



Noise Reduction at a NAM-compressor Station

Harry Korst

**Flow and Structural Dynamics
(PULSIM)**

**TNO Science and Industry
Delft**

The Netherlands

harry.korst@tno.nl

Willem Brocatus

NAM-EPE-T-PC

**Nederlandse Aardolie Maatschappij
Assen**

The Netherlands

willem.brocatus@shell.com

**4th Conference of the EFRC
June 9th / 10th, 2005, Antwerp**

Abstract:

The introduction of a converted depletion compressor at the NAM-Grootevast location resulted into excessive airborne noise levels that were clearly violating the permitted noise levels. Pulsation and noise measurements revealed that –high amplitude- pulsation levels at the higher compressor speed harmonics (> 300 Hz) were the main cause of the problem. To investigate the attenuation of these pulsation levels a High-Frequency pulsation analysis was carried out, during which the effect of the installation of Multi-Bore Restriction Orifices (MBROs) at well-chosen locations was investigated. The analysis resulted in the recommendation to replace the existing single bore ROs with 15 MBROs. Pulsation measurements after the installation of the MBROs, confirmed a noise reduction of 7dBA. Together with other noise reducing measures like the application of pipe insulation and the sand filling of most supporting structures a total reduction of 15 dBA was achieved, clearly reducing the noise levels to within the permitted levels.

Final analysis shows that in this particular case the combination of a high-speed machine, the reverse flow capacity control system and a sub-optimal design of a re-used compressor was the main cause of the problem. To detect and solve these problems during the design stage, we therefore recommend carrying out a High Frequency pulsation analysis in those cases where a high-speed machines and/or a reverse flow capacity control system is used.