

Re Fw VSD Summary.txt

From: michael.chandler [REDACTED]  
Sent: Monday, March 07, 2011 7:33 AM  
To: virginia.kay [REDACTED]  
Cc: drew.grainger [REDACTED]; h.gunter [REDACTED]; Dimarzio, John A.; Eichner, John M.; Kaltreider, Randall  
Subject: Re: Fw: VSD Summary

I've prepared a document that summarizes the environmental impact and I reference the latest SRNL report concerning VSD. I hope to have it issued today.

It's really a simple process, the Pu oxide containing the salts are heated in a vacuum. The salts are evaporated and condense on a cooled surface. The salts are scraped off of the cooled surface. For certain salts it may be necessary to add dry chemical that alters a salt to a more evaporable salt. Some fluoride salts may require the alteration.

From: Virginia Kay [REDACTED]  
To: Drew Grainger [REDACTED]; Michael Chandler [REDACTED]; H Gunter [REDACTED]  
Cc: "Dimarzio, John A." [REDACTED]; "Eichner, John M." [REDACTED]; "Kaltreider, Randall" [REDACTED]  
Date: 03/04/2011 03:57 PM  
Subject: Re: Fw: VSD Summary

Mike and Allen,

Are there any other description documents that provides a detailed process description? Also is there a source document that is referencable confirms no additional operational/environmental impacts from operating VSD?

Thanks,

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Virginia

From: Drew Grainger [REDACTED]  
To: "Dimarzio, John A." [REDACTED] "Eichner, John  
M." [REDACTED]  
Cc: "Kaltreider, Randall" [REDACTED] Virginia  
Kay [REDACTED]  
Date: 03/03/2011 03:23 PM  
Subject: Fw: VSD Summary

Here is what I know on VSD. There are ~150 kg of chlorides and 300-400 kg of florides.

Andrew R. Grainger, NEPA Compliance Officer Savannah River Operations Office  
[REDACTED]

----- Forwarded by Drew Grainger [REDACTED] on 03/03/2011 03:21 PM -----

From: Michael Chandler [REDACTED]  
To: Drew Grainger [REDACTED]  
Cc: H Gunter [REDACTED]  
Date: 03/02/2011 04:13 PM  
Subject: Fw: VSD Summary

Drew, Let me know if this is enough for the Pu SEIS. As stated the only environmental impact is the salts being collected and becoming waste but the Pu is usable for MOX, otherwise the entire mass (Pu and contaminating salts) would have been dispositioned to DWPF or WIPP. These actions would be bounded by the analyses for the DWPF or WIPP disposition pathways from HBL/H-Canyon.

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----- Forwarded by Michael Chandler [REDACTED] on 03/02/2011 04:09 PM -----

From: James Therrell [REDACTED]  
To: Todd Woodsmall [REDACTED], Michael Chandler [REDACTED]  
Cc: Curtis Gardner [REDACTED]  
Date: 03/02/2011 03:32 PM  
Subject: VSD Summary

Vacuum Salt Distillation (VSD) was recently integrated in the HB-line Phase I process as a pretreatment to prevent dissolver and piping corrosion. The VSD process separates plutonium oxide from chloride salts which accelerate damage to expensive equipment during dissolution. Recent research has demonstrated that fluoride salts can also be removed, thus potential exists to expand its utilization to convert excess non-MOXable materials into acceptable feed stocks. The fluoride removal capability requires an additional exchange reaction step which is accomplished through dry chemistry and results in by-products consistent with current VSD processing.

Distillation of chloride salts is a physical separation which occurs under low pressure and high temperature. Corrosive salts can be selectively distilled due to the large difference in vapor pressures that exists between plutonium oxide and chlorides. Vaporized salts condense in an actively cooled section of the VSD vacuum chamber and are subsequently recovered. The salt solids are treated as TRU waste under the currently approved Waste Acceptance Criteria (WAC). In addition to the salt waste stream, the only other by-product from the process is a small amount of water vapor. The purified oxides are repackaged in convenience cans and can be used as feed stock for Phase I.

Processing to date has demonstrated that oxides can be de-chlorinated down to less than

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500 ppm

chloride concentration. Facility assaying has shown the waste salt to meet the applicable MC&A

attractiveness Level E requirements for TRU waste.