



HANFORD CHALLENGE PERSPECTIVE ON RECENT TANK VAPOR EXPOSURES AT THE HANFORD NUCLEAR SITE

February 12, 2010

In late January 2010, a contractor at the Hanford Nuclear Site in southeastern Washington State began pumping a high-level radioactive waste tank called Tank C-104. In a short timeframe, over a dozen workers reported being potentially exposed to hazardous vapors.

The large, underground waste tanks at the Hanford Nuclear Site contain some of the most toxic inventories of chemicals and radioactivity in the nation. Hanford is starting to transfer waste from some of the older single-shell tanks for temporary storage in newer, double-shell tanks. Eventually, all of Hanford's 177 waste tanks containing 53 million gallons of waste will be emptied and treated, and the waste mixed with glass.

Hanford's waste tanks are multi-layered and complex. Some 1500 chemicals have been detected in the gases and vapors that collect in the upper portion of the tank headspace. Many of these chemicals are known to cause adverse health effects, although little is understood about the health effects of mixing these chemicals together, even at low levels.

Whenever Hanford has conducted waste-disturbing activities, vapors are released to the atmosphere. There has been a decades-long controversy about the health impact of these vapors on workers, resulting in Congressional hearings, news media coverage, and independent investigations by DOE, NIOSH, the State of Washington and others.

During the most recent tank operations connected with C-104, over a dozen workers complained of exposure to very strong odors, accompanied by, in some cases, noticeable and demonstrable health effects. Most of the exposed workers were outside the controlled area of the tank farm perimeter at the time of the exposure. These health effects include raspy throats, nosebleeds, numb lips and gums, irregular heartbeat, tightness in the chest, metal taste, headaches, and a burning feeling in the lungs. Hanford Challenge has been receiving numerous communications from various sources about the recent series of vapor incidents since the start of the C-104 pumping.

Following the reports of exposures, workers were sent for medical evaluation. In one instance, an off-shift crew was sent to the local hospital (Kadlec) for evaluation since the Hanford medical clinic was closed. One worker, who suffered two exposure events, was given a chest X-ray which a doctor diagnosed as "abnormal," with a possible connection to workplace chemical exposure.

Six workers have filed claims with Washington State Labor and Industries for compensable injury under worker's compensation laws. All of the workers involved in these exposure incidents that suffered physical effects were outside the fenced-in area of the C-Tank farms when the exposures occurred.

The contractor, Washington River Protection Solutions (WRPS), took several stack samples (the emission point from the tank from where the vapors are emitted). Those samples indicated levels of elemental mercury were detected at twice the Occupational Exposure Limit, and that there were elevated levels of other contaminants as well. However, a small number of area and field samples did not find levels of contaminants above permissible limits for exposure.

To the contractor's credit, in response to the concern generated by the doctor's finding of a potential chemical injury, work was shut down at the site on February 2, 2010. As of this writing, February 12, 2010, work remains shut down, and is planned to be restarted soon.

Hanford Challenge is particularly concerned about the following developments since the advent of these exposures:

1. There is medical evidence supporting an injury from an exposure. However, the doctors who evaluated the medical symptoms of this one individual have apparently reversed their diagnoses following contacts from Hanford-site personnel.
2. Workers who reported to the Hanford Site medical clinic report that they were offered a psychological evaluation. Even assuming that this suggestion was made in good faith, it raises an implication that the symptoms are psychosomatic and not real, and raises questions about their fitness for duty – a direct threat to employment.
3. Many workers experienced physical symptoms, and yet the contractor was unable to detect harmful levels of chemicals in the sampling it undertook. This suggests that some workers may be more sensitive to chemical vapors than understood, especially the synergistic effects of 1500 chemicals. This calls into question whether the contractor's program is sufficient or complete. It also raises concerns that the presumed levels at which harm occurs is not well understood or conservative. This also raises questions about the approach of relying upon sampling as a method to protect workers.
4. The Chief Union Steward at the Hanford tank farms filed a Stop Work request on February 1 after the first wave of exposures in late January. Contractor managers overrode his Stop Work request in less than two hours, allowing work continue.
5. The six workers who filed worker's compensation claims are being investigated by the Hanford third-party administrator contractor, Penser, including criminal and financial background checks. Interviews with employees who have filed claims have been tape-recorded.
6. The contractor does not have actual real-time data for every chemical that might be present in the workplace, and must rely on lab sampling for ascertaining the concentrations of certain harmful chemicals. These tests can take as long as 50 days in which to obtain results. The contractor took seven site samples that were quickly analyzed for many chemicals up to a certain sensitivity level, and which were analyzed.

Hanford Challenge believes that the current set of responses to the worker concerns and exposures has resulted in a chilled work environment that discourages, and even punishes workers for raising health concerns associated with vapor exposures. We also note that some of these actions are beyond the

control and knowledge of the contractor, WRPS. For instance, the actions of the Hanford medical clinic, AMH, or of the third-party administrator, are beyond the contractual control of WRPS.

Workers are entitled to a response that considers and validates their experiences and aligns with what they see as reality. Telling a worker who has experienced a vapor exposure that all of the sample data shows chemical concentrations well below regulatory limits and that therefore there is no evidence of exposure is counter-productive. This repeats the patterns of past behavior, and suggests that workers' experiences are invalid, or worse. There have been workers who have suffered injury, illness, and received compensation and medical validation for their claims related to chemical vapor exposure. Saying there is no evidence of exposures is a disconnect.

Even though there is much that requires addressing, Hanford Challenge also recognizes that the Department of Energy and the contractor WRPS want to resolve these issues and acknowledge the complexity of the situation. Some things that are going well from our perspective include:

- There has been a good deal of transparency between the contractor, the government and Hanford Challenge on this issue, including numerous meetings and responses to questions.
- The DOE and WRPS have committed to a protective approach called "ALARA", or "As Low as Reasonably Achievable." Few companies in the United States have attempted this approach with chemical exposures, and we believe that this is the right direction. Some of the actions under this principle taken by the contractor include:
 - Limiting presence of workers in tank farm areas
 - Expanding control zones
 - Plans to install real-time monitoring on the stacks
 - Moving beyond a compliance mentality to one that seeks to minimize and hopefully prevent exposures
- There is a commitment on the part of the DOE and the contractor to long-term engineering solutions that remove the vapors from the work environment to the maximum extent possible.
- The messaging to the workforce is improving. In recent memos to the workforce about the C-104 incident WRPS has referred to worker experience of the incident as a "vapor exposure" instead of the usual claim that workers "smelled an odor." Though a small step, it is messaging like this on a larger scale that is needed to validate the vapor exposure reality.

Hanford Challenge recognizes that remediating the high-level nuclear waste tanks is important and necessary work that must be accomplished as expeditiously as possible. However, as this remediation proceeds, we all need to recognize that there are human health costs related to the cleanup effort, and that workers are taking most of this risk. Much is *not known* about the health effects of chemical exposures, especially chronic long-term effects on individuals who may be more susceptible to such effects. Therefore, a conservative approach to protecting workers is required, and when workers report health effects, such complaints should be heeded, work stopped, and the workers given independent evaluations, and, where necessary, compensation. The burden of proof should not be on the worker to show that they are hurt.

In addition to taking more aggressive measures to protect workers from chemical exposures, ensuring that all workers feel free to raise concerns about safety is critical to ensuring their safety. Attempts by

the Chief Union Steward to invoke stop work following the first set of exposures were too quickly overridden by management and fellow union officials. This is ironic since the company itself subsequently stopped work on its own shortly thereafter. Further, workers who presented with medical symptoms were asked to undergo psychological examinations, which throws doubt upon their veracity and stability.

Adding insult to injury, workers who filed worker comp claims are undergoing criminal and financial background checks simply because they filed a health claim. Management can reasonably expect that this presents a significant deterrence effect for worker to file concerns or claims. The combination of these events has resulted in an atmosphere of intimidation and fear. Workers are made to feel as if they are now targets for having raised concerns, with the end result of suppressing the expression of concerns. Workers should be encouraged to report their concerns and health effects, not punished .

Hanford Challenge offers the following recommendations:

1. All investigations of workers who have filed injury claims should immediately be halted.
2. Efforts to remove the chemical vapors from the work area through engineering controls should be intensified and implemented as soon as possible, as the first line of defense against exposures.
3. Work at the C Tank Farms should remain stopped until there is agreement among workers that they are being protected and their future concerns will be respected and taken seriously.
4. Independent medical evaluations should be offered, at the contractor's expense, to all workers who request them. All workers should be supplied with personal monitoring equipment.
5. Allegations of intimidation by medical or investigative personnel should be independently investigated and appropriately addressed.
6. WRPS and DOE should immediately seek expert help in responding to the vapor concern issues, and the conflicts between management and workers. Expert intervention is also needed to directly and forcefully act to reverse the messages that reporting exposures will lead to job jeopardy.
7. Since mercury has been detected at twice the permissible occupational exposure limits at the C-104 stack, the contractor should focus on improving mercury detection in real-time, and assuring that workers are appropriately protected from potential exposure to mercury.

Hanford Challenge will continue to closely monitor the ongoing chemical vapor exposure issues as work proceeds at Hanford.

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For more information and background on the Hanford's chemical vapor exposure history, Check Hanford Challenge's website at www.hanfordchallenge.org, Human Health and Safety page.