

BAPETCO INTERVIEW: STRATEGIES FOR EXPLOITING AND OPTIMIZING IN THE WESTERN DESERT

By Nicholas Linn

Recently Egypt Oil & Gas had the opportunity to sit down with the Bapetco's Chairman, Emad Hamdy, and learn a little about the operations and plans of the company. The interview is too detailed to print in full, but selected highlights are below.

Bapetco

The Badr El Din Petroleum Company (Bapetco)—a joint venture between Royal Dutch Shell and the EGPC—is one of the largest joint ventures in Egypt, operating primarily in the Western Desert. While many of the fields under its control are quickly maturing, the company has been aggressive in pursuing options allowing for secondary and even tertiary recovery, also employing advanced technologies to reach previously unrecoverable resources.

Reversing the Trend

"We are one of the major companies in the oil and gas production. Production is close to 130,000 boe/d," said Mr. Hamdy. He went on to explain that Bapetco is attempting to counter the trend of the Western Desert—namely declining fields—through the application of technology. "If you look at our production for the last two years, our production is increasing in both oil and gas."

Hamdy noted that before he took over the chief job at Bapetco, production was around 95,000 b/d and declining. A main goal of the new executive was to figure out how to reverse the trend and start increasing production. "If you were just looking at a typical production profile of a company in concessions like ours, production should decrease due to the normal decline in mature wells. But we are actually increasing production," said Hamdy.

One of the main ways the company is increasing production is through more extensive use of water flooding. "Over the past two years our application of water injection was giving us about 20,000 b/d," stated Hamdy, "But now we are producing 45,000 b/d by water injection."

Internal reports show that better application of water injection has minimized the effect of declining wells on production. The production decline was over 30% per year—but through water flooding—this has now been brought down to less than 10%.

"This has improved the reservoir stability and the parameters. It is helping us support our reservoirs and helping us produce for a longer period of time," said Hamdy.

Bapetco is also pushing the envelope in using advanced techniques not previously applied in

the Western Desert, including drilling horizontal wells and using HIWAY hydraulic fracturing on a formation basis.

"For tight formations, such as the Obaiyed, we have improved production by using advanced technology such as HIWAY fracking. We have started to produce from tight formations with this method. For other areas, we have implemented other technologies such as; fracking and reduced tubing size to increase production and efficiency," said Hamdy.

The chairman finished by explaining that despite decreasing returns from Western Desert wells, the company has continued investment in them. "We have tried to drill new wells in addition to intervention activities to combat the natural decline in production and improve our production," finished Hamdy.

Increasing Efficiency

Under Hamdy's leadership, Bapetco has been making a push for more efficient operations. One of the principal ways this has been achieved is through setting up committees dedicated to specific components such as Electric Submersible Pumps (ESPs).

80% of the company's oil fields are artificially lifted with ESPs, so operating this equipment efficiently is essential for Bapetco. "We have created a committee for ESPs. Most of our oil production comes from ESPs and this team is mainly to discuss and evaluate and to troubleshoot problems with the pumps. We have improved the skills of this team, and we've tried to reduce the loss in production from ESPs. We have done a good job with this too," said Hamdy.

The continuous improvement program has been dedicated to ESP design and operation with the objective of reducing ESP production deferment by 50% in the next two years. Some of the achievements of the program include, improved designs (utilizing shrouds), new technology (allowing the pumps to be operated in wells with a high gas/oil ratio), incentive-based contracting for better performance from partners, and the beginning of having all pumps transferred to centralized power.

The goal of the program is to "minimize production deferment, reduce operating costs, and avoid the loss of well productivity which occurs during work-over operations."

"We are especially increasing production in gas. I think when I arrived we produced about 350m mcf/d, and now we are producing closer to 500m mcf/d," said Hamdy.

Recent Projects

In November of last year, Bapetco successfully built and began production at the new Assil and Karam gas plant (a CRP plant). This project will add about 150 mcf/d of natural gas and 2000 barrels of condensate per day to Bapetco's production. The project has a budget of at least \$300m, and the main contractors are Enppi and Petrojet.

"This project has been praised by Shell as being the most safe, with high production and a very good quality of work," said Hamdy. "This was awarded the top global project for Shell in 2014." (In recognition of the project's added value for the company.)

In addition to the CRP plant (which operates by sweetening gas by removing CO₂ from gas), the project includes drilling and hook-ups of new three gas wells: Karam 5, 6, and 7, and the construction of two new pipelines (each 12" diameter and 27 km length.) Since the start of the project, cumulative production has reached about 22.7bcf together with 310,000 barrels of condensate.

The Obaiyed field has also been a strong area of growth for the company, as it has allowed engineers to develop expertise in a complicated environment. The geology is extremely complex and the rock quality ranges from "excellent to extremely tight." Vertical wells have previously been used to exploit gas reserves in "sweet spots," but vertical wells cannot be used to commercially develop the gas reserves held in the poorer sands, roughly 40% of total reserves.

In order to better exploit this field, Bapetco is in the process of drilling two horizontal wells to "evaluate the application of the latest hard rock drilling techniques."

Current Challenges

Low oil prices have affected nearly all oil producers over this past year, but those hardest hit are the companies operating in expensive areas such as the deep Mediterranean. As Bapetco's operations are in the Western Desert, they have not been hit as hard by the prices as others. However, no company is immune.

"The lower prices affect the oil and gas industry not only for Bapetco but for all companies. By implementing the exercise of the low prices you find that the partner tries to reduce his cost in order to cope with the price environment. We did that this year with some water wells, but not for the backbone of the production. (drilling, frack, intervention, and workover). But this effect is shared with others, especially service companies," Hamdy said.

Hamdy continued, "One of the challenges is to reduce the unit cost. We are working hard on that by negotiating with service companies to reduce the cost. They have been flexible to work with. Even with companies affiliated with the government. We have been given some discounts on the extension of the new contracts. We also have to increase the production. We have to continue to support the reservoir pressure for production."

Hamdy said that another of Bapetco's chief ways to combat the problem is to become more efficient and create a culture of safety. "We have started to improve our skills, we've tried to improve production, first of all. We are improving our safety requirements; safety is number one in our company, because without safety, there is no asset integrity. There is no production. There is nothing in the oil industry without safety," said Hamdy.

"We've started to improve our skills in safety, quality, asset integrity, production, loss control, etc. Everything to improve the skills of the company in order to cope with the critical situation we are facing; low oil prices and national demand for natural gas," Hamdy finished.

Some oil companies have mentioned to Egypt Oil & Gas that it can be difficult to get authorization to use advanced techniques. However, Mr. Hamdy said that was not the case with Bapetco, particularly concerning the EGPC.

"The EGPC is encouraging us to use high technology; even if it is expensive. One good example is the HIWAY fracking. It is expensive, it costs us more than \$1m per job and we do it in our company and the EGPC does not complain about it. They encourage us in this. They also support feasibility studies," stated Hamdy.

Personal History

Egypt Oil & Gas asked Mr. Hamdy a little about his personal career, and how he ended up at Bapetco. "I started with Suco in 1982 as a well-side petroleum engineer." Mr. Hamdy spent about several years at Suco, and was promoted to the rank of petroleum engineer department head. "I got my experience from Suco, Suco was a very big school for engineers during this time," Hamdy said.

Hamdy then left for the GPC, where he was promoted to petroleum engineer sector manager. "I later achieved the rank of petroleum engineering general manager."

The current chairman has been with Bapetco for two years.