In January 2008, the first phase of the $4.5 billion Kizomba C project offshore Angola started up—benefiting from ExxonMobil’s highly successful “Design One, Build Multiple” approach that captured lessons learned and synergies from the earlier Xikomba, Kizomba A and Kizomba B projects.

Xikomba and Kizomba A, B and C are deepwater development projects of a size and complexity not previously seen in offshore West Africa. Under a Production Sharing Agreement with Sonangol, the Angolan national oil company and concessionaire, Esso Exploration Angola (Block 15) Limited (EEAL), an ExxonMobil affiliate, operates Block 15. There are three other co-venturers in the block.

In total, EEAL has announced 38 discoveries in Angola, which represent world-class development opportunities with an estimated recoverable resource potential of almost 13 billion oil-equivalent barrels. The challenge was to move the projects from front-end engineering and design to production as quickly and cost-effectively as possible, while delivering superior safety and environmental performance.

Using a standardized design for all four projects had dramatic results — reducing up-front investment, shortening the design phase, lowering costs, reducing cycle times and facilitating excellent uptimes — all factors that improved project economics.

proven project execution

In 2001, EEAL began construction on the Kizomba A project for Block 15’s Hungo and Chocalho fields. Angola’s industrial capabilities were just emerging, so many components for Kizomba A were built elsewhere and delivered ready for assembly. Various project elements were built in South Korea, the United States, Malaysia, the Netherlands and Angola, then moved to offshore Angola and assembled. At least a dozen nationalities were represented on the team. In August 2004, the Kizomba A floating production, storage and offloading vessel (FPSO) began production — just 36 months after the funding commitment, a record time for West Africa. Within this same period, Xikomba was developed utilizing an early production system (EPS) class FPSO, a converted very large crude carrier (VLCC) tanker. This was the third such vessel used in West Africa by ExxonMobil, and production started up in November 2003—19 months after funding, overlapping the ongoing work on Xikomba and Kizomba A. In February 2003, construction began on Kizomba B to develop the Kissanje and Dikanza discoveries. Kizomba B came on stream in July 2005 after only 31 months of construction, almost five months ahead of schedule.

Building on ExxonMobil’s diverse knowledge base and our “Design One, Build Multiple” approach, construction on Kizomba C began in January 2006. Two EPS-class FPSOs, located 11 miles (18 kilometers) apart, are used at Kizomba C to develop resources efficiently. While smaller in production capacity than the newly built Kizomba A and B FPSOs, each has internal storage capacity of about 2 million barrels of oil. The first of these Kizomba C FPSOs, Mondo, was completed in a record 23 months and has started production offshore. The second FPSO, Saxi/Batuque,
started up in 2008, bringing total peak production capacity in Block 15 to about 800,000 barrels of oil per day.

ExxonMobil’s “Design One, Build Multiple” FPSO approach has delivered multiple benefits, with development costs and delivery times continuing to improve for each new vessel. The Kizomba C Project benefited from the earlier EPS projects by applying lessons learned and using many of the people who participated on the EPS projects. All projects executed in Angola Block 15 have also benefited from consistently strong implementation of global safety standards and, as a result, have achieved world class safety performance. Steady improvement in operational uptime has been achieved on both the Kizomba A and B developments. Through the end of 2007, uptime since start-up has been nearly 97 percent on Kizomba A, while Kizomba B reached 99 percent, another world class achievement.

proprietary technology

The Kizomba projects involved one of the most challenging extended-reach drilling programs ever undertaken. The longest wells approach nearly four miles (six kilometers) horizontal distance. Thin reservoirs made the horizontal sections extremely difficult to complete. ExxonMobil developed technologies to efficiently drill and complete many of the high-angle wells.

environmental responsibility

Optimization of hookup and commissioning activities and tailoring of drilling schedules minimized the amount of gas flared during the start-up of Kizomba B. Just 32 days after start-up, all gas was being reinjected. Kizomba C similarly minimizes flaring through gas injection.

growing national capacity

During the construction phase, employment peaked at several thousand workers worldwide. EEAL’s local workforce is more than 700 people, the majority of whom are Angolans. The focus on national workers is essential to the success of the Kizomba developments and the country’s growing industrial capacity and economy.

EEAL and its partners also invested $12 million to upgrade the Lobito fabrication yard and training facility. A new manufacturing plant in Lobito now makes the umbilical lines used to control subsea wells, and the Kizomba developments were its first customer. Approximately 400 local jobs were created in Soyo and Lobito to support construction and fabrication contracts.

national content

Xikomba and Kizomba A, B and C developments have awarded about $4 billion of work to the estimated 3,500 local contract and subcontract workers who support ongoing operations. Furthermore, EEAL’s development activities in Block 15 have created an even larger benefit to Angolan workers in other economic sectors, including transportation, logistics, maintenance and food services. Angolan expenditures have increased significantly over time as local companies, working with EEAL, have developed the capabilities to perform work required for such complex projects. The in-country fabrication of high-strength steel turret components for Kizomba C, for instance, was the first of its kind in West Africa.

Xikomba and Kizomba A, B and C are benchmark projects that set world-record cycle times with the lowest unit-development costs for projects of this size and complexity. The outstanding success of these projects demonstrates the value of skilled and experienced project management and the knowledgeable and innovative application of technology.