

Subject

Application of "Approved Method" to existing diesel engines under the provisions of MARPOL ANNEX VI  
- Addition of Approved Method for MAN B&W L50MC engines -

# **ClassNK**

## ***Technical Information***

No. TEC-1028  
Date 29 May 2015

To whom it may concern

As already advised in ClassNK Technical Information No. TEC-0771 dated 13 May 2009, in case where an existing diesel engine to which an Engine International Air Pollution Prevention Certificate (EIAPP Certificate) has not been issued can comply with Tier I emission limits using the Approved Method, it is required to apply the Approved Method to the engine. The applicable Approved Method to MAN B&W L50MC engines have been added recently, as described below. As for the details, please refer to MEPC.1/Circ.837 as attached.

1. Diesel engine to which the Approved Method is to be applied and deadline for the application  
Installed onboard ships constructed on or after 1 January 1990 but prior to 1 January 2000 and diesel engines that correspond to the following table are required to apply the Approved Methods provided that the fuel nozzle type and shop test performance values satisfy the conditions specified in MEPC.1/Circ.837.

Engine Type	Application Cycle (Use)	MCR per cylinder (kW/cyl)	Rated Speed (rpm)
L50MC	E3 (Fixed Pitch Propeller)	1,075-1,330	133-148

For the MAN B&W L50MC engines to which the Approved Method is to be applied, application of the Approved Method will become mandatory by no later than the first renewal survey for MARPOL ANNEX VI (IAPP) that occurs on or after 5 June 2015.

(To be continued)

NOTES:

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- Back numbers are available on ClassNK Internet Homepage (URL: [www.classnk.or.jp](http://www.classnk.or.jp)).

## 2. Identification of the diesel engine to which the Approved Method is to be applied

In cases where the intended use of the engine is for driving Fixed Pitch Propeller and also MCR and rated speed of the diesel engine installed onboard the ship are within the range specified in the IMO Circular, please contact MAN Diesel & Turbo or the engine manufacturer for confirmation of the applicability of the Approved Methods. Also, unlike the Approved Methods that were previously certified, in cases where the Approved Method for L50MC engines are not applicable to the engine since only shop test performance values don't satisfy the conditions specified in the IMO Circular, the applicability of the Approved Method needs to be authorized by the Administration of Denmark. In this case, the shipowner is to obtain a view report on the applicability authorized by the Administration of Denmark through MAN Diesel & Turbo or the engine manufacturer.

Also in cases where the engine manufacturer or MAN Diesel & Turbo determines that the Approved Methods are not applicable due to the nature of the modifications made to the diesel engine, the applicability of the Approved Method needs to be authorized by the Administration of Denmark.

## 3. Information on relevant surveys

### (1) Periodical Survey and Occasional Survey before application of the Approved Method

In cases where a diesel engine to which an applicable Approved Method exists is installed, the check box in 2.2.1, "Approved Method exists" of the Supplement to the IAPP Certificate needs to be ticked off. Therefore, in cases where ships onboard which MAN B&W L50MC engines specified in the tables mentioned in sections 1. above are installed, and the Periodical Survey or Occasional Survey for MARPOL ANNEX VI (IAPP) is carried out before application of the Approved Method, the shipowners are to confirm the applicability of the Approved Method in the manner described in section 2 above. Prior to the survey, the shipowners are to prepare the following documents in order to show the appropriate applicability of the Approved Method at the time of the survey.

- View report on the applicability of the Approved Method issued by the engine manufacturer or MAN Diesel & Turbo.
- Record of the fuel nozzles type at the time of manufacture (If there is no available record, the relevant information may be included in the view report issued by the engine manufacturer or MAN Diesel & Turbo.)
- Shop test report, or similar documentation (including data on Pmax and Pmax-Pcomp)
- View report on the applicability authorized by the Administration of Denmark, if the Approved Methods cannot be applied due to the following reasons
  - Only shop test performance values don't satisfy the conditions specified in the IMO Circular
  - Some modification was made to the engine after the delivery of the ship

(To be continued)

(2) Confirmation survey after application of the Approved Method

Once the Approved Method is applied, a confirmation survey of the Approved Method is to be carried out following the procedure specified in the Approved Method File. The shipowner is to obtain the Approved Method File approved by DNV-GL on behalf of the Administration of Denmark in communication with MAN Diesel & Turbo or engine manufacturers, and to present the Approved Method File to the surveyor at the confirmation survey. During the Survey, a check will also be made to confirm that all designated components are installed in the subject diesel engine, and the operational data at 75% load is within the range specified by MAN Diesel & Turbo. For more details, please confirm the Approved Method File. Operational data that is mandatory for the confirmation survey is to be obtained prior to the confirmation survey after application of the Approved Method. For the confirmation survey, please prepare the operational data obtained by the responsible person, e.g. chief engineer, etc.\*

\* The confirmation survey cannot be completed unless the operational data has been obtained. Please give due attention to the timing of the Approved Method application, because the survey needs to be completed by the deadline upon obtaining the operational data onboard after application of the Approved Method.

As for the list of Approved Methods previously notified to IMO, please refer to MEPC.1/Circ.845 as attached. Also, as for diesel engines to which Approved Methods have been already applicable other than MAN B&W L50MC engines, please refer to the following ClassNK Technical Information.

- TEC-0836(MAN B&W S70MC engines)
- TEC-0848(WÄRTSILÄ RTA engines)
- TEC-0867(MAN B&W S70MC and S50MC engines)
- TEC-0878(MAN B&W S60MC engines)

For any questions about the above, please contact:

NIPPON KAIJI KYOKAI (ClassNK)  
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Address: 3-3 Kioi-cho, Chiyoda-ku, Tokyo 102-0094, Japan  
Tel.: +81-3-5226-2022 / 2023  
Fax: +81-3-5226-2024  
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Attachment:

1. MEPC.1/Circ.837
2. MEPC.1/Circ.845

4 ALBERT EMBANKMENT  
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MEPC.1/Circ.837  
10 June 2014

## **INFORMATION ON AN APPROVED METHOD UNDER MARPOL ANNEX VI**

### **Communication received from the Administration of Denmark**

1 In accordance with the provisions of regulation 13.7.1 of MARPOL Annex VI, a communication has been received from the Administration of Denmark concerning certification of an approved method for marine diesel engine MAN B&W L50MC. The details are annexed hereto, and hereby circulated to Parties to MARPOL Annex VI and Member States of the Organization for information and appropriate action.

2 It should be noted that, for marine diesel engines with a power output of more than 5,000 kW and a per cylinder displacement at or above 90 litres installed on a ship constructed on or after 1 January 1990 but prior to 1 January 2000, installation of an approved method is required if the approved method for that engine has been certified by an Administration of a Party, or alternatively, certification as provided for under regulation 13.7.1.2 of MARPOL Annex VI.

3 It should be also noted that the Marine Environment Protection Committee, as its sixty-sixth session, adopted the *2014 Guidelines in respect of the information to be submitted by an Administration to the Organization covering the certification of an Approved Method as required under regulation 13.7.1 of MARPOL Annex VI* (resolution MEPC.242(66)).

4 As the Administration of Denmark notified the certification of the approved method for engines specified in the annex to this circular on 4 June 2014, installation of the method for such engines will be mandatory no later than the first renewal survey for the International Air Pollution Prevention Certificate, which occurs on or after 5 June 2015, subject to commercial availability.

5 Member Governments are invited to bring this circular to the attention of their Administrations, relevant shipping organizations, recognized organizations, shipping companies and other stakeholders, and encourage them to take action as appropriate.

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**ANNEX**

**APPROVED METHOD FOR MAN B&W L50MC**

Specification of the Engine Type				Type of Approved Method	Approved Method Number	Date of notification
Engine type	Manufacturer	MCR per cylinder (kW/cyl)	Rated speed (rpm)			
L50MC	MAN B&W	1,075 – 1,330*	133-148*	Fuel nozzle	94988-14 HH	4 June 2014

\* See attached Notice of Compliance for further details.



The International Maritime Organization  
4 Albert Embankment  
London SE1 7SR  
United Kingdom

4. juni 2014

**Our reference:**  
Case 2014012876/4

Regulation, Manning and  
Certification/PK

**Notification of the Certification of an Approved Method as required  
under Regulation 13.7.1 of MARPOL Annex VI**

Dear Sirs,

In accordance with the revised MARPOL Annex VI and Resolution MEPC 242(66) "2014 Guidelines in respect of the information to be submitted by an Administration to the Organization covering the certification of an Approved Method as required under regulation 13.7.1 of MARPOL Annex VI" the Danish Maritime Authority hereby informs that Denmark has certified the enclosed Approved Method for the NOx reduction for engine type MAN B&W L50MC.

The certification is based on the Notice of Compliance Revised MARPOL 73/78, Annex VI Regulation 13 "Approved Method" for the Reduction of NOx Engine Type MAN B&W L50MC AM no. 94988.14 HH, issued by Germanischer Lloyd at Hamburg, 2014-04-15, enclosed, and Documentation for an Approved Method for MAN B&W L50MC GL approval No. 94988-14 HH.

An example of the Approved Method File and an example of the On-board Survey Procedure is included in the enclosed documentation. The Approved Method file required to accompany the specific engine will be issued based on the onboard verification carried out after installation of the Approved Method.

The Approved Method applies to:

Manufacturer	Engine type	MCR per cylinder (kW/cyl)	Rated speed (rpm)	Application cycle
MAN B&W	L50MC	1075-1330	133-148	E3

More detailed information of the identification of engines to which the Approved Method applies is specified in the diagrams in the enclosed Notice of Compliance

The Approved Method contact point (CP) is:

**DANISH MARITIME AUTHORITY**

Carl Jacobsens Vej 31  
2500 Valby  
Danmark

Tel. +45 91376000  
CVR-no. 29 83 16 10  
EAN-no. 5798000023000  
dma@dma.dk  
www.dma.dk

MINISTRY OF BUSINESS AND GROWTH

MDT Copenhagen, PrimeServ Dept DR (DR-cph@mandieselturbo.com)

The Approved Method complies with the requirement in the revised  
MARPOL Annex VI, regulation 13.7.5.1 and 13.7.5.2.

Yours sincerely



**Palle Kristensen**  
**Principal Ship Surveyor**  
**Special Adviser**

Direct phone: 91376372

E-post: PK@dma.dk



## Notice of Compliance



Revised MARPOL 73/78, Annex VI Regulation 13

"Approved Method" for the Reduction of NO<sub>x</sub>

Engine Type MAN B&W L50MC

AM no. 94988-14 HH

### This is to State

That a-m. "Approved Method" (AM) has been verified under the provisions of the IMO Revised MARPOL Annex VI, Regulation 13, Paragraph 7.1, whereby a marine diesel engine with a power output of more than 5,000 kW and a per cylinder displacement at or above 90 litres installed on a ship constructed on or after 1 January 1990 but prior to 1 January 2000 shall comply with the emission limits set forth in subparagraph 7.4 of this regulation, provided that an "Approved Method" for that engine has been certified by an Administration of a Party and notification of such certification has been submitted to the Organization by the certifying Administration.

### This is to Note

1. That this Notice of Compliance is valid only for the combination of engine type, fuel valve nozzles and lay-out area mentioned below.
2. That this Notice of Compliance does not replace the Approved Method file of the individual engine.
3. That this Notice of Compliance includes a specification of allowed 'existing' fuel nozzles with IMO marking numbers, engine rating and max. performance values. The performance values should be taken from the test-bed report, or similar documentation.
4. That this Notice of Compliance includes a lay-out area graph for which the Approved Method with AM no. 94988-14 HH is applicable.

### Specification of "Approved Method"

Manufacturer : MAN Diesel & Turbo

GL approval no. : 94988-14 HH

Date of primary issue : 2014-04-15

AM	Load Cycle	Specification of engine type <sup>i</sup>			Specification of performance <sup>iv</sup>			
		'Existing' fuel nozzles drawing number/ IMO ID number <sup>i</sup>	MCR per cylinder (kW/cyl) <sup>ii</sup>	Rated speed (rpm) <sup>iii</sup>	P <sub>max</sub> at max tolerance (barabs) <sup>iii</sup>		P <sub>max</sub> -P <sub>comp</sub> at max tolerance (bar) <sup>iii</sup>	
					100%	75%	100%	75%
MD-C-L50-1#1 1144789-3 (AM-1)	E3	1242912-0 (M1)	1075-1330	133-148	144	134	29	49

<sup>i</sup> not all fuel nozzles are marked, but if drawings are referenced to original MAN B&W (drilling) drawings (i.e. identical nozzles) these engines are also included in the AM

<sup>ii</sup> within the range bounded by MCR per cylinder and rated speed as defined in attached lay-out graph (a +/- 25 kW tolerance shall be allowed on the power limits, respectively, to allow for minor conversion errors)  
(a metric conversion factor: 0.7355 kW/bHp is used)

<sup>iii</sup> at ISO ambient conditions based on original test-bed data at 75 & 100% loads (or interpolated from adjacent loads, if not available)

<sup>iv</sup> (performance data to be specified with one decimal, P<sub>max</sub> rounded up & P<sub>comp</sub> rounded down)  
exemptions may be introduced on approval by the Administration after evaluation by the Contact Point



Germanischer Lloyd  
Issued at Hamburg, 2014-04-15

*[Signature]*  
Dr. Fabian Klock

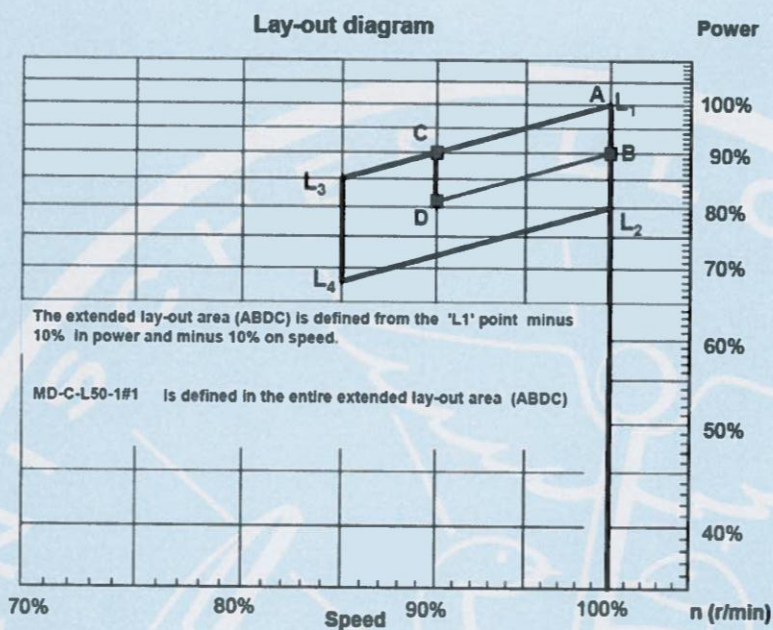
*[Signature]*  
Markus Bugdol





**"Approved Method" for the Reduction of NO<sub>x</sub>**  
**Engine Type MAN B&W L50MC**  
**AM no. 94988-14 HH**

Lay-out area graph (with AM-#'s indicated, if appropriate)



For L50MC L<sub>1</sub>: 1330 kW/cyl and 148 r/min  
Comment: To avoid errors with unit conversions a +/-25 kW/cyl power allowance is observed for upper and lower power limit respectively (a metric conversion factor of 0.7355 shall be used)

**This is to Confirm**

1. That the a.-m. "Approved Method" has been verified and approved in accordance with all provisions and requirements as applicable.
2. In particular the a.-m. "Approved Method" fulfils the following requirements:
  - The cost of the Approved Method does not exceed 375 Special Drawing Rights per metric tonne NO<sub>x</sub>.
  - The power of the engine is not reduced by more than 1.0%.
  - The specific fuel consumption (SFOC) as calculated following ISO standard conditions for the appropriate E3 or E2 cycle is not increased by more than 2.0%.



Germanischer Lloyd  
Issued at Hamburg, 2014-04-15

Dr. Fabian Kock

Markus Bugdol



## MAN Diesel & Turbo

### **Approved Method File** **(‘Existing’ engine emission document)**

issued under the provisions of the Protocol of 2008 to amend the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 related thereto (MARPOL 73/78 Annex VI.)

for

**MAN B&W – L50MC**

**MD-C-L50-1#1 (VIT, CC-F)**

Engine group .....

Engine type	Test cycle	Rated power (kW/cyl)	Rated speed (r/min)
<b>L50MC</b>	<b>E3</b>	<b>1075-1330*</b>	<b>133-148</b>

\*a +/- 25 kW/cyl allowance is given on upper and lower power limits, respectively

**B&W engine #nnnn (vessel IMO #yyyyyy,) zL50MC, rating 1330 kW/cyl at 148 r/min**  
Specific member engine: .....

THIS IS TO CERTIFY that engines specified in this engine group, when complying with the given description in Table 1 and 2 (requirements for design and performance,) fully satisfies the requirements as amended in the Revised MARPOL Annex VI and the NOx Technical Code 2008.

<b>Applicable NOx emission limit (IMO Tier I) (g/kWh)</b>	<b>16.6</b>
<b>Estimated NOx emission value:</b>	
<b>at reference conditions (g/kWh):</b>	<b>14.2</b>
<b>at maximum tolerances (g/kWh):</b>	<b>16.3</b>

**MAN Diesel, PrimeServ dept. DR-CPH**

prepared by .....

(full designation of the competent person or organization authorized under the provisions of the Convention)

**Copenhagen, 14 June 2013**

place and date of issue .....

Approved by .....

(Seal or Stamp of the authority, as appropriate)





## MAN Diesel & Turbo

### Engine Description – Design and Performance Values

Engine type: **MAN B&W – L50MC**

Engine group: **MD-C-L50-1#1 (VIT, CC-F)**

**Table 1 – NOx Components\*)**

Component (parameter)	Specification	MAN B&W IMO ID	Other IMO ID
Fuel valve nozzle	2 fuel valves pr. cylinder	1144789-3	
Fuel pump plunger (diameter)	Ø47 mm	not applicable (N/A)	
Fuel cam (rise)	1.268 mm/deg	not applicable (N/A)	

\*) A cross reference table for all 'IMO' components of less importance for the NOx emission has been submitted to the Administration to define the engine group

**Table 2 – Reference and maximum allowed operating values**

	Parameter (ISO ambient conditions)	Reference value				Maximum allowed **)			
	Power – %	100	75	50	25	100	75	50	25
Engine parameters	Maximum combustion pressure – barabs	141	130	98	70	144	133	101	73
	Cylinder pressure rise – bar (Pmax - Pcomp)	21	40	37	29	28	48	45	37
	Scavenging-air temperature – °C	48	43	39	44	54	46	42	47
	Turbine back pressure – mmWC	300	179	86	25	450	340	225	115
	VIT load break point (if applicable):	85 %				Reference value			
Ambient conditions (ISO ambient conditions)	Ambient pressure – mbar					1000			
	Ambient temperature – °C					25			
	Humidity – rel. %					30			
	Sea-water (inlet) temperature – °C					25			
	Central sea-water-cooler fresh-water-outlet temperature (for central-cooling system) – °C *)					36			

\*) Based on 25°C sea-water temperature (but depending on cooling strategy, (see also Instruction book 'Operation'))

\*\*) Additionally, common MAN B&W engine instructions shall always be followed.



## MAN Diesel & Turbo

### On-board survey

In order to ensure compliance, the following must be checked:

1. The design must correspond with the above description (Table 1 – NOx components.)
2. A standard performance check must provide performance data (corrected to ISO ambient conditions) within the tolerances as specified in Table 2 – Reference and maximum allowed operating values.

The attached flow chart describes the procedure for an on-board survey and Appendix A provides a complete on-board survey based on the original test-bed report.

It is required to perform an on-board survey within one-month period from a called (or anticipated) survey. Further, soonest after docking (or performance adjustment or repair on-board,) a survey shall be performed to verify setting values and ensure continuing compliance.

#### Survey code

A dedicated survey code issued for the engine group (following the AMF specifications) can be used to demonstrate compliance and print out a new Appendix A for the initial and later on-board surveys.

The survey code adjusts automatically Pmax and Pcomp to ISO ambient conditions with input of the specified performance parameters (yellow fields in the tables.) However, it is possible to check compliance manually, using the equations stated in Appendix A.

Actual date for the survey and actual member engine# shall be stated in the Appendix to ensure that the correct survey is carried out and all surveys shall be signed by the Chief Engineer and added to the record book.

#### Performance data

Performance data shall be obtained following a standard performance-observation check as described in the MAN B&W engine 'operation instructions.' Pmi measurements or indicator cards will provide Pmax and Pcomp. The data should be specified with one decimal where possible (especially Pmax and Pcomp,) and Pcomp rounded down as being the 'worst' condition.

Usually three or four load points are measured in a standard performance check, but only data from 75% load (and a load point above the VIT break point for engines with VIT) are then filled in the survey code 'input fields' to verify compliance.

If compliance is not obtained the first time, the engine needs to be adjusted for compliance, and data obtained again. Please observe that measuring equipment must be calibrated according the IMO Regulation before the scheduled survey.

#### Record book

An engine record book can be created by collecting all future survey print outs and add description on the performed maintenance (date for installation or renovation of new IMO components and performance adjustments.)

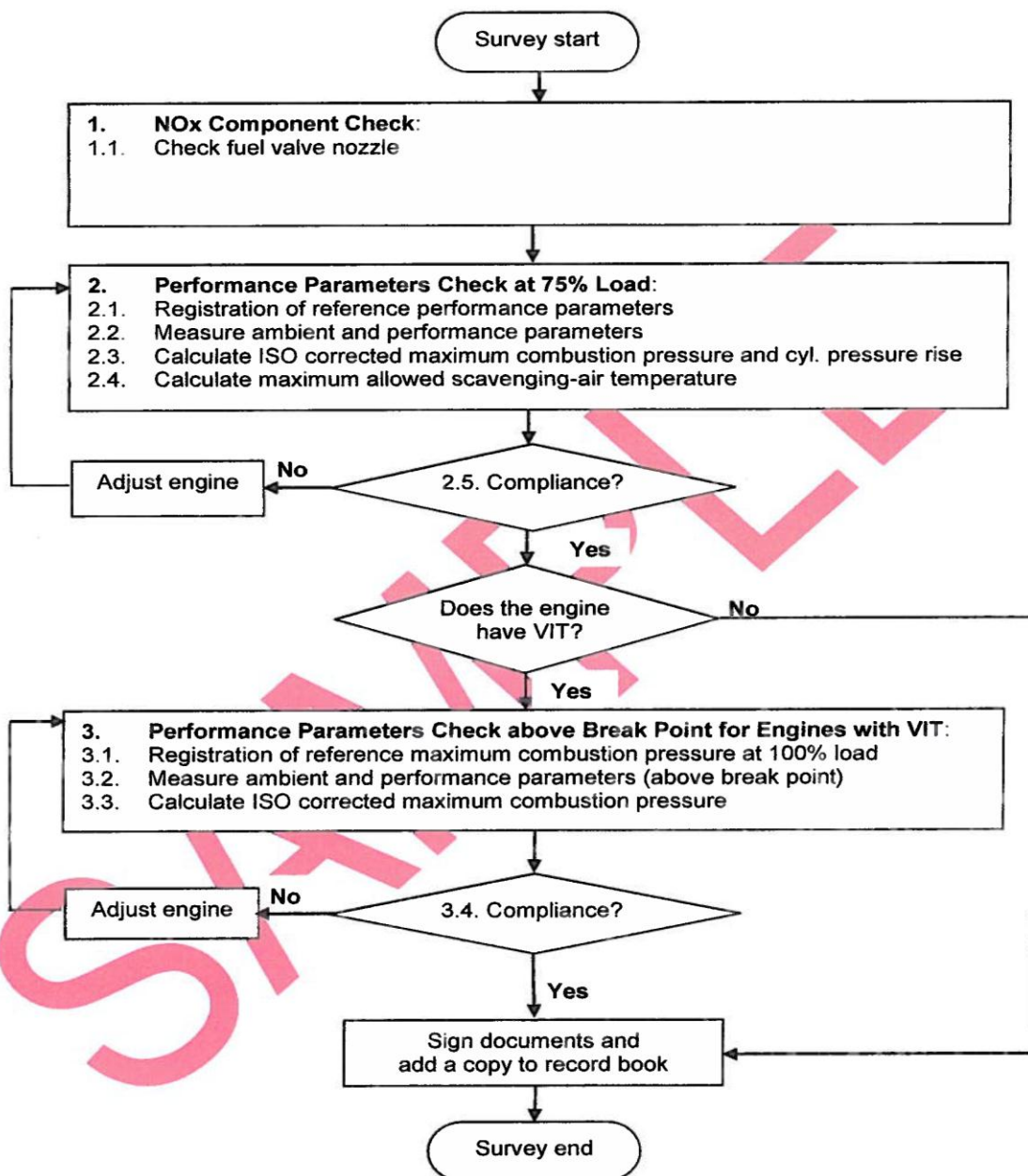
#### Procedure

1. On-board surveys are carried out following the above description based on standard MAN B&W engine performance observations and in agreement with performance measurements in the NOx Technical Code
2. Add, as part of the AMF (page 5,) the filled-out survey code (Appendix A) with original test-bed data for pre approval (initial approval) of the 'individual' AMF and, as an example for an on-board survey \*)
3. Following the AM installation, a new survey shall be performed on board to show compliance before renewal of the IAPP certificate. Similarly, on-board surveys shall be performed before future annual or intermediate surveys
4. Add future on-board surveys to show continued compliance as part of the engine record book

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\*) The scavenging-air temperature may not show compliance on test bed due to the different cooling set up on the test facilities. Non compliance of other parameters on test bed requires the Administration approval.



## MAN Diesel & Turbo





## Appendix A: On-board Survey Procedure

For onboard survey fill out and print the following form (yellow fields)

Engine group MD-C-L50-1  
Engine No M1 T14-T17  
Date 24-03-2003

Engine group MD-C-L50-1  
Engine No M1 T14-T17  
Date 24-03-2003

### 1. NOx Component check (AMF Table 1)

Fuel valve nozzle	check	IMO ID#
		1144789-3

### 2. Performance parameter check at 75% load

#### 2.1 Registration of reference performance parameters (AMF Table 2)

Performance parameters	Reference			Max. allowed		
	Units	Symbol	Values	Units	Symbol	Values
Max combustion pressure	barabs	A	131	barabs	E	134
Cylinder pressure rise	bar	B	41	bar	F	49
Turbine back pressure	mmWC	C	179	mmWC	G	340
Scavenging air temperature	°C	D	43	°C	H	46

#### 2.2 Measure ambient and performance parameters (at 75% load ± 5%)

Performance parameters	Measured			ISO Corrected (see 2.3.2.4)		
	Units	Symbol	Values	Units	Symbol	Values
Max combustion pressure	bar	I	132	barabs	Q	131.04
Max cyl compr. pressure	bar	J	91	barabs	R	90.66
Turbine back pressure	mmWC	K	123	mmWC		
Scavenging air temperature	°C	L	31	°C		
Ambient pressure	mbar	M	1018	mbar		
T/C inlet temperature	°C	N	16.5	°C		
Sea-water inlet temperature	°C	O	9.8	°C		
Set point coolant outlet temp.	°C	P	36	°C		

#### 2.3 Calculate ISO corrected max. combustion pressure and max. cyl. compression pressure

$$Q = (I + M/1000) * (1 + 0.002198 * (N - 25) - 0.00081 * (L - D) - 0.00022 * (M - 1000) * 0.75 + 0.00005278 * (K - C)) \quad (1)$$

$$R = (J + M/1000) * (1 + 0.002954 * (N - 25) - 0.00153 * (L - D) - 0.000301 * (M - 1000) * 0.75 + 0.00007021 * (K - C)) \quad (2)$$

#### 2.4 Calculate maximum allowed scavenging air temperature

$$S = H + (O - 25) \quad (3)$$

$$\text{Central fresh water Cooling system with Fixed outlet temperature (CC-F)} \\ \text{If } O \leq P - 2 \quad S = H \quad (4a)$$

$$\text{Else} \quad S = H + (O - (P - 2)) \quad (4b)$$

Where P is the central cooler set point for outlet coolant temperature

#### 2.5 Compliance check

Performance parameters	Engine performance			Max allowed		Compliance
Max combustion pressure	Q	131.0	≤	134	E	yes
Cylinder pressure rise	Q · R	40.4	≤	49	F	yes
Turbine back pressure	K	123	≤	340	G	yes
Scavenging air temperature	L	31.0	≤	46	S	yes

Only for engines with VIT:

### 3. Performance parameter check above break point for engines with VIT (if appropriate)

#### 3.1 Registration of reference performance parameters at 100% (AMF Table 2)

Performance parameters	Reference			Max allowed		
	Units	Symbol	Values	Units	Symbol	Values
Max combustion pressure	barabs	A	141	barabs	E	144
Turbine back pressure	mmWC	C	300	mmWC	G	450
Scavenging air temperature	°C	D	48	°C	H	54
Break point	%	T	85			

#### 3.2 Measure ambient and performance parameters (above the break point)

Performance parameters	Measured			ISO Corrected (see 3.3)		
	Units	Symbol	Values	Units	Symbol	Values
Max combustion pressure	bar	I	141.6	barabs	Q	140.52
Turbine back pressure	mmWC	K	230	mmWC		
Scavenging air temperature	°C	L	36	°C		
Ambient pressure	mbar	M	1019	mbar		
T/C inlet temperature	°C	N	17	°C		
Measured load	%	U	100			

#### 3.3 Calculate ISO corrected maximum combustion pressure

Use equation (1)

#### 3.4 Compliance check

Performance parameters	Engine performance			Max./Min. allowed		Compliance
Max combustion pressure	Q	140.5	≤	144	E	yes
Measured load	U	100	≥	85	T	yes





**E**

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MEPC.1/Circ.845  
18 July 2014

## **INFORMATION ON AN APPROVED METHOD UNDER MARPOL ANNEX VI**

### **List of notifications from Administrations**

1 In accordance with the provisions of regulation 13.7.1 of MARPOL Annex VI, for marine diesel engines with a power output of more than 5,000 kW and a per cylinder displacement at or above 90 litres, installed on a ship constructed on or after 1 January 1990 but prior to 1 January 2000, installation of an approved method is required if the approved method for that engine has been certified by an Administration of a Party and notification of such certification has been submitted to the Organization or, alternatively, certification as provided for under regulation 13.7.1.2 of MARPOL Annex VI.

2 The notifications that the Organization has received to date are set out in the annex.

3 Member Governments are invited to bring this circular to the attention of their Administrations, relevant shipping organizations, recognized organizations, shipping companies and other stakeholders and encourage them to take action as appropriate.

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**ANNEX**

**LIST OF NOTIFICATIONS FROM ADMINISTRATIONS**

Date of notification	Administration	Engine type	Manufacture	Type of approved method	MCR per cylinder (kW/cyl)	Rated speed (rpm)	IMO Circular No.
5 October 2010	Denmark	S70MC	MAN B&W	Fuel nozzle	2,530 – 2,810	81 – 91	MEPC.1/Circ.738 MEPC.1/Circ.738/Add.1 MEPC.1/Circ.738/Add.2 MEPC.1/Circ.738/Add.3/Rev.1
4 February 2011	Germany	RTA52 RTA52U RTA58T RTA62 RTA62U RTA72 RTA72U RTA84C RTA84CU RTA84M RTA84T-B RTA96C	Wärtsilä Switzerland Ltd.	NO <sub>x</sub> optimized injection timing	---	---	MEPC.1/Circ.743
11 August 2011	Denmark	S70MC	MAN B&W	Fuel nozzle	2,250 – 2,810	81 – 91	MEPC.1/Circ.764 MEPC.1/Circ.764/Add.1
11 August 2011	Denmark	S50MC	MAN B&W	Fuel nozzle	1,160 – 1,430	114 – 127	MEPC.1/Circ.765
5 October 2011	Denmark	S60MC	MAN B&W	Fuel nozzle	1,650 – 2,040	94 – 105	MEPC.1/Circ.770
4 June 2014	Denmark	L50MC	MAN B&W	Fuel nozzle	1,075 – 1,330	133 – 148	MEPC.1/Circ.837