MONDAY - AM

1. "Fixatives Used for Contamination Control at Hanford", Greg Perkins, Fluor Hanford

In this presentation, the various fixatives used for contamination control at Hanford, how the fixatives may be used and applied and other points that may assist in a decision as to which fixatives may be best for a specific application will be discussed. A handout will be provided to the attendees whom will consolidate the information provided in the presentation as well as where the various fixatives may be procured.

2. "HDB8 Jumper Repair", B. D. Higby, WSRC

We were tasked with repairing an HDB8 Jumper: repairing the valves and replacing the connector gaskets. A portable acid flushing system was used to remove as much internal contamination as practical. The acid flushing resulted in lowering the whole body working rate from 1 Rem to 200 mrem at the valves. Lead blankets were placed on the valves and connectors prior to making the acid flushing hookups and valve disassembly. The Jumper gaskets were changed prior to flushing which resulted in lowering the whole body working rate from 100 mrem to 30 mrem at the connectors. Personnel moved to a low dose area when not performing the work. The time that it took to reassemble the valves was reduced by preassembling the valve bonnet and stem assemblies in a clean area using new parts. The QA and welding inspections were performed from a clean area using the remote camera in the decontamination cell.

3. "Recovering a 1521 Curie Cobalt Source in a Very Unique Situation", Fred Ogden, WSRC

Subcontract personnel were in the process of transferring sources from the Gamma Beam Irradiator source carousel to the spare storage carousel so that maintenance could be performed on the carousel system. During the transfer of the highest activity GBI source (1521 Curie Cobalt 60 source) to the shipping/transfer cask, the source became lodged in the cask transfer drawer (below the normal position). The source was lodged approximately 2" from the rear of the 20" diameter transfer cask resulting in a Very High Radiation Area (200 R/hr) at the rear of the cask and rate greater than 100 mR/hr in the room. Several major challenges had to be overcome to recover the source with ALARA principles in mind. This presentation will cover the concentrated efforts from several organizations and ALARA measures used to maneuver the source to a safe position with a total dose to the workers of 13 mrem.

4. "ISMS AND ALARA GO HAND-IN-HAND", T. R. Crowder, WSRC

Through the implementation of the ISMS process and ALARA, a solution of simplicity was devised to perform radiography of concrete and steel TRU waste casks. Instead of attaching the radiography film directly to the waste casks, which could take up to thirty minutes of close contact, the film was attached to modified carts in a low background. To position the film for radiography, the carts were rolled into position adjacent to the cask. This resulted in a reduction of time spent near the radiation source and an increase in distance from the source.

5. "Repair of Defense Waste Processing Facility Contaminated Vessel", James T. Gee and John R. Neuville, WSRC-DWPF

Several million dollars were saved by the successful return to service of a repaired vessel at the Defense Waste Processing Facility. The vessel was highly contaminated after years of service in a process that contains radioactive slurry. The vessel was moved to a cell where decontamination could be performed by remote control equipment. The residual vessel content was de-inventoried, and internals were cleaned by a rotary tank cleaner. The vessel was then moved to a remote entry cell where a repair plan was developed to repair a hole and reinforce thinned areas on the tank bottom. Personnel exposure was reduced during the repair by installing lead shielding and partially filling the tank with water.

MONDAY - PM

6. "ALARA Measures used to Prepare Building 244-AR at Hanford for D&D", Larry Waggoner, Fluor Hanford

Building 244-AR had four radioactive waste tanks containing 19,000 gallons of highly radioactive liquid that had to be removed before the building could be turned over to the D&D Contractor. High levels of contamination existed in the building and the HEPA filtered building ventilation was no longer operational. The tanks were located in cells below the floor. Normal access to these tanks would be to lift five foot thick concrete blocks with the building's bridge crane. This crane could no longer be used and there was no other method available to lift the blocks. This presentation will cover the innovative ALARA measures used to obtain access to the tanks and remove the liquid from the tanks.

7. "SRS Visual Survey Data System Implementation and Anticipated ALARA Contribution", Russ Morgan, WSRC

Savannah River Site (SRS) is implementing commercial software to document radiological surveys electronically including electronic approvals. In-house software will automatically capture completed, authenticated survey records and transmit them to the site records organization. SRS is adapting to the format and symbol conventions in the commercial product, but some software features required modification to support SRS radiological operations. Because SRS is large, site areas and buildings are grouped into 23 "facilities" to be served by 6 software instances on one server. The implementation involves two pilots and a phased rollout over 6 months. Positive contributions to ALARA are anticipated.

8. "Experience Monitoring for Low Level Neutron Radiation at the H-canyon of the Savannah River Site", Mark Hogue, WSRC

An important radiation protection regulatory requirement is that personal dosimetry be provided where an individual can receive an effective dose equivalent to the whole body of 0.1 Rem (0.001sievert) or more in a year. For a working year of 200 hours, this translates to a dose rate of 0.05 mrem/hr (0.5 µSv/hr). This can be a challenging requirement for neutron exposure because traditional survey methods with shielded BF3 proportional counters are difficult to conduct, particularly at low dose rates. A modified survey method was developed wherein an unshielded He3 detector was used to find elevated gross slow neutron counts. Areas with high count rates on the unshielded He3 detector were further investigated with shielded BF3 proportional counters and thermoluminescent neutron dosimeters were placed in the area of interest. An office area was investigated with this method. The data initially suggested that whole body neutron dose rates to office workers could be occurring at levels significantly higher than 0.1 Rem (0.001sievert). The final evaluation showed that the office workers were exposed to much less than the target levels.

9.0 "Deactivation of H-Canyon's Section 9 Tunnel", Deborah Solomon, WSRC

After many years of dealing with H-Canyon's Section 9 Elevator, (H-Canyon's Pandora's Box) a decision was made to completely remove the elevator from service. The elevator served as a cavity for leaks in both the Hot and Warm Canyon to deposit into. As a result of the leaks, high levels of contamination and high radiation rates were observed. H-Canyon Team concluded it was not a good ALARA practice to continuously subject our personnel to the previously mentioned hazardous radiological conditions, and it was not very cost effective we utilized fixative coatings and remote monitoring to allow us to lay-up the elevator in a safe manner. This presentation will discuss the history of the elevator and the actions H-Canyon took to reduce/eliminate this hazard.

10 & 11. "ALARA Measures Used to Move Pump Pit 6 Agitator at SRS", Steve Shuford - John Gall - Dean Thames, WSRC

Pump Pit 6 at Savannah River Site contains a pump tank through which high curie waste from H-Canyon had been pumped for several decades. This pump tank contained an agitator which was designed to maintain the solids in solution. However, the agitator had not functioned in 20+ years. In order to support new process needs this agitator had to be removed from the pump pit and pump tank. Since the agitator had not functioned for such a lengthy time there were concerns that solids could have accumulated on the agitator and/or accumulated in the bottom of the pump tank. In addition to these concerns, previous pump pit work activities had resulted in contamination events. The plan developed for the work involved innovative dose profiles and dose modeling, remote monitoring, fixative coatings, flushing methods as well as a remote method that would be developed to remove the agitator successfully. This presentation will detail the engineered controls and work practices used to move the agitator without spreading contamination or exposing personnel unnecessarily.

12. "Melter Bellows Cleanout", H. M. Bolen, WSRC

In November 2004, workers at the Defense Waste Processing Facility (DWPF) were tasked with manually removing glass from the melter bellows. Normally a remote operation, this was a first-time evolution that required creative solutions to minimize worker dose. The glass removal required workers to work through ¼" wide by 1" long slits located four inches inside the bottom opening. ALARA principles of time, distance, and shielding saved 15,000 mrem extremity, 4,500 mrem skin, and 650 mrem whole body cumulative worker dose.

13. "Tank 34 Jet Replacement Containment and Cutting Methods", Charles Cothran and Pat Parsons, WSRC

Tank 34 primary use is for storing and processing radioactive waste. One of the primary movers of the waste are Transfer Jets. In the event a Jet stops its normal transfer capability a work package is approved for the repairs with work instructions identifying the required task. Due to the Tank Farm being an outside facility, engineering controls are vital in preventing the spread of contamination and reducing the personnel exposure. During the repairs/ replacement of these Jets an engineering control method has been developed referred to as a sleever. Due to the high expected dose rates improvements were made on this sleever along with tools to complete the task.

14. "Radiological Design Process at the Savannah River Site", Laurie Taus, WSRC

This presentation will review how radiological protection requirements are incorporated in the design of new and modified facilities at SRS. It provides the bases used for design, how the process is integrated with the Site Engineering organizations, and the radiological concerns addressed in design.

15. "Tritium Extraction Facility (TEF)", Marvin Barnett and Joye Brotherton, WSMS

The primary mission of the TEF is to extract tritium from tritium producing burnable absorber rods (TPBARs) that have been irradiated in a commercial light water reactor and to deliver tritium-containing gas to the Savannah River Site Facility 233-H. The tritium extraction segment provides the capability to deliver three (3) kilograms per year to the nation's nuclear weapons stockpile. The TEF includes processes, equipment and facilities capable of production-scale extraction of tritium while minimizing personnel radiation exposure, environmental releases, and waste generation.

TUESDAY - AM

16. "Decontamination Techniques and Fixative Coatings Evaluated in the Building Legacy Source Term Removal Study", W. E. Farrell (presenter), C. G. May and R. S. Howell, WSRC

SRS Building was being considered for future plutonium storage and stabilization missions but the DNFSB noted that large quantities of Plutonium-238 left in cells and glove boxes from previous operations posed a potential hazard to both the existing and future workforce. This material resulted from the manufacture of Pu-238 heat sources used by the NASA space program to generate electricity for deep space exploration satellites. A multi-disciplinary team was assembled to propose a cost effective solution to mitigate this legacy source term which would facilitate future DOE plutonium storage activities. One aspect of this study involved an evaluation of commercially available radiological decontamination techniques to remove the legacy Pu-238 and fixative coatings that could stabilize any residual Pu-238 following decon activities. Four chemical decontamination methods were identified and will be presented. Short and long term fixatives and encapsulates will be reviewed with particular attention to the potential radiation damage caused by Pu-238, which has a high specific activity and would be expected to cause significant radiation damage to any coating applied.

17. "Deactivation and Disposal of a Pipeline Potentially Contaminated with Uranium Hexafluoride (UF6) at the Savannah River Site (SRS)", Joe Santos, WSRC

Building 247-F at SRS was designed and constructed in the 1980s to produce nuclear reactor fuel using UF6 as the feed material. The facility is currently undergoing Deactivation and Decommissioning. During work planning for deactivation of the UF6 processing system, a sealed section of pipe requiring removal and disposal was identified. This pipe was determined by non-destructive assay to potentially contain up to 150 grams of UF6, which, if allowed to escape containment would react with the water vapor in the air to form hazardous HF gas. Therefore, the requiring breaching of the line could result in adverse worker health effects, ranging from respiratory system irritation to fatality. This hazard necessitated the development of administrative and engineered work controls to safely remove the line. An innovative low cost containment system was designed to capture and stabilize any radiological and chemical constituents generated during the line removal. The line was safely removed and discarded as low level radioactive waste. Continuous air monitoring for HF emissions during the evolution detected none.

18. "Hot Cell Clean-out Using a Tracked Robot", R.E. Thornhill and T. L. Reining, Battelle Pacific National Northwest Laboratory

PNNL recovered and disposed of approximately 63ft^3 of high dose radioactive waste (failed equipment and debris) from six Hot Cells using a tracked robot. The work was conducted remotely using CCTV's inside a containment constructed around one of the Hot Cell shielded access doors. The wastes were transferred from the Hot Cells into shielded boxes staged inside the containment. The unique containment design allowed the shielded waste boxes to be staged and recovered after loading without staff entering containment. This approach resulted in an order of magnitude reduction in staff radiation dose compared to previous Hot Cell clean out evolutions.

19. "Processing of Neptunium Oxide", S. Wheatley, WSRC

Processing of Neptunium Oxide was a first time evolution for the HBL Facility. Extensive radiological planning and preparations went into this new campaign considering the high dose rates. Due to the in growth of protactinium, Health Physics Technology performed a dose assessment which provided operations personnel with projected exposures. Baseline surveys were performed in predetermined locations. Specialized engineering controls were developed to reduce the expected dose during specific evolutions of the process. A combination of specialized dosimetry was utilized to tract individual exposure. The dose received by personnel has been roughly 1/3 of the expected dose. This can be attributed to the shielding of the work area and to the proper "worker technique" being exhibited by the RCO and Operations personnel in the field.

20. "Radiological Work in SD&D (Site Deactivation and Demolition) 230-H Beta-Gamma Incinerator", Mignon Scruggs, WSRC

SD&D actively searches for better practices during performance of radiological work while maintaining ALARA. SD&D recently utilized a glove bag engineering control during characterization sampling of the internals of an incinerator. The large glove bag was constructed and installed to allow a worker access to the internals for sampling. Successful use of a glove bag kept the contamination in the incinerator. The work was performed in minimal PPE without compromising the safety of the worker.

21. "Cell 8 Shielded Window Replacement", R.L. Chafin, WSRC

The 773-A Cell 8 window "hot side" gasket had deteriorated over time, creating a significant oil leak through the degraded gasket. This original window needed to be removed from the cell and converted from a "hot side" load to a "cold side" loaded window. Conversion of the window assembly involved changes in the wall opening configuration. The window liner was cut out of the wall and a new one fabricated and installed to accommodate "cold side" or "clean side" loading. This presentation will show the engineering controls that were implemented to control the spread of contamination and reduce dose to personnel.

22. "Open-Air Demolition of Hanford's Plutonium Concentration Facility, Building 233-S", Larry Waggoner, Fluor Hanford

Building 233-S at Hanford was deactivated in 1967 and had been slowly deteriorating over the last three decades. The purpose of the 233-S Facility Demolition Project was to safely demolish the facility and package and properly dispose of all associated waste material. Most of the reinforced concrete building was one story tall except for the process hood area that was four stories. High contamination levels from previous spills and a fire were present in the facility. The contamination had been "fixed" by applying many coats of a sealant until the thickness was about 3/4". Previously, Bechtel Hanford Inc had completed a significant amount of work removing equipment from the process and non-process areas of the building. Several options on how to remove the building were evaluated and the final decision was to demolish it in the open-air using engineered controls to prevent contamination spread. This presentation will show the engineered controls and work practices used to demolish this building without spreading contamination. This includes use of fixatives, misting, fog cannons, circular saws, and large excavators equipped with hydraulic shears.

23. "Double Door Transfer Ports (DPTE™) use to Maximize ALARA in Contained Transfer Operations", P.A. Westover, SRNL - Presenting; S.D. Chunglo, la Calhène Inc., Minnesota

Nuclear material transfers between glove boxes have often been associated with increased dose to operators namely due to the tedious nature of the process. The double door transfer port (DPTE™) was originally developed over 40 years ago to improve efficiency and safety of nuclear material transfers. α and β exposures and γ dose can be greatly reduced if not eliminated with the use of DPTE™ technology as compared with many other glove box transfer methods used in the U.S. today. This paper will discuss the methods and give examples of where ALARA improvements can be realized.

24 & 25. "HAZARD ANALYSIS PROCESS IMPROVEMENTS", Jim Tisaranni, WSRC

The Automated Hazard Analysis (AHA) program was introduced to SRS in 2002 from the Hanford Site as an improvement to the manual Job Hazard Analysis program which proved to be cumbersome. The output of the AHA program was cumbersome and difficult to use by workers. A diverse team of workers, First Line Managers, Safety and Health professionals, engineers and others worked to provide improvements to the existing AHA program. The team produced a greatly improved walk-down checklist, hazard categorization determination, hazard tree questions, embedded hierarchy of controls, and most importantly, a Safe Work Permit for workers that clearly tells them their tasks, the hazards for those tasks, and what controls are in place for the identified hazards.

TUESDAY - PM

26. "DWPF MELTER 1 REMOVAL FROM SERVICE", J. E. OWEN AND J. F. IAUKEA, WSRC

On October 18, 2002, the Westinghouse Savannah River Company decided to replace melter 1 which had been in radioactive service since April 1996. This decision was based upon several factors including degraded performance and continuing problems with pour spout wear. While continued canister production was possible, a leak in the Slurry Mix Evaporator (SME) vessel led to the decision to replace the melter while the SME was being repaired or replaced. This presentation will discuss the operational and technical issues related to de-inventory of the melter, removal from the facility, and interim storage in an engineered storage vault.

27. "Mitigating Airborne Contaminants and Controlling Loose Surface Contamination Using the Passive Aerosol Generator Model PK2002", D. L. Boring, WSRC

The benefits of using a coating material as an engineering control for work in outside environments at F and H Tank Farms will be discussed. The application of an aerosol of organic material fixative created by a Passive Aerosol Generator (PAG), Model PK 2002, that is slowly introduced into a process area (such as a room, glove box, ventilation duct, etc) without requiring personnel inside the area. This aerosol encapsulates contamination and prevents resuspension of the contaminants by slowly and evenly coating all surfaces within the area. Specifically, the F and H Tank Farms have used this process inside pump pits, central transfer systems, and an evaporator to perform work safer and more cost efficient. This engineering control reduces airborne activity, reduces worker exposure and reduces the spread of contamination. Wind speed work limits for the job can be increased and allow more work to be performed.

28. "Dismantling of Tritium 234-3H Hold Volume Facility", Richard Sullivan, WSRC

In support of a dual initiative to reduce site building footprint and make way for future building, the Tritium hold volume facility (the Snake) was slated to be removed. The uniqueness of this job was to reduce exposure to personnel to low levels of tritium as well as providing a mechanism to transfer to another part of the site for disposal. Method previously available was cuts by welding which not only increased exposure would also entail elevated labor costs. An alternate method utilizing the Tri-tool Model 642SB Low profile Clamshell Pipe Lathe provided the necessary mechanism to ensure personnel exposure was minimal and realized cost savings substantial. In addition to alternate methods, huts utilizing clear view windows to assist in lessons learned and task oversight were constructed. This presentation will cover the advantages as well as additional safety measures encountered during the task.

29. "FB-Line Deactivation ALARA Methods", R. K. Black, WSRC

The FB Line facility was constructed in the early 1960s to receive plutonium-239 nitrate solution produced in F-Canyon and convert it to a solid form. The solutions were transferred from the canyon and concentrated in the FB Line. The solution was then precipitated, filtered, dried and finally reduced to a metal form. The process continued until 2002, when all operations to stabilize plutonium-bearing materials from the site's production era were safely and successfully completed. During that period, FB Line produced 35% of the weapons grade plutonium used in the nation's nuclear stockpile. Process cabinets and glove boxes containing production equipment within the facility are highly contaminated and deactivation of the facility is now in progress. This presentation will discuss some of the contamination control methods used thus far.

FOUR VENDOR PRESENTATIONS

30. "Changing the Protective Clothing Paradigm", D. Kay, Eastern Technologies, Inc. /OREX (Presenter), J. Poston, Sr., PhD, Texas A&M University, M. Lantz, Palo Verde Nuclear Generating Station

During the past three years, OREX dissolvable protective clothing and other consumable supplies, manufactured from the polymer polyvinyl alcohol (PVA), have become commonly used through out the commercial nuclear power industry. These products offer plants the benefits and convenience of single-use products while at the same time mitigating generation of large quantities of low level radioactive waste requiring disposal at a licensed radioactive waste disposal facility. Experience with OREX single-use products have resulted in improvements in radiological safety, industrial safety, logistics and handling, and waste minimization. This paper describes the experience with OREX dissolvable products in commercial power plants.

31. "High Density Composites Replace Lead for Reactor Vessel Head Shielding", R. R. Durkee, III, Ecomass Technologies

Inspired by an Omaha Public Power District (OPPD) corporate initiative to eliminate the purchase of lead wherever possible, high-density, lead-free, composite materials were selected to provide shielding during the inspection/repair of its Ft. Calhoun Generating Station reactor vessel head penetration welds. Recognizing the escalating costs associated with procurement, handling, ownership, regulatory compliance, storage, and ultimate disposal of lead, OPPD commissioned the fabrication of composite wall panels, roof panels, and control element assembly shielding devices. These composite materials provide the same shielding as lead, but do not contain any lead, lead compounds, or any materials on EPA's Hazardous Substances Priority List.

32. "Encapsulating Suit Systems, "The Total System Concept", Samuel Ozil and Gary Zimmermann, Delta Protection North America

There are many methods of protecting a worker from the risks of air borne contamination and skin contamination. The many aspects of combining respiratory protection with PPE are evident; however, there are other considerations that must be taken into account when faced with high risk environments. This brief discussion will define the various parameters (challenges) that the individual is faced within his environment, and will explain to you how to bring these challenges together in one singular encapsulating suit system solution. Examples of typical respirator/PPE solutions will be discussed as well as total suit systems.

33. "SUBMICRON SEPARATION AND CONTAINMENT – WITHOUT THE FILTER", Dr. Thomas Shope (Presenter), Inventure Laboratories, Inc.

The U.S. Department of Energy (DOE) continues to emphasize the need for accelerated cleanup of its sites, including the decontamination and decommissioning (D&D) of former production facilities. At the same time, safeguarding the site personnel, the environment, and potentially-affected interests outside the waste management professional field is of paramount importance. The need to balance both the accelerated cleanup, and the safeguarding of all, has spawned innovate, yet highly efficient cleanup technologies. One innovative approach capitalizes on a well-documented technology, cyclonic separation, to effectively remove particles down to sub-micron sizes (0.2 mm), the size often encountered as "dust particles" and airborne particulates during cleanup operations – without using traditional filtration techniques. Fine particulates may include radioactive and/or hazardous components, and may represent exposure pathways to cleanup personnel and the environment. Effective removal of particulates is essential to reducing worker exposure and achieving the ALARA principles desired during cleanup. As recent as a decade ago, cyclonic separators were deemed incapable of separating or removing particles less than 10 mm in size. Recent

advances, however, are breaking new ground in separator efficiencies. Independent laboratory tests confirm a cyclone can remove particles down to the 0.2 mm effective diameter range - (comparable to a standard HEPA filter, with a typical efficiency rating in the 0.3 mm range). Additionally, the cyclonic separator removes the particles from the air-stream, and simultaneously collects the particles in an enclosed container to prevent clogging of downstream filters. The collection container is easily removed for disposal, with minimal possibility of re-introduction of the particles to the operating environment - thereby further reducing operator exposure.