Written by Rick Page, Vice President Marketing, John Crane America
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Rick Page, Vice President Marketing, John Crane America The challenges Maintenance and Reliability Professionals face in today's business environment are daunting. Not only are they being asked to do more with fewer people, but hiring well-qualified people is increasingly difficult. Expectations are much higher with respect to plant productivity, health and safety and environmental compliance. To add even more complexity, equipment suppliers are introducing new technologies at an accelerating pace. Invariably, these technologies overlap, leaving multiple choices available for a given application.

Evaluating your options

It is more important than ever that Maintenance and Reliability Professionals maintain strong relationships with world-class suppliers who not only can offer the full range of technologies, but also can make educated recommendations as to the most cost-effective solutions for a given application. For example, let's look at the mechanical seal technologies that can be applied to pumps handling environmentally sensitive process fluids covered by EPA's Clean Air Act:

- Single seals generally are preferred by pump users, the advantages being simplicity and potentially lower life-cycle cost (LCC). Single seals have been proven to perform to low emission levels, in compliance with regulations. Data, however, also shows the potential for significant variability in emission readings during upset conditions, which can trigger an LDAR event, even though the seal may be capable of recovering once conditions return to normal.

- Dual seals with a buffer/barrier liquid are used to contain leakage from the inner seal during upset or failure, and built-in alarms notify the control room of a problem. Various arrangements are available, including un-pressurized buffer systems (API Plan 52) and pressurized barrier systems (API Plans 53A/B/C and 54). Despite their widespread use, dual seal arrangements generally have higher initial cost and ongoing maintenance disadvantages associated with the care and feeding of the liquid buffer/barrier fluid reservoir. In some cases, though, they remain the best solution.
- Dry gas seals with specially designed lift-off groove patterns on the seal faces are extremely effective in containing environmentally sensitive products, and require only a simple pressurized gas barrier system (API Plan 74) to act as the barrier fluid. Dry gas seals can

operate maintenance-free for years. While they may carry a higher initial cost, their total LCC is low.

- Secondary containment seals with lightlyloaded dry-running outboard seals also are effective at containing emissions from the inner seal, diverting them to vapor recovery or flare. They utilize a simple leakage diversion system (API Plan 76), leading to a reliable system at low LCC.

Making informed decisions

Which technology is best? It depends on any number of application variables. Only a global supplier of all available technologies with access to real-world data can make a truly objective recommendation.

At John Crane, we maintain databases detailing hundreds of thousands of specific seal installations around the globe. For the 200,000+ applications where we also contract to deliver reliability improvement services, we have additional insight into RCFA performed by on-site engineers, MTBR trends by customer and by application and adoption rates for various technologies. This accumulated knowledge provides direction for our application recommendations, new product development and technology research. I suspect other global equipment manufacturers have similar capabilities.

Maintenance and Reliability Professionals should take full advantage of the comprehensive knowledge bases available to them through their global suppliers to select the best technologies at the lowest LCC based on real-world experience.

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