PROJECT GOALS

To evaluate new mobile communication infrastructure in an industrial context where we can validate the technology, applications and business models.

The project will work with the tough requirements for safety, robustness and productivity required of operations in underground mines.
REQUIREMENTS IN FOCUS: SAFETY

How can safety be improved by using a 5G mobile system?

• Robustness
• Coverage ratio
• Applications
How can the productivity of a mine be improved by using a 5G mobile system?

- Bandwidth
- Flexibility
- Coverage ratio
- Efficient network expansion
PROJECT PARTNERS

ABB will work on interfaces for monitoring and control using mobile based communication.

Boliden will participate with domain knowledge, test site and experts on mine environment, applications and installation.

Ericsson will participate with the latest mobile technology and with knowledge of technology and business models.

Luleå University of Technology will contribute with domain knowledge of mobile communications in confined environments.

SICS will lead the project and will provide expert knowledge of industrial digitization, business models and complex systems as well as information dissemination.

Telia will provide core network as well as contribute expertise and business innovation.

Volvo Construction Equipment will adapt and provide equipment for testing automation and remote control.

Wolfit will contribute system knowledge of installation and operation in mining environments.
HOW?

• The project builds a state-of-the-art mobile network in the Kankberg mine.
• Several applications will be implemented, tested and evaluated. From voice communications to control of machines.
KANKBERG MINE OVERVIEW
KANKBERG MINE RADIO DESIGN

Map on previous slide
WHERE ARE WE TODAY?

The PIMM pickup outside Boliden office

The Radio Dot in its enclosure

Wheel loader with installation equipment

First underground Dot ever

Installation discussions
PROJECT PLAN

Use Cases and requirements

Site installation and verification

Pilot 1

Pilot 2

Site preparations

Eco system and business models

Dissemination and exploitation

2015-07

2016-01

2016-07

2017-01

2017-06
HOW WE RUN THE PROJECT

• Lean setup using Scrum of Scrum
• Self organizing WP teams
• Kanban boards
• Distributed teams – organizations and localisations
• Weekly online meetings
USER STORY: UNDERGROUND SMARTPHONES

“As a mine operator I want to use a standard smartphone for my communication because it will be more efficient”
“As emergency doctor I want to monitor sick or injured people in the mine and the whole way to the hospital because it can save lives”
USER STORY: REMOTE LOADING

“As mine operator I want to remotely control my wheel loader, because it will improve productivity”
USER STORY: WIRELESS SENSORS

“As an automation engineer I want to install I/O without data cabling because it will be more efficient”
EXPECTED RESULTS 1(2)

• Safety
  ✓ Fewer people in the production area
  ✓ More connected equipment
  ✓ Seamless above-below ground integration in critical situations

• Productivity
  ✓ Enables automation and remote control
  ✓ Seamless above-below ground integration with mobile systems
  ✓ Monitoring of equipment
  ✓ Preventive maintenance through remote diagnostics
EXPECTED RESULTS 2(2)

• Determining requirements for industrial 5G
  ✓ Environmental requirements – Improved energy performance
  ✓ Improved robustness and performance – Network slices
  ✓ Transport performance – Lower latency, increased bandwidth
  ✓ Economy – Improved total cost for deployment and operations

• Business models and roles
  ✓ Technology provider and operator
  ✓ The industry
  ✓ Contractors etc.