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Concept of solution for environmental regulation

JUMP <J-ENG Unique Marine Power>

Ultra low FOC engine by MGO(MDO) mono-fuel

UEC-LSJ

JUMP
J-ENG, Unique Marine Power

Concept of "JUMP"

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Merit for all marine stakeholders!

Merit for operator

- Ultra low FOC (both in operation and at port)
- Reducing non-operating risk
- Increase CSR by environmental consideration

Merit for crew

- Easy operation
- Reducing maintenance
  ⇒ Reducing crew's work

Merit for ship owner

- Higher engine reliability
- Reducing non-operating risk
- Reducing maintenance cost
- Incentive of tax and interest, etc.

Merit for shipyard

- SOx scrubber unnecessary
- Simple engine room (Mono-fuel, heating system unnecessary)

What is “UEC-LSJ”？

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In order to crystallize JUMP concept, “UEC-LSJ” is MGO(MDO) mono-fuel engine developed by J-ENG.

- Single responsibility for NOx & SOx regulations

- Combined with “Combustion tuning technology" and “Stratified water injection technology" which are the developed technology of UE engine, greatly lower FOC (※) is realized, complying with NOx Tier2 regulation.
  ⇒Improved approx.5 % of FOC compared with conventional engine on NOx Tier2 condition.
  When the calorific value difference between MGO and the C oil (approx. 5 %) is considered, it's improved total of approx. 10 %.
  （※）Not only in operation, but also reducing FOC of boiler at port.

- Advanced development of 5&6UEC50LSJ

(Remarks)
As for NOx Tier3, complied with by installing『LP-EGR』or『LP-SCR』, which has been developed.

Concept MGO(MDO) mono-fuel engine

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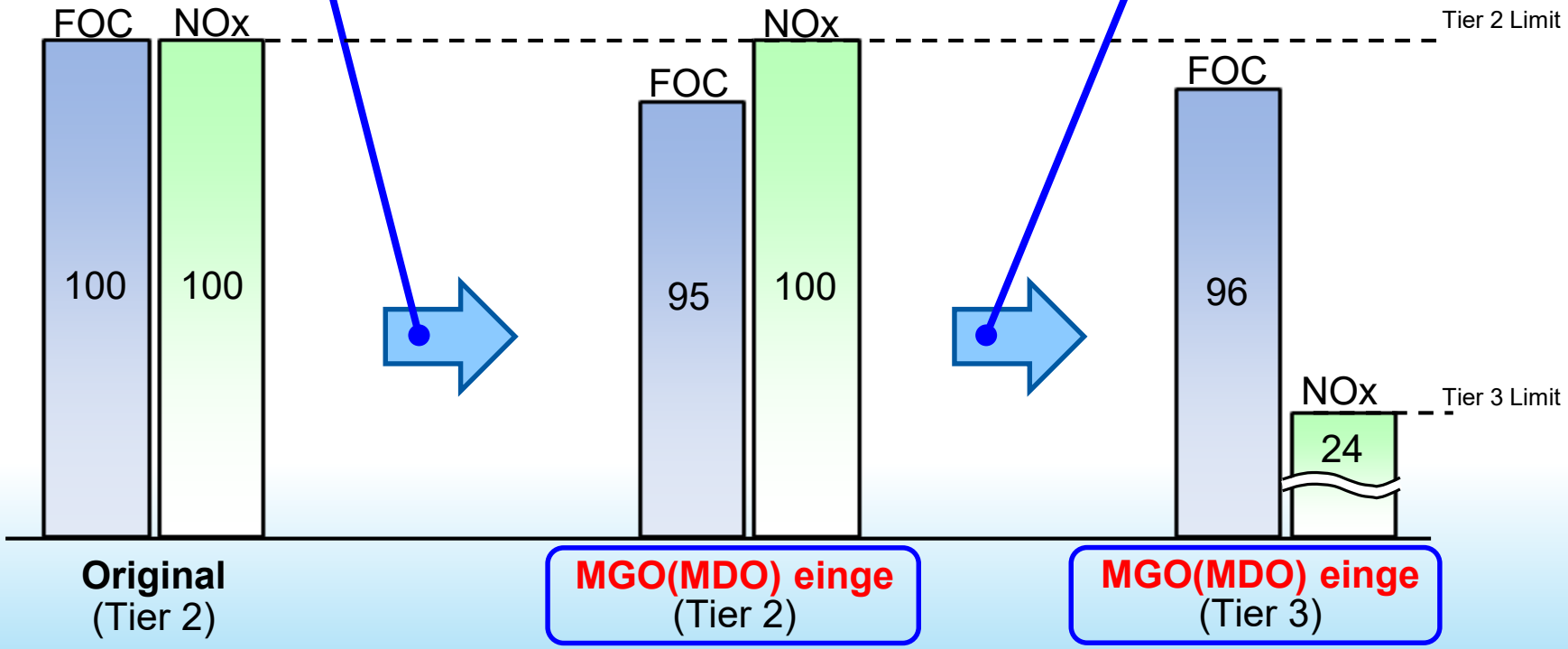
Realize low FOC meeting with NOx regulations by comprehensive UE engine technology and mixture of existing technology

- Ultimate low FOC
  Combustion tuning to prioritize low FOC
- Reduction of NOx
  Application of water injection system

- Compliance with Tier 3
  LP-EGR or
  LP-SCR



Combustion tuning

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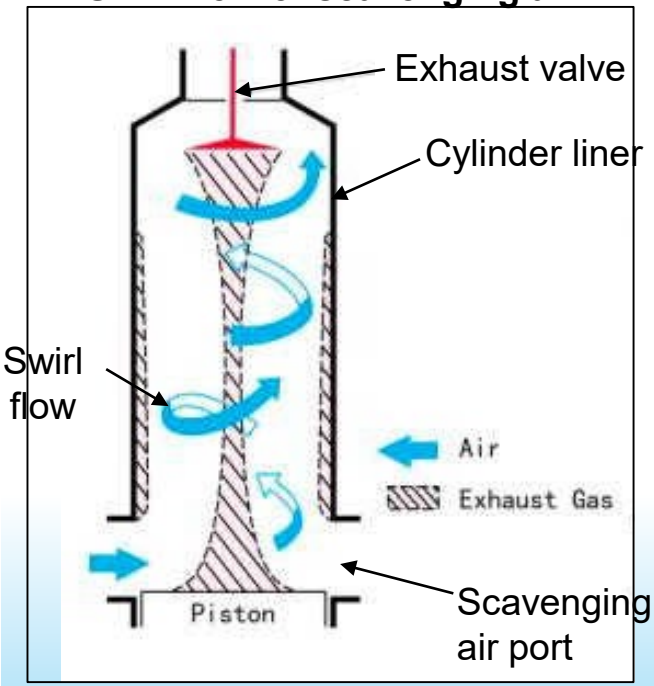
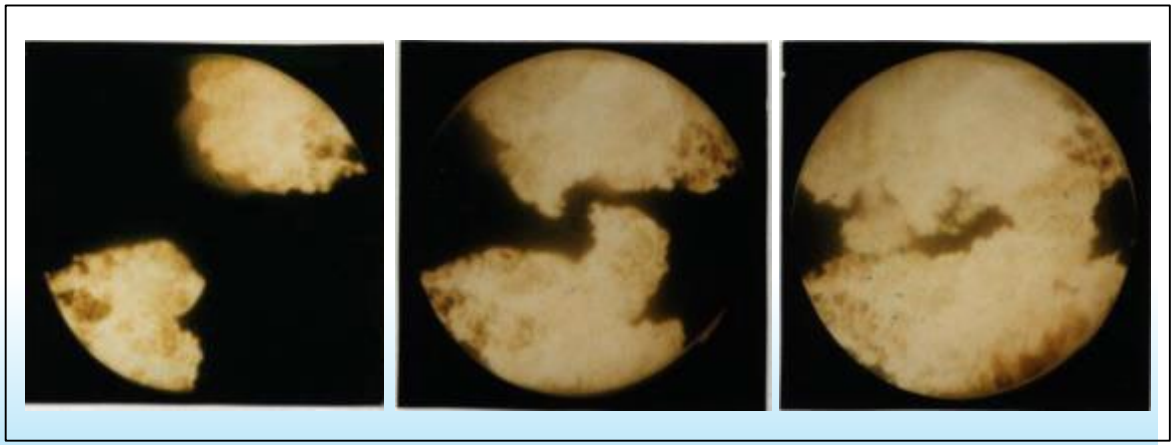
Sufficient mixture of fuel oil and scavenging air for higher combustion efficiency can be realized by

- Appropriate swirl flow of scavenging air port arrangement of cylinder liner, etc.
- Optimization of atomizer design for fuel injection valve, fuel injection pressure, etc.

Swirl flow of scavenging air



Flame in combustion chamber



Water Injection System

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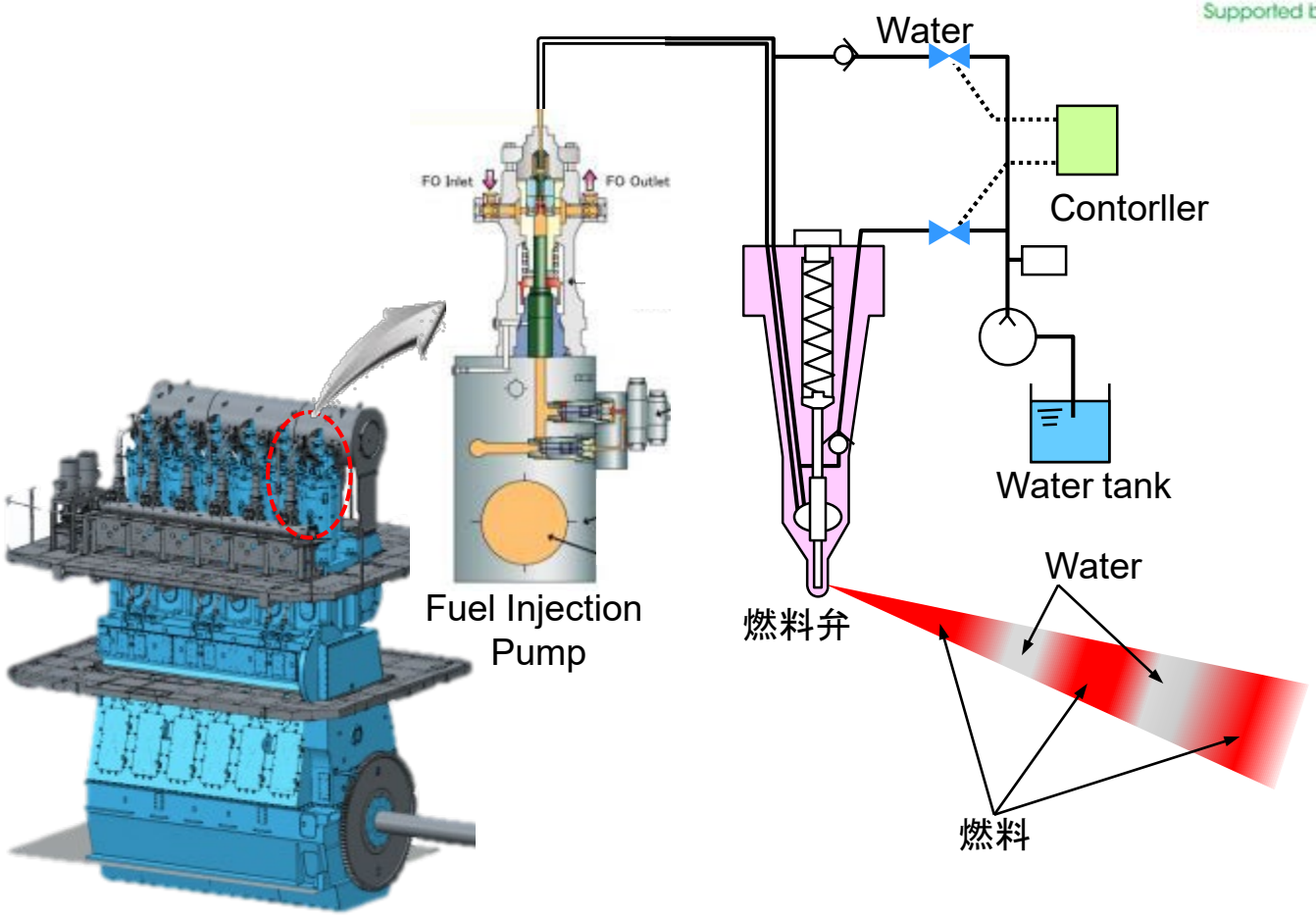

- Insert water in fuel line valve during standstill period of injection at each cycle
- Fuel and water can be injected by layers according to actuation of fuel pump