



# Workshop: Can EURO VI engines solve Stage V NRMM requirements? EURO VI engines equivalent to Stage V NRMM

Khalid Tachi

Gorinchem, May 9th, 2017





## Stage V NRMM Regulation

#### **Two parts:**

#### A. Regulation (EU) 2016/1628 of September 14<sup>th</sup>, 2016

Requirements relating to gaseous and particulate pollutant emission limits and typeapproval for internal combustion engines for non-road mobile machinery;

#### B. Delegated Regulation (EU) 2017/654 of December 19th, 2016

Supplementing Regulation (EU) 2016/1628 <u>with regard to technical and general</u> <u>requirements</u> relating to emission limits and type-approval for internal combustion engines for non-road mobile machinery.



# **Stage V NRMM Regulation: Equivalence (1/2)**

## **Regulation (EU) 2016/1628**

i. Article 42 (3) =>

equivalence between Euro VI engines and Stage V engines of category NRE;

ii. Article 4 (1), point (1)(b) => (Stage V) NRE engines <560kW can be used in place of Stage V IWP or IWA engines.

Equivalence means (from i. & ii.):

With type-approved Euro VI engine <560kW =>

no need for a separate type-approval granted under Regulation (EU) 2016/1628.



# Equivalence between Euro VI and Stage V NRMM engines, category NRE

## Regulation (EU) 2016/1628; Article 42(3) / 42(4)(b)

#### Article 42 Acceptance of equivalent engine type-approvals

- 3. EU type-approvals granted on the basis of Union acts as listed in the delegated act referred to in point (b) of paragraph 4 shall be recognised as being equivalent to the EU type-approvals granted in accordance with this Regulation.
- 4. The Commission is empowered to adopt delegated acts in accordance with Article 55 supplementing this Regulation by setting out:
  - (b) the list of Union acts pursuant to which EU type-approvals are granted, including any requirements set out therein which relate to their application.



## NRE engines <560kW in place of IWP or IWA engines

Regulation (EU) 2016/1628; Article 4(1) point (1)(b)

#### Article 4 Engine categories

- 1. For the purposes of this Regulation, the following engine categories, divided into the sub-categories set out in Annex I, apply:
  - (1) 'category **NRE**':

(b) engines having a reference power of less than 560 kW used in the place of Stage V engines of categories **IWP, IWA**, RLL or RLR;



## Engine power limit <560kW



Category	Net Power	СО	HC	NOx	РМ	PN
	kW	g/kWh				1/kWh
NRE-v/c-6	$130 \le P \le 560$	3.50	0.19	0.40	0.015	1×10 <sup>12</sup>
NRE-v/c-7	P > 560	3.50	0.19	3.50	0.045	-

No PN counting for NRE engines over 560kW!



EIBIP | European Inland Barging Innovation Platform

## Stage V NRMM Regulation: Equivalence (2/2)

## Annex XIII to Delegated Regulation (EU) 2017/654

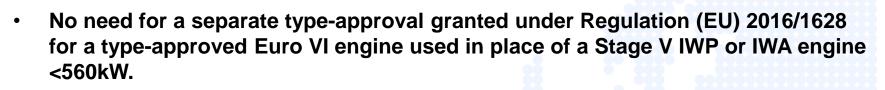
Euro VI engine (type-approved under Regulation (EC) No 595/2009) used in place of a Stage V IWP or IWA engine <560kW:

Additional obligation: Fulfil the <u>additional</u> requirements set out in Regulation (EU) 2017/654, Annex IV, Appendix 2, to ensure the <u>correct operation of NO<sub>x</sub> control measures</u> that apply for engines of categories IWP/ IWA, and <u>that this is being confirmed by a Technical Service</u>.



EIBIP | European Inland Barging Innovation Platform





- An additional arrangement for a correct operation of NOx control measures/ after treatment system, <u>must be confirmed by a Technical Service</u>. E.g. the speed derating procedure should be adapted in the software for another procedure.
- EURO VI type approved engines can be used for inland navigation already before 2019 on the grounds of Art 65(2), 2<sup>nd</sup> paragraph, under the same conditions related to the equivalency discussed here.

