



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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August 14, 2017

17-NWP-102

Mr. Kevin W. Smith, Manager
Office of River Protection
United States Department of Energy
PO Box 450, MSIN: H6-60
Richland, Washington 99352

Mr. Mark A. Lindholm, President
Washington River Protection Solutions LLC
PO Box 850, MSIN: H3-21
Richland, Washington 99352

Re: Likely Failure of Double-Shell Tank AP-102 Secondary Containment

References: See page 3

Dear Mr. Smith and Mr. Lindholm:

The Department of Ecology (Ecology) is very concerned that the secondary tank bottom for the Double-Shell Tank (DST) AP-102 has likely failed.

Ultrasonic testing (UT) inspection of a small area in the annulus identified a location where greater than 70% thinning of the secondary tank bottom has occurred (Reference 1). The suspected cause is corrosion from the underside due to excessive liquid levels in the leak detection pit, and groundwater infiltration beneath the tank.

The area of the secondary tank bottom which could be inspected was limited to only a small portion of the annulus between the primary tank and the secondary tank. The thickness of the secondary tank bottom in this narrow region is 1/2" to support the weight of the tank walls. However, the vast majority of the secondary tank bottom is hidden under the primary tank and cannot be accessed by the UT crawler. That portion of the secondary tank bottom is 3/8" thick, which is the same as the measured amount of thinning due to corrosion (Reference 2).

Further, AP-102 just received the sludge pumped out of the failed high-heat DST AY-102. That sludge originated in the single-shell tank C-106, and generates a considerable amount of heat due to its radionuclide content. As a result, the waste temperatures measured in AP-102 are now increasing, which will further accelerate the corrosion rate.

In the *2016 Double-Shell Tank System Integrity Assessment Report (DSTAR)*, the independent qualified registered professional engineer (IQRPE) discussed this flaw in the AP-102 secondary tank bottom, and noted it occurs in areas directly over the drain slots in the concrete foundation (Reference 3). Those drain slots extend from the outer edge all the way to the center of the tank. The IQRPE simply recommended to revisit this small area in five years and repeat the UT inspection.



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Ecology commented that is not sufficient, given that the tank has not been proven to be fit for use (Reference 4). The United States Department of Energy (USDOE) response only reiterated that the remaining liner thickness is sufficient at the “measured liner location,” ignoring that the majority of the tank bottom was constructed of thinner materials (Reference 5).

Past attempts to access the undersides of the primary and secondary tank bottoms have been largely unsuccessful due to obstructions, maneuverability, and interference of the steel retaining ring around the insulating concrete pad. Better methods are available for assessing the integrity of the entire secondary tank bottom, which are not limited to only the annulus space (e.g., tracer gas).

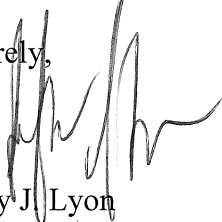
USDOE plans to use AP-102 in the long-term. Removing AP-102 from service would significantly impact the Direct-Feed Low Activity Waste mission. USDOE needs to assess the integrity of the AP-102 secondary tank bottom, and determine if this DST is acceptable for storing tank waste.

Because this is a high priority, Ecology requires a plan for assessing the integrity of the AP-102 secondary containment be submitted to Ecology for approval by March 31, 2018.

The final IQRPE integrity assessment report for the AP-102 secondary containment must be submitted to Ecology for approval by September 30, 2018.

If you have any questions, please contact me at jeff.lyon@ecy.wa.gov or (509) 372-7914, or Cheryl Whalen, Cleanup Section Manager, at cheryl.whalen@ecy.wa.gov or (509) 372-7972.

Sincerely,



Jeffery J. Lyon
Tank Systems Operation and Closure Project Manager
Nuclear Waste Program

sl/aa

cc: See page 3

References:

1. WRPS Report, dated March 10, 2015, *Ultrasonic Inspection Results for Double-Shell Tank 241-AP-102 - FY 2015*, RPP-RPT-58276, Rev. 0
2. WRPS Drawing H-2-90534, dated July 14, 1998, Tank Cross Section 241-AP Tanks, Rev. 4
3. WRPS Report, dated November 21, 2016, *Double-Shell Tank System Integrity Assessment Report (DSTAR)*, RPP-RPT-58441, Rev. 1
4. Letter 16-NWP-109, dated June 20, 2016, "Department of Ecology's (Ecology) Comments on the 2016 Double-Shell Tank System Integrity Assessment Report (DSTAR), RPP-RPT-58441, Rev. 0, dated March 2, 2016"
5. Letter 16-TF-0117, dated November 3, 2016, "U.S. Department of Energy, Office of River Protection Response to Washington State Department of Ecology Comments on RPP-RPT-58441, 2016 Double-Shell Tank System Integrity Assessment, Rev.0"

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