

## **Physiological Effects of Underground Mine Rescue and Recovery Work: Vital Sign Monitoring Data Analysis of Mine Rescue Responders at Work**

Presenter: Justin Konrad,  
Ontario Mine Rescue Graduate Research Student (CROSH Secondment)  
Workplace Safety North

The purpose of this paper is to present the findings of a study conducted during the 2017 International Mines Rescue Competition on the physiological effect of underground mine rescue work on responders. The study was conducted by the Center for Research in Occupational Safety and Health (CROSH) based out of Canada's Laurentian University, in partnership with Ontario Mine Rescue.

The scope of the project includes the vital sign monitoring data and analysis from the long duration underground search & rescue task conducted during IMRC 2016. Out of scope is the evaluation of teams that did not register to participate in this study, as well as cross-comparison with previous studies conducted in Poland, Czech Republic or Australia.

The method used was the standardized vital sign monitoring of team members (heart rate, heart rate variability, respiratory rate, skin temperature, core temperature, estimated VO<sub>2</sub> Max, estimated energy expenditure). Each team completed the same 4 tasks in identical conditions and time constraints, with variability occurring due the freedom given to teams in the method of task completion (distribution of work and unique procedures followed by each team's home jurisdiction).

Results will be presented at the 2017 International Mines Rescue Body (IMRB)

Conference with the goal of introducing the concept of live-monitoring of Mine Rescue teams, understanding the physiological stress experienced during actual underground Mine Rescue work, and briefly providing an overview of what Ontario Mine Rescue will be changing from a fitness standard perspective as a result.