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Rigs-to-Reefs Policy, Progress, and Perspective

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Abstract

The Minerals Management Service (MMS) has updated its policy affecting oil and gas platform abandonment and removal procedures that should facilitate efforts between coastal states and oil and gas companies in the development of better offshore Rigs-to-Reefs (RTR). Over the past 13 years oil and gas companies have donated 151 platforms for construction of reefs in the Gulf of Mexico (GOM). Through partial platform removals and the elimination of explosives in the RTR conversion process, companies can now conserve reefs with higher profiles and less trauma to platform-associated reef organisms. Providing the industry with more productive offshore disposal alternatives and options can lead to reduction of abandonment costs and preservation of environmental values, thereby generating more incentives to convert platforms to reefs. In addition to producing 98 percent of the gas and 91 percent of the oil on our Nation's Federal Outer Continental Shelf (OCS), GOM platforms provide the largest artificial reef complex in the world.

Introduction and Background

The U.S. Department of the Interior (USDOI), Minerals Management Service (MMS), is responsible for leasing submerged Federal lands on the U.S. Outer Continental Shelf (OCS) for minerals exploration, development, and production under the provisions of the OCS Lands Act Amendments of 1978 (92 Stat. 629). To meet this responsibility the MMS is charged with four priority goals.

1. Orderly minerals resource development on public land.
2. Protection of the human, marine, and coastal environments.
3. Receipt of fair market value from the development of mineral resources.
4. Preservation of free enterprise competition.

In 1980, the MMS Gulf of Mexico (GOM) Region initiated an effort to develop a database that would increase understanding of the scope and magnitude of recreational use of oil and gas platforms. The effort also provided a foundation for future decisions by government and industry concerning the role of platforms in fishery production. The MMS negotiated an interagency agreement with the National Marine Fisheries Service to carry out studies, with the active participation of the petroleum industry and Texas A&M University. This cooperative initiative had five objectives: (1) to develop a national policy that recognizes the artificial reef benefits of oil and gas platforms, (2) to prepare a Rigs-to-Reefs (RTR) program plan for the GOM, (3) to establish a standard procedure to ensure and facilitate timely conversion of obsolete platforms as reefs, (4) to identify research and studies necessary to optimize the use of platforms as reefs, and (5) to identify legal restrictions that may prevent use of obsolete platforms as artificial reefs.

In addition to this cooperative effort, the Secretary of the USDOI joined with the president of the National Ocean Industries Association to form the Recreational Environmental Enhancement for Fishing in the Seas task force. The task force was composed of fishery representatives from coastal states and private and public officials. The goal of the task force was to develop a strategy that would lead to the creation of a national RTR policy, plan, and program in the United States (Reggio, 1987). This goal was realized when The National Fishing Enhancement Act (NFEA) was signed into law (Public Law 98-623, Title II) in 1984. The Act includes the following: (1) recognition of social and economic values in developing artificial reefs, (2) establishment of national standards for artificial reef development, (3) creation of a National Artificial Reef Plan (NARP) under leadership of the U.S. Department of Commerce, and (4) establishment of a reef-permitting system under the U.S. Army Corps of Engineers (USACOE).

Increasing interest and participation in fishing at offshore oil and gas platforms, along with widespread support for effective artificial reef development by coastal states, led Congress to enact the NFEA. The NARP, written in 1985, allowed for the planning, siting, permitting, constructing, installing, monitoring, managing, and maintaining of artificial reefs within and seaward of state jurisdictions.

The removal of platforms from the GOM has resulted in the loss of valuable reef and fishery habitat. Researchers report fish densities to be 20 to 50 times higher at oil and gas platforms than in nearby open water. Each standing platform seasonally serves as critical habitat for 10,000 to 20,000 fishes, many of which are of recreational and commercial importance (Stanley and Wilson, 1997). Reggio (1987) estimated that 70 percent of all saltwater fishing trips offshore Louisiana were destined for one or more oil and gas platforms. Avanti Corporation, Inc. (1991) estimated that 30 percent of the recreational fisheries catch, a total of approximately 15 million fish, was caught near platforms offshore Louisiana and Texas.

Policy

At the end of 1999, 5,862 platforms had been installed and 1,879 platforms had been retired from the GOM. The total number of platforms installed and removed per year is presented in Figure 1. At the end of 1999, 3,983 oil and gas platforms existed in the GOM. Platform distribution across the GOM is presented in Figure 2. Rigs-to-reefs locations across the Gulf of Mexico are presented in Figure 3.

Abandonment and removal of offshore oil and gas platforms are regulated and required by the MMS in Federal waters and by the USACOE in state waters.

The MMS requirements for platform abandonment are the following:

1. remove all platforms from the lease within one year after lease termination;
2. sever all well conductors and pilings at -15 feet below the mudline; and
3. verify the location is clear of any bottom obstructions after platform removal.

Recognizing the benefits oil and gas platforms contribute to the enhancement of marine fisheries habitat, the MMS announced in 1983, and again in 1993, its support for the conversion of selected obsolete oil and gas platforms for permanent use as artificial reefs (i.e., RTR) on the OCS.

In 1998 the MMS policy on RTR was revised to reflect the progress made through the artificial reef permitting requirements of the USACOE and artificial reef criteria of the NARP. The MMS policy is as follows.

> The MMS supports and encourages the reuse of obsolete offshore petroleum structures as artificial reefs in U.S. waters. The structure must not pose an unreasonable impediment to future mineral development. The reuse RTR plan must comply with the artificial reef permitting requirements of the U.S. Army Corps of Engineers and the criteria in the National Artificial Reef Plan. The state agency responsible for managing marine fisheries resources must accept liability for the structure before MMS will release the Federal lessee from obligations in the lease instrument.

Progress

Three methods of platform removal and reefing have been used in the RTR process (Figures 4, 5, and 6).

1. Tow-and-Place Platform
2. Topple-in-Place Platform
3. Partial Removal in Place Platform

The first use of an oil and gas structure for a reef occurred in 1979 with the relocation of an Exxon experimental subsea production system from offshore Louisiana to a permitted artificial reef site offshore Apalachicola, Florida. In 1982 the first platform jacket was donated. Owned by Tenneco, it was towed from offshore Louisiana to a location offshore Pensacola, Florida. The first platform toppled in place for a reef occurred in 1987 with the Oxy USA, Inc. donation of their platform "A" in South Marsh Island Block 146 to the Louisiana Artificial Reef Program.

Since the first RTR project, progress has been made in the RTR conversion process. In 1995 Union Pacific Resource Company used the first non-explosive partial platform removal method offshore south Texas at their North Padre Island A-58 platform reef site. At the end of 1999, 16 partial platform removals had been used as the method of conversion from platform to reef. This progress in the RTR process has resulted in economic savings to the industry and monetary reward to the state. Equally important are the higher reef profile and minimal trauma to and loss of platform-associated reef organisms.

The RTR donations and methods of removal and reefing by state are presented in Table 1.

Table 1. Rigs-to-Reefs Donations and Methods of Removal and Reefing by State at the End of 1999

State	Rigs-to-Reefs Donations	Tow-and-Place Platforms	Topple-in-Place Platforms	Partial Removal Platforms
Louisiana	94	59	31	04
Texas	50	24	14	12
Florida	03	03	00	00
Alabama	04	04	00	00
Mississippi	00	00	00	00
Totals	151	90	45	16

Recognizing the preservation of environmental values associated with the method of partial removal of the platform, the MMS in 1997 established a policy to allow the industry the option to partially remove the well conductors at the same depth below the water line (BWL) at which the industry had proposed to remove the platform jacket.

During the MMS review of the initial application by the industry for partial platform removal, a concern came up about the failure of the well conductor(s) associated with a partial removal. The concern was what effect does the eventual toppling of the well conductor have on the wellbore's integrity and surface plug? Consequently, the MMS conducted a structural failure analysis of a typical well conductor and found that failure would occur around -16 feet below the mud line (BML), whether or not the top of the conductor was above or -85 feet BWL. This was also in agreement with experience of well abandonments caused by Hurricane Andrew (a category 4 storm that traversed the Central GOM in 1992), which found that, when toppled, wells were vertical around -15 feet BML. Since wellbore surface plugs are required to be set per MMS regulation at -150 feet BML, loss of surface plug integrity should not occur because of the eventual toppling of a platform that has become a reef in place. Thus, the MMS adopted the policy that allows for the retention of well conductors at the same depth at which industry proposed to remove the platform jacket. This policy eliminates the need for explosives in the removal process and minimizes the impacts on the platforms' fish and reef communities.

Perspective

The use of obsolete oil and gas platforms for reefs has proved to be highly successful. Their large numbers and availability, particularly in the Central and Western GOM, their stability and durability, and their function as the world's largest artificial reef complex, are surely a success story.

As previously stated, 3,983 active oil and gas production platforms existed within the GOM's Federal OCS by the end of 1999. Also, 1,879 platforms were retired from oil and gas production, and 1,728 platforms were removed from the GOM and disposed of onshore for scrap metal. Alternatively, 151 of the retired platforms have been permanently dedicated as RTR for fisheries enhancement. The addition of oil and gas platforms in the GOM has positively affected fish populations and has been an important component of the Gulf's recreational and commercial fishing industries.

The oil and gas industry has demonstrated its interest in productive reuse of obsolete platforms by its participation in the states' RTR programs. Oil and gas companies that donate platforms to the states' artificial reef programs are asked to contribute half the disposal savings realized by not having to remove the platform to shore, to the state's artificial reef program fund.

In addition to structure, participating companies have donated nearly $20 million in disposal savings to sponsoring state RTR programs for fisheries conservation, research, and management. Presumably, these companies saved a comparable amount in structure disposal costs. Clearly, it is

to the economic benefit of the company if a productive use were found for oil and gas platforms, a use that can mitigate the cost of platform removal and disposal as scrap onshore.

So, at the beginning of the 21st century, several questions need addressing by RTR stakeholders in the Gulf of Mexico:

1. Should we strive harder to retain and use oil and gas platforms for fisheries enhancement and development, considering that the majority of current removals are going to shore for scrap metal?

2. Should we be even more selective and conservative in encouraging artificial reef development with obsolete platforms?

3. Just how important are these platforms to ecological productivity and diversity, fisheries sustainability, or the development, use, and enjoyment of marine fisheries in the GOM?

4. What are the biological, legal, social, economic, technological, and regulatory limits to using oil and gas platforms for artificial reef development in the GOM?

5. What can we do to avoid problems and conflicts with other users of the marine environment?

Conclusion

Federal and state governments, the oil and gas industry, as well as commercial and recreational fishermen, have all been beneficiaries of the RTR development in the GOM. However, it will take the continued cooperation and support of these stakeholders and user groups to ensure that the RTR program will enjoy continued successes through the 21st century.

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Stanley, D.R. and C.A. Wilson. 1997. Seasonal and spatial variation in abundance and size distribution of fishes associated with a petroleum platform. International Council on the Exploration of the Sea, Journal of Marine Science 202:473-475.

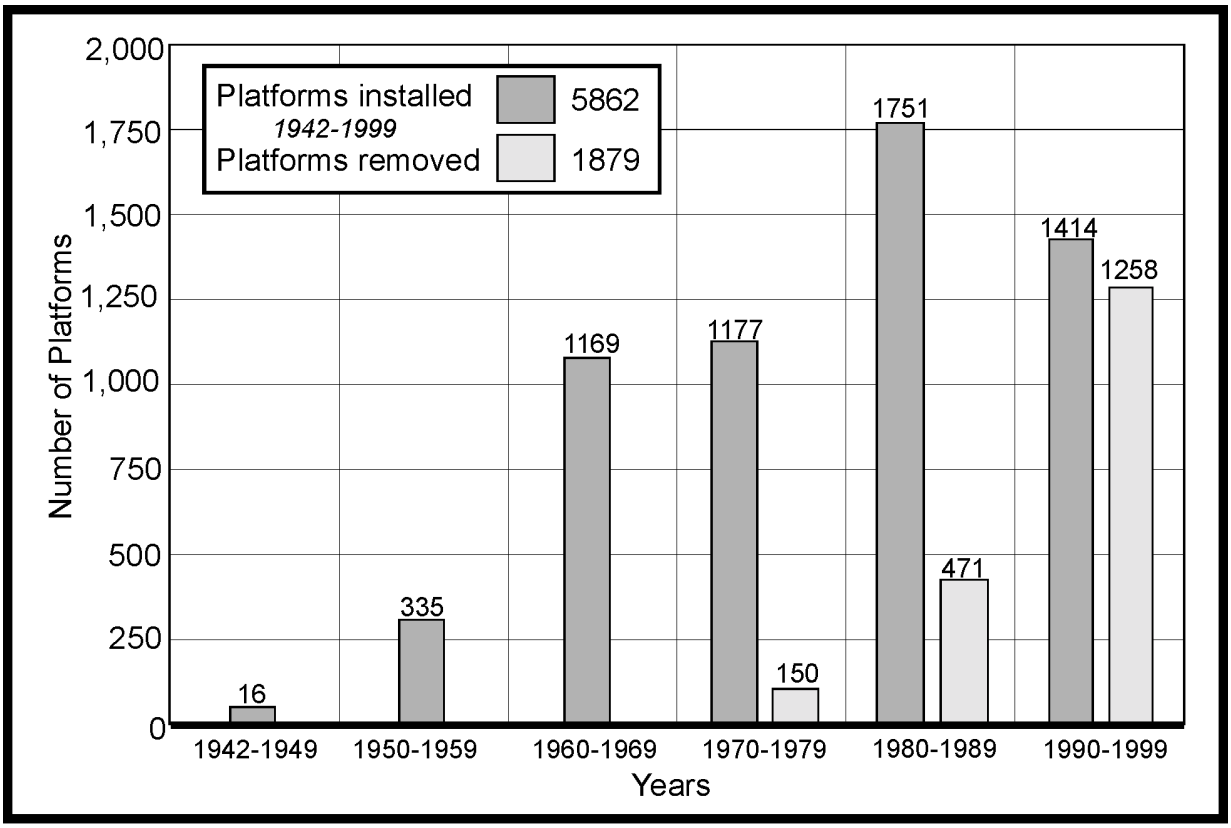

Figure 1.-Platforms installed and removed by year

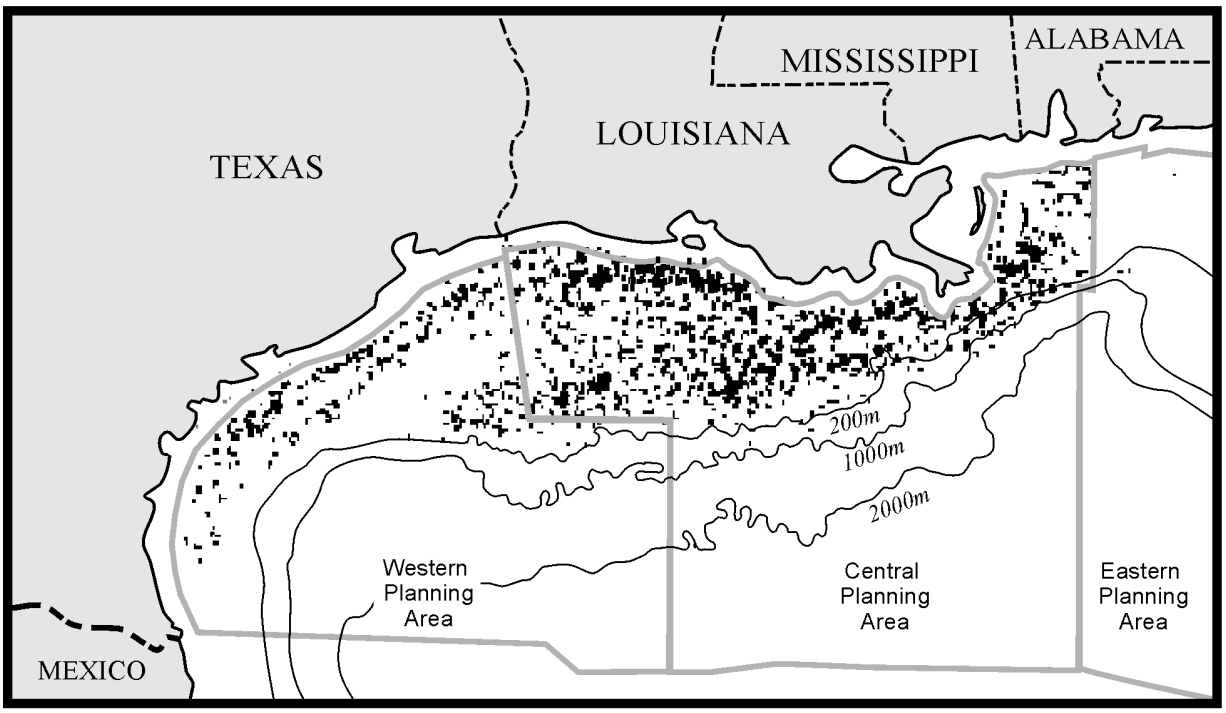

Figure 2.-Platform distribution across the Gulf of Mexico

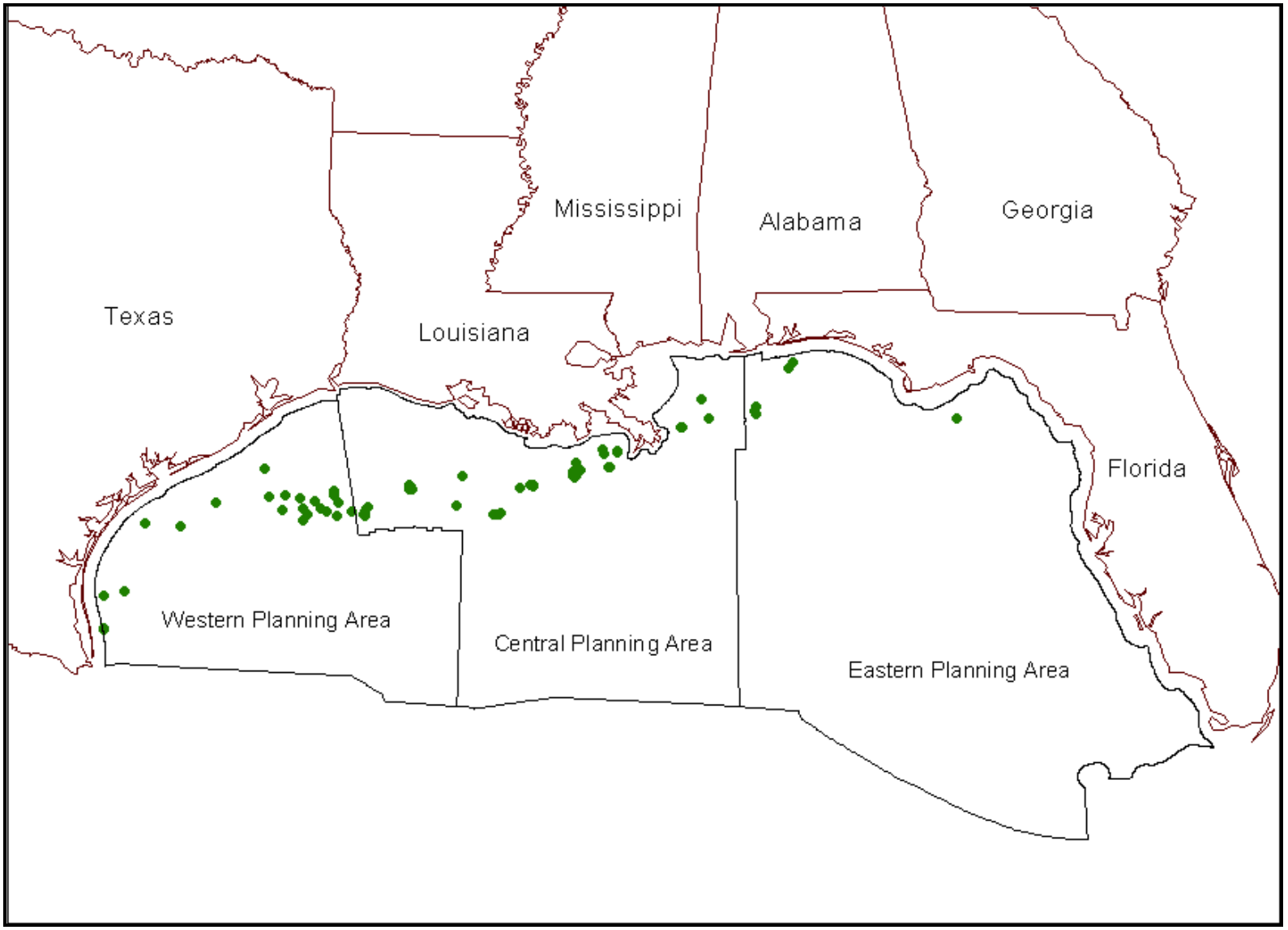

Figure 3. -Gulf of Mexico Rigs-to-Reefs Locations

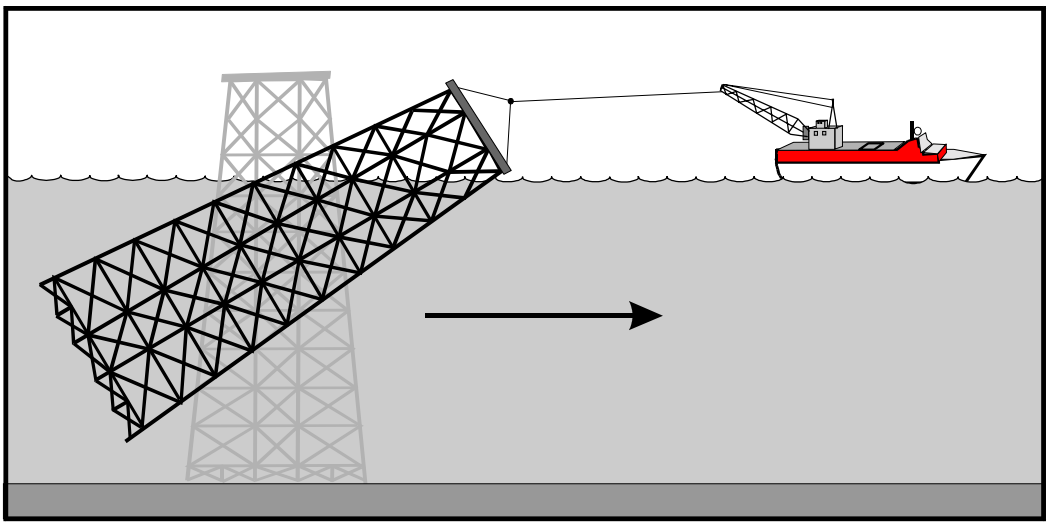

Figure 4.-The tow-and-place platform reefing method

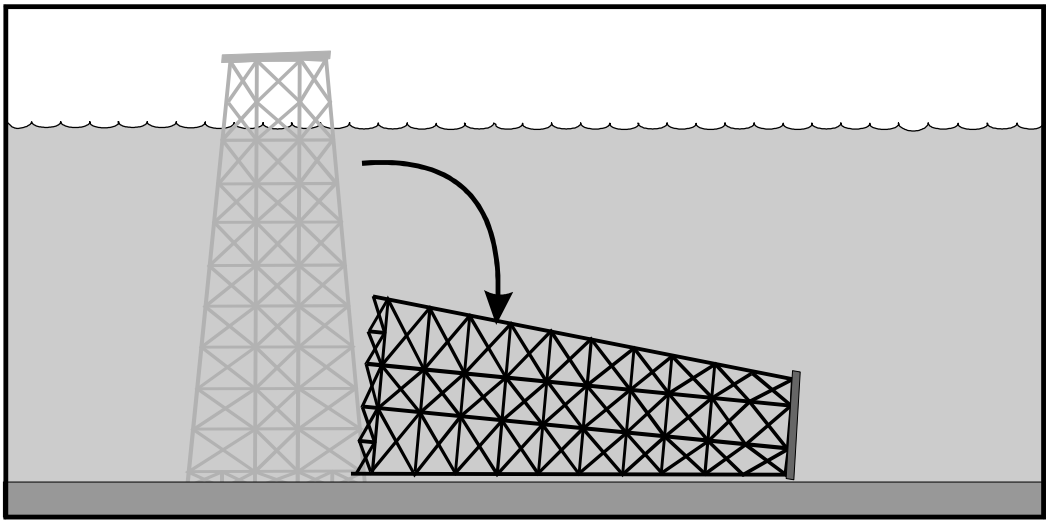

Figure 5.-The topple-in-place platform reefing method

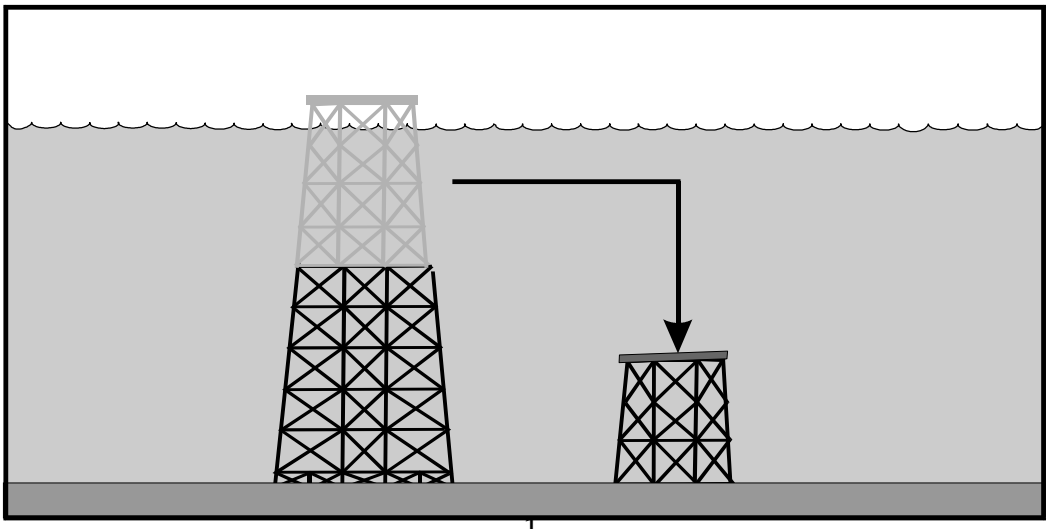

Figure 6.-The partial removal platform reefing method