

Off-cycle Emissions GTR – Status Report for GRPE

52nd GRPE

June 8, 2006

Overview

- OCE GTR draft development
- Draft OCE GTR Status
 - Table of Contents
 - Section-by-Section overview
- Priority Open Issues

OCE GTR draft development

- March 2004 OCE Plenary Meeting
 - Agreement to draft OCE GTR using the U.S. not-to-exceed approach as starting point
- June 2004 OCE Plenary Meeting
 - Editorial Committee formed
- September 2004 Plenary Meeting
 - Outline of GTR developed and discussed
- Nov. 2004: 1st meeting of OCE Editorial Committee
- Jan. 2005 OCE Plenary Meeting
 - 1st draft of GTR distributed to OCE members
- April 2005: 2nd Editorial Committee meeting
- June 2005: GTR discussed at OCE Plenary Meeting
- September 2005: 3rd Editorial Committee meeting
- January 2006: GTR discussed at OCE Plenary meeting
- April 2006: 4th Editorial Committee meeting

Draft OCE GTR - Table of Contents

- A. Statement of Technical Rationale and Justification
 - 1. Introduction
 - 2. Background on Off-cycle Emissions
 - 3. Procedural Background and Development of GTR
 - 4. Technical and Economic Feasibility
 - 5. Anticipated Benefits
 - 6. Potential Cost Effectiveness

- B. Text of Regulations
 - 1. Scope and Purpose
 - 2. Application
 - 3. Definitions
 - 4. General Requirements
 - 5. Performance Requirements
 - 6. Applicable Ambient Conditions
 - 7. WNTTE Test Procedures
 - 8. WNTTE Deficiencies
 - 9. WNTTE Exemptions
 - 10. Documentation for Application for Compliance

Draft OCE GTR – Section A.1 – A. 2

A. Statement of Technical Rationale and Justification

- 1. Introduction*
- 2. Background on Off-cycle Emissions*

○ Introduction Section

- GTR addresses OCE from HD diesel engines;
 - Provisions prohibiting the use of defeat strategies
 - World-harmonized Not-to-Exceed (WNTE)
 - OCE GTR compliments the WHDC GTR

○ Background on Off-cycle Emissions

- Broad overview of what off-cycle emissions are in the context of modern HD diesel engines

Draft OCE GTR – Section A.3

- A. Statement of Technical Rationale and Justification
 - A. 3. Procedural Background and Development of GTR
- Overview of the work of the OCE informal working group
 - Provides reader with references to appropriate WP.29 & GRPE documents
 - Highlights any key issues discussed during the development of the GTR
- Discusses relationship between OCE GTR & In-use Testing;
 - GTR has been developed with the specific intent to allow for testing of compliance with the WNTTE during in-use, on the road operation of the engine
 - GTR does not include requirements or specifications for in-use testing, or for on-vehicle emission measurement equipment
 - Individual countries and regional authorities may specify their own provisions in this regard in order to enforce this GTR, and such enforcement provisions could include requirements for in-use, on-vehicle emissions testing of heavy-duty engines

Draft OCE GTR – Section A.4 – A.6

A. Statement of Technical Rationale and Justification

4. Technical and Economic Feasibility

5. Anticipated Benefits

6. Potential Cost Effectiveness

○ A.4.

- Will follow format used by WMTC, WHDC, and WWH-OBD

○ A.5 - Highlights 3 potential benefits

- Improved emissions control
- Improved certification/type-approval reviews
- Reduced costs for industry from global harmonization

○ A.6.

- Will follow format used by WMTC, WHDC, and WWH-OBD

Draft OCE GTR – Section B.1 – B.4

B. Text of Regulations

1. Scope and Purpose
2. Application
3. Definitions
4. General Requirements

- B.1. – GTR establishes performance based emission requirements (WNTÉ) and a prohibition on the use of defeat strategies
- B.2. – GTR applies to CI, natural gas, and LPG positive ignition engines used in highway vehicles
- B.3. – Definition
 - Draft definitions for defeat strategy, element of design, emission control strategy, base emission control strategy, auxiliary emission control strategy, engine system, emission control system, etc.
- B.4. – Engine systems and vehicles must be designed, constructed and assembled to comply with the GTR; they must not be equipped with a defeat strategy; and must comply with the WNTÉ limits

Draft OCE GTR – Section B.5

B. Text of Regulations

5. Performance Requirements

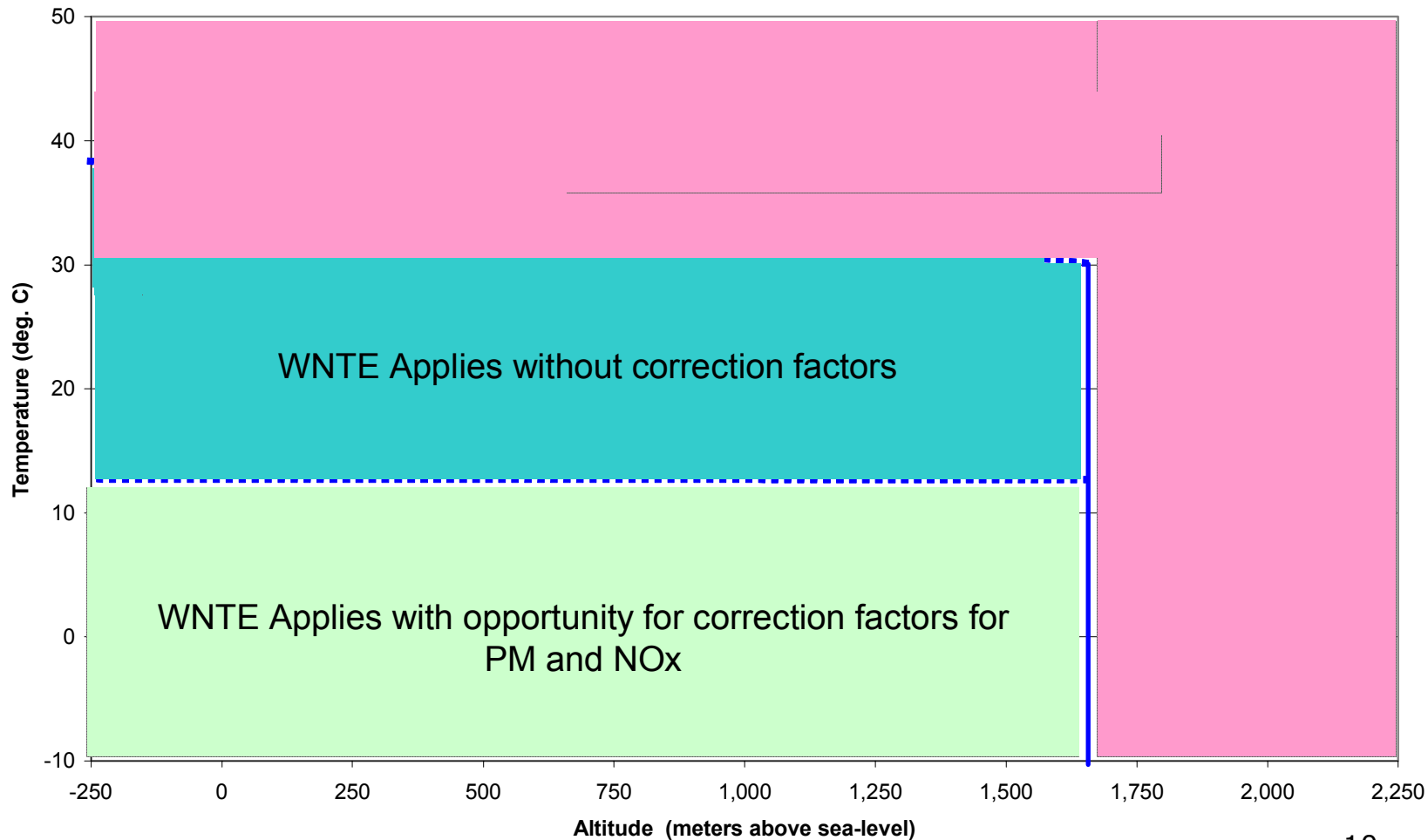
- B.5. – WNTE Limits specified
- NO_x, CO, (NM)HC, PM
 - WNTE Emission Limit = WHTC Emission Limit x WNTE Factor
- Smoke limits also specified

Pollutant	WHTC Emission Limit*	WNTE Factor*
NO _x	Less than “x”	“y”
	“x” - ≤ 2.0 g/kWh	1.5
	> 2.0 g/kWh	1.25
(NM)HC		
	≤ 0.6 g/kWh	1.5
	> 0.6 g/kWh	1.25
CO		
	≤ 1.0 g/kWh	1.5
	> 1.0 g/kWh	1.25
PM		
	≤ 0.05 g/kWh	1.5
	> 0.05 g/kWh	1.25

Note:
Numerical
values
suggested
by OICA

Draft OCE GTR – Section B.6

WNTe Altitude and Temperature Range:



Draft OCE GTR – Section 6.2 & 7

B. Text of Regulations

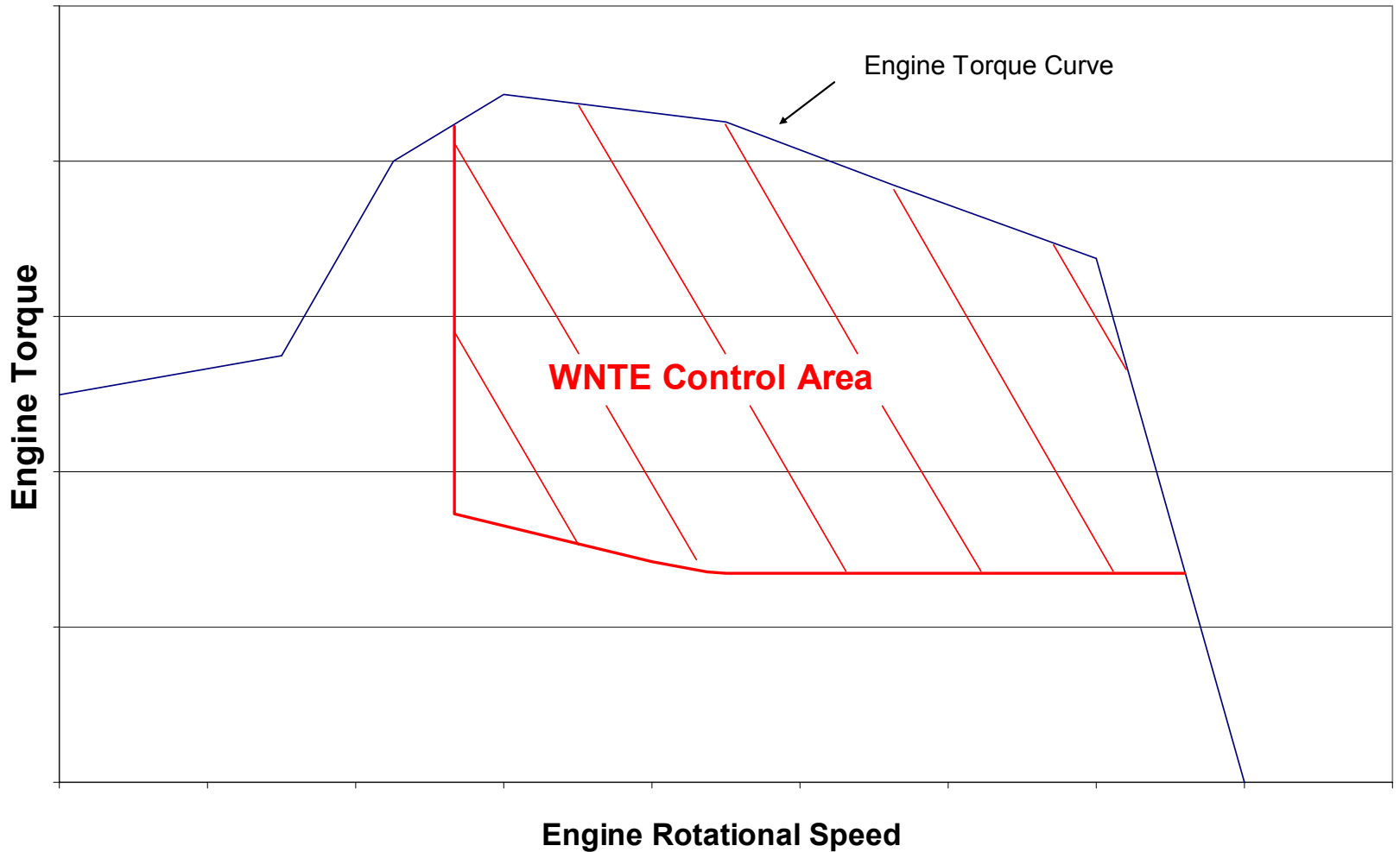
- 6. Applicable Ambient Conditions
- 7. WNTE Test Procedures

- B.6.2 Ambient temperature & humidity correction procedures

- B.7.1 Defines WNTE control area
- B.7.2 & 7.3 WNTE minimum sampling period
- B.7.4 WNTE smoke measurement procedures
- B.7.5 Numerical rounding requirements

Draft OCE GTR – Section B.7.1

Example WNTE Control Zone



Draft OCE GTR – Section 8

B. Text of Regulations

8. WNTE Deficiencies

○ WNTE Deficiencies

- Allowed for first 3 years after a new emission limit is implemented
- A deficiency allows an engine family to be approved, even if some limited WNTE requirements are not met
- Unmet provisions must be limited in scope, and due to feasibility or reasonability issues
- Approval is at the discretion of the type approval/certification authority
- No more than 3 WNTE deficiencies can be granted per engine family
- Similar in concept to WWH-OBD deficiencies

Draft OCE GTR – Section 9

B. Text of Regulations

9. WNTE Exemptions

○ B.9 WNTE Exemptions

- Allows a contracting party to specify aspects of the WNTE which do not apply to all manufacturers
- Considered to be a provisional requirement until final limit values are specified in the WHDC & OCE gtrs

Draft OCE GTR – Section 10

B. Text of Regulations

10. Documentation for Application for Compliance

- B.10 Documentation for OCE GTR
 - B.10.1 Statement of WNTE Compliance
 - B.10.2 Basis for WNTE Compliance Statement
 - B.10.3 Optional WNTE Data submission requirements
 - Contracting party can decide to require specific data submission requirements
 - Current draft GTR includes a series of steady-state points tested at a wide range of temperature and simulated altitude

Key Issues being discussed by Plenary Group

- WNTE Compliance Statement
- Defeat Strategy and related definitions
- WNTE control zone
 - Size of control zone
 - 30 second emissions averaging period
 - Alternative approach's to the control zone
- Ambient conditions during which WNTE applies (altitude & temperature)
- WNTE Factors and Associated WHDC Emission Limits