

MARINE & PORTS | UNITED STATES

ABB Electric Towboat

Technical specifications

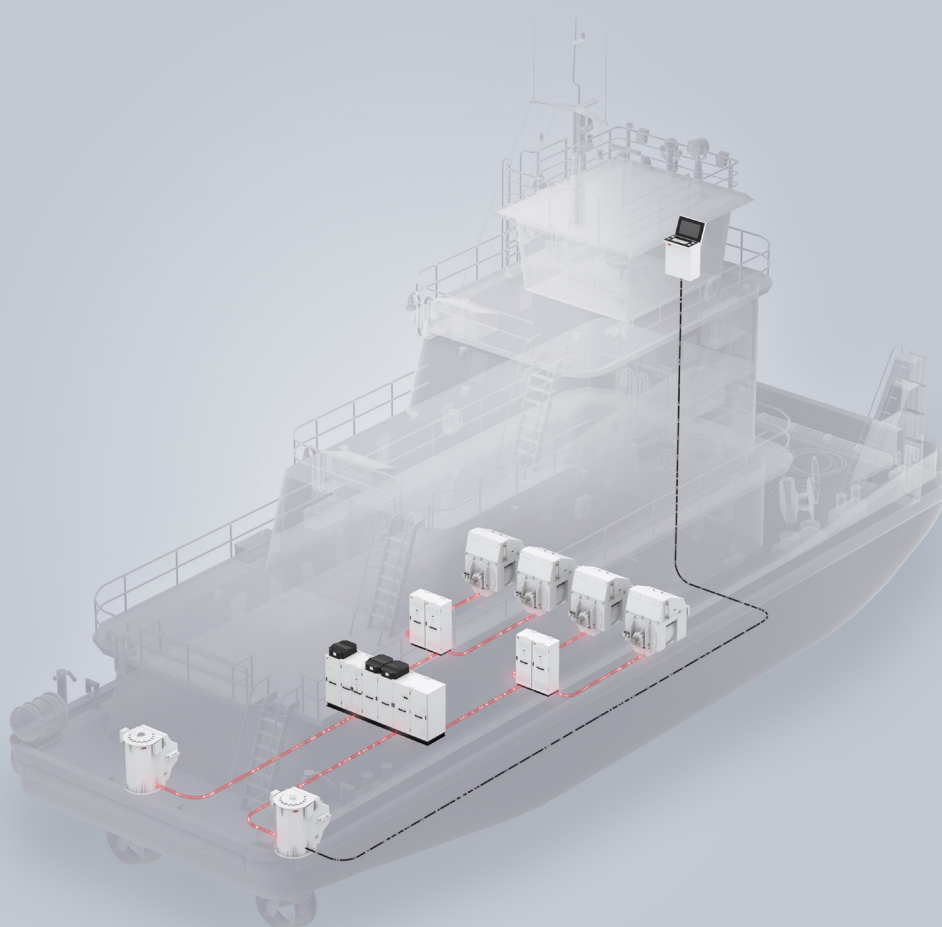


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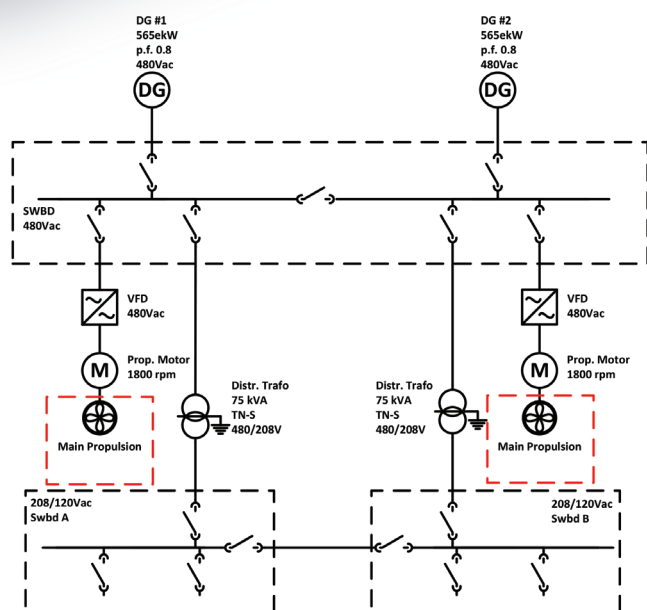
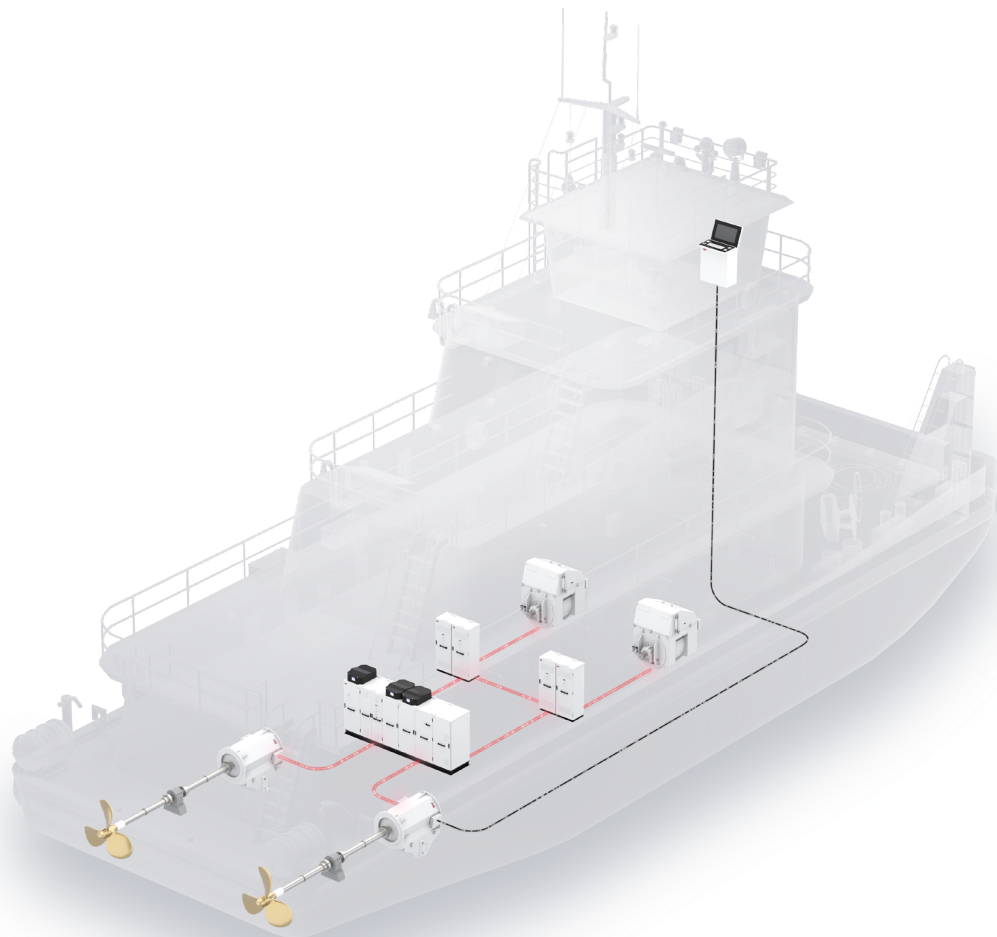
1600 HP

Technical specifications

—
01 Electric Towboat
including scope
of 2 generators

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02 Single line
drawing with scope
of 2 generators

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01



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02

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02

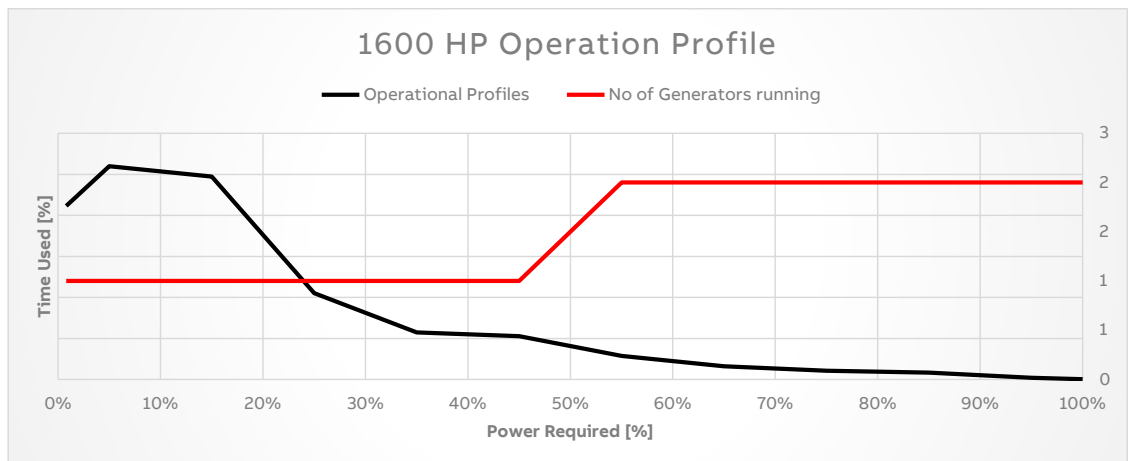
= Not Included in ABB
Scope of Supply

Operational profile

The operational profile shown is an actual profile provided by towboat owner based on a study of real river operations. It can be concluded that the true nature of push boat operation is not 100% continuous duty or anything close to it. The market requires equipment that performs day-in day-out in harsh environments, but operating profiles vary greatly but most of the time is spent at very low loads.

Power required [%]	Time used [%]	Number of generators running
100 %	0.04 %	2
90 - 100 %	0.20 %	2
80 - 90 %	0.83 %	2
70 - 80 %	1.06 %	2
60 - 70 %	1.61 %	2
50 - 60 %	2.88 %	2
40 - 50 %	5.28 %	1
30 - 40 %	5.74 %	1
20 - 30 %	10.51 %	1
10 - 20 %	24.72 %	1
0 - 10 %	25.99 %	1
Idle	21.14 %	1

Operational profile: usage of 2 generators



Output

Utilizing the ABB ETB solution not only helps owners to avoid the use of UREA more importantly it drives down cost of ownership. In this real world example one can see a significant reduction in fuel costs but even more beneficial will be the reduction in total engine hours. This will benefit should save owners considerable costs related to engine maintenance.

OPERATIONAL COST CALCULATIONS

Diesel Mechanical

Fuel	217 560	gallons
UREA	0	gallons
Running hours / Engine / Year	8 500	hrs
Total engine running hours / Year	25 500	hrs
Fuel* + UREA** - Cost / Year	\$435 119	dollars

Diesel Electrical (ABB ETB)

Fuel	162 058	gallons
UREA	0	gallons
Running hours / Engine / Year	4 528	hrs
Total engine running hours / Year	9 056	hrs
Fuel* + UREA** - Cost / Year	\$324 116	dollars

Advantages of ABB ETB

Fuel savings in % / Year	34.248 %	percent
Fuel savings in \$ / Year	\$111 003	dollars
Saved engine running hours / Year	16 444	hrs

*Fuel cost per gallon \$2 dollars

**UREA cost per gallon \$2 dollars

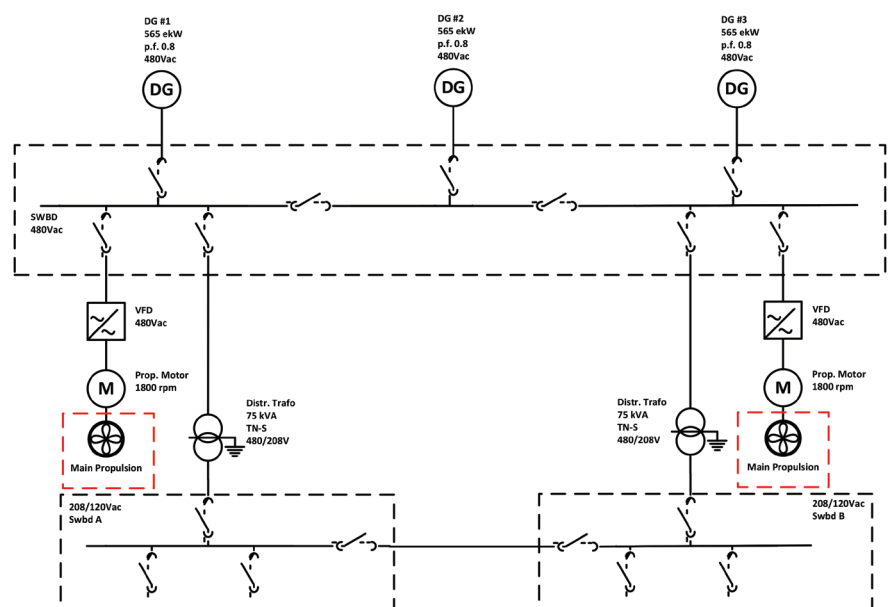
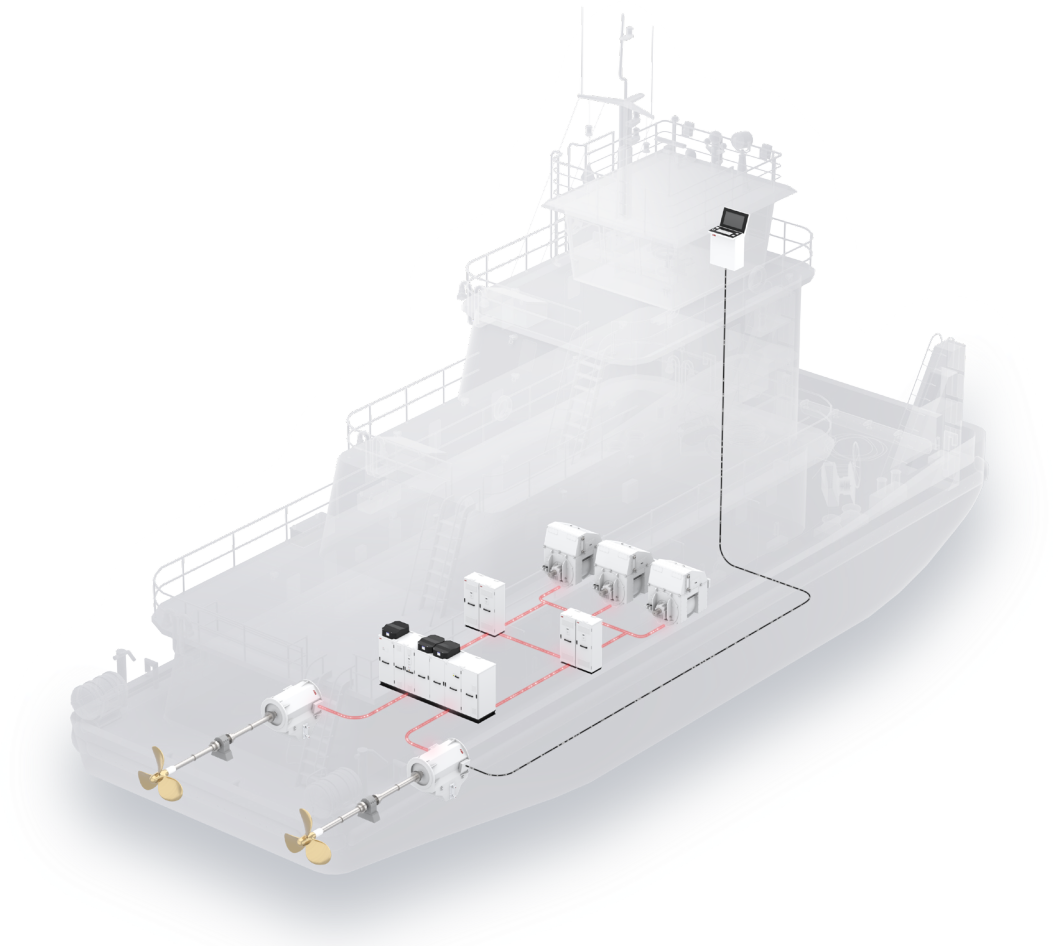
2400 HP

Technical specifications

— 01 Electric Towboat including scope of 3 generators

— 02 Single line drawing with scope of 3 generators

— 01



— 02

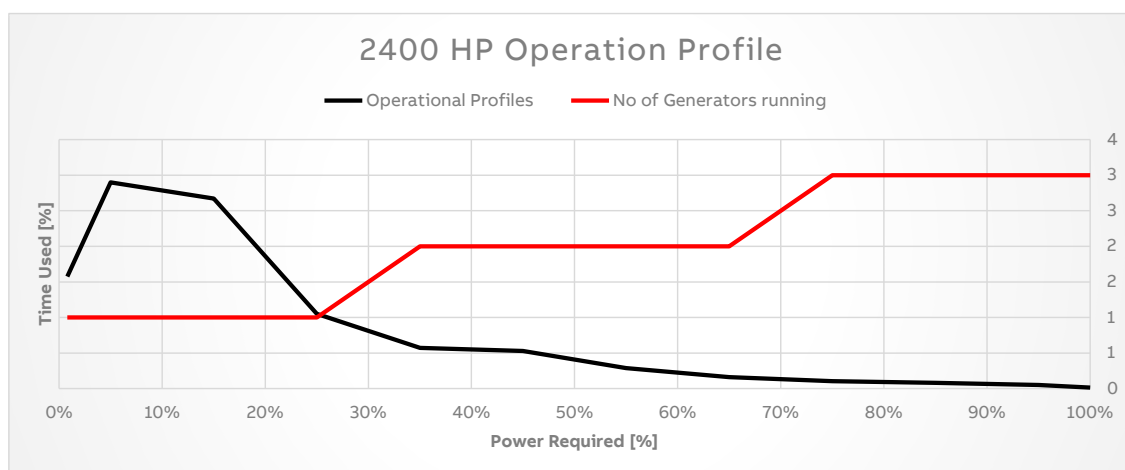
= Not Included in ABB
Scope of Supply

Operational profile

The operational profile shown is an actual profile provided by towboat owner based on a study of real river operations. It can be concluded that the true nature of push boat operation is not 100% continuous duty or anything close to it. The market requires equipment that performs day-in day-out in harsh environments, but operating profiles vary greatly but most of the time is spent at very low loads.

Power required [%]	Time used [%]	Number of generators running
100 %	0.14 %	3
90 - 100 %	0.50 %	3
80 - 90 %	0.83 %	3
70 - 80 %	1.06 %	3
60 - 70 %	1.61 %	2
50 - 60 %	2.88 %	2
40 - 50 %	5.28 %	2
30 - 40 %	5.74 %	2
20 - 30 %	10.51 %	1
10 - 20 %	26.72 %	1
0 - 10 %	28.99 %	1
Idle	15.74 %	1

Operational profile: usage of 3 generators



Output

Utilizing the ABB ETB solution not only helps owners to avoid the use of UREA more importantly it drives down cost of ownership. In this real world example one can see a significant reduction in fuel costs but even more beneficial will be the reduction in total engine hours. This will benefit should save owners considerable costs related to engine maintenance.

OPERATIONAL COST CALCULATIONS

Diesel Mechanical			
Fuel	272 281	gallons	
UREA	12 808	gallons	
Running hours / Engine / Year	8 500	hrs	
Total engine running hours / Year	25 500	hrs	
Fuel* + UREA** - Cost / Year	\$570 178	dollars	
Diesel Electrical (ABB ETB)			
Fuel	221 382	gallons	
UREA	0	gallons	
Running hours / Engine / Year	3 404	hrs	
Total engine running hours / Year	10 213	hrs	
Fuel* + UREA** - Cost / Year	\$442 764	dollars	
Advantages of ABB ETB			
Fuel savings in % / Year	28.777 %	percent	
Fuel savings in \$ / Year	\$127 414	dollars	
Saved engine running hours / Year	15 287	hrs	
*Fuel cost per gallon \$2 dollars			
**UREA cost per gallon \$2 dollars			

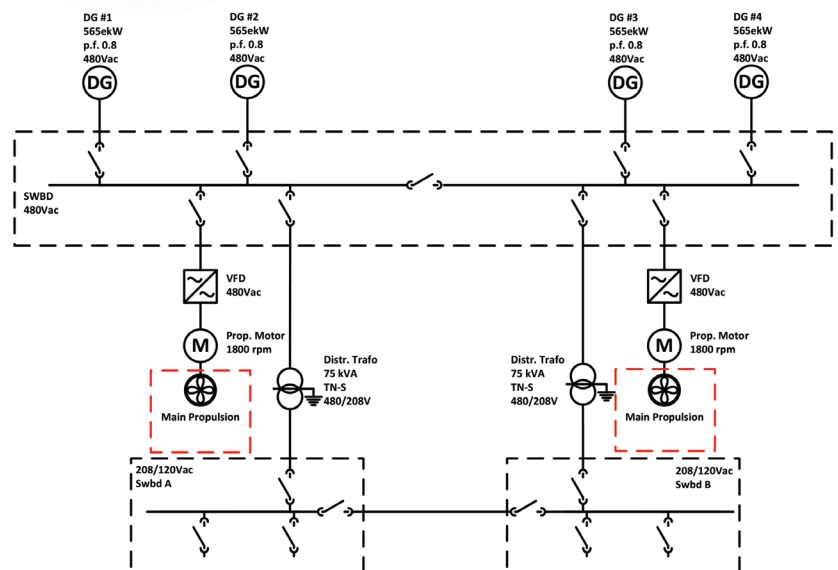
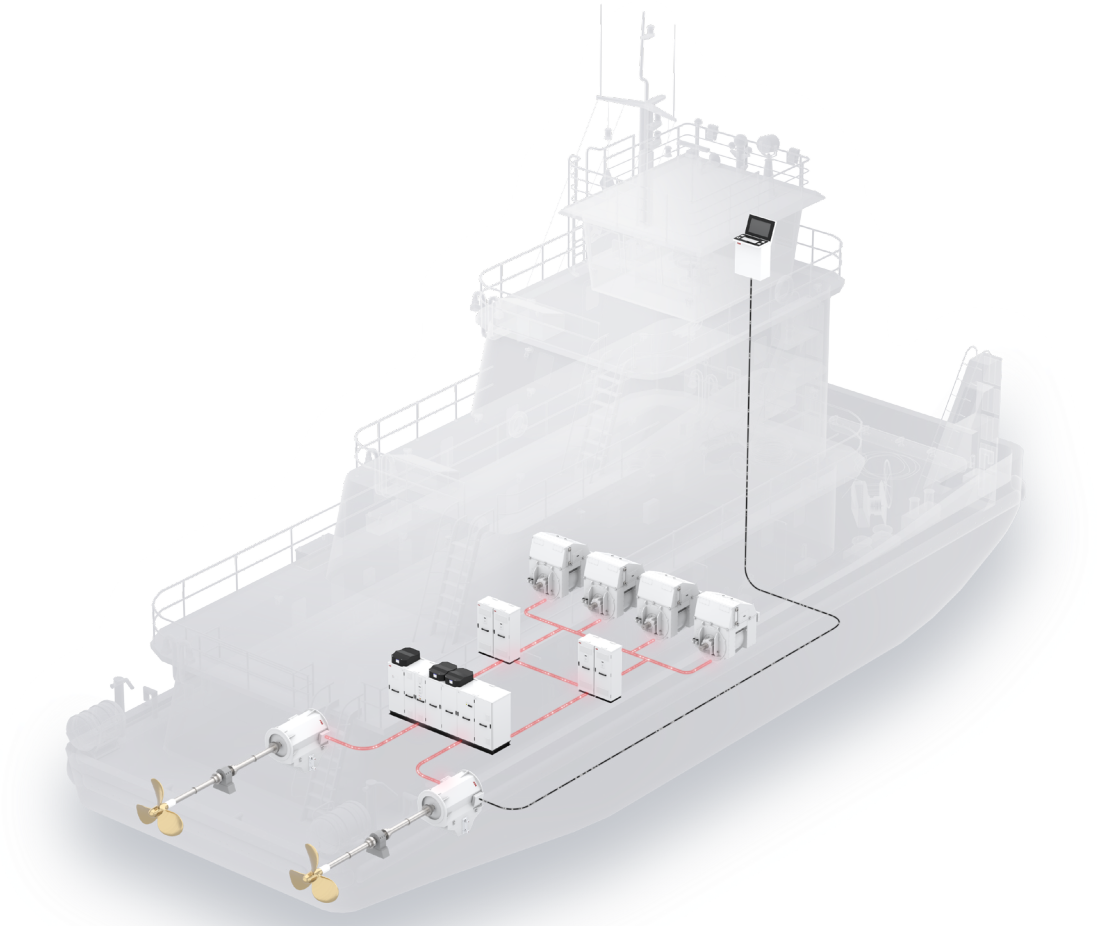
3200 HP

Technical specifications

— 01 Electric Towboat including scope of 4 generators

— 02 Single line drawing with scope of 4 generators

— 01



— 02

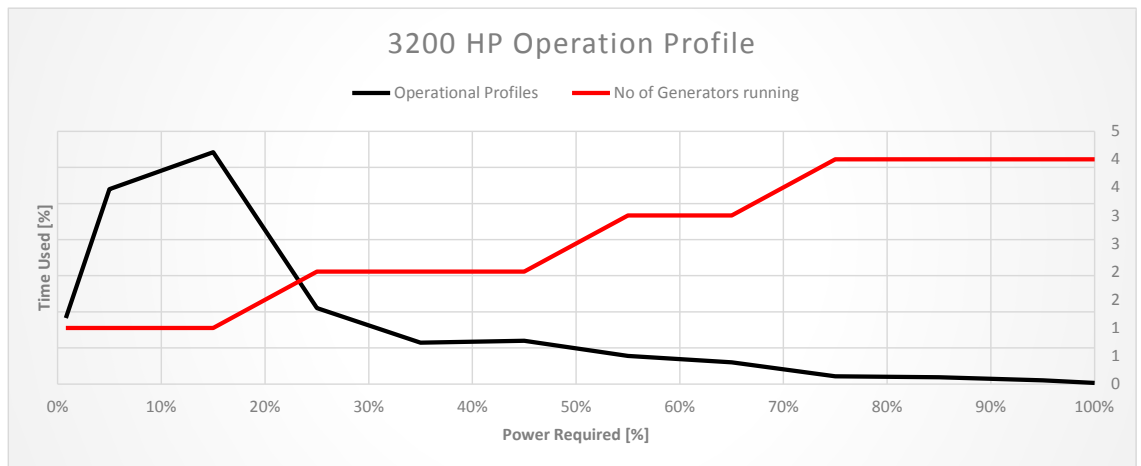
= Not Included in ABB
Scope of Supply

Operational profile

The operational profile shown is an actual profile provided by towboat owner based on a study of real river operations. It can be concluded that the true nature of push boat operation is not 100% continuous duty or anything close to it. The market requires equipment that performs day-in day-out in harsh environments, but operating profiles vary greatly but most of the time is spent at very low loads.

Power required [%]	Time used [%]	Number of generators running
100 %	0.14%	4
90 - 100 %	0.50%	4
80 - 90 %	0.93%	4
70 - 80 %	1.06%	4
60 - 70 %	3.01%	3
50 - 60 %	3.88%	3
40 - 50 %	5.98%	2
30 - 40 %	5.74%	2
20 - 30 %	10.52%	2
10 - 20 %	32.12%	1
0 - 10 %	26.99%	1
Idle	9.13%	1

Operational profile: usage of 4 generators



Output

Utilizing the ABB ETB solution not only helps owners to avoid the use of UREA more importantly it drives down cost of ownership. In this real world example one can see a significant reduction in fuel costs but even more beneficial will be the reduction in total engine hours. This will benefit should save owners considerable costs related to engine maintenance.

OPERATIONAL COST CALCULATIONS

Diesel Mechanical

Fuel	319 197	gallons
UREA	15 154	gallons
Running hours / Engine / Year	8 500	hrs
Total engine running hours / Year	25 500	hrs
Fuel* + UREA** - Cost / Year	\$668 703	dollars

Diesel Electrical (ABB ETB)

Fuel	307 844	gallons
UREA	0	gallons
Running hours / Engine / Year	3 046	hrs
Total engine running hours / Year	12 185	hrs
Fuel* + UREA** - Cost / Year	\$615 688	dollars

Advantages of ABB ETB

Fuel savings in % / Year	8.611 %	percent
Fuel savings in \$ / Year	\$53 016	dollars
Saved engine running hours / Year	13 315	hrs

*Fuel cost per gallon \$2 dollars

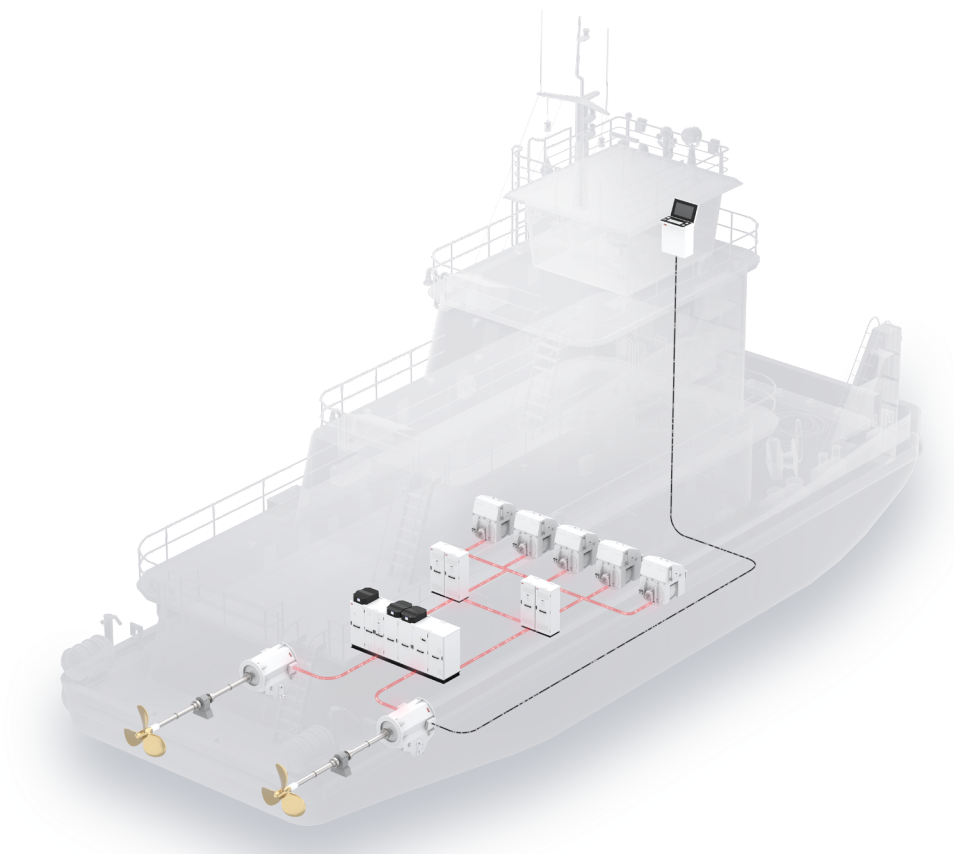
**UREA cost per gallon \$2 dollars

4000 HP

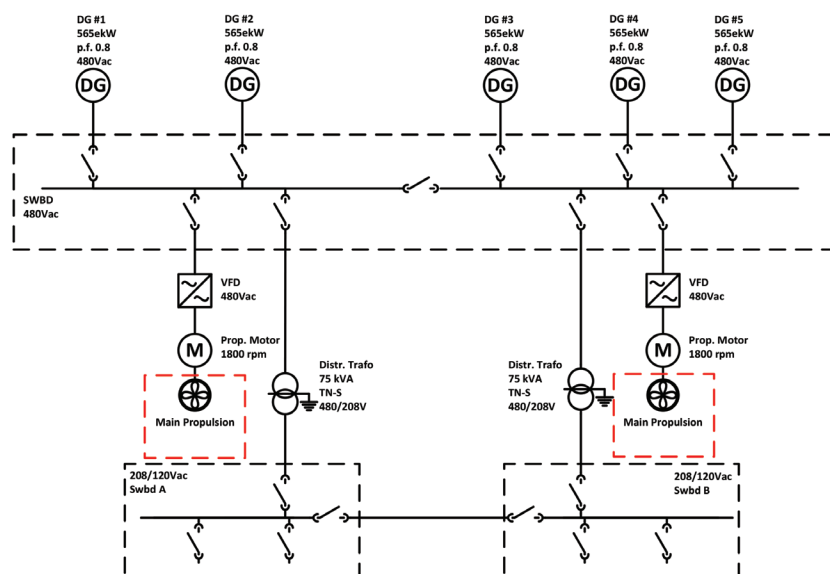
Technical specifications

— 01 Electric Towboat including scope of 5 generators

— 02 Single line drawing with scope of 5 generators



— 01



— 02

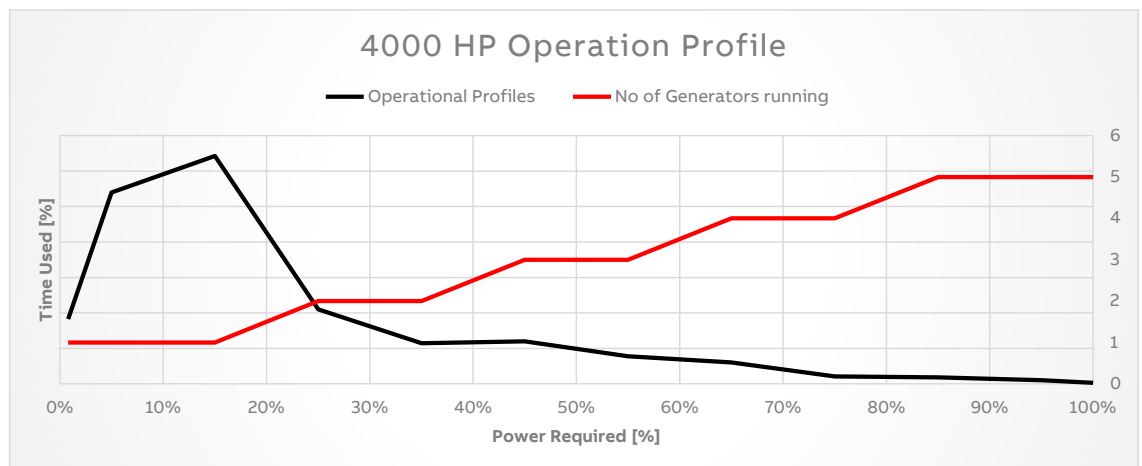
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Scope of Supply

Operational profile

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Power required [%]	Time used [%]	Number of generators running
100 %	0.14%	5
90 - 100 %	0.50%	5
80 - 90 %	0.93%	5
70 - 80 %	1.06%	4
60 - 70 %	3.01%	4
50 - 60 %	3.88%	3
40 - 50 %	5.98%	3
30 - 40 %	5.74%	2
20 - 30 %	10.52%	2
10 - 20 %	32.12%	1
0- 10 %	26.99%	1
Idle	9.13%	1

Operational profile: usage of 5 generators



Output

Utilizing the ABB ETB solution not only helps owners to avoid the use of UREA more importantly it drives down cost of ownership. In this real world example one can see a significant reduction in fuel costs but even more beneficial will be the reduction in total engine hours. This will benefit should save owners considerable costs related to engine maintenance.

OPERATIONAL COST CALCULATIONS

Diesel Mechanical			
Fuel	540 265	gallons	
UREA	26 208	gallons	
Running hours / Engine / Year	8 500	hrs	
Total engine running hours / Year	25 500	hrs	
Fuel* + UREA** - Cost / Year	\$1 132 945	dollars	

Diesel Electrical (ABB ETB)			
Fuel	371 674	gallons	
UREA	0	gallons	
Running hours / Engine / Year	2 614	hrs	
Total engine running hours / Year	13 070	hrs	
Fuel* + UREA** - Cost / Year	\$743 347	dollars	

Advantages of ABB ETB			
Fuel savings in % / Year	52.411 %	percent	
Fuel savings in \$ / Year	\$389 598	dollars	
Saved engine running hours / Year	12 430	hrs	

*Fuel cost per gallon \$2 dollars

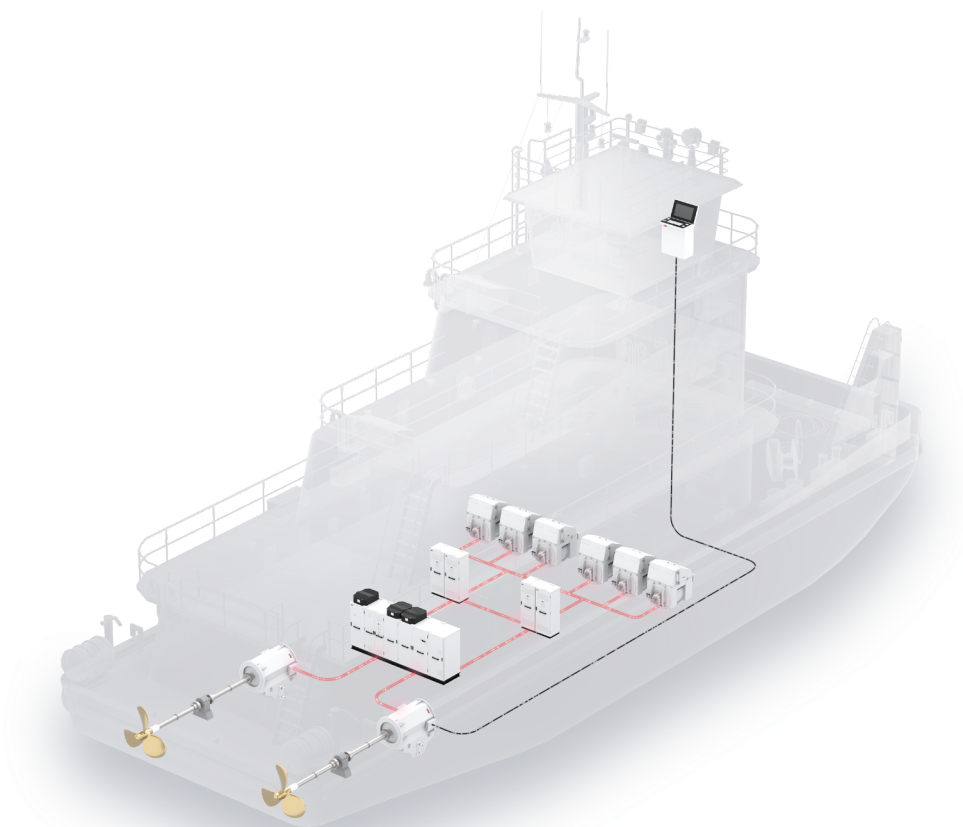
**UREA cost per gallon \$2 dollars

4800 HP

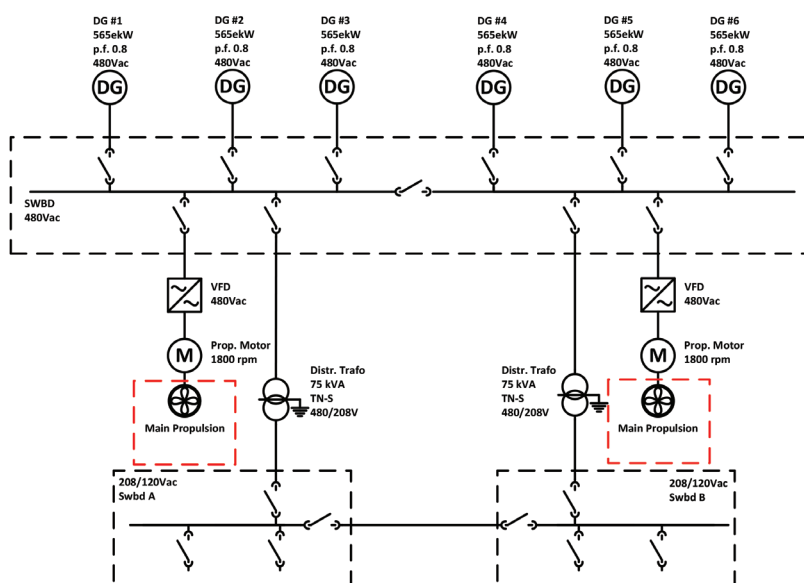
Technical specifications

—
01 Electric Towboat
including scope of
6 generators

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02 Single line
drawing with scope
of 6 generators



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01



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02

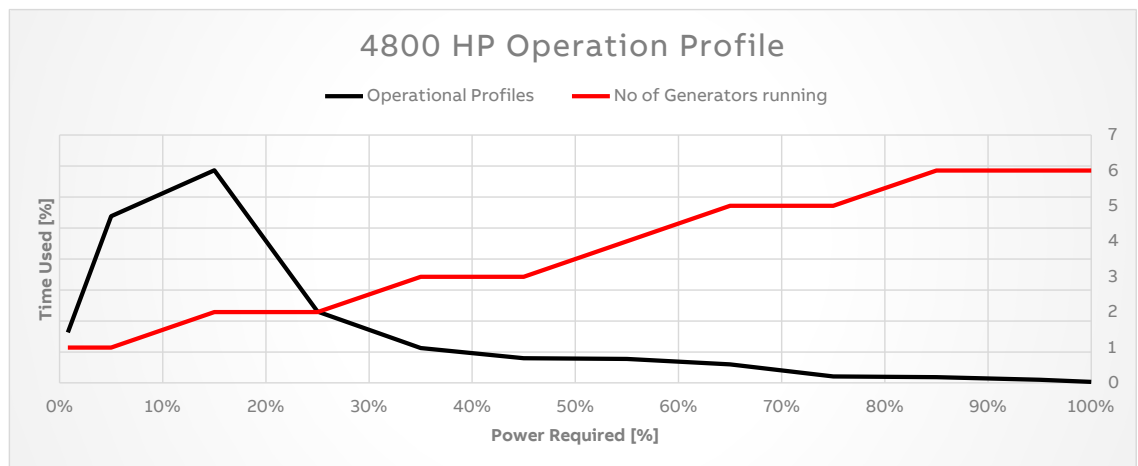
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Scope of Supply

Operational profile

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Power required [%]	Time used [%]	Number of generators running
100 %	0.17%	6
90 - 100 %	0.50%	6
80 - 90 %	0.92%	6
70 - 80 %	1.05%	5
60 - 70 %	3.01%	5
50 - 60 %	3.87%	4
40 - 50 %	3.98%	3
30 - 40 %	5.63%	3
20 - 30 %	11.52%	2
10 - 20 %	34.32%	2
0- 10 %	26.89%	1
Idle	8.14%	1

Operational profile: usage of 6 generators



Output

Utilizing the ABB ETB solution not only helps owners to avoid the use of UREA more importantly it drives down cost of ownership. In this real world example one can see a significant reduction in fuel costs but even more beneficial will be the reduction in total engine hours. This will benefit should save owners considerable costs related to engine maintenance.

OPERATIONAL COST CALCULATIONS

Diesel Mechanical			
Fuel	529 213	gallons	
UREA	25 655	gallons	
Running hours / Engine / Year	8 500	hrs	
Total engine running hours / Year	25 500	hrs	
Fuel* + UREA** - Cost / Year	\$1 109 736	dollars	
Diesel Electrical (ABB ETB)			
Fuel	437 102	gallons	
UREA	0	gallons	
Running hours / Engine / Year	2 831	hrs	
Total engine running hours / Year	16 986	hrs	
Fuel* + UREA** - Cost / Year	\$874 205	dollars	
Advantages of ABB ETB			
Fuel savings in % / Year	26.942 %	percent	
Fuel savings in \$ / Year	\$235 531	dollars	
Saved engine running hours / Year	8 514	hrs	
*Fuel cost per gallon \$2 dollars			
**UREA cost per gallon \$2 dollars			



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ABB Inc.

11600 Miramar Parkway, Suite 100
33025 Miramar, FL, USA

ABB Inc.

3700 W Sam Houston Pkwy S,
Houston, 77042, Texas, USA

abb.com/marine