The first integrated hybrid power module in the marine industry

“Enabling sustainable societies with smart technology”
WHAT'S INSIDE THE MODULE?

**Diesel-mechanical version**
- Main Engine (ME)
- Shaft Generator-Motor (SG-M)
- DC Power Electronics
- Energy Storage System (ESS)
- Engine
  - Constant Speed
  - Through PTO/PTI or inline
  - Including clutches

**Diesel-electric version**
- Main Engine (ME)
- Shaft Generator-Motor (SG-M)
- DC Power Electronics
- Energy Storage System (ESS)
WÄRTSILÄ HY IS THE RESULT OF MASTERING SYNERGIES
Wärtsilä HY is different from a hybrid system

Ad-hoc components design:
Internal components are pre-designed to work in the Wärtsilä HY environment, allowing best results and advanced features

Next-generation EMS:
The Energy Management System works as the brain, enabling advanced features (start&stop, cold start…) and controlling energy flows towards energy efficiency, performance, safety, emissions and smoke levels, lifetime

Customization:
Hardware and software are optimized for specific ship types and they can be customized for specific requirements

Tuning:
Wärtsilä HY can be tuned over time based on field data collection and to cope with evolving requirements and op. profiles
SMART APPROACH TO DESIGN

- Identification of ship type and mission
- Wärtsilä HY model selection and customization based on specific requirements (optimal balance between stationary and transient parameters)
- First tuning after initial data collection
- Periodic monitoring and tuning during lifecycle
IT COMES WITH ALL THE BENEFITS OF A HYBRID SYSTEM...

Environment
Lower emission levels
Green image
Green mode enabled

Design
Built-in redundancy
Power boost available
Less installed cylinders
Better EEDI
GA flexibility
DP benefits

Operations
High op. flexibility
Peak shaving
Optimal engine loads
Stable parameters
Instant backup (safety)
Instant load taking
Less engines running hours

Operational costs
Lower fuel consumption
Lower maintenance costs
…AND BRINGS ADDITIONAL, UNIQUE BENEFITS

Environment
Lower emission levels
Green image
Green mode enabled
Even lower emission levels
No visible smoke

Design
Built-in redundancy
Power boost available
Less installed cylinders
Better EEDI
GA flexibility
DP benefits
Guaranteed performance
Ship-type optimized
Ship-mission optimized
Integration by Wärtsilä
All-in-one power module

Operations
High op. flexibility
Peak shaving
Optimal engine loads
Stable parameters
Instant backup (safety)
Instant load taking
Less engines running hours
Auto-optimization by EMS
Cold starting
Automatic start&stop

Operational costs
Lower fuel consumption
Lower maintenance costs
Even lower operational costs
FOCUS ON IMPORTANT VALUES

ENVIRONMENT

- High energy efficiency
- Low emission levels
- Best use of shore power (when available)
- Green mode available in sensitive areas
- No visible smoke:
  - during all normal operations
  - during load ramps
  - during engines starting (Wärtsilä Patent Pending)

SAFETY

- Built-in redundancy
- Instant load taking and power boost (manoeuvers, crash stop, harsh environment, towing, heavy duties…)
- Instant backup in case of engine failures
- Energy backup in case of blackout: propellers always turning
  - additional hotel services (with ref. to typical emergency standards)
  - energy for restarting engines
References

Port of Luleå  
(Swedish port in the northern end of the Baltic Sea, extreme climate conditions)

Contract signing in November 2017

Vessel built at Gondan Shipbuilders  
(Spain)

90 tbp harbour tug
100 tbp on boost mode

Ice breaking operations

Wärtsilä HY 227

Delivery in Q3 2018

Start of operations in Q1 2019
Q2 2015
Start of developments

Q2 2017
NOR-SHIPPING
Product launch
Approval in principle by Lloyd’s Register
Wärtsilä HY on new small-cruise design by Pastrovich

Q4 2017
Contract signed with Port of Luleå

Q3 2018
First delivery planned

Q1 2019
First on-field operations
Start of data collection
THANK YOU!

For more information about Wärtsilä HY
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