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Danger zone modelling – calculation of a danger zone surrounding a blast

EPC United Kingdom PLC > Rough Close Works **5**



DESCRIPTION

Currently, most quarries determine a blast danger zone (exclusion zone) based on a combination of experience and practicality. This often results in the specification of 'a danger zone of convenience', typically set to the boundary of the quarry. This method may lead to danger zones that do not reflect the actual risk involved with the process.

EPC UK has succeeded in implementing an improved approach to setting the zone, governed by mathematics and using software technologies. By utilising a formula explained within the ISEE Blasters' Handbook, together with a pre-determined factor of safety, the company's skilled metrics team recognised that a numerical danger zone could be effectively calculated and implemented. Quarry engineers could safely apply the guidance and improve the positioning of the controllable boundary.

The algorithm can work out the fly rock distance for either a collar, or from the free face. Depending on the unique blast design, this information can calculate maximum fly rock distances using data entry of blast properties, including explosives type, burden, spacing and rock density. The quarry is then free to increase the zone to a controllable boundary – such as the limit of the excavation without compromising any areas which have been identified using the modelling tool.

The modelling software's plotting capabilities also generate an overlay of Google Maps and provide clear, visible information for all individuals involved.

EPC-UK has ensured appropriate, high-quality training for users.

BENEFITS

- Enables comprehensive identification of the danger zone and its potential risks
- Reduced risk of individuals being struck by fly rock
- Enables site to be more effectively managed during blasting
- The system supports quarry managers' practical site knowledge and training
- Helps to change or improve individuals' behaviours surrounding 'using a danger zone of convenience'.

TRANSFERABILITY AND DEVELOPMENT

- The danger zone modelling tool benefits from its ability to 'be developed' as a response to user feedback and subsequent iterations
- EPC-UK will release the software to an increasing number of operations as an on-going process both in UK and internationally

- Danger zone modelling could be applied to other industry sectors such as the wider construction sector, transportation and logistics. It has the scope to be adapted and applied to risk orientated situations and deliver vast potential for safety improvements
- EPC-UK specialist training courses, both classroom-based lessons and virtual webinars, are open to all industry professionals
- The development of the system to utilise both drone surveying and danger zone modelling together.

