Deficiencies in control and identification of electrical hazards during facility demolition have resulted in hazardous working conditions.

Events

Site/Facility: **NNSA Service Center**
Electrical Near Miss while Cutting Wire in Conduit -- Reference: **ORPS Report** ALO--GOAL-NNSASC-2004-0001
On February 10, 2004, a carpenter, performing demolition activities, came across a conduit that needed to be dissembled. While cutting a ground wire in the conduit with insulated pliers, he nicked an energized wire causing an electrical arc and a four-hour power outage. The carpenter was not injured

Important Points:	• **The carpenter did not verify that the wires inside the conduit were de-energized before cutting them.** • **The carpenter assumed that the wires de-energized and proceeded to disassemble the conduit.**

Site/Facility: **Mound Plant Tritium Facilities**
Demolition Worker Cuts Energized Circuit while Removing Conduit -- Reference: **ORPS Report** OH-MB-BWO-BWO01-2003-0004
On October 14, 2003, a demolition craftsman cut an energized 110-volt circuit while removing conduit with a double insulated reciprocating saw. The conduit contained numerous branches and only a cursory check was made for air-gapped circuits. Work control documents specifically required verification of zero energy or installation of a lockout/tagout if verification could not be performed.

Important Points:	• **The demolition worker failed to request a "meter check" to ensure a zero-energy condition existed.** • **The worker failed to complete a thorough walkdown of the area to verify that all conduit branches and runs were air-gapped and there was no potential for energy being fed from other sources.**
Contributors:	• **The demolition worker made assumptions about the task based on previous work experience on the same system months earlier. He assumed the lighting circuit was totally de-energized by an electrician when the light circuits were removed.**

Site/Facility: **Savannah River Site Fire Water Facility**
Worker Cuts Through Conduit and Observes Sparks -- Reference: **ORPS Report** SR--WSRC-SUD-2003-0006
On May 5, 2003, an electrical and instrumentation mechanic was cutting through conduit located below an electrical panel with a hacksaw when he saw sparks and detected smoke coming from the conduit. He immediately removed the hacksaw from the conduit. Subsequent engineering review of the electrical drawings for the system being demolished revealed unexpected voltage of 17 and 112 volts DC fed from a 2.3-kV cubicle.

Important Points:	• **A voltage check was not performed before cutting the conduit.** • **An inadequate review of the electrical drawings resulted in the failure ot identify an alternate source of voltage.**
Contributors:	• **There was no sign on the panel that indicated the presence of an alternate**

	energy source. • **Worker training on the requirement for conducting voltage checks was inadequate.**

Site/Facility: **Oak Ridge New Hydrofracture Facility**
Ironworker Cuts 120-Volt Service while Sectioning Conduit -- Reference: **ORPS Report** ORO--BJC-X10ENVRES-2003-0002
On May 1, 2003, an ironworker cut into an energized circuit while sectioning conduit with a hand-held hydraulic shear. He heard a pop and felt tingling in two fingers. Inspection by electricians after the incident revealed that the conduit was not to be removed and had been marked incorrectly for removal with spray paint.

Important Points:	• **The demolition subcontractor mistakenly marked an energized circuit from deactivation.** • **A zero-energy check was not performed before cutting as required.**
Contributors:	• **The demolition subcontractor Site Manager did not follow the detailed work instructions and allowed the laborer to cut electrical conduit wires without using a commercially available device (meter) to double check deactivation.** • **Work controls for the demolition task did not fully take into account the added risks of partial electrical isolation in the facility versus total isolation.**

Site/Facility: **Rocky Flats 371 D&D Project**
Electrician Cuts Conduit Containing Energized Wires -- Reference: **ORPS Report** RFO--KHLL-371OPS-2002-0039
On July 8, 2002, a demolition electrician cut a conduit containing an energized 120-volt line, causing a spark. The electrician was not injured. Although wires in the conduit were verified to be de-energized, a "T" connection in the conduit allowed an energized wire to enter at the connection and go undetected.

Important Points:	• **The electrician failed to fully inspect all branches of the conduit to ensure that all wires were verified to be de-energized.**
Contributors:	• **The electricians performing the demolition believed all wires in the conduit were identified and verified.** • **The electrician was not wearing dielectric gloves as specified in the procedure that required dielectric gloves, insulated tools and insulated mats.**

Important Considerations for Electrical Demolition (Lessons Learned)

☐ Who will verify that circuits have been properly isolated and de-energized?

☐ Have the circuits been air-gapped?

☐ Has a zero-energy check been performed to ensure that the circuits have been de-energized?

☐ Have all conduits/circuits been marked to indicate removal? Are cutting locations marked? Are there other circuits in the work area that must remain energized (including temporary power sources)?

☐ Are trained electricians performing the demolition? If not, are they available to support safe removal?

☐ Has the appropriate personal protective equipment been identified and provided to the workers?

☐ Have the workers and supervisors/foreman performed a walkdown of the electrical systems and conduit to verify the configuration and ensure the boundaries are understood?

☐ Has a pre-job briefing reviewed the scope of the job and the working boundaries? Have all parties involved in the work attended the briefing? Have all workers been reminded of their "stop work" responsibility.

☐ What actions are to be taken if the field configuration is not as anticipated by the work plan?