

Berm Monitoring System

Berms (Bunds or Windrows)



Continuous monitoring of dynamic berms

Safety berms of an active mine dump form part of the critical control measures utilised to ensure that haul trucks do not reverse over the edge of a dump, whilst dumping. The laser-based Berm Monitoring System (BMS), with its wide area coverage is used to monitor and identify non-compliant berm heights.

Berms change and degrade in a working waste dump and the BMS system assists by autonomously monitoring for non-compliance. The data can be viewed at the system itself or remotely via the web interface.

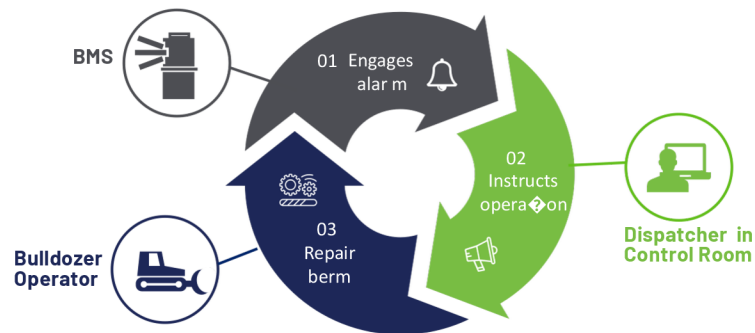
Berm data is relayed automatically to the In-Dozer Navigation Feature which assists the dozer operator in navigating to the non-compliant sections of the berm.

Functionality and alarming

The BMS consists of a highly mobile trailer that can be quickly deployed by means of a light vehicle. The standard system includes a fully autonomous solar powered, uninterrupted power supply. Communication to the control room or any other remote PC is by means of an integrated Wi-Fi or site-specific communication system.

BMS CONTROL CIRCUIT

Together with the personnel in the control room and the dozer operator, the BMS forms a closed control circuit whose task is to prevent and, if necessary, repair non-compliant berms.



01 ALARM

When detecting and identifying non-compliant berms, the BMS triggers an alarm that is automatically sent to the control center.

02 INSTRUCTION

The responsible personnel in the control room observes the alarm on the BMS website and gives instructions so that appropriate repair measures can be initiated.

03 REPAIR

The bulldozer operator repairs the corresponding berm section and reports the repair back to the BMS and control room.

Features

WATER PONDING

The BMS calculates the floor profile of a waste dump, predicting areas prone to water ponding. If low-lying areas are detected before rainfall, they can be rectified and addressed according to water management procedures. This proactive, early detection approach eliminates the possibility of water accumulating in ponds on the dump floor.

DUMP TO DESIGN

Adherence to dump design is a constant challenge during dump construction and is not easily rectified upon completion. The BMS continuously monitors dump design, offering an early detection solution if the design is not followed or exceeded. Non-conformance to dump design carries both legal and monetary implications, often only detected towards the end of the dump's construction. By detecting non-conformance early, mitigating factors are less costly and labour-intensive.

DUMP ADVANCE RATE

A high dump advance rate will result in instability at the dump edge, cracks, subsidence, and potential failures. To ensure adequate material compaction a steady dump and advance is required. The BMS monitors the progress of the dump over the last 24 hours and compares the average distance of the old crest and the current crest. The symmetry then indicates if the progress of the dump is parallel or unsymmetric to the design.

Technical specifications



- Height accuracy: 10cm within the measurement range of 400m
- Standard temperature: 0°C to 45°C
- Optional cold weather kit: -30°C
- Range: 10m to 400m
- Scan intervals: between 3 and 11 minutes range dependent
- Scan envelope: 360°
- Operating system: Windows 10 or Windows server, Web interface



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