

Subject

Application of "Approved Method" to existing diesel engines under the provisions of Revised MARPOL ANNEX VI

- Certification of an Approved Method for WÄRTSILÄ RTA engines -

ClassNK

Technical Information

No. TEC-0848

Date 7 March 2011

To whom it may concern

As already advised by ClassNK Technical Information No.TEC-0771 dated 13 May 2009, 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 ships constructed on or after 1 January 1990 but prior to 1 January 2000 are to comply with Tier I emission limits using an Approved Method, provided that an Approved Method for that engine has been certified by an Administration (Reg. 13.7.1 of ANNEX VI).

On 4 February 2011, the Administration of Germany notified the IMO that they had certified an Approved Method for the WÄRTSILÄ RTA engines listed in the table below. As a result, on 17 February 2011, the IMO published the related information in MEPC.1/Circ.743 as shown in Attachment 1. (This is the second case in which an Approved Method was certified by an Administration. The first case was the Approved Method for the MAN B&W S70MC engine whose relevant information was described in ClassNK Technical Information No.TEC-0836). The Approved Method for the WÄRTSILÄ RTA engines is applicable to the individual diesel engines only as listed in the MEPC Circular.

Engine Type	Manufacturer	Description of Approved Method
RTA52 RTA52U RTA58T RTA62 RTA62U RTA72 RTA72U RTA84C RTA84CU RTA84M RTA84T-B RTA96C	Wärtsilä Switzerland Ltd.	NOx-optimized injection timing

(To be continued)

NOTES:

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The Approved Method is to be applied, in principle, by no later than the first renewal survey that occurs 12 months or more after it has been submitted to the IMO after having been certified by the Administration. Therefore, with the aforementioned notification by the Administration of Germany, application of the Approved Method will become mandatory by no later than the first renewal survey for IAPP Certification that occurs on or after 5 February 2012. As described in the German letter which is attached to the MEPC Circular, please contact the engine manufacturer about the detailed information of the Approved Method for each diesel engine.

For any questions about the above, please contact:

NIPPON KAIJI KYOKAI (ClassNK)

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Attachment:

1. MEPC.1/Circ.743

4 ALBERT EMBANKMENT
LONDON SE1 7SR
Telephone: +44 (0)20 7735 7611 Fax: +44 (0)20 7587 3210

Ref. T5/1.01

MEPC.1/Circ.743
17 February 2011

INFORMATION ON AN APPROVED METHOD UNDER MARPOL ANNEX VI

Communication received from the Administration of Germany

1 In accordance with the provisions of regulation 13.7.1 of MARPOL Annex VI, a communication has been received from the Administration of Germany concerning certification of an approved method for marine diesel engines. 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 those engines have been certified by an Administration of a Party, or alternatively, for such engines, certification as provided for under regulation 13.7.1.2 of MARPOL Annex VI.

3 As the Administration of Germany notified the Organization of the certification of an approved method for engines specified in the annex to this circular on 4 February 2011, installation of the method for those engines will be mandatory no later than the first renewal survey for the ship's International Air Pollution Prevention Certificate, which occurs on or after 5 February 2012, subject to commercial availability.

4 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.

ANNEX

APPROVED METHOD FOR WÄRTSILÄ RTA

Specification of the Engine			Approved method complies with the following requirements		Date of notification
Engine type	Designer/Manufacturer	Description of approved method	Reg. 13.7.5.1	Reg. 13.7.5.2	
RTA52 RTA52U RTA58T RTA62 RTA62U RTA72 RTA72U RTA84C RTA84CU RTA84M RTA84T-B RTA96C	Wärtsilä Switzerland Ltd.	NO _x -optimized injection timing*	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4 Feb. 2011

- * Individual scope of delivery for each engine can be obtained from the designer of the approved method.



Bundesministerium
für Verkehr, Bau
und Stadtentwicklung



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**Subject: Certification of an approved method under the
revised MARPOL Annex VI, regulation 13.7.5.**

Reference: WS24/6247.5/1-6
Bonn, 4 February 2011
Page 1 of 2

Dear Sirs,

In accordance with the revised MARPOL Annex VI, the German Federal Ministry of Transportation, Building and Urban Development hereby informs you that Germanischer Lloyd (GL) on the authority of the German administration has certified the enclosed method in accordance with regulation 13.7.5 of the revised MARPOL Annex VI.

The certification of the approved method for the NO_x reduction engine types Wärtsilä RTA52, RTA52U, RTA58T, RTA62, RTA62U, RTA72, RTA72U, RTA84C, RTA84CU, RTA84M, RTA84T-B, RTA96C is attached for circulation in accordance with the revised MARPOL Annex VI, regulation 13.7.1 to contracting Member States.

A thorough review and check of the detailed technical description was part of the certification process undertaken by GL. Documents containing all details of technical data, measurement results and calculations are in the hands of GL. The individual scope of delivery for each engine listed in the appendix of the Notice of Compliance has been defined and can be obtained from the designer of the approved method.

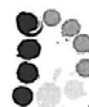
Nevertheless GL reviewed the „Notice of Compliance“ for the AM and reworded accordingly:

- In the heading a name for the AM has been added: AM no. 20347-10 HH
- In the specification of the AM a description has been added: „NO_x-optimized injection timing“. Individual scope of delivery





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Seite 2 von 2

for each engine listed in the appendix of this document is defined and can be obtained from the designer of the approved method.

Yours sincerely,

Jan von Hagen
Desk Officer





Notice of Compliance

Revised MARPOL 73/78, Annex VI Regulation 13
'Approved Method' for the Reduction of NO_x
Wärtsilä Switzerland Ltd.
AM no. 20347-10 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 applies to main propulsion engines as listed in the appendix to this document.
2. that this Notice of Compliance does not replace the 'Approved Method File' issued for the individual engine.

Specification of the 'Approved Method'

Designer/Manufacturer : **Wärtsilä Switzerland Ltd.**
GL approval no. : **20347-10 HH**
Description : **"NO_x-optimized injection timing"**
Individual scope of delivery for each engine listed in the appendix of this document is defined and can be obtained from the designer of the Approved Method.
Date of primary issue **2011-01-24**

Specification of the Engine Types

Engine types **RTA52, RTA52U, RTA58T, RTA62, RTA62U, RTA72, RTA72U, RTA84C, RTA84CU, RTA84M, RTA84T-B, RTA96C**

Remark **The 'Approved Method' certified hereunder is applicable to the individual engines only as listed in the Appendix to this 'Notice of Compliance'.**

This is to Confirm

1. That the a.-m. 'Approved Method' has been verified, approved and certified in accordance with chapter 7 of the revised NO_x Technical Code 2008 and further provisions and requirements as applicable.
2. In particular, subject 'Approved Method' fulfils the following requirements, as verified by the engine designer:
 - The cost of the Approved Method does not exceed 375 Special Drawing Rights per metric tonne NO_x.
 - The engine rating is not decreased by more than 1.0%.
 - The specific fuel consumption (SFOC) as calculated following ISO standard conditions for the appropriate E3 or E2 test cycle is not increased by more than 2.0%.



Germanischer Lloyd

Issued at Hamburg, 2011-01-24 / Rev. 1

[Signature]
Hans-Joachim Götze

[Signature]
Dr. Fabian Kock

Appendix to Notice of Compliance

Revised MARPOL 73/78, Annex VI Regulation 13

“Approved Method” for the Reduction of NO_x

Wärtsilä Switzerland AM no. 20347-10 HH

IMO Number	Hull Number	Engine Serial Number	Engine Type	Licensee
8618413	5866	1819	6 RTA62	Grandi Motori Trieste
8814299	B 369/01	7	6 RTA62	H. Cegielski, Poznan
8814304	B 369/02	4	6 RTA62	H. Cegielski, Poznan
8821931	658	730229	5 RTA62	3.Maj, Diesel Engine Works
8821943	659	730231	5 RTA62	3.Maj, Diesel Engine Works
8821955	660	730230	5 RTA62	3.Maj, Diesel Engine Works
8900426	5900	1746	6 RTA72	Grandi Motori Trieste
8902644	160	750	6 RTA72	Industrias Verolme-Ishibras (IVI)
8902656	161	751	6 RTA72	Industrias Verolme-Ishibras (IVI)
8906963	B 369/03	8	6 RTA62	H. Cegielski, Poznan
8906975	B 369/04	5	6 RTA62	H. Cegielski, Poznan
8907620	1168	3038	6 RTA62	Diesel United Ltd.
8910897	123	3043	7 RTA62	Diesel United Ltd.
8910902	124	3044	7 RTA62	Diesel United Ltd.
8912182	303	518	6 RTA62	Kvaerner Kincaid Ltd.
8912613	1167	3037	6 RTA62	Diesel United Ltd.
8914037	1102	3032	6 RTA52	Diesel United Ltd.
8915328	1171	3071	6 RTA62	Diesel United Ltd.
8915665	3007	3088	8 RTA84C	Diesel United Ltd.
8915677	3008	3089	8 RTA84C	Diesel United Ltd.
8915689	3009	3090	8 RTA84C	Diesel United Ltd.
8915691	1184	3591	8 RTA84C	Mitsubishi Heavy Industries
8915706	1185	3592	8 RTA84C	Mitsubishi Heavy Industries
8916736	377	3581	5 RTA62	Mitsubishi Heavy Industries
8917754	5898	1740	6 RTA72	Grandi Motori Trieste
8917778	3002	3064	6 RTA84C	Diesel United Ltd.
8917807	129	3058	7 RTA62	Diesel United Ltd.
8917819	1173	3073	6 RTA62	Diesel United Ltd.
8917821	1174	3093	6 RTA62	Diesel United Ltd.
8918277	10137	3067	7 RTA52	Diesel United Ltd.
8918289	10138	3068	7 RTA52	Diesel United Ltd.
8918825	3005	3078	9 RTA84C	Diesel United Ltd.
9000431	1104	3034	6 RTA52	Diesel United Ltd.
9001007	5060	124	7 RTA84M	Korean Heavy Industries & Constructions
9001186	1180	3574	6 RTA62	Mitsubishi Heavy Industries
9001332	362	3142	9 RTA84C	Diesel United Ltd.



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Issued at Hamburg, 2011-01-24 / Rev. 1

Approval No. 20347-10 HH

Page 2 of 15

Page 2 of 15

Appendix to Notice of Compliance

Revised MARPOL 73/78, Annex VI Regulation 13

“Approved Method” for the Reduction of NO_x

Wärtsilä Switzerland AM no. 20347-10 HH

IMO Number	Hull Number	Engine Serial Number	Engine Type	Licensee
9002491	131	3099	7 RTA62	Diesel United Ltd.
9002714	363	3143	9 RTA84C	Diesel United Ltd.
9002726	364	3144	9 RTA84C	Diesel United Ltd.
9002908	1539	730254	5 RTA72	3.Maj, Diesel Engine Works
9004528	133	3108	7 RTA84M	Diesel United Ltd.
9004530	134	3109	7 RTA84M	Diesel United Ltd.
9004607	1110	3117	6 RTA62	Diesel United Ltd.
9005170	1183	3131	7 RTA84M	Diesel United Ltd.
9005223	5062	126	7 RTA84M	Korean Heavy Industries & Constructions
9005235	5063	127	7 RTA84M	Korean Heavy Industries & Constructions
9005417	664	730248	6 RTA72	3.Maj, Diesel Engine Works
9005429	665	730249	6 RTA72	3.Maj, Diesel Engine Works
9005431	666	730250	6 RTA72	3.Maj, Diesel Engine Works
9005534	3020	3121	9 RTA84C	Diesel United Ltd.
9005546	3021	3122	9 RTA84C	Diesel United Ltd.
9005558	3022	3123	9 RTA84C	Diesel United Ltd.
9005560	921	3128	9 RTA84C	Diesel United Ltd.
9006904	1083	595	6 RTA62	Hyundai Engine Manufacturing
9006916	1084	596	6 RTA62	Hyundai Engine Manufacturing
9007269	403	4	7 RTA62	H. Cegielski, Poznan
9007271	404	5	7 RTA62	H. Cegielski, Poznan
9007532	10144	3114	7 RTA52	Diesel United Ltd.
9007544	10145	3115	7 RTA52	Diesel United Ltd.
9008548	95	11125	6 RTA72	Bremer Vulkan AG
9008550	96	11126	6 RTA72	Bremer Vulkan AG
9008562	279	11129	6 RTA72	Bremer Vulkan AG
9008574	280	11130	6 RTA72	Bremer Vulkan AG
9008603	500	11128	6 RTA72	Bremer Vulkan AG
9008615	499	11127	6 RTA72	Bremer Vulkan AG
9008706	10146	3116	7 RTA52	Diesel United Ltd.
9008718	1112	3118	6 RTA62	Diesel United Ltd.
9009023	304	519	6 RTA62	Kvaerner Kincaid Ltd.
9009229	1113	3119	6 RTA62	Diesel United Ltd.
9009358	163	799	6 RTA72	Industrias Verolme-Ishibras (IVI)
9012616	164	800	6 RTA72	Industrias Verolme-Ishibras (IVI)
9012903	1114	3120	6 RTA62	Diesel United Ltd.



Germanischer Lloyd
Issued at Hamburg, 2011-01-24 / Rev. 1

Approval No. 20347-10 HH

Page 3 of 15

Page 3 of 15

Appendix to Notice of Compliance

Revised MARPOL 73/78, Annex VI Regulation 13

“Approved Method” for the Reduction of NO_x

Wärtsilä Switzerland AM no. 20347-10 HH

IMO Number	Hull Number	Engine Serial Number	Engine Type	Licensee
9014066	10164	3179	7 RTA52	Diesel United Ltd.
9014078	10165	3180	7 RTA52	Diesel United Ltd.
9015527	7	562	10 RTA84C	Hyundai Engine Manufacturing
9015539	8	563	10 RTA84C	Hyundai Engine Manufacturing
9015541	9	564	10 RTA84C	Hyundai Engine Manufacturing
9017020	2022	3084	9 RTA84C	Diesel United Ltd.
9017032	2026	3085	9 RTA84C	Diesel United Ltd.
9017264	B 369/05	62167	6 RTA62	Dieselmotorenwerk Rostock
9017276	B 369/06	12	6 RTA62	H. Cegielski, Poznan
9018646	252	14	6 RTA62	H. Cegielski, Poznan
9018658	253	21	6 RTA62	H. Cegielski, Poznan
9019119	B 369/I/1	3	6 RTA62	H. Cegielski, Poznan
9019121	B 369/I/2	62162	6 RTA62	Dieselmotorenwerk Rostock
9020560	1182	3094	6 RTA62	Diesel United Ltd.
9021679	11	131	10 RTA84C	Korean Heavy Industries & Constructions
9021681	12	151	10 RTA84C	Korean Heavy Industries & Constructions
9021693	13	152	10 RTA84C	Korean Heavy Industries & Constructions
9030723	2035	3618	10 RTA84C	Mitsubishi Heavy Industries
9030735	2032	3617	10 RTA84C	Mitsubishi Heavy Industries
9030917	5925	1877	6 RTA72	Grandi Motori Trieste
9033971	5927	2054	6 RTA72	Grandi Motori Trieste
9035010	165	811	6 RTA72	Industrias Verolme-Ishibras (IVI)
9035060	3026	3134	6 RTA72	Diesel United Ltd.
9036430	610	133	5 RTA52	Korean Heavy Industries & Constructions
9039597	1117	3148	6 RTA62	Diesel United Ltd.
9039676	1098	635	6 RTA62	Hyundai Engine Manufacturing
9039688	1099	636	6 RTA62	Hyundai Engine Manufacturing
9040352	10148	3135	6 RTA52	Diesel United Ltd.
9040364	10149	3139	6 RTA52	Diesel United Ltd.
9040376	10150	3140	6 RTA52	Diesel United Ltd.
9040388	10151	3141	6 RTA52	Diesel United Ltd.
9040479	10156	3136	6 RTA52	Diesel United Ltd.
9043627	4869	7299	9 RTA84C	Hitachi Zosen Corporation
9043639	4870	7300	9 RTA84C	Hitachi Zosen Corporation
9043641	4871	7301	9 RTA84C	Hitachi Zosen Corporation
9043689	1192	3615	6 RTA62	Mitsubishi Heavy Industries



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Issued at Hamburg, 2011-01-24 / Rev. 1

Approval No. 20347-10 HH

Page 4 of 15

Page 4 of 15

Appendix to Notice of Compliance

Revised MARPOL 73/78, Annex VI Regulation 13

“Approved Method” for the Reduction of NO_x

Wärtsilä Switzerland AM no. 20347-10 HH

IMO Number	Hull Number	Engine Serial Number	Engine Type	Licensee
9043691	1193	3622	6 RTA62	Mitsubishi Heavy Industries
9044396	3032	3155	6 RTA52	Diesel United Ltd.
9044401	3033	3156	6 RTA52	Diesel United Ltd.
9044413	3034	3157	6 RTA52	Diesel United Ltd.
9050010	500	172	6 RTA72	Korean Heavy Industries & Constructions
9051600	166	821	6 RTA72	Industrias Verolme-Ishibras (IVI)
9051612	167	822	6 RTA72	Industrias Verolme-Ishibras (IVI)
9055462	1197	3650	9 RTA84C	Mitsubishi Heavy Industries
9055474	1198	3651	9 RTA84C	Mitsubishi Heavy Industries
9056088	56	11133	7 RTA72U	Bremer Vulkan AG
9056090	57	11134	7 RTA72U	Bremer Vulkan AG
9057135	B 186/II/02	16	6 RTA62	H. Cegielski, Poznan
9057147	B 186/II/04	18	6 RTA62	H. Cegielski, Poznan
9057159	B 186/01	15	6 RTA62	H. Cegielski, Poznan
9057161	B 186/03	17	6 RTA62	H. Cegielski, Poznan
9057173	B 186/III/05	19	6 RTA62U	H. Cegielski, Poznan
9060182	267	11136	9 RTA84C	Bremer Vulkan AG
9060546	B 186/IV/06	20	6 RTA62	H. Cegielski, Poznan
9060601	1191	3172	6 RTA62	Diesel United Ltd.
9061112	1204	3672	9 RTA84C	Mitsubishi Heavy Industries
9061124	1205	3674	9 RTA84C	Mitsubishi Heavy Industries
9061136	1206	3675	9 RTA84C	Mitsubishi Heavy Industries
9062960	B 8109/01	197	7 RTA84C	Korean Heavy Industries & Constructions
9062972	B 8109/02	198	7 RTA84C	Korean Heavy Industries & Constructions
9062984	8111/1	206	6 RTA72U	Korean Heavy Industries & Constructions
9062996	8111/2	204	6 RTA72U	Korean Heavy Industries & Constructions
9064322	8113/1	207	6 RTA72U	Korean Heavy Industries & Constructions
9064334	8113/2	205	6 RTA72U	Korean Heavy Industries & Constructions
9065443	1105	213	7 RTA84C	Korean Heavy Industries & Constructions
9067556	102	11135	9 RTA84C	Bremer Vulkan AG
9067568	103	11137	9 RTA84C	Bremer Vulkan AG
9067570	104	11138	9 RTA84C	Bremer Vulkan AG
9070711	10166	3187	6 RTA52	Diesel United Ltd.
9070723	10167	3188	6 RTA52	Diesel United Ltd.
9070735	10168	3189	6 RTA52	Diesel United Ltd.
9070967	1107	227	7 RTA84C	Korean Heavy Industries & Constructions



Germanischer Lloyd
Issued at Hamburg, 2011-01-24 / Rev. 1

Approval No. 20347-10 HH

Page 5 of 15

Page 5 of 15

Appendix to Notice of Compliance

Revised MARPOL 73/78, Annex VI Regulation 13

"Approved Method" for the Reduction of NO_x

Wärtsilä Switzerland AM no. 20347-10 HH

IMO Number	Hull Number	Engine Serial Number	Engine Type	Licensee
9071521	381	72191	7 RTA72U	Dieselmotorenwerk Rostock
9071533	382	72206	7 RTA72U	Dieselmotorenwerk Rostock
9073062	1106	214	7 RTA84C	Korean Heavy Industries & Constructions
9074016	1218	3640	6 RTA62	Mitsubishi Heavy Industries
9074054	10170	3211	6 RTA52	Diesel United Ltd.
9074066	10171	3212	6 RTA52	Diesel United Ltd.
9074078	10173	3199	7 RTA52	Diesel United Ltd.
9074406	291	62208	6 RTA62U	Dieselmotorenwerk Rostock
9074418	292	62216	6 RTA62U	Dieselmotorenwerk Rostock
9077109	170	761	6 RTA62	Hyundai Engine Manufacturing
9078220	1231	3663	6 RTA62	Mitsubishi Heavy Industries
9078232	1232	3676	6 RTA62	Mitsubishi Heavy Industries
9079547	3038	3194	9 RTA84C	Diesel United Ltd.
9080297	1198	3214	6 RTA62U	Diesel United Ltd.
9080405	B 186/V/07	22	6 RTA62	H. Cegielski, Poznan
9080417	B 186/III/9	23	6 RTA62U	H. Cegielski, Poznan
9080522	293	62224	7 RTA62U	Dieselmotorenwerk Rostock
9080534	294	62230	7 RTA62U	Dieselmotorenwerk Rostock
9080613	3037	3193	9 RTA84C	Diesel United Ltd.
9082336	2058	3685	10 RTA84CU	Mitsubishi Heavy Industries
9082348	2060	3686	10 RTA84CU	Mitsubishi Heavy Industries
9082790	B 170/I/01	25	6 RTA62U	H. Cegielski, Poznan
9082805	B 170/I/02	26	6 RTA62U	H. Cegielski, Poznan
9082879	949	238	5 RTA62U	Korean Heavy Industries & Constructions
9082881	950	239	5 RTA62U	Korean Heavy Industries & Constructions
9082960	17	252	10 RTA84C	Korean Heavy Industries & Constructions
9083263	1123	3216	6 RTA52U	Diesel United Ltd.
9083275	1124	3217	6 RTA52U	Diesel United Ltd.
9083524	5943	1977	5 RTA62U	Grandi Motori Trieste
9083536	5944	1979	5 RTA62U	Grandi Motori Trieste
9083548	5945	1980	5 RTA62U	Grandi Motori Trieste
9084580	953	242	5 RTA62U	Korean Heavy Industries & Constructions
9085936	952	241	5 RTA62U	Korean Heavy Industries & Constructions
9085948	951	240	5 RTA62U	Korean Heavy Industries & Constructions
9086045	5946	1976	5 RTA62U	Grandi Motori Trieste
9086057	5947	1978	5 RTA62U	Grandi Motori Trieste



Germanischer Lloyd
Issued at Hamburg, 2011-01-24 / Rev. 1

Approval No. 20347-10 HH
Page 6 of 15

Appendix to Notice of Compliance

Revised MARPOL 73/78, Annex VI Regulation 13

“Approved Method” for the Reduction of NO_x

Wärtsilä Switzerland AM no. 20347-10 HH

IMO Number	Hull Number	Engine Serial Number	Engine Type	Licensee
9086942	1226	3667	6 RTA62	Mitsubishi Heavy Industries
9087738	1219	3645	6 RTA62	Mitsubishi Heavy Industries
9087740	1220	3646	6 RTA62	Mitsubishi Heavy Industries
9087855	2050	3664	6 RTA62	Mitsubishi Heavy Industries
9088110	377	7310	9 RTA84C	Hitachi Zosen Corporation
9088122	378	7311	9 RTA84C	Hitachi Zosen Corporation
9088251	18	724	10 RTA84C	Hyundai Engine Manufacturing
9102162	1228	3697	6 RTA62	Mitsubishi Heavy Industries
9102289	2098	3683	12 RTA84CU	Mitsubishi Heavy Industries
9102291	2099	3684	12 RTA84CU	Mitsubishi Heavy Industries
9102306	1208	3699	12 RTA84CU	Mitsubishi Heavy Industries
9102318	1209	3700	12 RTA84CU	Mitsubishi Heavy Industries
9102497	B 170/I/03	27	6 RTA62U	H. Cegielski, Poznan
9102502	B 170/I/04	28	6 RTA62U	H. Cegielski, Poznan
9102514	B 170/II/01	24	6 RTA62U	H. Cegielski, Poznan
9102526	349	492	6 RTA52U	Manises Diesel Engine Co.
9102538	350	493	6 RTA52U	Manises Diesel Engine Co.
9102796	1127	3222	6 RTA52	Diesel United Ltd.
9102930	T1500-1	116	6 RTA72U	Dalian Marine Diesel Works
9103037	3054	3223	9 RTA84C	Diesel United Ltd.
9104407	10172	3207	6 RTA52	Diesel United Ltd.
9104897	928	734	8 RTA84CU	Hyundai Engine Manufacturing
9104902	929	735	8 RTA84CU	Hyundai Engine Manufacturing
9105097	669	730285	6 RTA52U	3.Maj, Diesel Engine Works
9105102	670	730286	6 RTA52U	3.Maj, Diesel Engine Works
9105114	671	730287	6 RTA52U	3.Maj, Diesel Engine Works
9105906	1205	3229	6 RTA62	Diesel United Ltd.
9105968	B 170/III/01	29	6 RTA62U	H. Cegielski, Poznan
9105970	B 170/III/02	31	6 RTA62U	H. Cegielski, Poznan
9105982	B 170/III/03	34	6 RTA62U	H. Cegielski, Poznan
9105994	B 170/III/04	35	6 RTA62U	H. Cegielski, Poznan
9106170	3055	3226	9 RTA84CU	Diesel United Ltd.
9106182	3056	3230	9 RTA84CU	Diesel United Ltd.
9106194	3057	3231	9 RTA84CU	Diesel United Ltd.
9106209	3058	3232	9 RTA84CU	Diesel United Ltd.
9108099	5962	1999	5 RTA62U	Grandi Motori Trieste



Germanischer Lloyd
Issued at Hamburg, 2011-01-24 / Rev. 1

Approval No. 20347-10 HH

Page 7 of 15

Page 7 of 15

Appendix to Notice of Compliance

Revised MARPOL 73/78, Annex VI Regulation 13

“Approved Method” for the Reduction of NO_x

Wärtsilä Switzerland AM no. 20347-10 HH

IMO Number	Hull Number	Engine Serial Number	Engine Type	Licensee
9108128	4037	744	7 RTA72U	Hyundai Engine Manufacturing
9108130	4038	745	7 RTA72U	Hyundai Engine Manufacturing
9108166	1148	3702	12 RTA84CU	Mitsubishi Heavy Industries
9108178	1149	3703	12 RTA84CU	Mitsubishi Heavy Industries
9108295	4039	746	8 RTA84CU	Hyundai Engine Manufacturing
9108300	932	758	6 RTA72U	Hyundai Engine Manufacturing
9109483	1130	3258	7 RTA52U	Diesel United Ltd.
9109495	1131	3242	7 RTA52U	Diesel United Ltd.
9110561	383	72251	7 RTA72U	Dieselmotorenwerk Rostock
9110614	10187	3240	6 RTA52	Diesel United Ltd.
9110975	1155	6	7 RTA84CU	Samsung Heavy Industries
9111046	B573/1/1	1	6 RTA52U	H. Cegielski, Poznan
9111058	B573/2/1	8260 (2)	6 RTA52U	H. Cegielski, Poznan
9113161	351	501	6 RTA52U	Manises Diesel Engine Co.
9113173	352	502	6 RTA52U	Manises Diesel Engine Co.
9113654	322	11156	7 RTA84CU	Bremer Vulkan AG
9113666	323	11157	7 RTA84CU	Bremer Vulkan AG
9113678	324	11158	7 RTA84CU	Bremer Vulkan AG
9113680	325	11159	7 RTA84CU	Bremer Vulkan AG
9113692	326	11160	7 RTA84CU	Bremer Vulkan AG
9115717	4040	747	8 RTA84CU	Hyundai Engine Manufacturing
9115729	4041	311	8 RTA84CU	Korean Heavy Industries & Constructions
9116577	1211	3713	12 RTA84CU	Mitsubishi Heavy Industries
9116589	1212	3721	12 RTA84CU	Mitsubishi Heavy Industries
9116591	1213	3722	12 RTA84CU	Mitsubishi Heavy Industries
9116606	1214	3723	12 RTA84CU	Mitsubishi Heavy Industries
9116618	1215	3724	12 RTA84CU	Mitsubishi Heavy Industries
9116620	944	3715	7 RTA62	Mitsubishi Heavy Industries
9116632	945	3716	7 RTA62	Mitsubishi Heavy Industries
9116747	933	779	6 RTA72U	Hyundai Engine Manufacturing
9116890	3059	3252	9 RTA84CU	Diesel United Ltd.
9117313	619	7335	6 RTA52U	Hitachi Zosen Corporation
9117325	620	7336	6 RTA52U	Hitachi Zosen Corporation
9117399	1137	3288	6 RTA52	Diesel United Ltd.
9117404	1138	3289	6 RTA52	Diesel United Ltd.
9118056	B573/1/2	3	6 RTA52U	H. Cegielski, Poznan



Germanischer Lloyd
Issued at Hamburg, 2011-01-24 / Rev. 1

Approval No. 20347-10 HH

Page 8 of 15

Page 8 of 15

Appendix to Notice of Compliance

Revised MARPOL 73/78, Annex VI Regulation 13

“Approved Method” for the Reduction of NO_x

Wärtsilä Switzerland AM no. 20347-10 HH

IMO Number	Hull Number	Engine Serial Number	Engine Type	Licensee
9118666	616	7347	5 RTA62U	Hitachi Zosen Corporation
9118678	617	7348	5 RTA62U	Hitachi Zosen Corporation
9121297	10196	3256	7 RTA52	Diesel United Ltd.
9122033	B 170/I/06	30	6 RTA62U	H. Cegielski, Poznan
9122045	B 170/I/07	33	6 RTA62U	H. Cegielski, Poznan
9122057	B 170/I/08	36	6 RTA62U	H. Cegielski, Poznan
9122409	971	812	8 RTA72U	Hyundai Engine Manufacturing
9122411	972	813	8 RTA72U	Hyundai Engine Manufacturing
9122423	973	814	8 RTA72U	Hyundai Engine Manufacturing
9122435	B 8113/03	1	6 RTA72U	H. Cegielski, Poznan
9122447	8113/4	867	6 RTA72U	Hyundai Engine Manufacturing
9122564	5981	2051	5 RTA62U	Grandi Motori Trieste
9122576	5982	2052	5 RTA62U	Grandi Motori Trieste
9122588	5983	2053	5 RTA62U	Grandi Motori Trieste
9123075	T1500-2	125	6 RTA72U	Dalian Marine Diesel Works
9123104	295	266	7 RTA62U	Dieselmotorenwerk Rostock
9123116	296	277	7 RTA62U	Dieselmotorenwerk Rostock
9123154	1156	7	7 RTA84CU	Samsung Heavy Industries
9123166	1159	14	7 RTA84CU	Samsung Heavy Industries
9123221	B 170/I/14	47	6 RTA62U	H. Cegielski, Poznan
9123520	B 186/III/10	39	6 RTA62U	H. Cegielski, Poznan
9123532	B 186/VI/11	40	6 RTA62U	H. Cegielski, Poznan
9123623	1133	3280	6 RTA52	Diesel United Ltd.
9123635	1134	3281	6 RTA52	Diesel United Ltd.
9123740	624	7342	6 RTA52U	Hitachi Zosen Corporation
9124392	B 186/III/08	38	6 RTA62U	H. Cegielski, Poznan
9124524	111	11163	6 RTA84CU	Bremer Vulkan AG
9125592	4042	316	8 RTA84CU	Korean Heavy Industries & Constructions
9125607	4043	326	8 RTA84CU	Korean Heavy Industries & Constructions
9125619	4044	327	8 RTA84CU	Korean Heavy Industries & Constructions
9126297	1214	3274	6 RTA62U	Diesel United Ltd.
9127540	8143/1	5	6 RTA72U	H. Cegielski, Poznan
9128130	40	AA0851	10 RTA84C	Hyundai Engine Manufacturing
9128180	1172	21	6 RTA84CU	Samsung Heavy Industries
9128192	1173	22	6 RTA84CU	Samsung Heavy Industries
9128207	1174	23	6 RTA84CU	Samsung Heavy Industries



Germanischer Lloyd
Issued at Hamburg, 2011-01-24 / Rev. 1

Approval No. 20347-10 HH

Page 9 of 15

Page 9 of 15

Appendix to Notice of Compliance

Revised MARPOL 73/78, Annex VI Regulation 13

"Approved Method" for the Reduction of NO_x

Wärtsilä Switzerland AM no. 20347-10 HH

IMO Number	Hull Number	Engine Serial Number	Engine Type	Licensee
9128489	957	243	5 RTA62U	Korean Heavy Industries & Constructions
9129574	5991	2075	5 RTA62U	Grandi Motori Trieste
9129706	1215	3275	6 RTA62U	Diesel United Ltd.
9129809	297	282	7 RTA62U	Dieselmotorenwerk Rostock
9129811	298	289	7 RTA62U	Dieselmotorenwerk Rostock
9129823	300	298	7 RTA62U	Dieselmotorenwerk Rostock
9129873	5958	2031	7 RTA84CU	Grandi Motori Trieste
9129885	5959	2032	7 RTA84CU	Grandi Motori Trieste
9130121	B 170/I/17	51	6 RTA62U	H. Cegielski, Poznan
9130133	B 170/IV/01	58	6 RTA62U	H. Cegielski, Poznan
9130145	B 170/IV/02	59	6 RTA62U	H. Cegielski, Poznan
9130157	B 170/IV/03	62	6 RTA62U	H. Cegielski, Poznan
9130169	B 186/III/13	48	6 RTA62U	H. Cegielski, Poznan
9130171	B 186/VI/12	42	6 RTA62U	H. Cegielski, Poznan
9130937	5984	2066	7 RTA62U	Grandi Motori Trieste
9130949	5985	2067	7 RTA62U	Grandi Motori Trieste
9130951	5986	2074	7 RTA62U	Grandi Motori Trieste
9131058	29	752	10 RTA84C	Hyundai Engine Manufacturing
9132686	3065	3257	6 RTA72	Diesel United Ltd.
9132698	3066	3260	6 RTA72	Diesel United Ltd.
9133410	667	730298	5 RTA62	3.Maj, Diesel Engine Works
9133422	668	730299	5 RTA62	3.Maj, Diesel Engine Works
9133587	1213	3310	6 RTA62	Diesel United Ltd.
9134244	1222	3765	12 RTA84CU	Mitsubishi Heavy Industries
9134256	1223	3766	12 RTA84CU	Mitsubishi Heavy Industries
9134268	1224	3767	12 RTA84CU	Mitsubishi Heavy Industries
9134270	1225	3768	12 RTA84CU	Mitsubishi Heavy Industries
9134282	1226	3769	12 RTA84CU	Mitsubishi Heavy Industries
9134517	1194	36	7 RTA84CU	Samsung Heavy Industries
9134622	B 170/I/09	45	6 RTA62U	H. Cegielski, Poznan
9134634	B 170/I/10	49	6 RTA62U	H. Cegielski, Poznan
9134646	B 170/III/05	37	6 RTA62U	H. Cegielski, Poznan
9134658	B 170/III/06	41	6 RTA62U	H. Cegielski, Poznan
9134660	B 170/III/07	43	6 RTA62U	H. Cegielski, Poznan
9134672	B 170/III/08	44	6 RTA62U	H. Cegielski, Poznan
9134684	B 186/III/14	50	6 RTA62U	H. Cegielski, Poznan



Germanischer Lloyd

Issued at Hamburg, 2011-01-24 / Rev. 1

Approval No. 20347-10 HH

Page 10 of 15

Page 10 of 15

Appendix to Notice of Compliance

Revised MARPOL 73/78, Annex VI Regulation 13

“Approved Method” for the Reduction of NO_x

Wärtsilä Switzerland AM no. 20347-10 HH

IMO Number	Hull Number	Engine Serial Number	Engine Type	Licensee
9135042	3071	3290	6 RTA72	Diesel United Ltd.
9135638	960	796	8 RTA72U	Hyundai Engine Manufacturing
9135925	299	295	7 RTA62U	Dieselmotorenwerk Rostock
9136577	3068	3261	6 RTA72	Diesel United Ltd.
9136589	3070	3272	6 RTA72	Diesel United Ltd.
9137674	8143/2	6	6 RTA72U	H. Cegielski, Poznan
9137698	8143/3	18	6 RTA72U	H. Cegielski, Poznan
9137703	8144/1	10	6 RTA72U	H. Cegielski, Poznan
9138238	393	620002	7 RTA62U	Dieselmotorenwerk Rostock
9138252	301	620006	7 RTA62U	Dieselmotorenwerk Rostock
9138264	302	620007	7 RTA62U	Dieselmotorenwerk Rostock
9138381	5987	2072	7 RTA62U	Grandi Motori Trieste
9138393	5988	2073	7 RTA62U	Grandi Motori Trieste
9138410	5992	2076	8 RTA62U	Grandi Motori Trieste
9138422	5993	2077	8 RTA62U	Grandi Motori Trieste
9138599	PC1100-01	142	7 RTA62U	Dalian Marine Diesel Works
9138604	PC1100-02	143	7 RTA62U	Dalian Marine Diesel Works
9138678	161	SE2-88	5 RTA52	Shanghai Shipyard
9138680	162	SE2-89	5 RTA52	Shanghai Shipyard
9138692	163	SE2-92	5 RTA52	Shanghai Shipyard
9138707	164	SE2-93	5 RTA52	Shanghai Shipyard
9138886	952	3748	6 RTA62	Mitsubishi Heavy Industries
9139505	1195	44	7 RTA84CU	Samsung Heavy Industries
9139713	1203	45	12 RTA84CU	Samsung Heavy Industries
9139725	1204	46	12 RTA84CU	Samsung Heavy Industries
9139737	1205	47	12 RTA84CU	Samsung Heavy Industries
9139749	1206	48	12 RTA84CU	Samsung Heavy Industries
9139907	329	11169	7 RTA84CU	Bremer Vulkan AG
9139919	330	11170	7 RTA84CU	Bremer Vulkan AG
9139921	331	11171	7 RTA84CU	Bremer Vulkan AG
9142162	2121	3770	12 RTA84CU	Mitsubishi Heavy Industries
9142174	2122	3771	12 RTA84CU	Mitsubishi Heavy Industries
9142186	2123	3772	12 RTA84CU	Mitsubishi Heavy Industries
9142198	2124	3773	12 RTA84CU	Mitsubishi Heavy Industries
9142473	46	366	10 RTA84C	Korean Heavy Industries & Constructions
9142485	47	367	10 RTA84C	Korean Heavy Industries & Constructions



Germanischer Lloyd
Issued at Hamburg, 2011-01-24 / Rev. 1

Approval No. 20347-10 HH

Page 11 of 15

Appendix to Notice of Compliance

Revised MARPOL 73/78, Annex VI Regulation 13

“Approved Method” for the Reduction of NO_x

Wärtsilä Switzerland AM no. 20347-10 HH

IMO Number	Hull Number	Engine Serial Number	Engine Type	Licensee
9142928	2220	90	6 RTA52U	Shanghai Shipyard
9142930	2221	91	6 RTA52U	Shanghai Shipyard
9143001	3077	3302	9 RTA84CU	Diesel United Ltd.
9143013	3078	3303	9 RTA84CU	Diesel United Ltd.
9143025	3079	3304	9 RTA84CU	Diesel United Ltd.
9143037	3080	3305	9 RTA84CU	Diesel United Ltd.
9143063	2129	3761	12 RTA84CU	Mitsubishi Heavy Industries
9143075	2130	3762	12 RTA84CU	Mitsubishi Heavy Industries
9143233	8148/1	16	6 RTA72U	H. Cegielski, Poznan
9143245	8148/2	17	6 RTA72U	H. Cegielski, Poznan
9143702	6018		7 RTA62U	Grandi Motori Trieste
9144134	B 170/I/11	53	6 RTA62U	H. Cegielski, Poznan
9144146	B 170/I/12	55	6 RTA62U	H. Cegielski, Poznan
9144158	B 170/III/09	56	6 RTA62U	H. Cegielski, Poznan
9144160	B 170/III/10	63	6 RTA62U	H. Cegielski, Poznan
9144354	10197	3263	7 RTA52	Diesel United Ltd.
9144756	2127	3759	12 RTA84CU	Mitsubishi Heavy Industries
9144768	2128	3760	12 RTA84CU	Mitsubishi Heavy Industries
9146015	1147	3329	7 RTA52U	Diesel United Ltd.
9146302	8145/1	9	6 RTA72U	H. Cegielski, Poznan
9146314	8145/2	12	6 RTA72U	H. Cegielski, Poznan
9146584	3060	3291	6 RTA72	Diesel United Ltd.
9146596	3072	3292	6 RTA72	Diesel United Ltd.
9147100	1030	939	8 RTA84CU	Hyundai Engine Manufacturing
9147112	1031	940	8 RTA84CU	Hyundai Engine Manufacturing
9148025	1041	917	8 RTA72U	Hyundai Engine Manufacturing
9149873	B 170/I/15	57	6 RTA62U	H. Cegielski, Poznan
9149885	B 170/I/16	61	6 RTA62U	H. Cegielski, Poznan
9149897	B 170/I/19	52	6 RTA62U	H. Cegielski, Poznan
9149902	B 170/I/20	54	6 RTA62U	H. Cegielski, Poznan
9150183	4051	368	8 RTA84CU	Korean Heavy Industries & Constructions
9150195	4061	390	6 RTA72U	Korean Heavy Industries & Constructions
9150200	4062	96372	8 RTA84CU	Korean Heavy Industries & Constructions
9150212	4063	389	6 RTA72U	Korean Heavy Industries & Constructions
9150303	672	730300	5 RTA62	3.Maj, Diesel Engine Works
9150365	174	3373	6 RTA72	Diesel United Ltd.



Germanischer Lloyd
Issued at Hamburg, 2011-01-24 / Rev. 1

Approval No. 20347-10 HH

Page 12 of 15

Appendix to Notice of Compliance

Revised MARPOL 73/78, Annex VI Regulation 13

“Approved Method” for the Reduction of NO_x

Wärtsilä Switzerland AM no. 20347-10 HH

IMO Number	Hull Number	Engine Serial Number	Engine Type	Licensee
9150377	175	3374	6 RTA72	Diesel United Ltd.
9150406	B 170/II/02	64	6 RTA62U	H. Cegielski, Poznan
9151838	PC1100-03		7 RTA62U	Dalian Marine Diesel Works
9151840	T1500-3	134	6 RTA72U	Dalian Marine Diesel Works
9152832	954	3757	7 RTA62	Mitsubishi Heavy Industries
9152923	B 186/VI/15	60	6 RTA62U	H. Cegielski, Poznan
9153850	3088	3315	12 RTA96C	Diesel United Ltd.
9153862	3089	3316	12 RTA96C	Diesel United Ltd.
9154191	4052	379	6 RTA72U	Korean Heavy Industries & Constructions
9154206	4053	380	6 RTA72U	Korean Heavy Industries & Constructions
9154218	4054	381	6 RTA72U	Korean Heavy Industries & Constructions
9154220	4055	382	6 RTA72U	Korean Heavy Industries & Constructions
9155028	51	375	10 RTA84C	Korean Heavy Industries & Constructions
9155092	1045	937	8 RTA72U	Hyundai Engine Manufacturing
9155107	1046	938	8 RTA72U	Hyundai Engine Manufacturing
9157648	4059	377	8 RTA84CU	Korean Heavy Industries & Constructions
9157650	4060	378	8 RTA84CU	Korean Heavy Industries & Constructions
9157698	1075	969	9 RTA84CU	Hyundai Engine Manufacturing
9157703	1076	968	9 RTA84CU	Hyundai Engine Manufacturing
9159438	10220	3306	6 RTA52	Diesel United Ltd.
9159452	1157	3394	6 RTA52	Diesel United Ltd.
9159464	1158	3395	6 RTA52	Diesel United Ltd.
9160190	5106	395	7 RTA84T-B	Korean Heavy Industries & Constructions
9160243	2233	SE2-100	5 RTA58T	Shanghai Shipyard
9160255	2234	SE2-101	5 RTA58T	Shanghai Shipyard
9160798	10235	3345	7 RTA52	Diesel United Ltd.
9160803	10236	3346	7 RTA52	Diesel United Ltd.
9161259	964	3776	7 RTA58T	Mitsubishi Heavy Industries
9161297	1224	71	7 RTA84CU	Samsung Heavy Industries
9161766	55	413	10 RTA96C	Korean Heavy Industries & Constructions
9161778	56	414	10 RTA96C	Korean Heavy Industries & Constructions
9162007	955	3774	7 RTA62	Mitsubishi Heavy Industries
9162215	3090	3367	12 RTA96C	Diesel United Ltd.
9162227	3091	3368	12 RTA96C	Diesel United Ltd.
9162356	303	620020	7 RTA62U	Dieselmotorenwerk Rostock
9162485	3086	3313	11 RTA96C	Diesel United Ltd.



Germanischer Lloyd
Issued at Hamburg, 2011-01-24 / Rev. 1

Approval No. 20347-10 HH

Page 13 of 15

Appendix to Notice of Compliance

Revised MARPOL 73/78, Annex VI Regulation 13

“Approved Method” for the Reduction of NO_x

Wärtsilä Switzerland AM no. 20347-10 HH

IMO Number	Hull Number	Engine Serial Number	Engine Type	Licensee
9162497	3087	3314	11 RTA96C	Diesel United Ltd.
9162875	1089	989	7 RTA84T-B	Hyundai Engine Manufacturing
9162887	1090	990	7 RTA84T-B	Hyundai Engine Manufacturing
9164201	663	730302	6 RTA62U	3.Maj, Diesel Engine Works
9164213	662	730301	6 RTA62U	3.Maj, Diesel Engine Works
9164756	6027	2158/2133	8 RTA62U	Grandi Motori Trieste
9164768	6028	2159	8 RTA62U	Grandi Motori Trieste
9164782	6030	2161	8 RTA62U	Grandi Motori Trieste
9165346	5108	400	7 RTA84T-B	Korean Heavy Industries & Constructions
9165932	5107	399	7 RTA84T-B	Korean Heavy Industries & Constructions
9167203	PC1100-04	154	7 RTA62U	Dalian Marine Diesel Works
9167215	PC1100-05	155	7 RTA62U	Dalian Marine Diesel Works
9168831	1231	3784	12 RTA84CU	Mitsubishi Heavy Industries
9168843	1232	3785	12 RTA84CU	Mitsubishi Heavy Industries
9168855	1233	3786	12 RTA84CU	Mitsubishi Heavy Industries
9168867	1234	3787	12 RTA84CU	Mitsubishi Heavy Industries
9168879	1235	3788	12 RTA84CU	Mitsubishi Heavy Industries
9168881	1167	3396	6 RTA52	Diesel United Ltd.
9168893	1168	3397	6 RTA52	Diesel United Ltd.
9169122	1101	1005	9 RTA84CU	Hyundai Engine Manufacturing
9169134	1102	1006	9 RTA84CU	Hyundai Engine Manufacturing
9169158	2141	3780	12 RTA84CU	Mitsubishi Heavy Industries
9169160	2142	3781	12 RTA84CU	Mitsubishi Heavy Industries
9170274	1306	3384	6 RTA62	Diesel United Ltd.
9175080	1114	1021	7 RTA84T-B	Hyundai Engine Manufacturing
9175315	6025	2175	5 RTA62U	Grandi Motori Trieste
9175327	6026	2176	5 RTA62U	Grandi Motori Trieste
9175705	1142	1034	6 RTA62U	Hyundai Engine Manufacturing
9176395	8168/01	6	7 RTA62U	H. Cegielski, Poznan
9176747	702	111	5 RTA62U	Samsung Heavy Industries
9176759	703	112	5 RTA62U	Samsung Heavy Industries
9177648	704	113	5 RTA62U	Samsung Heavy Industries
9177650	705	114	5 RTA62U	Samsung Heavy Industries
9179608	1163	1103	7 RTA84T-B	Hyundai Engine Manufacturing
9179610	1164	1104	7 RTA84T-B	Hyundai Engine Manufacturing
9180920	PC1100-07	166	7 RTA62U	Dalian Marine Diesel Works



Germanischer Lloyd
Issued at Hamburg, 2011-01-24 / Rev. 1

Approval No. 20347-10 HH

Page 14 of 15

Page 14 of 15

Appendix to Notice of Compliance

Revised MARPOL 73/78, Annex VI Regulation 13

“Approved Method” for the Reduction of NO_x

Wärtsilä Switzerland AM no. 20347-10 HH

IMO Number	Hull Number	Engine Serial Number	Engine Type	Licensee
9181182	1165	1105	7 RTA84T-B	Hyundai Engine Manufacturing
9183336	3098	3409	6 RTA72	Diesel United Ltd.
9185293	343	1108	8 RTA72U	Hyundai Engine Manufacturing
9187576	3116	3429	6 RTA72	Diesel United Ltd.
9188154	1236	3782	12 RTA84CU	Mitsubishi Heavy Industries
9189342	19	1130	10 RTA96C	Hyundai Engine Manufacturing
9189354	20	1150	10 RTA96C	Hyundai Engine Manufacturing
9189366	21	1151	10 RTA96C	Hyundai Engine Manufacturing
9189495	1	1152	10 RTA96C	Hyundai Engine Manufacturing
9191711	196	3456	6 RTA72	Diesel United Ltd.
9192442	742	1146	7 RTA84CU	Hyundai Engine Manufacturing
9193226	1184	1140	9 RTA84CU	Hyundai Engine Manufacturing
9193238	1185	1141	9 RTA84CU	Hyundai Engine Manufacturing
9196955	1241	3798	12 RTA84CU	Mitsubishi Heavy Industries
9197002	10249	3402	7 RTA52	Diesel United Ltd.
9200421	10255	3403	7 RTA52	Diesel United Ltd.
9200677	67	487	10 RTA96C	Korean Heavy Industries & Constructions
9200835	1234	1176	7 RTA84T-B	Hyundai Engine Manufacturing
9201695	3117	3462	6 RTA72	Diesel United Ltd.
9202649	63	448	8 RTA84CU	Korean Heavy Industries & Constructions
9202651	449	064	8 RTA84CU	Korean Heavy Industries & Constructions
9202663	486	072	8 RTA84CU	Korean Heavy Industries & Constructions
9204489	B 170/III/13	70	6 RTA62U	H. Cegielski, Poznan
9205873	980	3794	7 RTA58T	Mitsubishi Heavy Industries
9209295	976	3795	7 RTA58T	Mitsubishi Heavy Industries
9210438	8168/02	7	7 RTA62U	H. Cegielski, Poznan
		730275	12 RTA84C	Waertsilae France
		730289	12 RTA84C	Waertsilae France



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Page 15 of 15