SRS WATCH

Savannah River Site Watch

November 2015

H-Canyon Folly, Plutonium Failure

H-Canyon/HB-Line at Savannah River Site Dramatically Fails to Meet Production Goals for Purified Plutonium Oxide "Feedstock" for the Mismanaged Plutonium Fuel (MOX) Program

Given Likelihood of MOX Termination No Need to Continue Questionable and Potentially Risky Mission to Produce Purified Plutonium for MOX Fuel Fabrication in Aging Facilities

Photo of 60-Year Old H-Canyon Reprocessing Plant at the U.S. Department of Energy's Savannah River Site (SRS) near Aiken, South Carolina, with HB-Line Comprising the Raised Portion on Top, Right of the Facility

H Canyon was originally constructed in the 1950s and began operations in 1955. For nearly 40 years, the facility separated and recovered plutonium, as well as uranium-235 and neptunium- 237, from irradiated, aluminum-clad, enriched-uranium fuel assemblies from site weapons production reactors. The end of the Cold War in 1991 led to a significant change in the role of H Canyon, as this facility, once used to produce weapons-grade nuclear materials, was no longer needed for that purpose. (SRS news release of August 12, 2015: http://www.srs.gov/general/news/releases/nr15_srs-h-canyon-60.pdf)

Savannah River Site has Fallen Far Short of Production Targets for Plutonium Oxide in the Problem-Plagued H-Canyon/HB-Line, for the Plutonium Fuel (MOX) Project - Only 9.6 Kilograms of Plutonium Oxide have been Produced, 0.3% of Target of 3.7 Metric Tons

The U.S. Department of Energy's Savannah River Site (SRS) agreed in 2011 to begin production of purified plutonium oxide from which plutonium fuel could be fabricated in the Mixed Oxide Fuel Fabrication Facility (MFFF). The MOX facility is now under construction at SRS by DOE's National Nuclear Security Administration (NNSA) via contractor CB&I AREVA MOX Services.

The plutonium oxide was to be produced in the H-Canyon and the associated HB-Line, facilities operated by the DOE's Office of Environmental Management (EM) by contractor Savannah River Nuclear Solutions (SRNS). The plutonium to be processed into oxide was to be taken from the 12.8 metric tons of "non-pit" plutonium - not in the form for use in nuclear weapons - stored in the K-Area at SRS.

As of November 12, 2105, only a paltry 9.6 kilograms of plutonium oxide have been produced. This is less than 10% of the revised FY 2015 cumulative goal of 100 kilograms and less than 3% of the FY 2016 cumulative goal of 350 kilograms. Of even more surprising note, the 9.6-kilograms is less than 0.3% of the unrealistic production goal of 3700 kilograms (3.7 metric tons) initially established to be reached in Fiscal Year 2018 (and now shifted to FY 2022).

NNSA is paying EM about $20 million per year for oxide production in H-Canyon facilities, which are capable of producing a highly purified oxide to meet MOX fuel standards. Problems with H-Canyon operation in 2014 and 2015 have severely impacted production goals, with production targets being ever lowered and it is unclear how much oxide can ever be produced.

NNSA in 2013 presented a need for a production "campaign" of the 3.7 metric tons of plutonium oxide as "Alternate Feed Stock" (AFS) for the MOX plant. The "Alternate Feed Stock" (AFS) made from non-pit plutonium was to provide feed material for the MOX plant before weapons pit were processed into plutonium oxide for MOX fuel fabrication.

In DOE's FY 2015 budget request annual production goals were presented, with a target of 180 kg of plutonium oxide produced in FY 2014, with the campaign of 3.7 MT being completed in FY 2018. According to SRS, only 1.4 kg of oxide was produced in FY 2014.

Due to failure by H-Canyon to meet initial production goals, revised production goals with significantly lower production goals were presented in the FY 2016 budget request sent to Congress in February 2015. A goal of 100 kilograms was to be produced in FY 2015 and 2,415 kg were to be produced by FY 2020 and 3.7 MT produced by end of FY 2022.

Due to continued operational and technical problems with HB-Line, the facility has been closed twice in CY 2015 and remained closed as of November 12, 2015. According to SRS, only 8.2 kgs of plutonium were produced in FY 2015 and none so far in FY 2016, meaning that a cumulative total amount of only 9.6 kg has been produced through FY 2015. The 9.6 kg of oxide produced

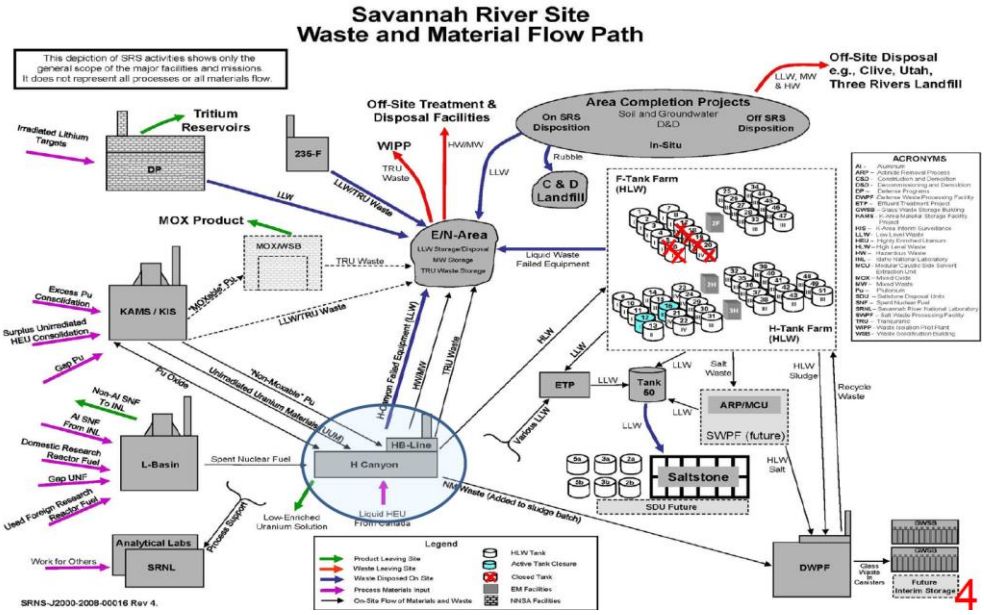
so far with the sporadic operation of HB-Line does not establish that the facility or personnel can carry out the larger production mission into FY 2022.

As the MOX facility may not be completed for another 15 years and may never operate, there is no need for production of highly purified MOX feedstock in the H-Canyon and HB-Line. The project to produce purified plutonium oxide must thus be considered for termination.

While there may be an attempt to ramp up plutonium oxide production to catch up with production goals, such an effort may place strains on both personnel and the aging facility and thus increase risks of more procedural violations or accidents. If the oxide mission is not terminated, newly revised downward goals are expected in FY 2016 and in the FY 2017 budget request likely to be delivered to Congress in February 2016. If past performance is an indication of future performance, then DOE will have trouble meeting new production goals and the risk of more operational incidents remains. While the two HB-Line incidents in 2015 may be reason enough to permanently close HB-Line, a third incident, which could be more likely if the facility were placed into full production mode, would almost certainly end utilization of the facility.

If a decision is made to cancel the MOX project, which appears likely, and a decision is made to dispose of plutonium as waste, other methods, such as furnaces, can be deployed to produce impure plutonium oxide in lieu of the aqueous process utilized in the H-Canyon.

SRS Diagram of Savannah River Site Operations Managed by the Office of Environmental Management, with H-Canyon Circled; Note that the Plutonium Fuel (MOX) Plant is Not Shown but a Line Labeled "Non-MOXable Pu" from the KAMS Plutonium Storage Facility to H-Canyon Can be Seen:



From *Update on H Area Operations*, Aug. 4, 2015, to SRS Citizens Advisory Board (CAB) nuclear materials committee, http://www.srs.gov/general/outreach/srs-cab/library/meetings/2015/nm/FinalHCanyonUpdatetoCABJuly2012Rev2.pdf

Based on information from DOE budget requests to Congress and from information provided to SRS Watch by SRS, the plutonium oxide production targets and the actual production can be compared, as can be seen in Table A. Actual production is far below targets and there has been no demonstration that any of the present or future production targets can be met.

Table A - Plutonium Oxide Production Targets and Actual Amounts Produced in H-Canyon/HB-Line, in kilograms (kg) – for MOX Fuel "Feedstock" – as of November 12, 2015

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Fiscal Year 2014 DOE budget request (vol. 1, page DN 144	180 kg				complete project with 3.7 MT (3,700 kg)		
Fiscal Year 2015 DOE budget request (vol. 1, page 540)	180 kg	1,145 kg cumulative	2,145 kg cumulative	3,145 kg cumulative	3,700 kg cumulative; project finishes		
Fiscal Year 2016 DOE budget request (vol. 1, page 566)		100 kg cumulative	350 kg cumulative	800 kg cumulative	1,275 kg cumulative	1,1875 kg cumulative	2,415 kg cumulative; 3.7 MT produced by end of FY 2022
Actual Production (see SRS email - Appendix B)	~1.4 kg	~8.2 kg	0 kg, from October 1 to November 12, 2015				
Cumulative Production (see SRS email - Appendix B)	~1.4 kg	~9.6 kg cumulative	~9.6 kg cumulative to Nov. 12, 2015; new goals for future production not established				

DOE FY 2014 budget request, Volume 1: http://energy.gov/sites/prod/files/2013/04/f0/Volume1.pdf;
DOE FY 2015 budget request, Volume 1:
http://www.energy.gov/sites/prod/files/2014/04/f14/Volume%201%20NNSA.pdf;
DOE FY 2016 budget request, Volume 1:
http://www.energy.gov/sites/prod/files/2015/02/f19/FY2016BudgetVolume1_1.pdf;
Actual Production and Cumulative Production from SRS email to SRS Watch of October 5, 2015 - see Appendix B

Background on Decision to Produce Plutonium Oxide for MOX Fuel in H-Canyon

In search of work to keep the H-Canyon operating, the Savannah River Site in August 2011 directed the contracted operator of the facility, Savannah River Nuclear Solutions (SRNS), to prepare for the "mission" of production of purified plutonium oxide from which plutonium fuel (MOX) could be made.

SRS took on the oxide-production mission for H-Canyon in spite of the MOX project being administered by the National Nuclear Security Administration. With the MOX-related work to be carried out in an Office of Environmental Management (EM) facility, the MOX effort has thus become intertwined between EM and NNSA. SRS officials have stated at public meetings that EM was being paid $20 million per year by NNSA for the plutonium oxide production mission but documentation on any EM-NNSA agreement this has never been released.

The processed, purified plutonium is called "feed stock" as it can be used to feed preparation of MOX fuel pellet production in the Mixed Oxide Fuel Fabrication Facility (MFFF) at SRS. It is called "Alternate Feed Stock" (AFS) as it's an alternate to oxide derived from plutonium in "pits" removed from weapons. In theory, the "Alternate Feed Stock" would be used at the start of MFFF operations and oxide made from pits would be used later in operation.

In spite of questions over the fate of the mismanaged MOX project and if any "feed stock" would be needed for it, SRS pushed forward with the oxide-production mission. In a January 24, 2012 presentation entitled "*Citizens Advisory Board Update on H Canyon*," the SRS Citizens Advisory Board (SRS CAB), a federal advisory panel on SRS clean-up, was advised of the new MOX mission for the H-Canyon and that the project would involve "up to 3.7 MT of plutonium material to purify and convert to oxide to make suitable as feed to MFFF." It was further stated that production would being "no later than October 2012" and that production would ramp up "to 1 MT per year within 3 years." In reality, the FY 2015 production level of 8.4 kg was almost 992 kg short of the annual 1 MT (1000 kg) production goal, which can only be classified as a stunning programmatic failure.

Interim Action Results in Lengthy Delays

In an "Interim Action Determination" dated June 26, 2012, the SRS site manager signed off on an initial production goal of 2.4 MT of plutonium oxide "Alternate Feed Stock" derived from the ~12.8 MT of plutonium stored in the K-Area at SRS.

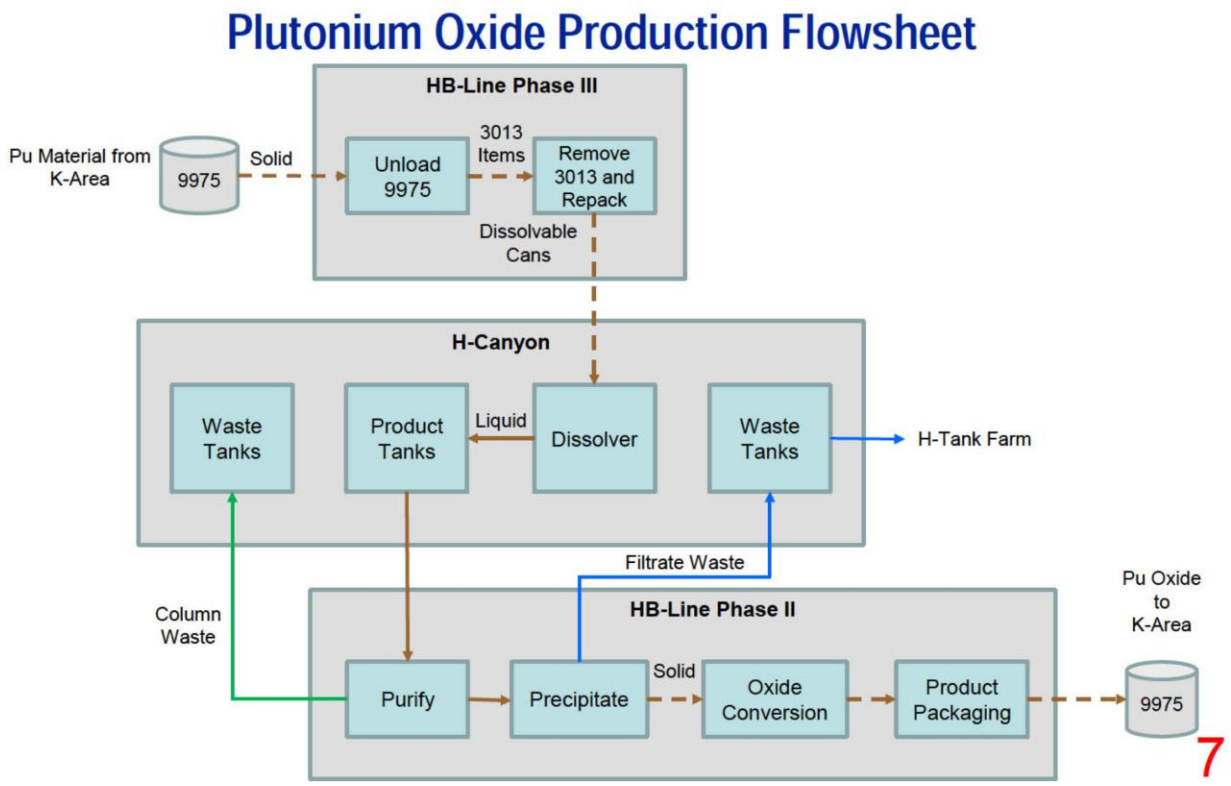
See Interim Action Determination:
http://www.srs.gov/general/pubs/envbul/documents/AFS_IAD_06-26-12.pdf

The Interim Action Determination stated that construction of the MOX plant "is scheduled to be completed and operations are slated to begin in 2016." This date of completion of construction and beginning of operations of the MOX plant was known to be incorrect at the time but was

used to present a false urgency of the need for H-Canyon to prepare the plutonium oxide feed stock. Such misrepresentation has become standard fare with all aspects of the MOX project.

In a September 25, 2012 presentation entitled "*Citizens Advisory Board Update on H Area Operations*," the SRS CAB was informed of the decision embodied in the Interim Action Determination.

SRS schematic outlines how plutonium oxide is produced utilizing the HB-Line and H-Canyon, with the process starting by the opening of plutonium "3013" cans brought from K-Area into HB-Line and ending with solid oxide be repackaged in HB-Line for return to K-Area for storage awaiting disposal:



From *Update on H Area Operations*, Aug. 4, 2015, to SRS CAB nuclear materials committee, http://www.srs.gov/general/outreach/srs-cab/library/meetings/2015/nm/FinalHCanyonUpdatetoCABJuly2012Rev2.pdf

During 2013, SRS continued efforts to begin utilization of the H-Canyon and HB-Line for production of plutonium oxide. Recognizing H-Canyon operational problems, DOE informed the SRS CAB on September 23, 2013 in an "*Update on H Area Operations*" (http://www.srs.gov/general/outreach/srs-cab/library/meetings/2013/fb/09gunter.pdf) that SRS had sent a letter on April 8, 2013 to the contractor, Savannah River Nuclear Solutions, "stating its concern with the status of conduct of operations in its facilities." As a result, "SRNS submitted a Corrective Action Plan to SR on 5/20/13 with a revision on 6/14/13" and SRS stated that it "has seen an improvement in the conduct of operations in the facilities and will continue

to evaluate SRNS's continuing progress." Given what was to happen with operation of H-Canyon in 2014 and 2015, it's now clear that corrective actions taken by SRNS and SRS in 2013 were totally insufficient.

SRS reported to the SRS Citizens Advisory Board on January 24, 2012 that the overall production goal was 3.7 metric tons of plutonium oxide, to begin "no later than October 2012" and that production would reach a 1 metric ton (1000 kg) per year level:

Full presentation linked at:
http://www.srs.gov/general/outreach/srs-cab/library/meetings/2012/fb/01hcanyon.pdf

Oxide Production via H-Canyon and HB-Line Began on August 8, 2014

According to an update to the SRS CAB on November 17, 2014, after approval by DOE of a "Documented Safety Analysis/Technical Safety Requirements (DSA/TSR)" for use of H-Canyon to process non-pit plutonium into oxide and the approval of the "HB-Line Readiness Assessment," DOE "introduced plutonium into H-Canyon on August 8, 2014 and produced the first can of oxide on August 27, 2014. (see below for page extracted from "*Update on H Area Operations*," to SRS CAB on November 17, 2014, http://www.srs.gov/general/outreach/srscab/library/meetings/2014/fb/Allen%20Gunter%20H-Canyon%20Update%20to%20CAB%20on%2011-17-2014%20Rev%201.pdf)

OFFICE OF ENVIRONMENTAL MANAGEMENT

Plutonium processing for Mixed Oxide Fabrication Facility

Progress/Current Status:

- Completed multiple safety basis changes, procedure changes, training, etc.
- H Canyon continues dissolution of non-pit plutonium
- Savannah River approved the Documented Safety Analysis/Technical Safety Requirements (DSA/TSR) to support oxide production and the facility has implemented the DSA/TSR requirements including personnel training
- Savannah River completed its HB-Line Readiness Assessment and concurred the facility ready to start oxide production
- Introduced plutonium solution to the facility on August 8, 2014 and produced the first can of oxide on August 27, 2014

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H-Canyon Safety Problems – Warning Signs from 2014

Throughout 2014, the Defense Nuclear Facilities Safety Board (DNFSB) mentioned problems with testing and operational issues with H-Canyon. As an example of problems cited, in an August 29, 2014 weekly report, the safety board cited problems with a plutonium precipitator tank and associated agitator, raising concern about proper criticality controls in the facility:

> **HB-Line:** The unexpected sample results in the concentrate tank resulted from: 1) a tank heel of concentrated acid leftover from cold runs, 2) the less dense heart cut solution forming a layer on top of this, 3) a small diameter orifice in the recirculation line reducing the mixing effectiveness, and 4) taking samples from the bottom of the tank….This week, SRNS precipitated and filtered plutonium solids, calcined the solids, and then sampled the oxide. After operators had mixed the plutonium concentrate solution with oxalic acid in the precipitator, they received a precipitator tank level high alarm followed seconds later by a precipitator tank level error alarm and the precipitator agitator interlock tripping. After the alarms cleared, operators restarted the agitator, and the same thing happened again. Based on other volume readings up and (later) downstream of the precipitator, it appears that the precipitator's capacitance level instrument was indicating a level more than 20% greater than the actual volume. Furthermore, when the instrument went out of range on the high side, it triggered the error and shut down the agitator (normally only desired if the solution is below the agitator's blades). This was highly undesirable because the agitator is essential in keeping the plutonium solids suspended until the slurry is transferred to the filtration station. Realizing this, facility management in the control room verbally directed operations to 1) restart the agitator and 2) transfer the slurry to the filtration station. This was accomplished. The site rep expressed concern to DOE and SRNS about the reliability of the capacitance level indicator and whether there should be an agitator interlock once precipitation has begun. (Report at: http://www.dnfsb.gov/sites/default/files/Board%20Activities/Reports/Site%20Rep%20Weekly%20Reports/Savannah%20River%20Site/2014/wr_20140829_116.pdf)

Likewise, in a November 21, 2014 weekly report, the DNFSB documented problems with the performance of HB-Line personnel, a harbinger of more personnel problems to arise in 2015:

> SRNS has now had four reportable cases of degradation of safety significant equipment in the last 3 weeks plus a fifth one when a fire maintenance technician pushed the wrong button and triggered a SS interlock (see 11/7/14 report). In addition, the SRNS Independent Evaluation Board issued a core issue after the HB-Line team demonstrated a reluctance to remove equipment from service despite identified hazards, out of limit readings, and significant maintenance issues." (http://www.dnfsb.gov/sites/default/files/Board%20Activities/Reports/Site%20Rep%20Weekly%20Reports/Savannah%20River%20Site/2014/wr_20141121_116.pdf)

HB-Line Faces Two Unplanned Shutdowns in 2015, Halting Plutonium Oxide Production for Most of Year and Threatening Overall Production Goals

On February 8, 2015, according to information first reported by the Defense Nuclear Facilities Safety Board in a weekly report of February 13, 2015 (http://www.dnfsb.gov/sites/default/files/Board%20Activities/Reports/Site%20Rep%20Weekly%20Reports/Savannah%20River%20Site/2015/wr_20150213_116.pdf), operation of H-Canyon and HB-Line were impacted due to a power loss.

As a result or the power-loss situation, the DNFSB in a February 20, 2015 weekly report (http://www.dnfsb.gov/sites/default/files/Board%20Activities/Reports/Site%20Rep%20Weekly%20Reports/Savannah%20River%20Site/2015/wr_20150220_116.pdf) noted that "most of the plutonium oxide production equipment went into an alarm/fault state" and the NT-51 tank containing a dissolved plutonium solution was not properly "agitated" to meet criticality control measures. Lack of required agitation to keep the solution in the tank at a "plutonium (Pu) concentration…less than 6 g/l" meant that "all the defenses were violated and no other documented controls remained to protect the criticality safety limit."

This "criticality violation" resulted from both technical problems and personnel errors and as a result the H-Canyon was taken out of operation. According to the DNFSB, the situation required "nuclear criticality safety evaluations" (NCSE) for HB-Line and H-Canyon, with review by a "Corrective Action Review Board." Savannah River Nuclear Solutions was required to revise the "Documented Safety Analysis" and conduct a "contractor readiness assessment" (RA) before allowing plutonium solution transfer from HB-Line to H-Canyon.

According to the DNFSB, a Readiness Assessment (RA) determined that it "did not appear that the facility had an effective program to maintain formal and disciplined operations" and that there was "less than adequate determination of readiness, inadequate closure of pre-start corrective actions, improper classification of opportunities for improvement, inadequate preparation by the assessors, and repeat issues in conduct of operations and training."

In a SRS presentation to the SRS CAB on August 4, 2015, SRS affirmed that it had approved the RA as well as corrective actions conducted by Savannah River Nuclear Solutions and allowed restart of H-Canyon plutonium processing operations on July 20, 2015:

OFFICE OF ENVIRONMENTAL MANAGEMENT

HB-Line Agitator Event

- Fissile limits defined in the criticality analyses were never violated
- The facility safety basis credits the thorough mixing of the solutions in HB-Line to ensure representative sample prior to transfer to H-Canyon as one of its criticality controls.
- The facility experienced a loss of power in the facility which resulted in the variable speed drives on the agitators tripping off-line without operations personnel recognition.
- After sampling, but without agitation, three transfers were made between HB-Line and H-Canyon.
- Upon discovery, operations were suspended and vessels were evaluated to ensure within established safety limits, a thorough extent of conditions was performed to ensure all credited actions could be performed, and modifications were made to assist operators in the verification of tank agitation.
- SRNS then completed a readiness assessment, SR shadowed the RA and validated closure of corrective actions, and operations were resumed on July 20, 2015.

Update on H Area Operations, Aug. 4, 2015, to SRS CAB nuclear materials committee, http://www.srs.gov/general/outreach/srs-cab/library/meetings/2015/nm/FinalHCanyonUpdatetoCABJuly2012Rev2.pdf

Restart of operations proved to be short-lived as more mistakes in HB-Line criticality controls were made on September 3, 2015, when personnel willfully ignored criticality safety controls in removal and handling of plutonium from "3013" storage cans in violation of established procedures. The DNFSB documented those problems in a September 11 weekly report (http://www.dnfsb.gov/sites/default/files/Board%20Activities/Reports/Site%20Rep%20Weekly%20Reports/Savannah%20River%20Site/2015/wr_20150911_116.pdf). The operation of HB-Line and H-Canyon facility was once again placed on hold and preparation of a "Recovery Plan" was mandated by SRNS management.

Due to HB-Line safety concerns and other site-wide concerns, the SRNS president took the unprecedented step of placing all "non-essential" SRNS operations in an "Operational Pause" on September 11. According to an SRS email of November 5, the HB-Line remained in an operational pause and "HB-Line may enter deliberate operations by the end of November," after conducting a "root cause analysis and associated corrective actions for the HB-Line Technical Surveillance Requirement (TSR)" to be reviewed by a "SRNS Senior Management Review Board." The exact role of DOE is unclear while SRNS brings the HB-Line out of "deliberate operations." (see Appendix C below)

Restart of HB-Line and Ramped-Up Production Poses Avoidable Safety Risks

As a result of the unprecedented shutdowns in operation of the H-Canyon and HB-Line, the safe operation of the aging facilities has been called into question. Though SRS will likely approve restart of HB-Line plutonium oxide production and approve an end to "deliberate operation," it is far from a given that HB-Line can continue uninterrupted, safe operations.

So far in 2015, HB-Line has only been in operation for just over 2 months. As production targets have not been met and are slipping away, DOE may bring the facility back into operation with an increased number of shifts and expanded operations to try and meet the NNSA's fanciful and continually delayed plutonium oxide production schedule for 3.7 MT of plutonium oxide. Operations driven by the production schedule for plutonium oxide that is not needed for the MOX program is an ill-advised approach that could lead to yet further safety, technical and personnel problems in HB-Line.

Despite holding great responsibility for the operation problems of H-Canyon in 2014 and the two shutdowns in 2015, it is not known if SRNS will be fined or the production mission will be taken away from the company. Also unknown is if NNSA will cancel any oxide production agreement or what degree of pressure NNSA is putting on SRNS and SRS to correct problems and restart ramped-up oxide production. In any event, it is clear that NNSA has received little for its $20 million per year payment to SRS. NNSA should thus demand to be reimbursed. At the same time, NNSA should admit that it has no need for continuation of a campaign to produce purified plutonium oxide for the troubled MOX program.

If HB-Line is placed back into service for the unnecessary oxide production mission, pressure will be on equipment and personnel to flawlessly perform, which will be a challenge given recent operational history. A single safety incident could cause permanent closure of HB-Line.

A positive outcome of the current shut-down situation - and certainly if a third closure incident occurs in the future - should be that DOE will now more rapidly develop non-aqueous options for producing less pure plutonium oxide, such as via furnaces. With termination of the grossly mismanaged MOX project, such impure oxide could be disposed of as waste, via immobilization in existing high-level waste at SRS or otherwise. HB-Line could thus be taken out of service for further plutonium oxide production.

Note: Appendices A-I follow. Many of the appendices present Savannah River Site and Savannah River Nuclear Solutions communication of September, October and November 2015 on the "operational pause" at SRS and the status of H-Canyon and HB-Line. Appendix B is an SRS email to SRS Watch of October 5, 2015, documenting amounts of plutonium oxide actually produced in HB-Line in Fiscal Year 2014 and Fiscal Year 2015 and is being publicly released here for the first time.

Appendix A – Photos of H-Canyon, in middle of photos, with HB-Line on top of the facility, July 30, 2015, photos can be used with credit: *"©High Flyer, Special to SRS Watch"*

Images on SRS Watch website at: http://www.srswatch.org/uploads/2/7/5/8/27584045/6893258.jpg and http://www.srswatch.org/uploads/2/7/5/8/27584045/9307925.jpg

Appendix B – SRS email of October 5, 2015, in response to SRS Watch email of September 15, 2015 - on amount of plutonium oxide produced in H-Canyon/HB-Line

From: james-r.giusti <james-r.giusti@srs.gov>
To: Tom Clements <tomclements329@cs.com>
Subject: Response: Amount of MOX feedstock from H-Canyon/HB-Line
Date: Mon, Oct 5, 2015 4:27 pm

As preparation of MOX plutonium oxide "feedstock" in H-Canyon/HB-Line is an EM mission (paid for by NNSA), you should be able to answer these simple questions:

1. How much MOX feedstock was prepared in H-Canyon/HB-Line in Fiscal Year 2014?
~1.4kg Pu as oxide

2. How much MOX feedstock has been prepared in H-Canyon/HB-Line so far in Fiscal Year 2015?
~8.2kg Pu as oxide (~9.6kg cumulative)

3. Assuming H-Canyon and HB-Line continue to operate, what is the current SRS target (in kgs) for MOX feedstock preparation in H-Canyon/HB-Line in Fiscal Year 2016?

H-Canyon/HB-Line operations to produce plutonium oxide are being impacted by the current SRS site wide pause in EM operations.
New FY 2016 production projections will be established once operations are resumed.

Appendix C – SRS email on status of Operational Pause, November 5, 2015

As of November 5, 2015, all facilities under Savannah River Nuclear Solutions (SRNS) management have entered deliberate operations with exception of HB-Line. HB-Line may enter deliberate operations by the end of November. DOE-SR continues to assess SRNS activities.

The current facility/organization status is as follows:

- Operational Pause: HB-Line.
- Deliberate Operations: Solid Waste Management Facility, Savannah River National Laboratory, H-Canyon, K-Area, F-Area Complex, L-Area, and the National Nuclear Security Administration Tritium Facilities.
- All non-nuclear operations and business and support organizations (including Technical and Business Services, Engineering and Environment/Safety/Health) have entered deliberate operations.
- No facilities or organizations have completed actions required to exit deliberate operations.

The root cause analysis and associated corrective actions for the HB-Line Technical Surveillance Requirement (TSR) violation is complete and will be presented to the SRNS Senior Management Review Board this week.

The SRNS Sustainment Plan is complete and has been discussed with all SRNS managers. The plan will be revised as necessary as new information is learned. Sustainment plan actions include a half-day pause by each organization monthly for six months; an externally-led assessment of nuclear operations focusing on nuclear safety culture; quantifiable improvements in the training and qualifications program; and improvement to the Contractor Assurance System under the supervision of the SRNS Senior Management Review Board (SMRB). Long-term actions necessary to sustain improvement include requirements for periodic self-assessments, Internal Evaluation Board assessments, operational pause periods and routine periodic involvement of the Operational Excellence organization and the SMRB.

DEFINITIONS

1. **Operational Pause:** Work that is essential to safe and secure operations of the site, which requires the execution of technical work documents and work execution observed by SRNS Management.

2. **Deliberate Operations:** A timeframe where processes being conducted require specific, intentional, and well-thought-out actions in the identification of critical activities. During this period, only work approved by the Facility Manager may be performed. All work is expected to be performed in a slow, very deliberate manner with more attention given to the critical steps. Management engagement in the field is also greater during this time.

During deliberate operations, additional reviews are completed of the work (similar to a Job Hazard Analysis) and a hazard category is assigned. Depending on the complexity, additional assessors (observers) are assigned to witness the activity and the assessors document the performance. This is in addition to the already additional management presence observing work activity.

NOTE: *Release from deliberate operations requires approval of the SRNS President or Executive Vice President and the decision reviewed with DOE-SR senior management.*

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Appendix D – Emailed messages from SRS and SRNS on status of "operational pause" in SRS facilities, including H-Canyon and HB-Line, October 21, 2015

SRS Operational Pause Update

October 21, 2015

Current Status

Currently, with the exception of H-Canyon and HB-Line, all Savannah River Nuclear Solutions (SRNS) organizations have exited the Operational Pause and entered Deliberate Operations.

H Canyon is expected to enter Deliberate Operations during the week of October 26. HB-Line is expected to enter Deliberate Operations by the end of November.

SRNS organizations will exit Deliberate Operations when all actions of the Deliberate Operations Plan have been completed. Actions to maintain sustainability of work practices has been developed and will be reviewed with DOE-SR senior management.

Release from deliberate operations requires approval of the SRNS President or Executive Vice President and the decision reviewed with DOE-SR senior management.

Background

Savannah River Nuclear Solutions entered into a company-wide Operational Pause on September 11, following the discovery of a non-compliance with a procedure during movement of special nuclear material in HB Line. The event was self-reported immediately and there were no injuries and no damage to any equipment.

During the operational pause, all employees participated in briefings and reviews to ensure understanding of the importance of procedural compliance. The approval of each organization's recovery plan was required in order to enter into deliberate operations*.

**Deliberate Operations is a timeframe where processes being conducted require specific, intentional, and well-thought-out actions in the identification of critical activities. During this period, only work approved by the Facility Manager may be performed. All work is expected to be performed in a slow, very deliberate manner with more attention given to the critical steps. Management engagement in the field is also greater during this time.*

During deliberate operations, additional reviews are completed of the work and a hazard category is assigned. Depending on the complexity, additional assessors (observers) are assigned to witness the activity and the assessors document the performance. This is in addition to the already additional management presence observing work activity.

Julie H. Petersen | Office of External Affairs | U.S. Department of Energy | Savannah River Ops Office | 803.952.7690 (O) | 803.646.1066 (C) | julie.petersen@srs.gov

Appendix E – SRS email on operational status of SRS facilities, October 9, 2015

October 9, 2015

With the exception of H-Canyon, HB-Line and K-Area Complex, all Savannah River Nuclear Solutions (SRNS) organizations have exited the Operational Pause and entered Deliberate Operations.
The K-Area Complex is expected to enter Deliberate Operation the week of October 12.
There are no established dates when H-Canyon or HB-Line will enter Deliberate Operations.
SRNS organizations will not exit Deliberate Operations until all actions of the Deliberate Operations Plan have been completed and a plan to maintain sustainability of work practices is developed. There are no established dates when SRNS organizations will exit Deliberate Operations.
Release from deliberate operations requires approval of the SRNS President or Executive Vice President and the decision reviewed with DOE-SR senior management.
SRNS began the Operational Pause on September 11th.

What is Deliberate Operations?

Deliberate Operations: A timeframe where processes being conducted require specific, intentional, and well-thought-out actions in the identification of critical activities. During this period, only work approved by the Facility Manager may be performed. All work is expected to be performed in a slow, very deliberate manner with more attention given to the critical steps. Management engagement in the field is also greater during this time.
During deliberate operations, additional reviews are completed of the work and a hazard category is assigned. Depending on the complexity, additional assessors (observers) are assigned to witness the activity and the assessors document the performance. This is in addition to the already additional management presence observing work activity

Appendix F – SRS email to SRS Watch on H-Canyon incident of September 3, 2015

From: james-r.giusti <james-r.giusti@srs.gov>
To: Tom Clements
Sent: Mon, Sep 14, 2015 5:14 pm
Subject: Re: Jim: partial shutdown update?; HB-Line criticality incident?

As you know, this facility maintains specific, independent procedure requirements that control material spacing and mass to ensure nuclear criticality safety while moving plutonium within the facility. On September 3, a violation in procedural controls on material spacing occurred (mass controls were not violated), thus reducing margins of safety and violating technical safety requirements for operation of the facility. This violation came to light on September 8, when HB-Line operations personnel noted the plutonium samples had been temporarily stored in a storage vault in an unapproved container.

A fact finding critique was held on September 10, which identified a number of concerns regarding failures to implement disciplined conduct of operations in the facility (violation of procedural steps, failure to stop the work when it was clear the procedure was unworkable, N/Aing of mandatory procedure steps, etc.). As a result of these issues, SRNS took immediate action to stop fissile material movement in HB-Line and have now implemented a pause in non-essential nuclear and non-nuclear EM operations at SRS.

This pause will enable SRNS management to express expectations for safe work performance, to engage with operations staff to ensure that appropriate disciplined operational rigor is being applied to safely perform work and to reinforce accountability for safety top to bottom in the organization.

James R Giusti

W: 803-952-7684
M: 803-645-1350

Appendix G – SRS message on Operational Pause of September 11, 2015

From: james-r.giusti <james-r.giusti@srs.gov>
Sent: Fri, Sep 11, 2015 5:25 pm
Subject: DOE-SR UPDATE … Savannah River Nuclear Solutions Pauses All Non-essential Operations at SRS

Based on recent Conduct of Operations issues identified with HB-Line activities, effective today Savannah River Nuclear Solutions has implemented an operational safety pause for all non-essential and discretionary Office of Environmental Management activities site-wide. All work activities are on hold for those facilities under the SRNS management and operations contract.

SRNS is developing a recovery plan for resuming non-essential and discretionary operations and the plan will be submitted to the Department for review and concurrence. The plan will include corrective actions that will be implemented to assure workers adhere to management expectations for safe work performance, to reinforce accountability, and to re-initiate work in a controlled, phased manner.

SRNS will notify the DOE-SR management of any non-essential or discretionary work that SRNS believes needs to be performed before executing the work.
This operational safety pause does not affect other contractors at SRS.
James R. Giusti
Director
DOE-SR Office Of External Affairs
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M: (803) 645-1350
E: james-r.giusti@srs.gov

Appendix H – Message from president of Savannah River Nuclear Solutions declares "Operational Pause" for all its "non-essential work," September 11, 2015

September 11, 2015

To: SRNS Employees
From: Carol Johnson, President & CEO

Operational Pause Effective Immediately

This week, we discovered a significant procedural violation in HB Line. Several individuals made a conscious choice to deviate from established procedures created to ensure the safety of the people within and near the facility. While the investigation and corrective actions for this singular event are ongoing, there have been other recent conduct of operations issues that are also of concern to me given the standard of expectations of all employees.

Consequently, I am directing an operational pause for all non-essential work. This includes the execution of operational procedures, technical work documents, etc… My intent is to suspend work that is not essential to safe and secure operation of the site. Routine surveillance and maintenance activities for safety, security and habitability systems; operator rounds; near-term required regulatory monitoring; emergency and medical services; response to abnormal conditions and emergencies will continue. Any exceptions, including work by subcontractors, are to be granted only by either myself, Dave Eyler or Dr. Terry Michalske. This operational pause will remain in effect until the following is completed:

- A management expectations briefing conducted by Vice Presidents or their Level 2 managers will be communicated throughout all organizations.
- Prepare an assessment plan regarding behaviors of all personnel to ensure understanding of our expectations, particularly with respect to procedural adherence and understanding, as well as management engagement to verify and reinforce expected behavior. This plan shall be reviewed with and approved by either myself or an Executive Vice President.
- Upon completion of these actions, deliberate operations as defined by Manual 2S Procedure 5.1 can be resumed for applicable organizations. Otherwise, the applicable Vice Presidents shall propose a written policy to define deliberate operations for their organization that shall be approved by myself, or either Executive Vice President, after which the organization shall operate under those approved provisions.
- During this period of deliberate operations, the assessment plan developed above shall be executed by the management team. Once satisfied that personnel behavior and understanding of expectations are satisfactory, the results will be reviewed by the applicable Vice President with me or either Executive Vice President before normal operations are resumed.

I do not want to lose sight of the great work that so many or our employees perform on a daily basis and this action is not taken lightly. However, I must consider the nature of our experience in HB Line, and the fact that we have had several operational issues in recent months relative to procedural adherence.

Our vision is to be the standard of excellence in nuclear materials management. That requires each of us making sound, responsible decisions in every aspect of our important work.

Carol

Appendix I – "K Area Overview/ Update" to SRS CAB, July 25, 2015 – on storage of ~12.8 metric tons of plutonium in the old K-Reactor; "9975" storage containers, each containing a "3013" plutonium storage can, are taken to HB-Line where plutonium is removed for processing into plutonium oxide

http://www.srs.gov/general/outreach/srs-cab/library/meetings/2015/nm/Revised%20Allen%20Gunter%20Final%20CAB%20K%20Area%20Overview%20-%20Presentation%20Rev%201%206-2-15.pdf

H-Canyon Folly, Plutonium Failure **was released on November 12, 2015 and was prepared for the non-profit public interest organization SRS Watch by:**

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