MECHANICAL DRIVE RECIPROCATING ENGINE ORDERS, June 2006 – May 2007

Output Range (MW)	Units Ordered	Total Engine Output (MW)	Speed Range (r/min)			Fuel		Western Europe	Eastern Europe & Russia	Middle East	Far East	Southeast Asia/ Australia	Central Asia	North Africa	Central, W., E., & S. Africa	North America	Central America & Caribbean	South America
			300 to 600	720 to 1000	Above 1000	Liquid Fuel	Natural Gas											
.50 to 1.00	2809	1908	7	1	2801	2286	523	418	5	13	141	65	11	0	0	2115	28	13
1.01 to 2.00	3322	4386	0	33	3289	1994	1328	163	62	2	192	45	23	18	25	2733	8	51
2.01 to 3.50	199	514	0	54	145	122	77	25	10	10	20	24	12	0	0	81	0	17
3.51 to 5.00	41	171	0	41	0	41	0	15	0	2	4	18	0	0	0	0	0	2
5.01 to 7.50	14	84	0	14	0	14	0	6	0	0	8	0	0	0	0	0	0	0
7.51 and above	4	32	0	4	0	4	0	2	0	0	2	0	0	0	0	0	0	0
Totals	6389	7095	7	147	6235	4461	1928	629	77	27	367	152	46	18	25	4929	36	83

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			300 to 600	720 to 1000	Above 1000	Liquid Fuel	Natural Gas											
.50 to 1.00	3384	2260	1	44	3339	2662	722	415	30	28	178	74	30	32	13	2554	3	27
1.01 to 2.00	2175	2796	0	7	2168	958	1217	133	17	4	93	60	2	6	12	1821	0	27
2.01 to 3.50	104	264	0	0	104	40	64	18	9	0	4	5	0	0	0	63	0	5
3.51 to 5.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.01 to 7.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7.51 and above	5	45	0	5	0	0	5	0	0	5	0	0	0	0	0	0	0	0
Totals	5668	5365	1	56	5611	3660	2008	566	56	37	275	139	32	38	25	4438	3	59

Mechanical Drive Survey Enters 2nd Year

To continue what we started in 2006, we are pleased to bring you the 2nd Mechanical Drive Order Survey, an exclusive to Diesel & Gas Turbine Publications. This is a continuation of our other survey efforts, the 31st Power Generation Order Survey and the Annual Marine Propulsion Order Surveys, published in October and November, respectively.

The engine order data reporting follows an identical format to the power and marine surveys with regard to the timeframe surveyed, where engine manufacturers are asked to report engine orders from June 1, 2006, to May 31, 2007. The mechanical drive survey also follows a very similar survey format to the other order surveys. A list of survey participants accompanies this data.

This survey, combined with the very large and complete surveys of the power generation and marine propulsion industries, represents a record-breaking total of 162 016 MW of reciprocating and gas turbine engines ordered during the 12-month timeframe referenced above. The total number of power generation, marine and mechanical drive engines above 500 kW ordered for the 2007 surveys easily tops 58 357 units.

While it is still difficult to draw many conclusions from the first two years of data, the Mechanical Drive Order Survey offers a glimpse into the robust market of larger engines intended for use in mechanical drive installations. It must again be noted that while a large subset of these engines are utilized for what we might consider "traditional" mechanical drive applications, specifically pumps and compressors, it is also true that many of the engines reported will see service in industrial applications, such as off-highway equipment and oil exploration machinery.

Reciprocating Engines

A total of 6389 engines above 500 kW were reported in this year for a total output of 7095 MW. This represents an increase of 13% in unit orders and a large 32% increase in output. While most of the engines were congregated in the smallest output ranges, including 500 kW to 2.0 MW, the increase in total output was due to many more orders reported in the 2.0+ MW categories.

Engine speeds reflected the smaller output population, with most of the engines operating at speeds above 1000 r/min.

There were 1928 gaseous-fueled engines out of the 6389 total, so a slight decrease in the percentage of gas engines ordered this year. The gas engines have implications for natural gas production and transmission applications, while the liquid fuel engines more typically see industrial applications, such as large rock crushers, tub grinders, oil fracture rigs and other applications where the engine drives a transmission or hydraulic pump drive for mechanical power output.

From a geographic region perspective, North America again dominated the orders with 4929 units. The second largest market was Western Europe, with 629 engines, again at about 10% of the total.

Gas Turbines

At 217 units, the total number of mechanical drive gas turbines was down a slight 9% this year. The total output for these gas turbines was 4661 MW, which is down 19% and reflects the fact that fewer large gas turbines were reported in the 30+ MW categories. Units ordered in the 30 to 180 MW size ranges were down 26%, while

MECHANICAL DRIVE GAS TURBINE ORDERS, June 2006 – May 2007

Output Range (MW)	Units Ordered	Total Engine Output (MW)	Fuel		Western Europe	Eastern Europe & Russia	Middle East	Far East	Southeast Asia/ Australia	Central Asia	North Africa	Central, W., E., & S. Africa	North America	Central America & Caribbean	South America
			Liquid Fuel	Natural Gas											
1.00 to 2.00	5	7	5	0	0	0	0	5	0	0	0	0	0	0	0
2.01 to 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.51 to 5.00	3	14	0	3	3	0	0	0	0	0	0	0	0	0	0
5.01 to 7.50	19	142	0	19	0	2	0	0	0	0	0	0	0	0	17
7.51 to 10.00	6	53	0	6	0	6	0	0	0	0	0	0	0	0	0
10.01 to 15.00	21	225	0	21	3	11	3	0	0	4	0	0	0	0	0
15.01 to 20.00	54	868	0	54	0	44	8	2	0	0	0	0	0	0	0
20.01 to 30.00	58	1478	0	58	8	16	2	0	11	0	17	3	0	0	1
30.01 to 60.00	47	1527	0	47	1	0	8	0	3	27	5	2	1	0	0
60.01 to 120.00	4	347	0	4	0	0	0	0	2	0	0	2	0	0	0
120.01 to 180.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180.01 and above	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	217	4661	5	212	15	79	21	7	16	31	22	7	1	0	18

MECHANICAL DRIVE GAS TURBINE ORDERS, June 2005 – May 2006

Output Range (MW)	Units Ordered	Total Engine Output (MW)	Fuel		Western Europe	Eastern Europe & Russia	Middle East	Far East	Southeast Asia/ Australia	Central Asia	North Africa	Central, W., E., & S. Africa	North America	Central America & Caribbean	South America
			Liquid Fuel	Natural Gas											
1.00 to 2.00	2	3	2	0	0	0	0	2	0	0	0	0	0	0	0
2.01 to 3.50	4	11	2	2	0	0	0	4	0	0	0	0	0	0	0
3.51 to 5.00	6	29	0	6	6	0	0	0	0	0	0	0	0	0	0
5.01 to 7.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7.51 to 10.00	7	56	0	7	3	0	1	0	0	0	0	0	0	0	3
10.01 to 15.00	52	671	0	52	6	7	8	2	0	9	0	0	0	0	20
15.01 to 20.00	38	613	0	38	2	36	0	0	0	0	0	0	0	0	0
20.01 to 30.00	60	1534	0	60	1	8	40	0	0	0	11	0	0	0	0
30.01 to 60.00	58	1796	0	58	0	3	9	26	14	0	0	1	0	1	4
60.01 to 120.00	8	687	0	8	0	0	4	0	0	0	4	0	0	0	0
120.01 to 180.00	3	378	0	3	0	0	3	0	0	0	0	0	0	0	0
180.01 and above	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	238	5778	4	234	18	54	65	34	14	9	15	1	0	1	27

output in those categories was down 35% from 2006.

Fuel type for these gas turbines is overwhelmingly natural gas, which makes it fairly easy to draw the conclusion that the majority of the mechanical drive machines are seeing service in the natural gas industry.

From a geographic standpoint, most of the machines reported are going into areas that continue to develop gas as a natural resource, including Russia, Central Asia, North Africa, South America and Southeast Asia. Again, only one engine was reported in North America, which reflects the ongoing lack of completeness of data reporting in the smaller output ranges.

Conclusions

It would seem as though the manufacturers of larger engines in mechanical drive applications continue to enjoy much of the prosperity that they are experiencing in the power generation and marine propulsion industries. Although the uses for the reciprocating engines in mechanical drive applications are more varied, the gas turbine order numbers speak to strong activity in the gas production and transmission sectors — including LNG production.

As always, our most sincere thanks goes out to those manufacturers that have agreed to participate in this "third" survey for *Diesel & Gas Turbine Worldwide*. It is also my personal hope that all of the major manufacturers will choose to participate in next year's Mechanical Drive Order Survey so that we can provide the most accurate and useful information possible.

Electronic versions of past surveys are available on our website at: www.dieselgasturbine.com.

Diesel, Dual-Fuel and Gas Engine Manufacturers Participating and Reporting Orders in this Mechanical Drive Survey

- Caterpillar Engine Div.
- Cummins Engine
- Daihatsu Diesel Mfg.
- Electro-Motive Diesel
- Fairbanks Morse Engine
- GE Jenbacher
- Hyundai
- MTU Friedrichshafen (including Detroit Diesel)
- Rolls-Royce
- Waukesha Engine, Dresser, Inc.

Gas Turbine Manufacturers Participating and Reporting Orders in this Mechanical Drive Survey

- Aviadvigatel
- Daihatsu Diesel Mfg.
- GE Oil & Gas
- MAN Turbo
- Motor Sich
- Niigata Power Systems
- NPO Saturn
- Perm Engine Company
- Rolls-Royce Energy
- Siemens PG (Industrial Applications)
- Zorya-Mashproekt