Guideline for Shaft Generator Test with Disconnected Propeller during Dock Trial

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Change History	D	mhu019	dst009	14.07.2022	CNAA002112	Drawing Updated		4	3
	C	tzi003	sgo015	09.06.2016	EAAD086720	Legacy information. See corresponding ChangeNotice		4	-
	B	rbe015	bfr005	29.10.2010	EAAD082354	Legacy information. See corresponding ChangeNotice		4	-
	-	grpadm	grpadm	18.01.2001		-		-	-
	Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C

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PC-Drawing

Dimension

	Design Group 4037	Q-Code XXXXX		Standard
	A4	Document ID **107.038.645**		PC Page/s 1/4

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1 General

During dock trials, the operation of main engines with disconnected propeller shafts is often required in connection with PTO-Generator tests.

WinGD does not recommend such engine operation, mainly because of the following possible risks:

- Inadmissible vibrations in shafting and/or gears
- Overspeeding of the engine
- Internal fouling of the engine due to incomplete combustion of fuel and/or lubricating oil

To minimise the above risks, WinGD strongly recommends the following procedures:

- A complete Torsional Vibration Calculation (TVC) must be performed by the engine builder or shipyard to identify possible barred speed ranges under these conditions. This also must include the effect on shaft generator, gearbox, couplings, etc. Different parameters must be checked and compared to their admissible limit:
  - Torsional stress and maximum absolute torque in the crankshaft
  - Elastic and damping torque in damper (if any) and elastic coupling, as well as the thermal load
  - Torque variations in the gear wheels
  - Angular amplitude and acceleration at the generator rotor
- Before starting the engine for the first time, all control and safety systems related to the main engine must be thoroughly checked by commissioning engineer(s) and the Remote Control System (RCS) supplier.
- The main power supply of the safety system must be backed-up by an Uninterruptable Power Supply (UPS) that must provide power for at least 15 minutes to ensure controlled engine shutdown
- Operation of the main engine(s) with disconnected propeller shafts should only be performed after successful completion of the standard dock trial
- Running in the prohibited operating ranges, as stated in the MIM Chapter ‘Engine Power and Speed’ and in the OM section ‘The relation between engine and propeller’ must be limited to a maximum 30 minutes
- Several parameters in the Engine Control System (ECS) must be adjusted for this operating condition (e.g. start fuel command, start fuel limit, speed controller, overspeed setting, etc.) These parameters of the ECS can be modified by the engine builder.
- During these procedures and prior to each start-up manoeuvre, the overspeed setting must be set as low as possible to avoid overspeed and/or excessive acceleration. Similarly, during all running tests the overspeed shutdown point must be set to a maximum of 5% higher than the set-point of the engine speed.

It is possible that the engine and the turbocharger(s) may foul due to the low and variable loads. To keep the potential for fouling as low as possible it is recommended to:

- Run the engine under the above conditions no longer than necessary
- Maintain the temperature of the jacket cooling water close to the upper limit (see the WinGD webpage document, 'Usual Values and Safeguard Settings' and the OM)
- Check, if possible, the condition of the exhaust channel, air receiver flaps, cylinder liner ports, piston undersides, etc. in intervals of 5 to 10 running hours
- In case of fuel and/or lubricating oil accumulation in the exhaust gas receiver or on top of pistons, the cause(s) must be investigated and addressed

Due to the low loads during these tests, adequate running-in of the piston rings is not possible. Running-in of the engine during sea trials must be carried out according to the normal running-in program.

During these tests, the operational responsibility remains with the engine builder and the shipyard.

2 Cylinder lubrication

Adjust the specific cylinder lubricating oil quantity for full load to 1.2 g/kWh.

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TRACK CHANGES

DATE	SUBJECT	DESCRIPTION
2022-07-14	INSTRUCTION	First web upload

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