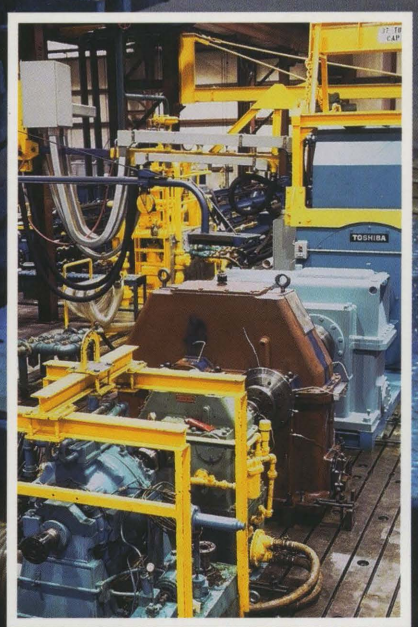
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LUFKIN

Gear Testing

Assures Outstanding Performance

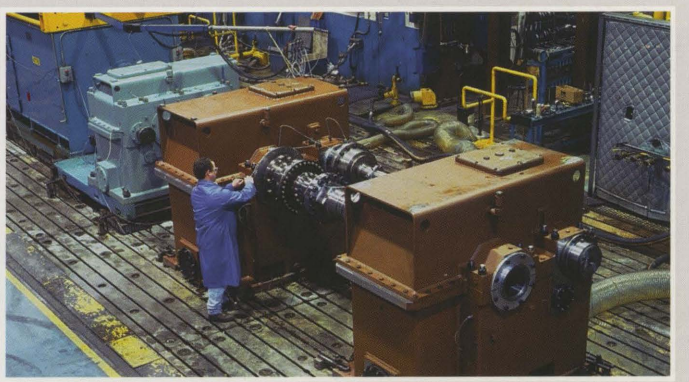


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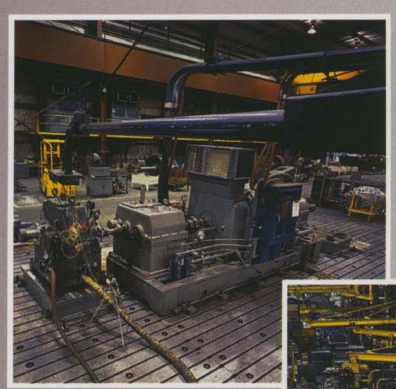


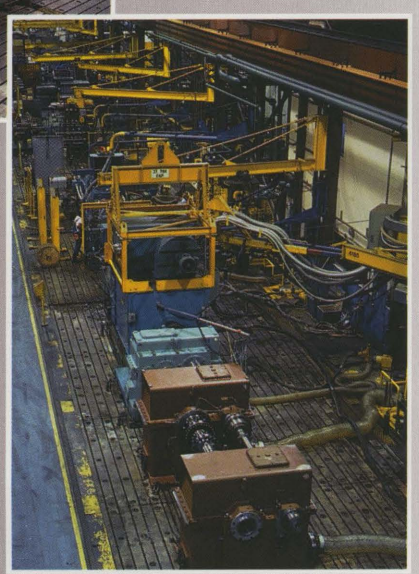
The Lufkin test stand utilizes a 950 gpm lube system.



Test Engineers at Lufkin oversee each phase of product testing.

Lufkin Industries requires all new and refurbished gear units to be full-speed tested. This applies to new installation gearing or the redesign and manufacture of a drop-in replacement unit for a retrofit application. In addition, many units are built and tested to the demanding API 613, 4th Edition, and API 677 industry specifications. Utilizing leading edge technology to enforce stringent, comprehensive performance testing and product inspection prior to shipment, Lufkin has been able to supply its customers worldwide with reliable, high performance, precision gear drives for over 50 years.





Lufkin's full-range performance testing facility is recognized throughout the industry.



All Lufkin units receive thorough testing and inspection prior to shipment.

Lufkin's extensive testing process, coupled with state-of-the-art 3-D design technology, sophisticated analytic capabilities and vertically-integrated manufacturing, ensures that all Lufkin units provide a smooth initial start-up and years of outstanding service. At Lufkin, performance testing is an integral component in the commitment to quality assurance and product development. That is why Lufkin has designed and created one of the finest gear testing facilities in the world.

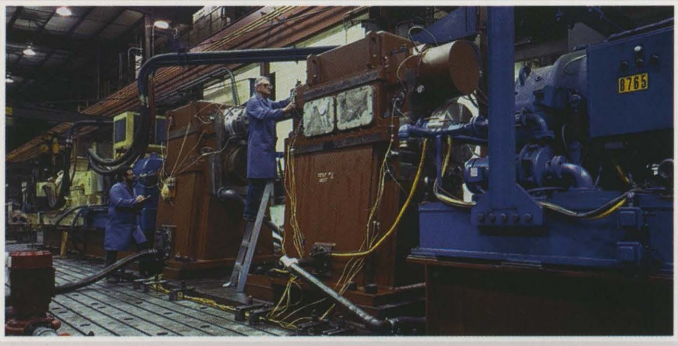
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Recognizing that any technically intensive operation requires constant upgrading, Lufkin's complete testing facilities are continually being improved and expanded to handle higher speeds and higher power ratings. The control and monitoring capabilities for high-tech data acquisition and analysis of tests in progress have been upgraded as well. This gives Lufkin the capability to test over a wide range of speeds and power levels while closely duplicating field conditions.



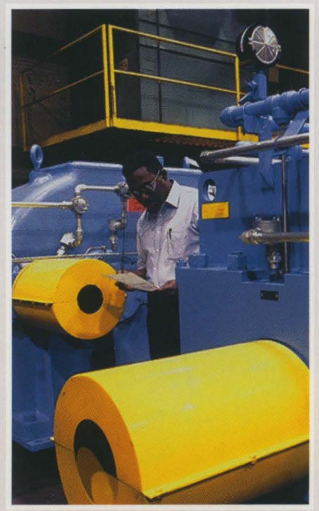
The test stand control room houses the latest in technology for monitoring and data acquisition.

Meeting or exceeding industry standards and customer criteria is no problem for Lufkin Industries, a certified ISO 9001 company. Lufkin produces many custom-designed gear drives to meet exacting customer specifications for a variety of applications. Just as Lufkin can customize gear units, test programs can also be specifically designed and tailored to meet the most rigorous customer requirements. Baseline test data can be extremely beneficial to customers for establishing in-house diagnostic and condition-monitoring programs.



This back-to-back locked torque test of two 66,650 HP gear boxes is among the largest such tests ever conducted in the world.





As a certified ISO 9001 company, Lufkin maintains a steadfast commitment to quality.

All spare gearsets when built and purchased with a parent unit at Lufkin are also certified through the same mechanical performance test as the primary unit. Lufkin can test virtually any drive configuration. All tests are supervised by Lufkin Test Engineers, and customers have accessibility at all times to engineering and testing personnel.



Lufkin provides comprehensive diagnostic testing and field service.

Lufkin's technical expertise includes not only a wide range of design, manufacturing and testing capabilities. Lufkin also provides field diagnosis and all types of gear repair. The standard procedure in Lufkin's Repair Operations is to conduct a full-speed mechanical performance test on each piece of equipment, including non-Lufkin units, which are repaired, refurbished or rebuilt. Lufkin can provide other support services anywhere in the world at any time.

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Lufkin's Full-Range Performance Testing Assures Optimum Gear Drive Performance

- Casing Joint Tightness Check
- Records of Inlet Oil Temperature and Pressure, Oil Flow, Outlet Oil Temperature
- Shaft Vibration Level Including Overall Unfiltered Level; Level Filtered at ½x, 1x, and 2x Shaft Speed; and Frequency Spectrum to 1 kHz
- Vibration Sweep for Amplitudes at Nonsynchronous Frequencies
- Casing Vibration Level Including Overall Unfiltered Level and Frequency Spectrum to 1 kHz
- Sound Level Test
- Complete Record of Bearing Temperatures
- Analytical Checks of Tooth Contact Pattern and Dimensional Accuracy
- Documentation of All Test Results for Record and Reference

Units Furnished to API 613, 4th Edition, Receive the Following Additional Testing to Meet Specific API Requirements:

- Lateral Critical Speed Analysis
- Deceleration Plots Showing Vibration and Phase Angle vs. Speed
- Over-Speed Testing
- Disassembly Inspection After Test

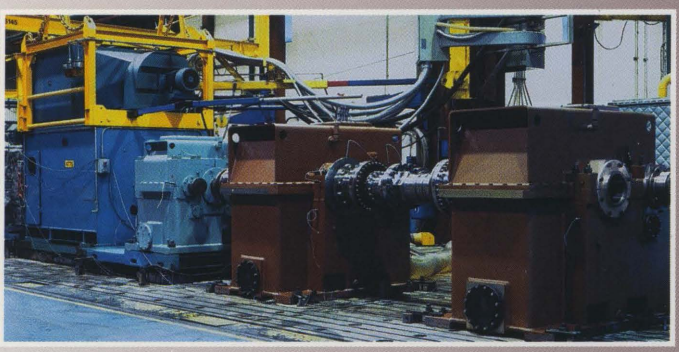
Other Testing Options That can be Provided by Lufkin Include:

- Partial Load Testing
- Back-to-Back Locked Torque Testing
- API 677 Testing

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Lufkin Industries' Test Stand Components

- Seven Fully-Instrumented Test Cells
- Variable Speed DC Motors Including a Toshiba 2,500 HP (1,864 kW) and a General Electric 1,000 HP (746 kW) Motor
- Motors are Double-Ended and can be Operated in Tandem to 3,500 HP (2,610 kW)
- Dynamometers for Load Testing up to 2,800 HP (2,088 kW)
- 950 gpm (3,800 L/min) Lube System Capable of Furnishing Lube Oil at Multiple Pressures and Temperatures to Two or More Units During Simultaneous Testing
- State-of-the-Art Control Room With a Full-Range Data Acquisition System Including a Bently Nevada ADRE Dynamic Acquisition System With Windows Software



Back-to-back locked torque testing of two 41,000 HP generator drive gear units.

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Lufkin Industries' worldwide service and sales offices create a network of experienced professionals committed to providing technical support anywhere at any time.

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