18th OCE Plenary Meeting
San Francisco
October 16/17, 2007

Off-Cycle Emissions (OCE) GTR

OICA Proposal for Amendment

AECS Requirements

- Only definitions are not sufficient for type approval systems
- Therefore, specific sections in chapter 4 (general requirements) and chapter 5.1 (emission control strategy) are needed for type approval
- OICA proposes to include section 5.1.2, which is basically derived from EU Directive 2005/78/EC
- Similar requirements are also found in the USA, but in a guidance document rather than in the Federal Register

WNTE Components

- Since the OICA proposal uses an additive component (or constituent), the expression "WNTE factor" can not be used
- Rounding of the WNTE component to the same number of places as in the applicable standard
- The proposed WNTE components are shown below:

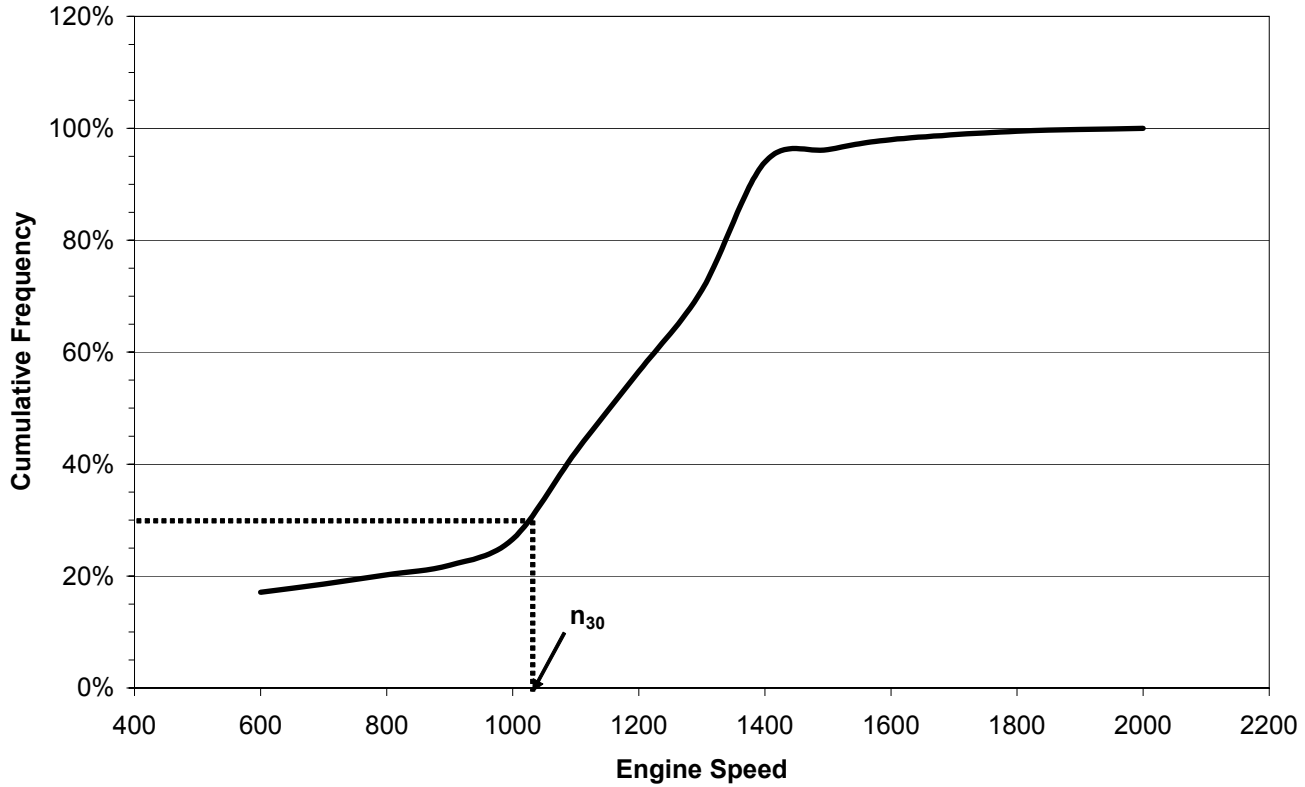
for NOx:	**WNTE Component = $- 0.0248 * EL^2 + 0.2946 * EL + 0.0963$**
for HC:	**WNTE Component = $0.15 * EL^2 + 0.01 * EL + 0.09$**
for CO:	**WNTE Component = $0.025 * EL^2 + 0.1 * EL + 0.2$**
for PM:	**WNTE Component = $1.25 * EL^2 + 0.0875 * EL + 0.005$**

Ambient Conditions

- In line with earlier proposals, OICA proposes the following conditions for application of the WNTE limits:
  - all atmospheric pressures >= 82.5 kPa
  - all temperatures <= -0.4514 x (101.3 - p_b) + 311
  - all engine coolant temperatures between 70°C and 100°C
- Principles applied:
  - EU-COM proposal of 1700 m altitude combined with EMA proposal on atmospheric pressure leads to 82.5 kPa
  - EU-COM proposal of 38°C leads to 311K
  - engine coolant provision from Directive 2005/78/EC

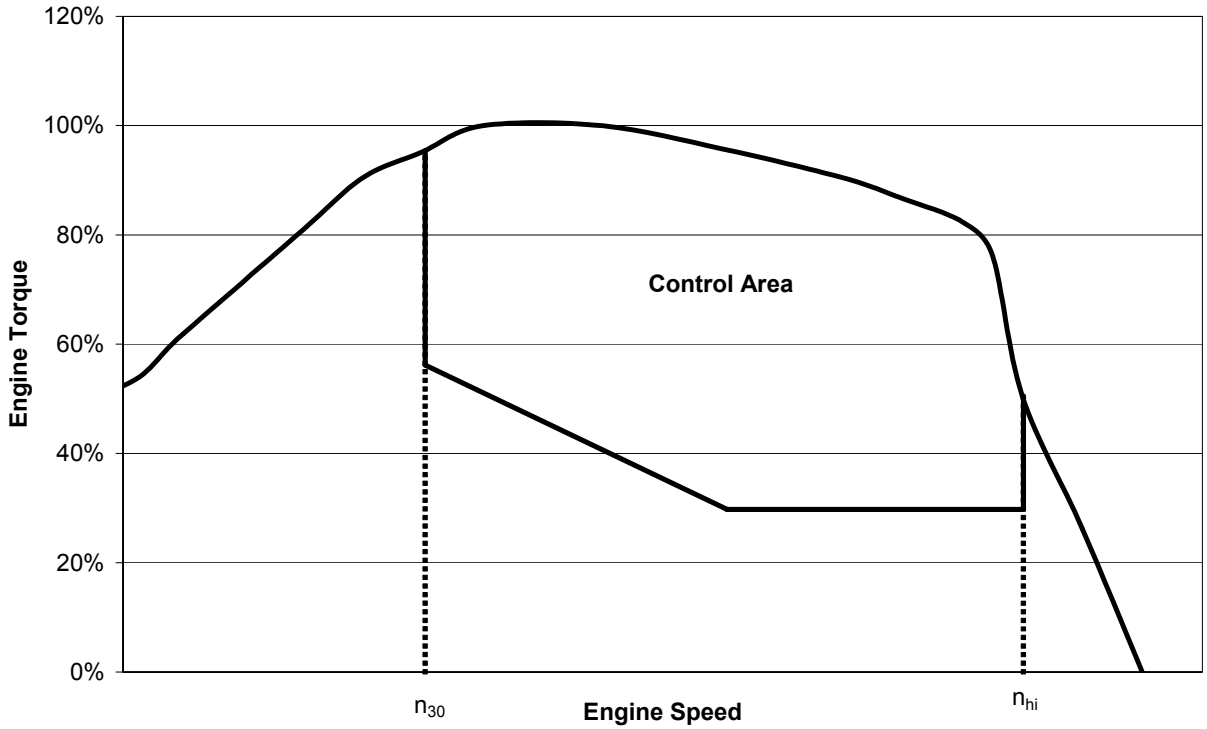
WNTE Speed Distribution

- Definition of n_{30}: 30th percentile cumulative speed distribution over the WHTC, incl. idle

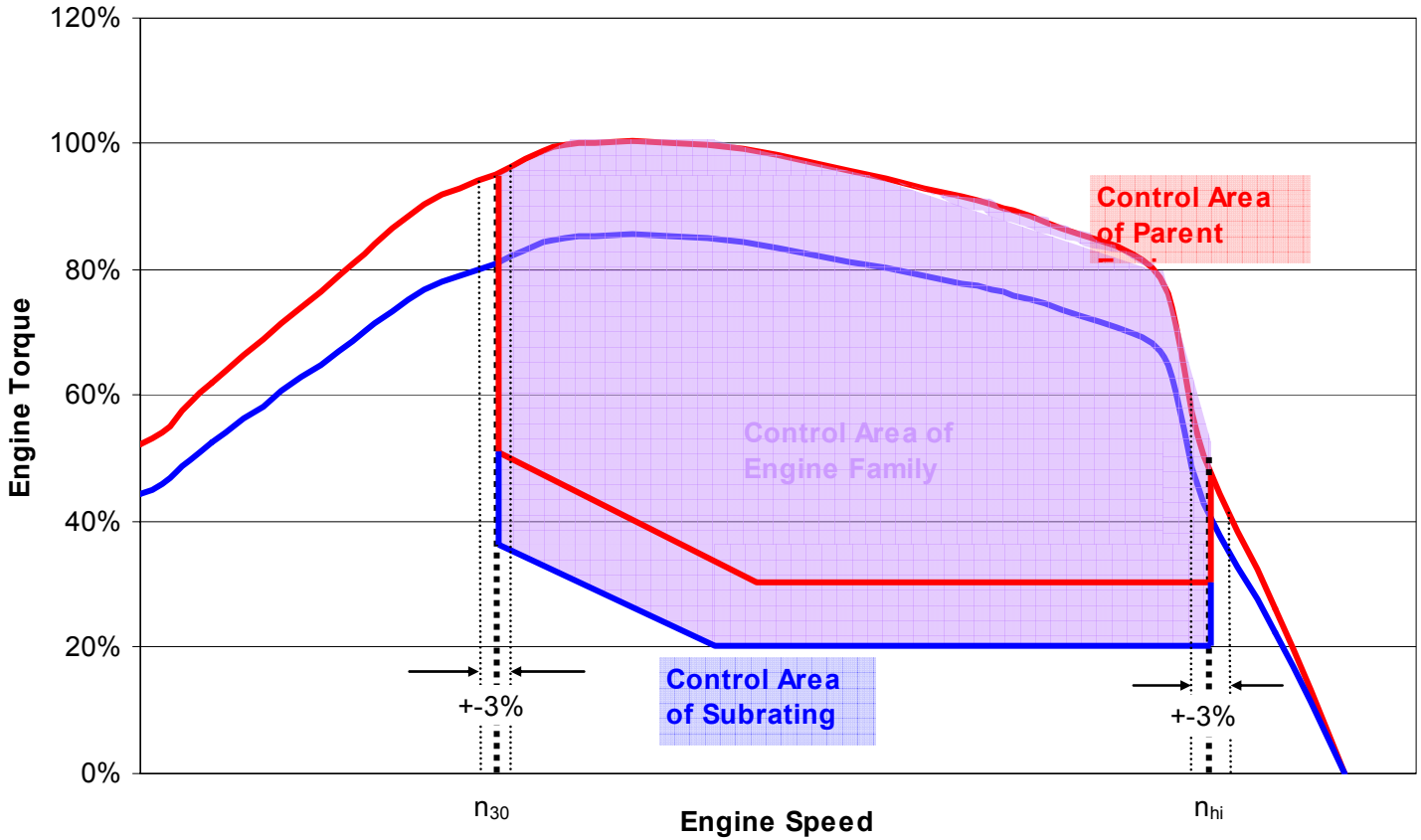


WNTE Control Area

- Lower engine speed range: n_{30}
- Upper speed range: n_{hi}, but no further carve-outs
- Torque/power limit of 30%, as in the USA



WNTE Control Area for Engine Family



WNTE Laboratory Testing (section 7.4)

- Selection of 15 random points within the WNTE control area by type approval authority
- Combination into 3 ramped steady state cycles, each with 5 random points
  - Will deliver 3 test results for demonstrating compliance against the WNTE limits
- Possible alternative: 1 ramped cycle with 15 points
- Advantages:
  - Compared to single mode testing, the proposal includes some degree of averaging like during in-use testing
  - Allows for PM measurement, which would be very difficult for single mode testing
  - WHSC calculation procedure can be principally applied

WNTE Laboratory Testing, cont'd (section 7.5)

- Engine warm-up at WHSC mode 9
- 5 minutes soak time before start of test
- Engine operation 2 minutes at each random point
- 20 seconds linear ramp between random points
- Data evaluation according to WHDC gtr

Other Issues

- WNTE limited testing region provisions should be deleted
- Compliance statement should be based on either
  - test data submitted by the manufacturer incl. in-use data, if available
  - or engineering analysis by the manufacturer in line with current section 10.2
  - or WNTE laboratory testing as suggested by OICA in new sections 7.4 and 7.5
- WNTE deficiencies should be limited
- Technology based exclusions should be deleted
- WNTE exemptions (section 9) should be limited to the highest degree possible