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# EMA Concerns With Draft Off-Cycle GTR

# Effective Off-Cycle Control Should Include:

- a. A set of emission requirements that apply when engines operate “Off-Cycle”;  
and
- b. Evaluation criteria that are used to ensure that Off-Cycle emission requirements are met.

# Evaluation Criteria Should:

- a. ensure emission requirements are met;
- b. inform manufacturers so that objective design criteria can be established;
- c. be uniform across all countries adopting the GTR;  
and
- d. be developed in a manner which ensures that expensive evaluation programs are not duplicated in each adopting country.

# U.S. EPA Approach to Off-Cycle Emissions

Regulations Include:

- a. NTE emission limits that apply under a broadly specified range of operating conditions;  
and
- b. Specified evaluation criteria for assessing engine emissions for the purpose of comparison with the limits.

Compliance / Evaluation Is Done Via:

- a. A manufacturer compliance statement given at the time of certification;  
and
- b. A manufacturer run in-use testing program that evaluates vehicles operating under real-world conditions (details of this program are still being finalized).

# U.S. EPA Approach to Off-Cycle Emissions

- The U.S. EPA program does not include an “NTE Test Procedure.”
  - There is no fixed “Cycle” or “Cycles” that can be run to demonstrate compliance with the NTE requirements

# U.S. EPA Approach to Off-Cycle Emissions

- The U.S. EPA program was initially implemented with a manufacturer compliance statement as the only defined means to evaluate compliance.
- Engine manufacturers objected to this and initiated litigation because:
  - basis for compliance statement was not clear;
  - uncertainty if/how in-use compliance testing would be performed, how “Pass/Fail” decisions would be made and what liabilities would result;
  - lack of sufficient information regarding compliance evaluation criteria to properly inform design groups during engine development phase.

# U.S. EPA Approach to Off-Cycle Emissions

- U.S. EPA and engine manufacturers resolved the litigation through a settlement agreement which provided guidance regarding the basis for completing the compliance statement and established a manufacturer run in-use test program as the means to evaluate compliance with the NTE requirements
  - details of the in-use test program are still being finalized via a rulemaking process;
  - it is expected that this rulemaking will define the compliance evaluation criteria with sufficient detail to enable engine manufacturers to develop engines with a reasonable confidence that compliance requirements will be met.

# GRPE Approach to Off-Cycle Emissions

- The Draft Off-Cycle GTR proposes NTE requirements with certification compliance statements as the only specified means of compliance evaluation
  - no guidance is provided regarding the type of information which will be necessary to form the basis for giving the compliance statement
  - In-use compliance testing is “inferred” but not explicitly required in the draft GTR
    - no details are included regarding the nature of the in-use testing or the associated acceptance/rejection criteria
- EMA believes that more definitive compliance evaluation criteria need to be included in the GTR if NTE requirements are to be used as the basis for off-cycle emission control
  - Finalization of the GTR in its current form will put manufacturers in much the same situation that caused EMA to pursue litigation against the U.S. EPA.

# GRPE Approach to Off-Cycle Emissions

- There are several possible options to evaluate compliance with NTE requirements that can be considered for inclusion in the GTR – unfortunately they all have important drawbacks
- These Options are outlined in the following slides, along with their respective drawbacks

# Compliance Evaluation Options

## Option #1:

- Simple compliance statement by manufacturer at the time of type approval
- Basis for completing statement undefined in GTR

## Drawbacks:

- Significant uncertainty about what is required
- Potential for uneven application by various type approval authorities
- May not be effective in controlling in-use emissions

# Compliance Evaluation Options

## Option #2:

- Simple compliance statement by manufacturer at the time of type approval
- GTR specifies that compliance statement is to be based on manufacturer analysis of emissions under the full range of NTE conditions

## Drawbacks:

- Very subjective
  - no standardized techniques exist to allow emissions at tested conditions to be extrapolated. This is particularly true for engines with sophisticated electronic controls
  - there is no assurance that manufacturers and type approval authorities will agree on the analysis used, thus the potential for protracted discussions
- Potential for uneven compliance assessments by different type approval authorities
- Manufacturers wishing to obtain type approval in multiple jurisdictions will need to gain approval from different type approval authorities
- In spite of best intentions, manufacturer assessments may be in error and thus compliance is not ensured

# Compliance Evaluation Options

## Option #3:

- Simple compliance statement by manufacturer at the time of type approval
- GTR specifies a fixed set of test conditions that must be run in the laboratory as the basis for completing the compliance statement

## Drawbacks:

- Creates potential for manufacturers to design engines to meet the NTE limits under specified evaluation conditions, but have lesser control at other conditions
- Full range of applicable NTE conditions can not be evaluated in most laboratories
- Can not ensure NTE compliance under all applicable NTE conditions which may be encountered in-use

# Compliance Evaluation Options

Option #4:

- Simple compliance statement by manufacturer at the time of type approval
- GTR specifies that type approval authority specify a unique set of test conditions that must be run in the laboratory for each engine family as the basis for completing the compliance statement (similar to MAEL “Mystery Point” concept)

Drawbacks:

- Full range of applicable NTE conditions can not be evaluated in most laboratories
- Could greatly extend and complicate type approval testing since test facility would need to be “programmed” to run unique test conditions
- Could add significant time/expense to type approval process – especially where witness testing is required
- Unless reciprocity is provided, type approval in other jurisdictions may necessitate running a different set of test conditions for type approval in each specific jurisdiction
- Can not ensure NTE compliance under all applicable NTE conditions which may be encountered in-use

# Compliance Evaluation Options

## Option#5:

- simple compliance statement by manufacturer at the time of type approval
- GTR specifies that manufacturers perform a specified level of in-use tests on prototype vehicles as the basis for completing the statement

## Drawbacks:

- Specialized In-use testing equipment is required (currently no PM equipment is available)
- In-Use testing methods need to be specified
- Measurement uncertainties of In-Use test equipment and methods need to be quantified and accounted for
- Could add significant time/expense to type approval process – especially if witnessing of in-use testing is required
- Unless reciprocity is provided, type approval in other jurisdictions may necessitate running an in-use test in each specific jurisdiction
- Limited In-Use testing can not ensure compliance under all applicable NTE conditions which may be encountered in-use

# Compliance Evaluation Options

## Option #6:

- Post production in-use testing of in-use vehicles

## Drawbacks:

- Specialized In-use testing equipment is required (currently no PM equipment is available)
- In-use testing methods and “pass/fail” assessment criteria need to be specified
- Measurement uncertainties of In-Use test equipment and methods need to be quantified and accounted for
- Requires access to privately owned vehicles
- Only determines non-compliance “After The Fact.”
- In-use testing could be expensive and time consuming
- Unless reciprocity is provided, it may be necessary to perform separate In-use test programs in each jurisdiction where an engine is type approved

# Compliance Evaluation Options

Option #7:

- Some combination of preceding methods

Drawbacks:

- While combining methods may overcome drawbacks, it will certainly result in additional costs

# Conclusion

- EMA recognizes that the 1998 Global Agreement precludes GTRs that
  - obligate Contracting Parties to a specific conformity assessment regime (i.e. type approval, self-certification, etc.) or to commit to reciprocal recognition of regulations adopted by other Contracting Parties or
  - impose an enforcement regime, which negates the sovereign rights of each Contracting Party to implement and enforce the global technical regulation in accordance with their respective national or regional regulatory process and/or laws.
- The Global Agreement does not preclude GTRs that specify the evaluation criteria to be used to assess whether the GTR requirements have been met
  - In fact, EMA believes that inclusion of such criteria is an essential feature of an effective GTR

# Conclusion

- EMA strongly believes that workable compliance / evaluation criteria provisions should be considered up front and made an integral part of this GTR.
- If NTE compliance / evaluation criteria meeting the needs of all stakeholders can not be developed then the use of NTE as the basis for “off-cycle” emission control needs to be reconsidered.