

Waste steel in the Gulf of Mexico

June 10 2010

The huge tonnages of waste steel from decommissioned offshore oil and gas structures represents a serious problem for operators looking to recoup losses and avoid environmental harm. A way to calculate the weight of the problem has been developed by US researchers and described in the *International Journal of Oil, Gas and Coal Technology*.

Oil and gas operations over water were first carried out at Summerland, California in 1896 with wells drilled from piers extending from the shore. By 1937, at Ferry Lake, Louisiana, wooden decks were erected on platforms. Exploration then moved into the swamp lands of South Louisiana using timber structures, and by the mid-1940s, the open seas of the Gulf of Mexico were being drilled. In open water, drilling structures are susceptible to the lateral forces of tidal currents, wind and waves, which means wooden frames are no longer adequate, and strong and robust steel structures became necessary. After World War II, the growth of offshore drilling in the Gulf of Mexico and elsewhere intensified and the amount of steel dispatched to sea grew enormously.

Two grades of steel are commonly used for offshore construction work. Low-carbon steel is used for structural elements such as jackets, decks, railings, walkways, and deck plating; high-strength, low-alloy steel is used for critical components and [extreme climate](#) conditions, such as tubular joint and spanning nodes.

At the end of its useful life, when an operator determines that a facility will be decommissioned, disposal and reuse options are made as part of the overall assessment. Decisions as to whether to refurbish, reuse,

recycle, or remove for landfill are determined by economic, technological, and regulatory conditions.

According to Mark Kaiser of the Center for Energy Studies, Louisiana State University, "The weight of an offshore structure is an important factor in design and is closely linked to its fabrication, installation, and removal cost." Kaiser points out that weight comparisons between structures are difficult because there are so many variables involved. He has now developed a first-order algorithm that can approximate the weight of steel in an offshore structure in the Gulf of Mexico.

The algorithm will allow operators charged with decommissioning shallow or deep water structures to determine logistical needs based on structure and site characteristics. "In 2003, 73 caissons, 25 well protectors, and 70 fixed platforms were decommissioned in Gulf of Mexico," explains Kaiser, "Twenty structures were reefed in the Central and Western Gulf of Mexico during the year, and the remaining structures were brought ashore for storage and to be processed in the scrap and storage market."

Kaiser has now successfully applied the algorithm to the quantity of [steel](#) decommissioned in the Gulf of Mexico in 2003 destined for scrap, reefing and storage along the US Gulf Coast to illustrate proof of principle. The analytical technique could be used to lubricate the process of decommissioning current and future oil and gas structures.

More information: "Steel waste streams associated with decommissioning offshore structures in the Gulf of Mexico" in Int. J. Oil, Gas and Coal Technology, 2010, 3, 113-143

Provided by Inderscience Publishers

Citation: Waste steel in the Gulf of Mexico (2010, June 10) retrieved 27 April 2024 from <https://phys.org/news/2010-06-steel-gulf-mexico.html>

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