



Physics Department

Potential Usage in Experiments @ CERN

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Overview

- LHC Experiments
 - Layout
 - Communication Needs
 - Use Cases
- Other Experiments
- Desired Functionality



LHC Experiment – Typical Layout

XCR
typically SCXn

Surface Halls
typically SXn, etc.

Personnel Lift

Machine Shaft

Experiment Shaft

LHC

Service Cavern(s)
typically USxn, etc.

Experiment Cavern
typically UXn

one special case:
TOTEM

LHC-Experiment – Typical Organization

□ Operation (24/7)

- XCR manned
 - 2-xx positions
- large On-Call
 - up to 35 counted on first level
- large number of second-level specialists
 - @CERN
 - in the region
 - far away

□ Shutdown/ Intervention Periods

- Operation mode
 - less positions in XCR
- numerous groups of personnel in underground areas

(Radio) Communication Needs

Normal Operation

- Patrols for Short Accesses
- Repairs
- On-Call Services
- Safety Tours

"Shutdown"

- Patrols
- Repairs
- Transports
- Crane Operations

"Problem"

- Patrol
- Communication with
 - SCR
 - TCR
 - different "piquets"
 - Intervention Teams
 - ...

Scenarios – On-Call

without adequate communication means

- person called (e.g. via GSM)
- pass-by XCR
 - gather information
- Intervention
 - together with second person from XCR or other on-call

with



- person called (e.g. via GSM)
- pass-by XCR
 - gather information
 - pick-up handset
- Intervention
 - lone worker possible
 - direct call XCR, TCR, SCR possible
- expert call-in via GSM*

Scenarios – Short Access

without adequate communication means

- persons called (e.g. via GSM)
- pass-by XCR
 - gather information
 - prepare repairs
- Repair Intervention
 - together with several persons in the underground
 - how to re-call?

with



- persons called (e.g. via GSM)
- pass-by XCR
 - gather information
 - prepare repairs
 - pick-up handsets
- Repair Intervention
 - lone worker/group
 - direct call XCR, TCR, SCR possible
 - re-call by XCR possible



LHC-Experiment – Equipment Idea



Operator Station
Localization
Visualization



Handsets for
Pick-up



Handsets for
Pick-up

XCR

US* / UX

“Small” Experiments

- AD, Fixed Target, ISOLDE, Testbeams
 - layout varies
 - in general not underground
 - small experiment teams
 - mostly
 - XCR close by
 - experts on-call
- communication needs
 - XCR ↔ experiment
 - workers/tuners
 - intervening experts
 - XCR/experiment ↔ TCR
 - electricity problems, etc.
 - XCR/experts ↔ Piquets
 - electricity, ventilation, ...
- functionality
 - localization
 - lone worker protection
 - basic alarms

Desired Functionality

- all-around communication
 - direct work communication
 - surface ↔ underground
 - group calls
 - SCR/TCR at a keypress

- safety monitoring
 - basic parameters
 - ODH
 - Temperature
 - Radiation
 - localization



- lone worker protection
 - in line with safety rules
 - rapid communication
 - basic alarms
 - ODH
 - Temperature
 - Radiation
 - localization
- localization
 - more direct help possible
 - in connection with sensors/scanners easy mapping and tracing

Conclusion

- all experiments and projects in PH (*whom I talked to*) are
 - interested in a secure communications means
 - interested in lone worker protection
 - interested to have a more direct connection to TCR/SCR
 - happy to help testing
 - appreciating the EMC advantages of a single system
 - willing to develop further steps/procedures in a coherent approach in order to use the given advantages

- all LHC Experiments would be interested to have the system soon for normal operation especially for the wider operations during the coming long shutdown