

Savannah River Site

IMPLOSION OF K-AREA COOLING TOWER

May 25, 2010



Presentation By:

Robert English

Facility Representative

Department of Energy Savannah River Operations Office

May 4-5, 2011





PHYSICAL CHARACTERISTICS





PHYSICAL CHARACTERISTICS

- Dimensions: Height – 452' Base ID – 345' Top ID – 210'
- Wall Thickness: Maximum – 36" Minimum – 8"
- Footprint: Approximately two acres
- Materials of Construction: Steel reinforced concrete
- Volume of Concrete and Rebar: 18,000 cubic yards
- Metals: 1,600 tons of rebar, stainless steel, copper, and aluminum





185-3K COOLING TOWER HISTORY

- Construction Completed: Late 1992
- Operational Testing Initiated: February 1993
- DOE Orders K Reactor Placed on "Cold Stand-by": April 1993
- DOE Announced that K Reactor Would Not Be Restarted: November 1993
- Demolishing tower improved security posture of area and assisted in site's effort to achieve footprint reduction





CHALLENGES AND CONCERNS

- At DOE facilities, compliance with the American Conference of Governmental Industrial Hygienist (ACGIH) guidelines is required. ACGIH requirements are more restrictive than OSHA providing a higher level of worker protection
- Zero degradation to nuclear materials storage in K-Area by adjacent demolition, 3000 ft. away
- Use of explosives on any DOE site poses unique challenges from coordination, logistics, permitting, security, and safeguards viewpoint





STEPS PRIOR TO DEMOLITION



- ARRA funded
- American Demolition Nuclear Decommissioning (ADND) awarded contract
- Controlled Demolition Incorporated (CDI) incorporated as the blaster





STEPS PRIOR TO DEMOLITION

(continued)



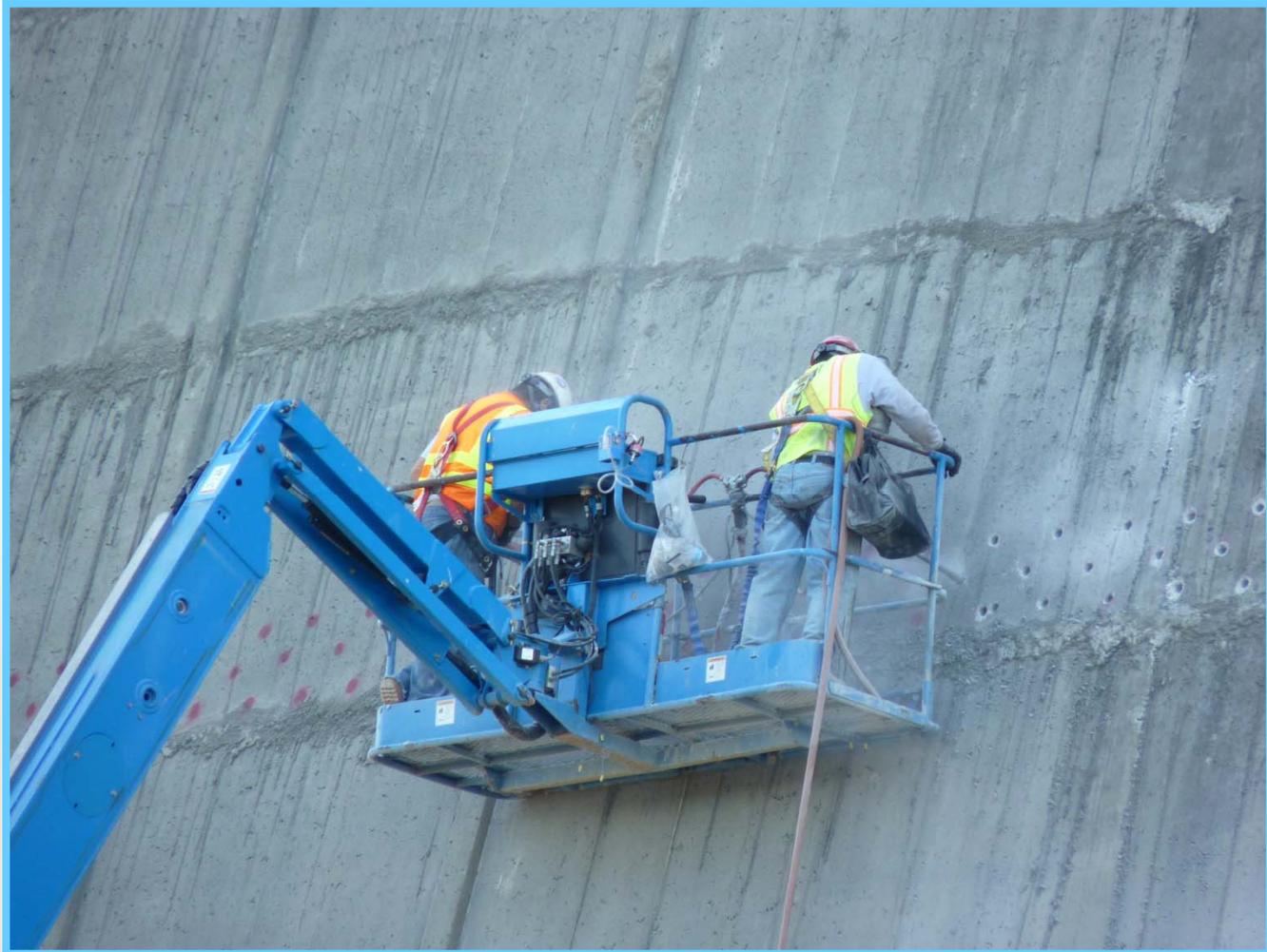
- Seismic study concluded that ground vibration levels would be well below project specified limits
- Modified Security Plan for Explosives (MSP) covered the physical security requirements which included the receipt, storage, and placement of explosives at the tower





STEPS PRIOR TO DEMOLITION

(Continued)





STEPS PRIOR TO DEMOLITION

(Continued)

- Approved Stormwater Pollution Protection Plan
- Approved Demolition and Stabilization Plan
- Power lines relocated
- ADND's IH monitored drillers for silica and noise exposure establishing appropriate controls and PPE requirements
- Selected tower columns and portions of the shell were covered with a layer of chain link fence and geo-textile fabric to minimize flying debris





NON-ELECTRIC INITIATION OF EXPLOSIVES

- Provides high level of safety against accidental initiation by static electricity, stray electrical currents, and radio frequency energy
- CDI used two (2) non-electric blasting detonators, with non-electric signal tube, at each initiation point
- Signal tube has an inner coating of high explosive and aluminum powder, when ignited, transmits a low-energy signal at 6000 – 7000 feet/second. Shock wave is similar to dust explosion
- Project used 1400 lbs of explosive, 900 non-electric detonators, 8000 ft. of detonating cord, and 2,000 ft. of non-electric signal tubing

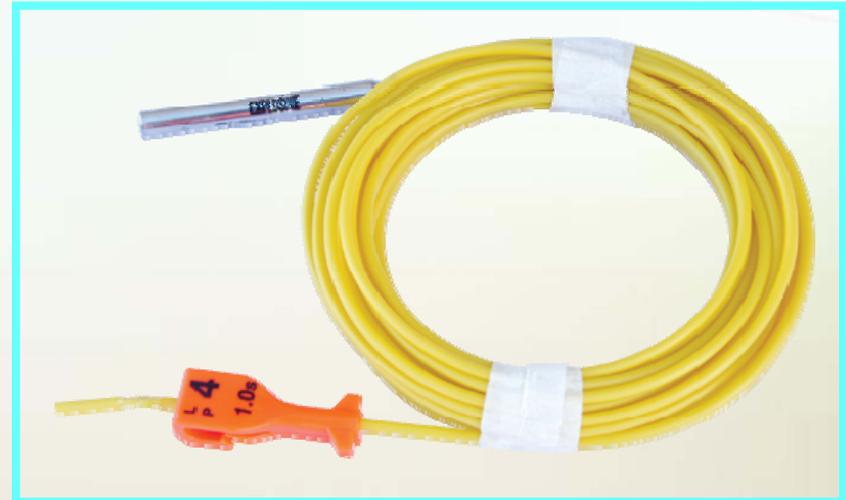




DETONATORS



Electric Detonator



Non-Electric Detonator





FIRING

- Firing position for demolition was situated 1000' from the base of the cooling tower
- All site personnel, aside from the blaster, were removed to a safe area (a minimum of 2640 ft. from the tower)
- Access to the area was secured by site protective forces
- After accountability clearance, CDI commenced a countdown procedure





COOLING TOWER IMPLOSION





POST IMPLOSION INSPECTION





POST EXPLOSION INSPECTION

- Dust remained in the area approximately 10 minutes following the implosion
- After the dust cleared, the CDI personnel inspected the area for undetonated explosives
- The site was confirmed as safe, and debris removal began





DEBRIS REMOVAL





END STATE FOR COOLING TOWER





PROJECT WRAP UP

- Project completed one month ahead of schedule
- Safely performed over 18,500 man hours of work
- Zero OSHA Recordables, Zero Accidents, Zero Total Recordable Cases
- Earned 100% value for safety incentive bonus from the site managing and operating contractor
- Loaded, transported, and dumped over 1,600 truckloads of concrete debris without incident





PROJECT WRAP UP

(continued)

- Recycled over 1,100 tons of steel rebar, stainless steel, aluminum piping, steel plates, copper wire from tower
- Logged over 20,700 miles of heavy hauling onsite without incident and zero traffic violations
- Site restoration included re-vegetating areas, barricades for future site protection, water run-off management, and rip-rap placement





CONTROLLED DEMOLITION INC. WORLD RECORDS

- Trojan Nuclear Station, Rainier, Oregon, 05/2006
Record: Largest cooling tower ever demolished 499 feet tall 41,000 tons
- Seattle Kingdom, Seattle Washington, 03/26/2000
Record: World's largest structure by volume (19.821 million cu. m.) to be demolished by explosives
- J.L. Hudson Department Store, Detroit, Michigan, 10/24/1998
Record: At 2.2 million square feet, Hudson's is the largest single building ever imploded
- Omega Radio Tower, Trelew, Argentina, 06/23/1998
Record: At 1201 feet, the tallest manmade structure ever felled with explosives





QUESTIONS





CONTACT INFORMATION

- Robert English, Facility Representative
- DOE-Savannah River, Office of Assistant Manager for Closure Project
- Email: robert.english@srs.gov
- Phone: (803) 952-5613

