Petra Diamonds – Cullinan Diamond Mine

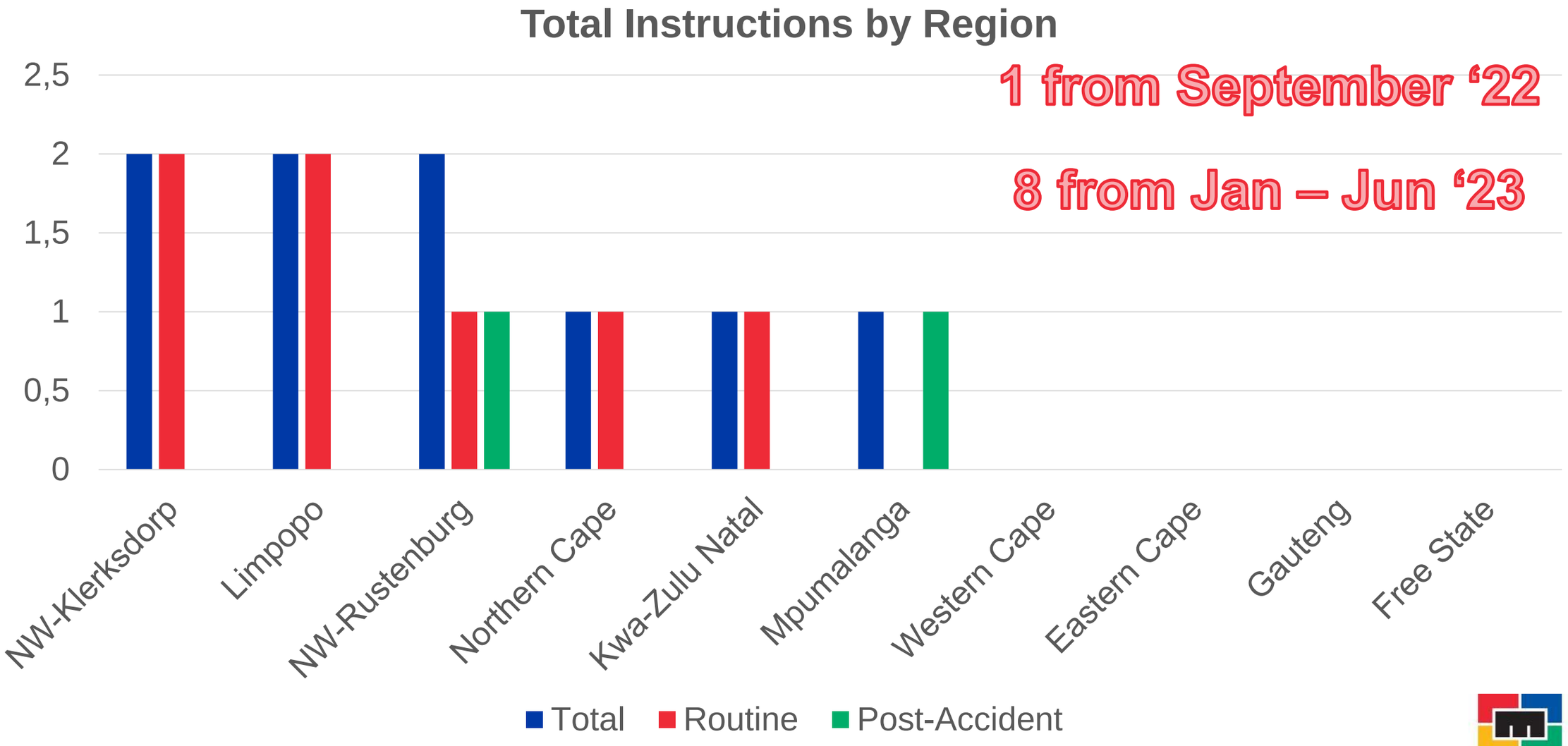
MOSH TRANSPORT & MACHINERY TEAM

LESSONS LEARNT: ANALYSIS OF SECTION 54/55

Multidisciplinary Technical Experts Team Meeting, 22 June 2023

MINERALS COUNCIL
SOUTH AFRICA

Total Instructions



1 from September ‘22

8 from Jan – Jun ‘23

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Objective Observations (“the good”)

Observations
• Inadequate measures in place to ensure that pedestrians are prevented from being injured as a result of collision between the TMMs and pedestrians. Interaction between the TMMs to pedestrian and TMMs to TMMs at the brake test ramp, workshop area, parking and loading bay. • The mine operational standard calls for the installation of centre berms for separating HMEs from Light vehicles when possible. - No separating centre berms on haul roads. • The standard calls for the centre berm where possible, no risk assessment done to provide measures to be taken should it not be possible to install centre berms. • No measures in place to ensure that two-way roadways are visibly separated.

Contentious Observations (“the bad”)

Observations
• PDS warns operators exactly when the TMMs are passing each other, and not a distance away before passing each other. • The Trackless Mobile Machinery at the mine were not installed with proximity detection system. • The mine had No exemption from the office of the Principal Inspector of Mines on the installation of proximity detection system on the TMMs.

Post-Accident Instructions (“the ugly”)

Post Fatality Instruction Findings

1. Poor Traffic Management

- No traffic management plan detailing the rules to guide operators
- No system in place detailing the sequence of activities to be performed by different types of TMMs in the section.
- No dedicated areas for refilling activities of the utility vehicles.

2. Inadequate Proximity Detection System (PDS)

- The PDS device did not "fail-to-safe" to avoid the collision
- Display screen installed on the floor of the LHD operator cabin.
- The PDS/VDS data downloads not available - system not keeping records.
- The lamp of the now deceased did not detect the LHD.
- LHD did not pass the "fail-to-safe" test when tested against different lamps on the bucket side and the engine side.
- LHD did not detect the UV in the area where the deceased person was found.
- The machine-to-person detection warning alarm was not working.

3. Poor maintenance of the Trackless Mobile Machinery (TMM)

- OEM maintenance of PDS/VDS conducted on LHD does not indicate if the test conducted were for vehicles or persons.
- The maximum distance for the green zone is 9m, however 10m was measured and not calibrated.

Post Serious Injury Instruction Findings

- The engineer never inspected the UV in question for PDS/VDS functionality.
- The safety department never covered such machine compliance as per regulations 2.19.1. (b)
- The VDU was never tested on installation. We could not find certificate of compliance which has serial number of the VDU.
- Apparently the PDS was not functional at the beginning of the shift. (Supplier provided the download evidence)
- The DC circuit breaker for the PDS is not enclosed and it allowed operators to switch off the system.
- The PDS of the UV was scheduled to be inspected but it was never done. Apparently the PDS job cards are issued directly to OEM technicians.

Thank you

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