From: Waggoner, Larry O
Sent: Thursday, September 22, 2005 10:42 AM
Subject: ALARA Center Activities for Week of September 19, 2005

Attachments: bag com.doc; lube-group.jpg; EPRI-ISOE ALARA-2005 (1).pdf
Visit our Website at www.hanford.gov/alara/index.cfm

1. Met with salesrep from Olympus Industrial Systems who demonstrated their line of fiberoptic and borescopes. These units have the capability of taking remote precise measurements and can be connected to wireless internet. Personnel interested in remote viewing should contact Brian Collier at (206) 465-6568 or email brian.collier@olympusindustrial.com. Forwarded brochures to PFP and FFTF D&D organizations.

2. Forwarded message from T Plant ALARA Coordinator to PFP D&D personnel concerning a scabbler that T Plant no longer needs. PFP has some scabbling to do on the floor of their Scrubber Room. After discussion, it turns out the scrubber room is very small and the scabbler is a larger, walk-behind model. PFP is ordering a Desco scabbler. Anyone else needing a larger scabbler should contact Dave Andrews at 373-0815. Forwarded request to other DOE Sites to obtain a copy of their material release procedure. FH Central Radcon is going to streamline the procedure we are presently using. Received replies from INEEL and West Valley so far.

3. Forwarded a recommendation from Columbia Basin Hotsy to Tank Farms Operations to see if they were interested in testing a Hotsy Pressure washer. Recommendation was to test the Hotsy to see how effective it might be at decontaminating the internals of risers that extend above underground tanks. They offered to supply the Hotsy and a technician at no charge. Tank Farms Radcon used the glove bags at the ALARA Center to certify RCTs on their OJTs for glove bag operations. Workers from 222-S Labs stopped by to look at the portable safety rails manufactured by Bluewater Manufacturing and sold by National Safety. Rails on display were exactly what they needed. See www.bluewater-mfg.com.

4. Provided brochures and samples of cutting fluids to PFP Operators preparing to cut piping in the Scrubber cell. Earlier, testing by PFP engineers at the ALARA Center found that we could double the number of cuts if we used the Boelube instead of cooling the saw blade with water. Gave them a paper from the PFP chemist that approved the use of BoeLube (now called Prolube) in PFP gloveboxes. They will probably purchase the stick lubricant and use saws-alls and porta-band saws for most of the work. The lubricant is sold by CS Unitec at www.csunitec.com. See attached photo. They are also interested in the tools sold by CS Unitec that mount to the piping with clamps. After the tool is attached to the clamp, all the worker has to do is push or pull on the saw. The weight of the saw is borne by the clamp. This reduces worker fatigue, which is especially important when wearing the multiple sets of protective clothing and respiratory equipment that will be required to work in the Scrubber Cell. Another advantage to the CS Unitec tools is they have blades that were developed for cutting stainless steel.

5. Received call from INEEL Radcon concerning the types of gloves being worn to handle waste drums being recovered from burial grounds. Set up a conference call with SWSD (T. Haan)and WRAP(J.Parson & C.Wielang). SWSD wears leather gloves when handling the drums. After they are connected to the WRAP gloveboxes workers use leaded gloves and either wear Kevlar gloves under or over the leaded gloves. The Kevlar gloves are worn over the leaded gloves at those locations where the objects being handled are most likely to puncture the glove. The thickness of leaded gloves varies within the glovebox, depending on what type of waste is being handled and whether it could puncture the glove.

6. Forwarded photos of Fog Cannon being used at 233-S to Wash Group ALARA Coordinator. Met with SWSD Radcon Manager and went over final design of a lifting bag that will be placed around drums found in the burial ground that are in danger of separating when touched. Design was developed with input from all trades involved with recovering the drums. Lanc's Industries will fabricate two bags at no

charge for workers to test. Forwarded picture of a drum previously found in the burial ground that was in poor condition.

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

FOR YOUR INFORMATION

1. Found a chapter from an ASME Publication on D&D concerning "Dismantlement" of Facilities. It can be found at http://www.asme.org/pro_dev/D&D/Ch18.pdf. The Concrete Sawing and Drilling organization is holding their 34th annual conference in Charleston, SC in January, 2006. The "World of Concrete" Conference has many presentations concerning concrete and includes methods of removing concrete structures during D&D. If you're planning future work involving the dismantlement of concrete structures, you might want to attend this conference, meet the vendors and see demonstrations of the tools and equipment. See http://www.csda.org/displaycommon.cfm?an=1&subarticlenbr=231

2. Designed a glovebag that can be used in a horizontal position (i.e. decontaminating the floor or removal of asbestos floor tile) or a vertical position (decontamination of a wall or work on equipment attached to a wall). The glovebag has a flange that can be used to tape or glue the glovebag to the surface. Dimensions of the glovebag are 24" x 30" x 14". After installation, the back wall can be cut out to expose the surfaces to be worked on. Once the work inside the glovebag is complete, the glovebag can be moved to the next location and a new surface worked on. The frame shown in the pictures was constructed from PVC fittings and 1/2" and 3/4" PVC pipe at a cost of about $17.00. Photos of the glovebag and frame are attached. Lanc's has assigned a model number of LI-300-LW1 to this glovebag.

3. A few years ago the Mound site used Nochar Petrobond (Tech ID 2313) to solidify titrated and heavy-metal-laced mixed waste oil that was used in vacuum pumps that supported glovebox operations. Their inventory was 1,700 gallons of oil containing an estimated 50,000 curies. Read about this product and the success Mound had at: http://www.p2pays.org/ref/14/0_initiatives/init/spring01/nochar.htm DOE has an Innovative Technology report that has more details on the cost and performance of this product. This report can be found at www.apps.em.gov/ost/. Click on "Reports" and then scroll to the third category on Innovative Technology Reports. Select "All Reports-Alphabetically" and scroll down the list of ~180 reports to "Nochar Petrobond Absorbent Polymer Titrated Oil Solidification". A presentation given at the Waste Management Symposium in 2001 can be found at: http://www.wmsym.org/Abstracts/2001/19/19-7.pdf A 100 page report from Savannah River that compares the performance of six similar products can be found at http://sti.srs.gov/fulltext/tr2001526r1/tr2001526r1.pdf See Attached paper on Nochar. For additional info, call Charles Pietsch at (434) 384-8099 or email cpietsch@chamberlaingroup.net.

4. Last weeks report gave the incorrect spelling and email address for Eric Tchemitcheff. His email is eric_tchemitcheff@rl.gov. Eric is working to bring new technology on site and can provide info on engineered controls used for radiological work in France.

5. **Respiratory Protection Incidents**. Several serious respirator failures have occurred during this calendar year at DOE Sites. Multiple events occurred where respirators actually fell apart in service. Due to these problems, DOE issued a bulletin to highlight recent respirator failures in the DOE Complex. This bulletin can be read at http://www.eh.doe.gov/paa/safety_bulletins/2005-14.pdf Respiratory protection is a vital tool for safe work in hazardous and contaminated atmospheres, and respirators are widely employed in accomplishing the DOE mission. Part of the action from the Bulletin requests Site managers to review their respiratory protection program to ensure it complies with DOE O 440.1A. The new Site Technical Authority for Respiratory Protection is Al Lilly, who has replaced Cliff Ledford. Al's phone is 376-0776.

6. Safety Info - See http://www.eh.doe.gov/paa/oesummary/oesummary2005/OES2005-12-screen.pdf The article on page 10 describes several incidents that have occurred that resulted in the loss of life or damage to equipment. Everyone is encouraged to read this article.

NEW PRODUCT

Inflatable Shelter - Bartlett is an authorized distributor of FSI's decon showers and inflatable shelters. See https://www.safetysystemshawaii.com/pdf-catalog/Haz-Fire/decon.pdf These portable units come in a wide range of configurations and sizes. Possible uses include temporary training or processing facilities, shelters and safe rooms. They can be equipped with decontamination shower systems to form quickly deployable clean decontamination centers. Compressed air inflates the shelters in 1 to 8 minutes, depending on size. Contact Bartlett at (800) 225-0385 or www.bartlettinc.com.

LESSONS LEARNED

Use of Ground Penetrating Radar to See Through Concrete

In the past, we have used Ground Penetrating Radar to locate burial grounds and services. If you're doing D&D work, this technology may help you determine the location of piping and rebar before you start to demolish concrete.

It used to be that the only person who could see underground and through concrete slabs was Superman, but now contractors are able to see underground and through walls, floors and other materials usually inaccessible to the human eye with the help of Ground Penetrating Radar systems.

Ground Penetrating Radar (GPR) systems are used to non-destructively explore the subsurface of the ground for a wide variety of industries and to inspect infrastructure systems. These systems are used in the construction industry to allow contractors to precisely locate reinforcing, electrical conduit, water and sewer lines, and voids in and below a concrete slab. This technology is much safer than X-rays and can be performed without disturbing surrounding areas or occupants of structures.

GPR works by transmitting pulses of ultra-high-frequency radio waves into the ground or other material through a transducer or antenna. The transmitted energy is reflected from buried objects or evident contacts between different earth materials. The antenna then receives the reflected waves and stores them in the digital control unit. GPR waves can reach depths up to 100 feet in low-conductivity materials like dry sand or granite. Clays, shale and other high-conductivity materials may weaken or absorb GPR signals, which can limit the depth of penetration to three feet or less.

A number of CSDA members have recently begun to employ this new technology, including Ground Penetrating Radar Systems, Inc. (GPRS), a subsidiary of CSDA member Ohio Concrete Sawing and Drilling, Sylvania, Ohio. GPRS recently employed the GSSI Structure Scan GPR system for a job at the Westin Hotel, which is currently under construction in the recently completed McNamara terminal of the Detroit Metro Airport. Matt Aston, president and owner of GPRS, said he was chosen for this job because he offered the only technology available that was safe and efficient for this job.

During construction of the hotel, Pace Mechanical, the mechanical contractor for this job, made some changes for the location of the plumbing beneath the concrete floors in the hotel. The changes required that 400 new holes be drilled in the floor. The floors were threaded with post-tensioned cables for structural reinforcement of the building. It was vital that these cables not be cut during the drilling process. Post-tensioned cables can hold up to 100,000 pounds of tension and, if severed, the release of the tension would force them to break out of the concrete floor and cause severe structural damage to the building. GPRS was contracted to map out each area the contractor wanted to drill in and create grids to show where it was safe to drill and where it was not.

Aston performed the scan with a GPR system in 404 rooms of the hotel, covering a total of about 6,400 square feet between March and August. Aston mapped out each four-by-four-foot location by first rolling the antenna of a GSSI Structure Scan over the floor to detect any steel cables. Detected cables were visible on the Structure Scan screen. He marked each discovery on the floor and repeated this process numerous times within each 16-square-foot area. He then “connected the dots” to create grids on the floor. Aston mapped out 400 locations during the course of this job, taking about 30 minutes to map and double check each location.

“There is a learning curve, but once you get to the peak of that curve, I found the system itself pretty easy to use,” Aston said.

Another CSDA member that has recently begun to employ the Structure Scan and GPR technology for its clients is Construction Solutions, Olathe, Kan. Rick Norland, P.E., general manager of the Construction Solutions division at Diamant Boart, Inc., recently returned from England where he completed a GPR scan on a decommissioned graphite pile nuclear reactor. The graphite pile had survived a fire many years ago, but the flames left it structurally unsound. When burned, graphite becomes spongy and porous like charcoal. The general contractor for this job contracted Norland to perform a GPR scan to determine the structural integrity of the graphite pile prior to commencing demolition work.

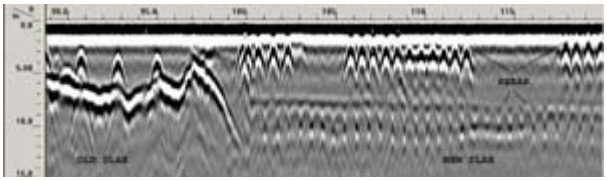
Since radiation levels would increase steadily the further the operators delved into the pile, quick reactions to structural changes were necessary to avoid prolonged exposure. The contractor needed to know all the structural details of the graphite pile before they began deconstructing it so they would be prepared for any structural circumstance they encountered.

Since GPR technology had never been employed to scan graphite, Norland constructed a test structure using eight two-foot by eight-foot graphite bricks left over from construction of the reactor. Using the GSSI Structure Scan, Norland found he was able to see considerable detail in the graphite including voids within the graphite bricks, the cooling chase (hollow core inside the graphite) and gaps between the graphite blocks. After completing this highly-successful test scan, Norland recommended that he conduct a full scan of the graphite pile and create a three-dimensional computer model to illustrate what is present within the pile. Norland is currently waiting to see if the contractor chooses to contract for a full scan.

“Structure Scan and other GPR devices are not something the average contractor can go out and buy, use and be happy with the results,” Norland said. “The post-processing software is not user-friendly and requires

considerable training and a high degree of computer knowledge to use. Individuals who want to conduct GPR scanning must dedicate themselves to this task 100 percent," he said.

Todd Forbush, has been working with a GPR system as an independent contractor working with CSDA member Constructions Solutions as a field technician.

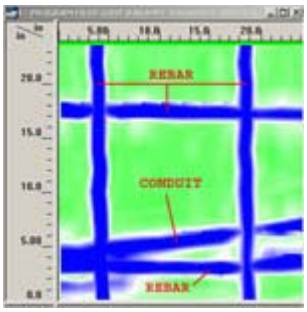


"Not only do you need personnel dedicated to learning the technology and performing the work, but also a commitment to exploring the variety of potential applications," Forbush said. After his initial GPR training, Forbush spent several weeks practicing with the technology in as many different applications as possible. "In the radar manufacturer's training program, they had us practice identifying as many different media as possible: concrete, asphalt, steel, pvc, dirt, air, etc. So, when I was on my own to practice, I followed the same format and looked for as many different and unusual applications to develop my skills."

Forbush points out that sometimes contractors may need to look for what is beyond the concrete, not just what is embedded in the concrete. Forbush recently found this to be true on a job in he performed in Norwood, Ohio. A utility contractor was excavating to replace old water lines in a residential sub-division. The blueprints used by the city to identify the old lines were not completely accurate, which resulted in waterline damage during excavation that caused expensive downtime and unplanned repair costs. Forbush used a GPR system to scan an area of the project scheduled for future excavation and indicated where the GPR showed variations of the existing waterline from the blueprint layout.

Tony Burnett has been using GPR technology for a little over one year, and has also used the Structure Scan to scan concrete slabs, floors, walls and bridges to locate plumbing, piping, voids and other anomalies. He has used GPR under conditions ranging from 35 degrees Celsius to negative 35 degrees Celsius. Recently, Burnett used GPR technology to scan the concrete floor of a warehouse in Winnipeg. Burnett conducted the scan to determine the structural integrity of the surface. This was important to warehouse employees who frequently drive heavy machinery across the floor. Burnett sampled sections over a 6,000-square-foot area to determine where voids existed beneath the surface; areas drivers would have to avoid in the future. The entire project took Burnett less than a day to complete.

"The nice thing about radar is that you can scoot along at a pretty rapid pace," Burnett said. "I have found GPR to be a very versatile, non-intrusive, non-destructive method of investigation. To date, the degree of accuracy of the information we have been able to provide our customers is amazing." Burnett hopes to see GPR technology in the future that would not require working on his hands and knees. "There are always areas for improvement," he said. Both Burnett and Norland said they find new ways to use GPR technology every time they go out on a job.



David Gronemeier, president and owner of Gronemeier Concrete Cutting Inc., Bloomington, Ill., has been using GPR for about three months. Recently he employed a GPR system to locate radiant heat tubing in a warehouse floor. An Illinois-based home decorator manufacturer contracted Gronemeier to perform GPR scans in the concrete floor of their warehouse. The company wanted to create a 12-inch by 20-foot by 1.5 inch-deep trough in the floor for slurry run-off from the production of granite countertops. They also wanted to install anchors for their equipment and erection of walls. The floor was known to be embedded with radiant heat tubing, which needed to be located prior to cutting for the trough and installing the anchors. The company also needed to be sure the tubing was a least two inches below the surface. Gronemeier

performed about 40 line scans over a 20-foot by 40-foot area with a Structure Scan to determine the location and depth of each section of tubing. He scanned the area, marking the location of any tubing in each area as he went. Then, he was able to map out the pattern of the tubing to let his clients know where it was safe to cut.

Gronemeier found one anomaly less than two inches beneath the surface that, after performing a detailed analysis using the GPR software, he found to be rebar that could not be avoided. Gronemeier also performed a more detailed scan and analysis of another section of the floor that was chosen to be the site of installation for a new sump pit.

"I have found the equipment to be very user friendly and with the three-dimensional capabilities, it gives you a real intuitive feeling for what is in the concrete. I think it is becoming a real asset to my company's capabilities," Gronemeier said.

Other CSDA members who have successfully employed GPR systems include Ohio Concrete Cutting and American Concrete Cutting.

Resources:

Construction Solutions
Olathe, KS
Tel: 913-928-1149
Fax: 913-438-7945

Di-Tech International, Inc.
Winnipeg, Manitoba
CANADA
Tel: 204-222-7400
Fax: 204-222-9933

Gronemeier Concrete Cutting
Bloomington, IL
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(309) 829-2685

Ground Penetrating Radar
Sylvania, OH
(419) 843-9804