

## LIGHTWEIGHT HOT TAP SYSTEM

The Navy's Lightweight Hot Tap System is a tool used for removing oil and oily waste from submerged compartments. This allows pumping of oil from individual tanks of sunken vessels while minimizing the risk of spilling petroleum product into the sea. Two recent examples of this technique being used to successfully offload product from sunken vessels are the EX-USS *CHEHALIS* operation in Pago Pago, American Samoa (2010) and the USS *MISSESSINEWA* operation in Ulithi Atoll, Micronesia (2003).



The Lightweight Hot Tap System is designed for tapping in mild steel hull plating up to 1-inch thick. The Tap machine has the capability of tapping a 5 ½ inch hole through a 6 inch knife valve; however, the most practical size of tap is either a 2 5/8 inch hole through a 3 inch full port ball valve or a 3 ½ inch hole through a 4 inch full port valve.



The process begins with identifying an ideal, high suction point on the ship's hull where product is known to be located that is clear of hull features (frames, tank tops, etc.). After identifying the proper location for the hot tap to take place, the hull is thoroughly cleaned of marine growth to ensure the flange gasket can seal properly against the hull, preventing weeping of the petroleum product.

The actual flange/valve assembly, through which the "tap" is accomplished, is available in two configurations: a flat surface plate and a contour forming plate. The flat plate is 12 inches in diameter with a 12-bolt hole pattern on a 10 inch bolt circle. This plate is used for flat shell or tank top applications. The contour forming plate has a 12 inch by 4 inch base with serrated tabs perpendicular to the base. These tabs can be formed to the contour of the hull.

The flange is secured to the hull temporarily using magnetic clamps while self-tapping, self-drilling bolts driven by a hydraulically operated underwater drill are used to permanently attach the flange. Above is a picture of two divers using the hydraulic drill to secure the flange to the hull of the USS *MISSESSINEWA*. Once the flange is secured, the magnets are removed and a valve assembly is threaded to the flange and tightened.



The hot tap assembly is then cam-locked onto the valve. Two divers are required to operate the hot tap drill assembly because of the simultaneous step process. It uses a threaded hand wheel to slowly advance the cutter into the ship's hull while the hydraulic drill attached is used to turn the cutter at the rapid speed needed for cutting. Once the hole is complete, the hot tap is extracted, including the coupon (hole center) and the valve is closed, securing the product within the tank. Fittings, hoses and pumps can then be attached to the end of the valve for the removal of the product.



A short movie that demonstrates this process in the underwater environment is available from the Pollution Publications page of the SUPSALV website. For additional information, please contact the 00C25 Pollution Response team using the Points of Contact link on the left side of the homepage menu.