

From: Waggoner, Larry O
Sent: Thursday, October 20, 2005 12:49 PM
Subject: ALARA Center Activities for Week of October 17, 2005

Attachments: Hanford History.doc; pic1.doc
Visit our Website at www.hanford.gov/rl?page=974&parent=973

1. Sponsored two personnel from GE Inspection Technologies (formerly Everest VIT) who displayed several of their video probes and pan/tilt/zoom cameras. Several facilities sent personnel to look at this technology. See info below on Olympus Industrial Video demonstration of their camera systems and high speed video systems. Found an excellent paper on remote viewing. "Remote Inspection Systems for Hazardous Sites" can be found at <http://www.osti.gov/bridge/servlets/purl/348933-Wlq8Td/webviewable/348933.pdf> This document has some very interesting sections on the problems with trying to see things remotely and it's worth reading. The paper describes attempts to inspect special nuclear material that is in long term storage using remote viewing. It uses virtual reality technology along with robotics.
2. Met with Eugene Kotchick concerning his plans to demonstrate a product called NuCap at HAMMER within the month. ALARA Center will provide two rusty 55 gallon drums so he can demonstrate how Nucap could be used to encapsulate a leaking drum. The Nucap is applied with an airless sprayer, which would make it much easier to apply than polyurea. The Nucap can also be applied as a foam, grout, or sealer. We are anxious to learn if this product is as good as their literature and salesperson claims. Time and date of the demo has yet to be determined.
3. Received a box of samples of the product "NoChar". This product has been used to solidify aqueous and organic liquid TRU waste at other DOE Sites and is acceptable at WIPP. The waste is solidified "at its point of generation" rather than storing it and treating it in larger batches. See www.nochar.com Forwarded brochures to PFP D&D Manager for evaluation. An SNF Operator stopped and took brochures and lessons learned on the Wachs Guillotine Saw. See www.wachsco.com He was looking for tools that could be used underwater. Sent him down the hall to tour the Plastic Shop.
4. ALARA Coordinator from LEF stopped by and discussed a problem they had with a movable hot spot on the back of a tanker trailer. Plan is to remove the hot spot by reaching down through a 3" opening. Introduced him to the GE Inspection Technology personnel who were conducting a demonstration at the ALARA Center. They showed them their video probe/retrieval tool.



Plan would be to bend some conduit and insert it into the tanker so the open end is near the high rad material. The video probe could then be inserted down the conduit and as it exits the conduit, it will be close to the location of the source. Once identified, workers could decide what retrieval tool would work the best. The retrieval tool is then operated by workers on top of the tanker trailer.

5. Traded two HEPA filters made from galvanized metal to D&D personnel working on the B Plant Canyon HEPA filter change. They gave the ALARA Center two newer HEPA filters with stainless steel frames. The galvanized filters are much lighter and are easier to mount in the containment walls and require less scaffolding underneath to support their weight. The filters will permit makeup air to enter the containment when the portable HEPA filtered exhaust ventilation connected to the containments are operating. T-Plant ALARA Coordinator and Radcon Supervisor stopped to look at protective clothing similar to a full apron to protect workers sorting waste. Gave them info on companies that make aprons and forwarded some websites with pictures. They took samples of disposable OREX Lab Coats to try an experiment. Plan is to test wearing them backwards, similar to a hospital gown and trim around the neck and back where the workers wear their PAPR.

6. T. Bradfield from Groundwater stopped by and discussed the methods PFP was using to decon gloveboxes. Referred him to M. Minette and A. Westra. They had heard about the "Glygel" process and thought it might work on decontaminating their drilling equipment. Provided him a sample of the Glygel final product that is vacuumed up after the chemical Glygel dries. It looks like "Corn Flakes".

Larry Waggoner / Jerry Eby
Fluor Hanford ALARA Center
(509) 376-0818 / 372-8961

VENDOR DEMONSTRATIONS

Olympus Video will be at the ALARA Center Wednesday, Oct 26 from 9:00 to 4:00 demonstrating their line of fiberoptics, borescopes and high speed video equipment. Some of their equipment is similar to what was shown this week by GE Inspection Technologies but they have brand new equipment that is entirely different as well.

FOR YOUR INFORMATION

1. Need anything made from plastic? The PFP Plastic Shop is now located down the hall from the ALARA Center at Building 2101-M (373-2668). It has several new sealers that reduce the time it takes to make items from plastic materials. The mission at PFP has changed and less containments are being fabricated for PFP. This means the Plastic Shop has more time to work on containments needed at other facilities. So if you need something made from plastic, bring your sketch and see the operators in Building 2101-M. They will quote you a price and an estimated delivery date. If you can't draw what you need, call the plastic shop and they can walkdown the job and create a sketch with you. See attached pictures taken at the Plastic Shop

2. The ALARA Center recently received excess personal clothing from West Valley DOE Site. The shipment included 22 pair of light blue TyChem 7500 coveralls that have elastic arms, ankles, and hood.



This chemical clothing has high tensile and burst strength, resistant to hydrocarbons and has been tested against Weapons of Mass Destruction Agents. It is not flame resistant.

632 pair of Plastic Wet Suits with elastic collars, wrists and ankles, exhaust vent in each calf and air hose/communication sleeve.

The shipment also included 25 HEPA filter and 46 prefilter bag-in/bag-out disposal bags, 126 46" x 72" yellow bags and 82 52" x 63" yellow bags. The yellow plastic bags were made by Lancs Industries. These products are in excellent condition and need a new home.

3. Los Alamos ALARA Center forwarded info on an Audio Guard device that can be programmed to provide warning messages to personnel who get within range of the motion detector. See <http://www.rubbermaidcommercialproducts.com/store.cfm?d=3030&c=8986&p=20277&do=detail> It can also have six pre-programmed messages. They intend display this device along with radiation warning signs to demonstrate that personnel could be warned by both a sign and a verbal message before entering restricted spaces.

4. Several workers have stopped in looking for better drum handling equipment for waste containers being retrieved from the burial sites. Recommended they look at these websites:

<http://downscrane.com/Products/Drum/Drum.htm>

<http://www.morsemfgco.com/>

<http://www.vestilmfg.com/dhequip.html>

http://www.materialflow.com/Drum_Handling_Equipment.htm

<http://www.seiequipment.com/>

<http://www.tseq.com/dhequip.html>

<http://www.easylifteqpt.com/rollhandling.php>

5. Hanford History: See attached article on the early days of Hanford.

LESSONS LEARNED

1. Last weeks report discussed a job at WRAP where workers were preparing to troubleshoot a hoist located inside one of their gloveboxes. An evaluation is on-going trying to determine whether the hoist can be fixed without entering the glovebox. Russell Lauber from Bechtel at the Waste Treatment Plant forwarded info on how a similar job was accomplished during D&D of a glovebox at West Valley. They

had initially tried to fog the glovebox with an aerosol fixative but there was too much ventilation. They finally drilled 1" holes in the top, bottom and sides of the glovebox and sprayed Polymeric Barrier System sealer into the glovebox and hoist using an orchard sprayer and coated all internal surfaces. The hoist was then removed by opening a side panel and sliding a box up to the hole that had a monorail the same as the one in the glovebox. Since the contamination was all "fixed", they didn't install a containment. The hoist was then placed inside the box and removed. Then they disassembled the glovebox and completed D&D. Forwarded this info to WRAP ALARA Coordinator and recommended one of the options to sending personnel into the glovebox would be to fix the contamination and remove the hoist.

2. Last Week's report also described lessons learned from Bechtel while using the BROKK Demolition Machine at the 105H Fuel Storage Basin. Kevin Funke, who now works for Bechtel-Jacobs at Oak Ridge forwarded more details about lessons learned using a BROKK. See www.brokkinc.com

Below is a listing of how doses were kept ALARA at the 105H Fuel Storage Basin, which was part of an old reactor plant undergoing D&D.

- Use of remotely operated tools/equipment to handle high dose rate items and suspect spent nuclear fuel (SNF) and processing of basin fill material. (Long handled tools, remote monitoring equipment such as the AMP-100 and Alpha Sentry CAM).
- Use of Brokk remote excavator to remove basin sediments from identified hot spot areas.
- Use of the long arm on the 365 Excavator to process and remove fill material from the basin without requiring personnel entry into below grade areas.
- Fabrication and use of concrete shields during loadout of suspect SNF from the Fuel Storage Basin (FSB) into the PAS-1 cask in preparation for shipment to K-Basin.
- Testing and use of advanced fixatives on the basin floor to minimize airborne generation during demolition and disposal.
- Use of soil to cover the basin floor during demolition activities to further minimize airborne generation and reduce personnel exposures during demolition activities.
- Better equipment was obtained to increase efficiency for reaching all parts of the basin. Examples of these are the 125' man lift and the 75 ton crane.
- Cameras were placed in better locations throughout the basin (and more of them), to make identification and inspection of high dose rate items and suspect SNF more efficient.
- Modifications were made to the Brokk excavator prior to the start of the 105H FSB cleanout phase to reduce breakdowns.
- High dose rate items were logged (e.g. dimensions, visual, photo, etc.) as they were found for characterization/disposal at a later time.

Equipment modifications to the BROKK:

At 105F FSB, it was recognized that the Brokk 330 as supplied by Brokk could be improved to meet our particular requirements and situations.

Electrical Power Cord

The electrical power cord was supplied with a spring-loaded reel mounted on the rear of the Brokk. The spring tension in the reel was not sufficient to maintain adequate tension in the power cord to enable it to either stay out of the way of the moving Brokk or to keep itself up out of the contaminated soil. From the first use of the Brokk in that FSB, a crane with a pulley attached to the hook was necessary to keep the power cord away from the moving Brokk and to keep it from being grossly contaminated by the material in the FSB. The crane with pulley worked sufficiently to perform the job but it was not an ideal situation, requiring both an expensive crane and an expensive crane operator to be on duty at all times while the Brokk was

being operated. Even with the crane support, the cable was caught in the operation a couple of times, both cutting the cable and interfering with the other necessary concurrent operations.

After the use of the Brokk at the 105F FSB, a vice president and chief engineer of Brokk Inc. visited Bechtel engineers and discussed some of the changes we wanted to implement. They approved of all our suggestions.

The first improvement was to procure an electrical supply reel with a high strength return spring that would be sufficient to keep the cable up out of the material and out of the way of the Brokk while it was traveling. The reel was removed from the Brokk unit and the new stronger reel was mounted to a flatbed trailer that could be moved to different sectors accommodating the Brokk anywhere in the basin. To attach the end of the power cable to the Brokk, a four-foot tall A-frame arrangement was welded to the top of the picking framework. The power cord, (which was supplied with the reel by the manufacturer and rated for the reel tension) was attached with a klemmum (Chinese finger style) cable anchor and clevis to the top of the A-frame. This enabled the cable to remain up out of the way of the Brokk and it did not touch the ground at any time. The cable reel worked very well and did not have any faults during its use at 105H FSB. If used outdoors, a Brokk equipped with a diesel-powered motor would be preferable to an electrical tether.

Camera System

Along with the power cable, the Brokk included a camera to supply power and video signals between the Brokk control chair and the Brokk unit. This cable was also held up out of the way with a crane hook while at the 105F FSB, but eliminating the crane support also meant eliminating the analog video cable. A digital camera system was purchased that included a 5.2 GHz wireless transmission and receiver system that eliminated the need for an analog cable.

The transmission system worked well, however, the pan and tilt system on the supplied cameras were not strong enough to endure the drastic actions and movements of the Brokk unit itself. This caused the belt drive systems of the pan/tilts to be repaired several times. The cameras were not affected, but the pan/tilt system should be modified for any future use of the Brokk.

Hydraulics

An additional problem at the 105F FSB was the abuse on the hydraulic hose that ran along the side of the boom and activated the various hydraulic cylinders and end attachments.

As supplied from Brokk, the hoses started at the valve body control block inside the machine and ran the total length of the boom to the end attachment. While digging between the concrete stem walls, the hoses would receive severe abrasions and cuts that would lead to failures. The total length of hose would have to be replaced which required extra time and energy to disassemble the machine and replace the hose (approximately 8 meters long).

At 105H FSB we installed brackets and bulkhead fittings and divided the hoses into three equal lengths with standard JIC fittings that could be quickly and easily changed. This resulted in all the hoses being the same size and length so one replacement hose could fit any position. The hose sections within the Brokk internals did not ever require replacement while working at the

105H FSB, but the boom end hoses were replaced several times, quickly and easily, with minimal downtime.

A continuing trouble spot is the remote hydraulic coupler that connects the boom to the end attachments. The female couplers are abused each time an attachment is changed, and if there is any dirt on them, the o-rings are scarred and start to leak.

The o-rings are not available separately and the female couplers are only available from Brokk in Sweden, so the price and the lead-time are excessive. The coupler was specially designed in Europe and no dealers are available here.

Equipment Options

Many options supplied with this unit were not necessary or not utilized.

- The silicone coated hydraulic hoses were extremely expensive and provided no additional value and were replaced during the 105H upgrades.
- The stainless steel cover was very sharp on the edges and caused a first aid call.
- The metal sheer, the hammer, and the large grapple were never used.
- **The lifting ball was essential and used often.**

You can also read reports about the BROKK,manipulators and end effectors at :

<http://apps.em.doe.gov/ost/pubs/itsrs/itsr2938.pdf>

<http://www.osti.gov/bridge/servlets/purl/272556-uAcXSf/webviewable/272556.pdf>

<http://apps.em.doe.gov/ost/pubs/itsrs/itsr2100.pdf>

<http://www.osti.gov/bridge/servlets/purl/750121-phWUIt/webviewable/750121.pdf>

SCHEDULE OF UPCOMING EVENTS THAT CONCERN RADIOLOGICAL OR D&D WORK

Beryllium Particulates & Their Detection Salt Lake City 11/08 -11/09, 2005

World of Concrete Las Vegas 01/16 - 01/20, 2006

International ALARA Symposium Lake Buena Vista, FL 01/16 - 01/18, 2006

Health Physics Society Midyear Meeting Scottsdale, AZ 01/22 - 01/25, 2006

Waste Management Symposium Tucson, AZ 02/26 - 03/02, 2006

Health Physics Society Annual Meeting Providence, RI 06/25 - 06/29, 2006