

# Tesco casing-drilling system slashes tripping, targets 30% decrease in drilling time

A NEW CASING-DRILLING technique being developed by **Tesco Corp** could cut drilling costs by 30%, said Tesco President **Robert M Tessari**, speaking at the 1998 IADC Annual Meeting, held 23-25 Sept in New Orleans.



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—Robert M Tessari, Tesco Corp

ing a mud motor," he said. Right off the bat, drill pipe and collars are eliminated, along with related handling tools and manpower.

As Mr Tessari described it, the casing drilling process results in:

- Simultaneous drilling and casing;

ogy, both in surface drilling and downhole tools," Mr Tessari said, "but we're still forcing all those tools to go into the drilling rig through a tripping procedure.... If we're going to reduce the cost of drilling, we have to address that non-productive time."

Mr Tessari said Tesco's goal was to shoot for a 30% reduction in drilling costs, excluding unscheduled events. The well is cased as it is drilled.

"We do that by rotating the casing or us-

- Elimination of drill pipe and drill collars;
- Elimination of drillstring tripping;
- Reduction of unscheduled events;

- Increased drilling safety;
- Lower rig costs;
- Lower well costs.

The casing-drilling process, Mr Tessari explained, works by collapsing everything downhole and bringing it up through the casing. Tesco used wireline to accomplish this, though coiled tubing could also be used.

"The whole idea," he said, "is not to trip the pipe out of the hole."

The process, he said, can avoid numerous hole problems that cause unscheduled events, including swelling and sloughing formations, washouts, difficulties running logs, among others.

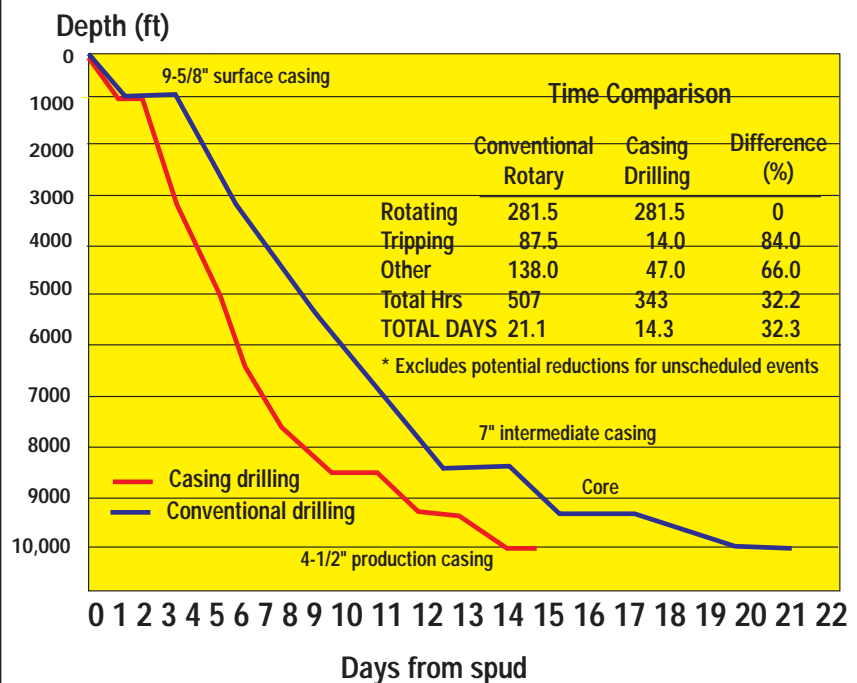
"The name of the game in casing drilling is always circulate," he said.

## RUNNING TOOLS

The system uses a tool with a shoe, a torque collar and an axial collar. It is latched to the casing axially and torsionally. Currently, Tesco is using off-the-shelf bit and underreamer. A pack-off assembly is used to pump in.

"Today, we're shallow and soft, and we've had some good success in that part," Mr Tessari said. "We've had a lot of problems latching and unlatching. Those have been the big challenges."

## Time -depth comparison: Casing drilling vs conventional operations on 10,000-ft well



## 30% SAVINGS

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A typical 10,000-ft well, Mr Tessari said, might take 21.1 days or 507 hours. 281.5 hours or 55.5% of that time would be spent rotating, with tripping amounting to 87.7 hours or 17.3%, and other operations representing the remaining 138.0 hours or 27.2%. The casing-drilling system, conversely, would spend the same 281.5 rotating hours, but the percentage rotating time soars to 82.2%, while only 14.0 hours is spent tripping. This is just 4.1% of the total time. Other operations account, Mr Tessari said, for 47.0 hours, or 13.7%. The total time is then 343 hours or 14.3 days, 32.3% less than the conventional drilling example.

## RIG CONVERSIONS

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Tesco has built 3 new rigs to test the technique. However, he said converting conventional rigs to casing-drilling operations is cost-effective. 80% of the rig, he explained, is still usable. Modifications include adding a wireline winch with an electric line, incorporating a split block and crown, and adding wireline preventers and pack off above the top drive.

The casing-drilling rig features a single

derrick with no monkey board or set back. "The drawworks now is basically a glorified automatic driller," he said. It

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will also require less horsepower for circulation and tripping, as well as requiring no drill string.

It will also constitute a much lighter unit, he said. For example, the 3 units Tesco has manufactured have weighed just 500,000 lb, compared to some 750,000 lb for a similar conventional unit.

## CHALLENGES

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Still, challenges remain. These include casing connections. Mr Tessari suggested that these could be made on the rig in less than a minute using induction welding. He further believes that difficulty with connections will be minimal on directional wells less than 40°.

Other challenges include setting downhole tools in a drilling mud environment, due to pressure, temperature and erosion. Stuck casing contingencies are also a challenge.

Crews must also be retrained, especially because this operation relies heavily on programmable logic controlled processes. Finally, Mr Tessari said, good drilling practices must be established. These include learning curves for annular velocities and torques.

## FUTURE APPLICATIONS

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The new process could make air drilling more effective, Mr Tessari said. It would also allow underbalanced drilling with completion strings. In addition, casing points could be pushed deeper. Riserless drilling is yet another application, he said.

"It's been 60 years with the rotary drilling process," Mr Tessari said. "We still use the same procedure, even though we've evolved the tools. I think we're looking at a huge change that has the potential of making casing actually work for drilling." ■