HYDROCARBON PROCESSING®

FEBRUARY 2009

HPIIMPACT

US refining requires tune-up

Viability questions for coal-to-liquids

SPECIALREPORT

CLEAN FUELS

Innovative methods enable 'green' fuels production

BONUSREPORT

SEAL TECHNOLOGY

Update on latest rotating equipment seal advances

www.HydrocarbonProcessing.com

Originally appeared in:
February 2009, pg 9.
Used with permission.
HYDROCARBON PROCESSING®

HPIN RELIABILITY

HEINZ P. BLOCH, RELIABILITY/EQUIPMENT EDITOR

HB@HydrocarbonProcessing.com

Modern blowers can be reliable

If you have ever had to struggle with unreliable blowers, you are not alone. Blowers are low-pressure machines with typical differential pressures of five to 20 psi (roughly 0.3 to 1.3 bar). Whether it is due to blower vibration issues, bearing failures or lubrication and overheating problems, these machines are very often found on the "troublesome equipment" lists of many plants.

Why, then, have blowers with less than optimum reliability for years found their way into many HPI projects? One reason is that the cost-estimating manuals of many design and project contractors often tend to list only the least expensive machines. Regrettably, project appropriations and monetary allocations are based on these low costs and the less-qualified bidders, in terms of long-term equipment reliability, win the contest. Among the dozens of additional reasons we might cite project teams that are rarely held accountable for future machine reliability or uptime. Also, due to the initial expense of bringing blowers into compliance with the more highly structured API-617 centrifugal compressor standard, blowers in the petrochemical industries have been lost in the interpretative no-man's-land between the API-617 standard and other industry low-pressure fan standards. Accordingly, blowers often end up being purchased as "manufacturer's standard only."

FIG. 1 One of several high-quality blowers at a remote installation in the Middle East (Source: Abdulrahman Al-Khowaiter, with the permission of Saudi Aramco).

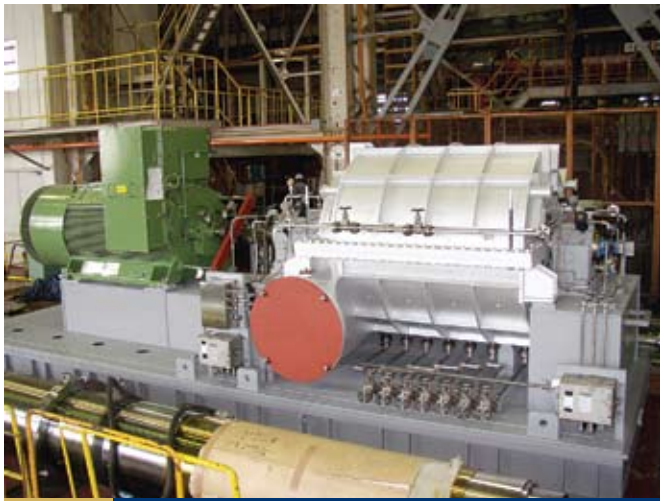

FIG. 1 Modern high-quality blower, shown with an electric motor driver (Source: Dengyosha Machine Works, Tokyo, Japan).

Reliability thinking and checking things out. We commend a senior reliability engineer in the Middle East who made it his business to thoroughly acquaint both himself and others with available upgrade options and alternatives. In an equipment experience survey and during subsequent field visits in 2001, he was searching for a high-quality multistage centrifugal blower manufacturer capable of replacing the lower-quality/reliability multicasing, tie-rod-type blowers he had seen at some facilities. The best mean-time-between-failures (MTBFs) for the tie-rod-type blowers averaged two years, with a mean-time-between-overhaul (MTBO) of three years. During the field visit he noticed some strange-looking blowers (Fig. 1) at one of the corporation's rather remote locations. They were air blowers rated at 600 hp (450 kW) each.

The reliability engineering consultant immediately went back and copied all available nameplate information; it gave the name of the Japanese manufacturer, Dengyosha Machinery Works, or DMW (http://www.dmw.co.jp/english.html). On the next day, he informed another corporate compressor specialist of his findings and obtained confirmation of reliability through the computerized maintenance history files. This specialist, too, was strongly interested and the two men started contacting the vendor via the Internet. The two engineers also verified that blower reliability was well recognized at other projects. In fact, since 2003 this vendor has won five separate competitive orders to supply blowers to the owner-user's facilities; Fig. 2 shows a 1,000-hp/750-kW blower. Referring back to the old machines and as of late 2008, neither failures nor vibration problems had occurred on any of them. Varying from 350 hp/260 kW to 1,200 hp/900 kW they have, at one remote location, operated for 20 years without failures. In other words, the blowers achieved a 20-year MTBF.

High reliability and uncompromising excellence are still available, but you will have to search for it. HP

The author is the equipment/reliability Editor of *HP*. A practicing engineer and ASME Life Fellow with close to five decades of industrial experience, he advises process plants on maintenance cost-reduction and failure-avoidance issues. He has written over 400 papers or articles. His 16th and 17th reliability-related textbooks (*Maximizing Machinery Uptime*, ISBN 0-7506-7725-2, and *Practical Guide to Compressor Technology*, ISBN 0-471-72793-8) were released in 2006.