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DEINVENTORY AND DEACTIVATION OF NUCLEAR FACILITIES AT THE ARGONNE NATIONAL LABORATORY - ALPHA GAMMA HOT CELL AND 205 K-WING FACILITIES

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DEINVENTORY AND DEACTIVATION OF NUCLEAR FACILITIES AT THE ARGONNE NATIONAL LABORATORY - ALPHA GAMMA HOT CELL AND 205 K-WING FACILITIES

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Abstract: In 2006, Argonne began working on increasing the compliance posture and risk reduction efforts for ten nuclear facilities. One of those facilities, Building 212 Alpha Gamma Hot Cell Facility (AGHCF) was identified by DOE EM as the highest-ranked risk among all Office of Science (SC) facilities (Reference 1). At the time of this writing and since the 2006 period, Argonne has reduced the number of its nuclear facilities to four (including the Transportation Nuclear Facility). One of the largest contributing factors to the success of Argonne's de-inventory program is the successful disposition of legacy materials and waste from the AGHCF and the Building 205 K-Wing hot cell facility (205K). In 2015, the Deactivation Projects and Nuclear Footprint Reduction Program have removed nearly 90% of the total amount of nuclear material from the Argonne site. This paper will focus on the deactivation program development and successes from the AGHCF and 205K deactivation processes.
The Remote Handled (RH) TRU Program developed at Argonne includes several "Fist of a Kind"waste streams that allowed disposition of Fuel Examination Waste (FEW) and Separations Science waste from the hot cells. These Argonne Programs are already being implemented at other DOE TRU Waste sites, and have the potential to add significant value to those Sites'Programs. The inventory reduction from the AGHCF alone amounts to approximately 66x the HazCat 2 (HC-2) SOF TQ. These risk reduction and compliance efforts included removal and disposition of nuclear materials from two additional HC-2 Nuclear Facilities (hot cells), that have since been de-inventoried and downgraded to radiological facilities. These Projects were accomplished on-time and under budget, while transitioning from "vintage"Safety Bases to 3009/3011 compliant Safety Bases (Basis for Interim Operation [or BIO] for Deactivation work). As a result of these de-inventory efforts, Argonne has dispositioned more curies of RH TRU waste to the Waste Isolation Pilot Plant (WIPP) than all other DOE Lab Programs combined (through close of FY15). This successful completion of the projects advanced de-inventory efforts at the Laboratory by several years. The deinventory process successfully dispositioned approximately 10,000 irradiated test specimens from the AGHCF.

1. INTRODUCTION

Prior to the establishment of the Deactivation Projects, DOE EM identified the Building 212 AGHCF as the highest-ranked risk of all legacy DOE-Office of Science (SC) nuclear facilities in 2008. Since then, Argonne has maintained an aggressive path forward in removing inventory from the AGHCF, and by the end of FY15 had reduced the AGHCF inventory to .024x HC-2 SOF. The inventory of the AGHCF at the end of FY15 contains only the surface contamination values, as all of the source term has been removed.

1. METHDOS Argonne's NFRDP and ARRA efforts led directly to the establishment of several new waste streams within the RH TRU Program. Fuel Examination Waste (FEW) and Solidified Separations Science Waste (S3W) streams were developed to drive disposition of irradiated fuel test specimens, SWARF, and solidified liquids generated from UREX experiments in various hot cells. The approval of these waste streams allowed the disposition of 100% of the 205 K-Wing RH TRU, and approximately 80% of the AGHCF discrete inventory, to WIPP near Carlsbad, NM. This leading effort promises complex-wide benefits in the future.
2. RESULTS • De-inventory and deactivation of Building 205 K-Wing Hot Cells (HC2 to Radiological Facility (RF)) • De-inventory and Deactivation of Building 200 MA/MB Wing multi-story Hot Cell Facility (HC2 to RF) • De-inventory of the AGHCF (Spent fuel repatriated to INL, over 500 drums of RH TRU shipped to WIPP, reduction of approximately 66X HC2 SOF) • Development of 5 new RH TRU characterization methods, and approval of 5 Tier-One Change Requests through the US EPA and CBFO • AGHCF won the UChicago-LLC Award for Team Safety Performance in 2012 and 2013
3. CONCLUSIONS Argonne's important future mission work will benefit greatly from the success of the NFRDP, the accelerated pace of those successes provided by the ARRA funding, and by maintaining a

record for safety and production that demonstrates the Laboratory's expertise in executing high-risk work on a daily basis. Argonne maintains the core set of expertise in the realm of RH TRU FEW Program Development and Management, and has been instrumental in partnering with other DOE facilities assisting in implementing similar programs and project work.

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