidence” (now termed “continued storage”) case, several states and environmental groups are likely to challenge the assumption that indefinite storage can be safe and/or is authorized under the Atomic Energy Act.¹
- In the “fee” case, the federal government (now without a credible program for waste disposal) is no longer collecting the one-mill per kilowatt-hour fee from nuclear ratepayers, but arrangements for funding nuclear waste management are not determined. The Blue Ribbon Commission recommended that utilities might hold the fee in escrow, to prevent its expenditure by Congress for other purposes. Others recommend that interest on the fund balance (currently about $1 billion annually) could support the program up to but not through repository construction.
- In the “mandamus” case, review of the NRC’s Safety Evaluation Report² and DOE’s Supplemental EIS could begin in early 2015 and continue to the extent supported by obligated funds ($13.5 million re NRC, $30 million re DOE). But further funding is uncertain, and, since DOE abandoned Yucca Mountain as “unworkable” in 2009, the Yucca Mountain Project has not had a “willing applicant”.

Meanwhile, Congressional authorization is very uncertain, and appears dependent on results in the November mid-term elections, in which Republican control of the Senate appears possible, and Republican control of the House a near certainty. In this event, Senator Murkowski (R-AK) would likely chair the Senate Energy Committee. Murkowski has expressed support for Yucca Mountain in the past, as well as her dismay at the fiscal drain due to the federal government’s partial breach of contract stemming from its failure to begin acceptance of SNF in January 1998.

Based on a court-specified acceptance rate of 2,650 MT per year, the federal government should have accepted 42,400 MT through January 2014, and 45,050 MT through January 2015. Through FFY’13, the federal government (via the Judgment Fund, supported by taxpayers) has paid the utilities that hold these queue slots $3.7 billion, and the bill could escalate to $25 billion (as estimated by DOE) or $50 billion (as estimated by NEI).

Murkowski may be motivated to negotiate a modus vivendi with her House colleagues, who still insist that all SNF and HLW go to Yucca Mountain, with no intervening offsite storage. Murkowski has also restated her support for S.1240, the Nuclear Waste Administration Act, a bill that would implement many BRC recommendations, but which would not eliminate the Yucca Mountain project as currently written. A separate authorization, regarding a pilot facility for off-site storage of SNF at shutdown sites (including three in her own state), has been proposed by Senator Feinstein (D-CA), who chairs the Senate Energy Appropriations Committee.

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¹ A motion was filed by environmental groups on Oct. 15.
² Volume 3 regarding repository performance after closure was issued by NRC on Oct. 15, 2014.
The DOE-NE Nuclear Fuel Storage and Transportation Project
(Jay Jones: DOE-NFST, and Judith Holm: North Wind Services)
After the chair’s welcome and a round of introductions (See list above.), Jay Jones reviewed the status of the DOE-NFST project. The project intends to build on the January 2013 DOE Strategy, while remaining consistent with DOE’s authorization under the NWPA and not limiting the options of any future organization (Draft NTP, page 2). Key FFY’14 activities include:

- Complete visits to shutdown reactor sites—excluding San Onofre and Crystal River, where litigation prevents such visits.
- Complete an evaluation of standardized canisters for storage, transport and potential disposal. (Currently, utilities find it more economical to use a variety of large dual-purpose canisters and casks, whose use for disposal is presumed unlikely?
- Conceptual design for a generic storage facility.
- Continued work on the NTP and Section 180c.

For FFY’15, DOE has requested $30 million (including $24 million from the Nuclear Waste Fund) for activities including development of railcars meeting AAR standards specified in S-2043. The House would appropriate $205 million to make DOE an effective applicant for the Yucca license application. The Senate would appropriate $86 million for activities consistent with BRC recommendations, including a pilot program to license, construct, and operate one or more “pilot” consolidated storage facilities. Though FFY’15 began on October 1, the resolution of the conflicting requests and bills is yet to be determined.

Jay reviewed comments (received to date) on the draft NTP, and discussed a proposal for “NTP Issue Resolution”, which would be developed by DOE in coordination with the NTP WG. This could include White Papers which delve into selected topics, and develop a common understanding (if not consensus) on the issues. As produced, they could be posted on the NTP wiki site, and/or incorporated as an appendix to the NTP.

Jay intends to conduct webinars or meetings with the NTP WG, and produce a revised NTP in Spring 2015. This will lead to a NTP WG discussion at the NTSF in May, and to a second revision/update in the Fall of 2015.

Note to HLRW Committee: Members currently on the NTP WG include Ken N., Connie N., and Bob H. Others who may be interested should contact Jim W.

Jay then discussed the Section 180c “Policy Implementation Exercise”. Over the past nine months, Carla S., Tammy O., and Jim W. have served on a Section 180c Interregional Team, formed in late 2013 to address unresolved Section 180c issues. DOE now wants to conduct a policy implementation exercise, involving two volunteer states from each region. These volunteers would participate (with others attending) in an NTSF workshop in May 2015, arrive at “lessons learned” during the summer, and begin scoping a “full-scale pilot” in the Fall of 2015.

Note to HLRW Committee: During the meeting, Nebraska (Carla S. and J. Schwarz) and Oregon (Ken N.) volunteered for the Section 180c “Pilot Implementation Exercise”. California (Danielle M.) expressed interest to observe in process.

Jay then discussed the “Stakeholder Tool to Assess Radioactive Transportation” (START), an “open-architecture” routing tool, which will be hosted by INL. As reviewed in Atlanta on Oct. 1, the tool has
impressive potential, but also has significant data validation concerns. “Open architecture” means that the tool can incorporate data from many national and other sources, but it also incorporates any data omissions or flaws. Webinar training is being considered.

Note to HLRW Committee: Carl S. and Jim W. participated in the START “roll-out” on Oct. 1 in Atlanta. Jim W. has inquired regarding applications to:
1. Identify logical 10, 15 and 20 mile route segments in urban, suburban and rural areas,
2. Identify “priority responder” fire stations within each such route segment,
3. Identify “centers of gravity” for sets of sites with varying current and potential inventories of SNF or HLW,
4. Identify sets of sites that minimize transport for interim storage.

Jim W. will review the training manual and provide draft comments, for review by the Committee. Contact Jim W. if you want a copy of the START manual, and/or if you have inputs regarding this DOE initiative.

DOE-NFST Technical Initiatives
(Matt Feldman: Oak Ridge National Laboratory)
Matt Feldman provided an overview of NTSF transportation system development, including institutional, operational, and hardware elements. After a review of the shutdown sites report (focusing on Trojan, Humboldt Bay, and Rancho Seco), he described the UNF-ST&DARD SYSTEMS system, which is intended to extend from discharge through storage, transportation and disposal. It includes an updated database of spent fuel discharges, and transportability considerations (including cask dose rate estimates). Feldman did not discuss the operation or application of this system, though he received a question (from Rick Moore) regarding transportation system optimization.

Matt then discussed the DOE initiative to develop railcars compliant with AAR standard S-2043 for rail transport of SNF. This is expected to be a 7-8 year process, including manufacturing and testing of a prototype. The railcar will involve several features (e.g. electronically-controlled pneumatic brakes) to avoid derailment. Testing will be conducted first on a single car and then on a consist with at least one cask car, buffer car, and escort car. The AAR approval process will also be rigorous. All this is notable in an industry that has welcomed shipment of thousands of single-shell tanker cars filled with Baaken crude oil.

Feldman said that the NFST program requires linkage between institutional (NTP, 180c, routing), hardware (casks, railcars, cask ancillary equipment: e.g. cradles) and operational (shutdown sites info, UNF ST&DARDS, START) aspects.

A question was asked regarding the coordination of necessary on-site improvements (financed by the utility) and near-site improvements (financed by the rail carrier, perhaps with DOE assistance). Another question clarified that casks would be mounted on railcars using cask-specific cradles.

NRC Regulatory Initiatives
(David Pstrak, NRC)
David Pstrak reviewed NRC’s consideration of full-scale casks, noting that a full-scale cask test could cost $40 million, that several, full-scale tests have been conducted in Europe, and that, while NRC has no current activity on this topic, it has conducted several studies:
• An EIS on the transportation of radioactive material by air and other modes;
• A Draft EIS on transportation of radionuclides in urban environs,
• A study of shipping container response to severe highway and rail accident conditions, and
• A re-examination of spent fuel shipment risk estimates.

Pstrak briefly discussed NRC’s 1999 “package performance study”, and the construction of BAM’s “unyielding surface” for drop tests (in Horstwalde, Germany). He concluded that Type B packages provide a high degree of protection against real-life accidents, but noted that NRC periodically re-assesses the effectiveness of its Type B standards.

Pstrak received questions regarding trust and confidence in NRC’s model-based certifications as these apply to multiple cask designs, certifications, manufacture and maintenance.

Section 180c Inter-Regional Team
(Carla Schreiber, Nebraska)
Carla reported on the Inter-Regional Team meeting in Atlanta, including proposed SRG participation in a Section 180c implementation exercise, in which two state volunteers from each region would develop (with an estimated time commitment of 40-60 hours) a grant application for review (by a mock “merit review panel”) during the May 2015 NTSF meeting in Albuquerque. Oregon and Nebraska expressed special interest in participating the process.

Discussion of Draft NTP Elements and Features
(Ken Niles, Oregon)
Ken Niles led a discussion on the DOE-NFST Draft National Transportation Plan, and WIEB’s Draft Comments on the Draft NTP. Key topics included:
• The focus on transport from shutdown sites, understanding that:
  o The initial focus is likely to become the “template” for subsequent phases;
  o A single “pilot” destination for SNF is likely to become the destination for subsequent phases;
  o The older-fuel-first criterion is unlikely to be an impediment at shutdown sites, but utility’s use of queue slots to ship this fuel (versus more-recently discharged fuel at other sites) could be.
• “Concentrated removal” and the effective marshaling of resources (DOE, utility, state, local, carrier and contractor) at origin sites; the tradeoffs involved in implementing such an objective.
• Systematically addressing NAS and BRC recommendations—DOE says that this is currently underway.
• The geography of nuclear waste……Were Mississippi to provide a repository, would it make sense to ship from Crystal River to (say) Bellingham, WA for interim storage and then back to Mississippi for disposal? Is the implicit DOE “strategy” to expand a pilot facility (for SNF from 9 or 12 shutdown sites) into an interim storage facility for, say, 40,000 MT, then into an interim facility for (say) 140,000 MT plus repackaging, then into a repository for which the key criterion is that it is located nearby?
• The (maximized) use of dedicated trains. Is this currently a DOE commitment? If so, should it not then be an NTP assumption? Should not backhaul shipment (of expensive specialized railcars) be by dedicated train?
• Rail route issues in the West—e.g. flash floods in NV and AZ. Are these reflected in the “Critical Infrastructure and Key Resources” (CIKR) program coordinated by U.S. DHS? How (if at all) are CIKRs reflected in START?
Railroads and the implementation of “above-regulatory” best practices. Railroads have massive political power, and reserve the right to ship as they deem appropriate. However, an opportunity exists for DOE to include specific transport conditions in their contracts with the railroads.

While SNF shipments at 50 mph need not be a bottleneck for other rail freight, railroads are likely to prioritize revenue-producing shipments (e.g. 100-car unit trains) over SNF shipments, which could get sidelined for hours or days. How does DOE get rail carrier cooperation on routing (hand-offs at carrier-specified locations) or inspections, or bad weather?

Who are the escorts? Currently this is an open question. DOE has federal agents, which escort Navy SNF shipments. Security measures would follow NRC (security) regulations, but dedicated train shipments will surely be known to train-spotters.

Regarding cask testing, what about the WIPP program example, which included a full-scale test of Trupact II? Boeing periodically conducts full-scale tests of airplanes, despite the costs involved.

Bob Halstead (referring to a paper by K. Niles and L. Janairo) argued that the NTP must address the “radiological facts of life”: the material is very hazardous for the first 100 years at least. The NTP should acknowledge the radiological characteristics of spent fuel that are the basis of risk estimates and then discuss how transportation risks (routine, accident, and sabotage), and social impacts (especially public perception of risks) can and will be managed. DOE should especially consider how the NAS 2006 and BRC 2012 recommendations can reduce and manage both transportation risk and social impacts. WIPP doesn’t help much in this area, since the radioactivity of most TRU waste shipments (except for the small percentage of remote-handled TRU) is very small compared to SNF.

Halstead mentioned that we don’t yet know the full range of policy and technical implications of NRC’s recent “continued storage” rule as it might affect future storage and transportation of SNF.

Halstead also raised transportation cost as a “sleeper issue” in the reformulated nuclear waste program. In the most recent life-cycle cost estimates for the YMP (2008), transportation was estimated to cost $20.3 billion (2008$), about 21% of total life-cycle cost including cost of containers and transportation over-packs (but about 18% excluding the $3 billion cost of the proposed Caliente rail alignment).

- The YMP estimated a need for 100 cask cars at $700,000 and 37 buffer cars at $500,000. What will be the estimates for the S-2043 compliant railcar discussed by Matt Feldman?
- The YMP estimated $10.9 billion for “cask systems”, including 13,000 TAD canisters. What will be the estimates for comparable systems required by the DOE Strategy?
- The YMP estimated $3.1 billion for “operations execution”—i.e. fees paid to rail carriers. What will be the “operations execution” costs in the revised program?

After this discussion, Ken suggested and the Committee agreed to remove “draft” from the current WIEB comments on the NTP, so that they could be officially submitted to DOE-NFST for their review and consideration.

State Roundtable: Special Reports

- Cheryl Whalen reviewed recent issues at Hanford. Leaks have been found in one double-shell tank. Risk factors include the complexity and variability of tank contents, annulus ventilation, corrosion chemistry and temperature history, water intrusion, plate material and thickness, and construction quality.

The waste treatment plant has (again) been delayed. WA Dept. of Ecology estimates that the radiological risk increases by an order of magnitude if the percentage of tank waste retrieved declines from 99% to 90%, and by another order of magnitude if the percentage retrieved declines from 90% to 0%.
Between 1989 and 2000, three tank waste treatment projects were terminated. Since 2000, schedule slips (in 2003, 2005 and 2007) have delayed treatment plant operation 13 years, to 2019. Meanwhile, estimated Waste Treatment Plant costs have escalated from $7 to $13 billion.

- Using slides prepared by Charles Maquire for the September 18, 2014 NRC meeting, Roger Mulder reviewed the status of waste management at WCS in Andrews County, TX. The WCS facility is lined and expensive, and therefore cannot compete costwise with Environmental Solutions (Clive, UT) for disposal of Class A waste. Currently, WCS accepts Class B and C waste only, 40% of which comes from states not in the TX-VT compact.

Though currently licensed by EPA, WCS could approach NRC for a Part 72 license for storage of SNF, HLW and/or GTCC waste.

Currently, WCS is storing TRU waste generated at LANL prior to the finding that LANL-packaging was a key cause of the WIPP incident.

- Bob Halstead mentioned State of NV issues regarding the transport of unique waste streams (including U-233 and sealed sources) for disposal at NNSS. Halstead also noted Nevada’s continued opposition to Yucca Mountain, as evidenced by the Legislature’s recent commitment of an additional $1.38 million for legal and expert witness costs to prosecute more than 200 admitted contentions (challenges) in the licensing proceeding before the NRC.

- Kerry Martin discussed the August 2014 NWTRB meeting in Idaho Falls, and praised INL’s effort to move SNF from wet to dry storage.

Kerry also discussed the status of INL’s Integrated Waste Treatment Unit (IWTU)\(^3\), which she described as “death by duck bite”.

INL is shipping most of its LLRW to Energy Solutions, and most of its Mixed LLW to NNSA in Nevada.

- New member Danielle Mills discussed decommissioning at SONGS, which is estimated to cost $4.4 B, with about half coming from shareholders. About $5 million per year is being spent on research regarding the additional greenhouse gas emissions due to the SONGS shutdown. NRC will conduct a meeting on SONGS towards the end of October.\(^4\)

- Carla Schreiber returned to the Section 180c topic. Ken Niles says that he’s OK with the proposed “policy implementation exercise”, but thinks that discussion of the assessment process should be re-opened if the exercise demonstrates that the current process is not acceptable. Kerry Martin and

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\(^3\) The Integrated Waste Treatment Unit, a first-of-a-kind, 53,000-square-foot facility, will begin in 2014 treating 900,000 gallons of liquid radioactive and hazardous waste that has been stored in underground storage tanks – above the Snake River Plain Aquifer – for decades. The waste that will be treated – called sodium-bearing waste – was generated during the later stages of spent nuclear fuel reprocessing from the 1950s until 1992. The liquid was transferred to three, 300,000-gallon storage tanks that were part of a tank farm of 15 tanks. The IWTU, located east of the Idaho Nuclear Technology and Engineering Center, will use a steam-reforming technology to heat up the liquid waste, essentially drying it; consolidating the solid, granular material; packaging it in stainless steel canisters; and storing the containers in concrete vaults at the site. Ultimately, the treated material will be transported to a national geologic repository for permanent disposal.

\(^4\) I looked for this meeting on the NRC website, but failed to find it.
Doug Edmiston expressed concerns about the 2007 FRN formula but did not object to going forward with the exercise. Danielle Mills reiterated her interest in following the OR and NE processes.

The WIEB group continued the discussion of the funding allocation method for 180C.
- The Population description needs to be clearer
- Would like to see a risk assessment attached to route (similar to David’s comments)
- Do not like the $500,000 cap on the funding allocation. (I believe this is an error on the document)
- Should use exercise to evaluate the effectiveness of the formula
- Needs based allocation would be demonstrated in the grant application process during exercise

A voted was taken on the 2008 FRN formula as presented (with the $500,000 cap language removed).

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<tr>
<th>State</th>
<th>Comments</th>
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<tbody>
<tr>
<td>Texas</td>
<td>Agrees with proposal</td>
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<tr>
<td>Utah</td>
<td>Agrees with proposal</td>
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| California  | Agrees with basis of proposal with modification -
               Use exercise to either validate or redesign the formula |
| Arizona     | Agrees with the basic proposal with modifications to
               the table scoring |
| Nevada      | Agrees with the basic proposal with modifications
               following the exercise |
| Washington  | Agrees with basis of proposal - review after exercise
               - consider modification based on exercise results |
| Oregon      | Agrees with proposal - evaluate following exercise |
| Idaho       | Agrees with proposal - evaluate following exercise |
| Wyoming     | Agree with basis of proposal with modification to
               risk assessment of route miles |
| Nebraska    | Agree with proposal - evaluate following exercise |

- Richard Arnold (Pahrump Paiute Tribe) updated the group on Tribal involvement in the SNF/HLW transportation process. He suggested a state-tribal consultation group, which Neil Weber (Pueblo de San Ildefonso, NM) said should be modeled on STGWG. Richard noted that his visits to shutdown sites identified additional tribes in the vicinity of these facilities.

- Phil Klevorick (Clark County, NV) mentioned a tabletop exercise conducted with OST earlier this year. Clark County is generally very well prepared (for radwaste emergency response) but better lines of communication with DOE are needed.