Techniques or Technologies

Pressure Washing - Usually used for decontamination, that utilizes a stream of pressurized water up to 1,800 psi to remove loose contamination for pickup by a suction nozzle. A wet-service vacuum unit with filter is used to separate collected particulate from the discharged effluent.
Includes the operations and maintenance activities such as making repairs to components, replacing parts and components, inspection and cleaning of equipment, and other tasks during the used of this technology.

Surface Wiping - Usually used for decontamination, that includes manual cleaning and wiping using non-aqueous cleaning solutions such as detergent/surfactant, industrial strength 409 and Radiacwash.

Concrete Scabbling - Use of mechanical device used to remove contaminated material from hard surfaces by removing top layer of the material

The element also includes the operations and maintenance activities such as making repairs to components, replacing parts and components, inspection and cleaning of equipment, and other tasks during use of this technology.

Crushing/Size Reduction - Use of mechanical device to reduce volume or compact waste and materials. Some of these devices also include cutting tools. Cost also includes the operations and maintenance activities such as making repairs to components, replacing parts and components, inspection and cleaning of equipment, and other tasks during the use of this technology.

Demolition by Explosives - Demolition of building and facilities using explosives such as dynamite.

Mechanical Demolition - Demolition of structures and facilities using mechanical equipment.

Controlled Blasting - Demolition of structures and facilities using explosive compounds placed into drilled holes to radially fracture the material upon detonation. The spread of contamination is controlled with blasting mats and water fog sprays and construction of contamination envelope. ”

Hydraulic Shear - Method is used to dismantle concrete or masonry structure (e.g., wall, column, etc.) up to 2 ft. thick provided that a light-medium duty front-end loader can be provided with ample working room (the ability to segment reinforcing steel in the concrete is limited to approximately 1.25” of metal thickness). The hydraulic tool attachment on the wheel loader is used to crush and tear off pieces of concrete and reinforcing steel with its crusher jaws (e.g., pincers). Dust production can be controlled to an extent with ventilation or a water fog spray. This method of dismantlement is used in areas when vibration to surrounding structures is to be minimized which may prohibit the use of an alternative method such as controlled blasting.

Oxyacetylene Torch - Generally, used to cut internal building structures with metallic components (e.g., handrails, I-beams, reinforcing steel) containing ferrous metals such as carbon steel or cast iron. Standard oxyacetylene torches are generally unable to cut through stainless steel, aluminum, and other nonferrous metals because of the production of metallic oxides which can have a melting point above that of the flame temperature. The ability to cut through thick metal plating is dependent on the skill of the cutter and the effectiveness of the oxidizing fuel mixture to clear away molten metal and oxides from the kerf.

Oxy-Gasoline Torch - This cutting method generates a flame temperature which is several hundred degrees hotter (e.g., $1,500^{0}$F) than an oxyacetylene torch. The fuel source is 87-octane unleaded gasoline fed from a 2.5 gallon tank pressurized by a manual pump. Oxygen from a cylinder is used as the oxidizing gas. Since gasoline burns at a higher flame temperature and is cheaper on a heat content (e.g., $/Btu) basis than acetylene, this method is beginning to be considered in some decommissioning work because of reported savings in cutting time and fuel costs.

Thermite Reaction Lance - Thermite reaction lances are hand-held iron pipes (e.g., 10.5 feet long) packed with oxidizable metal wires such as aluminum, steel, or magnesium. Because all the metal components are consumed during the reaction, the lance stubs are discarded when they burn down to 2-3 feet in length. Compressed oxygen flowing through an annulus in the pipe sustains the reaction at 4,000 - 10,000 ^{o}F. Since this is well above the melting point of most typical metal building components, most metals may be cut using this method. The practical cutting depth is restricted only by the ability of the cutter to keep the kerf free of molten metal and oxides.

Metal Powder ("Flame") Cutting - Metal powder cutting, or more commonly flame cutting, oxidizes a suspension of iron oxide and aluminum powder in a stream of oxygen gas to produce a thermite reaction with temperatures up to 16,000 ^{o}F. At these temperatures, the flame tip literally disintegrates concrete or masonry materials into a powdered ash. Flame cutting torches can cut 2 feet deeper than wall/floor saws and are also not impeded by reinforcing steel. The cutting torch or lance is not consumed in this process and is thus reusable.

Arc Saw - An arc saw uses a smooth, rotating circular blade to pass an electrical arc between the blade edge and a conductive material that comes into close contact with it. The separation distance between the cutting blade and the metal being cut is typically less than one inch. As the material to be cut must be conductive, generally only metals may be cut. The rotation of the blade (e.g., 350-1,800 RPM) aids in removing molten metal and oxides from the kerf. Remote operability of these units is available. Blade wear during cutting is estimated at a few percent of the amount of metal that is removed from the kerf. Arc saws are not portable and require a cutting table. In addition, power requirements can be steep as a 36 in. diam. blade for cutting up to 12 in. thick metals requires a power supply of 6,000 Amps.

Plasma Arc Saw - A plasma arc saw uses an inert gas such as argon flowing through a constricting orifice to intensify an arc between an electrode and any conductive material that comes into close contact with it. The separation distance between the electrode and the metal being cut is typically less than one inch. As the material to be cut must be conductive, generally

only metals may be cut. Remote operability of these units is common, and portable hand-held units are available. A plasma arc saw cutting head may be mounted on motor-driven rollers and remotely driven over a section of metal to be cut. The power supply requirements for plasma arc torches is somewhat less than arc saws as a plasma arc torch with a 6 in. cutting ability would require an electrical supply of 1,000 Amps.