



ARIE SMITS, ABB TURBOCHARGING

FiTS2: Flexible integrated Turbocharging System for 2-Stroke Engines

Marintec Shanghai 2017

ABB

FiTS2

FiTS2 = Flexible integrated Turbocharging System for 2-Stroke Engines.

Direct savings:

- A significant fuel reduction of up to 8 gr/kWhr in part and low load,
- keeping full flexibility over entire engine load by means of automatic valve switching.

Setup:

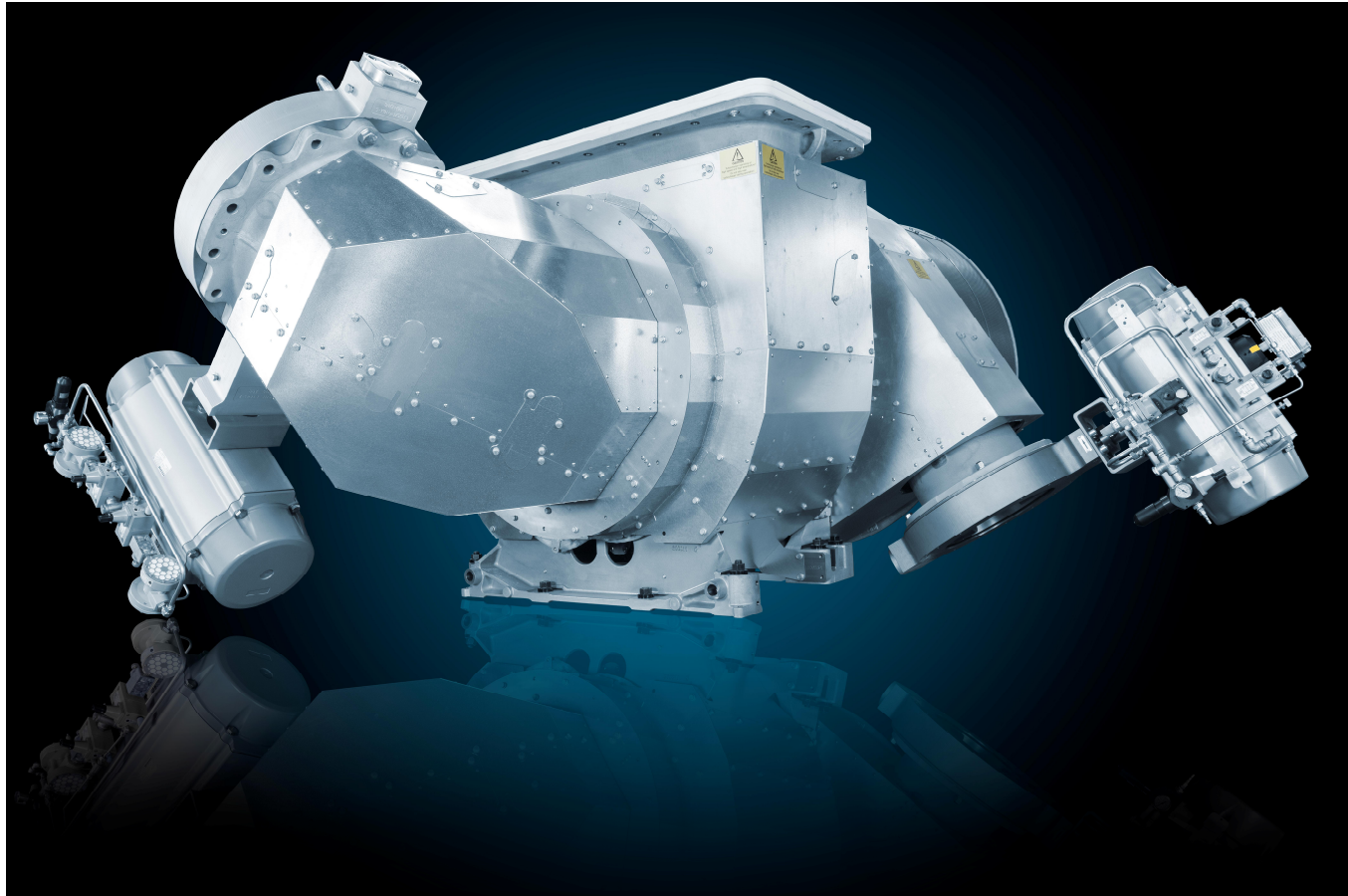
- Smaller and bigger T/C instead of just one big turbocharger
- Smaller T/C able to be automated “cut-out” during part load.
- Optimized engine settings for FiTS2 by means of special tuning by WinGD

Indirect :

- Additional fuel saving: Aux blower switch-off point at approx. 10% lower engine load.
- ABB-System Solution: Compact and lean design, clear responsibility.
- System complies fully with NOx Tier II Requirements.

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Valves Pneumatic



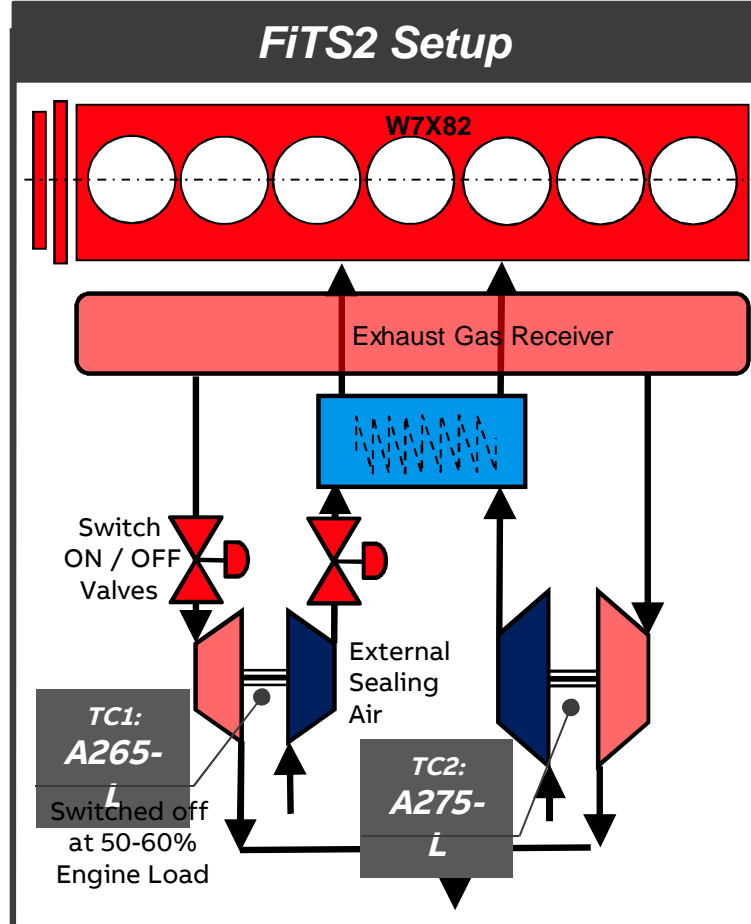
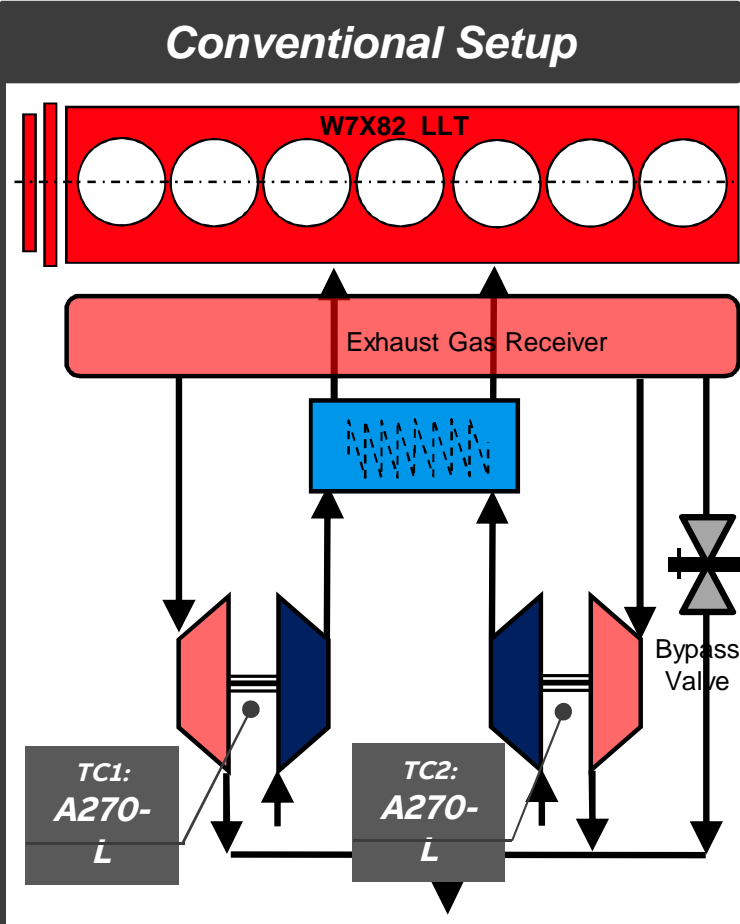
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Integrated valves

Flow optimised

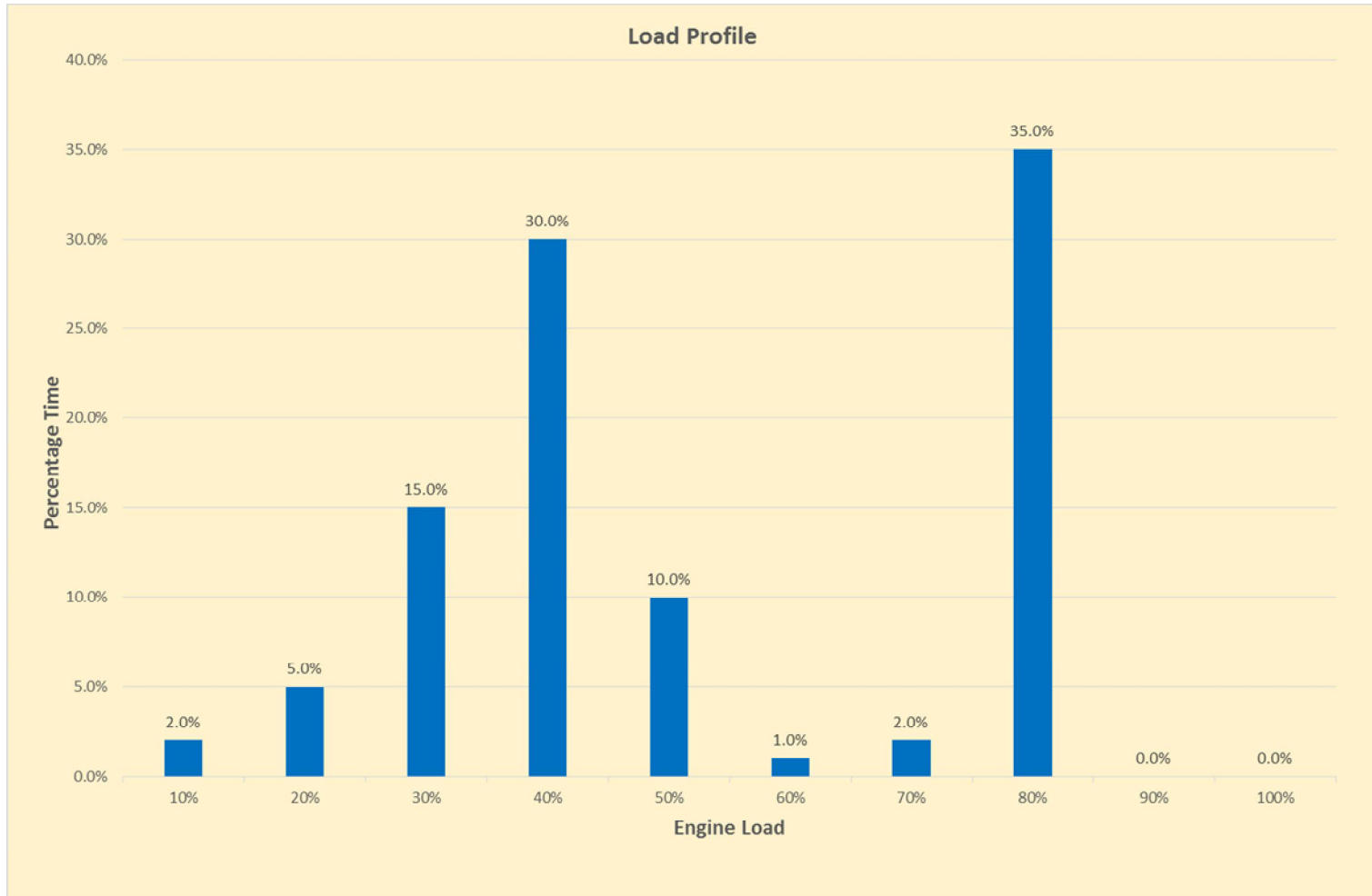


FiTS2 Set-up



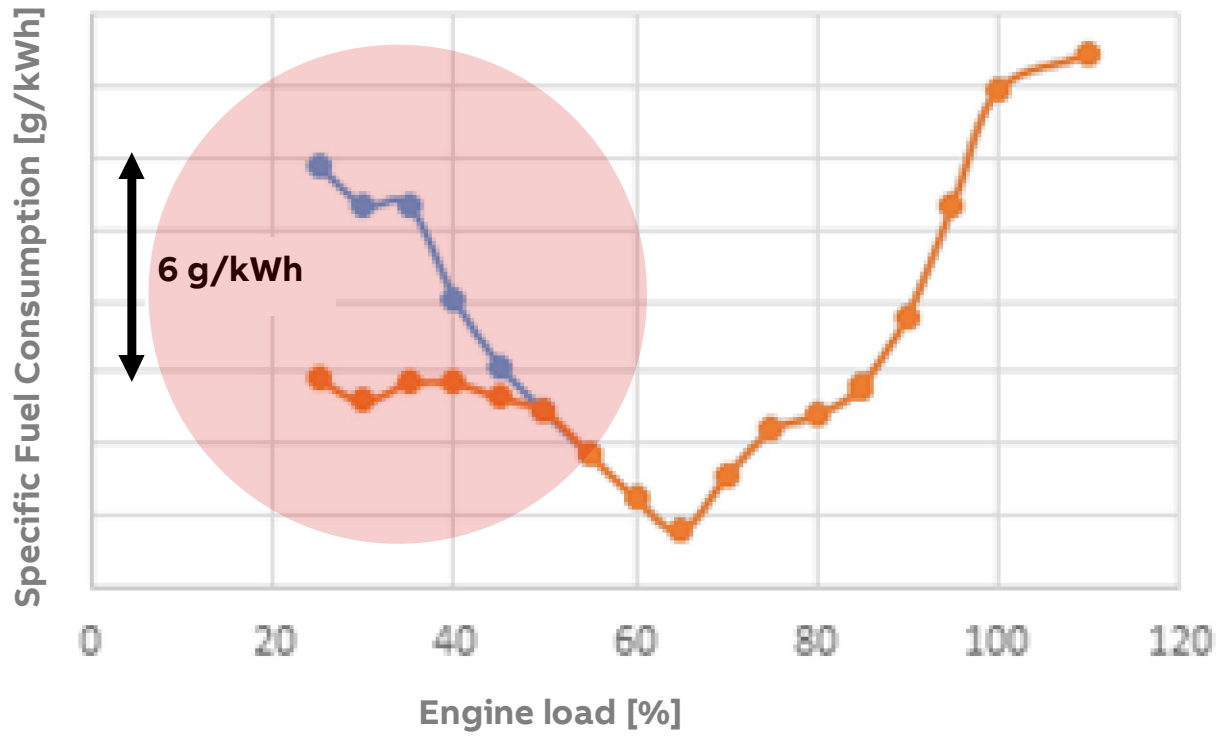
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Load profile



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Fuel saving



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Business Case

- FiTS2-Business Case :
«VLCC W7X82»
- Assumptions:
- Vessel Utilization = 5500 rhs/a, with below Operations Profile:

Engine Load	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
% Time	1.0%	2.0%	13.0%	32.0%	10.0%	1.0%	2.0%	39.0%	0.0%	0.0%

- Engine Output = 24.200 KW, 58 rpm, LL I
- Fuel Price HFO = \$350/t
- Shifting point: at ~50% engine load
- PLUS: Reduced Aux Blower Operation: max. 35% to max. 25% load

Note: use of Low Sulphur or MDO will highly improve the business case.

FiTS2

Pay-back



		1st year	2nd year	3rd year	4th year	5th year
Investments	Base Case 2x A270-LT/C					
	FiTS2-Case 1x A265-LT/C 1x A275-LT/C 1x FiTS2 Package Different Piping and Cooler Adaptions					
	→ Add. Invest for FiTS2 in total	-60				
	Savings	Savings with FiTS2				
	Direct Fuel Savings/a	26	26	26	26	26
	Indirect Fuel Savings from Blower Opt/a	11	11	11	11	11
	Reduced Service Costs/a (FiTS2 vs. Base Case)	2	2	2	2	2
	→ Savings with FiTS2 in total	39	39	39	39	39
Cash Flow		-21	39	39	39	39
Savings over 10 years		all numbers above in KUSD				
IRR in %						
Payback in years						

Thank you!

Questions?



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