

Minutes of Meeting

Place: Washington DC, USA – EPA Office

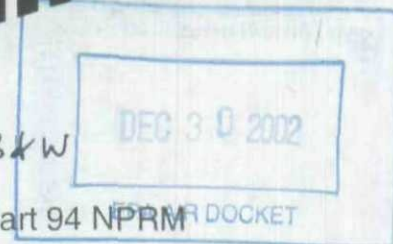
Participants: See the enclosed list – encl. 1

Time: 18 September 2002

From: Kjeld Aabo / Svend Henningsen , MAN B&W

Subject: Environmental Protection Agency 40 CFR Part 94 NPRM

A-2001-11
14-E-01
preliminary



Purpose

The purpose of the meeting was to discuss the EPA proposal for control of emissions of air pollution from New Marine Compression – Ignition Engines at/or above 30 litres/cylinder.

Background

EPA published a notice of proposed rule making (NPRM) for the large category 3 engines in 40 CFR part 94 in the spring of 2002. Since then different questions have arisen regarding the practical execution and appliance from different parts of the marine industry.

In the meeting, MAN B&W Diesel and Wärtsila represented the major volume of the large engine designers for the marine marked including Euromot (European Association of Engine Designers) from where MBD received a confirmation to present comments to EPA.

As reference, all mentioned parties have in writing separately commented on the issues before the deadline of 1 July 2002.

In more than 10 years, the engine builders have worked with IMO to find a technically possible and practical solution for an international NO_x control. EPA has also participated actively in this work regarding IMO Annex VI. This work resulted in the now existing IMO Annex VI, though, still to be ratified.

The EPA 40CFR part 94 deviates from IMO on a number of points, which have to be clarified before introduction to the marine marked.

Meeting

After introduction of the participants including Marcia Ginley on telephone and Jean-Marie Revelt, Alan Stout, Line Wehrly and Mike Samulski on video, MBD/Wärtsila explained their concern on the EPA proposal and by the meeting assisted EPA in considerations to the deviations from IMO Annex VI. Furthermore, the practical experience from the marine industry and the necessary areas to consider before emission rules are introduced were discussed.

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MBD/Wärtsila further informed that the limits for NO_x in Tier 1, also according to IMO, are fully understandable and reasonable and that the industry has an internal obligation and responsibility to protect the environment. The issue for the meeting is how such limits are enforced and checked.

The biggest difference between IMO Annex VI and EPA 40 CFR part 94 is the control and check of NO_x levels from the engine using continuing emission measurement, as proposed by EPA on-board. IMO has accepted that such equipment is not available on the market today and therefore based the survey on NO_x measurements and engine parameter checks on test bed, followed by a survey on-board in agreement with the established engine technical file.

MBD/Wärtsila also find as IMO is investigating, that sometimes in the future continuing emission monitoring may be realistic. However, so far, test and practical experience on-board show that operation on HFO, actual conditions on-board as change in temperature, vibrations etc. makes it impossible to-day. Therefore, until then a practical and workable solution should be chosen, and MBD/Wärtsila suggested to follow the already carefully prepared solution from IMO.

The complication for ship owners having to apply two different sets of rules is expected to make confusion on policing of the rules.

EPA expressed that it is normal policy to put forward rules and force the industry to make further developments.

In the opinion of MBD/Wärtsila 40 CFR part 94 is characterized by previous rules made for smaller mass-produced engines. The small engines are operated on cleaner fuel and not the actual marine engine operation on HFO. The category 3 engines are often being individually optimised and matched with individual components influencing the NO_x levels.

EPA expressed that it is important to use measurement, which makes it difficult to cheat the regulation.

MBD expressed that such emission control measurements can be very difficult, and that it must be as for all other rules that, if you cheat and you are caught, you will be punished. According to IMO, this will result in holding back a ship, and this is normally a very hard punishment for a ship owner where a tight sailing schedule is their earning.

EPA proposed HFO in order to have the actual NO_x level measured. However, MBD informed that this is only obtainable if the fuel is known. HFO is a multitude of different blends, and not two fuel barges are alike. NO_x is influenced by the nitrogen content in the fuel whereas other components affect the HC, Particulate, CO or CO₂. Therefore, to find the worse fuel, as basis for Tier 1 and later for the future Tier 2 is not possible.

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Useful lifetime: According to EPA "the useful lifetime of an engine" is defined as 3 years (where components are being replaced), which differs from the common industry's point of view, respectively.

The definition needs to be stated clearly in EPA's rulemaking proposal.

Also maintenance as being ship owner's responsibility (which was recommended to EPA) should be stated clearly in EPA's rulemaking proposal.

In MBD's opinion the deviation in fuel quality and in engine design is so large, the engine should be evaluated only based on a "reference" fuel and not by the fuel quality.

MBD made a presentation of the technical file, as suggested by IMO and the way it has been accepted by the major Classification Societies as well as IACS (the International Association of Classification Societies). Only minor deviations exist between the technical files from different engine designers and engine producers.

The technical files have since January 2000 followed all international vessels only waiting on the ratification of Annex VI. All engine builders, as well as EUROMOT, anticipate this to happen during 2003 at the latest. MBD can forward this presentation on request. In encl. 2, MBD has listed some of the major differences between EPA and IMO.

The Tier 2 limit (IMO minus 30%) was not discussed largely in the meeting; only the different emission control technologies were mentioned at the beginning of the meeting. There are emission control technologies available such as fuel-water emulsion, direct water injection and SCR, but all methods are fairly expensive and space demanding and, retrofit of an SCR in an existing vessel is very complicated, if not impossible, on existing ships depending on ship design and engine type.

EPA informed that during the next month EPA 40 CFR part 94 is to be finished for presentation in the government and that EPA will likely discuss further the situation with the engine industry before the proposal is finished.

Both MBD and Wärtsila were positive to further assistance.

Encl.

 participants.PDF

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Comparison between EPA 40 CFR part94 and IMO Annex VI



EPA	Euromot/IMO/MBD
Tier 1	
1 On-board measurement	Technical code and on-board survey based on actual performance data
2 Fixed "small test bed" condition	Ambient and performance corrections
3 Test on Heavy Fuel	Test on distillate fuel
4 Measured fuel bound N	10% allowance for fuel bound N
5 Different regulations for different flags	Same regulations for all flags
6 The engine builder has the responsibility for engine emission compliance	The owner has the responsibility for engine emission compliance

Comparison between EPA 40 CFR part94 and IMO Annex VI



EPA	Euromot/IMO/MBD
Tier 2	
7 NO _x 30% reduction compared to Tier 1 speed related curve	To follow agreement within IMO
8 Combination of HC and NO _x	Separate limits for HC and NO _x
9 Use of the benefits of electronic engine	Electronic engine new on the market
10 Legislations for further NO _x reduction	Voluntary or incentive programs for further reduction of NO _x

Comments on EPA Proposal



- Discussion on emission limits
- Include foreign flagged vessels
- Post installation verification provisions
- Direct monitoring of emissions onboard
- Engine builder guarantee
- Deterioration of emissions
- The emission limits met at all operating conditions
- Announced review of IMO Regulation

2002-09-15 / Basic Research 2431 /

Discussion



- unified technical file
- compression pressure tolerances
- T/C inlet versus ambient temperature
- test-bed vs. engine sensors / certificates vs. data sheets
- survey procedures – performance parameter check
- survey responsibilities
- summary of performance data from test bed report
- new excell sheet to support TF calculation tables
- major conversions /substantial modifications
- amendment procedures
- record book guidelines

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