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Theory of Constraints Tapped to Accelerate BP's Gulf of Mexico Cleanup

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The process helped BP save more than $200 million by identifying key measurements and planning the bottleneck into the operation.

Rarely does a business management theorist get a chance to prove himself by taking a key role in the fast-breaking news story of the year. And even rarer does it lead to concrete success.

That was the opportunity presented to Pinnacle Strategies CEO Mark Woeppel when BP surprised him with a call for help fighting the oil spill in the Gulf of Mexico. The call would lead Pinnacle on an international mission to boost output of spill fighting equipment and then to help organize a historic mop up -- the cleaning of more than 10,000 boats, ships and rigs.

As the magnitude of the spill became clear last April, BP put out the order to buy all material that could possibly be of use. But it found the entire U.S. production of critical cleanup resources was not enough. Oil was spreading -- often where no workers, booms, skimmers or other equipment existed to contain it.

As with many success stories, Pinnacle's involvement started with an incidental connection. Clint Wood, the BP executive in charge of supply, recalled a time years earlier when he briefly collaborated with Woeppel to boost production.

Now, Wood needed decontamination suits, boats, detergents, real estate for clean up sites, containment boom, dock space, boats, and other scarce material. More than equipment, Wood realized he needed to mobilize minds.

"I sifted through old e-mails and found one of Mark's marketing letters," Wood said. "I've always been an early adopter. I wanted to see if we could use Theory of Constraints to increase throughput."

Within 48 hours of Wood's Friday evening phone call, Pinnacle launched a marathon of visits through North America and Europe to work with BP's key suppliers to increase production.

One early visit was to a Walker, Michigan factory. Prestige Products was asked by BP to supply as much oil containment boom as it could.

"When we started manufacturing boom, 500 feet a day was the biggest order anybody could handle," said Brian Rickel, Prestige's owner. "A single order on the scale BP wanted would surpass the entire capacity of every boom manufacturer in the country combined." Rickel increased staff to 75 from five and raised production to 12,800 feet daily and felt he had reached a limit.

So Woeppel sent Ed Kincer. Kincer watched as Prestige workers assembled boom in a flurry and then slowed with little to do for several minutes. Nearby, cutters sliced boom by cutting one side, walking 100 feet, and cutting the other. Other workers were idle for minutes while waiting for a welding machine. The walk, the waits and changing rhythms were waste. Prestige could more than triple capacity.

Prestige ended up making 1 million feet of boom for BP.

Pinnacle showed Seattle boat manufacturer Kvichak Marine how to quadruple output of oil skimmers, allowing it to deliver twice its target in half the time planned. The consultants advised Illinois-based Elastec on how to ramp up production from four skimmers a week to 26. At Abasco, a Houston-based boom manufacturer, rebalancing staff to keep welding during breaks would increase production 20%. Supply Pro, a Texan manufacturer of absorbent boom, raised output by using plentiful cellulose instead of scarce polypropylene.

"There was no precedent for how fast this operation grew," Wood said. "We had to start work with supply chains that didn't even exist. But at virtually no point did supply end up constraining the operation. Our boom capacity grew 1,000% in a month."

When the spill came under control, BP was left holding the bags. It cost $1,000 a day to keep each of the thousands of workers in the field and the boats cost tens of millions of dollars a day. It was time for control.

BP tapped Pinnacle for an even bigger task than boosting supply -- accelerating the cleaning of equipment so it could return to its owners.

Boats ranged from aircraft carrier-sized vessels to family shrimping boats. Each had separate cleaning requirements. Some needed wooden planking replaced, others needed specialized cleaners to work in dangerous, oil-filled interior spaces and others needed expensive dry docks. Most were particularly vulnerable to oil. Some used ocean water to cool engines. When sailing on an oil slick, the cooling system gunked the works. Others had oil-soaked wood or textile to replace while more required complete dismantling.

Dom Sawchuk, an Illinois-based Pinnacle consultant, was charged with helping devise a plan to clean billions of dollars worth of goods.

Boat cleaning had started off slow. Dozens of contractors through Texas, Florida, Louisiana, Alabama and Mississippi were testing techniques with little coordination. Boats showed up at sites without warning and workers would take days to figure out how to clean them.

Pinnacle viewed the cleaning sites as a massive, roofless factory and set about designing the process to clean rapidly. It was at this point, the decision was made to design the bottleneck into the system; the cleanup docks. The crew started to tackle it.

The team first designed a system to measure dock space use. Only about half the space was being used, leaving plenty of opportunity to increase the rate of cleanup.

When site managers started to understand the implications, dock utilization shot up to 80%, then to 100 percent and higher. Quick visits showed managers were tying boats side by side or backing them in so the stern touched the dock to boost their numbers beyond dock capacity. But work wasn't progressing much faster. Many boats were idle.

The next step was to refine the measurements, looking at productivity through number of feet of boat cleaned per week. Pinnacle then helped monitor and shave off lost time, or the amount of time that workers were idle due to inefficient processes, safety concerns or factors like weather. At the beginning, lost time measured 50 percent.

The measurements first required resolving a major holdup that affected every aspect of the operation. In the mix of contractors, subcontractors, conflicting interests and disparate locations, communication desperately needed streamlining. Each company had different methods of communicating -- if they had a method at all.

Teams were given templates to ensure communication was uniform and available at a glance, detailing the status of each boat. This allowed identification of other delays.

Shift changes were costing an hour. Management staggered them to ensure the most constraining tasks were staffed. Supply trailers moved closer to work sites, walkways were shifted to minimize movement time and parking lots were expanded to smooth equipment flow.

Results started to show. The measurements helped rearrange staff, pressure management and figure out what works, cutting lost time from about 50 percent at the start of the cleanup to as little as 12 percent.

"The boat cleaning happened fast," Wood said of the six-month operation. "Normally it would have taken years. The footprint was expanded dramatically when we figured out what needed to be done dockside. We ended up turning away extra dock capacity because we no longer needed it."

In six months, Pinnacle had more than doubled supply of skimmers, boom and other critical resources by identifying bottlenecks at dozens of factories, ensuring that supply never constrained the fight against the oil spill. The company had then accelerated the cleaning of the boats, helping save more than $200 million, by identifying key measurements and planning the bottleneck into the operation. Woeppel said the success on such diverse operations was due to the adaptability of the Theory of Constraints.

"The Theory of Constraints is a scientific approach but the implementation is a bit of an art," Woeppel said. "Our implementation was a blending of approaches to getting the job done -- from the supply to the boat cleaning. It required a demonstration of versatility and I'm thankful we had such an opportunity to showcase it."

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