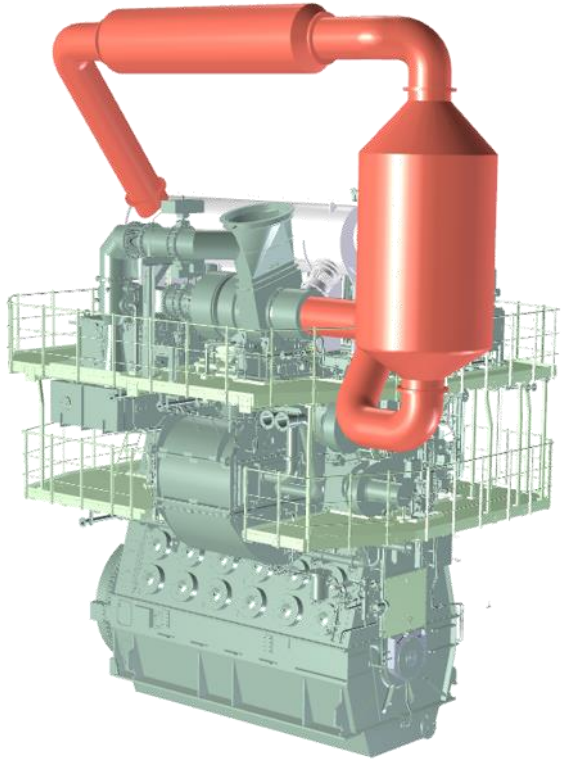
IMO NOx Tier III technology for UE Engine

HP-SCR system



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Japan Engine Corporation

NOx emission control area（ECA）

The emission regulations of IMO for NOx and sulfur content in fuel are getting strict year by year.

As for the NOx regulation, from 2011 Tier II regulation is in effect.

As the result of MEPC66, from 2016 Tier III regulation became into effect.

Its level is over 75% less than that of Tier II inside of ECA. Outside of ECA its emission level is same as Tier II.

Existing ECA

＜NOx-ECA＞（2021～）

IMO NOx Tier III Solutions

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UEC engine complies with IMO NOx Tier III regulation
by LP-EGR, HP-SCR or LP-SCR system, which has the enough ability to reduce NOx emission for the regulation.

①METHODS IN-ENGINE

- EGR (Exhaust Gas Recirculation)

②AFTER TREATMENT

- SCR (Selective Catalytic Reduction)

Contents

Configuration of HP-SCR system

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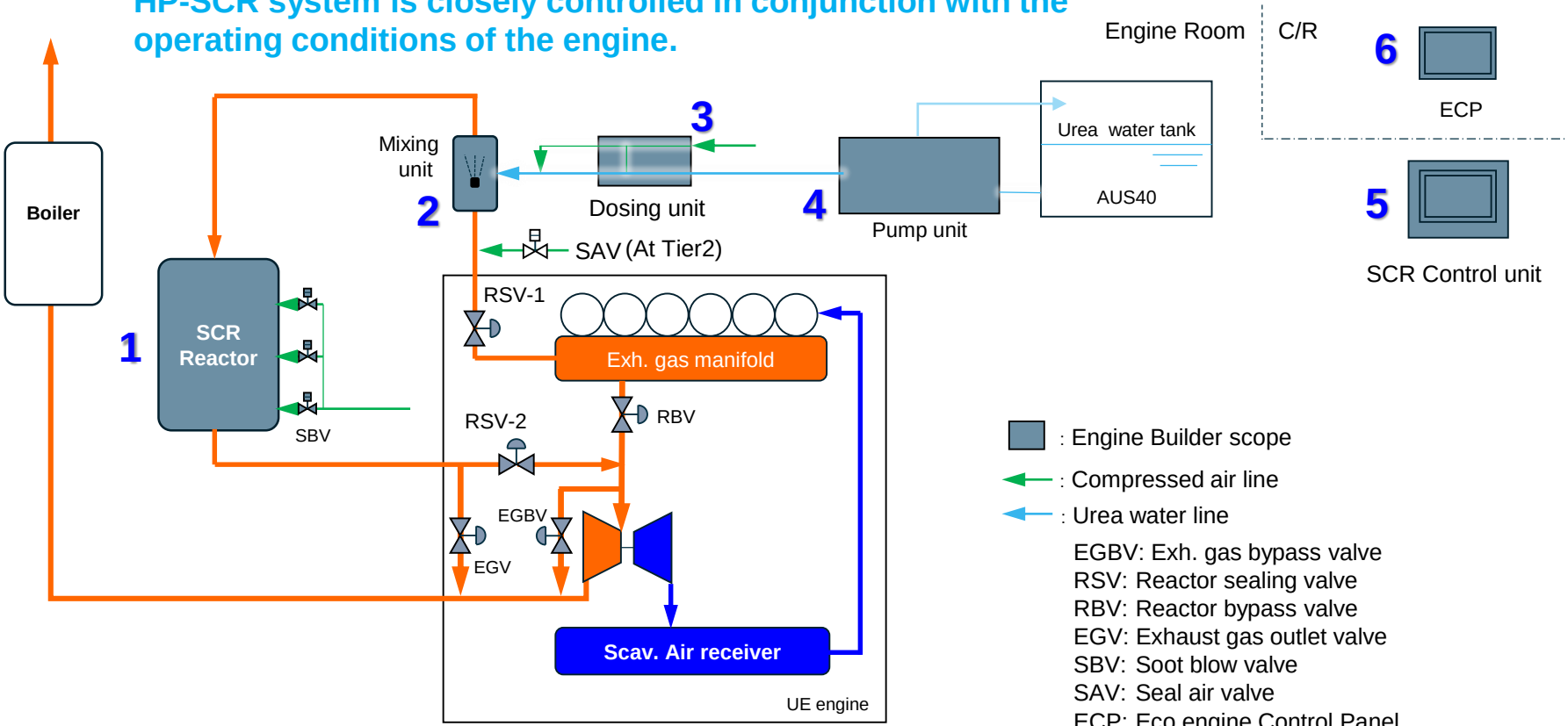
PROVISIONAL

HP-SCR system is closely controlled in conjunction with the operating conditions of the engine.



: Engine Builder scope

: Compressed air line

: Urea water line

EGBV: Exh. gas bypass valve
RSV: Reactor sealing valve
RBV: Reactor bypass valve
EGV: Exhaust gas outlet valve
SBV: Soot blow valve
SAV: Seal air valve
ECP: Eco engine Control Panel
※Urea water tank : Shipyard scope

Arrangement of HP-SCR system components (for reference)

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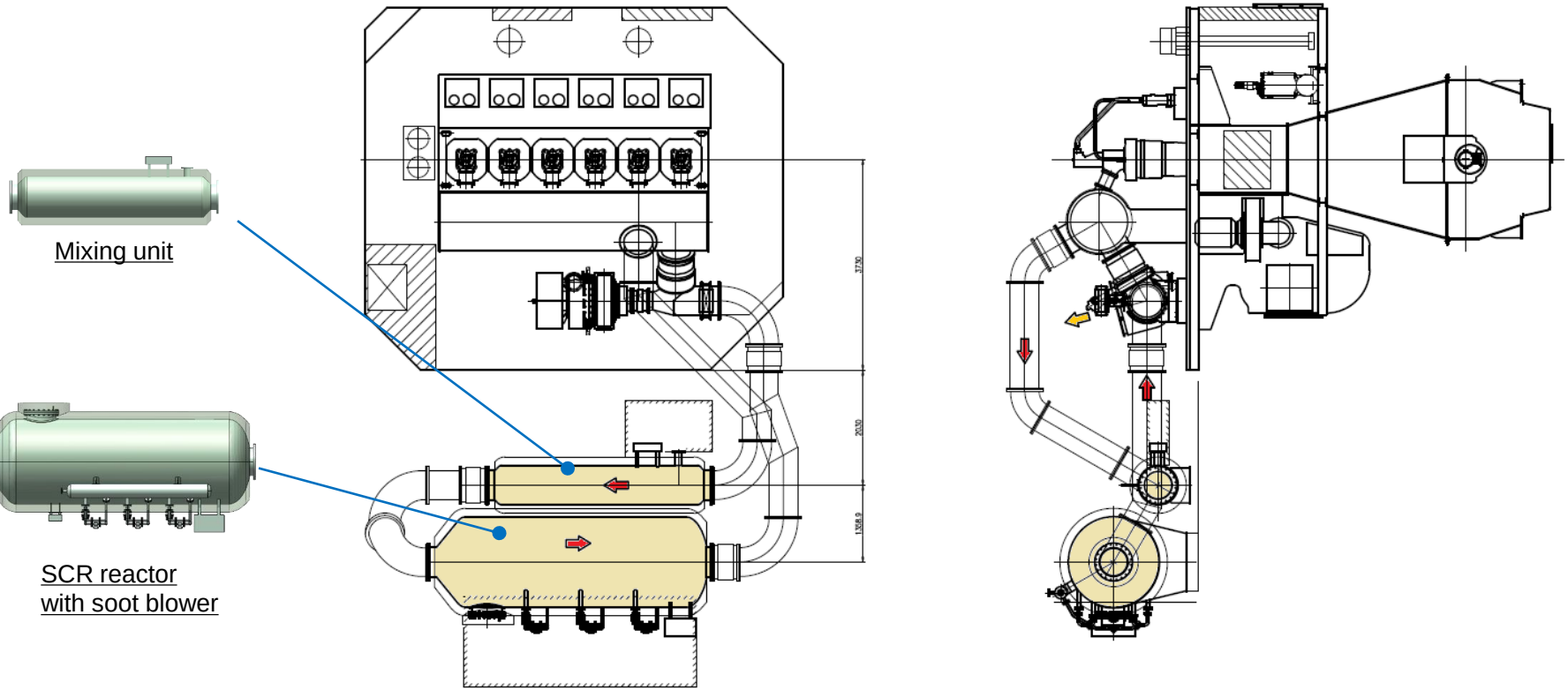
PROVISIONAL

HP-SCR system components are located near the main engine for closely control and exhaust gas exchange.



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Contents

Maintenance of LP-SCR in service

		Maintenance interval						Remarks
		3 months	6 months	12 months	18 months	36 months	60 months	
De-nitration Performance	(Spot Check)			✔				NOx measurement every 12 months
Catalyst	(Replacement of Catalyst)						✔	Replaced when SCR operating time reaches 10,000hrs or 5 years after first use, whichever comes first
Dosing unit	(Replacement of Solenoid Valve, etc.)						✔	
SCR control panel	(Replacement of Board)						✔	

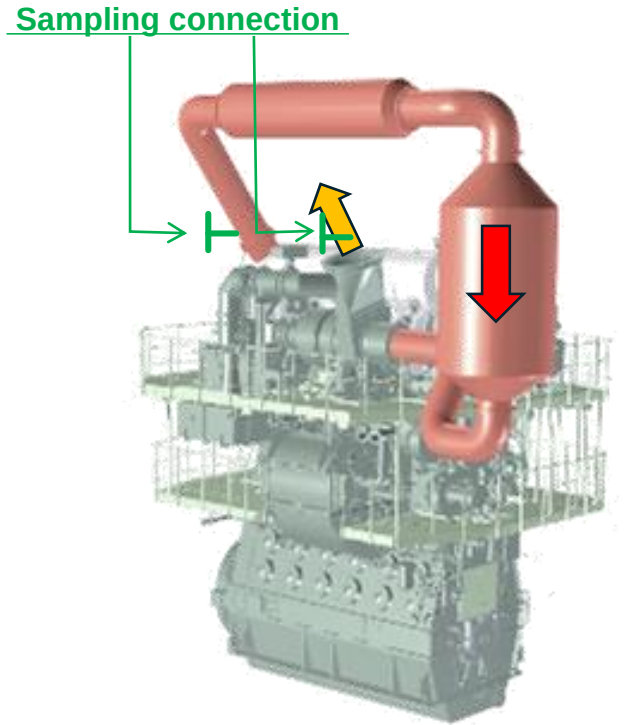
In addition to the above, there are inspections of electrical components and filters, but it is not always necessary to replace them, and they will be replaced according to the inspection status.

Spot Check (1)

- Because of denitration performance in service, SCR should be carried out **annual spot check.**
  It is described in Resolution MEPC. 291 (71) Chapter

- The NOx emission will be measured / analyzed in two sampling connections of exh. gas piping.

  1) NOx emission after engine outlet
  2) NOx emission after SCR reactor



Spot Check (2)

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- For spot check of LP-SCR, the below items should be prepared and used.

1) Low sulfur fuel oil under S 0.1% and less (LSMDO, LSMGO)
2) 32 or 40% Urea solution* (AUS32 or 40)
3) NOx analyzer

Portable NOx analyzer is available for spot check.
(e.g. Testo350 Maritime, etc)

*: The concetration of usable urea solution depends on SCR specification.

〈 Representative portable NOx analyzer (Testo350 Maritime) 〉

Source: photo supplied by Testo K.K

Thank you

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