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1998 AGREEMENT

Implementation of the 1998 Agreement programme of work by the Working Parties Subsidiaries to the World Forum

Preliminary and progress report on the development of a global technical regulation concerning the approval of compression-ignition (C.I) engines to be installed in agricultural and forestry tractors and in non-road mobile machinery with regard to the emissions of pollutants by the engine

Submitted by the Working Party on Pollution and Energy (GRPE)

Note: The text reproduced below was adopted by GRPE at its fifty-third session. It is based on informal document No. GRPE-53-05 and it has been amended as recommended by GRPE. It is submitted to WP.29 and AC.3 for consideration (ECE/TRANS/WP.29/GRPE/53, para. 16).

I. INTRODUCTION

1. The 1998 Global Agreement establishes a process through which countries from all regions of the world can jointly develop global technical regulations regarding the safety, environmental protection systems, energy sources and theft prevention of wheeled vehicles, equipment and parts. The covered equipment and parts include, but are not limited to, vehicle construction, exhaust systems, tyres, engines, acoustic shields, anti-theft alarms, warning devices, and child restraint systems.

2. The ultimate goal of the 1998 Agreement is to continuously improve global safety, decrease environmental pollution and consumption of energy and improve anti-theft performance of vehicles and related components and equipment through globally uniform technical regulations. This shall be done whilst providing a predictable regulatory framework for a global automotive industry and for the consumers and their associations.

3. Engines intended to be installed on non-road mobile machinery are oriented towards a global market as the technical requirements are the same, but national legislations set boundary conditions which seriously limit the possibility to develop a single product for a real single market. A gtr for non-road mobile machinery engines will be a global regulation, which helps the market, the environment and the consumer at the same time. The benefits to society would be the reduction of emissions. Manufacturers would benefit from reduction of the cost of development, testing, and fabrication process of new models.

II. OBJECTIVE OF THIS PRELIMINARY AND PROGRESS REPORT

4. The objective of this report is to inform about the evaluation performed of the proposed NRMM gtr, as requested under the guidelines governing the development of a gtr.

(a) An examination of the merits of the proposal in detail;

(b) Consideration of other regulations on the same subject, which are listed in the compendium;

(c) A determination that the proposal addresses a problem of sufficient magnitude to warrant the development of a regulation;

(d) An examination of whether the nature, extent and cause of the problem addressed by the proposal are correctly characterized;

(e) An examination of whether the proposal provides a sufficiently effective, performance oriented approach to address the problem; and

(f) A determination that the approach identified in the proposal is appropriate to address the problem.

5. Finally, the progress report summarizes the main issues discussed by the working group in evaluating the proposal to develop a draft global regulation on the emissions from non-road mobile machinery engines and it outlines the work done so far.

III. REQUEST TO PROCEED WITH THE DRAFTING OF THE GTR

6. The objective of this work is to establish a global technical regulation (gtr) for non-road mobile machinery (NRMM) compression-ignition (C.I.) engine emissions under the 1998 Global Agreement. The basis will be the harmonized non-road test protocol, including test cycles, as developed by the NRMM informal group of the GRPE and by the international task force (development of non-road transient test cycle, 2000 - 2002). The work on the gtr provided an opportunity to consider the international procedures as well as available technological developments and thus providing all necessary elements for the gtr on NRMM engines. The transient nonroad test cycle covers the most emission relevant operational conditions of nonroad mobile machinery engines. It was also developed to make it runnable on non-electric dynamometers. The procedure includes partial flow sampling for the determination of particulates. Thus considering (and allowing when and where necessary) to reduce the cost of related laboratory equipment.

7. Some countries have already enforced regulations governing exhaust-emissions from non-road mobile machinery engines but the test procedures vary. To ensure the maximum benefit to the environment as well as the efficient use of energy, it is desirable that as many countries as possible use the same test protocol for emission control. For this the gtr is an important step forward. In the light of the ongoing international effort on improving the emission regulations from NRMM engines, it is considered by governments and industries that this is an excellent opportunity to develop and establish a gtr in this area.

8. Everyone would benefit from the harmonization of the regulations. The benefits to the governments and society will be the harmonization of requirements and a general global reduction of the emission levels. Manufacturers of non-road mobile machinery are already operating in a world market and it is economically more efficient for manufacturers to develop engine models to meet internationally consistent emissions regulations. To enable manufacturers to develop new models most effectively, it is desirable that a gtr should be developed. Finally, the consumer would benefit by having a choice of low emitting engines built to a globally recognized standard at a lower price.

IV. WORK PERFORMED PRIOR TO NRMM WORKING GROUP

9. By 2002 two important goals had been achieved in view of non-road legislation:

(a) US and the European Community reached a good level of regulative alignment, especially in view of scope, limit values and implementation dates.

(b) As part of this effort an international taskforce, coordinated by EC DG-JRC, worked to develop a real world and representative test cycle for non-road mobile machinery compression-ignition (C.I.) engines. Major regulators from United States of America, Japan and EU with the active contribution of industries (EUROMOT, EMA and LEMA)

were stakeholders in this effort. After intense work throughout 2000 to 2002, an internationally representative cycle was derived and validated in an extensive test campaign based on the duty cycle development initiated by U.S. EPA. This test cycle is today part of U.S. EPA (standard-setting part 1039), EC (directive 2004/26/EC) regulations and it is close to be accepted by the Japanese Ministry of the Environment in the frame of their legislation on non-road engines.

V. HISTORY OF THE DEVELOPMENT OF THE NRMM GTR (UNECE WP.29 AND GRPE)

10. During the one-hundred-and-twenty-sixth session of WP.29 of March 2002 the representative of the European Union suggested areas as potential candidates for gtrs under the 1998 Global Agreement. The harmonised emission test procedure for non-road mobile machinery (engines) was listed under item B.

11. At the same meeting the Administrative Committee for the Coordination of Work WP.29/AC.2 transmitted the 1998 Global Agreement Program of Work to the Executive Committee AC.3 for consideration. Included in the work intended to begin officially at first priority level (under GRPE) was the one on non-road mobile machinery (engines).

12. AC.3 accepted this proposal and transmitted it to WP.29. After the meeting of AC.3, WP.29 congratulated the Contracting Parties to the 1998 Agreement on the conclusion of their consideration of priorities for developing future global technical regulations and examined the 1998 Global Agreement Programme of Work.

13. During the one-hundred-and-twenty-seventh session of WP.29, the Executive Committee of the 1998 Global Agreement adopted the Programme of Work, which includes the development of a global technical regulation (gtr) addressing harmonised emission test procedures for non-road mobile machinery (engines).

14. After the fifth session in June 2002, the Chairman of AC.3 informed WP.29 that the technical sponsors had been identified for the majority of the high priority items concerning the preparation of proposals for global technical regulations. EC offered and was nominated technical sponsor for the non-road mobile machinery (engines) gtr. WP.29 acknowledged and endorsed the agreements reached by AC.3.

15. Also in relation to the list of priorities for developing global technical regulations under the 1998 Global Agreement, the Chairman informed WP.29 that GRPE requested the United States of America, in cooperation with Japan and the European Community, to recommend a Chairperson for the informal group on the measurement of emissions from non-road mobile machinery. The recommendation was to be presented at the January 2003 meeting of GRPE.

16. U.S. EPA, Japan and EC proposed to WP.29 GRPE to initiate the new working group with the chairman from EC DG-JRC, with the task to develop a global technical regulation for non road mobile machinery engines, including the transient test cycle for NRMM engines. This would also allow to complete the alignment between US/EPA and EU Tier IV (including interim)/Stage IIIB and IV thus removing remaining measurement differences in the test protocol.

17. Due to the experience in the coordination of the development of the non-road transient test cycle, G. De Santi DG JRC was asked to chair the working group, which he accepted.

18. At the forty-fifth GRPE session in January 2003 the charter for the non-road working group was presented by the group chairman. This charter proposed the line of work and identified the transient cycle / test protocol as developed by an international task force during 2000 - 2002 as the basis of this work. The charter was discussed and then welcomed by GRPE. GRPE established the non-road working group.

19. The working group developed the technical outline for the NRMM gtr and in the forty-ninth GRPE meeting the Chairman of the NRMM working group introduced informal document No. GRPE-49-9 regarding the proposal to develop a gtr on NRMM. GRPE endorsed that document and agreed that it should be submitted by the sponsor (EC) as a formal proposal to WP.29/AC.3, for consideration at their March 2005 sessions.

20. The proposal to develop a gtr states that the proposed gtr will be based on the task forces' work, which represents a worldwide pattern of real non-road machinery engine operation. During the discussion the representative of US EPA acknowledged the progress made by the non-road working group and said that this will be a good example for a gtr and global harmonisation. Indeed, the proposal represents a very solid base for the UNECE effort for international harmonisation of regulations. All stakeholders from contracting parties and industry welcomed this approach.

21. In the one-hundred-and-thirty-sixth meeting of WP.29, AC.3 the sponsor EC presented the proposal to the executive committee of the 1998 Agreement, which adopted the proposal to develop the gtr (TRANS/WP.29/2005/38). The proposal is now document TRANS/WP.29/AC.3/14 in the list of "proposals to develop a gtr adopted by AC.3".

22. This preliminary report is the next formal step in the procedure of gtr development. Contemporaneously, it is accompanied by the progress report.

23. This preliminary and progress report has been presented as informal document No. GRPE-53-05 to GRPE at its fifty-third session (Geneva, 9 - 12 January 2007). GRPE acknowledged the progress made by the group and fully endorsed the group's proposal for a guidance document for the use of the gtr. The expert from the EC volunteered to submit a revised progress report to WP.29 and AC.3, for consideration at the June 2007 sessions.

VI. PARTICIPANTS

24. The working group is open to all experts. At the moment 56 experts are on the mailing list of the NRMM WG. Experts from Australia, Canada, Denmark, Germany, India, Japan, Sweden, Switzerland, the United States of America and the European Commission are participating to the working group. Representatives from EUROMOT, EMA, LEMA and ISO are also participating.

VII. REVIEW OF EXISTING REGULATIONS AND INTERNATIONAL STANDARDS

25. The following regulations, directives, and standards are related to non-road mobile machinery engines emissions:

(a) UNECE Regulations (1958 Agreement)

(i) UNECE Regulation No. 96 - Uniform provisions concerning the approval of compression-ignition (C.I.) engines to be installed in agricultural and forestry tractors and in non-road mobile machinery with regard to the emissions of pollutants by the engine.

(ii) UNECE Regulation No. 120 - Uniform provisions concerning the approval of internal combustion engines to be installed in agricultural and forestry tractors and in non-road mobile machinery, with regard to the measurement of the net power, net torque and specific fuel consumption

(b) UNECE Regulations (1998 Agreement)

Global technical regulation (gtr) N° 4 - Test procedure for compression-ignition (C.I.) engines and positive-ignition (P.I.) engines fuelled with natural gas (NG) or liquefied petroleum gas (LPG) with regard to the emission of pollutants (World-wide harmonized heavy-duty certification (WHDC) procedure)
OCE (under development)

(c) EU

(i) Directive 97/68/EC of the European Parliament and of the Council of 16 December 1997 on the approximation of the laws of the Member States relating to measures against the emission of gaseous and particulate pollutants from internal combustion engines to be installed in non-road mobile machinery.

(ii) Directive 2002/88/EC of the European Parliament and of the Council of 9 December 2002 amending Directive 97/68/EC on the approximation of the laws of the Member States relating to measures against the emission of gaseous and particulate pollutants from internal combustion engines to be installed in non-road mobile machinery.

(iii) Directive 2004/26/EC of the European Parliament and of the Council of 21 April 2004 amending Directive 97/68/EC on the approximation of the laws of the Member States relating to measures against the emission of gaseous and particulate pollutants from internal combustion engines to be installed in non-road mobile machinery.

(iv) Directive 2000/25/EC of the European Parliament and of the Council of 22 May 2000 on action to be taken against the emission of gaseous and

particulate pollutants by engines intended to power agricultural or forestry tractors and amending Council Directive 74/150/EEC.

(v) Commission Directive 2005/13/EC of 21 February 2005 amending Directive 2000/25/EC of the European Parliament and of the Council concerning the emission of gaseous and particulate pollutants by engines intended to power agricultural or forestry tractors, and amending Annex I to Directive 2003/37/EC of the European Parliament and of the Council concerning the type-approval of agricultural or forestry tractors.

(vi) It is important to note that these tractor Directives are setting emission requirements totally in line with those of the NRMM engines Directive 97/68/EC as amended. (For emissions they are actually linked to the NRMM engines directive:

(vii) Technical progress requires rapid adaptation of the technical requirements set out in the Annexes to this Directive. The Commission is committed to aligning without delay the limit values and dates in this Directive to future changes in Directive 97/68/EC).

(d) Japanese Regulations

(i) Air Pollution Control Law, Law No. 97 of June 10, 1968, as amended by Law No. 51 of May 25, 2005, Article 19 "Maximum permissible limits of exhausts of motor vehicles"

(ii) Road Vehicles Act, Law No.185 of June 1, 1951, as amended by Law No. 55 of May 26, 2004, Article "System and Devices of Motor Vehicles"

(iii) Safety Regulations for Road Vehicles, Ordinance, No. 67 of July 28, 1951, as amended by Ordinance No. 97 of December 2, 2004, Article 41 "Emission Control Devices"

(iv) Announcement that Prescribes Details of Safety Regulations for Road Vehicles, Announcement No. 619 of July 15, 2002, as amended by Announcement No. 1400 of December 2, 2005 Article 41 "Emission Control Devices", Attachment 43 "Measurement Procedure for 8-mode Exhaust Emission of Diesel-Powered Special Motor Vehicles", promulgated on September 26, 2003 and Attachment 103 "Measurement Procedure for 7-mode Exhaust Emission of Gasoline- or LPG-fuelled Special Motor Vehicles", promulgated on December 2, 2005

(v) TRIAS 24-8-2003, "8-Mode Exhaust Emission Test Procedure for Diesel-Powered Special Motor Vehicles"

(vi) Law on Regulation, etc. of Nonroad Special Motor Vehicles Exhausts, Law No. 51 of May 25, 2005

(vii) Announcement that Prescribes Necessary Issues regarding Law on regulation, etc. of Nonroad Special Motor Vehicles, Announcement No. 1 of March 28, 2006

(viii) Enforcement Regulations for Law on Regulation, etc. of Nonroad Special Motor Vehicles Exhausts, Ordinance No.1 of March 28, 2006

(e) United States of America Regulations

(i) Non-road Diesel Engine Regulations:

(ii) 40 CFR 89 Tier 1, 2, 3, 4 Non-road Diesel,

(iii) 40 CFR 1039 Land-based nonroad diesel engines - Tier 4

(iv) 40 CFR 1065 Test Procedure and Equipment

(v) 40 CFR 1068 General Compliance Provisions for Non-road Programs

(vi) 40 CFR 80 Non-road Diesel Fuel Regulations

It should also be added that document "Control of Emissions of Air Pollution from Nonroad Diesel Engines and Fuel; Final Rule" has been introduced into the list of candidates for harmonization or adoption as global technical regulations, under the listing No. 3.

This document has been discussed and evaluated by the NRMM WG and parts of it are being considered throughout the NRMM gtr under development.

(f) ISO Standards

(i) ISO 8178-1 Reciprocating internal combustion engines - Exhaust emission measurement - Part 1: Test-bed measurement of gaseous and particulate exhaust emissions

(ii) ISO 8178-4 - Reciprocating internal combustion engines - Exhaust emission measurement - Part 4: Test cycles for different engine applications

(iii) ISO 8178-5 - Reciprocating internal combustion engines - Exhaust emission measurement - Part 5: Test fuels

(iv) ISO DIS 8178-11 Reciprocating internal combustion engines - Exhaust emission measurement - Part 11: Test-bed measurement of gaseous and particulate exhaust emissions from engines used in non-road mobile machinery under transient test conditions.

All these documents have been studied and the working group decided that the future gtr should be based on the best elements of these documents in order to develop a technologically valid, harmonised procedure. Additionally, research and activities that have been conducted by international institutions and experts have been considered in the work.

Where it is possible the gtr will be written in accordance with other gtrs under development. The working group agreed to use the structure of US EPA 40 CFR 1065 as the starting point (consistent with gtr protocol) for developing the NRMM gtr test procedures.

VIII. PLANNED SCHEDULE OF WORK

15th informal meeting of NRMM WG September 2006
1st meeting of NRMM editorial committee December 2006
16th informal meeting of NRMM WG January 2007
Preliminary and progress report (as inf. doc.) to GRPE January 2007
2nd meeting of NRMM editorial committee April 2007
17th informal meeting of NRMM WG June 2007
Preliminary and progress report to AC.3 June 2007
3rd meeting of NRMM editorial committee September 2007
18th informal meeting of NRMM WG January 2008
2nd Progress Report/Draft gtr to GRPE January 2008
2nd Progress Report/Draft gtr to AC.3 March 2008
19th informal meeting of NRMM WG June 2008
Presentation of gtr to GRPE June 2008
Presentation of gtr to AC.3 June/November 2008

IX. SUMMARY OF WORK

26. By June 2006, the working group has met 14 times:

27. The first meeting (June 2003) served to inform all participants of the work done so far in the field of testing of nonroad machinery (e.g. development of transient cycle) and to discuss the possible contributions by non-governmental organisations and industries. The current global situation of the non-road legislation was analysed in order to develop the line of work. There was agreement that the amendment of the EU Directive on emissions from non-road mobile machinery (later 2004/26/EC), the U.S. requirements as formulated in the proposal for rule making (later CFR 40 part 1039 and 1065) and the ISO standard 8178-11 (under development) were forming the sound basis for the development of a gtr.

28. Meeting 2 to 8: development of strategy for harmonisation. In order to develop a gtr which contains the important technical aspects of the existing regulations the NRMM working group decided to derive a comparison document between the US measurement procedure (1065), the European directive 2004/26/EC and the ISO standard 8178. The resulting 400-page document was presented in September 2004. The identified differences were discussed in subsequent meetings and solutions elaborated. Thus allowing the gtr to become an important tool for the harmonisation of the existing regulations. Many of the solutions identified were applied also in other global technical regulations under development, thus supporting the

alignment of methodologies in different gtrs. At the end of these meetings only a short list of items is remaining.

29. The working group has examined the merits of the proposal in detail. It has considered other regulations on the same subject. It has determined that the proposal addresses a problem of sufficient magnitude to warrant the development of a regulation. It has found that the nature, extent and cause of the problem addressed by the proposal are correctly characterized and that the proposal provides a sufficiently effective, performance oriented approach to address the problem.

30. Meeting 9 and 10: definition of the structure of the NRMM gtr.

31. Meeting 11 to 14: start of drafting of the gtr chapters.

X. NATIONAL REGULATIONS AND UNECE REGULATION

32. From its very beginning (early 1990's), the legislation limiting exhaust emission from engines on Non Road Mobile Machinery (NRMM) was established to regulate engines as opposed to regulating vehicles. This was necessary as the large diversity of non-road mobile machines made it almost impossible to define them neither in legislation nor International Standards (ISO or CEN). Their emission control can be managed practically only by regulating the engines installed.

33. Engines in this field are produced by a relatively small number of manufacturers (compared to equipment manufacturers) and their classification, independent of the application, is rather easy. Compared to road motor vehicles, the market of NRMM is of a more global nature. In principle the same product could meet the technical needs and thus be sold all over the world. The manufacturing industry is made up of different size players from huge multinational companies down to a multitude of SME's, specially in the EU.

34. Harmonisation has thus been an important element of legislation regarding especially US, EU, and Japan. The present EU legislation both for NRMM (97/68/EC) and tractors (2000/25/EC) has a very high level of alignment with USA in terms of the level of stringency (limits) and the implementation timetable. 1/

35. On the other hand there are still discrepancies between the test protocols and the development of the NRMM engines gtr represents the political answer to this need of technical alignment.

1/ The current legislation started from NRMM engines (a good definition of NRMM is given in 97/68/EC; the one by US EPA does not differ significantly). An important peculiarity is that in the European (EU) legislation agricultural tractors are classified as vehicles and thus are dealt with in separate legislation, while they are considered normal NRMM in the US. UN ECE started with specific agricultural legislation, which were later developed into general NRMM engines requirements much like US EPA.

36. Any emerging country can follow the same steps as the developed nations with a delay depending on their priorities, as foreseen in the 1998 Agreement.

37. If a useful gtr shall be developed, it should have a scope as close as possible to the existing US and EU legislation, thus resulting in NRMM with a wide interpretation of their definition.

38. Due to the international regulatory upgrade effort, this is an excellent opportunity for the international community to develop and establish a gtr in this area. It is the belief of the working group that everyone could benefit from harmonization and new technology based improvements.

XI. EVALUATION OF THE RELEVANCE OF THE LEGISLATIVE SITUATION

A. Introduction

39. This chapter does not represent an impact assessment for this gtr. This is impossible as the requirements are due to be defined later.

40. Thus the aim of chapter 11 is to highlight the important effect which is expected from non-road machinery engine emission related legislation in selected areas of the world.

41. Evidently, the major benefit of the gtr is to be seen in the global harmonisation of national regulations and procedures and in the adoption of this emission regulation worldwide.

B. United States of America

42. Nonroad diesel applications represent a significant contribution to the mobile source inventories of NOx, PM, and HC. Nonroad diesel applications can range from a 1 or 2 kW diesel generator set to mobile applications such as off highway trucks well over 747 kW. The engines used in this equipment may be sold across platforms and in some instances may be based on similar engines used for heavy duty highway diesel applications. Nonroad diesel equipment currently accounts for 47 percent of diesel particulate matter (PM) and 25 per cent of nitrogen oxides (NOx) from mobile sources nationwide. The rough distribution of diesel fuel consumption is 67% highway diesel, 10% land-based nonroad diesel equipment, 3.5% locomotive and 2.5% marine.

43. With the implementation of the Clean Air Nonroad Diesel rulemaking, it is expected that by 2030, that contribution to NOx and PM will be reduced by 738,000 tons, 129,000 tons, respectively.

44. Overall benefits of the Heavy Duty Highway diesel and Nonroad Diesel rulemakings are summarized in the tables below.

Nonroad Diesel Application	**Population** (thousands)
Agricultural	1,879
Construction/Mining	1,773
Lawn and Garden	331
Commercial/Industrial	1,469
Logging Equipment	23
Recreational Marine	301

Table 2. Based on NONROAD model for MY 2000

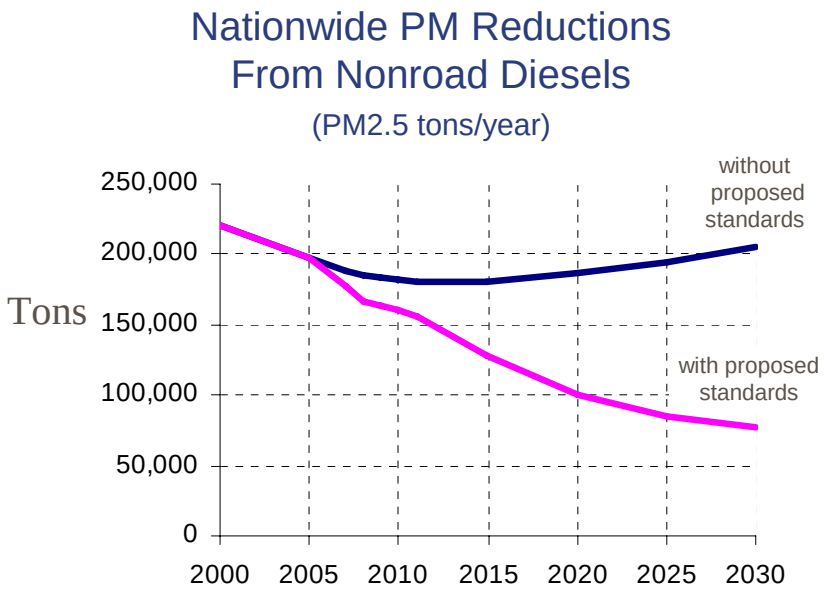

Figure 11.1.1: US wide PM reductions from nonroad diesels

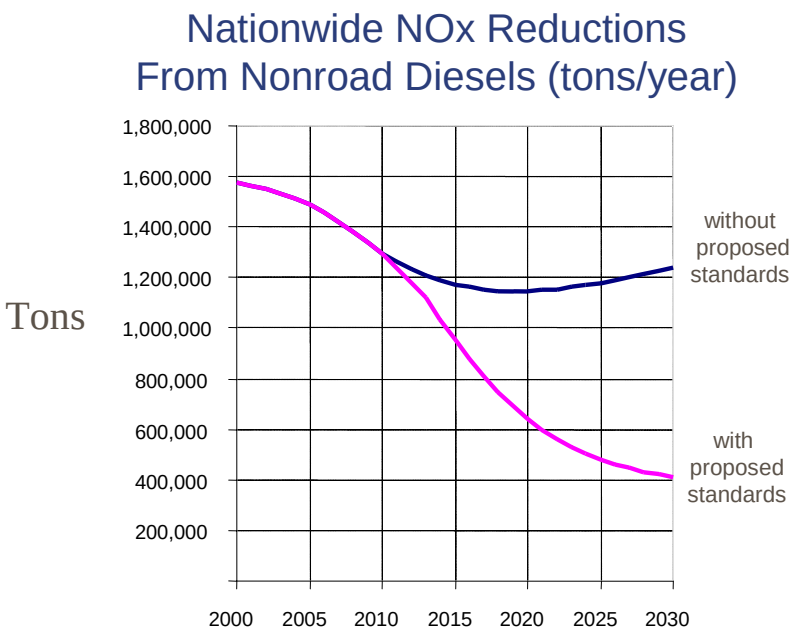

Figure 11.1.2: US wide NOx reductions from nonroad diesels

C. Europe

45. The following numbers present the overall quantity of NRMM in operation as a percentage of all machinery running on diesel. The EU 15's diesel consumption in 1998 was of the order of 227 117 000 tonnes; NRMM accounted for 9.3 % of the total:

- Road vehicles 52.4 %
- Non-road machinery (1) (estimate) 9.3 %
- Inland waterway vessels 2.1 %
- Other (mainly heating) 36.2 %

Total 100 %.

46. Agricultural machinery (except for tractors), civil construction and mining machinery, etc. (Official Journal of the European Union 16.9.2003; Opinion of the European Economic and Social Committee on (COM (2002) 765 final).

47. These European numbers quoted, are in the process of review and will be updated according to the technical review 2007 as requested by art 2 of Directive 2004/26/EC.

D. Japan

48. The air pollution in Japan is particularly high in the densely-populated areas, i.e. East Densely Populated Area (EDPA), which includes Tokyo and Yokohama, and West Densely Populated Area (WDPA), which includes Osaka, Kyoto and Kobe. According to the study carried out in 2003, the sources of air pollution can be broken down as follows:

Nitrogen-oxides

Motor vehicle:	EDPA: 57.2%	WDPA: 53.3%
Ship:	EDPA: 6.7%	WDPA: 15.8%
Aircraft:	EDPA: 0.9%	WDPA: 0.8%
Stationary source:	EDPA: 35.2%	WDPA: 30.0%

Particulate matter

Natural source:	EDPA: 30.9%	WDPA: 29.6%
Stationary source:	EDPA: 28.7%	WDPA: 25.3%
Motor vehicle:	EDPA: 28.1%	WDPA: 29.4%
Others:	EDPA: 12.3%	WDPA: 15.7%

49. The survey in 2003 reported that NRMM holds the contribution of 32% in nitrogen-oxides and 15% in particulate matter among the contribution of Motor vehicles in 2000. The ratio of NRMM will increase and in 2010 those of NRMM will reach presumably 37% in nitrogen-oxide and 29% in particulate matter.

XII. PURPOSE AND SCOPE

50. The following definitions have been presented and discussed at the thirteenth NRMM working group meeting, April 2006.

A. Purpose

51. This regulation aims at providing a world-wide harmonized method for the determination of the levels of pollutant emissions from compression-ignition (C.I.) engines used in vehicles of category T and non-road mobile machinery in a manner which is representative of real world vehicle operation. The results can be the basis for the regulation of pollutant emissions within regional type-approval and certification procedures.

B. Scope

52. This regulation applies to the determination of the emissions of pollutants of compression-ignition (C.I.) engines to be used:

(a) in category T vehicles 2/ ,

(b) in nonroad mobile machinery.

XIII. DISCUSSION OF ISSUES TO BE ADDRESSED BY GTR (INTERCOMPARISON REPORT)

53. The following paragraphs reflect the working group's identification of specific issues, as well as the group's evaluation of those issues. This resulted in the definition of the main subjects to be introduced into the gtr.

A. Motivation

54. The scope of the work was to derive a test procedure, which is as simple as possible but still covered all aspects concerning the NRMM engine tests and meeting the overall requirements of a good methodology such as repeatability, etc. The tool to achieve this goal was to compare the various test procedures at worldwide level (US, Japan, EU).

55. The ongoing work was defined according to the above target and a number of objectives where set:

(a) Consider all the national legislations and international procedures

(b) Consider available technological developments

(c) Take into account cost effectiveness of related laboratory equipment

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2/ As described in Annex 7 to the Consolidated Resolution on the Construction of Vehicles (R.E.3) (TRANS/WP.29/78/Rev.1/Amend. 2).

(d) Develop a harmonized, user friendly and modern test protocol

(e) Make outcome of the comparison of the different legislations at world level available for use for other test protocols under GRPE.

B. Methodology

56. To make such a comparison, a base procedure was selected which was seen as the most complete one for number of topics necessary to account for very stringent emission standards.

57. The base-procedure represented an ordered list of subjects (topics, sub-topics, characteristics) that had been followed methodically subject by subject. The description of each subject of the base-procedure was compared with what described for the corresponding subject by other regulations: Europe, Japan and ISO. Of course, subjects of other regulations, which were not described in the base-procedure (e.g.: partial flow dilution), were also to be considered.

C. Progress of work

58. After identification of the relevant national regulations and international standards an extensive comparison exercise between the different existing regulations and international standards was performed, elaborating a comparison report. This comparison and the identified technical differences were presented in a large working document (400 pages). This way all the open items were presented. Subsequent item-per-item discussions through 2003 and 2004 lead to development of possible solutions supporting the harmonisation process.

59. Consequently, the future gtr will include the most up-to-date technical and procedural improvements currently under consideration. In this way, the gtr will not only reflect the engine testing under cycle conditions representative for real world operation but it will also improve the global standards of emission measurements of existing and future NRMM machinery engines to a high level.

D. Conclusion

60. The strategy of the NRMM working group, as defined in 2003, of elaborating an extensive comparison document between different regulation and standards has been very successful. After the extensive document had been elaborated, it was reviewed and worked through by the contributing experts. The effort culminated in two informal NRMM WG meetings in Ann Arbor September 2004 and San Antonio January 2005 where the discussion of all items was concluded. This way allowed differences to be analyzed and compromises agreed upon. Nearly all issues are solved and they will form the building blocks for the future draft gtr. Few items are left open but the discussion is continuing with important input from the experts. The NRMM working group decided to use a split approach on the remaining open issues and to handle duty cycle issues and test cell procedures separately in order to not impede the progress of work.

XIV. STRUCTURE OF NRMM GTR

61. The structure of the gtr has been developed in a number of meetings of the NRMM working group (Annex 1).

62. The point of reference was the document TRANS/WP.29/882 - "Guidelines regarding proposing and developing of global technical regulations (gtr) ". The gtr work is strictly based on the indications contained in this document.

63. Within this frame the guiding idea of the group has been to develop the procedure in a user-friendly way, following the logical line of work of an emission test.

XV. GUIDANCE DOCUMENT

64. A gtr should be written in clear language for both experts and new users, which have to build new facilities, e.g. small volume manufacturers with lack of experience. Especially in view of a gtr for countries with emerging emission legislation or for previously unregulated countries, recommendations and explanations help to understand the procedure. Experienced users (for certification or type approval) in the US and Europe easily can ignore the explanatory part.

65. In order to overcome the discussion on wording such as "we recommend", "components of measurement instrument may include", etc. that can be found in documents released by EU, ISO and EPA, these sections are introduced into a separate explanation document called the "guidance document". The guidance document includes additional explanations and background information for the users. It is not absolutely necessary for conducting an emissions test and consequently not part of the gtr.

66. In view of the decision (taken in San Antonio in January 2005) to keep the gtr clearly separated from the guidance document, the secretary of the working group explained the approach used in the EU for "product market access directives" with the practical example of the European Noise Directive (2000/14/EC) with a compulsory legal text and a separate supporting guidance document (Annex 2). In order to facilitate reading, the guidance document alternates the legal text with the relevant recommendations, thus forming a readable document on its own. In the EU the Directive text remains the only one legally binding, while the guidelines are "useful literature". This scheme is very valid for the gtr and the supporting guidelines too.

67. In order to facilitate the readability, whilst maintaining the level of information the group welcomed the suggestion by DG ENTR to follow their style of Directive text. The legal part synthesises the requirements and some indispensable explanations. The guidelines give all the additional information that will allow a laboratory with less specific experience in this field to run an emission test successfully.

68. During its fifty-third session (Geneva, 9 - 12 January 2007) the Working Party on Pollution and Energy fully endorsed the proposal for a guidance document accompanying the gtr. The expert from the EC volunteered to submit a revised progress report to WP.29 and AC.3, for consideration at the June 2007 session.

Annex 1

NRMM ENGINES GTR - CONTENTS
28/02/2007

Legal Text

3/ *Blue italic characters means items considered in the guidelines*

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Annex 2

EXAMPLE FOR LEGAL TEXT AND GUIDELINE (ARTICLE 11)

European Noise directive (2000/14/EC) 4/
with a compulsory legal text and a separate supporting guidance document

Legal Text:
Article 11
Marking

1. Equipment referred to in Article 2(1) placed on the market or put into service which complies with the provisions of this Directive shall bear the CE marking of conformity. The marking shall consist of the initials "CE". The form of the marking to be used is shown in Annex IV.

2. The CE marking shall be accompanied by the indication of the guaranteed sound power level. A model of this indication is given in Annex IV.

3. The CE marking of conformity and the indication of the guaranteed sound power level shall be affixed in a visible, legible and indelible form to each item of equipment.

4. The affixing of markings or inscriptions on the equipment which are likely to be misleading with regard to the meaning or the form of the CE marking or to the indication of the guaranteed sound power level shall be prohibited. Any other marking may be affixed to the equipment, provided that the visibility and legibility of the CE marking and the indication of the guaranteed sound power level is not thereby reduced.

5. Where the equipment referred to in Article 2(1) is subject to other Directives concerning other aspects and which also provide for the affixing of the CE marking, the marking shall indicate that such equipment also fulfils the provisions of those Directives. However, should one or more of these Directives allow the manufacturer, during a transitional period, to choose which arrangements to apply, the CE marking shall indicate that the equipment only fulfils the provisions of the Directives applied by the manufacturer. In this case the particulars of those Directives, as published in the Official Journal of the European Communities, must be given in the documents, notices or instructions required by those Directives and accompanying such equipment.

4/ Legal text:
http://europa.eu/eur-lex/pri/en/oj/dat/2000/l_162/l_16220000703en00010078.pdf
Guideline:
http://ec.europa.eu/enterprise/mechan_equipment/noise/pdf/021016ppwg_en.pdf

Guidelines
Article 11
Marking

1. Equipment referred to in Article 2(1) placed on the market or put into service which complies with the provisions of this Directive shall bear the CE marking of conformity. The marking shall consist of the initials "CE". The form of the marking to be used is shown in Annex IV.

There is only one CE marking on an item of equipment that indicates compliance with all the relevant directives for that item of equipment.

2. The CE marking shall be accompanied by the indication of the guaranteed sound power level. A model of this indication is given in Annex IV.

The pictogram shown in the model given in Annex IV is part of the marking It has been changed compared to the directives which have been repealed by this one. Furthermore, the sound pressure level at the operator station and the corresponding marking are no longer covered by this new Directive. See also the comment on article 21.

The rules for the size of the plate are given in the same Annex.

3. The CE marking of conformity and the indication of the guaranteed sound power level shall be affixed in a visible, legible and indelible form to each item of equipment.

CE marking and the indication of the guaranteed sound power level do not need to be close one to the other.

CE marking is generally affixed outside of the machine; the guaranteed sound power level may be outside of the machine or at the operator station. Locations for marking which are partly covered by components or that need removal of equipment parts or need mirrors or similar devices should be avoided. Marking has a fundamental role for the information of customers, labels placed under the seats of equipment or on removable attachments do not fulfil the visibility and indelibility conditions of this article.

4. The affixing of markings or inscriptions on the equipment which are likely to be misleading with regard to the meaning or the form of the CE marking or to the indication of the guaranteed sound power level shall be prohibited. Any other marking may be affixed to the equipment, provided that the visibility and legibility of the CE marking and the indication of the guaranteed sound power level is not thereby reduced.

5. Where the equipment referred to in Article 2(1) is subject to other Directives concerning other aspects and which also provide for the affixing of the CE marking, the marking shall indicate that such equipment also fulfils the provisions of those Directives. However, should one or more of these Directives allow the manufacturer, during a transitional period, to choose which arrangements to apply, the CE marking shall indicate that the equipment only fulfils the provisions of the Directives applied by the manufacturer. In this case the particulars of those Directives, as published in the

Official Journal of the European Communities, must be given in the documents, notices or instructions required by those Directives and accompanying such equipment.

The CE marking, as presented in annex IV, is the same for all the directives of new and global approach as defined in the relevant directive. Each equipment shall bear a single CE marking valid for all the directives applied. The list of the directives applied appears in the declaration(s) of conformity which accompanies(y) each item of equipment.

Foreword of guidelines in European Noise directive (2000/14/EC)
This Guide is intended to contribute to better understanding of the Directive 2000/14/EC. This directive of the European Parliament and the Council of 8 May 2000 concerns the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors and throughout the single market.

This Guide is addressed to the users of the directive to ensure both the free circulation of the CE marked products as well as a high level of protection throughout the Community. It is intended to answer the questions that are likely to be asked by the directive's users, such as manufacturers, their representatives and machinery users.

It captures the directive before transcription by member states and so there are no case studies. It is expected that the guidance offered could be modified in the future.

The draft document was submitted to various relevant parties, including the Member States experts from within the Committee created by the Directive.

Only the text of the Directive is authentic in law. Accordingly, the text of the Directive is applicable where there are differences between the provisions of the Directive and the contents of this Guide.

Although the Directive is only really applicable after it has been transposed into national law in each of the Member States such transposition must not change the spirit of the Community legislation. The Guide is intended to explain this spirit.

The Commission has produced another guide that is for the implementation of Community technical regulations based on the "New approach" and the "Global approach" which may be of particular interest to the authorities responsible for market surveillance and the notified bodies.

The attention of the reader is drawn to the fact that this Guide covers only the Directive 2000/14/EC "Noise emission in the environment by equipment for use outdoors". Some of the equipment may be covered by other directives such as the machinery directive.

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