

**From:** Waggoner, Larry O

**Sent:** Friday, July 07, 2006 1:51 PM

**Subject:** ALARA Center Activities for Week of June 26 and July 3, 2006

**Attachments:** CH2M HILL-IB-06-020.pdf; SY-101 Tank.bmp

Visit our Website at <http://www.hanford.gov/rl/?page=974&parent=973>

1. Waggoner attended the Health Physics Society Annual Meeting and brought back some new information and lessons learned. Bartlett Nuclear Services and Radeco Air Sampling have offered to supply their latest equipment to the ALARA Center. Met several people from other DOE Sites and reestablished our network of sharing information. Forwarded Hanford ALARA Workshop registration info to three organizations that want to attend the workshop, which is July 18 and 19. Major topics of discussion at the meeting were: (1) Construction of 22 new reactor power plants in the United States, (2) Aging Health Physics Workforce, (3) Use of the MARISSM process to release rad work facilities, and actions needed in case there is a "dirty bomb" explosion. Attended a Physics class at Brown University and learned new teaching techniques that I will use in our ventilation training class. Some important things learned at the presentations that affect our future:

- With the construction of 22 new plants, there will be a greater need for Health Physics personnel.
- 50% of the existing Health Physics personnel will reach retirement age by 2010.
- The Health Physics Society intends to increase their scholarships to attract more students.
- Companies will lose their Health Physics personnel if they don't do something to retain them.

2. PFP Operations borrowed a can of HH-66 Vinyl Cement and a glue-on swipe box to repair a containment at Building 241-Z. Forwarded info on heat stress to CH2M manager working on improving Tank Farm operations. Attended ALARA Workshop meeting chaired by Owen Berglund. Plans are to set up on Monday July 17 and hold the Workshop on July 18 and 19 at the Clarion Hotel. Loaned an anemometer to personnel from ERDF so they can check ventilation flow direction during grouting operations. Received a Flic Cordless scanner Model HS 2142-51. Dan Powers will be using this to inventory all ALARA Center Tools and Equipment.

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#### FOR YOUR INFORMATION/LESSONS LEARNED

1. To read a lessons learned on Degradation and Failure of Stored Radioactive Material Containers and Packages see <http://www.eh.doe.gov/ll/HQlessons.html>  
To read about the **10 Principles and Ten Commandments of Radiation Protection** see <http://qecc.pnl.gov/10prin.pdf> This paper was written by Dan Strom from PNNL and is worth your time to read.

2. Received literature concerning the Websites for new industrial products.

- Adhesives/Sealants/Coatings See [www.Master-Bond.com](http://www.Master-Bond.com)
- Large Load Movers See [www.skarnes.com](http://www.skarnes.com)
- Spray Nozzles See [www.bex.com](http://www.bex.com)
- Safety Products See [www.cubicsafetyproducts.com](http://www.cubicsafetyproducts.com)
- Industrial Ducting Solutions See [www.novaflex.com](http://www.novaflex.com)
- Reinforced PVC Hose See [www.kuriyama.com](http://www.kuriyama.com)

- Vacuum Lifting Systems See [www.unimove.com](http://www.unimove.com)
- Maintenance Tips See [www.kanolabs.com](http://www.kanolabs.com)
- Hose and Ducting See [www.hitechduravent.com](http://www.hitechduravent.com)
- Drum Handling Equipment See [www.liftomatic.com](http://www.liftomatic.com)
- Specialized Radiological & Decon Services [www.icesolv.com](http://www.icesolv.com)
- Air Samplers [www.radecoinc.com](http://www.radecoinc.com) (NOTE: These samplers all have the Underwriters Lab listing)
- Quick Spill Recovery System [www.thespillpro.com](http://www.thespillpro.com)

3. D&D personnel might want to review the final D&D Report for the JANUS Reactor at Argonne Labs. Find it at <http://www.osti.gov/bridge/servlets/purl/563176-3rYPEv/webviewable/563176.pdf>. It lists several problems that were encountered and Lessons Learned. These include:

- Cutting Live Wires - (1) As-built drawings do not always reflect current conditions, (2) Procedure for wire removal needed more details, and (3) Remind personnel to stop work and notify management if conditions and events don't meet expectations.
- HEPA Filter Fire - (1) Install a metal spark arrestor in the HEPA vent intake, (2) Replace cloth prefilters with metal prefilters, and (3) Install household smoke detector at the exhaust of all HEPA units.
- Crane Damages Condensate Piping - During removal of floor plugs, a condensate line was damaged. Crane clearances need to be verified before using the crane.
- Wiring Problems - Wire attached to circuit breaker marked as a spare.

#### Noteworthy Practices -

- Air Conditioning eliminated heat stress problems. Ambient air temperatures dropped from 95 degrees F to 75 degrees F when a 20,000 BTU air conditioning unit was installed. Workers had been working 15 minutes and then resting 45 minutes. Cool Vests provided temporary relief but the air conditioning eliminated the heat stress conditions.
- Electric Powered Chain Saw Used to Segment Lead Block - A circular saw was tried first but depth of cut was limited and workers had trouble getting around corners. The chain saw worked well and the only maintenance was the replacement of several nylon sprockets. The chain did not require resharpening.
- Semi Remote Concrete Removal - Reinforced high-density concrete (270 lb/ft<sup>3</sup>) was extremely hard. Workers with jackhammers failed to do the job. Contractor brought in a BROKK 150 demolition machine with 750 lb jackhammer. A clear-walled containment was installed between the BROKK and the remote operator to provide clear vision, yet isolate him from dust and debris. Work with BROKK was complete in 3 weeks. An interchangeable bucket was then installed on the BROKK to scoop the rubble into waste containers. See [www.brokkinc.com](http://www.brokkinc.com)
- Frequent Safety Inspections - Argonne found that doing a monthly formal Safety Inspection was required at the beginning to help workers understand their commitment to safety. Near the end of the project, the frequency was reduced to quarterly

2. Read an article from Puget Sound Naval Shipyard that described a temporary roof system they were using over the top of nuclear submarines. They are using a Haki 750 Roof system that spans 40'. If you need this type of structure check out <http://www.haki.co.uk/news06.htm> and look under "Products".



3. New book tells story of Hanford's most notorious tank. See attachment on SY-101 Published by Battelle Press, *Hanford's Battle with Nuclear Waste Tank SY-101: Bubbles, Toils, and Troubles* tells the story of the origin and eventual remediation of the flammable gas hazard in Hanford's million-gallon double-shell tank 241-SY-101, a dominating element in DOE nuclear waste management for the last decade of the 20th century. The 462-page book was authored by Chuck Stewart, Environmental Technology Directorate. Chuck managed PNNL's activities supporting mitigation of SY-101's flammable gas releases and waste growth from 1993 through 2001. He currently supports PNNL's gas retention and release testing program in scaled process tanks for the Hanford Waste Treatment Plant. The book soon will be available in local bookstores and can be ordered directly from [Battelle Press](#).

4. Read the Lesson Learned at

[http://www.washingtonclosure.com/projects/safety/Docs/RCCC\\_06\\_0007\\_ALARA\\_Lessons\\_Learned.doc](http://www.washingtonclosure.com/projects/safety/Docs/RCCC_06_0007_ALARA_Lessons_Learned.doc) to see how a 75% reduction in dose occurred when workers applied ALARA Protective Measures to the handling of high-dose containers. Read the attached CH2M Lesson Learned on the dose saved during the removal of abandoned jumpers and debris from a valve transfer pit.

5. Need an instrument for detecting Tritium? Check out

<http://www.proteaninstrument.com/mpc9300.html>

Got Heat Stress? See

[http://www.occupationalhazards.com/safety\\_zones/30/article.php?id=7115](http://www.occupationalhazards.com/safety_zones/30/article.php?id=7115) and

[http://www.occupationalhazards.com/safety\\_zones/30/article.php?id=11808](http://www.occupationalhazards.com/safety_zones/30/article.php?id=11808)

Got Hand Injuries? See [http://www.occupationalhazards.com/safety\\_zones/39/](http://www.occupationalhazards.com/safety_zones/39/)

NIOSH has written a guide on how to select the best available ergonomically designed non-powered hand tools. Find it at: <http://www.cdc.gov/niosh/docs/2004-164/pdfs/2004-164.pdf> Recommend forwarding this article to workers who use hand tools. It's a good read for everyone.

6. The American Glove Box Society is holding its annual meeting in San Antonio on July 17-19. A vendor [Stanelco](#) will be present and will be demonstrating their plastic welder for transfer sleeves. We would appreciate anyone attending this conference to take a close look at this tool. It is supposed to eliminate the need for respiratory protection when doing bag-outs from glove boxes and is much faster than the horsetail methods used now. See

<http://www.gloveboxsociety.org/> and [www.stanelcopic.com](http://www.stanelcopic.com) We value your opinion so if you think it would improve glove box operations please contact the ALARA Center.

7. We started out with the goal this week of writing a 2-3 page document that would explain what everybody needed to know about puncture and cut resistant gloves. Fluor Hanford is emphasizing the need for better hand protection and radcon folks are concerned that if workers are cut while handling contaminated materials during D&D work they could get a high dose if they weren't decontaminated. We found out there are a lot of companies selling gloves and each one claims they have the best product on the market. There is so much information that it is easy to get confused and there is no way we could explain it in 2-3 pages. There is an ANSI Standard (ANSI/ISEA 105-2005) that was just recently issued on guidance for selecting the correct gloves that will protect workers. We understand the technical library at Washington State University has a copy and we will visit there on Friday. We searched 200 websites on the internet and found a document at [http://www.asse.org/practice/management/pdf/525\\_1.pdf](http://www.asse.org/practice/management/pdf/525_1.pdf) that seems like it provides some guidance to personnel trying to choose the right glove. Glove performance areas include cut resistance, puncture resistance, and abrasion resistance. The article also discusses gloves for handling chemicals, hot objects, flame protection and protection from cold temperatures. If you're trying to find a better glove to protect your workers, we recommend you read this article.

The lesson learned below describes a thumb laceration that occurred at another DOE Site. Had the cut been contaminated with Pu contamination, a high dose to the worker would have occurred if the cut wasn't decontaminated or the contamination surgically removed. Since we have several groups involved in D&D work that involve handling large amounts of debris that has been size reduced, there are many opportunities for workers to encounter situations where they are required to handle materials with sharp edges or burrs. Note: see the website listed above in section 5 on Hand Injuries. Fluor Safety and the ALARA Center are working on a project to familiarize all personnel with the products that are available to protect the worker's hands. We are accumulating several examples of the available gloves that have different cut, puncture and abrasion ratings and intend to show them, probably at the Presidents Zero Accident Council Meeting.

In general, looking at the glove samples we already have, the higher a glove is rated for protection, the less dexterity. Also, the higher the rating, the higher the cost. If you are considering purchasing better gloves, recommend searching for "Hand Protection" on the internet or contact a company that sells gloves and have their sales person demonstrate their products. The ratings for cut and puncture resistance are 1-5 with 5 providing the highest protection. Abrasion resistance has similar categories, except there are 6 categories.

**Thumb Laceration/Contamination at the Transuranic Visual Examination Facility (TVEF)** Lesson ID: 2006-SR-WSRC-0027B (*Source: User Submitted*)

**Originator:** Washington Savannah River Company

**Date:** 6/21/2006 **Contact:** WSRC TVEF - Charles Lewis (803) 557-8123

**Classifier:**

**Reviewer:**

**Statement:** There was a recent event at the Transuranic Visual Examination Facility (TVEF) at the Savannah River Site (SRS) that resulted in a thumb laceration. The event could have been prevented by following the facility's normal emergency response practices for radiological events, including:

- using outside RCO resources
- more emphasis on engineering controls
- more emphasis in assessments on nonradiological hazards versus radiological to provide worker and supervisor understanding of all hazards.

**Discussion:** On March 4, 2006, an RCO Inspector (RCI) covering the work in the secondary of TVEF sustained a laceration on the right hand thumb. The laceration occurred while the RCI was smearing/wiping down the blades of lopping shears in the open blade position. The shears are used to cut the pigtail that is made by twisting and taping the drum sleeve when a drum is prepared for removal from the TVEF glovebox.

**Analysis:** No matter how many times a task has been performed successfully in the past, the potential for an injury may still exist. Describing a task as being successful may overlook an at-risk element because the review focus is misplaced. Prior to performing work, it is essential that each worker deliberately evaluate all hazards associated with each task. It is also essential that every effort be made to eliminate or mitigate any hazard associated with performing the assigned work.

Everyone involved in the incident responded properly. The wiping down of the shears is a routine task that has been performed many times (probably in the thousands) without incident using this type of shear or other similar shears (see Attachment 2 for picture of shears). or similar shears pictured below. A specially designed type of shears from SRNL that are used at another SWMF glovebox operation were not in use in TVEF when this incident occurred. Both types of shears have intentionally sharp blades to facilitate an easy cut through sleeving.

This step is a recognized high potential release point for contamination. The wiping down and smearing of the shears is a routine step after the sleeving cut due to high probability of the shears being contaminated. The cut occurred during the second smearing of the shears by the RCI. [The RCI received the cut through the Massillon used to perform the smear, an outer pair of rubber gloves, surgeon gloves, and the cloth glove liners. After review of the task following the injury, a decision to require leather gloves as additional PPE was made.](#) Even though no prior injuries had occurred for this step, the step was considered to have been at risk in the past but had not been acknowledged as being at risk perhaps due to a false confidence based on no prior incidents.

An at-risk behavior may occur hundreds of times without incident before an injury. For this task the primary focus was for contamination control versus an injury potential. The risk potential had not been challenged by multiple observers and workers for thousands of drums processed based on the concern and focus for contamination releases for the pigtail securing and cutting. The PPE worn was inadequate for potential risk of a wrong technique, slip or distraction during the step of smearing the shears. A potential consequence of this step being performed improperly was major damage to a finger, including skin contamination and a radiological intake.

**A reminder that the Health Physics Society 2007  
Midyear Meeting deadline for the**

**CALL FOR PAPERS**

**is**

***Friday, July 14, 2006***

**Go to <http://www.birenheide.com/hps/2007MY/abstracts/> to  
submit an abstract**

**Health Physics Society**

**MIDYEAR TOPICAL MEETING**

**Knoxville Convention Center**

**Knoxville, TN**

**January 21-24, 2007**

**NOTE: They are hoping someone from Hanford or Rocky Flats will present a paper on the  
decon and demolition of hot cells. Anyone interested?**