



Underwater Scrap Shear UWS

During operation and decommissioning of nuclear power plants some of the reactor internals or core components, like control rods, flow limiters or water channels, which have a limited lifetime due to embrittlement, have to be disposed of as radioactive waste. These core components have been activated by the neutron flux in the reactor core and are as well contaminated by deposits of crud. The components have to be segmented for packaging into disposal containers like the shielded MOSAIK® II-15 casks. For this purpose GNS developed and fabricated the underwater scrap shears UWS III + IV. The UWS III shear includes a gas catcher which collects gas releases that occur e. g. if control rods are being cut. These gas releases will be emitted to the venting system deceleratedly. Cutting of the components is being performed in the fuel pool. The facilities can be easily adapted to the respective local conditions and available space in the pool.

Process

Core components are being cut under water by means of the UWS III or UWS IV in different consecutive steps. Compared to the UWS III the UWS IV develops a higher cutting force (see table). Radioactive particles generated from cutting are extracted from the pool water using an underwater suction cleaning device which is part of the system. In case of a release of radioactive gas the UWS III can be equipped with a gas catcher which collects the gas. The emission of these gas releases to the venting system of the power plant is decelerated by a buffer volume. The cuttings are collected in the so-called underwater box (UWB) or in directly in baskets which can be placed in waste containers. The baskets are placed in waste containers, e. g. MOSAIK®-II-15 casks. The lid is attached and the cask de-watered. For handling of the shears and MOSAIK® II-15 casks in the fuel pool there is a system of handling equipment available which was designed and manufactured according to the German KTA rules. The casks can be dried using the vacuum drying facility KETRA. After determination of the remaining humidity and leak test the casks are ready for shipment.