



Visualisering av støy

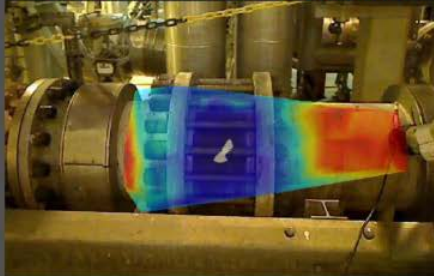
Nyhamna



Torbjørn Aae
A/S Norske Shell

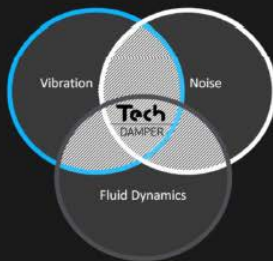
Tech DAMPER

SOLUTIONS FOR LESS VIBRATION



FEATURES

- **Fast and systematic localizing of the noise sources**
- **High resolution sound color map**
- **Visual representation**
- **Wide variety of damping solutions**
- **Customized damping panels**
- **Impedance measurement**



NOISE MAPPING AND DAMPING

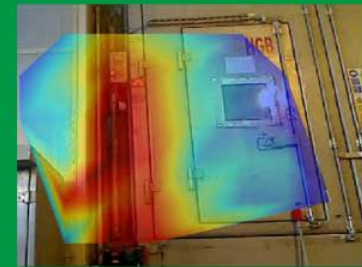
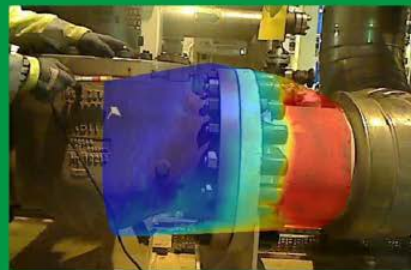
How to see what you hear?



Noise and vibration on offshore installations are gaining increased attention as Health, Safety and Environment awareness continues to grow. High noise levels can cause human fatigue, and increase the risk of miscommunication and human error. Permanent hearing damage may result as a consequence of working environments with high noise levels. The most efficient way to get rid of noise problems is to identify and isolate the source of the problem. Identifying the source may be especially challenging in noisy environments with sounds reflecting from other objects giving misleading measurements. Proper diagnosis is key for effective remedy.

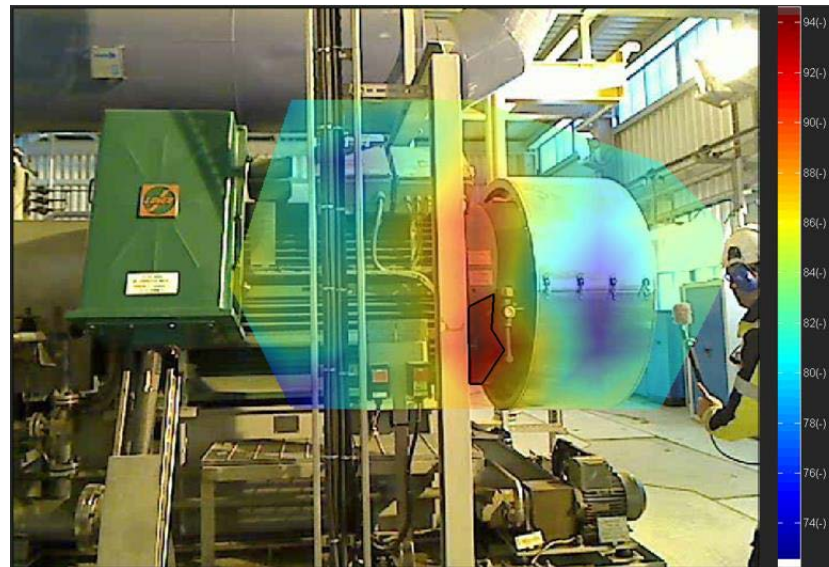
Tech Damper uses special tools to visualize stationary sound fields and to localize a noise's source. This requires techniques beyond traditional sound pressure measurement. Using a special probe, in combination with an HD camera, allows us to visualize the situation by creating a noise picture of the area. Giving a precise and unique understanding of how noise is generated enables Tech Damper to provide targeted and effective solutions. The technique can be used across a wide range of applications from noise scanning of machine rooms, to meeting rooms.

Choosing from a variety of noise damping solutions, noise problems can be solved with minimal material. Tech Damper can also customize noise damping solutions with noise plates and vibration damping tools to provide the most efficient and effective solution to each specific problem.



Målinger Nyhamna

- Benytter en spesiell lydmåleprobe i kombinasjon med kamera og software for å kunne lage bilder av hvordan lyd avgis fra en overflate
- Målingene utføres i nærfeltet 2-5cm i fra flaten. Målingen utføres av to personer, måleproben føres i nærfeltet til konstruksjonen av en person mens den andre passer måle pc og kamera.



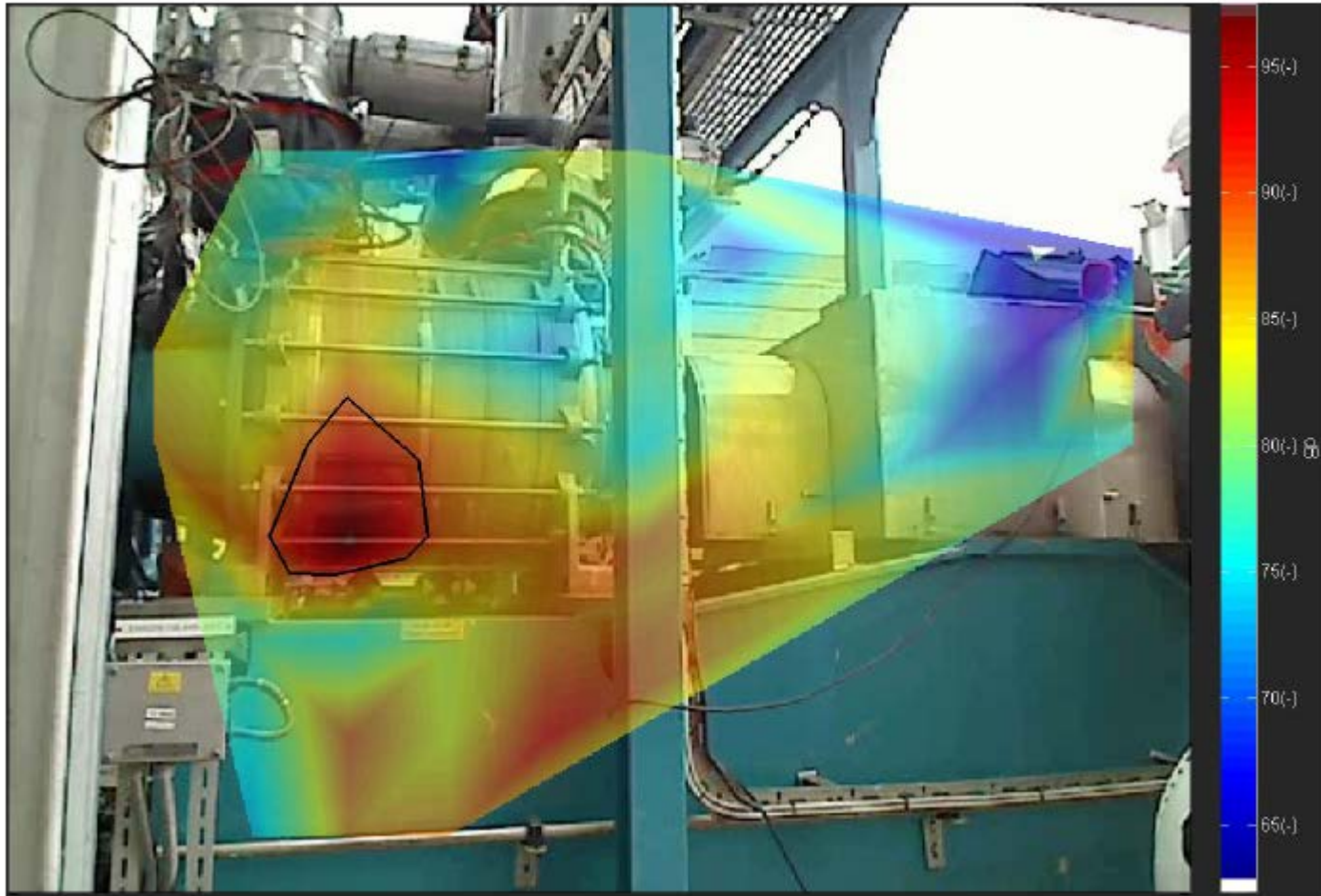
Figur - Området i rødt viser konsentrasjonen og lydintensitetsnivået ($SIL=100,27(re\ 1e-012\ W/m^2)$ dB) som er direkte koblet imot lydeffekten avgitt til omgivelsene. 88 – 355 Hz.

Målinger

- Måleproben inneholder et mikrofonelement og et måleelement for partikkelhastighet.
- Sammen kan de nevnte sensorelementene måle lyd i nærfeltet til en flate som avgir lyd. Kamera filmer måleprobens posisjon i forhold til overflaten, og sammen med algoritmer for posisjonsgjenkjenning er software i stand til å vise avgitt lyd fra overflaten.
- Software kan fokusere på spesielle frekvensområder og vise lite behandlede egenskaper som lydtrykk og partikkelhastighet og behandlede egenskaper som lydintensitet, lydeffekt for et gitt areal og videre egenskaper som transmissibilitet og impedans.

Målinger

355Hz – 1420Hz



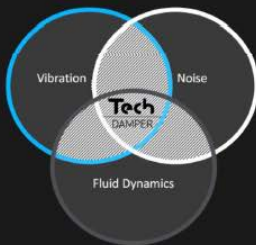
Tech DAMPER

SOLUTIONS FOR LESS VIBRATION



FEATURES

- Up to 99 % damping of resonance
- Large bandwidth
- Retrofitting of existing structures
- Tailor-made clamp-on
- Installation during operation
- No electronic components
- Does not inhibit thermal expansion
- Stainless steel
- Fall protection
- For 0.5 kg to 1000 kg structure



TVB VIBRATION DAMPER

How to remove resonance with an invisible force?

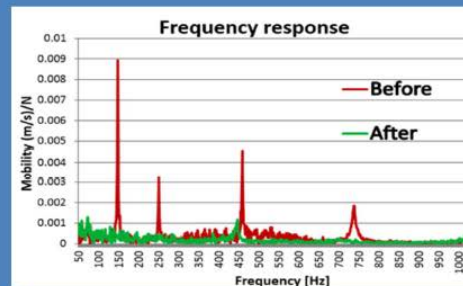


Vibration-induced fatigue can lead to catastrophic failures and result in complicated expensive repairs. Vibrations can exist as “hidden” threats that can be difficult to detect. According to the UK Health & Safety Executive, up to 21% of topside pipework failures offshore are caused by this type of issue.

The TVB Damper is a groundbreaking tool to extinguish resonance and reduce unwanted vibration in any kind of structure where traditional methods, such as pipe-support or fundament modification, are not desirable. The TVB Damper utilizes a two-mass damping technique, tuned to the dynamic response of the system, to effectively extinguish the resonating frequencies that trigger high-level vibration and resulting fatigue. It can be adapted to varying mechanical structure without any modification to existing equipment, and is ideal in situations where support is not possible, due to thermal expansion, etc.

CASE – GAS EXPORT COMPRESSOR

This case was a retrofit to the balancing pipe of a export compressor for gas on a oil and gas installation in the north sea.



Very high levels of vibration were measured at the balancing pipe of a gas export compressor on an oil and gas installation in the North Sea. Due to thermal expansions, traditional supports could not be applied, and a TVB Damper needed to be retrofitted. After it was mounted on the balancing pipe, 98% of resonating frequencies were dampened and vibration was brought down to an acceptable level.



Lydintensitet

- Lydintensitet, er definert som lydeffekten over et gitt areal i en avstand fra lydkilden.