



Savannah River Site Watch

Problems and Challenges Facing Export of AVR Spent Fuel to the U.S. Department of Energy's Savannah River Site (SRS) in South Carolina – Proposal Fails to Meet German Radioactive Emission Standards in the US, including those for Carbon-14, and Must be Terminated

Comment to Nationale Begleitgremium zur Endlagersuche, 19 February 2019, Jülich

By Tom Clements, Director, Savannah River Site Watch, Columbia, South Carolina USA,
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I hereby submit this comment as part of the official record of the meeting of the Nationale Begleitgremium on 19 February 2019 in Jülich.

Summary: Leaving aside questions in Germany and the European Union about the legality of the export of experimental reactor spent fuel, due to adverse environmental impacts and public opposition concerning the handling, processing and dumping of the AVR spent fuel at the US Department of Energy's Savannah River Site (SRS), the proposal to export the high-level AVR waste must be removed from consideration. As SRS is a US DOE facility, no activities at the site are regulated by the US regulatory agency, the Nuclear Regulatory Commission. Thus, standards met by DOE are below those enforced by the NRC for commercial facilities. For example, DOE's H-Canyon, the old reprocessing facility in which the AVR spent fuel could be processed, has no control over discharges of carbon-14 or noble gases; those gaseous radioactive emissions are discharged directly into the atmosphere without regulation. The solid radioactive waste arising from the AVR processing would either be dumped into unlined trenches at SRS, taken to another site for dumping or go into the high-level waste tanks for solidification in the future. As the US has no high-level waste repository, highly radioactive AVR materials would be stranded at SRS for an unknown period of time. Leaving the graphite fuel it in its current form in Germany may well pose a reduced environmental risk, and according to the US DOE, poses no proliferation risk if it remains in Germany. The main motivation for Savannah River Nuclear Solutions, Savannah River National Laboratory and the company that may ship the CASTOR casks, Edlow International, is that they all stand to make large amounts of money off Germany via the dumping-for-profit scheme. This alone raises suspicions about the project. SRS must address the current nuclear waste burden at the site, including 140 million liters of high-level liquid nuclear waste from the Cold War and beyond, and not import more waste that will complicate and delay site clean-up.

1. Emissions of carbon-14 and radioactive noble gasses to be discharged into the atmosphere in South Carolina, without controls – All C-14 and other radioactive gases escaping from the AVR spent fuel will be released directly into the atmosphere

As the U.S. Department of Energy is self-regulating, the U.S. Nuclear Regulatory Commission (NRC) has no role in operations at the Savannah River Site. Thus, radioactive discharges from the H-Canyon reprocessing plant, where the AVR graphite spent fuel may be processed, as well as other facilities at SRS, do not meet standards applied by the NRC to the commercial nuclear industry.

At the aging H-Canyon reprocessing plant, now 64 years old, and other current or future facilities at SRS, no containment of radioactive gaseous emissions is required under weak DOE regulations. At the H-Canyon - which was used to process nuclear materials from defense reactors for nuclear weapons purposes - radioactive discharge passes through a sand filter, where only solid radioactive particles are filtered, and then through a discharge chimney.



H-Canyon reprocessing plant at the Savannah River Site, with radioactive discharge chimney visible on the far side of the facility – radioactive gas emissions discharged without containment

According to a 1991 document entitled “The H-Modified Process” (<https://sti.srs.gov/fulltext/SRNL-STI-2018-00704.pdf>), Westinghouse Savannah River Company, the site contractor at the time, stated the role of filtering missions through a sand filter is to remove “particulate radioactivity” and not gaseous emissions:

CANYON AIR SYSTEM

Filtered outside air is supplied to the canyon by fans. Air enters the canyons through registers along the craneways and exits to the canyon air exhaust tunnel through registers near the bottom of each cell. The downward flow of air helps keep contamination inside the cell. Exhaust fans in Building 292-H pull the air through the sand filters, Building 294-H and 294-1H, and discharge it to the stack. The sand filters are made of layers of progressively smaller aggregate, starting with course stone on the bottom and ending with fine sand on top. Flow of air is from the bottom to top. The two sand filters operating in parallel remove about 99.98% of the particulate radioactivity from the air, equivalent to HEPA filters.

This and other documents reveal that only radioactive particles are filtered but not gaseous emissions.

It is unacceptable to even consider that Germany send the AVR spent fuel to SRS, where standards allow full discharge of carbon-14 and noble gases into the atmosphere. Due to this issue alone, which DOE does not like to talk about, the dump-it-in-the-US option must be taken off the table. At a minimum, if there is further discussion of the US option, Germany must demand that standards under German environmental laws and EU regulations be met at SRS.

2. “Exhaust tunnel” through which H-Canyon emissions are sent to sand filter and atmosphere is in a degraded state, may fail in case of seismic event

Radioactive emission from the H-Canyon are sent through the “exhaust tunnel” into the sand filter. Over the past several years, DOE and the Defense Nuclear Facilities Safety Board (DNFSB), a federal oversight agency, have cited problems with the degraded status of the concrete walls of the exhaust tunnel.

On 7 December 2018, the DNFSB released a report entitled “H-Canyon Exhaust Tunnel Fragility Analysis Input and Assumptions.” (See the report and H-Canyon diagrams at <https://www.dnfsb.gov/sites/default/files/document/16846/H-Canyon%20Exhaust%20Tunnel%20Fragility%20Analysis%20Input%20and%20Assumptions%20%5B2019-100-004%5D.pdf>). In the report, chronic problems with the exhaust tunnel were noted.

The DNFSB cited a DOE review of the H-Canyon Exhaust Tunnel (HCAEX Tunnel) which stated that “the ability of the HCAEX Tunnel to perform its intended safety class function during and following a design basis earthquake is indeterminate.” The DNFSB has asked DOE for a report on the situation - due in June 2019 - and raised a concern that at some point the HCAEX Tunnel will not be able to meet its “performance goal.”

Combined with other operational problems in the H-Canyon, the status of the HCAEX Tunnel is of serious concern. Continued degradation of the tunnel impacting its ability to perform its safety function or a seismic event during processing of the AVR spent fuel could result in a serious radioactive discharge of particulate radioactive material (in addition to all carbon-14 and noble gases not being contained, as noted above).

Additionally, the roof of the aging H-Canyon is leaking and recently resulted in a radioactive “hot spot” on the floor inside the facility. The leaking roof – publicized in an SRS Watch news release on 17 January 2019 - **Radioactive Hot Spot Caused by Rainwater Leak into Aging H-Canyon Reprocessing Plant at SRS**

(http://www.srswatch.org/uploads/2/7/5/8/27584045/srs_watch_news_h-canyon_leak_contamination_jan_17_2019.pdf) - is an indication about the degraded condition of the facility. We remain on high alert for more problems at the H-Canyon and a potentially serious accident in case of a seismic event or operational problems.

3. DOE reaffirms no proliferation risk to leave AVR spent fuel in Germany

A 1 August 2013 memo by the DOE’s National Nuclear Security Administration (NNSA) , Office of Nuclear Threat Science -

http://www.srswatch.org/uploads/2/7/5/8/27584045/doe_memo_on_no_proliferation_risk_of_avr_spent_fuel_august_1_2013.pdf -

concluded that it was “not of a proliferation concern” to leave the AVR spent fuel in Germany.

In response to a Freedom of Information Act (FOIA) request by Savannah River Site Watch, NNSA confirmed on 29 August 2018 that there had been no new proliferation assessment prepared by NNSA’s Office of Defense Nuclear Nonproliferation since the 2013 memo. (See NNSA response letter to SRS Watch:

http://www.srswatch.org/uploads/2/7/5/8/27584045/foia_response_no_new_risk_assessment_german_fuel_aug_29_2018-foia_18-00126-ew.pdf)

It is of key importance that the AVR import is not being undertaken by the non-proliferation arm of DOE - the NNSA - but rather by the Office of Environmental Management (EM), which operates the H-Canyon (via contract with the consortium Savannah River Nuclear Solutions). The goal is to make money on the import and processing of the spent fuel, not address any non-proliferation risk. If the NNSA believed that the AVR spent fuel, some of which does contain US-

origin highly enriched uranium (and some contain LEU), posed a proliferation risk in Germany, NNSA would be making the proposal for import of the material to the US and not EM.

Thus, it remains the position of DOE's National Nuclear Security Administration that there is no nuclear non-proliferation threat for the AVR spent fuel to remain in Germany for long-term disposal. The NNSA states that DOE help for disposal in Germany may be warranted.

4. Public opposes import and dumping of the AVR, THTR spent fuel at SRS

The public around SRS remains opposed to receiving the AVR spent fuel for storage, processing and dumping. SRS contains a large amount of existing high-level nuclear waste, for which no long-term storage or disposal plan exists, and receipt of yet more HLW would only make the situation worse.

Lacking a federal repository for HLW means that the German spent fuel would be stranded at SRS with no disposal plan. If the aging H-Canyon were to halt operation then SRS would be stuck with Castor casks full of the AVR graphite fuel balls, with no disposition plan. This is simply unacceptable.

The SRS Citizens Advisory Board (SRS CAB), a federal panel that advises DOE on environmental issues at SRS, has stood against the import over the last few years. Most recently, the CAB voted on 26 September 2017 in favor of a resolution entitled "Oppose Receipt of German SNF for Treatment and Storage in the U.S." (See https://www.srs.gov/general/outreach/srs-cab/library/recommendations/Rec_350_-_German_Fuel.pdf)

For Germany to persist in consideration of export of the AVR spent fuel to SRS will go against the public will in South Carolina and may result in more vocal opposition if the export were to become a likely option. Legal options would also be placed on the table.

5. Refusal by DOE to provide "Memorandum of Understanding between SRS and JEN

On 29 August 2018, SRS requested the most recent "Memorandum of Understanding (MOU) between SRS and Jülicher Entsorgungsgesellschaft für Nuklearanlagen (JEN).

DOE denied the request, which was appealed by SRS Watch. On 13 December 2018, DOE's Office of Hearings and Appeals directed SRS to provide the MOU, but it still has not been received by SRS Watch. (See letter to SRS Watch: http://www.srswatch.org/uploads/2/7/5/8/27584045/appeal_foia_decision_fia-18-0039_on_ger_man_wfo_docs_dec_13_2018.pdf)

As the MOU could outline work to be done at SRS on behalf of JEN, the Begleitgremium should make sure it has a copy of this key documents as well as all reports prepared under it by the Savannah River National Laboratory (SRNL). SRS Watch has also requested those reports.

In conclusion, for a host of environmental nuclear non-proliferation reasons and due to public opposition, the shipment of AVR spent fuel to the Savannah River Site must be rejected. Consideration of this “dumping for profit” option must be terminated and better options for disposal in Germany must become the focus of efforts, possibly with the help of the U.S. Department of Energy’s Office of Environmental Management.

Thank you for your attention to the matters raised here and for recommending that the AVR spent fuel not be exported to SRS. If you have questions or comments please feel free to get in touch.

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