



Savannah River Site Watch

*The Fog of Planning for Full-Scale Nuclear War*

## **Crossing the Line: South Carolina Nuclear Weapons Secrets Exposed**

### **The Role of the Westinghouse Nuclear Fuel Plant as an Obscure “Dual Use” Military-Commercial Nuclear Weapons Facility**

*The Westinghouse commercial nuclear fuel-fabrication facility near Columbia, SC produces special rods used to make radioactive tritium gas, which boosts the explosive power of all U.S. nuclear weapons, making it South Carolina’s “other” nuclear weapons site along with the Department of Energy’s Savannah River Site. Nuclear weapons-related use of this commercial facility crosses an imaginary line between commercial and military uses, undermining international nuclear proliferation norms. Is the work properly licensed and regulated?*

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A big thanks is due to Pamela Greenlaw, Conservation Chair of the Midlands Group, South Carolina Chapter of Sierra Club,<sup>2</sup> for inspiring much of the research that went into this report.

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Westinghouse “dual-use” civilian-military facility, with Columbia, SC in background. This facility is key to the dangerous U.S. policy to stay on a footing to fight a full-scale nuclear war. Photo ©High Flyer.

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<sup>1</sup> Brief biography of Tom Clements on website of Savannah River Site Watch: <https://srswatch.org/savannah-river-site-watch-about-us/>; Comments on this document and clarifying information are welcome: [srswatch@gmail.com](mailto:srswatch@gmail.com).

<sup>2</sup> Midlands Group, South Carolina Chapter of the Sierra Club, which taken a leading role on environmental and licensing issues concerning operation of the Westinghouse plant, <https://www.sierraclub.org/south-carolina/john-bachman-group-midlands-area>

## Summary

Inside the Westinghouse nuclear fuel plant on the outskirts of Columbia, South Carolina, key activities related to the production of nuclear materials for the U.S. nuclear weapons stockpile are taking place. Few know about this mysterious activity, which may be skirting regulation and which Westinghouse and government authorities are trying to keep out of the public spotlight.

The facility - the Westinghouse nuclear fuel fabrication facility, which fabricates uranium fuel for foreign and domestic nuclear power reactors - also quietly produces specialized rods that go into commercial nuclear reactors, where tritium gas is produced via their irradiation. That radioactive gas is extracted from the highly radioactive rods at the Department of Energy's Savannah River Site and placed into small canisters inserted into all U.S. nuclear weapons to boost their explosive power. The commercial Westinghouse facility thus plays an integral role in maintaining U.S. nuclear weapons and soon will be supporting the U.S. in deploying new nuclear weapons as a dangerous new nuclear arms race looms.

The public knows little about this military-civilian facility operating in our midst and this report is an attempt to reveal more about the secretive operation taking place at public expense but out of reach of public oversight. Key questions remain about who regulates the production of the tritium rods, if proper licenses and permits are in hand and where the tritium-rod waste goes. Though the U.S. Government and Westinghouse do not want attention on the issue of production of tritium rods, the public has a right to know the nuclear weapons role of the Westinghouse plant, which crosses the blurred, imaginary line separating civilian and military uses of nuclear facilities.

## Overview

In the mid-1980s, after the Savannah River Site (SRS) reactors<sup>3</sup> ceased production of radioactive tritium gas used in all U.S. nuclear weapons, the U.S. Department of Energy sought a new source of tritium.

By the late 1990s, the cheapest and most convenient tritium-production method chosen by DOE was to irradiate special rods in the government-owned Watts Bar commercial nuclear reactor<sup>4</sup> in Tennessee, beginning in 2003.<sup>5</sup> The lithium in the rods is converted to tritium, a radioactive gas that boosts the explosive power of a nuclear weapon. The extraction of the tritium gas and its packaging into reservoirs for insertion into nuclear weapons was continued

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<sup>3</sup> U.S. Department of Energy, Savannah River Site, SRS History Highlights, <https://www.srs.gov/general/about/history1.htm>

<sup>4</sup> U.S. Nuclear Regulatory Commission, Watts Bar Nuclear Plant Unit 1, <https://www.nrc.gov/info-finder/reactors/wb1.html>

<sup>5</sup> U.S. Nuclear Regulatory Commission, Tritium Production Backgrounder, June 2005, <https://www.nrc.gov/docs/ML0325/ML032521359.pdf>

to be done at SRS. Tritium in and of itself isn't "fissile" - it can't trigger a nuclear explosion - but goes into weapons in which the nuclear explosion is initiated by plutonium, previously produced at SRS, or highly enriched uranium (which has been separated at SRS from highly radioactive spent fuel, in the 66-year-old H-Canyon reprocessing facility).

Use of commercial facilities for production of military materials crosses the imaginary line between commercial and military uses of nuclear technology. Such "dual use" continues to pose an international nuclear proliferation concern, though the case under review here is generally overlooked both domestically and internationally. The tritium rods, called Tritium Producing Burnable Absorber Rods (TPBARs),<sup>6</sup> were designated by DOE's Pacific Northwest National Lab, to be produced by a company called WesDyne International, located in the Westinghouse commercial nuclear fuel plant near Columbia, South Carolina. WesDyne is a subsidiary owned by the Westinghouse Electric Company (WEC).

At the Westinghouse Columbia Fuel Fabrication Facility,<sup>7</sup> which is regulated by the U.S. Nuclear Regulatory Commission, uranium is fabricated into fuel for foreign and domestic commercial nuclear power reactors. Once again, by selecting a commercial facility for production of the tritium rods, the gray line between civilian and military uses of a nuclear facility was crossed.

The gravity of this proliferation matter is compounded as tritium is used in all U.S. nuclear weapons. Those weapons are maintained to keep the U.S. on a footing to fight a nuclear war. The use of the much-abused term "deterrence" to refer to the U.S. nuclear weapons stockpile of around 3800 active and reserve weapons is simply dishonest as the operative policy is preparation for full-scale nuclear war and not simply deterrence.

The secretive production of the TPBARs inside a commercial plant is something that neither DOE nor Westinghouse nor the NRC want to openly talk about. To compound concerns, the WesDyne operation, which may have been taken over by Westinghouse Government Services or Westinghouse itself, may lack proper environmental permits from the South Carolina Department of Health and Environmental Control, which says TPBAR fabrication produces "hazardous waste." It is not known how much waste is produced, how it's managed or if its disposal is regulated in any way.

In the draft Environmental Impact Statement on renewing the Westinghouse fuel plant license for 40 years, released on July 30, 2021, the NRC claims that TPBAR production is "outside the scope" of the EIS process. At public meetings, NRC officials have said that DOE's nuclear

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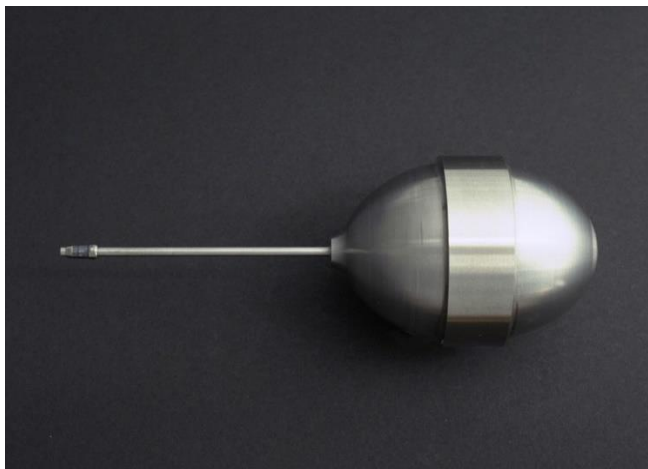
<sup>6</sup> U.S. Department of Energy, Pacific Northwest National Laboratory, *Description of the Tritium-Producing Burnable Absorber Rod for the Commercial Light Water Reactor*, February 2012, [https://www.pnnl.gov/main/publications/external/technical\\_reports/PNNL-22086.pdf](https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-22086.pdf)

<sup>7</sup> U.S. Nuclear Regulatory Commission, Westinghouse, <https://www.nrc.gov/info-finder/fc/westinghouse-fuel-fab-fac-sc-lc.html>

weapons arm, the National Nuclear Security Administration (NNSA),<sup>8</sup> regulates TPBAR production, but this is not accurate as the NNSA is not a regulatory agency. NNSA produces and maintains nuclear weapons for its client, the Department of Defense. The EIS yet to be finalized on the Westinghouse license must address the TPBAR issue.

Due to obfuscation at every turn, very little has been written on the matter at hand. Perhaps the best documentation heretofore on the role of the fuel plant in the nuclear weapons industry was an article in the Free Times, Columbia, SC, on June 26, 2013: *Obscure Columbia Facility Assembles Key Components for U.S. Nuclear Weapons.*<sup>9</sup>

While much is unknown, there is the appearance that operation of the TPBAR facility and its waste are “semi-regulated” or unregulated. This, it appears that the military aspects of TPBAR fabrication have resulted in a potentially unregulated, unlicensed facility in our midst. Authorities have much to explain and clarify about the nuclear-weapons related work hidden inside the Westinghouse fuel plant and what happens to the hazardous waste from the TPBAR operation.



Pre-9/11 DOE photo of tritium reservoir. No scale provided.  
(See another reservoir image in description of SRS “Defense Programs” -  
<https://www.srs.gov/general/programs/dp/index.htm>)

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<sup>8</sup> U.S. Department of Energy, National Nuclear Security Administration,  
<https://www.energy.gov/nnsa/national-nuclear-security-administration>

<sup>9</sup> Charleston (South Carolina) Post & Courier, *Obscure Columbia Facility Assembles Key Components for U.S. Nuclear Weapons*, June 26, 2013, [https://www.postandcourier.com/free-times/news/obscure-columbia-facility-assembles-key-components-for-u-s-nuclear-weapons/article\\_044c6cdf-2fc7-5c69-b963-47f60ca4d7b9.html](https://www.postandcourier.com/free-times/news/obscure-columbia-facility-assembles-key-components-for-u-s-nuclear-weapons/article_044c6cdf-2fc7-5c69-b963-47f60ca4d7b9.html)

## Overview of Secretive Nuclear-Weapons-Related Activities in Richland County, South Carolina – Just Who is Involved?

Located in Hopkins, South Carolina, on the outskirts of Columbia, a company engaged in key nuclear weapons activities operates for the U.S. Department of Energy in the shadows and outside of the public eye. This memo is a brief attempt to outline the situation of this facility that plays an essential role key to all U.S. nuclear weapons. Much information is lacking about the nuclear-weapons related industrial operation hiding in our midst and many questions remain unanswered, but this report attempts to generally lay out what is known.

On the road to the Congaree National Park,<sup>10</sup> in Richland County to the south of Columbia, one passes by the Westinghouse nuclear fuel plant. The area where it's located is called Lower Richland. The facility, one of three such commercial fuel-fabrication facilities in the United States, processes uranium hexafluoride into fuel for nuclear power reactors. The fuel pellets, made from low enriched uranium - which is not directly usable in nuclear weapons - are placed into rods and then fuel assemblies and are shipped to foreign and domestic nuclear power plants. Under the same roof is located an industrial operation, not known to be actively inspected by the NRC, that fabricates specialized rods which play a key role in maintaining the entire U.S. nuclear weapons stockpile.

Given lack of accurate, up-to-date information by all involved parties, just who is doing the fabrication of the Tritium Producing Burnable Absorber Rods (TPBARs) is unclear. The TPBARs are irradiated in commercial NRC-regulated reactors in Tennessee - Watts Bar units 1 and 2, owned by the Tennessee Valley Authority - to produce radioactive tritium gas used in all U.S. nuclear weapons. The activity was initially carried out by a company called WesDyne International LLC, which was contracted by NNSA in 2000 for the job.<sup>11</sup> Part of that contract has been obtained via a Freedom of Information Act response by NNSA to SRS Watch on September 20, 2021.<sup>12</sup> At some point, Westinghouse Government Services LLC may have taken over and that company appears to have merged into WesDyne. It is unclear if Westinghouse Electric Company, which operates the nuclear fuel facility, may now be in charge of part or all of the TPBAR work or if Westinghouse Government Services or WesDyne is fully in charge of the work.

According to a Westinghouse website,<sup>13</sup> WesDyne, is “a wholly owned subsidiary of Westinghouse Electric Company, LLC, is a leading supplier of non-destructive examination (NDE) services and products to the power generation industry.”<sup>14</sup> Westinghouse Government

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<sup>10</sup> National Park Service, Congaree National Park, <https://www.nps.gov/cong/index.htm>

<sup>11</sup> Signature page of NNSA-WesDyne International contract for TPBAR fabrication, July 24, 2000, obtained by SRS Watch via a FOIA request, [https://srswatch.org/wp-content/uploads/2021/09/Document-2.-Signature-Page-from-DE-AC02-00DP00229-Contract-07-24-2000\\_Redacted-1.pdf](https://srswatch.org/wp-content/uploads/2021/09/Document-2.-Signature-Page-from-DE-AC02-00DP00229-Contract-07-24-2000_Redacted-1.pdf)

<sup>12</sup> NNSA FOIA response cover letter to SRS Watch, request for NNSA-WesDyne TPBAR contract, Sept. 20, 2021, <https://srswatch.org/wp-content/uploads/2021/09/FOIA-21-00055-DD-Clements-FRL-1.pdf>

<sup>13</sup> Westinghouse Nuclear (WesDyne) website, <https://www.westinghousenuclear.com/operating-plants/outage-services/nde-inspection-services-wesdyne>

<sup>14</sup> Westinghouse Electric Company, WesDyne blurb, <https://www.westinghousenuclear.com/operating-plants/outage-services/nde-inspection-services-wesdyne>

Services LLC also appears to be a Westinghouse subsidiary (registered in Hopkins, SC at the address of the nuclear fuel plant).<sup>15</sup>

The relationships between Westinghouse, Westinghouse Government Services and WesDyne - is hard to unravel, perhaps by intention but the bottom line is that they all appear to be part of the same corporate structure. This overview will leave it to others to sort out those corporate entanglements but as DOE's National Nuclear Security Administration has been clear, the TPBAR fabrication job is being carried out under the roof of the Westinghouse fuel plant.

A Government Accountability Office report from 2010, entitled *Nuclear Weapons: National Nuclear Security Administration Needs to Ensure Continued Availability of Tritium for the Weapons Stockpile*<sup>16</sup> is concise in what was known at the time: "In 2000 NNSA contracted with WesDyne International—a subsidiary of Westinghouse—to fabricate TPBARs. WesDyne procures and maintains an inventory of TPBAR components and assembles TPBARs at a Westinghouse facility in Columbia, South Carolina."

It is unclear when Westinghouse Government Services may have taken over the TPBAR operation and if the WesDyne contract with NNSA was amended to reflect this.

The irradiation of the TPBARs convert the non-radioactive lithium-6 isotope in the rods to tritium gas, which is extracted at DOE's Savannah River Site<sup>17</sup> near Aiken, SC. The gas is placed in small canisters, or "reservoirs," and sent to Department of Defense nuclear weapons sites or to the DOE's Pantex Plant in Texas. At those sites, the canisters are inserted into nuclear weapons.

The tritium gas "boosts" the explosive power of the plutonium-powered "primary" of a nuclear weapon during the detonation process, which then sets off the secondary part of the weapon, which also contains highly enriched uranium. It can't be emphasized enough that the fabrication of TPBARs for military purposes at the Westinghouse commercial nuclear facility has turned the facility into a "dual-use facility." Such commercial-military nuclear facilities are of nuclear proliferation concern and violate nuclear non-proliferation norms.

As the TPBAR fabrication is shrouded in secrecy, details about it are hard to come by. But key facts are available in spite of efforts by the National Nuclear Security Administration, the U.S. Nuclear Regulatory Commission and Westinghouse to keep its activities out of the limelight.

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<sup>15</sup> Westinghouse Columbia Fuel Fabrication Facility, Frequently Asked Questions, September 2021, <https://www.westinghousenuclear.com/Portals/0/Columbia%20Community/Westinghouse%20CFFF-WGS%20FAQ%20Final%20Draft%20II.pdf>

<sup>16</sup> U.S. Government Accountability Office, *Nuclear Weapons: National Nuclear Security Administration Needs to Ensure Continued Availability of Tritium for the Weapons Stockpile*, October 7, 2010, <https://www.gao.gov/products/gao-11-100>

<sup>17</sup> Congressional Research Service, *The U.S. Nuclear Weapons Complex: Overview of Department of Energy Sites*, March 31, 2021, <https://sgp.fas.org/crs/nuke/R45306.pdf>

Based on public information, a picture of a company avoiding public oversight and possibly operating without required regulation emerges. In spite of any security issues involved, this should not be the case.

Especially given that few people know about the nuclear weapons-related work taking place at Westinghouse, a full explanation as to what is happening with TPBAR fabrication and associated hazardous waste production is necessary by all the entities involved. If Westinghouse Government Services and/or WesDyne is operating without proper county licenses and absent proper oversight that should not be allowed in Richland County.<sup>18</sup>

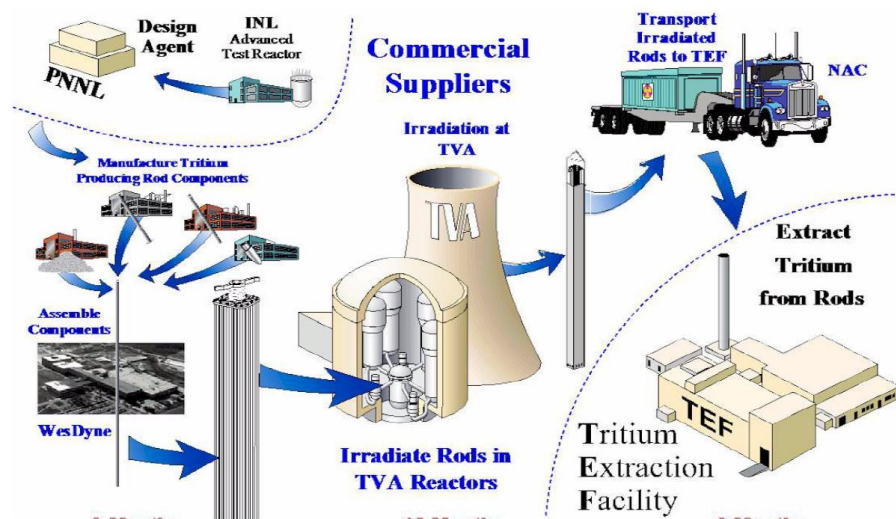


Figure 3 Tritium Production Process Flow

From memo entitled “National Nuclear Security Administration Tritium Supply Chain,”<sup>19</sup> UNT Libraries Government Documents Department, August 21, 2013, note inclusion of WesDyne and image on the left of Westinghouse fuel plant in Richland County, SC

### What is Tritium?

Tritium<sup>20</sup> is a radioactive gas produced as a by-product during normal operation of nuclear power reactors. It can also be produced by design in a reactor via irradiation of special targets. Tritium has a half-life of 12.3 years, meaning it takes that long for half of the tritium to undergo radioactive decay, which is about 5.5% per year. Due to a glow that it puts out during decay, tritium has been used in such things as exit signs and lights for remote airplane runways.

<sup>18</sup> Richland County, South Carolina, where the capital of the state is located, <https://www.richlandcountysc.gov/>

<sup>19</sup> Link to TPBAR image: [https://digital.library.unt.edu/ark:/67531/metadc844120/m2/1/high\\_res\\_d/1090765.pdf](https://digital.library.unt.edu/ark:/67531/metadc844120/m2/1/high_res_d/1090765.pdf)

<sup>20</sup> U.S. Environmental Protection Agency, Tritium: Radionuclide Basics, <https://www.epa.gov/radiation/radionuclide-basics-tritium>

Tritium can also be used to boost the explosive power of nuclear weapons and is thus used by the U.S. Department of Defense (DOD) in all US nuclear weapons, with the National Nuclear Security Administration being the tritium supplier for its client, DOD.<sup>21</sup>

### **Tritium Production at DOE's Savannah River Site Ended Over 30 Years Ago**

The Savannah River Plant, now known as the Savannah River Site, was established near Aiken, South Carolina in the early 1950s by the Atomic Energy Commission, a precursor to DOE. Thousands of people were removed from the 310-square miles that became the nuclear facility. By 1955, SRP was operating five "military" reactors that were heavy-water moderated. The reactors were operated not for electricity production but rather to produce plutonium and tritium for U.S. nuclear weapons. SRP produced about 36 metric tons of plutonium.<sup>22</sup> (About 3 kilograms of plutonium is enough to make a "pit," used as the core of all weapons.<sup>23</sup>)

The last of the SRS reactors, which lacked containment domes and which were not required to meet any NRC safety standards, were shut down by 1988. An effort was undertaken around 1990 to restart the old K-Reactor to produce tritium, via irradiation of special targets in the reactor. In the aftermath of the Chernobyl nuclear reactor disaster, after a large waste of money and in the face of wide-scale public opposition, the reactor was briefly restarted but was permanently shut down in 1992.<sup>24</sup> This left the U.S. with no ability to produce tritium for nuclear weapons.

SRS has long processed tritium in specialized, highly secured facilities at the site<sup>25</sup> and packaged it into the small reservoirs that are sent to DOE's Pantex Plant<sup>26</sup> in Texas, where nuclear weapons are assembled and disassembled, or to DOD sites with nuclear weapons. Pantex also stores over 15,000 surplus plutonium pits from dismantled nuclear weapons.

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<sup>21</sup> Gregory S. Jones, "History of U.S. Tritium Production 1948-1988," June 12, 2017.

<https://nebula.wsimg.com/a4bccfe8ef76f715d91ec4c4f3123259?AccessKeyId=40C80D0B51471CD86975&disposition=0&alloworigin=1>

<sup>22</sup> U.S. Department of Energy, *Plutonium: The First 50 Years*, February 1996,

<https://www.osti.gov/servlets/purl/219368>

<sup>23</sup> Wikipedia, "Pit (nuclear weapon)," [https://en.wikipedia.org/wiki/Pit\\_\(nuclear\\_weapon\)](https://en.wikipedia.org/wiki/Pit_(nuclear_weapon))

<sup>24</sup> Washington Post, "Plan to Restart K-Reactor Questioned," August 7, 1992,

<https://www.washingtonpost.com/archive/politics/1992/04/07/plan-to-restart-k-reactor-questioned/85d59cff-05f8-4de4-9973-ef0dcc897b20/>

<sup>25</sup> Savannah River Tritium Enterprise fact sheet, SRS, [https://www.srs.gov/general/news/factsheets/srs\\_srte.pdf](https://www.srs.gov/general/news/factsheets/srs_srte.pdf)

<sup>26</sup> U.S. National Nuclear Security Administration, Pantex Plant, "Plutonium Pit Storage," June 2007,

<https://fissilematerials.org/library/pan07.pdf>





Tritium complex in H-Area at the Savannah River Site. DOE photo.

### **Production of Tritium after Closure of SRS Reactors**

Lacking tritium-production ability, the Department of Energy by 1990 began reviewing new tritium-production options.

The DOE's Pacific Northwest National Laboratory (PNNL), in Richland, Washington, in a historical review of the "Tritium Production Enterprise" stated that from 1988-1992 that "The US considered the use of dedicated reactors for tritium production."<sup>27</sup> Those reactors included heavy water reactors (HWRs), high temperature gas-cooled reactors (HTGRs) and light water reactors (LWRs).<sup>28</sup> At SRS, use of a linear accelerator<sup>29</sup> was formally proposed for tritium production.

A new dedicated reactor to produce tritium at SRS, the New Production Reactor (NPR), was the "preferred strategy" of DOE's Office of New Production Reactors.<sup>30</sup> The New Porkbarrel Reactor, as it was mockingly called, faced withering public opposition and plans for it were terminated. As it would have been a DOE facility it would not have had NRC oversight.

PNNL states that from 1995 to 1998 that "the US considered dual-use facilities" for pursuit of a new tritium production source. Those facilities included the mentioned linear accelerator and commercial light water reactors.

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<sup>27</sup> Pacific Northwest National Laboratory, "Irradiation Testing in Support of the Tritium Production Enterprise," 2012,

<https://tcw15.mit.edu/sites/default/files/documents/Irradiation%20Testing%20for%20Tritium.pdf>

<sup>28</sup> U.S. Department of Energy, Office of New Production Reactors, 1990,

"New Production Reactors Program Plan," <https://www.osti.gov/servlets/purl/6320732>

<sup>29</sup> U.S. Department of Energy, Office of NEPA Policy and Compliance, "Accelerator Production of Tritium at the Savannah River Site," 1999, <https://www.energy.gov/nepa/articles/doeeis-0270-final-environmental-impact-statement-march-1999>

<sup>30</sup> U.S. Department of Energy, Office of New Production Reactors, Draft Environmental Impact Statement for the Siting, Construction, and Operation of New Production Reactor Capacity, 1991, <https://www.osti.gov/servlets/purl/10191203>

After conducting various reviews, DOE made a formal decision to produce tritium in commercial light-water reactors operated by the federally owned Tennessee Valley Authority. Those reactors are so-called ice-condenser reactors, with the ice being used to melt hot water in the event of a reactor breach. The use of TVA's commercial reactors for this military purpose "undermines the U.S. commitment to curb nuclear weapons proliferation," as told in the 2002 book *Tritium on Ice: The Dangerous New Alliance of Nuclear Weapons and Nuclear Power*.<sup>31</sup>

TVA's Watts Bar unit 1, a thin-domed "ice condenser" reactor<sup>32</sup> on the Tennessee River north of Decatur, TN, was chosen as the first reactor to produce tritium. The plan was to irradiate special rods containing lithium in the reactor to produce tritium gas, which would be contained in the rods before its removal. In order to do this, DOE's PNNL designed those specialized rods, which became known as Tritium Producing Burnable Absorber Rods (TPBARs).<sup>33</sup>

In October 1996, the U.S. Nuclear Regulatory Commission allowed Watts Bar unit 1 to irradiate 8 TPBAR "lead test assemblies"<sup>34</sup> and in 2002 licensed loading of up to 2304 TPBARs, a number which was reduced in 2003 to 240 TPBARs.<sup>35</sup> In 2005, problems were revealed that the rods leaked tritium into reactor cooling water at higher than anticipated rates, and thus into the environment. PNNL could not fully solve the TPBAR leakage problem.

It appears that tritium leakage from Watts Bar, likely in part from TPBARs, remains a concern. In a October 29, 2021 "event notification report"<sup>36</sup> posted on line by the NRC, it was indicated that "results for two on-site monitoring wells that indicated tritium activity above the GPI [Groundwater Protection Initiative] voluntary communication threshold." The event report goes on to say that "The suspected source, a permitted release line, has been isolated, and additional corrective actions are in progress."

Since the beginning of the idea to produce tritium for nuclear weapons in a commercial reactor, public interest groups have expressed concern. For example, in 2011, a number of groups filed

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<sup>31</sup> Ken Bergeron, *Tritium on Ice: The Dangerous New Alliance of Nuclear Weapons and Nuclear Power*, 2002, <https://mitpress.mit.edu/books/tritium-ice>

<sup>32</sup> Ed Lyman, Nuclear Control Institute, "Plutonium Fuel and Ice Condenser Reactors: A Dangerous Combination," 2002, <https://www.nci.org/e/el-ice-condensers.htm>

<sup>33</sup> Pacific Northwest National Lab, "Design and Fabrication of In-Reactor Experiment to Measure Tritium Release and Speciation from LiAlO<sub>2</sub>, April 2013, and LiAlO<sub>2</sub>/Zr Cermets," <https://www.energy.gov/sites/prod/files/2015/08/f26/Senor%20-%20TMIST-3%20Irradiation%20Experiment.pdf>

<sup>34</sup> U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, "Safety Evaluation Report" on tritium rod lead test assemblies, 1997, <https://www.osti.gov/servlets/purl/491562>

<sup>35</sup> Tennessee Valley Authority, "TPBAR Loading Increase License Amendment Request Alignment Meeting," 2015, <https://www.nrc.gov/docs/ML1522/ML15225A377.pdf>

<sup>36</sup> Event Notification Report, Nuclear Regulatory Commission, October 29, 2021, <https://www.nrc.gov/reading-rm/doc-collections/event-status/event/2021/20211029en.html>

comments in NNSA's environmental-review document "Supplemental Environmental Impact Statement (SEIS) for the Production of Tritium in a Commercial Light Water Reactor."<sup>37</sup>

In 2019, the NRC authorized up to 1792 TPBARs to be irradiated in both Watts Bar unit 1 and Watts Bar unit 2.<sup>38</sup> Unit 2 apparently began TPBAR irradiation in 2020.<sup>39</sup> Two reactors at TVA's Sequoyah site near Chattanooga, TN are also being considered for tritium production.

TVA is paid by DOE for the TPBAR irradiation service, which is regulated by the Nuclear Regulatory Commission, and due to the dual civilian-military nature of the operation, only U.S.-origin uranium, known as "unobligated uranium,"<sup>40</sup> is used as fuel in the reactors.

Once removed from the reactors, the highly radioactive TPBARs are allowed to cool for a short period of time and then taken to the DOE's Savannah River Site for processing. Tritium extraction occurs in the Tritium Extraction Facility (TEF),<sup>41</sup> which began operation in 2007, and a new tritium handling and packaging facility, the Tritium Finishing Facility (TFF),<sup>42</sup> is under construction. Over the years, tritium extraction and processing at SRS has caused large releases of the radioactive gas into the environment, where it can combine with oxygen to form tritiated water, which is radioactive and can enter cells the same as water.

The Defense Nuclear Facilities Board (DNFSB), an independent agency that oversees DOE operations, has been concerned about health and safety issues concerning potential tritium releases by SRS tritium operations. Concern of the DNFSB about SRS tritium operations remains high and their on-going interest is reflected in a report entitled *Safety of the Savannah River*

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<sup>37</sup> Various nonprofit groups, including SRS Watch, "Comments on "Notice of Intent to Prepare a Supplemental Environmental Impact Statement (SEIS) for the Production of Tritium in a Commercial Light Water Reactor", November 14, 2011, [https://www.srswatch.org/uploads/2/7/5/8/27584045/comments\\_by\\_groups\\_on\\_tritium\\_seis\\_11.14.2011\\_pdf.pdf](https://www.srswatch.org/uploads/2/7/5/8/27584045/comments_by_groups_on_tritium_seis_11.14.2011_pdf.pdf)

<sup>38</sup> U.S. Nuclear Regulatory Commission, Environmental Assessment on irradiation of 1792 TPBARs in Watts Bar, 2019, <https://www.nrc.gov/docs/ML1833/ML18332A013.pdf>

<sup>39</sup> ExchangeMonitor, "Watts Bar 2 to Start Weapons Tritium Production When Current Refueling Outage Wraps," November 17, 2020, <https://www.exchangemonitor.com/watts-bar-2-start-weapons-tritium-production-current-refueling-outage-wraps/?printmode=1>

<sup>40</sup> U.S. Department of Energy, "Tritium and Enriched Uranium Management Plan Through 2060," Report to Congress, 2015, <http://fissilematerials.org/library/doe15b.pdf>

<sup>41</sup> U.S. Department of Energy, Office of NEPA Policy and Compliance, Final EIS on "Construction and Operation of a Tritium Extraction Facility at the Savannah River Site," 1999, <https://www.energy.gov/nepa/eis-0271-construction-and-operation-tritium-extraction-facility-savannah-river-site>

<sup>42</sup> U.S. Department of Energy, Office of NEPA Policy and Compliance, Final Environmental Assessment on "The Tritium Finishing Facility at the Savannah River Site," March 21, 2021, <https://www.energy.gov/nepa/articles/doeea-2151-final-environmental-assessment>

*Tritium Facilities*,<sup>43</sup> delivered to DOE on July 12, 2019. On July 13, 2021, the DNFSB held a public meeting<sup>44</sup> on SRS activities and tritium operations was a focus of the meeting.

According to DOE documents, highly radioactive waste from the processing of irradiated TPBARs is defined as low-level waste and is disposed of in above-ground concrete storage and disposal facilities called the “E-Area Intermediate Level Vaults.”<sup>45</sup> Leakage of tritium from the spent rods is reported by SRS to be of concern.<sup>46</sup>

An incident of “safety significance” as reported in an “occurrence report”<sup>47</sup> of July 8, 2021 indicates that a waste package from tritium processing at the H-Area New Manufacturing tritium facility - functions housed there include reservoir unloading, gas processing, reservoir loading, and gas transfer system surveillance - was off gassing tritium gas, posing a risk to personnel:

On July 1, 2021, a B6 waste container (B6) was shipped from H-Area New Manufacturing to the Solid Waste Management Facility (SWMF). The B6 was not off-gassing at the time of shipment, but when it arrived at the SWMF a low level of off-gassing was detected in the working area. The SWMF shift operations manager gave direction for field personnel to back away from the area and stay upwind. A facility announcement was made to alert personnel to stay clear of the affected location. A small gap was noted in the plastic covering which was likely created during shipping. The gap was re-taped which stopped the off-gassing. The container receipt continued and the B6 was then placed in Intermediate Level Vault Cell 7 as originally planned. Notifications were made to Savannah River Site Security Operations Center, the Department of Energy, and the National Nuclear Security Administration. This is being reported as a management concern due to the impact caused to another area onsite. A follow-up issue investigation will be performed.

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<sup>43</sup> Defense Nuclear Facilities Safety Board, *Safety of the Savannah River Tritium Facilities*, 2019, <https://www.dnfsb.gov/board-activities/recommendations/safety-savannah-river-tritium-facilities>

<sup>44</sup> Defense Nuclear Facilities Safety Board, public meeting notice and archived video of July 13, 2021 meeting on tritium and SRS issues, <https://www.dnfsb.gov/public-hearings-meetings/public-meeting-and-hearing-status-savannah-river-site>

<sup>45</sup> U.S. Department of Energy, Westinghouse Savannah River Company, *Special Analysis: Production TPBAR Waste Container Disposal Within the Intermediate Level Vault*, 2005, <https://ntrl.ntis.gov/NTRL/dashboard/searchResults/titleDetail/DE2006882717.xhtml>

<sup>46</sup> U.S. Department of Energy, Savannah River National Lab, *Updated Estimate of Tritium Permeation from TPBAR Disposal Containers in ILV*, April 2021, <https://sti.srs.gov/fulltext/SRNL-TR-2020-00298.pdf>

<sup>47</sup> SRS Occurrence Report, NA--SRSO-SRNS-TRIT-2021-0004, Waste Container Shipment to SWMF, July 8, 2021, <https://orpspublic.doe.gov/orps/reports/displayReport2.asp?crypt=%87%C3%95%9Ba%8Evdv%5D%8E>

## Amount of TPBAR Fabrication, Irradiation and Processing Set to Skyrocket

According to a presentation by a National Nuclear Security Administration official to the South Carolina Nuclear Advisory Council on October 16, 2020,<sup>48</sup> the amount of TPBAR processing at SRS is set to jump dramatically. NNSA revealed that the number of TPBAR extractions in the TEF is set to go from about 2 extractions per year to “8 extractions per year by 2026 and potentially 10.”

According to a Savannah River Nuclear Solutions news release of September 27, 2021, “TEF completed seven tritium extractions during Fiscal Year (FY) 2021 (which runs Oct. 1, 2020 through Sept. 30, 2021) - the five that were promised for FY21 and the first two for next fiscal year. This more than doubles the previous record of three extractions in a single year.”<sup>49</sup>

In a NNSA presentation<sup>50</sup> on October 18, 2021 to the South Carolina Nuclear Advisory Council,<sup>51</sup> a pro-nuclear-industry advocacy group that avoids presentations that balance environmental and public interest, Mr. Jason Armstrong, Savannah River Field Office Manager, said that there has been an “85% growth in three years” in tritium operations. He went on to say that “tritium extraction and processing capabilities increasing to meet demand,” with “6 extractions annually by 2023” and “7 completed FY21.” He also said that “reservoir loading and testing complexity will increase.”

Affirming that “tritium is a radioactive isotope of hydrogen that is a key element of modern nuclear weapons,” and that “SRS is the nation’s only facility for extracting, recycling, purifying, and reloading tritium,” Mr. Armstrong stated that the new Tritium Finishing Facility (TEF) project is “expected to come on-line” in fiscal Year 2031.”

Increased tritium processing at SRS will put pressure on operations, increasing risk of tritium exposure to on-site staff and increasing risk to the public and the environment in case of an accidental release of tritium being processed or stored. NNSA admitted in the mentioned presentation that “Reservoir loading and testing complexity will increase; more complicated surveillance,” but it is unknown if SRS systems can handle the greatly magnified tritium-processing demands. Thus the DNFSB is monitoring the situation for potential technical and safety issues.

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<sup>48</sup> National Nuclear Security Administration, Savannah River Field Office updates to the Governor’s Nuclear Advisory Council, October 16, 2020, [https://admin.sc.gov/sites/default/files/facilities\\_manage/NNSA%20Savannah%20River%20Field%20Office%20Updates.pdf](https://admin.sc.gov/sites/default/files/facilities_manage/NNSA%20Savannah%20River%20Field%20Office%20Updates.pdf)

<sup>49</sup> “SRS tritium Extraction Facility achieves record number of operations,” Savannah River Nuclear Solutions news release, September 27, 2021, [https://www.savannahrivernuclearsolutions.com/news/releases/nr21\\_srs-Tritium-Extraction-Facility-F.pdf](https://www.savannahrivernuclearsolutions.com/news/releases/nr21_srs-Tritium-Extraction-Facility-F.pdf)

<sup>50</sup> “Overview of NNSA Missions at the Savannah River Site,” Presentation to the S.C. Nuclear advisory Council by Jason Armstrong, Savannah River Filed office manager, October 18, 2021, [https://admin.sc.gov/sites/default/files/facilities\\_manage/NNSA%20Presentation.pdf](https://admin.sc.gov/sites/default/files/facilities_manage/NNSA%20Presentation.pdf)

<sup>51</sup> South Carolina Nuclear Advisory Council, <https://admin.sc.gov/NAC>

Likewise, fabrication of TPBARs at the Westinghouse fuel plant is anticipated to greatly increase and the number of TPBARs to be irradiated in TVA reactors will increase in parallel. TVA may need more than two reactors to get the job done. Such increased capacity will place demands on those facilities but no plan has been presented to the public to make the case that the expansion in operations can be achieved. In the case of the large increase in TPBAR production by Westinghouse Government Services/WesDyne, this means that there would likely be an increase in hazardous waste, such as solvents, that are produced. It is also possible that in the recent years, in anticipation of a ramping up of TPBAR irradiation in Watts Bar, that the rods have been stockpiled. No form of explanation to the public has been forthcoming and no environmental review has been conducted about this, meaning that the TPBAR operations continue to take place generally in the dark and out of public sight.

The reason for the big increase in TPBAR production, irradiation and processing, seems to be that NNSA aims to fully load tritium reservoirs that go into new and old nuclear warheads with a full charge of tritium,<sup>52</sup> which could be around 3 grams per warhead. Fully loaded reservoirs will mean less need to periodically full the reservoirs and perhaps result in more predictable operation of the weapons.

NNSA and politicians will claim that topping up all the U.S. nuclear weapons is being done for the sake of “deterrence” but in reality, as has always been the case, the large stockpile of around 3800 active and reserve weapons is being maintained not simply for deterrence but to engage in a full-scale nuclear war. If the U.S. abided by disarmament requirements of Article 6 the Nuclear Non-Proliferation Treaty (NPT), to which the U.S. is a signatory, the hyped up “demand” for tritium would decrease at a programmed pace.

Increased tritium processing at SRS goes hand in hand with efforts to locate the SRS Plutonium Bomb Plant (PBP)<sup>53</sup> at the site, to be used, if it goes forward, to make plutonium pits initially for two new nuclear warheads (the first being W87-1 warhead to go into the improperly and provocative missile named the Ground Based Strategic Deterrent). DOE estimates the cost of the pit plant has more than doubled to \$11 billion<sup>54</sup> in order to convert the abandoned plutonium fuel (MOX) building - on which \$8 billion was wasted - into a nuclear bomb factory,

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<sup>52</sup> Gregory S. Jones, “U.S. Increased Tritium Production Driven by Plan to Increase the Quantity of Tritium per Nuclear Weapon,” June 2, 2016, <https://nebula.wsimg.com/08a60104185a91e6db9008fb929a0873?AccessKeyId=40C80D0B51471CD86975&disposition=0&alloworigin=1>

<sup>53</sup> Savannah River Site Watch, “Lawsuit Filed by Public Interest Groups Against Biden Administration Over Nuclear Bomb Core Production Plans at SRS,” Los Alamos, June 29, 2021, <https://srswatch.org/lawsuit-filed-by-public-interest-groups-against-biden-administration-over-nuclear-bomb-core-production-plans-at-srs-los-alamos/>

<sup>54</sup> National Nuclear Security Administration, NNSA approves Critical Decision 1 for Savannah River Plutonium Processing Facility, June 28, 2021, <https://www.energy.gov/nnsa/articles/nnsa-approves-critical-decision-1-savannah-river-plutonium-processing-facility>

an operation that will increase the risks of a new nuclear arms race and produce various new streams of nuclear and chemical waste. \$20 billion being spent on a single building at SRS could make it one of the most expensive buildings in U.S. history.

SRS Watch and other groups have sued DOE/NNSA with a demand that a Programmatic Environmental Impact Statement to review impacts across the DOE complex of expanded pit production be prepared. A lawsuit<sup>55</sup> was filed against the project on June 29, 2021 by the South Carolina Environmental Law Project for clients Savannah River Site Watch, Nuclear Watch New Mexico, Tri-Valley CARES and the Gullah/Geechee Sea Island Coalition. On September 27, lawyers for the Department of Justice, representing NNSA and DOE, filed a “motion to dismiss,” the lawsuit. In response to the weak MTD, the groups filed a response<sup>56</sup> with the federal court in Columbia, SC on October 25, 2021, with the enduring goal to get DOE/NNSA to comply with the National Environmental Policy Act on complex-wide impacts of plutonium pit production.

Processing of tritium at SRS already makes it a key nuclear weapons site but if the pit project were to go forward the nuclear weapons role of SRS would be greatly expanded.

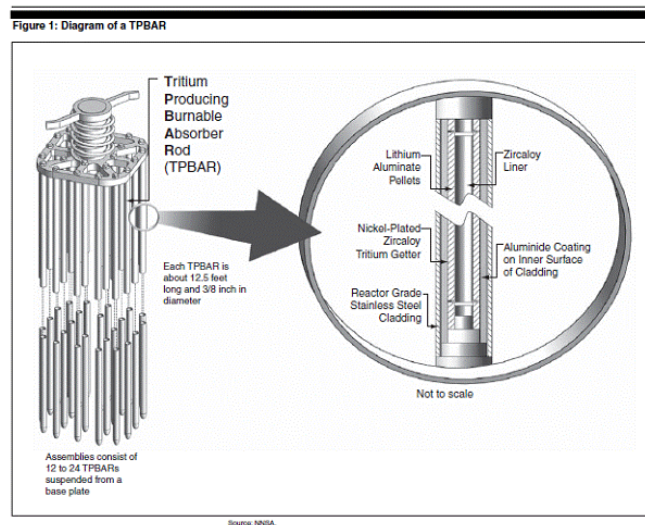


Diagram of TPBAR, from DOE's National Nuclear Security Administration.

### More on the TPBAR Mystery & Who is Licensed to do the Work?

According to historical documents, a company called WesDyne International LLC was the company since 2000 doing the TPBAR fabrication at the Westinghouse Electric Company plant.

<sup>55</sup> South Carolina Environmental Law Project, “Plutonium Pits (Nuclear Bomb Cores),” 2021, <https://www.scelp.org/cases/plutonium-pits>

<sup>56</sup> News release by SRS Watch and other groups on the October 25, 2021 filing in federal court, against the “motion to dismiss” the plutonium pit lawsuit, <https://srswatch.org/wp-content/uploads/2021/10/pitnews10.26.21.pdf>

In a fact sheet<sup>57</sup> issued in September 2021, Westinghouse claims that Westinghouse Government Services has taken over the work but no documentation about that was produced.

In the WEC factsheet, it is admitted that the TPBAR work takes place at the Westinghouse facility: “The assembly facility for TPBAR components is in a standalone manufacturing area with controlled access and no roof penetration to the environment. Once assembled, TPBARs are eventually coupled with nuclear fuel assemblies in the nuclear fuels section of the CFFF facility before being sent to TVA for insertion and irradiation in the Watts Bar nuclear reactors.” It also states that waste from TPBAR fabrication includes “acetone rags (similar to nail polish remover) and zirconium alloy metal shavings.”

The TPBARs assemblies from non-radioactive components believed to be produced elsewhere. The lithium in the rods, which converts to tritium gas when irradiated, likely comes from NNSA’s Y-12 nuclear weapons site near Oak Ridge, Tennessee.

Westinghouse, which had been owned by Toshiba, declared bankruptcy in 2017 and was acquired by Brookfield Business Partners.<sup>58</sup> It has been reported that Brookfield might have interest in selling Westinghouse but its profitability might motivate Brookfield to keep the fuel-fabrication business. In the Westinghouse takeover they also acquired the TPBAR nuclear weapons business but there appears to be no information in the public realm that operating a dual use commercial-military facility has caused Brookfield to want to shed that portion of the business.

A 2001 NNSA document, entitled *Tritium Readiness Campaign*<sup>59</sup> clearly states the role of WesDyne: “Fixed-price contract awarded to WesDyne International for assembly of TPBAR components.” That same document goes on to state that “WesDyne has set up a facility in South Carolina-for classified TPBAR work.”

The word “classified” may be the reason for the obfuscation and lack of openness about TPBAR fabrication and associated waste streams. When it comes to just who is involved in TPBAR fabrication, which federal licenses are held for such fabrication, which state and county licenses are held and how much waste is produced and how that waste is managed are all things that should be in the public realm and not hidden behind the claim of “classification” that doesn’t apply to those aspect of TPBAR fabrication.

WesDyne pops up many times since 2001 as the company doing the TPBAR fabrication, as an internet search will reveal. For example, a DOE Inspector General “Audit Report” from November 2013, entitled “Management of Tritium within the National Nuclear Security

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<sup>57</sup> Westinghouse Columbia Fuel Fabrication Facility, Frequently Asked Questions, Sept. 2021, <https://www.westinghousenuclear.com/Portals/0/Columbia%20Community/Westinghouse%20CFFF-WGS%20FAQ%20Final%20Draft%20II.pdf>

<sup>58</sup> Westinghouse news release, “Brookfield to Acquire Westinghouse Electric Company,” January 4, 2018, <https://info.westinghousenuclear.com/news/brookfield-to-acquire-westinghouse-electric-company>

<sup>59</sup> National Nuclear Security Administration, “Tritium Readiness Campaign,” August 2001, <https://www.nrc.gov/docs/ML0126/ML012690098.pdf>



Administration”<sup>60</sup> states that TPBAR irradiation by the Tennessee Valley Authority, owner of the Watts Bar reactors, stated that “NNSA contracted with WesDyne International, LLC (WesDyne) to assemble TPBARs to support each reactor cycle.”

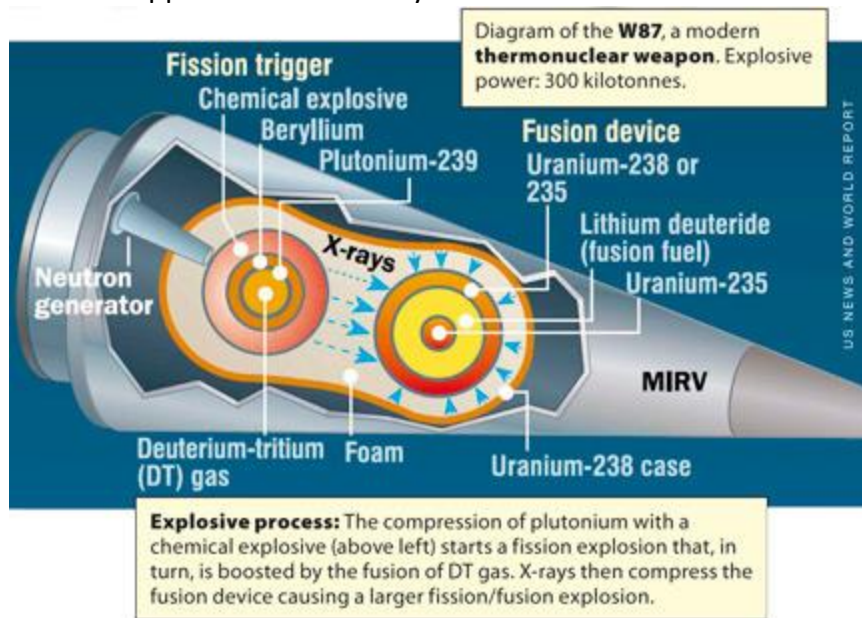


Diagram with nuclear warhead, with indication of where tritium is injected.  
Image from US News and World Report.

It appears that WesDyne is registered and has an active status with the South Carolina secretary of state. WesDyne is listed as being in “good standing,” with its “registered agent” being located at “C T CORPORATION SYSTEM, 2 OFFICE PARK COURT SUITE 103, COLUMBIA, South Carolina 29223.” (Search for the company names on the secretary of state website.<sup>61</sup>)

For Westinghouse Government Services, things get a bit more confusing.

Documents requested from the secretary of state’s office, for a small fee, reveal more details about WesDyne. An “Application for an Amended Certificate of Authority By A Foreign Limited Liability Company To Transact Business in South Carolina,”<sup>62</sup> filed with the SC secretary of state, with a filing date of 05/08/2020 and an “Original Application” date of 07/30/2010, is for WesDyne International LLC. The address for the company is the same as the fuel plant and “managers” included on the application list their affiliation as being with Westinghouse

<sup>60</sup> U.S. Department of Energy, Office of Inspector General, Audit Report on *Management of Tritium within the National Nuclear Security Administration*, November 2013, <https://www.energy.gov/sites/prod/files/2013/11/f5/OAS-L-14-01.pdf>

<sup>61</sup> South Carolina Secretary of State, to search for registered businesses: <https://businessfilings.sc.gov/BusinessFiling/Entity/Search>

<sup>62</sup> South Carolina Secretary of State document linked on SRS Watch website: [https://srswatch.org/wp-content/uploads/2021/09/Sec-State-doc-amended-certificate-Westinghouse-Government-Services-LLC\\_DownloadedDocument\\_8-6-2021-1.pdf](https://srswatch.org/wp-content/uploads/2021/09/Sec-State-doc-amended-certificate-Westinghouse-Government-Services-LLC_DownloadedDocument_8-6-2021-1.pdf)

Government Services LLC (also listed with the address of the fuel plant - 5801 Bluff Road, Hopkins, SC 29209).

Another document<sup>63</sup> filed with the SC secretary of state indicates that there was a merger between WesDyne International LLC and Westinghouse Government Services LLC, with an “effective day of merger” of 3/13/19 and that WesDyne International LLC is the “surviving or resulting limited liability company.”

But Westinghouse Government Services continues to exist, with other work, as reflected by a news release<sup>64</sup> that the former administrator of NNSA, Ms. Lisa Gordon-Hagerty, went through the revolving door after leaving NNSA in November 2020 to take a position as “lead Director for Strategic Programs” with Westinghouse Government Services.

Westinghouse claims in the above-mentioned fact sheet that that Westinghouse Government Services is in charge of the TPBAR work:

Westinghouse Government Services LLC (WGS), previously known as WesDyne International LLC, is a subsidiary of Westinghouse Electric Company (WEC). The Department of Energy/National Nuclear Security Administration (DOE/NNSA) contracts with WGS to fabricate tritium-producing burnable absorber rods (TPBARs). TPBARs are assembled at Westinghouse’s Columbia Fuel Fabrication Facility (CFFF) in Hopkins, SC, before being sent to Spring City, TN, to the Watts Bar Nuclear Reactors operated by the Tennessee Valley Authority (TVA). Tritium is produced when the TPBARs are irradiated in a nuclear reactor.

In a October 18, 2021 meeting<sup>65</sup> of the South Carolina Nuclear Advisory Council on Westinghouse and WesDyne operations, Mr. Mike Annacone, Vice President, Columbia Fuel Operations and. Manager, Columbia Plant. Westinghouse Electric Company, confirmed in his presentation<sup>66</sup> that TPBARs are produced at the Westinghouse facility. Mr. Annacone, as if to cloud the issue, did not clarify which Westinghouse entity is doing the work but he did confirm production of hazardous waste, such as acetone rags, from TPBAR fabrication. Further, he said that such was is disposed of via “normal waste disposal processes as permitted by DHEC,” but he did not clarify who holds such permits nor why such waste seems to not be covered in the

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<sup>63</sup> South Carolina Secretary of State document linked on SRS Watch website: [https://srswatch.org/wp-content/uploads/2021/09/Sec-State-doc-Articles-of-Merger-Westinghouse-Government-Services-LLC\\_DownloadedDocument\\_8-6-2021-2-1.pdf](https://srswatch.org/wp-content/uploads/2021/09/Sec-State-doc-Articles-of-Merger-Westinghouse-Government-Services-LLC_DownloadedDocument_8-6-2021-2-1.pdf)

<sup>64</sup> Westinghouse Electric Company, “Lisa Gordon-Hagerty Joins Westinghouse Government Services,” August 23, 2021, <https://www.prnewswire.com/news-releases/lisa-gordon-hagerty-joins-westinghouse-government-services-301360574.html>

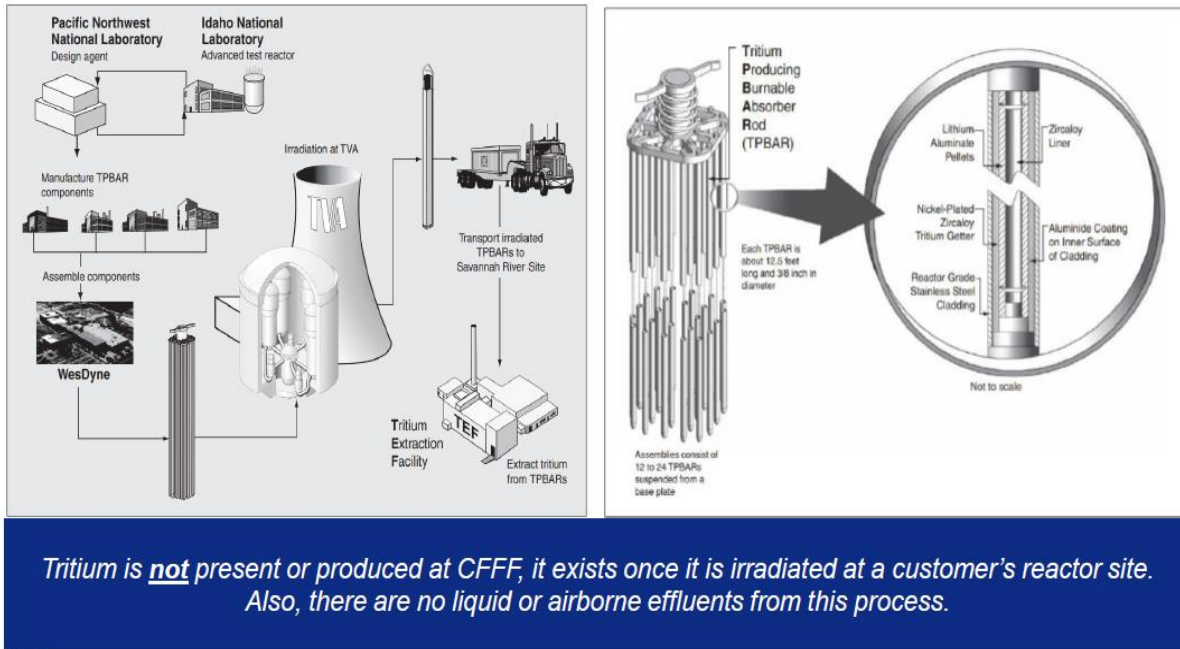
<sup>65</sup> Agenda of South Carolina Nuclear Advisory Council, October 18, 2021, [https://admin.sc.gov/sites/default/files/facilities\\_manage/10-18-21%20Agenda%20Final%20REV1.pdf](https://admin.sc.gov/sites/default/files/facilities_manage/10-18-21%20Agenda%20Final%20REV1.pdf)

<sup>66</sup> “Columbia Fuel Fabrication Facility,” Powerpoint presentation to S.C. Nuclear Advisory Council, Mike Annacone, Operations Manager, October 18, 2021, [https://admin.sc.gov/sites/default/files/facilities\\_manage/Westinghouse%20presentation.pptx](https://admin.sc.gov/sites/default/files/facilities_manage/Westinghouse%20presentation.pptx)

draft EIS on the requested 40-year license extension for the Westinghouse plant. His presentation also says that “there are no liquid or aerial or airborne effluents from this process.”

Here’s a slide from Annacone’s October 18, 2021 presentation to the South Carolina Nuclear Advisory council - note designation of WesDyne to “assemble components” of TPBARs:

### Tritium-Producing Burnable Absorber Rod (TPBAR) Production Process



### NNSA Solicitation Reveals TPBAR Irradiation Details, Including NRC Role Concerning WesDyne

A 2014 DOE solicitation for contract DE-SOL-0007797 - “Opportunity: Tritium Producing Burnable Absorber Rods (TPBAR)” - on the US Government contract solicitation site<sup>67</sup> - reveals a “sole source” contract was being sought with WesDyne International for TPBAR irradiation.

The “synopsis” with the solicitation contains a wealth of information. To introduce the synopsis, the solicitation says “The United States Department of Energy, National Nuclear Security Administration (NNSA) issues this Notice of Intent to Award a Sole Source Contract to WesDyne International, located in Columbia, South Carolina, for fabrication of Tritium

<sup>67</sup> At “FedConnect - The Government’s Acquisition and Grants Portal,” search under “Search Public Opportunities Only” for “TPBAR” in the “title” box and find the “solicitation” named “Opportunity: Tritium Producing Burnable Absorber Rods (TPBAR) F,” look for items in “Documentation” on the upper right: <https://www.fedconnect.net/FedConnect/Default.htm>

Producing Burnable Absorber Rods (TPBAR). This is a Sole Source synopsis published for informational purposes only.” The following details are attached to the solicitation:

The United States Department of Energy, National Nuclear Security Administration (NNSA) issues this Notice of Intent to Award a Sole Source Contract to WesDyne International, located in Columbia, South Carolina, for fabrication of Tritium Producing Burnable Absorber Rods (TPBARs). This is a Sole Source synopsis published for informational purposes only. In accordance with the Competition in Contracting Act, 41 U.S.C. 3304(a)(3), Use of Non-Competitive Procedures, as implemented by FAR Subpart 6.302-3, other than full and open competition is authorized when it is necessary to award a contract to a particular source to maintain a facility, producer, manufacturer or other supplier available for furnishing supplies or services to achieve industrial mobilization. The Government intends to solicit and negotiate with only one source using this authority. The NAICS code for the acquisition is 334517, Irradiation Apparatus Manufacturing, and the Produce Service Code is 4470, Nuclear Reactors.

Tritium has a half-life of 12.3 years and any inventory needs to be continually replenished. One of NNSA’s missions is to provide an assured domestic source of new tritium to ensure national security requirements can be maintained at the prescribed level by replacing that lost to radioactive decay.

Tritium is produced by irradiating enriched lithium-aluminate pellets with neutrons in one or more commercial nuclear reactors at the Tennessee Valley Authority (TVA). Specially designed and fabricated TPBARs are critical reactor core components. All components must be manufactured and assembled in accordance with applicable Federal requirements including, but not limited to 10 CFR 50 Appendix B, Quality Assurance (QA) Criteria for Nuclear Power Plants and Fuel Reprocessing Plants. TPBARs and certain TPBAR components must be protected at the Confidential Restricted Data (CRD) security level. Irradiated TPBARs are then transported from TVA to the Tritium Extraction Facility (TEF) at the Savannah River Site (SRS) in a continual effort to meet inventory requirements in support of Department of Defense’s (DOD) nuclear weapons stockpile mission.

Contractor shall provide all labor and material necessary to procure or fabricate all required components, materials, and equipment to assemble the TPBARs in accordance with the drawings and specifications provided by the Designer of Record, Pacific Northwest National Laboratory (PNNL), and in accordance with applicable regulations and statutes of which DOE is required to comply. The Government anticipates a period of performance for this award that will consist of a base period of five years with an option(s) for up to five additional years.

WesDyne is a vital source that possesses extensive tritium program experience, knowledge, and expertise with specialized nuclear fuel and fuel component capabilities to produce critical supplies of unique and highly specialized TPBARs. This

allows the Tritium Readiness Program to continually provide and maintain tritium at the prescribed level to meet nuclear weapons stockpile requirements and achieve industrial mobilization. This requirement will leverage the WesDyne team's (including parent, Westinghouse) existing infrastructure of which they are major suppliers of fuel and fuel components to the U.S. commercial Pressurized Water Reactor nuclear fleet, which is the only type of reactor compatible for irradiating TPBARs. WesDyne's corporate structure affords them access to the parent's commercial fuel component proprietary information for critical design and manufacturing functions, with respect to the TVA reactors, that is specifically needed to meet TPBAR fabrication program requirements, which is essential to the national security interest of the United States. WesDyne has a Nuclear Regulatory Commission (NRC) approved Quality Assurance Program which is accepted in the nuclear industry and is recognized by TVA for TPBAR activities. WesDyne also has a facility certified to handle confidential data and hardware to fabricate and assemble classified TPBARs. WesDyne is a vital source that has the required certifications, security, NQA-1 qualifications, and facility as well as knowledge, expertise and experience needed for immediate and continued implementation to ensure weapons stockpile inventory are continually replenished. To change contractors and lose a vital supplier's capabilities would cause a break in production and significantly impact the Tritium Readiness Program's ability to be prepared to provide new tritium, thereby jeopardizing the defense mission and placing the nation's security at severe risk in the event of a national emergency.

This notice of intent is not a request for competitive proposals and no solicitation is forthcoming. However, in accordance with FAR 5.207(c)(16)(i), all responsible sources may submit a bid, proposal, quotation or an exception to the intent to procure on a sole source basis, which shall be considered by the agency if received by 3:00 pm Local (Aiken, S.C.) Time, Tuesday, December 16, 2014.

A determination by the Government not to compete this proposed contract based upon responses to this notice is solely within the discretion of the Government. Information received will normally be considered solely for the purpose of determining whether to conduct a competitive procurement, if it is received by the established due date and time indicated below. If a vendor source takes exception to the Government's intent to sole source this requirement, they must (1) provide the basis for disagreement with this assertion, (2) demonstrate how they are qualified and capable of meeting NQA-1 requirements, meeting Security requirements which have classified components, and obtaining required NRC and TVA certifications for production of TPBARs, (3) demonstrate how they have the requisite expertise to meet the scope of this requirement without interruption (including transition) in order to maintain a constant production of TPBARs in support of the national security mission, and (4) demonstrate how a competitive procurement and a change in supplier will not result in a break or interruption of production, and will not adversely impact the Tritium Readiness program.

Submission of any information in response to this notice is purely voluntary. The Government assumes no financial responsibility for any costs incurred. Responses must be in writing, by email to Rita Pernell, Contract Specialist, at [rita.pernell@nnsa.srs.gov](mailto:rita.pernell@nnsa.srs.gov). The e-mail shall contain the following subject line: Response to Notice of Intent - TPBAR Fabrication. Please submit all responses no later than 3:00 pm Local (Aiken, S.C.) Time, Tuesday, December 16, 2014. Only information/inquiries received by this date will be considered.

The above TPBAR-irradiation contract solicitation by NNSA confirms that the Designer of Record (DOR) at the time for the TPBARs was DOE's Pacific Northwest National Laboratory and that Westinghouse is the "parent" of WesDyne. The document claims, without documentation, that "WesDyne has a Nuclear Regulatory Commission (NRC) approved Quality Assurance Program which is accepted in the nuclear industry and is recognized by TVA for TPBAR activities." This statement thus indicates some regulatory role for the NRC of WesDyne TPBAR activities, but it is unknown what role the NRC has in the case of TPBAR fabrication by Westinghouse Government Services. The NRC oversight apparently does not include on-site inspection of the facility or inspection of the TPBARs themselves and dodges oversight of aerial or liquid waste streams or emission.

At public meetings in South Carolina, the NRC's Region II fuel cycle facility staff have said that NNSA regulates TPBAR production. No evidence of this exists as the NNSA is not a regulatory agency as is the NRC. (DOE is self-regulating and the NRC does not inspect activities at DOE-owned sites.)

The DOE solicitation cited above further states, also without providing documentation, that WesDyne has "required NRC and TVA certifications for production of TPBARs." The EIS on the WEC license extension must provide evidence of the above-mentioned the Quality Assurance Program and NRC and TVA "certifications" for the record. If Westinghouse Government Services has indeed taken over the TPBAR work, when that may have taken place is unknown, but the same documentation for them must be provided.

An important part of the above solicitation lays out WesDyne's dependence on Westinghouse Electric Corporation, which fabricates uranium fuel and which seemingly has a crucial role in the management of TPBAR fabrication, as stated in the factsheet:

Tritium-producing burnable absorber rods (TPBARs) are assembled at the CFFF in Hopkins, SC, from components supplied by sources from across the United States. A TPBAR is made of a stainless-steel rod filled with lithium and zirconium alloy. TPBARs are inserted, along with fuel rods, into the core of a nuclear power reactor that is producing electricity.

## **WEC Document Indicates Aspects of the TPBAR Facility is its Responsibility**

A Westinghouse “Facility Change Report,”<sup>68</sup> dated January 6, 2020 and sent to the NRC says that “Westinghouse Electric Company LLC (Westinghouse) hereby submits the report of Columbia Fuel Fabrication Facility (CFFF) changes that did not require Nuclear Regulatory Commission (NRC) preapproval in accordance with 10 CFR 70.72. This report addresses those changes completed within calendar year 2019. Westinghouse had no facility changes that required NRC pre-approval during this time period.”

The document covering fuel plant operations includes reference to TPBAR work by WEC. Under “Replace TPBAR HVAC” the document (on page 26) says “The old TPBAR unit is obsolete, failure of this unit would significantly impact product.” It goes on to give more details about the HVAC replacement, located on the “TPBAR roof and outside”:

Install 480 & 120 VAC electrical service for the new HVAC unit to replace the existing TPBAR HVAC unit. The new air handling unit will be located on the roof of TPBAR south of the existing pad for AC-35. The new condensing unit will be installed outside east of the existing condensing unit. A new power panel and receptacle panel will be installed to feed the new HVAC equipment. AC-35 has been abandoned the electrical service for AC-35 will be removed. The old TPBAR electrical service will be removed.

On page 35 of the same document more is indicated about WEC’s “TPBAR HVAC Replacement,” noting the value of TPBARs in the facility:

TPBAR cladding has a special coating causing it to have a fairly high value of roughly a couple thousand dollars each. At current production levels, we have roughly up to 1,800 cladding tubes in various stages of production. A completed TPBAR is valued at roughly \$11,000, meaning at any given time in TPBAR we could have anywhere from approximately \$4 million to \$20 million worth of product that we would risk having to scrap should we lose the ability to control humidity.

The current DX Split System HVAC unit for TPBAR is approaching 20 years old. The expected life of such units is 15-20 years. Internal components of the unit have become obsolete and difficult to find. Over the past year and a half the unit has required numerous repairs. One such repair required parts found only on Ebay, an unreliable location to find parts. There is a leak in the unit as maintenance has had to add refrigerant more than once over the last year and a half. The required refrigerant is being phased out and federal regulations stipulate how much and how often that particular refrigerant can be added to a unit. As the leak worsens, we risk not being able to use that unit at all due to the federal regulations.

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<sup>68</sup> Westinghouse Electric Company, Columbia, Fuel Site, Facility Change Report, January 6, 2020, <https://www.westinghousenuclear.com/Portals/0/Columbia%20Community/LTR-RAC-21-10.pdf>

The above confirms a WEC role in TPBAR facility maintenance.

If WEC is admitting that TPBAR fabrication is in its facilities, or that it is in charge of maintenance aspects of those facilities, how can it be that such activities are not covered by WEC's NRC license? Why is waste from TPBAR activities not covered in the draft EIS prepared for the license-renewal application by Westinghouse?

It is not known but some type of document might exist between the NNSA and the NRC by which the NRC waives regulatory rights over TPBAR fabrication and resultant waste streams. In a related matter, DOE assumed responsibility for giving WesDyne security clearance for "secret" projects related to nuclear reactors and relieved the NRC of obligations to provide clearance for WesDyne. That agreement,<sup>69</sup> which has a history beginning in 2004,<sup>70</sup> was terminated in 2020.

### **NNSA-WesDyne Contract Reveals Responsibilities**

Though the NNSA did not provide a full copy of the NNSA-WesDyne contract from 2000 to fabricate TPBARs, requested under a November 19, 2020 Freedom of Information Act request by SRS Watch,<sup>71</sup> a few pages from the NNSA-WesDyne contract were provided.

Four pages from "Contract No. DE-AC02-00DP00229,"<sup>72</sup> which appears to be from May 2017, were provided to SRS Watch on May 4, 2021. Excerpts from those four pages reveal the following key information:

#### **C.6 PHASE IV SCOPE OF WORK**

The Contractor shall furnish all labor, materials and equipment necessary to fabricate TPBARs in accordance with this Statement of Work. The manufacture and delivery of TPBARs requires that the contractor provide management support to the Tritium Sustainment Program, and support technology development of the TPBAR design, manufacturing process development, and enhancements. The contractor shall perform required inspections, tests, and any special processes or procedures based on Designer of Record (DOR) specifications, drawings and other documents transferred through the interface agreement. The DOE-NNSA will provide

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<sup>69</sup> Westinghouse Electric Company, Columbia, Fuel Site, Facility Change Report, January 6, 2020, <https://www.westinghousenuclear.com/Portals/0/Columbia%20Community/LTR-RAC-21-10.pdf>

<sup>70</sup> U.S. Nuclear Regulatory Commission, WesDyne Security Cognizance Agreement Termination, May 8, 2018 and "WesDyne NNSA SCA Termination Package," <https://www.nrc.gov/docs/ML1812/ML18123A426.html>

<sup>71</sup> National Nuclear Security Administration FOIA acknowledgement letter for request for NNSA-WesDyne contract, December 8, 2020, <https://srswatch.org/wp-content/uploads/2021/09/Ack-Ltr-FOIA-21-00055-DD-1-WesDyne-NNSA-contract-Dec-8-2020.pdf>

<sup>72</sup> Excerpt from the NNSA-WesDyne contract was obtained via a Freedom of Information Act request filed in December 2020: <https://srswatch.org/wp-content/uploads/2021/09/FOIA-response-May-4-2021-Excerpt-of-Section-C-from-Mod-060-May-2017-1.pdf>



the contractor with projected quantities of TPBARs needed to support irradiation schedules at least 15 months prior to TPBAR Delivery. The projection will cover production quantities covering the next three (3) years. Provided below is the most current nominal schedule of TPBAR use through October 2025.

(a) TPBAR FABRICATION AND ASSEMBLY

(1) Provide a facility certified to handle hardware to fabricate and assemble TPBARs.

(2) Provide for storing components and interim storage of assembled TPBARs until shipment. Provide for storage of components and necessary material inventory. Examples include bare cladding tubes, full length getters, and SS 316 ingots. Storage will be in accordance with current requirements identified by the DOR and concurred by the COR.

(3) Provide all labor and material required to procure or fabricate all required materials, components, and equipment to assemble the TPBARs, in accordance with the DOR drawings and specifications, approved and provided by the COR.

(8) Provide a Product Certification to TVA, the irradiation utility, the DOR and the utility's fuel fabricator at the time of TPBAR delivery. This certification will list the TPBARs by unique identification numbers and certify that: (1) they were built in accordance with the approved Quality Assurance Program and the approved Manufacturing and Quality Plan and (2) they meet the requirements of applicable engineering drawings, specifications and acceptance criteria. A reference to each previously approved nonconformance dispositioned "repair" or "use-as-is" will be included as part of the Product Certification. Copies of all such certifications shall be sent to the DOE-NNSA COR at the same time. The format and sample content of the certifications are identified in Part I, Section F.8 (see example in Part III, Section J, Attachment 3).

(11) Provide for ultimate disposal of waste products, including coordination with PNNL, as appropriate, from the fabrication processes that the contractor is responsible for.

(b) PACKAGING AND SHIPMENT

(1) The Contractor shall coordinate with the Fuel Vendor (i.e., Westinghouse), the delivery of the TPBARs to TVA.

(2) The Contractor shall provide shipment services for hardware when required. The numbers of shipments and places of shipment will depend on program requirements.

(3) The Contractor shall ship TPBARs per agreed upon schedules provided by the COR. In order to accomplish this requirement, the Contractor shall provide the following services:

(-) WesDyne will deliver TPBARs to the Fuel Vendor (i.e., Westinghouse) in time for final assembly to meet delivery of fuel as agreed upon between the fuel vendor and TVA.

(A “COR” is a “Contracting Officer’s Representative,” a government employee who assists in technical monitoring or administration of a contract.)

The obtained pages from the contract appear to confirm WesDyne’s responsibility in assembly and delivery of the TPBARs and in handling resultant waste. Additionally it confirms that TPBAR activities will be coordinated with the “fuel vendor” (Westinghouse Electric Company).

On September 20, 2021, in response to a FOIA request mentioned earlier, the NNSA provided the full contract section (Section C) from which the above four pages was extracted.<sup>73</sup> Despite the FOIA request being for any contract between the NNSA and Westinghouse Government Services, no contract documents with Westinghouse Government Services were provided. Failure by NNSA to provide any contract amendment reflecting a shift in the contract from WesDyne to Westinghouse Government Services could be considered to be non-compliance with the SRS Watch FOIA request. Thus, beyond the mentioned Westinghouse “Frequently Asked Question” factsheet, there is no documentation that Westinghouse Government Services has taken over TPBAR work from WesDyne.

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<sup>73</sup> NNSA response to FOIA request by SRS Watch for NNSA-WesDyne contract, Section C, provided September 20, 2021, <https://srswatch.org/wp-content/uploads/2021/09/Document-1.-Section-C-from-DE-AC02-00DP00229-1.pdf>

## **Lack of Richland County Business License for WesDyne and Westinghouse Government Services**

According to a search of the list of “All Businesses with 2020 Richland County Business Licenses,” posted on the Richland County, South Carolina government website,<sup>74</sup> neither WesDyne International nor Westinghouse Government Services held a business license in 2020. The only Westinghouse entity holding a license is “Westinghouse Electric Co., LLC,” listed at 5801 Bluff Road (Hopkins, SC 29061) and with a “business description” involving “Oher Basic Inorganic Chemical Manufacturing.”

Likewise, a search on the Richland County database for taxes paid in 2020,<sup>75</sup> lists “Business/Merchant” taxes and vehicle taxes having been paid by Westinghouse Electric Company (listed with address of its parent company: 1000 Westinghouse Dr., Cranberry Towns, PA 16066-5200). It appears that no business taxes were paid in Richland County by WesDyne or Westinghouse Government Services.

What this search reveals is troubling. It appears that neither WesDyne nor Westinghouse Government Services have business licenses in Richland County and have not paid county business taxes. Thus, how can they operate without a business license and without paying taxes? Richland County should investigate this situation and should not accept any claim by Westinghouse that those entities operate under a Westinghouse business license and that business taxes were paid as part of Westinghouse tax payments.

This issue of the status of businesses license and no payment of taxes by Westinghouse subsidiaries is of greater concern. The area nearest to the WEC facility in Lower Richland has a large African-American population that is paying more attention to how Westinghouse operates. There are deep concerns in the wider Columbia community about Environmental Justice concerns in Lower Richland and beyond due to the presence of Westinghouse, the contamination from it and how it relates to the public.

Additionally, if WEC is actually doing any TPBAR work then this must be publicly revealed and the NRC must explain in the facility license-extension process, including the EIS, why it is not monitoring and regulating waste streams from TPBAR fabrication.

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<sup>74</sup> List of “All Businesses with Richland County Business Licenses,” on Richland County, South Carolina government website, December 13, 2020, [https://www.richlandcountysc.gov/Portals/0/Departments/BSC/Documents/2020\\_Business\\_Licenses\\_Alpha\\_Order.pdf](https://www.richlandcountysc.gov/Portals/0/Departments/BSC/Documents/2020_Business_Licenses_Alpha_Order.pdf)

<sup>75</sup> Richland County treasurer, web site for searches for taxes paid by businesses and individuals, <https://www6.richlandcountysc.gov/TreasurerTaxInfo/Main.aspx>

According to a news article on October 5, 2021,<sup>76</sup> Richland County may extend the time period in which to secure renewal of business licenses: “The Business License Ordinance Amendment would change the date of business license renewal to April 30th of each year. Currently, the renewal date in Richland County is March 15th. The change of date would allow Richland County to comply with Act 176, the SC Business License Standardization Act passed by the South Carolina General Assembly in 2020.” But WesDyne and Westinghouse Government Services appear not to have their 2020 business licenses, as required by law to operate in Richland County.

It should be noted, that in a comment for the draft EIS record by the U.S. Department of Interior<sup>77</sup>- dated September 17, 2021 but made public on November 5, 2021 - that the department has expressed concern about contamination from the Westinghouse plant impacting the Congaree National Park, which is located downstream in Richland County and which it owns and manages. (See article of November 5, 2021 in The State newspaper: “Congaree National Park threatened by nuclear fuel plant, federal document shows.”<sup>78</sup>)

### **Things Get More Mysterious: DHEC Says No Environmental Permits for WesDyne**

Communication<sup>79</sup> between SRS Watch the South Carolina Department of Health and Environmental Control (DHEC)<sup>80</sup> indicates that neither Westinghouse Government Services nor WesDyne have required environmental-discharge permits.

On August 4, 2021, Mr. Henry J. Porter, Chief Bureau of Land and Waste Management at DHEC, communicated to Tom Clements via email about the status permits:

DHEC does not have any permits issued to Westinghouse Government Services, LLC. DHEC has issued Air and NPDES permits to the Westinghouse Columbia Fuel Fabrication Facility (WCFFF), and the WCFFF is registered as a large quantity hazardous waste generator. Hazardous waste generated at the WCFFF including

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<sup>76</sup> WLTX TV, Columbia, SC, “Richland County to extend business licenses renewal deadline to May 1, 2022,” October 5, 2021, <https://www.wltx.com/article/money/business/richland-county-to-extend-business-licenses-renewal-deadline-to-may1-2022-comply-southcarolina-act176/101-c411a617-b6c0-4c43-a894-a2f49f8eff4d>

<sup>77</sup> U.S. Department of Interior comment into draft EIS on Westinghouse fuel plant license, September 17, 2021, <https://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber=ML21299A112>

<sup>78</sup> “Congaree National Park threatened by nuclear fuel plant, federal document shows,” Sammy Fretwell, The State, Columbia, SC, November 5, 2021, <https://www.thestate.com/news/local/environment/article255573511.html>

<sup>79</sup> See series of email exchanges in August 2021 between Tom Clements of SRS Watch and the head of the South Carolina Department of Health and Environmental Control, Chief of the Bureau of Land and Waste Management: <https://srswatch.org/wp-content/uploads/2021/09/DHEC-and-Clements-email-interaction-on-WesDyne-and-TPBAR-fabrication-etc-August-2021.pdf>

<sup>80</sup> SC Department of Health and Environmental Control website on “Westinghouse Columbia Fuel Fabrication Facility – Hopkins, South Carolina,” <https://scdhec.gov/environment/ongoing-projects-updates/westinghouse>

any hazardous waste resulting from the production of the TPBAR assemblies is managed under the WCFFF's hazardous waste registration.

On August 5, Mr. Porter clarified the situation, while deepening the mystery:

There are no agreements that Westinghouse Government Services, LLC would be regulated under permits that DHEC issued to WCFFF. All of the manufacturing at the Columbia facility is done by WCFFF, including the manufacturing of the TPBAR assemblies. Westinghouse Government Services, LLC does not have manufacturing operations at the Columbia facility.

It is of great concern that this above statement directly contradicts what Westinghouse said in its September 2021 factsheet, where it claimed that Westinghouse Government Services is doing the TPBAR work under the Westinghouse roof.

Then, on August 20, Mr. Porter, in response to another inquiry by SRS Watch further clarified DHEC's understanding about WesDyne operating at the Westinghouse fuel plant or not:

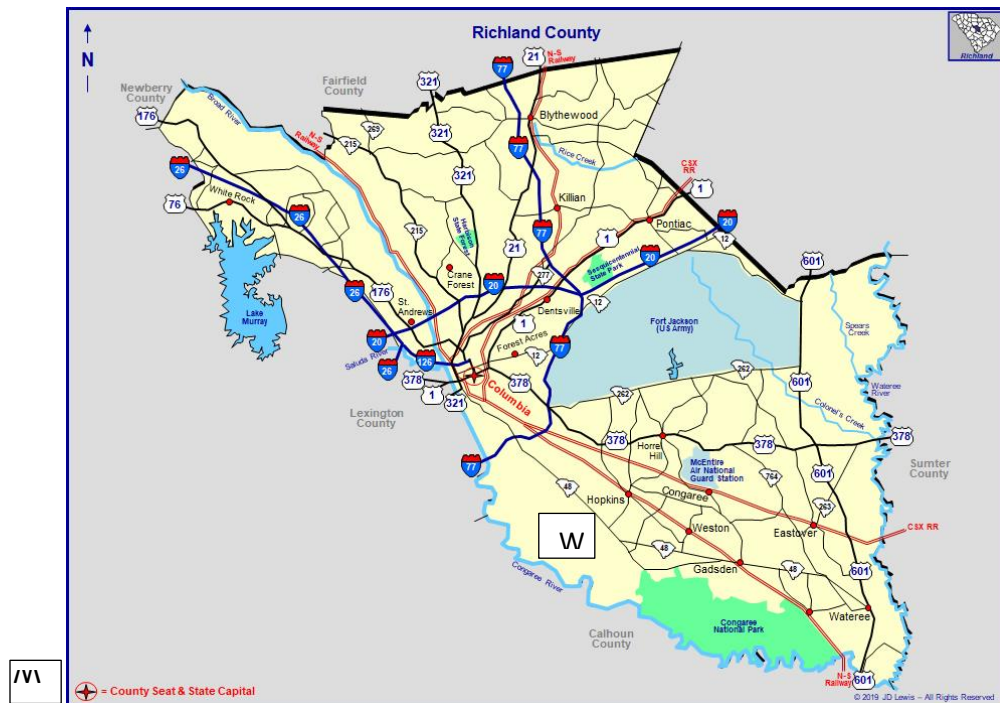
We do not have any permits issued to WesDyne, and WesDyne does not have any manufacturing operation at the Westinghouse fuel facility.

Do the DHEC emails reveal that WEC itself is producing waste from TPBAR manufacture? If so, why isn't such waste being reviewed in the draft EIS?

What DHEC definitively states seems to conflict with what other agencies have presented as far as which entity manufactures the TPBARs. DHEC's interpretation of the facts or information available to them is not questioned and the email exchange only serves to strengthen demands for clarification from Westinghouse and the NRC and NNSA.

The kinds and amounts of hazardous waste are unknown but could be solvents and perhaps a zirconium alloy. Westinghouse stated in the fact sheet that the hazardous waste generated included "acetone rags and zirconium fines." Most components of the TPBARs appear to be supplied by off-site contractors, meaning fabrication of them is done elsewhere. It is understood that no nuclear components are involved in the fabrication of the fresh, unirradiated TPBARs.

There appears to be no doubt that WEC is involved in aspects of TPBAR management, and possibly fabrication. But how can Westinghouse Government Services or WesDyne, both of which are Westinghouse subsidiaries, be doing the TPBAR fabrication without the required air-discharge permit and a National Pollutant Elimination System (NPDES) permit that it should have? How can Westinghouse Government Services or WesDyne be operating under the WEC permits that would apply to the uranium fuel fabrication part of the facility? These questions must be answered in the EIS.



“W” in the white box is the location of the Westinghouse site, Richland County, South Carolina (where Columbia is located); Large green area nearby, on the Congaree River, is the Congaree National Park.

If the Westinghouse Electric Company, which operates the fuel fabrication facility, also operates TPBAR fabrication under the same environmental permits as the uranium fuel fabrication part of the operation, then waste streams from TPBAR manufacture are under the control of WEC and thus must be covered in the Environmental Impact Statement being prepared on the license renewal for WEC. Those waste streams, apparently passed from the TPBAR area of work to the uranium fuel fabrication area, may become indistinguishable from fuel fabrication waste at some point and thus can't be separated out in the EIS analysis. Thus, the TPBAR operations are not “outside the scope” of the EIS, as claimed by the NRC in the summary of “scoping” comments received in advance of preparing the EIS on the facility's license renewal.<sup>81</sup>

### General Overview of Facts about TPBAR Production & Who Is Involved

Entities involved in any aspect of TPBAR work at the Westinghouse facility appear to be hiding under a NNSA claim that the work is “classified.” In general, as included in the SRS Watch

<sup>81</sup> U.S. Nuclear Regulatory Commission, “Environmental Impact Statement for the Westinghouse Electric Company Columbia Fuel Fabrication Facility License Renewal Application, Scoping Process Summary Report,” February 2021, <https://www.nrc.gov/docs/ML2103/ML21033A675.pdf>

comments<sup>82</sup> on the draft Environmental Impact Statement<sup>83</sup> on operation of the Westinghouse facility the following is what is generally known about the TPBAR issue. Given the lack of public information and the obfuscation about the matter, some of these summary items may appear to be inaccurate or contradictory.

- It appears that Westinghouse Government Services or WesDyne International LLC fabricates Tritium-Producing Burnable Absorber Rods (TPBARs) for production of tritium gas in the military-commercial Watts Bar units 1 & 2 reactors (known as the Watts Bar Nuclear Bomb Reactors) operated by the Tennessee Valley Authority;
- It appears that WesDyne, which has evidently absorbed Westinghouse Government Services LLC, is registered with the South Carolina Secretary of State;
- Though operating in Richland County, neither WesDyne nor Westinghouse Government Services are registered businesses in Richland County;
- Both WesDyne and Westinghouse Government Services appear to pay no business taxes in Richland County;
- At various public meetings, NRC officials have said that TPBAR activities are regulated by DOE's National Nuclear Security Administration (NNSA);
- NNSA, the nuclear weapons part of DOE, is not a regulatory agency;
- The NNSA-WesDyne contract, part of which has been obtained by a Freedom of Information Act request, states that the contractor is "responsible for ultimate disposal of waste products;"
- There are indications that the TPBAR work has been taken over by Westinghouse Electric Company (WEC) and that the TPBAR work is covered under existing WEC permits but that is not documented by any NNSA-Westinghouse Government Services contract nor in the draft EIS on WEC license extension;
- Though being asked by stakeholders to analyze the operation of WesDyne in the NRC's draft EIS (on extending the Westinghouse operation license), the NRC has totally ignored the matter and in the Scoping Process Summary Report and claims, without a single word of justification or explanation and with no documentation, that WesDyne is "outside of scope" of the draft EIS;
- Waste from TPBAR operations are not covered in the draft EIS;
- The South Carolina Department of Health & Environmental Control (DHEC) says that TPBAR activities produce hazardous waste and that such waste is handled by the Westinghouse facility;
- DHEC affirms that neither Westinghouse Government Services nor WesDyne have no stand-alone air permit and no National Pollutant Discharge Elimination System (NPDES) permit, both of which are required, and says that TPBAR operations are being done under the WEC permits;

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<sup>82</sup> SRS Watch comments submitted to NRC on draft EIS on Westinghouse fuel plant license extension, including about WesDyne, September 14, 2021, <https://srswatch.org/wp-content/uploads/2021/09/Comments-on-draft-EIS-by-Clements-of-SRS-Watch-September-14-2021.pdf>

<sup>83</sup> U.S. Nuclear Regulatory Commission, Draft Report for Comment on the "Environmental Impact Statement for the License Renewal of the Columbia Fuel Fabrication Facility in Richland County, South Carolina, July 30, 2021, <https://www.nrc.gov/docs/ML2120/ML21209A213.pdf>

- Highly radioactive TPBARs irradiated in TVA’s Watts Bar reactors are transported to the DOE’s Savannah River Site, where tritium gas is removed from the highly radioactive rods;
- NNSA processing campaigns per year of TPBARs is planned to go up to 8 to 10 “extractions” per year by 2026 which means TPBARs production at WEC could increase dramatically, meaning more waste will be produced;
- Tritium gas is packaged in reservoirs and shipped to the DOE’s Pantex facility in Texas or Department of Defense facilities for insertion into nuclear warheads;
- TPBAR waste at SRS is handled as low-level nuclear waste and “disposed of” in the “E-Area Intermediate Level Vaults.”
- Irradiation of TPBARs in Watts Bar units 1 & 2 is an NRC-licensed activity;
- It appears that there is no NRC inspection of TPBAR fabrication or waste production or waste management though there may be a NRC requirement for a Quality Assurance program covering TPBAR fabrication;
- There is no accounting for management and disposal of waste from TPBAR fabrication and thus no NRC reports of any kind about TPBAR activities taking place under the roof of the WEC facility and no public input of any kind;
- The draft EIS must clarify who regulates TPBAR operations and what wastes it produces and how that waste is managed;
- The public must be allowed to comment in the draft EIS process on the management and impacts of waste streams from TPBAR production.



While we work to eliminate nuclear weapons, per the binding Nuclear Non-Proliferation Treaty, let’s hope that there are no future nuclear blasts utilizing tritium gas produced in components manufactured at the Westinghouse dual-use facility in Columbia, South Carolina

## Conclusion

The Westinghouse Columbia Fuel Fabrication Facility has inside its secretive operations connected to all U.S. nuclear weapons - the fabrication of tritium rods irradiated to produce radioactive tritium gas that goes into all weapons to boost the explosive power of them. This makes the facility a “dual use” military-commercial facility, which threatens international



nuclear non-proliferation norms by crossing the imaginary line between civilian and military uses of nuclear technology and facilities.

Government entities must be fully forthcoming about management of the nuclear weapons aspects of the Westinghouse fuel fabrication facility. The Nuclear Regulatory Commission must reconsider its lack of regulation of the production of Tritium Producing Burnable Absorber Rods (TPBARs), reveal what types of waste are generated by the production of those rods, regulate the resultant waste and allow the public to comment about that in the current draft Environmental Impact Statement that must remain open for public comment. The final Environmental Impact Statement on the license extension for the Westinghouse plant, due in early 2022, must discuss TPBAR waste streams and offer full explanation, based on regulations and law, as to why the NRC claims it does not regulate the TPBAR area of the Westinghouse fuel-fabrication facility or the waste from it.

U.S. fabrication of tritium rods in a commercial facility and production tritium gas in commercial reactors reveals the weakened state of U.S. nuclear non-proliferation policies. The tritium issue underscores that the U.S. has a double standard on such matters while it seeks to impose a stricter standard on other countries. Production of nuclear weapons materials in the civilian fuel cycle undermines international nuclear non-proliferation norms and must be halted in the U.S. and all other countries.

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*This report is a working draft subject to edits and updates. Comments and information clarifying the matter at hand are welcome: [srswatch@gmail.com](mailto:srswatch@gmail.com).*