

# Technical Information Note 003

Remarks

**Steam production control (SPC) for the Wärtsilä low speed RT-flex and X-engines**

Subject

**RT-flex and X-engines**

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## Increasing steam production for the Wärtsilä low speed RT-flex and X-engines

The Wärtsilä RT-flex and X-engines can be equipped with an optional steam production control (SPC) based on an analogue controlled turbocharger bypass valve that modulates the opening on demand to control steam production according to actual need.

### 1. Steam production control (SPC) increases efficiency in steam production

Increasing steam production by means of SPC is more efficient than switching on the boiler. Fuel consumption savings of 2–6 g/kWh are possible, as shown in the example in Fig. 1.

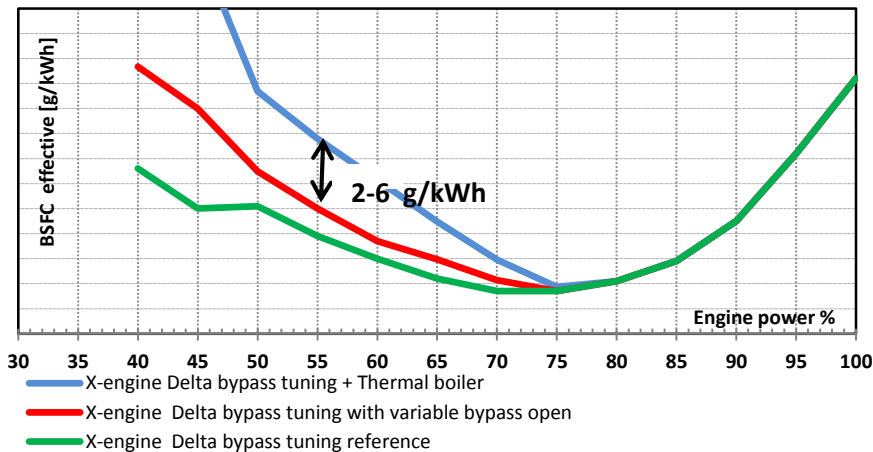


Fig.1 Effective specific fuel consumption (Propulsion + optimised steam production)

**2. Steam production control (SPC) concept**

In order to improve on board steam production using the exhaust gas economizer, the X-engines can be equipped with an analogue controlled exhaust gas bypass valve.

This valve can be opened on demand to the required adjustment when the exhaust gas temperature is lower than the target temperature, or when the steam pressure is lower than required. When the exhaust gas bypass is open, the exhaust gas temperature increases and steam production by the economizer is increased.

The rate of bypass is carefully controlled with particular consideration being given to the control of exhaust gas emissions and the thermal load of the engine.

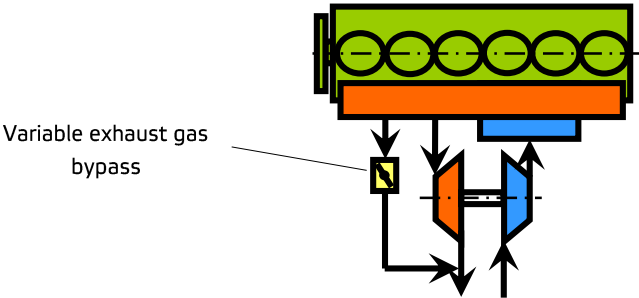


Fig.2 Exhaust gas bypass configuration

The bypass makes it possible to achieve, within limits, the minimum level of steam production needed should the exhaust gas temperature be lower than that required. Without the bypass being installed, the auxiliary boiler needs to be switched on in order to attain the required steam production.

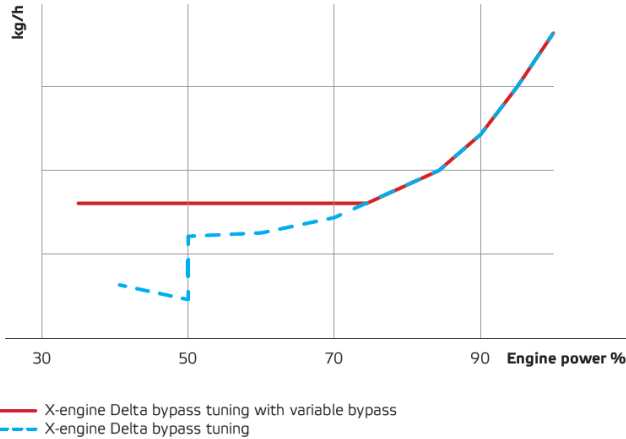


Fig.3 Steam production comparison shows the same X-engine with and without the steam production control (SPC)

### 3. Implementation

For implementing the steam production improvement concept together with Wärtsilä low speed engines, WinGD has developed/specified the following items:

- **Exhaust gas bypass valve control:**  
This controls the exhaust gas bypass valve and modulates the rate of bypass within the limits set by the engine's control system according to the requested steam production.  
It can be connected to external systems, such as the exhaust gas economizer and auxiliary boiler control systems, for exchanging signals so to automatize and optimise the steam production. In such cases, the engine and the boiler / economizer control system becomes the "Master" controller.
- **Exhaust gas bypass valve:**  
This concept is similar to the delta bypass and low load tuning but has been adapted for analogue control.

### 4. Conclusion

WinGD offers this steam production control solution for all low-speed diesel engines in its portfolio. Performance data can be calculated using GTD software from 1Q 2016. Meanwhile, individual projects will be investigated on a case-by-case basis. Please contact WinGD for further information.