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US Nuclear Bomb Is Cleared For Production Engineering

Defense News

August 1, 2016

WASHINGTON — The National Nuclear Security Administration has authorized the B61-12 warhead life-extension program to enter the production-engineering phase.

The decision marks the final development phase prior to actual production. The NNSA says the first production unit of the weapon is planned for fiscal year 2020.

"Reaching this next phase of the B61-12 LEP is a major achievement for NNSA and the exceptionally talented scientists and engineers whose work underpins this vital national security mission," NNSA head retired Lt. Gen. Frank Klotz said in a statement. "Currently, the B61 contains the oldest components in the US arsenal. This LEP will add at least an additional 20 years to the life of the system."

The announcement marks another major step in the Obama administration's overarching plan to modernize the nuclear force, which Pentagon officials have warned could cost $350-$450 billion over the next decade.

On July 29, the Air Force released requests for proposals for the Ground Based Strategic Deterrent (GBSD), which replaces the 1960s-era

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Minuteman III intercontinental ballistic missiles, and the Long Range Standoff (LRSO) weapon, which will replace the AGM-86B Air Launched Cruise Missile.

It also comes at a time when members of Congress have begun raising serious questions about the modernization plan, in particular over the need for the LRSO.

While the Defense Department manages the delivery systems of the nuclear force, including ships, planes and missiles, the NNSA -- a semi-autonomous department within the Department of Energy -- has oversight over the development, maintenance and disposal of nuclear warheads.

Those delivery systems tend to receive more focus than the warhead modernization. For example, a July 14 hearing of the House Armed Services Subcommittee on Strategic Forces featured only one passing mention of the B61 program. But the life extension program is a vital part of the overall modernization strategy.

The NNSA is perusing a modernization plan known as the "3+2 Strategy," under which the agency is consolidating the American arsenal of warheads into five variants. Five bomb and cruise missile warhead types are being consolidated into two replacement-warhead designs, the W80-4 and the B61-12. Meanwhile, the five ballistic missile warheads now in service are being consolidated into three new interoperable warheads known as the IW-1, IW-2, and IW-3.

The B61-12 will replace the existing B61-3, -4, -7, and -10 bomb designs. The program includes Boeing-designed tail-kits, provided by the Air Force.

Nonproliferation experts have questioned if the plan is still the best way forward, given growing concern about the cost of modernizing the US nuclear arsenal.

If the 3+2 strategy was shifted, it could potentially save money that could instead be plowed into NNSA infrastructure needs. In a February hearing, Klotz warned that the administration has a $3.7 billion bill in deferred maintenance to facilities, with some buildings dating back to the days of the Manhattan Project.

Legal action over Hanford safety heats up with judge's ruling

King5

August 2, 2016

A federal judge ruled Tuesday that the U.S. Department of Energy and the contractor managing millions of gallons of nuclear waste at the Hanford Site must take interim measures to better protect workers from poisonous gases.

The ruling by District Court Judge Thomas O. Rice came after Washington Attorney General Bob Ferguson filed an emergency legal motion on July 20 asking the judge to intervene in the operations at the nuclear cleanup site to protect workers from continued exposure to toxic chemical vapors.

On Tuesday, Judge Rice set October 12 as the date for oral arguments on the motion at the federal courthouse in Spokane. Rice also ordered measures to protect workers until the hearing.

Those measures include the use of oxygen tanks for all workers in the Hanford tank farms, where 56 million gallons of radioactive and chemically contaminated waste is stored in tanks underground. He also called for a pilot monitoring program to be installed to help warn the workforce when toxic vapors are in their breathing space.

Chemical vapors have long been a problem at Hanford. They vent from the underground tanks as the waste ages and is disturbed. Some of the

approximately 1,500 chemicals in the waste include mercury, ammonia, dimethyl mercury and heavy metals such as strontium 90 and cesium 137.

"These are basic but important safety measures that should have been in place long ago but weren't due to delays of Energy and its contractor, Washington River Protection Solutions. We're pleased that our motion for preliminary injunction has already brought benefit to Hanford workers by ensuring that these measures remain in place until the court rules on our motion," said Ferguson in a statement. "I will keep fighting for real, lasting change in the federal government's culture of indifference to Hanford worker safety."

The emergency motion was filed by the AG after nearly 60 workers were exposed to suspected chemical vapors at Hanford since April 28. Some workers were evaluated at hospitals in the Tri-Cities and at Harborview in Seattle and remain too sick to work. Others sought medical evaluation at Hanford's onsite medical clinic after experiencing symptoms including nose bleeds, dizziness, headaches, difficulty breathing and a metallic taste.

The state took the drastic action after filing a first of its kind lawsuit against the federal government and WRPS in 2015 for allegedly violating state and federal regulations by knowingly putting workers in harm's way of toxic chemical vapors.

Studies dating back to 1992, many of them commissioned by the Department of Energy itself, are critical of Hanford's vapor program and warn of a causal link between exposure to vapors and adverse health effects. Despite recommendations and warnings by their own experts, Hanford managers downplay the problem and instead repeatedly give the message that they never measure chemical vapors above the acceptable occupational limits, which means the workers are safe.

After a rash of exposures in 2014 brought to light by the KING 5 Investigators, one top Hanford official told the media no evidence of vapor exposures existed.

“By every indication we have, our workers are not exposed to any vapors,” said Bob Wilkinson, the WRPS manager of environment, safety, health and quality at WRPS in 2014. Wilkinson currently works as chief operations officer for another Hanford contractor, Mission Support Alliance.

Ferguson said given all these factors, his office isn’t willing to wait for a 2017 trial date.

“These problems need to be fixed yesterday. And the federal government knows what they can do to fix it. Their own reports tell them what they need to do to fix it and it’s frankly maddening that they refuse to do it,” said Ferguson. “In fact, since we filed our lawsuit they’ve actually reduced worker protection. If that’s not a culture of indifference, I don’t know what is.”

The problems facing Hanford workers today stem back to the 1940s when 595 square miles of land along the Columbia River near Richland was chosen by the federal government to be a crucial part of the secret Manhattan Project. It was at Hanford that plutonium was produced to fuel the bomb dropped on Nagasaki, Japan in 1945.

Production of plutonium continued into the late 1980s as the country stockpiled its nuclear arsenal throughout the Cold War. Nearly five decades of plutonium production left behind a toxic legacy – 56 million gallons of liquid nuclear waste stored in 177 aging underground tanks. Now, workers engage in cleanup activities only, including managing the toxic cocktail of radioactive isotopes and dangerous chemicals buried in the tanks.

The Department of Energy and WRPS had asked the judge to postpone the hearing until late November, but instead Judge Rice set the proceeding for October and imposed the safety measures.

“Although the U.S. Department of Energy, continuing its pattern of delay, asked the court to push the hearing off until nearly Thanksgiving, we will be arguing for our more robust safety plan on October 12 in the U.S. District Court for the Eastern District of Washington,” said Ferguson.

First-of-its-Kind NNSA Capability to Support Study of Materials at Extreme Conditions for Stockpile Stewardship

NNSA

August 4, 2016

WASHINGTON – A new first-of-its-kind-worldwide research capability will help unravel the mysteries of material behavior at extreme conditions and short time scales in support of the Department of Energy's National Nuclear Security Administration’s (DOE/NNSA’s) vital national security missions. NNSA, DOE’s Argonne National Laboratory and Washington State University (WSU) will dedicate the new Dynamic Compression Sector (DCS) in a ceremony hosted by WSU this week. DCS is a new installation located at Argonne’s Advanced Photon Source (APS), a DOE Office of Science user facility near Chicago, Ill.

“DCS is an exciting and visionary undertaking that adds a national security capability to an existing DOE laboratory,” said acting Deputy Administrator for NNSA’s Defense Programs Phil Calbos. “Work at DCS will lead to discovery-class science and address important materials issues for the Stockpile Stewardship Program.”

DCS is funded by NNSA and is managed as a partnership between WSU and APS. DCS will help address challenges related to the nation’s energy and national security needs, understand the structure of planetary interiors

and help make new, lightweight materials for industrial, aerospace and automotive applications.

DCS allows researchers, for the first time, to make movies of the behavior of materials subjected to extreme conditions through tunable, high-energy X-ray pulses for viewing condensed matter changes at the microscopic level during a shock compression event.

“DCS supports a broad range of multidisciplinary research and will allow scientists to observe material behaviors and the underlying microscopic mechanisms using techniques that have not been possible before,” said Director of the WSU Institute for Shock Physics Dr. Yogendra Gupta.

“All of us at Argonne and the APS are delighted to formally welcome DCS to our community,” said Director of the APS Dr. Stephen Streiffer. “Users of DCS are already publishing exciting results, and we’re eager to see what the future holds for this valuable national scientific resource.”

The fundamental dynamic compression science enabled by DCS will support NNSA’s mission to ensure the U.S. nuclear stockpile is safe, secure and effective, with the added benefit of a relatively rapid turnaround time per experiment. DCS’ experimental capabilities will also support Department of Defense national security research.

Washington State University has a long history of working successfully with NNSA and conducting world-leading research in dynamic compression science. Using state-of-the-art experimental and computational capabilities, ISP scientists conduct interdisciplinary research spanning the fields of physics, chemistry, materials science, solid mechanics and planetary sciences. DCS will enable ISP faculty and graduate student researchers to study matter under physical conditions previously inaccessible in the laboratory.

Argonne’s Advanced Photon Source is a DOE Office of Science national user facility. The APS is a stadium-sized X-ray microscope that provides ultra-

bright, high-energy X-ray beams and allows more than 5,000 scientists per year to conduct research in nearly every scientific discipline to see structures at the atomic level. APS enables understanding of the form and function of biological proteins, allowing scientists to see chemical processes happen at the nanoscale and to study arrangements of molecules and atoms.

To Prevent a Nuclear Disaster, Washington Firefighters Burned a Whole Mountain

Motherboard

August 3, 2016

The nation's largest nuclear waste dump was almost ignited by wildfire this weekend. The raging inferno, called the Range 12 Fire, threatened to summit Washington's Rattlesnake Mountain, and creep down the other side toward the Hanford Nuclear Site, an aging nuclear production complex that sits along the Columbia River.

On Sunday night, more than 100 firefighters in Yakima and Benton Counties attempted to triage the blaze that had by that point consumed 70,000 acres of land, according to KOMO News. The fire had already hopped several highways, and was making its way toward Rattlesnake Mountain—the only thing stopping "America's Fukushima" from setting aflame.

The Hanford Nuclear Site is no stranger to catastrophe. In April of this year, 3,500 gallons of radioactive sludge leaked out of storage tanks built during the Manhattan Project. Though the site is decommissioned, it still houses 56 million gallons of Cold War nuclear waste.

By Monday, fire teams realized they couldn't prevent the blaze from spreading once it reached the ridge base. At its peak, Rattlesnake Mountain looms 3,500 feet above sea level. This, in combination with its perilously

steep slopes, would have made it impossible to manually douse the wildfire, even with the help of aircraft.

So, emergency crews did the next best thing, and set the mountain on fire themselves.

“Sometimes, you fight fire with fire,” Marc Hollen, a spokesman for the incident management team, told the Tri-City Herald. Yesterday, Washington firefighters created a “backblaze,” or prescribed burn, to incinerate any fuel the wildfire might feed on, successfully containing it.

At face value, this practice seems counterintuitive. How can one fire possibly stop another? As unlikely as it seems, this technique makes sense—the key to halting wildfires is to eliminate their fuel source. In this case, the dense, tinderlike shrub-steppe of Rattlesnake Mountain.

Controlled burns can be used preventatively, or as an antidote to active fires. Though not totally devoid of risk, deployment plans account for variables such as wind, moisture, temperature, and humidity, to better ensure that everything burns safely. If things go as intended, little will be left for actual wildfires to consume.

“Prescribed fires try to mimic actual wildfire. The point is to keep wildfire as part of the natural ecosystem, but more on our own terms, instead of sweeping over vast areas completely out of our control,” Peter Morrison, executive director of the Pacific Biodiversity Institute, told me.

“Even indigenous people used, and still use, prescribed burns. It’s not same technology, but the intention to light fires to achieve certain land management objectives is the same.”

For many ecosystems, fire has rejuvenating properties, much like fertilizer. Not only do naturally occurring wildfires clear away dead underbrush, they also release nutrients locked in vegetation, and disseminate them in the

form of ash. Through dendrochronology, or tree ring dating, ecologists know that plants often survive periodic wildfires. And some species, such as morel mushrooms, only flourish in their aftermath.

“Shrub-steppe country, like Rattlesnake Mountain, needs fire. And when it doesn’t burn naturally, it can become dominated by grasses. Sometimes, it gets to a point where ecosystems that were there 100 or 200 years ago can be lost completely, or greatly altered,” Morrison said.

Fire suppression has been a part of American colonial heritage since the Great Fire of 1910, also known as the “Big Blowup,” which burned more than 3 million acres of land across Idaho, Montana, and Washington. As development continues to bump up against fire adapted ecosystems, both the risk of destruction, and the need to control it, sharply rise.

Because of this, initiatives like the Firewise Program are trying to help rural homeowners “fireproof” their homes. When moving isn’t an option, there are simple things residents can do to minimize the chance of losing their property to wildfire.

Still, there’s little anyone can do about the effects that climate change is having on wildfires. Scientists believe that global warming is causing them to burn longer, hotter, and more frequently. In American West, wildfire season is now 105 days longer than its historical average, making it a nearly year-round phenomenon.

Today, the US Forest Service spends approximately $830 million per year on fire suppression. Between 2004 and 2013, an astonishing 7.3 million acres of land nationwide were burned, compared to 2.7 million acres between 1984 and 1993.

Though Washington responders succeeded in fighting fire with fire, the blaze might have been less damaging if preventative measures had been

taken beforehand. If there's one lesson to be learned here, it's that letting a nuclear waste plant sit in a tinder box seems like a really bad idea.

Keeping Idaho clean for future generations

Idaho State Journal

August 3, 2016

By Fred Hughes

Looking back fondly at my 40-year career, one of the most memorable experiences was my time at the Department of Energy's Idaho Site and the people I worked with. Returning after 13 years, I'm impressed not only with the visible cleanup progress that's been achieved but the emphasis and true adherence to the safety culture that's been established and embraced by the 1,700 employees that currently make up the Idaho Cleanup Project.

On June 1, Fluor Idaho LLC took over as the ICP Project contractor. Since then, as we press forward to reach our project goals, we have taken seriously the need to tap into the expertise of our workforce and add the necessary resources to the project that will help the Department of Energy clean up and safely complete the ICP.

As we strive toward a successful completion of this project, we understand the cleanup will serve a very important purpose.

That purpose is to ensure the protection of our workers, the public, the environment and one of Idaho's most important resources — the Snake River Plain Aquifer. To date, more than 600 million gallons of groundwater from the aquifer have been properly treated, and 244,000 pounds of solvent vapors from underneath the buried waste have been removed — that's more than 330 barrels of solvents that were prevented from reaching the aquifer. This is in addition to shipping nearly 55,000 cubic meters of

above-ground waste out of Idaho, demolishing 225 facilities and structures, remediating 137 waste sites and suspect sites, and exhuming more than 73 percent of the targeted buried waste area.

The site's cleanup track record has been exemplary, and we want to continue to establish and strengthen the public trust by providing a safe and efficient work site. We understand more work remains as we build on these previous successes.

To do that, Fluor Idaho has enlisted the help of some of the top experts and resources in the world to assist in getting the Integrated Waste Treatment Unit ready to treat the remaining 900,000 gallons of liquid waste at the Idaho site. As always, these operations will be conducted in a safe and expeditious manner.

We will also continue to retrieve and repackage transuranic (TRU) waste in preparation for the reopening of the Waste Isolation Pilot Plant in New Mexico, with 161 remote-handled and 4,260 contact-handled TRU drums ready to ship. And under our new contract, we will be responsible for activities that include the safe storage of spent nuclear fuel at the Idaho site, retrieval of targeted buried waste and the operation of various facility infrastructure.

Continuing the safe and efficient cleanup of the Idaho site is a key goal for us as we know our success enables the Idaho National Laboratory to complete its important missions for our country and the world. Fluor Idaho will put the safety of our employees, the public and environment first — always.

It's exciting to be back in Idaho. It's great to be part of a team of exceptional employees who are and will accomplish tremendous things for Idaho while ensuring a strong legacy is left behind for our children and grandchildren.

Fred Hughes has 39 years of project-management and nuclear-operations experience associated with fuel removal, waste management, environmental remediation and nuclear facility decontamination and decommissioning. As Fluor Idaho's program manager, Hughes is responsible for providing centralized leadership, instilling a safety-conscious work environment, and delivering on-schedule and on-budget project performance.

Demolition work on K-27, last of big 5 uranium-enrichment buildings, to be complete this month

Oak Ridge Today

August 4, 2016

Demolition work should be complete this month on K-27, the last of the big five buildings once used to enrich uranium for nuclear weapons and commercial nuclear power plants at the former K-25 site in west Oak Ridge, officials said in July 2016. (DOE photo/Lynn Freeny)

Demolition work should be complete this month on K-27, the last of the big five buildings once used to enrich uranium for nuclear weapons and commercial nuclear power plants at the former K-25 site in west Oak Ridge, officials said last week.

Demolition work started on K-27 in February.

Like the other four buildings that have already been demolished, the four-story, 383,000-square-foot K-27 building once used a process known as gaseous diffusion to enrich uranium.

The demolition is part of Vision 2016. That's the plan by the U.S. Department of Energy Office of Environmental Management, or EM, to remove all five gaseous diffusion buildings from the site by the end of the year.

Federal officials said it's the first time in the world that a uranium enrichment complex has been cleaned and removed.

The K-25 site has also been known as the Oak Ridge Gaseous Diffusion Plant, East Tennessee Technology Park, and Heritage Center.

A significant amount of work occurred inside K-27 during the two years before demolition began. Deactivation, which concluded in January, included removing hazardous and radioactive materials to ensure protection of workers, the public, and the environment; isolating utility systems; and ensuring structural stability. In addition, all materials that could cause a nuclear criticality were removed.

As of early June, demolition crews had produced more than 4,000 truckloads of debris from the K-27 work site that were shipped to an onsite disposal facility, known as the Environmental Management Waste Management Facility, or EMWMF, on Bear Creek Road west of the Y-12 National Security Complex.

The K-27 teardown follows successful demolition of four other uranium enrichment process buildings: K-29, K-33, K-31, and the mile-long K-25 building. All of these facilities once produced highly enriched uranium for national defense and commercial energy production.

The K-25 site was built during World War II as part of the Manhattan Project, a top-secret program to build the world's first atomic weapons. The site enriched uranium for atomic weapons and commercial nuclear power plants through the Cold War. Operations ended in 1985, and the site was permanently shut down in 1987. Now, it is being slowly converted into a large industrial park.