

Upgraded Compressors

Oil & Gas Producing companies rely on high-speed reciprocating compressors to meet gas compression. This type of compressor has proven to be economic, flexible and reliable solution for a wide range of natural gas applications. In order to meet industry needs, GE Energy has upgraded its line of D, E and F series high-speed reciprocating compressors. Building on technology from its proven Nuovo Pignone API618 process compressors, “The result is higher efficiency, and improved reliability and robustness for compressor frames now identified as the DS, ES and FS Tradition Series of high-speed compressors,” says Colman de Jong, manager of high-speed reciprocating compressor sales in GE Energy’s oil and gas business.

As part of the upgrade effort, GE Energy applied Six Sigma methodology for defining, measuring, analyzing and improving quality. The first component to be evaluated by the Design for Six Sigma (DFSS) team was the compressor crankshaft, de Jong reports. Some models of the high-speed compressor crankshafts had been built with bolt-on counterweights, which GE determined as an unacceptable source of variance through failure mode event analysis.

“As a result, a new attachment method was developed that dramatically reduces variance in the manufacturing and assembly process,” de Jong says. “The crankshaft was redesigned, eliminating the bolt-on counterweights and utilizing a single-piece concept with integral counterweights, all machined from a single forging. These changes were phased into the high-speed product line in early 2004.”

As the DFSS process continued, other product upgrades for D, E and F series of compressors were rolled out. “The connecting rod was redesigned with new material, the crosshead pin eye was enlarged, and a new method of attaching the connecting rod cap was developed,” de Jong continues.

The crosshead was redesigned with a larger crosshead pin, and the entire assembly was simplified by making the crosshead shoes integral with the crosshead body. All components were designed to also fit the



existing fleet of D, E and F compressors. Table 1 shows the capabilities of the upgraded DS, ES and FS frames. For comparison, the load ratings of D, E and F Series compressor frames are in parentheses.

GE Energy offers reciprocating compressors ranging from slow-speed API-618 models operating at discharge pressures up to 50,000 psi (3,500 bar) and 40,000 brake horsepower, to a full line of high-speed reciprocating compressors ranging from 30 horsepower to 9,000 horsepower, de Jong concludes.

Cutline for Photo 4 (5-024M 5-024M GE Energy):

GE Energy has upgraded its line of D, E and F series high-speed reciprocating compressors for improved efficiency, reliability and robustness. The new DS, ES and FS Tradition series compressors were designed using the Six Sigma methodology to continuously define, measure, analyze and improve quality.

