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### NIOSH Special Exposure Cohort Investigations Too Often Continuing for Years as Claimants Die Without Compensation

While two special exposure cohorts (SECs) have made it through the gauntlet at the Idaho National Laboratory, there are many other years of operation and facilities at the INL that should qualify for an SEC, to make it easier for radiation workers to obtain compensation for radiation-induced illness. The approved SECs are for the INL between 1970 and 1974, and ANL-W workers for 1951 to 1957.<sup>1</sup>

The Idaho Falls Post Register wrote of one now deceased worker who died of pancreatic cancer whose son will now be receiving compensation. In the article, the son stated that his father, after seeing several colleagues die of rare brain cancers, began to doubt that they were fully informed of the risks of radiation exposure.<sup>2</sup>

The reason for including all of INL between 1970 and 1974 (but excluding ANL-W workers in this time frame), centers around work conducted at the spent fuel reprocessing plant call the Chem Plant, now called INTEC. Radiation badges for workers who worked at various INL locations do not necessarily reflect the fact that they may have also worked at the Chem plant. For this reason, the 1970 – 1974 SEC includes all INL workers with a radiation badge. Investigation of work at the Chem plant, particularly for 1963 to 1970 is “pending” — a NIOSHism for putting it on the back burner.

Argonne National Laboratory – West (ANL-W) was under Department of Energy, Chicago Office until 2005 when it was combined with other INL operations under the DOE Idaho Operations Office. The National Institute of Occupational Safety and Health (NIOSH) then subsequently combined INL and ANL-W in some ways but treats them separately in other ways. INL and ANL-W SEC investigations continue, but the track record for NIOSH at INL and other DOE sites gives reason for pessimism for timely resolution.

While there are time limits for some aspects of the SEC investigations, the Advisory Board for NIOSH radiation dose reconstruction does not adhere to time limits. In the case of DOE’s

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<sup>1</sup> See the NIOSH Radiation Dose Reconstruction Program at <http://www.cdc.gov/niosh/ocas>. See the Idaho National Laboratory status at <http://www.cdc.gov/niosh/ocas/ineel.html> and see the portion of INL formerly ANL-W at <http://www.cdc.gov/niosh/ocas/anlw.html>

<sup>2</sup> Reporter Luke Ramseth, *The Idaho Falls Post Register*, “Finally, some compensation – Former INL workers frequently faced radiation and chemicals on the job,” August 7, 2016.

Savannah River Site, SEC investigations have proceeded for over eight years without a decision. This leaves former radiation workers to die without compensation. And with long enough delay, their qualifying survivors may also die without compensation.

Public comment was given at the Advisory Board on Radiation and Worker Health held at the August 9 meeting in Idaho Falls pertaining to DOE sites across the country. It was a sobering reminder that many of the workers that were promised protection from any significant adverse health effects have been made ill by their radiation exposures at DOE facilities and are now being denied compensation. Reasons vary from not being able to prove the worker was employed by the DOE contractor, not being able to prove that so-called non-nuclear facilities were actually used as nuclear facilities, radiation exposure records not being found, and radiation exposure records not accurately reflecting the worker's exposures.

Inadequate technical baseline documents (TBDs) for DOE nuclear facilities are a widespread problem for NIOSH, not just at the INL. Earlier operational practices are glossed over as improved practices in later years are emphasized. Accidents, criticalities, and even whether a building was used as a nuclear facility are often not addressed in NIOSH TBDs and at some facilities, accidents went under reported. Public comment was given regarding evidence of unreported criticalities at the Rocky Flats plant in Colorado, and lack of monitoring following an accident kept secret for years at California's Santa Susana facility whose Sodium Reactor Experiment had an accident in 1959.<sup>3</sup> The public comment given at the August 9 meeting will be posted on the NIOSH website. From far and wide across the US, Department of Energy, **former radiation workers have a nearly impossible task of getting NIOSH to investigate the realities of radiation exposures that these workers faced.**

Addressing the environmental exposure from living near these facilities is off limits for NIOSH investigations even though workers and their families lived in off-site environmental radioactive contamination at the Hanford site,<sup>4</sup> the Nevada Test Site and the Savannah River site in South Carolina. And NIOSH has yet to attempt to address the health impact of workers drinking a soup of contaminants in their drinking water, both chemical and radionuclide contaminants that DOE was often aware of but inadequately monitoring and choosing not to tell the workers about the contamination. Workers at INL's Central Facilities Area were downgradient from waste water aquifer injection wells and percolation ponds at the Test Reactor Area and INTEC. Levels of contamination were over five times the current federal drinking water standard for many years as DOE emphasized its own "dose concentration guidelines" which are a 100 times more lax. The peak levels of contamination are deliberately not mentioned

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<sup>3</sup> Read more about Santa Susana Sodium Reactor Experiment and Rocketdyne at

<http://www.enviroreporter.com/2015/09/santa-susana-field-lab-health-study-hoax-stumbles-forward/>

<sup>4</sup> See EDI June 2016 newsletter regarding higher infant mortality rates near the Hanford site where iodine-131 exposures were higher found by Office of Health Studies and U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry, Centers for Disease Control and Prevention, National Center for Environmental Health, National Institute for Occupational Safety and Health, Agenda for HHS Public Health Activities (For Fiscal Years 2003–2008) at U.S. Department of Energy Sites, March 2003.p. 27

in US Geological Survey aquifer monitoring reports;<sup>5</sup> and many radionuclides and chemical contaminants were not monitored until the late 1980s. Along with elevated levels of airborne contamination, elevated gamma fields at many INL facilities, and the contaminated drinking water, I why understand former family friends died of cancer even though they were not defined as radiation workers. Site employees who never knew why they were sick worked in elevated background radiation levels at reactor and/or spent nuclear fuel facilities, and for decades drank and showered in water containing a soup of contaminants that may have included tritium, iodine-129, hexavalent chromium, and other contaminants.<sup>6</sup>

Public comment included the fact that radiation workers have also faced trouble having children or have had children more susceptible to cancer. The Department of Energy has steadfastly refused to acknowledge the increased risk of harm to children of radiation workers. But there are worker, medical worker and other witness accounts of “Hanford babies” and frail babies described to me as having translucent skin near Savannah River Site and known higher risk of leukemia in the children of radiation workers. The accounts remain unofficial, but there is plenty of evidence to encourage formal study.<sup>7 8</sup>

NIOSH uses a guise of technical jargon to argue that it is using a rational and technically-justified approach to deny claims while it is actually perpetuating DOE’s coverup of radiation worker harm. **Listening is heartbreaking not only because compensation is denied but because these workers know that their claims are being wrongfully denied as NIOSH radiation dose reconstructions churns out the “no” answer based on inadequate worker radiation exposure records.**<sup>9</sup>

## **Citizens Put Stop to Department of Energy’s Borehole Research in North and South Dakota**

While you would never know it from the Department of Energy’s poster sessions at the Boise Consent-based Siting meeting held July 14, borehole research which DOE is touting as a solution

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<sup>5</sup> USGS Report 90-4090, L.J. Mann and L.D. Cecil, “Tritium in Ground Water at the Idaho National Engineering Laboratory, Idaho,” June 1990. p. 32 and 34. <http://pubs.usgs.gov/wri/1990/4090/report.pdf>

<sup>6</sup> Tami Thatcher, “The Hidden Truth About INL Drinking Water,” available at <http://environmental-defense-institute.org/publications/INLdrinkwaterR1.pdf>

<sup>7</sup> Dr. Cathy Vakil, MD, and Dr. Linda Harvey, MD, Canadian Association of Physicians for the Environment, “Human Health Implications of the Nuclear Energy Industry,” May 2009. <https://cape.ca/human-health-implications-of-the-nuclear-energy-industry-2/>

<sup>8</sup> For radiation epidemiology, especially for children, see the EDI April 2016 newsletter.

<sup>9</sup> Employee radiation dose records, when containing excessive radiation doses have tended to be destroyed at DOE contractor facilities. See NIOSH public comment regarding the Idaho National Laboratory regarding the radiation dose records for the 1961 Stationary Low-Power 1 reactor accident firemen that could not be found years later, the 2011 ZPPR accident, various radiation exposure records at Rocky Flats that witnesses have given statements were destroyed, and others.

to permanent storage of some high level radioactive waste forms has been stopped by local citizens concerned that the study could lead to future nuclear waste storage in the area.

The DOE has touted borehole research as leading to a nuclear radioactive waste disposal solution and continues to tout this method despite the forced cancellation of research in North Dakota. Citizens were told that the research project phase would not involve storage of radioactive material, but citizens objected to the drilling through their aquifer to granite even to investigate future radioactive waste disposal because it could lead to radioactive waste disposal.<sup>10 11</sup>

South Dakota also prevented the DOE's borehole research despite Battelle Memorial Institute's insistence that the current project would not involve nuclear waste.<sup>12</sup>

With the strong objection of these states to even allow the DOE to conduct research that could lead to placing calcine or other forms of radioactive waste deep underground, why doesn't the DOE mention these roadblocks? Instead, DOE places borehole posters at its meetings and puts on a smile and tap dances that borehole research may contribute to radioactive waste disposal of DOE's vast quantities of waste once more research is done. The DOE apparently hopes that resulting seismic instability won't be attributed to the drilling, and apparently hopes that they can convince people that after a couple years of study, putting radioactive waste that could poison vast amounts of water in their state forever would be a good idea.

## **Nuclear Power Plants Becoming Storage Dumps for Radioactive Waste, writes Robert Alvarez**

Robert Alvarez, Senior Scholar at the Institute for Policy Studies, recently wrote about the fact that US nuclear power plants are now major radioactive waste management operations because the proposed Yucca Mountain nuclear waste repository remains in limbo. The issues of storage and transportation are made more complex by the practice of using high-burnup fuel that may make fuel cladding more brittle due to higher decay heat and higher buildup of fission products. Alvarez points out that owners of the shuttered Maine Yankee and Zion reactors have decided to package high burnup spent fuel as "damaged goods" and are using double-shell containers instead of single-shell, to allow for safer transport. The uncertainties of storing a mix of high- and low-burnup spent fuel in a canister are compounded by a lack of data on the long-

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<sup>10</sup> Reporter Karl Herchenroeder, *Exchange Monitor*, "DOE Axes North Dakota Borehole Project," March 4, 2016. <http://www.exchangemonitor.com/publication/exchange-monitor/doe-axes-north-dakota-borehole-project-2/>

<sup>11</sup> Reporter Lauren Donovan, *Bismark Tribune*, "Borehole Protests Stomp on Proposed Borehole Drilling," February 16, 2016 [http://bismarcktribune.com/news/state-and-regional/protests-stomp-on-proposed-borehole-drilling/article\\_92334c52-2015-5f7e-b9c8-61fb42393e43.html](http://bismarcktribune.com/news/state-and-regional/protests-stomp-on-proposed-borehole-drilling/article_92334c52-2015-5f7e-b9c8-61fb42393e43.html)

<sup>12</sup> Caheidelberger, *Dakota Free Press*, "Battelle, US Energy Dept, Gov Daugaard Say No Nuclear Waste at Spink Deep Borehold Site," April 29, 2016. <http://dakotafreepress.com/2016/04/29/battelle-us-energy-dept-gov-daugaard-say-no-nuclear-waste-at-spink-deep-borehole-site/>

term behavior of high-burnup spent fuel. Higher fuel burnup adds to the concern of safety of spent fuel pools. The US remains “dependent on leaps of faith in regard to nuclear waste storage—leaps that are setting the stage for large, unfunded radioactive waste “balloon mortgage” payments in the future.”<sup>13</sup>

While the Department of Energy stresses the urgent need for pilot interim spent nuclear storage and consolidated interim storage, Blue Castle Holdings, Inc. is stressing that the spent nuclear fuel that is highly toxic for over a million years can be stored safely for at least 100 years. Furthermore, Blue Castle Holdings states that:

*There is no current scientific, economic, or safety rationale requiring the near term movement of spent fuel from the nuclear power plants where it is generated. This has been the case since the first commercial nuclear power plant began operation in 1957. The Nuclear Regulatory Commission has concluded that spent fuel is safe to store on site for 100 years or longer.*<sup>14</sup>

That’s good enough for Blue Castle Holdings because they don’t have to care about what happens after 100 years. In contrast, the Department of Energy is urgently seeking pilot and interim consolidated storage arguing that this must be done even if no final deep geologic repository has been sited.

## **Federal Judge Orders the Department of Energy to Turn Over Idaho Nuclear Waste Documents**

The Associated Press reported that a federal judge has ordered the Department of Energy to make documents sought by former Idaho Gov. Cecil Andrus available to the court.<sup>15</sup> The response to the Freedom of Information Act request for documents submitted by Andrus to the DOE resulted in heavily redacted documents with entire pages blacked out. Andrus is seeking to understand the plans the DOE is making for storage of spent nuclear fuel (SNF) and plans DOE is considering regarding future shipments of SNF to Idaho. Naturally, the DOE thinks it’s none of our business to know what plans it is considering. Judge Winmill said disclosure may well be in the public interest.

One of the shipments to INL has been cancelled and will be shipped to another DOE laboratory. The remaining shipment involves detecting pyroprocessing, an SNF reprocessing technology that the University of Idaho and the Idaho National Laboratory have sold to the South Koreans with the argument that there was no weapons material proliferation concern.

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<sup>13</sup> Robert Alvarez, *Bulletin of Atomic Scientists*, “Nuclear power plant? Or storage dump for hot radioactive waste?” August 11, 2016. <http://thebulletin.org/nuclear-power-plant-or-storage-dump-hot-radioactive-waste9775>

<sup>14</sup> Blue Castle Holdings website on spent nuclear fuel at [http://www.bluecastleproject.com/faq.php?faq\\_id=5](http://www.bluecastleproject.com/faq.php?faq_id=5)

<sup>15</sup> Reporter Keith Ridler, AP, *The Idaho Falls Post Register*, “Court: Turn over Idaho nuclear waste documents.” August 10, 2016.

Now, the DOE is saying that the pyroprocessing research must be conducted in order to detect nuclear weapons material being obtained by using pyroprocessing, which critics of pyroprocessing long ago warned would be more difficult to detect than other processes for fuel separation. Now, anyone blocking the proposed shipment of research fuel to INL is deemed to be blocking essential security work to detect nuclear weapons proliferation. Oh my, how quickly the story changes to suit INL's agenda for getting money.

Without a waiver from both the current Idaho governor Otter and Idaho Attorney General Lawrence Wasden, the Idaho Settlement Agreement<sup>16</sup> only allows the receipt of research spent nuclear fuel from commercial reactors to come to the INL laboratory if DOE is meeting all settlement agreement milestones. The INL laboratory continues to miss the 2012 liquid radioactive sodium-bearing waste settlement agreement treatment schedule at the Integrated Waste Treatment Unit. Another schedule the DOE renegotiated with the Idaho Department of Environmental Quality pertaining to the lack of compliance with state requirements for hazardous waste is also being missed and no new date for commencing treatment has been established.

The INL is also missing and expects to miss other settlement agreement milestones associated with shipping transuranic defense waste to the struggling to reopen Waste Isolation Pilot Plant (WIPP) in New Mexico that closed following two 2014 accidents. Even if WIPP reopens for limited operation, the acceptance of shipments is likely to be at a very slow pace, not accommodating current settlement agreement milestones.

## **NuScale Small Modular Reactor Site at the INL Announced**

The proposed location for building the proposed NuScale small modular reactor at the Department of Energy Idaho National Laboratory, has been announced.<sup>17</sup> The location is on the southwestern side of the INL site near the Radioactive Waste Management Complex. The proposed site is about 6 miles southeast of the Lost River Rest Stop. A Utah-based energy consortium, Utah Associated Municipal Power Systems (UAMPS) CEO Doug Hunter said in the article that they hope to build the reactor on the 35-acre plot of land south of US highway 20 and 26 junction. Twelve modules would provide roughly 570 megawatts of power generation. Two UAMPS coal plants totaling 1,800 megawatts are to be shutdown in 2025.

The NuScale reactor design certification application is nearly ready to be submitted to the US Nuclear Regulatory Commission, but the review process is expected to take more than three

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<sup>16</sup> See the 1995 Idaho Settlement Agreement and related updates including the 2011 Memorandum of Understanding to allow research quantities of commercial spent nuclear fuel if DOE's settlement agreement milestones are being met at <http://www.deq.idaho.gov/inl-oversight/oversight-agreements.asp>

<sup>17</sup> Reporter Luke Ramseth, The Idaho Falls Post Register, "Location selected for small modular reactor," August 10, 2016.

years. According the USAMPS, the NuScale design should resolve technical, cost and safety barriers that currently limit deployment of nuclear energy in the US.<sup>18</sup> Twelve separate NuScale reactors, each with its own dedicated steam turbine generator, can be built at the site and will share the same reactor pool in a reactor building located below grade. Each reactor is a natural circulation light-water reactor and each has its own integral high-pressure steel containment that is opened each time fuel is changed out. Each of the twelve reactor vessel/containment modules is submerged in water in the common reactor building pool adjoining the reactor spent fuel pool.<sup>19</sup> I have not found a description of total spent fuel pool capacity.

The Department of Energy is providing a cost-sharing award of \$217 million over 5 year for the estimated \$3 billion plant. NuScale is majority owned by Fluor. The passive design reduces the number of emergency systems and operator actions required in existing nuclear plants. The small size of each reactor reduces the decay heat for each reactor module. The seismic design is capable of withstanding larger seismic events than existing nuclear plants. The fuel is expected to be less than 5 percent enriched U-235 and uses Areva M5 cladding. A study was performed to show that mixed oxide fuel can be used in the NuScale reactor, a selling point for the proposed plant in the UK.<sup>20</sup>

Light-water pressurized nuclear reactors generate various volatile offgases and tritium that are not captured in filters. Tritium is then released to the atmosphere and to water that comes in contact with the nuclear fuel in the reactor or spent fuel storage pool. Tritium releases at nuclear power plants from leaking piping or pools are usually only monitored periodically and only within the plant boundary.

At the Idaho National Laboratory, the historical scapegoat for tritium and other radionuclides in the aquifer, once off the INL site is frequently attributed to Nevada nuclear weapons testing or global weapons testing. Tritium released from the Advanced Test Reactor is not estimated by the Department of Energy or the operating contractor. Airborne releases from the INL blow to the northeast during the day and usually reverse to blow southwest at night. The result is radioactive airborne contamination spread far and wide in a 50-mile diameter region. The state and INL environmental monitoring of airborne radioactivity then frequently concludes that they have no idea the source of the radioactive airborne contamination when levels are many times normal.

A new finger-pointing blame game can be expected to ensue as NuScale blames the INL nuclear operations and INL blames weapons testing and NuScale for airborne or aquifer radioactive contamination. The proposed NuScale reactor is near the site of “mystery” chemical

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<sup>18</sup> Utah Associated Municipal Power Systems <http://www.uamps.com/index.php/38-items/24-carbon-free-power-project?id=208>

<sup>19</sup> See about the NuScale small modular reactor design at <http://www.uamps.com/index.php/38-items/24-carbon-free-power-project?id=208> and <http://www.nrc.gov/reactors/advanced/nuscale.html> “The NuScale Design” June 2016, ML16161A723.pdf

<sup>20</sup> World Nuclear News, “Study confirms NuScale reactor’s MOX capability,” January 21, 2016. <http://www.world-nuclear-news.org/WR-Study-confirms-NuScale-reactors-MOX-capability-2101164.html>

contamination in US Geological Survey multi-level well 2051 where multiple detections of tetrachloroethylene have been reported in the 1,100-foot-deep well.<sup>21 22 23</sup>

Nuclear utilities are not required to monitor offsite radiological releases. Lax standards for maximum contamination levels, spotty monitoring, and a pathological reliance on dilution as the solution to any contamination problem makes it difficult to stop routine contamination. Plants and regulators will typically now say that there is no drinking water near the plant, so federal drinking water standards do not apply.

Many of the small modular reactor promoters have hopes that the reactors can be sited in urban areas. If the epidemiology study of health effects of nuclear reactors to nearby populations had not been nixed by the US Nuclear Regulatory Commission, citizens would understand that children living within 3 miles of nuclear plants have roughly double the risk of cancer or leukemia, as was the case with every German nuclear power plant.<sup>24</sup> It is unknown what emission, airborne or groundwater, accounted for the health effect or whether it could be due to the high power transmission lines — or a combination of factors. It is doubtful that emissions from the new plant will be monitored carefully or can be distinguished for other INL radiological emissions.

## **Utah's Proposed Blue Castle Project for a 2-Unit Westinghouse AP1000 Nuclear Reactor Plant Has Failed to Find a Utility or Investors**

The proposed Blue Castle Project for a 2-unit Westinghouse AP1000 nuclear reactor plant to generate 3000 megawatts near Green River, Utah has failed to find a utility or investors, said Matt Pacenza, executive director of HEAL Utah.<sup>25</sup>

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<sup>21</sup> Luke Ramseth, Idaho Falls Post Register, "Mystery continues over water contamination – Officials say the chemical is coming from well, not aquifer," August 19, 2016.

<sup>22</sup> CERLCA cleanup new site identification (NSI) report for the surprise find of PCE (tetrachloroethylene) near proposed NuScale site at the Idaho National Laboratory at <https://ar.icp.doe.gov/images/pdf/201608/2016082401055BRU.pdf>

<sup>23</sup> See Environmental Defense Institute's July 2016 newsletter listing some historical PCE disposal into the aquifer at the Idaho National Laboratory at <http://www.environmental-defense-institute.org/publications/News.16.July.pdf>

<sup>24</sup> See the proposed US cancer risk study at nap.edu and Environmental Defense Institute's October 2015 newsletter article "NRC refuses to fund epidemiology around nuclear power plants" <http://www.environmental-defense-institute.org/publications/News.15.Oct.Final.pdf>

<sup>25</sup> KSL.com, "Appellate court upholds water rights diversion for planned nuclear power plant. July 24, 2016. [http://www.bluecastleproject.com/files/news\\_items/187-072416%20Appellate%20court%20upholds%20water%20rights%20diversion%20for%20planned%20nuclear%20power%20plant%20%20KSL.pdf](http://www.bluecastleproject.com/files/news_items/187-072416%20Appellate%20court%20upholds%20water%20rights%20diversion%20for%20planned%20nuclear%20power%20plant%20%20KSL.pdf)

Blue Castle Holdings Inc. (BCH) is working toward construction and operation of the 2-unit nuclear power plant.<sup>26</sup> Water rights for the nuclear plant will use 53,600 acre-feet per year of water from the Green River. The plant is to be located 5 miles west-northwest of Green River, Utah in Emery County.

A recent appeal of the state's decision to approve the application for water for the nuclear plant was denied. HEAL Utah's executive director, Pacenza, said that they have not decided yet if they will appeal the appellate court decision.

## **Idaho's "Kimama Lights"**

I recently learned of the "Kimama Lights." A google search turned up a few things – one discussion of the phenomena in 1963 — which makes perfect sense to me.

If you have seen the Kimama Lights, please contact our email address with the location, date, and time of day that you saw the "Kimama Lights."

Ghosts of the past — are not necessarily ghosts.

*Articles by Tami Thatcher, for September 2016.*

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<sup>26</sup> Blue Castle Project, Green River, Utah. <http://www.bluecastleproject.com/>