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# **CP-5 Research Reactor D&D Project**

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## CP-5 Research Reactor D&D



A major FY 1998 task for the CP-5 project staff was the dismantlement of the reactor vessel. The Rosie mobile work system, supplied by RedZone Robotics, Inc., and demonstrated as part of the DOE EM-50 Large-Scale Demonstration Project was used to complete this task. Operators, such as this ANL Waste Management Operations technician, were required to have special training and complete a qualification process in order to teleoperate Rosie (ANL Neg. No. 24663K, Frame 4A).

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## CP-5 Research Reactor D&D



The CP-5 facility's polar crane could be teleoperated from the second floor observation area. The crane was retrofitted for remote-control operations as part of the DOE EM-50 CP-5 Large-Scale Demonstration Project. It is used to move heavy objects inside the CP-5 facility (ANL Neg. No. 23982K, Frame 20).

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## CP-5 Research Reactor D&D



This overhead-view photo of the CP-5 bioshield looking down from the polar crane was taken shortly after the last segment of the reactor tank was removed (ANL Neg. No. 24327K, Frame 2A).

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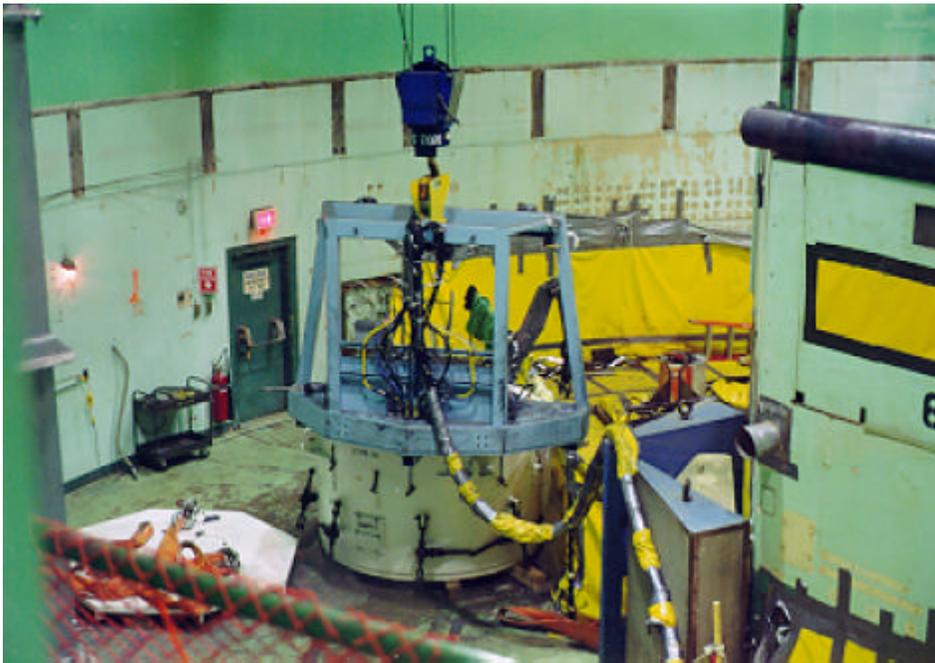
## CP-5 Research Reactor D&D



The Dual Arm Work Platform, provided by Schilling Robotics Systems, RedZone Robotics, Inc., Oak Ridge National Laboratory, and the Idaho National Environmental Engineering Laboratory was demonstrated as part of the DOE EM-50 CP-5 Large-Scale Demonstration Project. It was operated remotely using joystick-like controls and was used on a variety of tasks (ANL Neg. No. 23982K, Frame 17).

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## CP-5 Research Reactor D&D



The Dual Arm Work Platform was used to move freshly cut segments of the reactor tank into a 7-100 cask. Personnel radiation exposures were greatly reduced by performing this work remotely (ANL Neg. No. 23982K, Frame 8).

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## CP-5 Research Reactor D&D



After a 7-100 cask is fully loaded, it is transferred from the CP-5 containment building to the yard area for temporary storage (ANL Neg. No. 23755K, Frame 22A).

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## CP-5 Research Reactor D&D



Another major FY 1998 task was the removal of the CP-5 spent fuel pool and liner. Here, last-minute preparations are being made prior to entering the CP-5 spent fuel pool (ANL Neg. No. 23849K, Frame 20).

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## CP-5 Research Reactor D&D



The walls of the CP-5 spent fuel pool were pressure washed. This D&D technician is suspended within the pool walls on a specially built personnel lift platform that is suspended by the overhead crane (ANL Neg. No. 23849K, Frame 2).

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## CP-5 Research Reactor D&D



A breach in the spent fuel pool liner caused concern. Personnel working adjacent to the spent fuel pool collected soil samples for tritium analysis from below the concrete floor (ANL Neg. No. 24018K, Frame 18A).

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## CP-5 Research Reactor D&D



This core sampling rig, built to Argonne National Laboratory specifications for performing soil boring and sampling in remote locations, was used to obtain soil samples for analysis (ANL Neg. No. 23925K, Frame 10A).

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## CP-5 Research Reactor D&D



During FY 1998, work was also being done in the facility's E-Wing Hot Cell. Prior to performing gross decontamination of the hot cell's interior, an ANL Waste Management Operations technician removed excess tools and materials from the hot cell (ANL Neg. No. 23849K, Frame 5).

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## CP-5 Research Reactor D&D



A B-25 low-level waste disposal bin was used to collect the radioactive materials removed from the E-wing hot cell. The materials were surveyed by an ANL Health Physics technician prior to final disposition (ANL Neg. No. 23849K, Frame 6).

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## CP-5 Research Reactor D&D



Additional characterization of the CP-5 facility was performed in FY 1998. The Mobile Automated Characterization System (MACS), developed by Oak Ridge national Laboratory and the Savannah River Technology Center for the U. S. Department of Energy's Robotics Technology Development Program, was used to perform detailed floor surveys on the service floor of the CP-5 reactor facility. MACS had been previously tested at CP-5 as part of the DOE EM-50 CP-5 Large-Scale Demonstration Project (ANL Neg. No. 23660K, Frame 17).

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## CP-5 Research Reactor D&D



Personnel from Canberra performed characterization surveys in the CP-5 reactor building. This instrument, the In-Situ Object Characterization System (ISOCS), had been previously tested at CP-5 as part of the DOE EM-50 CP-5 Large-Scale Demonstration Project (ANL Neg. No. 23755K, Frame 8A).

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## CP-5 Research Reactor D&D



All samples removed during characterization work in the Bldg. 330 yard area were surveyed by ANL Health Physics technicians (ANL Neg. No. 23925K, Frame 8A).

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## CP-5 Research Reactor D&D



During FY 1998, more than thirty four groups visited the CP-5 D&D Project's control room. The project hosted visitors attending training courses (shown here is a group from the Japan Atomic Energy Agency, Fuji Electric, and the Latvian Nuclear Research Center); members of the press (such as Gerard M. Aziakou of Agence France-Presse); and members of student organizations (such as Purdue University's American Nuclear Society Student Branch) (ANL Neg. No. 24663K, Frame 2A).

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# **Future Projects**

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## Building 310 Retention Tanks D&D Project

The ANL-E Building 310 service floor retention tank facility was originally installed more than 30 years ago. Even though the Building 310 tanks were installed for excess storage capacity for the adjacent Building 306 tanks, they were infrequently used for this purpose. The facility consists of three rooms containing three tanks each, and a larger room containing one tank, for a total of ten tanks. The tanks have not been used since 1975, when it was decided that the excess capacity was no longer required.

Project planning was completed in FY 1997, and D&D activities are scheduled to begin late in FY 2000. D&D activities include the removal of the ten retention tanks and the fixtures and piping leading to the tanks, and decontamination of the retention tank area so that it can be released for unrestricted reuse (ANL Neg. No. 12379, Frame 15).

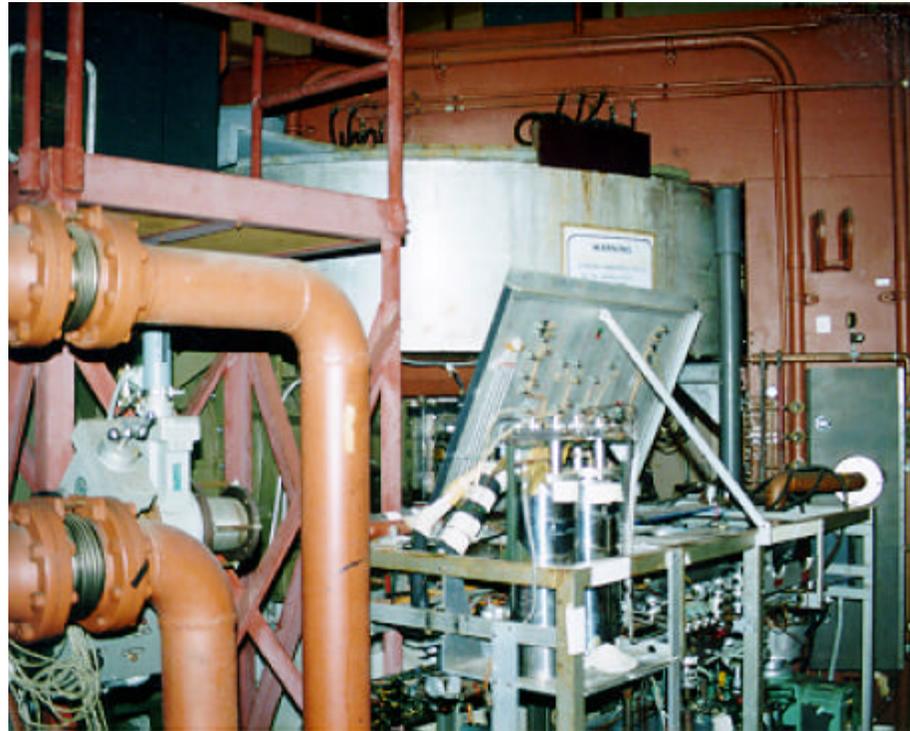


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## 60" Cyclotron D&D Project

Argonne's 60" Cyclotron in Building 211 was a fixed frequency machine built in 1952 to conduct basic research. It has had a rich history, meeting widely diversified operational requirements and producing deflected beams of deuterons, helium ions, singly charged hydrogen molecules, and neutrons of a broad energy spectrum. Early work encompassed fields of heavy element chemistry, nuclear activation studies, nuclear scattering, solid state physics, radiation chemistry, isotope production, and biological studies. Argonne's Nuclear Medicine Group was a significant later user of the facility; other users were the Argonne Physics Division and Oak Ridge National Laboratory. Operations ended in 1992.

The purpose of this project is to decommission the 60" Cyclotron and permit the release of the facility for unrestricted reuse. To accomplish this, the cyclotron will be disassembled, size-reduced and segregated. All radioactive materials associated with the facility will be disposed of at an approved facility. Project planning and documentation were 90% completed during FY 1998. They will be completed in FY 1999, and D&D activities are scheduled to begin in FY 2000 (ANL Neg. No. 25314K, Frame 6).



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## Building 301 Hot Cells D&D Project

The hot-cell facility in Building 301 was placed into use in the early 1950s to perform a variety of radiological research and development experiments for the U.S. Department of Energy on nuclear reactor fuel components and materials. The eight caves contained within the hot cell facility were phased out in 1971 because they were obsolete and deteriorating. The interior of the caves received a preliminary cleanup, but significant levels of fixed contamination within the painted floor, walls, cells, and equipment remains spread throughout the facility. From 1971 until it was taken out of active use in 1992, the hot-cell facility was used for non-radiological experimentation.



The scope of this project includes cleaning or dismantling radioactively contaminated equipment and disposing of it. The hot-cell area and other contaminated areas will be decontaminated and removed to permit the area to be released for unrestricted reuse, and the cave structures, retention tanks, and ventilation systems will be demolished. Project planning and documentation were 90% completed during FY 1998. They will be completed in FY 1999, and D&D activities are scheduled to begin in FY 2003 (ANL Neg. No. 24027K, Frame 12).

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## ZPR 6 & 9 D&D Project

The Zero Power Reactors (ZPR) 6 and 9 in Building 315 were low-power, experimental reactors utilized for fast reactor physics studies from the early 1960s until 1982. Uranium and plutonium fuels were used to study the neutronic properties of reactor assemblies. Each reactor is in an individual, blast-resistant, concrete cell. Shield walls separate the cells from their control rooms; between the cells is a separate work room used to load fuel drawers. The facility is no longer in use; it is contaminated with low-level radioactivity.

The purpose of this project is to decommission ZPR-6 and ZPR-9 and permit the area's release for unrestricted reuse. To accomplish this, the reactors, process systems and associated equipment will be cleaned or dismantled and disposed of properly. A characterization plan will be prepared in FY 1999. Remaining project planning and documentation will begin in FY 2001, with D&D activities immediately following (ANL Neg. No. 23663K, Frame 2A).



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## Juggernaut Reactor D&D Project

The Juggernaut Reactor in Building 335 was a light-water moderated and cooled, graphite-reflected research reactor with a rated thermal power of 250 kW. It operated from 1962 through 1970. The purpose of the facility was to provide neutron flux levels of medium intensity for research and development experiments for the fast reactor development program. At the time of reactor shutdown, the reactor fuel was removed and all systems were drained.

Only the high bay area of Building 335 housing the Juggernaut Reactor, the pump room, and the pit are covered by this project. The scope of this project includes the disassembly, size-reduction, segregation, packaging, and disposal of all radioactive materials associated with the facility. After the removal of all radioactive materials, the facility will be decontaminated to levels that allow its release for unrestricted reuse.

Project planning and documentation are scheduled to begin in FY 2000, with D&D activities following in FY 2001 (ANL Neg. No. 112-510).

