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DOE Misses INL Cleanup Deadlines

Alex Stuckey reports 11/7/12 in the Idaho Falls Post Register: "Start-up delays at the sodium-bearing waste treatment facility on the Department of Energy's desert site have caused the DOE to miss two Site Treatment Plan milestones. The DOE also will miss a milestone on the 1995 Idaho Settlement Agreement because of these delays. "We've had technical issues (with the treatment of this waste)," DOE spokesman Brad Bugger said. "We will eventually complete these milestones."

The Site Treatment Plan was established by the Federal Facility Compliance Act, which requires federal facilities to develop a plan outlining how to handle the generation, storage, treatment and disposal of mixed waste. The DOE is required to submit this plan to the Idaho Department of Environmental Quality every year. Because the DOE missed the milestones, the Department of Environmental Quality could fine the DOE up to $10,000 per day per violation until the milestones are met, Department of Environmental Quality spokesman Brian Monson said.

The delays came in June when nonradioactive material clogged a filter at the Integrated Waste Treatment Unit, which would process the sodium-bearing waste. Sodium-bearing waste contains a low level of radiation, the leftovers from reprocessing high-level radiation spent nuclear fuel. The settlement agreement required the removal of 900,000 gallons of sodium-bearing waste by Dec. 31. The waste is located in tanks at Idaho National Laboratory's Idaho Nuclear Technology and Engineering Center.

One missed milestone is for the date when sodium-bearing waste treatment at the Integrated Waste Treatment Unit must begin. The other is the date when the DOE must submit a schedule identifying the time required for processing the waste in storage. The DOE has asked for an extension on both milestones into 2013. The department will not be subject to a fine until the final determination is made.

Because the DOE is seeking an extension of a year, the Department of Environmental Quality has asked for public comment, which can be done online, via email or mail until Nov. 23. The Department of Environmental Quality will wait for public comment before making a decision, Monson said. "We remain optimistic that the extension will be granted," Bugger said.

Alex Stuckey can be reached at 542-6755. Comment on this story on Post Talk at: www.postregister.com/posttalk/. Comments can be submitted at tinyurl.com/STP-comment; emailed to brian.monson@deq.idaho.gov; or mailed to Brian Monson, DEQ State Office, Waste Management and Remediation Division, 1410 N. Hilton, Boise, ID 83706.

A Radioactive Conflict of Interest

Robert Alvarez reports in Huffington Post, 6/25/12: “Having the Energy Department control radiation health research makes as much sense as giving tobacco companies the authority to see if smoking is bad for you.

Last month, the Massachusetts Institute of Technology (MIT) heralded an Energy Department funded study indicating that evacuation zones around nuclear power stations might not be needed after a major nuclear accident. The study, which exposed mice to radiation levels comparable to those near the Fukushima nuclear disaster, found no evidence of genetic harm. "There are no data that say that's a dangerous level, “says Jacquelyn Yanch, a leader of the study. According to the MIT press release "current U.S. regulations require that residents of any area that reaches radiation levels eight times higher than background should be evacuated. However, the financial and emotional cost of such relocation may not be worthwhile, the researchers say."

It's quite a leap to claim that evacuation zones around nuclear power plants might not be needed based on the chromosomes of 112 irradiated mice. In a devastating critique, blogger, Ian Goddard points out that the MIT study excluded extensive evidence of genetic damage to humans living in a radiation-contaminated environment. Although doses in a peer-reviewed study of 19 groups of children living near Chernobyl were consistently lower than the MIT mouse study, most showed lasting genetic damage from radiation. "MIT's presentation of its study as the first scientific ever examination of the genetic risks of living in a nuclear disaster zone is pure science fiction, not fact," Goddard concludes.

Even more troubling, the Obama administration reduced emergency preparedness in case of a major nuclear accident in a quiet announcement made six months ago, right before Christmas -- virtually guaranteeing minimal media attention. Given that the number of people living near nuclear stations has grown four-and-a-half times larger since 1980, a move in the opposite direction would make more sense. Yet, the government's low priority for radiation protection is underscored by the Environmental Protection Agency’s Inspector General, who recently reported as radioactive fallout from the Fukushima nuclear site drifted over the U.S.,20percent of EPA's radiation monitoring stations were out of service for more than 6 months.

Also, during early stages of the Fukushima accident, the U.S. Nuclear Regulatory Commission (NRC) officially doubled the baseline annual public radiation dose from the environment by adding medical procedures. According the NRC this dose, " has not been shown to cause humans any harm." Although medical radiation exposures have soared over the past several years, unlike accidental nuclear power releases, an x-ray involves a choice by the patient and doctor. Moreover, in 1970, the world's largest human study of pregnancy x-rays reported that NRC's harmless dose more than doubles the risk of childhood cancer.

Observations based on radiation-exposed humans have long been considered of greater scientific importance, some which were obtained with a callous lack of ethics. In March 1954, after the U.S. exploded an H-bomb in the Marshall Islands that released a roughly comparable amount of cesium-137as the Fukushima accident, Japanese fishermen and Marshallese were exposed to life-threatening doses of radioactive fallout while forcing Japan to confiscate four million pounds of fish. Two years later, medical advisors to the U.S. Atomic Energy Commission (AEC now DOE) secretly recommended returning the Marshallese people to their homes after being told they would be living in "by far the most contaminated place in the world."

At the meeting an AEC expert stated," it would be very interesting to go back and get good environmental data... when people live in a contaminated environment... While it is true that these people do not live, I would say, the way Westerners do, civilized people, it is nevertheless also true that they are more like us than the mice."

Given this well-documented history of deception, why is the government reducing nuclear emergency preparedness and claiming no harm from radiation exposure, right after a major nuclear power disaster? The answer lies in the fact that since the 1940's, the United States remains a major pillar of nuclear support here and around the world. Currently, about 70 percent of the Department of Energy's $26.3 billion budget goes for nuclear activities -- not including$18.5 billion in loan guarantees for new U.S. power reactors being sold by Japan's failing nuclear industry.

The Energy Department is also the main source of funding for radiation health research -- much like having the tobacco industry determine the safety of smoking. This conflict-of interest is not new. Several prominent scientists on the nuclear payroll in the 1950's and 60'svigorously claimed that radioactive fallout from atmospheric nuclear weapons tests was harmless. Some went so far as to assert that fallout might be beneficial because increased radiation-induced genetic mutations could weed out the weak.

This problem was not lost on congressional investigators over the past 35years. They have revealed the government's suppression of incriminating data, blacklisting of uncooperative researchers, unethical human experiments, and submission of fraudulent research in federal court. By the late 1980's DOE was forced to move funding for radiation research to public health agencies. This all changed 10 years later, when the Republican-controlled Congress restored DOE's monopoly control.

Things have gotten to the point that the agency gave a$1.7million grant to MIT, last month that will address among other things, the "difficulties in gaining the broad social acceptance" of nuclear power. MIT has also received millions of dollars from Tokyo Electric Power Co (TEPCO), which is responsible for the Fukushima nuclear disaster.

This conflict of interest has tragic dimensions. The government and nuclear industry still face the costly disposal of enormous amounts of radioactive waste and profoundly contaminated "sacrifice zones “at the Energy Department's nuclear sites. Not to mention tens of thousands of sick nuclear workers, uranium miners, military veterans, experiment victims, and nuclear test "down-winders," who are receiving billions of dollars in compensation after being put in harm’s way on behalf of splitting the atom.”

Possible Radioactive Leak at Hanford Tank Farm

Kim Murphy reports 8/21/12: “SEATTLE -- As part of the biggest, costliest environmental cleanup project in the nation’s history—disposing of 53 million gallons of radioactive waste at the Hanford Nuclear Reservation in Washington state—one thing was supposed to be sure: Waste stored in the sturdy, double-wall steel tanks that hold part of the toxic ooze wasn’t going anywhere.

But that reassurance has been thrown into question with the discovery of a 3-foot-long piece of radioactive material between the inner and outer steel walls of one of the storage tanks, prompting new worries at the troubled cleanup site.

“We’re taking it seriously, and we’re doing an investigation so we can better understand what it is,” Department of Energy spokeswoman Lori Gamache told the Los Angeles Times.

The discovery marks the first time material has been found outside the inner wall of one of the site's 28 double-shell tanks, thought to be relatively secure interim storage for the radioactive material generated when Hanford was one of the nation's major atomic production facilities. It opened in 1943 and began a gradual shutdown in 1964. Cleanup started in 1989.

The $12.2-billion cleanup project eventually aims to turn most of the waste stored at Hanford into glass rods at a high-tech vitrification plant scheduled to be operational in 2019, assuming the formidable design and engineering hurdles can be overcome.

In the meantime, plant engineers have been gathering waste stored in the facility's 149 aging, leaky single-wall storage tanks and re-depositing them in the double-shell tanks for safekeeping.

Over the years, more than 1 million gallons of waste has leaked out of 67 single-wall tanks into the surrounding soil.

"There's been this presumption that the double-shell tanks at least are sound and won't fail, and they'll be there for us," said Tom Carpenter of the advocacy group Hanford Challenge. Several days ago the group obtained a memo from the cleanup site detailing discovery of the mysterious substance.

"This changes everything. It is alarming that there is now solid evidence that Hanford double-shell has leaked," Carpenter said in a separate statement on the discovery.

The 42-year-old tank, known as AY-102, holds about 857,000 gallons of radioactive and other toxic chemical waste, much of it removed several years ago from a single-shell storage tank where it was considered unsafe. Workers who relocated the material fell ill simply from inhaling the fumes, Carpenter said.

Department of Energy officials said none of the material has leaked outside the outer steel wall or the concrete casing that surrounds the structure, and there is no present hazard to workers or groundwater.

They said they were trying to determine whether the material leaked from the inner tank or oozed from a nearby pit into the space between the two walls, known as the annulus.

"There's no evidence of it leaking the liquid from the inner shell right now," Gamache said. The material – a mound 2 feet by 3 feet by 8 inches -- is dry and doesn't appear to be growing. It was discovered during a routine video inspection of the annulus conducted last month from a viewpoint not normally used. The possibility that it could have come as overflow from a nearby pit arises because a pipe runs into the annulus from the pit, Gamache said.

But Hanford Challenge Tom Carpenter, who has talked extensively with workers at Hanford and was briefed Tuesday by one of the Department of Energy's senior officials at the tank farm, said he believed the evidence was strong that there was a leak.

"I know Hanford would like it not to be so. But the people I'm talking to at the Hanford site say, no, it really does look like a leak," he said. "From what I'm being told and looking at the pictures, it appears it's coming from under the tank and going up. Which is a far cry from it coming from the pit."

Gamache said an initial sample of the material revealed that "the contamination levels were higher than expected" and it definitely contained radioactive waste. "There wasn't enough material to fully characterize the material, so we're preparing to pull another sample. That will probably happen around the mid-September time frame," she said.

Carpenter said that if the inner tank leaked, it would probably prompt the need to reevaluate expectations that the tanks could safely act as interim storage vessels for several decades.

"These are the tanks that are considered sound, that will last for another 40 years, and if that's

not true, then they're going to have to consider building new tanks at a minimum," he said. "They may also need to develop the ability to move waste around much quicker than they do now."

Hanford Challenge Concerned Over Audit of Vitrification Plant

Hanford Challenge reports 5/2/12: "A federal audit has concluded that the Energy Department and a contractor building a nuclear waste treatment plant at the Hanford reservation installed tanks that did not always meet requirements of a quality assurance program or the contract.

The $12.3 billion plant being built to convert radioactive waste into glasslike logs has been the subject of recent whistleblower complaints about its design and safety.

The audit focused on tanks that were received prior to mid-2005. The tanks' design is significant because they will be located in sections of the plant that will be too radioactively hot for workers to enter once the plant is operating.

The Energy Department says it has taken steps to improve oversight, conducting technical surveillance on tanks and holding installations until issues can be independently verified. Monday's audit is just the latest in a series of worrisome events at the vitrification plant. Isaac Kaplan-Woolner spoke with a nuclear waste watchdog about how he sees these latest problems. Meanwhile, Washington State is joining South Carolina today in asking a panel of federal appellate judges to force a reconsideration of Yucca Mountain as the nation's nuclear waste repository. Yucca Mountain plans were taken off the table by President Obama in 2010. The longstanding Yucca debate has been mired in politics. It was once seen as a possible permanent home for Hanford's nuclear waste.

"The pursuit to stay on schedule has crippled the entire operation. ***This sucker is not going to run as currently designed****, plain and simple, and a heck of a lot of people around here know it but are too afraid to speak up." — David Bruce, Nuclear Process Chemical Engineer, quoted in Seattle Weekly, Toxic Avengers, February 22, 2012*

"Engineers and other experts aren't just warning that the way this facility has been operated risks wasting more time and money by proceeding. … They're warning that continuing with these plans ***risks people's lives****. The Energy Department needs to prove it is committed to addressing the rampant mismanagement at the plant.*" — Ed Markey, Congressional Representative D-Mass., quoted in USA Today, Jan. 27, 2012

"*There's a lot of pressure … from Congress, from the state, from the community to make progress," As a result, "the design processes are cut short, the safety analyses are cut short, and the oversight is cut short. …* ***We have to stop now and figure out how to do this right, before we move any further.****"* — Don Alexander, Senior Scientist, Department of Energy

Issues not addressed by DNFSB and Sandia National Laboratories (Sandia) At the Annular Core Research Reactor (ACRR) Citizen Action New Mexico Presentation August 13, 2012

By Dave McCoy

1. Citizen Action letter of April 19, 2012 addressed the following issues and questions that do not appear to be addressed by correspondence between DNFSB and Sandia:
    a) Why is there no compliance with the most basic issue of regulatory provisions for seismic a nd building safety of the ACRR?

    b) Why were ACRR operations allowed from 2004 to the present at the ACRR despite the numerous safety violations described beginning in 2004 and continuing to the present? "Considering the inherent risk associated with the ACRR operations and sporadic operational occurrences involving the control system **during the past several years,** the staff is also concerned that the reliability of the safety-significant protection and control systems may be inadequate. … It is not possible to determine whether the controls are adequate to ensure protection of the public and workers." (DNFSB January 31, 2012 Spatz memorandum).

    c) The building housing the ACRR is not seismically qualified. The White paper analysis of 2005, attached to the March 3, 2005 letter of Linton Brooks to John T. Conway (DNFSB) , and the 2009 letter of Thomas P. D'Agostino to John Mansfield (DNFSB) all confirm that the ACRR facility does not meet seismic standards. Have modifications been made to the High Bay Ventilation System to meet the Design Basis Earthquake?

    d) What is the Design Basis Earthquake for Sandia generally and specifically for the ACRR?

    e) Are modifications planned for the building housing the ACRR? If not, why not? Mitigating unacceptable seismic risk is mandated. Why is Sandia allowed to flaunt the requirements?

    f) If modifications are not planned, then what steps or recommendations will be taken by DNFSB for non-compliance with Executive Order 12941 to meet RP4, Standards of Seismic Safety of Existing Federally-owned Leased Buildings?

    g) Are there seismic detection instruments located at Sandia? How many are there? Are accurate data collected from the seismic instruments and provided in reports?

2. The July 16, 2012 DOE Donald Cook letter does not offer any insight into the correction for the basic problems of ACRR building seismic safety.

3. Does DNFSB intend to furnish the report to Citizen Action that was transmitted from SNL/Sandia Site Office for current and planned actions to address the Board's concerns regarding quality assurance? Is the formal NNSA corrective action program currently posted on the DNFSB website?

4. Citizen Action appreciates the oversight of the DNFSB, but once again we wish to emphasize the issue that in light of Fukushima and the unreliability of systems throughout the nuclear industry that are not seismically competent, why is an unsafe DOE reactor allowed to operate in an unsafe building? It says little in favor of DOE nuclear reactor operations when the ACRR can operate with impunity for decades and the oversight organization does not have authority to order shutdown or enforcement actions.

5. What unresolved safety questions remain for the ACRR?

Blue Ribbon Commission Updates

by Robert Alvarez

The framework of the 1982 Nuclear Waste Policy Act (NWPA) for ultimate disposal of high-level radioactive waste, one of the planet's most dangerous human-made substances, has collapsed. Several events are converging that pave the way to reopen this law next year. They include:

- Abandonment of the proposed Yucca Mountain high-level radioactive waste geologic disposal site underscored by the 2012 elections;
- Recommendations of the Blue Ribbon Commission on America's Nuclear Future (BRC). The panel, convened in 2010 by President Obama after canceling the Yucca Mt. project, calls for a major institutional overhaul of storage and disposal site selection – expected to take several decades to implement if adopted;
- Rejection of the U.S. Nuclear Regulatory Commission's Waste Confidence Rule by the Federal Appeals Court of the District of Columbia for failure to thoroughly evaluate the environmental, safety and health impacts from spent nuclear fuel storage, as a result of an uncertain disposal future;
- Maximum high-density spent fuel pool storage capacity reached by all operating U.S. power reactors by 2015;
- Economic impacts from cheap abundant natural gas on aged nuclear power stations vulnerable to increased expenses associated with expanded dry storage of spent fuel; and
- Growing political pressure in states stranded with large amounts of defense high-level radioactive wastes in the Pacific Northwest, Northeast and Southeastern U.S.

Military Nuclear Wastes -- Between the 1940's and the late 1980's, the Department of Energy (DOE) and its predecessors reprocessed tens of thousands of tons of spent fuel in order to reuse uranium and make plutonium for nuclear weapons.

By the end the Cold War about 100 million gallons of high-level radioactive wastes were left in aging tanks that are larger than most state capitol domes. More than a third of some 200 tanks have leaked and threaten water supplies such as the Columbia River. According to DOE, treatment and disposal will cost more than $100 billion; and after nearly 30 years of trying, the Energy Department has processed less than one percent of the radioactivity in these wastes for disposal. It's turning out that the stabilization of military HLW has become a more daunting technological challenge than expected.

DOE also has about 2,700 metric tons of spent reactor fuel. There are 256 types of spent fuel in the DOE inventory, and only a few have been analyzed. Most of this fuel (2,100 metric tons) is at the Hanford Site. Smaller amounts of spent nuclear fuel associated with nuclear weapons production are stored at the Savannah River Site. Spent nuclear fuel from the Naval Nuclear Propulsion Program is stored at the DOE's Idaho National Engineering Laboratory (INL) and, for a short time, at some naval nuclear shipyards. Spent fuel from several nuclear power reactors are also the responsibility of DOE. The DOE will also assume responsibility for fuel from some special-case commercial nuclear reactors, foreign research reactors, and certain domestic research and test reactors.

In response to these difficulties, made worse by the absence of a permanent disposal solution, DOE is pursuing a quiet policy of onsite shallow disposal of much of these wastes, which remain hazardous for tens of thousands of years.

All told DOE is responsible for ~2 billion curies of intermediate and long-lived radioactive materials from liquid high-level wastes, and spent fuel. By comparison, spent power reactor fuel contains roughly 20 times more radioactivity and thus, a much greater level of decay heat.

Commercial Spent Nuclear Fuel -With respect spent power reactor fuel storage, I think that we need to change the narrative about the nature of this hazard. Instead, discussion of spent fuel is carried out using of innocuous terms such as metric tons, assemblies fuel rods etc.

It's not hyperbole to describe spent reactor fuel at individual reactor stations as having some of the largest concentrations of intermediate and long-lived radioactivity on the planet. Nor is it incorrect to state that nearly 75% of this spent fuel is stored in high-density pools 4-5 times more than their original designs intended. Despite having much more radioactivity capable of escaping into the environment than a reactor core, reactor pools do not have thick-secondary containment, and are not required to have their own emergency back-up power or water make-up capabilities, as are required for new reactor designs in the U.S. and all of the operating reactors in Germany.

The U.S. Government Accountability Office describes spent power reactor fuel as, "one of the most hazardous materials made by man" with good reason.

When the reactor is shut down, the spent fuel being removed contains a myriad of radioactive isotopes with different half-lives including longer lived radioisotopes, notably cesium- 137 (half-live=30 years), along with very long-lived fission products (i.e. iodine-129, Technetium-99, Cs-135) and actinides (plutonium-239, americium-241) that have half-lives ranging from tens of

thousands to millions of years.

Spent fuel contains materials that are in a class of their own because they are radiotoxic, meaning that they create biological damage based on their radioactive properties alone. The most immediate and severe form of harm is from tissue destructive doses of radiation estimated to be as low as 50 rems. Doses well above this level can damage or destroy organs of the human body, such as bone marrow, lungs, skin, gastro-intestinal system, brain and thyroid. Direct exposure to a spent nuclear fuel assembly at a near distance at would give off more than 10,000 rems per hour (100 Sv/hr) in the form of external penetrating radiation.[1] A person standing within 3 feet of this assembly would receive a lethal dose within minutes. For the next 100 years, it would give off life threatening doses at this distance.[2] Long-term damage from lower chronic environmental doses are mostly from mutational damage to individual cells and includes cancers, other diseases, and lasting genetic damage, including congenital abnormalities, chromosomal disorders, and range of diseases, which could span generations.[3] Women, the fetus/embryo and small children are the most vulnerable.

From the perspective of public safety, the cesium-137 content in spent fuel is an important radioisotope of concern. With a half-life of 30-years, Cs-137 gives off external penetrating radiation as it decays and accumulates in living organisms as if it were potassium. According to the National Council on Radiation Protection and Measurements (NCRP), "Cs -137 has often proven to be the most important long-term contributor to the environmental radiation dose received by humans and other organisms as a result of certain human activities.[4]" As the reactor accidents at Chernobyl, in the Ukraine in 1986 and the Fukushima Daiichi site in Japan last year, large-scale environmental contamination by Cs-137 underscores this concerns. Approximately 40 percent of the intermediate and long-lived radioactivity in the spent nuclear fuel generated by reactors in GA, SC and throughout the U.S. is Cs-137.

Let's take a look at reactors in South Carolina (SC) and Georgia (GA):

- According to the NEI as of December 31, 2011 reactors in SC and GA generated 8,897 and 10,630 spent fuel assemblies respectively.
- Assuming half of the SNF in the pools are high burn-up (18-24 months before refueling), and the remaining balance in wet and dry storage are from lower burnup (12 months before refueling), the reactors in SC and GA have generated ~700 million curies and ~500 million curies respectively of intermediate and long-lived radionuclides.
- SRS tanks hold ~416 million curies. So, the reactors in SC and GA have generated ~3 times more radioactivity than 35 years of nuclear weapons material production at SRS.
- Roughly 40% is Cs-137. So SC and GA reactors contain 280 million and Ci 200 million Ci respectively.
- Reactors in SC and GA have generated ~11 times and 8 times more Cs-137 then released by all atmospheric nuclear weapons tests in the world, and 148 times and 106 times more Cs-137 than released by Chernobyl respectively.

Nuclear Waste's Future Unclear in Idaho

Rockey Barker reports in the Idaho Statesman 11/27/12; "The decision to back away from Yucca Mountain as a long-term nuclear waste storage site is one of the first-term policies of President Barack Obama that is now solidified after his re-election.

That means Congress is going to have to address the long-term future examined by the Blue Ribbon Commission on America's Nuclear Future. The commission recommended developing an interim storage plan for the 70,000 tons of high-level spent nuclear fuel now sitting next to nuclear reactors in states that consent to take it.

Idaho has 300 tons of spent fuel, and the Navy's plans to ship its waste to Yucca Mountain will have to change.

In the meantime, eastern Idaho business and government leaders have sought to get Idaho to join New Mexico, North Carolina and Texas as states proposing their own interim storage sites.

Idaho National Laboratory contractor officials have less ambitious goals to allow more waste into the state for research purposes.

Gov. C.L. "Butch" Otter's 13-member Leadership In Nuclear Energy Commission has been exploring the future of nuclear research at INL. But its ability to maneuver became limited when former Gov. Cecil Andrus leaked a document from INL contractor Battelle Energy Alliance that showed it wanted to dramatically change the 1995 agreement to keep nuclear waste out of the state negotiated by Gov. Phil Batt.

The commission delayed its final report until Dec. 3. After that, it will take public comments into January.

Idaho voters backed Batt's 1995 agreement with the Department of Energy 60 to 40 percent, sending the message: Don't send more commercial nuclear waste to Idaho, and get rid of all of the waste that's here by 2035.

Otter himself shut the door to the idea that INL -- or the state for that matter -- would become a nuclear waste repository. "I'll say this as plainly and as unequivocally as I can: Idaho will NOT be a repository for nuclear waste," Otter wrote in a guest opinion.

Of course, that doesn't address the Navy's waste in eastern Idaho that has nowhere to go. When Idaho hits its deadline in 2035, the federal government can merely pay a fine and continue storing the waste here.

Federal court decisions also have upheld Department of Energy plans to leave some low-level, long-lived nuclear waste in the ground at INL forever, essentially leaving portions of the 890-square mile site as a permanent sacrifice zone. Batt never envisioned that.

Last week, Doug Sayer, president and CEO of Premier Technology Inc., a Blackfoot company that works in the nuclear industry nationwide, urged the state to consider the economic consequences of federal cutbacks on INL and the eastern Idaho economy.

Sayer thinks recycling spent fuel makes more sense than burying it, and he wants Otter's nuclear commission to push for a new agreement with the federal government. But Sayer wants state control, and he doesn't want the waste at INL. "I believe there might be a location in Idaho that is not over the aquifer and that has suitable geology and that the technology exists that would allow us to construct a safe and environmentally sound facility," Sayer said. "I would

build it on state endowment lands so all of the revenues would go toward our education system and our universities could manage and operate the facilities, once again generating opportunities and revenues for our state."

To address the realities of long-term nuclear waste, Idaho needs a new discussion on the level of the 1996 waste initiative campaign.

The Snake River Alliance, the Idaho anti-nuclear group, is certain to oppose any change. And it has the 1996 vote as its defense.

For Idaho to rewrite the nuclear waste agreement, Otter would have to take the lead, campaign hard statewide and get support from Batt and -- ideally --Andrus. It might take another voter initiative. Many Idahoans today weren't voters in 1996.

Sayer said the state must ask whether his plan makes environmental, social and economic sense. 'If the answers to these questions are no, then I will face the fiscal cliff right along with you,' Sayer said."

Nuclear Thermal Propulsion Like Lazarus Raises Again

Remember the INL Aircraft Nuclear Propulsion Program tests that spewed radiation on southern Idaho, between 1956 – 1961, and later the 1992 US Air Force classified "Timberwind" INL project to test nuclear rockets that was later scraped after public objections? Well it's back again – now slated for testing at the DOE's Nevada Test Site. Its current proponents claim:

- Nuclear Thermal Propulsion (NTP) is a proven technology; 20 NTR / reactors designed, built and tested at the Nevada Test Site (NTS) in the Rover / NERVA programs
- "All the requirements for a human mission to Mars were demonstrated" – thrust level, hydrogen exhaust temperature, max burn duration, total burn time at power, #restarts
- The smallest engine tested in the Rover program, the 25 klbf "Pewee" engine, is sufficient for human Mars missions when used in a clustered engine arrangement – No major scale ups are required as with other advanced propulsion / power systems
- In less than 5 years, 4 different thrust engines tested (50, 75, 250, 25 klbf – in that order) using a common fuel element design – Pewee was the highest performing engine
- "Common fuel element" approach used in the AISP / NCPS projects to design a small (~7.5 klbf), affordable engine for ground testing by 2020 followed by a flight technology demonstration mission in 2023. PWR sees strong synergy between NTP and chemical
- SAFE (Subsurface Active Filtration of Exhaust) ground testing at NTS is baseline; capital cost for test HDW is ~45 M$ with ~ 2M$ for each additional engine test (NTS Dec. 2011)
- Cost for engine development and ground testing will not "break the bank" & the system will have broad application ranging from robotic to human exploration missions
- NTP consistently identified as "preferred propulsion option" for human Mars missions:
  - NASA's SEI – Stafford Report (1991) listed NTP as #2 priority after HLV
  - NASA's Mars Design Reference Missions (DRMs) 1 (1993) – 4 (1999)
  - NASA's Design Reference Architecture (DRA) 5.0 (2009)
- Using NTP, the launch mass savings over "All Chemical" and "Chemical / Aerobrake" systems amounts to 400+ metric tons (~ISS mass) or ~4 or more HLVs. At ~1 B$ per HLV, the launch

vehicle cost savings alone can pay for NTP development effort
- The DRA 5.0 crewed MTV "Copernicus" has significant capability allowing reusable "1-yr" NEA missions & short (~1.5 yrs.) Mars / Phobos orbital missions before a landing
- JSC's "NEA Accessibility Study" presented by Bret Drake to Doug Cooke (April 7, 2011). Findings: NTR outperforms chemical, SEP/Chemical & all SEP systems, allowing access to more NEAs over larger range of sizes and round trip times for fewer HLV launches.
- With more LH2, faster "1-way" transit times to from Mars are possible if desired
- Lastly, NTP has significant growth capability (other fuels, bimodal & LANTR operation)

For more information on Timberwind see EDII website:
http://environmental-defense-institute.org