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An industrial Gas Turbine/Compressor package designed for rapid installation and commissioning

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AN INDUSTRIAL GAS TURBINE/COMPRESSOR PACKAGE DESIGNED FOR RAPID INSTALLATION AND COMMISSIONING

THE NEED

A reduction in both the time and the cost of installation of medium-to-large industrial gas turbine mechanical drive packages can be achieved. Gas turbine drivers, centrifugal compressors, and their ancillary equipment frequently arrive at site mounted on numerous separate baseplates which must be independently set, and which require extensive interconnecting piping and wiring. This accounts for significant time and expense in a new construction project.

THE TECHNOLOGY

Integration of the gas turbine driver, driven equipment, and ancillaries on two easily-assembled skids is made possible by the application of several technological developments, including aeroderivative gas turbine engines, dry gas compressor seals, compact plate-type heat exchangers, variable-speed AC motor drives, and microprocessor-based control systems which are certified for hazardous environments.

Aeroderivative industrial gas turbines are not new, having been adapted from their flight variants in the late 1950's. Their high power density makes them ideal for putting maximum power in a relatively small, transportable package. Thirty years' evolution has given them efficiency and maintainability that equals or surpasses their heavy frame-type industrial competition.

The use of dry gas seals has become the standard in the last decade for centrifugal compressors in many applications. This seal system eliminates the bulky and expensive arrangement of high-pressure pumps, filters, regulators, and reservoir that was required by the oil-film type seals of the past. Dry gas seals also improve compressor efficiency, while eliminating the potential fire hazard of the previous seal oil systems.

Plate-type heat exchangers occupy a fraction of the space required by traditional fin-type liquid-to-air heat exchangers, making them ideal for use in tight space constraints. They have been proven in numerous oil & gas industry applications in the last decade.

Variable-speed AC motor drives have also benefited from recent reductions in costs and improvements in reliability. Where an AC-powered start system would previously been an expensive and bulky electro-hydraulic combination, it is now possible to do direct-electric starting with variable-speed AC drive technology.

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Gas turbine engines and centrifugal compressors in the oil & gas industry are invariably located in environments which are classified as hazardous, usually Class 1, Group D, Division 1 or 2. The microprocessor-based control systems used to control them often require installation in safe atmospheres, meaning they are located in remote control rooms and require extensive (and expensive) interconnecting cabling. Development of proprietary controllers which can be installed in hazardous atmospheres enables location of the unit control panel on the equipment skid.

In addition to the components mentioned above, the fuel gas system, lube oil system, fire & gas detection / protection systems, air inlet filter, and exhaust system are all mounted at the factory on two skids which are easily transportable and quickly assembled at site. An example is shown in Figure 1.

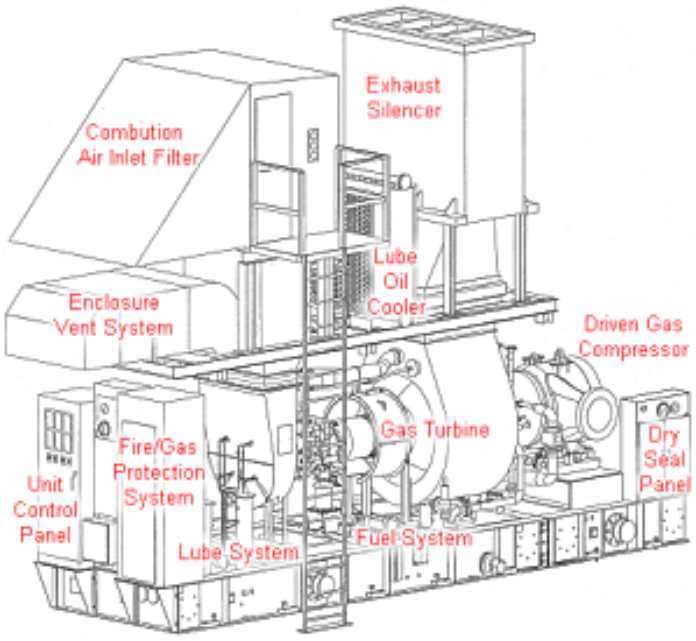

FIGURE 1 GAS TURBINE/COMPRESSOR PACKAGE

THE BENEFITS

By minimizing the need for interconnection of piping and wiring between multiple equipment and controls locations, site installation and commissioning time is drastically reduced. This can result in the savings of hundreds of thousands of dollars and several weeks time in an overall construction project. In addition, wiring and piping connections verified during factory testing remain in place during shipment and installation, instead of being disassembled and reassembled at site. This improves overall quality control as well. Another advantage accrues from the reduction in loose components shipped to site, meaning less risk of parts shortages during installation.

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Status

Package designs which integrate all components are complete for all Allison industrial turbines in the Cooper Rolls product lineup.

Barriers

Integrated packages require a certain degree of standardization of the manufacturer's package design. In the oil & gas industry, many operators expect equipment manufacturers to comply with the purchaser's proprietary technical specifications. A degree of compromise will be necessary between these two approaches.

Point of Contact

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Reviewers

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