Ekofisk Tank Protective Barrier

The NOVA Award was presented to the Ekofisk Tank Protective Barrier for innovation in offshore construction.

In 1984, the Phillips Petroleum Company discovered that platforms and collecting tanks in its largest North Sea oil field Ekofisk had sunk 20 feet into the sea bed.

To protect the field's central storage tank, Phillips engineers designed a massive sea wall: a circular concrete structure more than 460 feet in diameter and 350 feet high to be constructed in just one short summer.

The lower footprint of the barrier was cast in dry-dock in two halves, near Rotterdam, Holland. Once floated out of dry-dock, a submersible lift ship transported each half to a second staging area in Alfjord, Norway, close to the sea wall's installation site. Weighing 27,000 tons apiece, the semicircular components are the greatest dry-weight shipments of single objects ever made. In Alfjord, the remainder of the barrier was constructed of slip-formed and precast concrete. More than 6,000 metric tons of high-strength steel were used for vertical prestressing the largest single application to date.

The two halves of the sea barrier were then towed into position around the tank and joined. Gravel ballast was added to lower the barrier to the sea floor. The completed barrier contains 100,000 cubic meters of concrete and 24,000 metric tons of rebar. Installed weight of the complete barrier and gravel ballast is more than 900,000 metric tons.

The construction challenges of this project, a barrier built to protect a Phillips Petroleum storage tank in the North Sea, arise from its sheer size (one of the largest objects ever transported) and the need to complete all work in a single short construction season.

Primary Responsible:	Madison Wiley Barron; John C. Mihm; Jack P. Perryman
Contact:	Madison Wiley Barron
Organization:	Phillips Petroleum Company Phillips Building, 9th Floor Bartlesville, OK 74004
Phone No:	918-661-6600