MOSH

MINING INDUSTRY
OCCUPATIONAL
SAFETY & HEALTH

MINERALS COUNCIL
SOUTH AFRICA

TYRE DEFLATION
NOISE REDUCTION
SIMPLE LEADING PRACTICE
ADOPTION SUCCESS STORY

Mining Company	Khwezela Colliery
Commodity	Coal
Operation / Mine	Khwezela Bokgoni
H&S Success Story	Tyre Deflation Simple Leading Practice
Number of Employees affected by H&S Success Story	11
Stakeholders Consulted	RIMEX, MHSC, NUM
Occupations Affected / Benefited	Tyre Bay Attendants

Full description of the risk addressed

It was indicated during the launch of the remote tyre deflation simple leading practice that employees are exposed to noise emissions that are greater than the required OHS milestone during the process of tyre deflation. Khwezela embarked on a process of quantifying the level of noise exposed to employees during the deflation of various tyre sizes used on the mine to determine whether the noise risk is applicable to the mine.

The results of the measure are tabled below:

	Sound Pressure Levels (SPL) in dB (A)	Sound Pressure Levels (SPL) in dB (A)	
Tyre size	Pressure (KPa)	Free to air dB (A)	Time H : M : S
27, 00 R49	700	105.0	00 : 35 : 00
36, 00 R51	710	103.9	00 : 44 : 00
45/65 R45	600	91.6	00 : 31 : 00

Findings and Lessons learned from the adoption of the leading practice or implementation of the company best practice

Following the adoption of the Remote Tyre Deflation Simple Leading Practice (SLP), the following lessons were drawn by the mine from the Simple Leading Practice:

The detailed outcomes of the measurements are presented in the table 1 below:

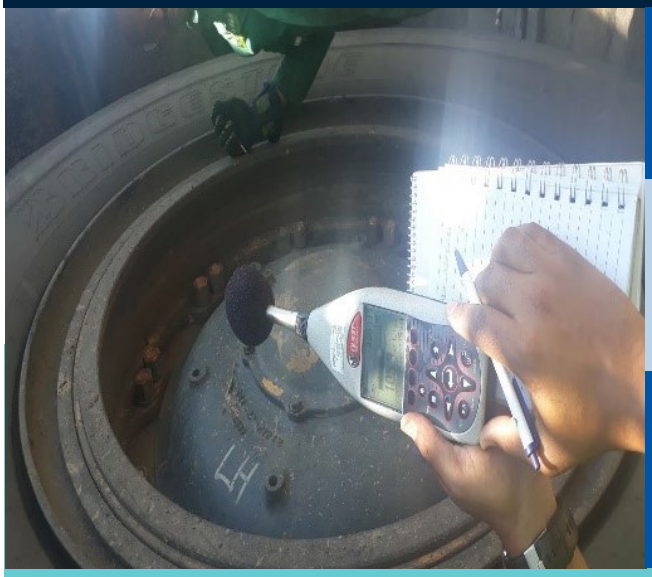
1. There is a significant reduction in tyre deflation duration, when making use of the noise reduction system, when compared to the traditional free to air tyre deflation methodology as depicted in the table below.
2. The operation was surprised, when the procurement costs for the mufflers (About R3000 each) and the fixed pole system installation (About R25 000) was significantly lower, than the original anticipated cost.
3. The maintenance costs associated with the installed systems has been minimal, since the installation and commissioning of the two tyre deflation systems.
4. The adoption of the Simple Leading Practice also reduced the noise emission levels associated with tyre deflation to such low levels, allowing employees to perform tyre deflation functions work without the risk to hearing loss even if no hearing protection is worn.

	Sound Pressure Levels (SPL) in dB (A)	Sound Pressure Levels (SPL) in dB (A)		Sound Pressure Levels (SPL) in dB (A)		Sound Pressure Levels (SPL) in dB (A)	
Tyre size	Pressure (KPa)	Free to air dB (A)	Time H : M : S	Muffler fited dB (A)	Time H : M : S	Work-shop fixed system dB (A)	Time H : M : S
27, 00 R49	700	105.0	00 : 35 : 00	65.5	00 : 25 : 35	54.6	00 : 11 : 26
36, 00 R51	710	103.9	00 : 44 : 00	58.4	00 : 27 : 22	54.0	00 : 12 : 54
45/65 R45	600	91.6	00 : 31 : 00	63.9	00 : 22 : 11	53.89	00 : 10 : 30

Table 1: Documented Noise emission levels and deflation duration, for the TMM tyres in use

Benefits and improvements reported by affected stakeholders

The following Benefits were realized by Khwezela as a result of the adoption of the Tyre Deflation Noise Reduction Simple Leading Practice:



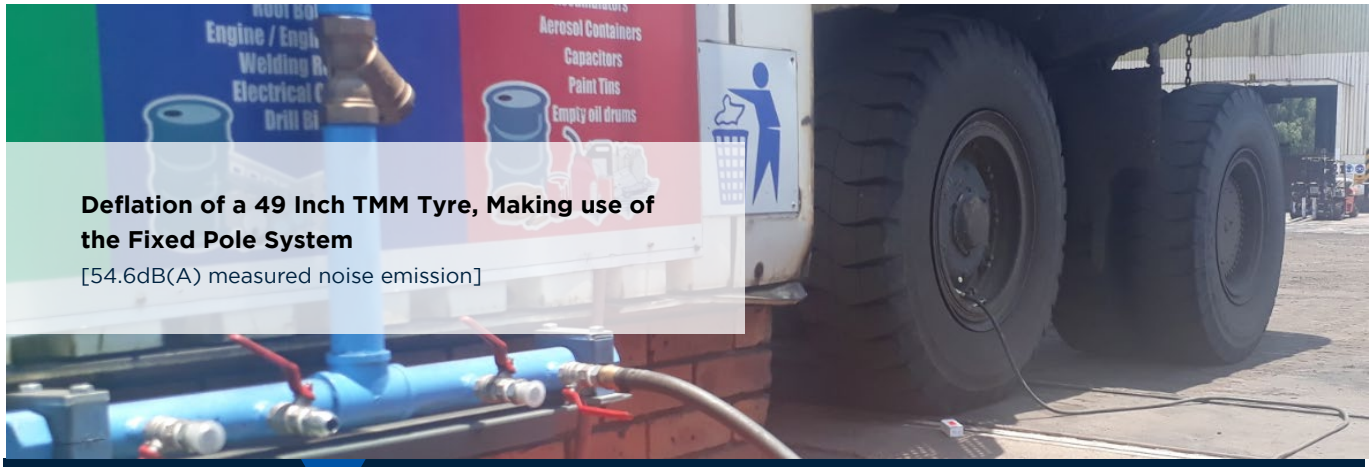
Deflation of a 49 Inch TMM Tyre, Making use of the old Free to Air Method
[105dB(A) measured noise emission]

Health and Safety benefit

1. Significant health and safety benefits were noted, due to the noise risk being engineered away. The Simple Leading Practice reduced the noise risk associated with the deflation of Trackless Mobile Machinery (TMM) tyres to levels significantly below the Occupational Exposure Limit (OEL), with the risk of mechanical injuries during the handling of tyres also significantly reduced.
2. A noise reduction of 46dB with a fixed system and 37dB with a deflation muffler has been realized on average.
3. Employees welcomed the adoption of the Tyre Deflation Noise Reduction Simple Leading Practice, due to the Health and Safety benefits outlined above and it being a simpler, better and more efficient way of working during the deflation of TMM tyres.

Production benefit

1. Employees are happy that the adoption of the Tyre Deflation Noise Reduction Simple Leading Practice resulted in a more efficient way of working as the deflation time has been reduced and multiple tyres can be deflated at the same time.
2. The initial sentiment amongst the work force was that “quitter is equivalent to longer” deflation times. This perception was changed by the studies done to corroborate the adoption benefits to be very efficient and more time now can be used in the tearoom than the shop floor while achieving the required turn arounds.



Deflation of a 49 Inch TMM Tyre, Making use of the Fixed Pole System
[54.6dB(A) measured noise emission]

Cost saving

1. The cost of adoption was very minimal compared to the long-term Health, Safety and Production benefits realized. The cost of Noise Induced Hearing Loss cannot be fully quantified in monetary value due to the social factors also involved, however a happy workforce is a more productive and efficient workforce.

Deflation of a 49 Inch TMM Tyre, Making use of the Mobile Silencer System
[65.5dB(A) measured noise emission]

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