ABB has launched the first industry turbocharger air outlet silencer. It reduces the effects of noise generated by compressed air leaving the turbochargers of its latest generation A100-L and A200-L series on low-speed two-stroke engines. The abatement of noise emissions aboard ships has taken on new significance with the 2014 introduction of new International Maritime Organization SOLAS regulations, and now ABB offers a package specifically to support operators in meeting these regulations.

The engine and its systems are a major source of both airborne and structure-borne noise aboard ships. In particular, given that ships are constructed largely of steel plates and the propulsion system is an integral part of the vessel, structure-borne noise poses a special problem since it will be converted back into airborne noise when radiated from large surfaces in the structure of the vessel.

With increasing engine power, turbochargers feature higher pressure ratios and specific volume flows. As a result, the increased energy in the compressed air exiting the turbocharger compressor can lead to increased noise emissions from the surfaces of engine components, despite insulation. This includes noise from the scavenge air ducting system, air coolers and air receivers.

Reducing noise at source
ABB’s air outlet silencer is capable of reducing air-related noise emissions by approximately 5 dB (depending on the turbocharger location, and other variables specific to engines, vessels and engine rooms). With this reduction the noise level perceived by a human ear is almost reduced by half, thus making a considerable contribution to the 5 dB noise level reduction targeted by the SOLAS regulation II-1/3-12 introduced in July 2014. Under these regulations, the revised IMO “Code on Noise Levels” requires new ships to be constructed to reduce on-board noise and to protect personnel from noise.

Aiming to reduce noise emissions at their source, the air outlet silencer employs the Helmholtz principle, adapted to high air flow speeds. It ensures that only a minimum of acoustic energy reaches the engine’s air ducts. An additional insulation ring and further measures complete the air outlet silencer package, unique to the industry as the first product of this type to be available on latest generation turbocharging technology. It effectively lowers noise radiation originating from the turbocharger to considerably reduce the noise levels in the engine room. Moreover, the total contribution of the turbocharger to noise levels in other parts of the ship is also reduced.
Improving health and safety
The new SOLAS noise emissions rules relate to ships built under a contract signed after July 1, 2014, keel laid after January 1, 2015, or with a delivery date of July 1, 2018. Aimed at safer and healthier work places for ships’ crews, they prescribe a considerable noise reduction of about 5 dB in crew accommodation and tighten the noise measurement procedures in engine rooms via noise survey reports.

The ABB air outlet silencer has the potential to both increase the well-being of ships’ crews and to reduce the need for expensive insulation of engines, engine rooms and noise radiating surfaces aboard ships. Beyond the engine room, the total contribution of the turbocharger to noise levels across multiple areas of the ship is also reduced.

Application and availability
ABB expects this level of noise attenuation is especially appreciated on small sized vessels with two-stroke engines, where engine rooms are proportionately smaller and the crew generally closer to sources of noise. Also structure-borne noise paths to other parts of the vessel are shorter.

The noise reduction package with the air outlet silencer is available for A100-L and A200-L turbocharger series. It is a maintenance free product for improving health and safety of seafaring employees.

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