

# Diesel & Gas Turbine **WORLDWIDE**

THE MARINE AND STATIONARY POWER AUTHORITY

# 2009 ANNUAL MARINE PROPULSION ORDER SURVEY



## Reality Check

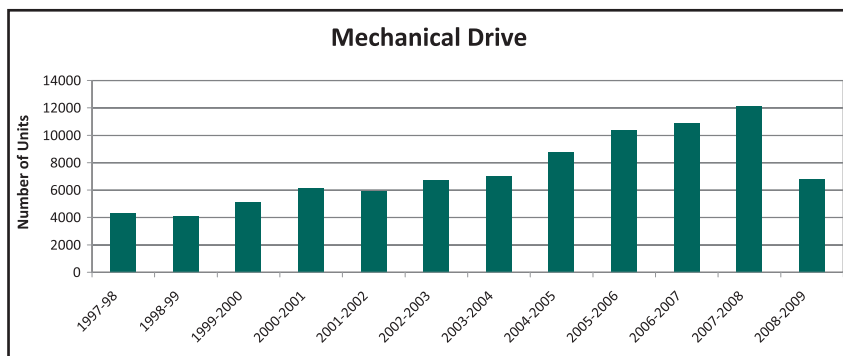
In an attempt to try and make sense out of this year's marine survey data, I scoured the archives and went back to the first surveys on record-making comparisons in the year-over-year data variances. To date, there have been no greater swings in the data than what is being reported for the 2008-2009 data, compared to a prior year, which I suppose in and of itself, sets a new kind (albeit, wrong kind!) of record.

The first marine auxiliary survey began with the 1991-1992 reporting period. The first diesel-electric survey began with the 1994-1995 reporting period, and mechanical drive was added with the 1997-1998 reporting period. In this, the marine order surveys are now in their 18<sup>th</sup>, 15<sup>th</sup> and 12<sup>th</sup> years, respectively.

Typical headlines of the last several years have joyfully read "phenomenal growth," "orders set new records" or "engine orders up, up, up." For the 2009 survey, I am faced with the challenge of how to report out, or in essence, how to put into words variances ranging from minus 40 to 49% across the three marine order surveys.

As stated in the Editor's Note of the annual power gen survey in the October 2009 issue of *Diesel & Gas Turbine Worldwide*, beginning with the 2010 surveys, the survey reporting period will move to a January through December fiscal year. The 2009 surveys discussed here were conducted using the historical reporting period of June through May.

A change in the reporting period will help align the order survey data to other market research sources as well as financial reports. The real silver lining in this reporting period change may be in that this year's data, the final data set with the June through May report-



ing period will not have any historical relevance going forward.

As with last month's power gen survey, which saw a 15% drop in recip engines and a 30% drop in turbines, perhaps this data, too, is "in line with expectations," as was concluded last month. Certainly news within the industry, quarterly financials, trade events and marine market indicators have not painted a rosy picture. But perhaps it's one thing to read about decreased or non-existent orders, plunging day rates and stagnating market indices. Quantifying these words into hard data has been a cold, stark reality.

Looking ahead, moving forward and putting a positive spin on the data — we have simply turned back the hands of time — not always a bad thing, right? We know now what we could've known then ... or something of that nature. The mechanical drive order volumes are comparable to levels from earlier in the decade, the 2002-2003 reporting period. In regard to both the diesel-electric orders and the marine auxiliary order levels, we have only regressed two years. The 2008-2009 diesel-electric orders were reported at 511, only 7% off order volumes from the 2006-2007 order survey, while the marine

auxiliary orders came in at 6125 compared to 6300 in the 2006-2007 report, a variance of just 3%.

It would be easier to chalk the year-over-year variances up to last year's record year being a one-time anomaly without current market news, information and data. The industry is not expected to make a rapid rebound any time soon due to a glut of capacity that is slowing a recovery in freight rates and vessel prices.

And now, on to the cold hard facts.

### Mechanical Drive Orders

Total mechanical drive propulsion orders decreased to 6825 units in 2009 from a record-breaking high of 12 143 units in 2008. This represents a decrease of 5318 engines or a 44% drop. Total power output in 2009 came in at 19 150 MW, a decrease of approximately 67% from the prior year.

The 2009 data shows an increase in the number of smaller-sized units as a percentage of the total. Units in the 0.50 to 3.50 range make up 85% of the total units, as compared to only 71% in 2008. The most significant drop was in the 7.51 to 15.00 category. In 2008, this represented 12% of the total units, and in 2009 it was just 6%, reporting 412 units. Average power per unit decreased to 2.8 MW

# MARINE PROPULSION ORDER SURVEY

## MECHANICAL DRIVE DIESEL MARINE PROPULSION ORDERS, June 2008 – May 2009\*

Output Range (MW)	Number of Engines	Total Output (MW)	Engine Speed (r/min)				Fuel (Units)			Western Europe	Eastern Europe & Russia	Middle East	Far East	Southeast Asia/Australasia	Central Asia	North Africa	Central, W. E. & S. Africa	North America	Central America	South America
			Below 300	300-600	720-1000	Above 1000	Diesel Fuel	Heavy Fuel	Natural Gas											
0.5 - 1.0	2343	1614	0	5	29	2309	2338	5	0	687	8	93	422	583	2	0	4	506	5	33
1.01 - 2.0	3039	4381	0	18	602	2419	2815	224	0	824	91	155	802	498	56	0	0	514	12	87
2.01 - 3.5	464	1213	14	26	253	171	345	116	3	78	6	49	177	42	30	0	0	70	0	12
3.51 - 5.0	181	761	31	49	52	49	77	104	0	33	0	2	98	14	10	0	0	8	0	16
5.01 - 7.5	184	1182	123	5	28	28	36	148	0	3	0	0	166	15	0	0	0	0	0	0
7.51 - 15.0	412	4123	342	45	8	17	23	389	0	38	12	2	336	9	2	0	0	8	0	5
15.01 - 30.0	166	3465	166	0	0	0	0	166	0	2	0	3	146	11	0	0	0	0	0	4
30.01 - 50.0	27	979	27	0	0	0	0	27	0	0	0	0	27	0	0	0	0	0	0	0
50.01 and above	27	1487	27	0	0	0	0	27	0	0	0	0	27	0	0	0	0	0	0	0
Totals	6843	19 205	730	148	972	4993	5634	1206	3	1665	117	304	2201	1172	100	0	4	1106	17	157

Revised data November 2009

\*Geographic location is at the shipbuilding site

## MECHANICAL DRIVE DIESEL MARINE PROPULSION ORDERS, June 2007 – May 2008\*

Output Range (MW)	Number of Engines	Total Output (MW)	Engine Speed (r/min)				Fuel (Units)			Western Europe	Eastern Europe & Russia	Middle East	Far East	Southeast Asia/Australasia	Central Asia	North Africa	Central, W. E. & S. Africa	North America	Central America	South America
			Below 300	300-600	720-1000	Above 1000	Diesel Fuel	Heavy Fuel	Natural Gas											
0.5 - 1.0	3257	2163	7	10	204	3036	3233	24	0	1019	8	51	506	886	21	0	38	656	4	68
1.01 - 2.0	3957	5706	10	74	783	3090	3672	285	0	1716	124	163	764	434	26	0	13	640	2	75
2.01 - 3.5	1299	3423	93	190	581	435	794	505	0	250	36	220	322	154	132	0	10	136	8	31
3.51 - 5.0	801	3311	201	15	502	83	201	600	0	111	33	53	443	62	54	0	0	6	20	19
5.01 - 7.5	601	3600	403	54	101	43	105	494	2	47	3	10	453	20	58	0	0	10	0	0
7.51 - 15.0	1492	14 813	1287	126	67	12	53	1439	0	140	6	10	1227	70	27	0	0	12	0	0
15.01 - 30.0	421	8063	418	3	0	0	0	421	0	20	0	0	391	5	4	0	0	0	0	1
30.01 - 50.0	127	4316	127	0	0	0	0	127	0	12	11	0	104	0	0	0	0	0	0	0
50.01 and above	188	11 841	188	0	0	0	0	188	0	5	0	0	180	3	0	0	0	0	0	0
Totals	12 143	57 236	2734	472	2238	6699	8058	4083	2	3320	221	507	4390	1634	322	0	61	1460	34	194

\*Geographic location is at the shipbuilding site

compared to 4.7 MW in 2008 and 4.2 MW in 2007.

The shift in smaller-sized units making up a larger percentage of the total is also reflected in the engine operating speed. Above 1000 r/min made up 73% of the total, whereas this number last year was just 55% of the total.

As for fuel types, diesel fuel engines represented 83% of total orders in 2009, compared to 66% in 2008. There were three natural gas units reported in the 2009 data compared to two in the prior period.

With regard to the geographic location, most regions had comparable order activity on a percentage basis. The Far East region showed a decrease to 32% of the total mechanical drive orders from 36% in 2008. North America saw an increase coming in at 16% of the total, compared to just 12% last year. Western Europe decreased to 24% of the total compared to 27% of the total in 2008. All other regions were within a few percentage points when compared to last year's data. As a reminder, the geographic location is the shipbuilding site.

### Marine Auxiliary Gen-Sets

Orders in this category decreased to 6125 units in 2009, decreasing 40% from last year's record-breaking total of 10 148 units. Total power came in at

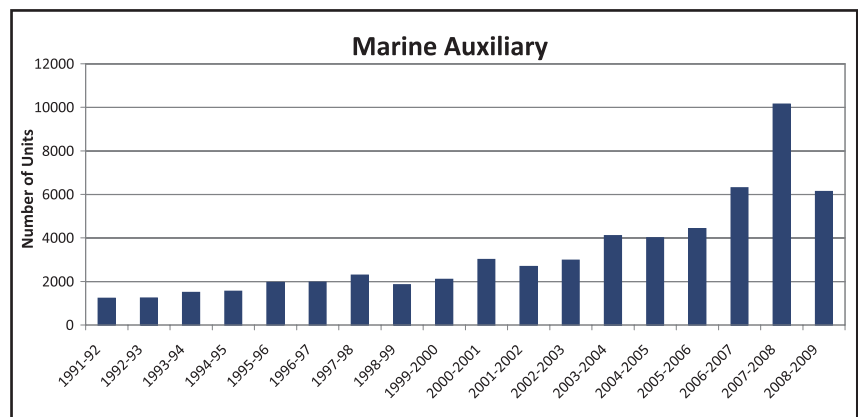
7458 MW compared to 11 580 MW in 2008, a decrease of 36%. There was little shift in power range percentages in 2009 compared to 2008, as average power came in at 1.2 MW compared to 1.1 MW in 2008 and 1.2 MW in 2007.

Engines in the output range of 0.50 to 2.00 MW make up 86% of the total units, equivalent to 2008 data. The 3.51 to 5.00 MW range saw a slight increase to 5% of the total, compared to just 3% in 2008.

Seventy-four percent of the orders will operate at within the 750 to 1000 r/min category compared to 77% last year, and units in the above 1000 r/min category made up 26% of the total compared to 23% last year — again, very little variance in this data, year over year.

There was also little change in the fuel split, with 38% of the orders fueled with diesel and 62% reported as heavy fuel. This data is comparable to prior year data, with 33% per diesel and 67% heavy fuel.

Geographic location data is also nearly identical to last year, with the largest variance being a slight decrease in orders as a percentage of the total, in Western Europe. In 2009, just 7% of the orders are for this region compared to 10% last year. For the Far East region, 81% of the orders were reported in the category compared to 80% in 2008. Southeast Asia and Australia saw a very minor increase, with 6% of the orders reported for this region in 2009, compared to just 5% in 2008. North America made up 3% of the total in 2009, compared to just 1% of the total



# MARINE PROPULSION ORDER SURVEY

## MARINE AUXILIARY GENERATING SET ORDERS, June 2008 – May 2009\*

Output Range (MW)	Number Auxiliary Units	Total Output (MW)	Engine Speed (r/min)			Fuel (Units)		Western Europe	Eastern Europe & Russia	Middle East	Far East	Southeast Asia/Australasia	Central Asia	North Africa	Central, W. E. & S. Africa	North America	Central America & Caribbean	South America
			300-600	720-1000	Above 1000	Diesel Fuel	Heavy Fuel											
0.5 - 1.0	3929	2832	0	2886	1043	1587	2342	182	11	22	3273	270	22	0	6	104	2	37
1.01 - 2.0	1320	1840	0	872	448	580	740	168	24	2	928	88	6	0	7	78	3	16
2.01 - 3.5	585	1556	6	484	95	150	435	64	0	2	473	16	13	0	0	13	0	4
3.51 - 5.0	284	1195	2	267	15	15	269	0	0	0	269	0	0	0	0	15	0	0
5.01 and above	7	35	0	7	0	7	0	7	0	0	0	0	0	0	0	0	0	0
Totals	6125	7458	8	4516	1601	2339	3786	421	35	26	4943	374	41	0	13	210	5	57

\*Geographic location is at the shipbuilding site

## MARINE AUXILIARY GENERATING SET ORDERS, June 2007 – May 2008\*

Output Range (MW)	Number Auxiliary Units	Total Output (MW)	Engine Speed (r/min)			Fuel (Units)		Western Europe	Eastern Europe & Russia	Middle East	Far East	Southeast Asia/Australasia	Central Asia	North Africa	Central, W. E. & S. Africa	North America	Central America & Caribbean	South America
			300-600	720-1000	Above 1000	Diesel Fuel	Heavy Fuel											
0.5 - 1.0	6637	4536	0	4839	1793	2341	4291	469	18	99	5442	384	95	0	5	69	17	34
1.01 - 2.0	2154	3079	0	1662	495	798	1359	406	49	79	1400	130	15	0	0	58	4	16
2.01 - 3.5	1097	2899	4	1030	65	197	902	72	0	0	1012	5	0	0	6	2	2	
3.51 - 5.0	255	1037	11	243	1	27	228	27	0	0	215	0	0	2	11	0	0	
5.01 and above	5	29	0	5	0	4	1	5	0	0	0	0	0	0	0	0	0	
Totals	10 148	11 580	15	7779	2354	3367	6781	979	67	178	8069	519	110	0	7	144	23	52

\*Geographic location is at the shipbuilding site

in 2008. As a reminder, the geographic location is the shipbuilding site.

### Diesel-Electric Propulsion

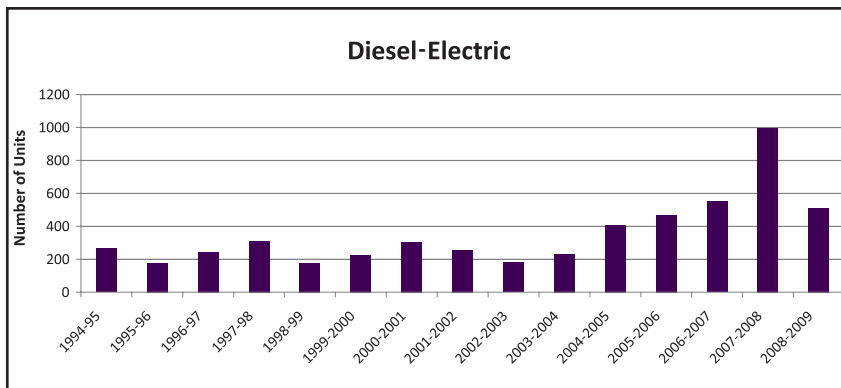
On par with the mechanical drive and marine auxiliary reports, diesel-electric

orders were down 49% year over year. Order volume was 511 units, compared to 998 in 2008. It should be noted, however, that the 2009 volumes are very similar to the 2007 level of 550 units.

Total power output was 1864 MW

compared to 3252 MW in 2008, a 43% decrease. In 2007, total power was 1891 MW. Average power in 2009 per unit is 3.65 MW compared to 3.26 MW in 2008 and 3.44 MW in 2007. The biggest shift was in the 2.01 to 3.50 MW range. In 2009, there were 208 units, or nearly 41% of the total reported into this category compared to 2008, when this category represented just 22% of the total.

Engine operating speed splits looked closer to the 2007 data as well. In 2009, 300 to 600 r/min made up 7% of the total, which is equivalent to the 2008 data, also 7%. In 2007, this category made up 10% of the total orders. The 750 to 1000 r/min category represented 59% of the orders in 2009. In 2008,



## DIESEL-ELECTRIC MARINE PROPULSION ORDERS, June 2008 – May 2009\*

Output Range (MW)	Number of Diesel-Electric Propulsion Units	Total Output (MW)	Engine Speed (r/min)			Fuel (Units)		Western Europe	Eastern Europe & Russia	Middle East	Far East	Southeast Asia/Australasia	Central Asia	North Africa	Central, W. E. & S. Africa	North America	Central America & Caribbean	South America
			300-600	720-1000	Above 1000	Diesel Fuel	Heavy Fuel											
0.5 - 1.0	2	2	0	2	0	2	0	2	0	0	0	0	0	0	0	0	0	0
1.01 - 2.0	93	155	0	38	55	82	11	23	4	4	36	11	4	0	0	11	0	0
2.01 - 3.5	204	506	0	90	114	191	13	82	1	0	20	35	0	0	0	56	0	10
3.51 - 5.0	88	342	3	85	0	72	16	13	0	2	11	52	0	0	0	10	0	0
5.01 - 7.5	46	293	3	43	0	23	23	3	0	0	39	0	0	0	0	4	0	0
7.51 and above	60	511	32	28	0	12	48	10	0	0	26	0	0	0	0	24	0	0
Totals	493	1809	38	286	169	382	111	131	7	6	132	98	4	0	0	105	0	10

Revised data November 2009

\*Geographic location is at the shipbuilding site

## DIESEL-ELECTRIC MARINE PROPULSION ORDERS, June 2007 – May 2008\*

Output Range (MW)	Number of Diesel-Electric Propulsion Units	Total Output (MW)	Engine Speed (r/min)			Fuel (Units)		Western Europe	Eastern Europe & Russia	Middle East	Far East	Southeast Asia/Australasia	Central Asia	North Africa	Central, W. E. & S. Africa	North America	Central America & Caribbean	South America
			300-600	720-1000	Above 1000	Diesel Fuel	Heavy Fuel											
0.5 - 1.0	223	153	0	0	223	223	0	102	0	30	64	27	0	0	0	0	0	0
1.01 - 2.0	261	383	0	56	205	235	26	162	4	10	8	17	30	0	0	30	0	0
2.01 - 3.5	220	534	0	50	170	197	23	77	0	11	24	17	0	0	0	91	0	0
3.51 - 5.0	81	321	4	71	6	77	4	19	0	0	48	4	0	0	0	10	0	0
5.01 - 7.5	85	551	6	73	6	51	34	18	0	0	49	2	0	0	0	16	0	0
7.51 and above	128	1310	63	65	0	61	67	55	0	0	63	0	0	0	0	10	0	0
Totals	998	3252	73	315	610	844	154	433	4	51	256	67	30	0	0	157	0	0

\*Geographic location is at the shipbuilding site

this category represented 32% of the total but in 2007, it was 58% of the total, nearly identical to 2009 data. Orders reported above 1000 r/min were 33% of the total in 2009 compared to 61% and 32% in 2008 and 2007, respectively.

With regard to fuel type, diesel fuel units were 75% of the total compared to 85% last year. Heavy fuel represented the balance, 25% in 2009 and 15% in 2008.

The geographic locations for diesel-electric showed some relatively large swings. Western Europe fell to just 26% of the total compared to 43% in 2008 and 43% in 2007. The Middle East region was just 1% of the total in 2009 compared to 5% in 2008 and 4% in 2007. Three regions gained ground as a percentage of the total. The Far East represented 29% of the orders in 2009 compared to 26% in 2008 and 24% in 2007. Southeast Asia and Australia were 19% of the total compared to 7% in both 2008 and 2007. North America also gained ground in the diesel-electric order activity, repre-

senting 21% of the total in 2009 compared to 16% in 2008 and 15% in 2007. As a reminder, the geographic location is the shipbuilding site.

### Overall Results


One year ago, we stated that “it would be safe to say that order activity remained at historically high levels.” There was also great anticipation in regard to the developing credit crisis and global economic situation and what kind of effect it would have on short- and long-term shipbuilding. This year, our “safe to say” statement highlights the fact that the shipbuilding industry has been severely impacted by the global economic crisis.

And although this order survey only reports order activity through May 2009, a recent report from the China Association of the National Shipbuilding Industry (CANSI) reported that orders have dropped for 11 consecutive months. The full year 2009 data to be reported in June 2010 will likely not show much improvement. Aggregate capacity at the world’s 55

biggest shipyards is already as much as 40% greater than demand.

Dry-bulk shipping rates tumbled 92% last year on overcapacity and China’s weakened demand for iron ore. Rates rebounded fivefold this year, reaching a high on June 3, according to the Baltic Dry Index. They have since dropped 49% as China pares imports of commodities.

After six consecutive years of robust activity, overall unit orders are down 42%, looking more like 2004 than 2009. The global shipping industry clearly needs a lifeline.

Once again, our sincere thanks go out to the engine manufacturers who invest time and effort to help us complete these marine order surveys. We believe that the combination of these three order surveys for the mechanical drive, marine auxiliary and diesel-electric marine engine applications provide the most complete and accurate picture of the marine market above 0.5 MW. Electronic versions of past surveys are available on our website at: [www.diesलगasturbine.com](http://www.diesलगasturbine.com). 

### Mechanical Drive Marine Propulsion Manufacturers Participating and Reporting Order in this Survey:

- Caterpillar Engine Division (including Caterpillar Marine Power Systems)
- Cummins Marine
- Daihatsu Diesel Mfg.
- Electro-Motive Diesel
- GE Marine
- Hyundai Heavy Industries
- Kawasaki Heavy Industries Ltd.
- MAN Diesel Group (including licensees and SEMT Pielstick engines)
- Niigata Power Systems
- Rolls-Royce Engines, Bergen
- Tognum Group (MTU Engines)
- Wärtsilä Corp. (including licensees)
- Yanmar Co. Ltd.

### Marine Auxiliary Generating Unit Engine Manufacturers Participating and Reporting Orders in this Survey:

- Caterpillar Engine Division (including Caterpillar Marine Power Systems)
- Cummins Marine
- Daihatsu Diesel Mfg.
- GE Marine
- Hyundai Heavy Industries
- MAN Diesel Group (including licensees)
- Niigata Power Systems
- Rolls-Royce Engines, Bergen
- Tognum Group (MTU Engines)
- Wärtsilä Corp. (including licensees)
- Yanmar Co. Ltd.

### Diesel-Electric Marine Propulsion Manufacturers Participating and Reporting Orders in this Survey:

- Caterpillar Engine Division (including Caterpillar Marine Power Systems)
- Cummins Marine
- Electro-Motive Diesel
- Fairbanks Morse
- Kawasaki Heavy Industries Ltd.
- MAN Diesel Group (including licensees and SEMT Pielstick engines)
- Rolls-Royce Engines, Bergen
- Tognum Group (MTU Engines)
- Wärtsilä Corp. (including licensees)