

# WORKING ENVIRONMENT: REQUIREMENTS AND RESTRICTIONS AT UNDERGROUND LABORATORIES

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## Background

The Underground laboratories (ULs) can be used for various purposes but firstly you have to know what are their working conditions.

We conducted a common standard of underground working environment in 6 ULs around the Baltic Sea. This standard act as the minimum level on which the working environment must meet.

Moreover, we collected best practices and experiences what ULs have implemented in order to improve their working conditions and lower daily costs.

The results are based on held questionnaire and data collection tour among in 6 ULs.



## Key findings of best practices

- ✓ All the ULs have something unique and practical they have adapted in their operations.
- ✓ The best practices shown have resulted in improved safety, increased usability and accessibility of the ULs.
- ✓ A separate category is investments to reduce daily energy consumption and maintenance costs. For example, for air heating use existing heat sources as waste water from flue gas scrubber and mine waste water (Callio Lab, Finland) and use of intelligent lighting (Äspo HRL, Sweden).
- ✓ Sharing of collected best practices will lead to knowledge transfer and implementation of the better working conditions where new practices can be applied.

## Underground Working environment 4.1.

### Safety, practices and monitoring

Safety and monitoring parameters	Is the parameter / function monitored		How the parameter / function is monitored		Is the monitoring required	
	yes	no			by law	by company policy
Air flow monitoring	yes		periodicaly measurement			
Air flow to individual facilities monitoring		no				
Air quality monitoring		no				
Gas monitoring		no				
Temperature monitoring		no				
Pressure monitoring		no				
Radiation (alpha/gamma)	yes		by individually exposimeters		no	yes
Fire detection		no				
Access to underground	yes		by the operator of the		yes	yes
Access to individual facilities		no				
Communications		no				

Fig 1. Excerpt from the questionnaire

## Key findings of working environment

- ✓ All activities in ULs are subordinated to local laws and regulations. Ownership relations, including liability, are sufficiently clear.
- ✓ Assuring safety is top priority in every UL. Monitored parameters varies in ULs and are chosen according to their local conditions. Minimum what every UL commonly monitor is air flow and access to the underground.
- ✓ Common in UL are availability of self-rescue devices or rescue shelters and trained personnel to give first-aid on site.
- ✓ All ULs are aware of their air and water quality risks and measure them periodically. However, the indicators monitored are different.
- ✓ The noise, vibration, radiation and lighting parameters are also monitored to the extent what is set by local legislation, UL own policy and permits. The frequency of monitoring and how this is done depends on ULs local conditions.



Fig 2. Data collection tour in Äspo HRL