The World’s First Commercial Guyed Tower Production Platform

Details:
- Brown & Root completed the fabrication, assembly, loadout, tiedown, launch, and installation of the world’s first commercial guyed tower production platform in 1,000 feet of water in the Gulf of Mexico in June 1983.
- The mammoth 1,078-foot long, 27,000-tonne tower was successfully side-launched from BAR-376 only 10 days after it was towed from Brown & Root’s Harbor Island Fabrication Yard at Aransas Pass, Texas, near Corpus Christi.
- With decks and drilling rig added, the structure stands about 1,300 feet tall - 50 feet higher than New York’s Empire State Building.
- The new design significantly reduced the construction costs of platforms for use in very deep water when compared with conventional “fixed” platforms. Cost efficiencies result from the use of less structural steel in the guyed tower.
- In addition to cost savings, the tower has been uniquely designed for stability. It is designed to move with wave and wind forces. Conventional platforms are designed to be rigid when exposed to environmental forces, and they are much wider at the bottom than at the top.
- Eight main piles, each one-quarter mile in length, anchor the tower to the ocean floor. Each pile was driven 550 feet into the seabed.
- The tower has 58 conductors, a total of 15 miles in length, and each conductor was driven 350 feet into the Gulf’s floor.
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Details:
• A network of 20 guylines arranged symmetrically around the tower and anchored into the Gulf’s floor keeps the structure from overturning. Each guyline extends approximately 1,800 feet from the tower to 200-ton clumpweights, then another 1,300 feet to the anchor pile.
• The clumpweights are built in segments and joined together much like the links of a bicycle chain. As wave or wind force moves the tower, the cable will lift segments in the clump-weights and then set them down when the tension relaxes.
• Three deck levels were installed by Brown & Root, utilizing the ATLAS I. The two acres of platform deck space held two drilling rigs, production equipment, and living quarters for up to 140 people during the first years of production at the Mississippi Canyon Block 280 site, offshore Louisiana.
• For Exxon, the guyed tower project represents an investment of more than $750 million.

Highlights:
• Lena spawned many innovations for its time:
  – Compliant pile foundations
  – Guying system components
  – Tower bouyancy & dynamic response designs
  – Side-launch installation
  – The use of a NASA-inspired “flangible nut assembly”
  – The first dynamically-positioned (DP) installation barge (ATLAS-1).
• The longest one-piece launch ever
• 200,000 man-hours were spent on installation engineering alone