
Question 66: Flare gas recovery systems are currently being engineered and installed in refineries. Please comment on your experience with these recovery systems, particularly with their reliability and maintenance.

Eric Thraen (Flint Hills Resources)

Our oldest flare gas recovery system has been in place for thirty years. This installation has sliding-vane style flare gas compressors. Our newer applications have liquid-ring compressors. The liquid-ring compressors offer a reliability advantage because the liquid ring/piston takes the place of the sliding vane contact wear parts. Both styles of machines have design issues that need to be understood, including winterization, if applicable, and the control system for varying capacity to match demand. An installation with a single machine of either type is relatively simple to control and winterize. An installation with multiple machines in parallel, ramping up or down on demand, to accommodate peak flare loads, including those loads related to shutdown decommissioning of other units, is highly complex. The control scheme for ramping the machines up and down, adjusting the staging sequence to balance individual machine run times, and limiting the start/stop event frequency within the limitations of the attached motors, is highly complex. Winterizing, where necessary, a battery of machines in parallel adds greatly to the cost of the system. The infrastructure requirement for processing produced sour water from liquid ring system blowdown needs to be understood and factored into the installation scope if SWS capacity is not already available. Care should be taken to ensure the provisions for isolating and maintaining equipment are included in the design and layout. This may require added design reviews and oversight of any skid-mounted systems included in the project scope. Care must also be taken when integrating skid vendor's instrument and other specifications and practices with the refinery's long-term operating and reliability needs.

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