

Use Case Scenario: Challenge Nr. 3

Remote inspection in CERN hazardous environments



Mario Di Castro

CERN
Route de Meyrin 385
Geneva, 1217
Switzerland
Tel.: +41 (0)22 7662-849
E-Mail: mario.di.castro@cern.ch

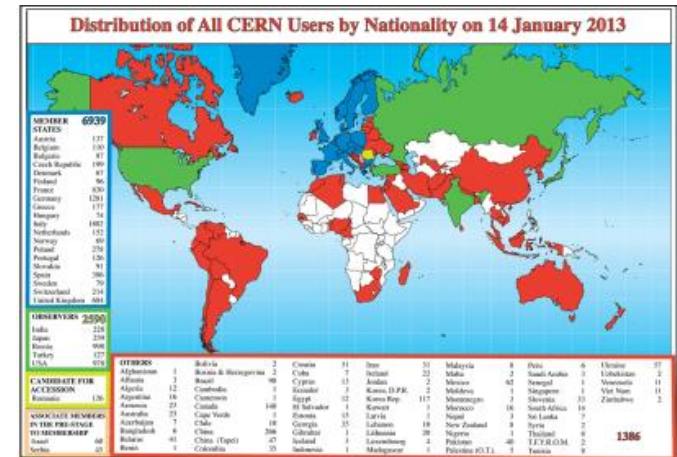


Company Profile



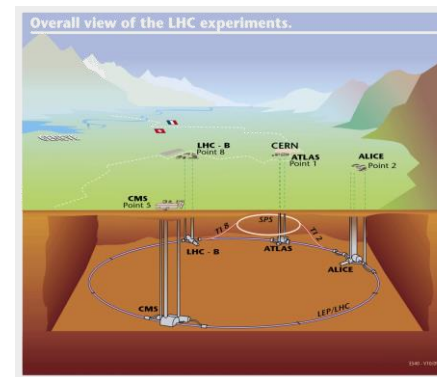
CERN: European Organization for Nuclear Research

- Founded in 1954
- Located in Geneva region (CH/FR)
- Today it counts 21 member states
- 2300 staff
- 1000 personnel on contract
- 11000 users



LHC: Large Hadron Collider

- World largest machine
- 27 km diameter, 100 m underground
- Colliding proton and lead ion beams
- 7 + 7 TeV



CERN is a European laboratory working to European safety standards and competing for funding in the international field of high energy physics

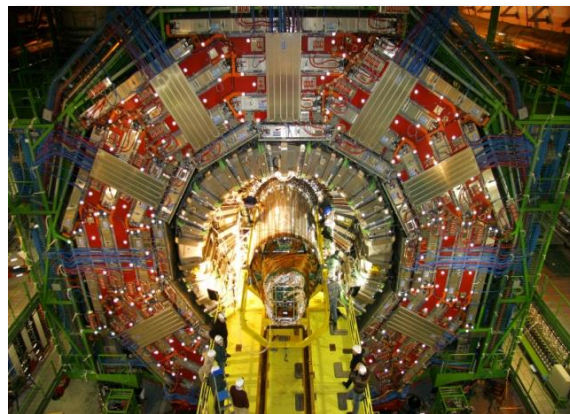
- **Motivation**

- Needs for autonomous equipment to inspect harsh and unstructured experimental environments
- Reduce exposure of personnel to hazards
- Maximize running time of accelerators



- **Obstacles**

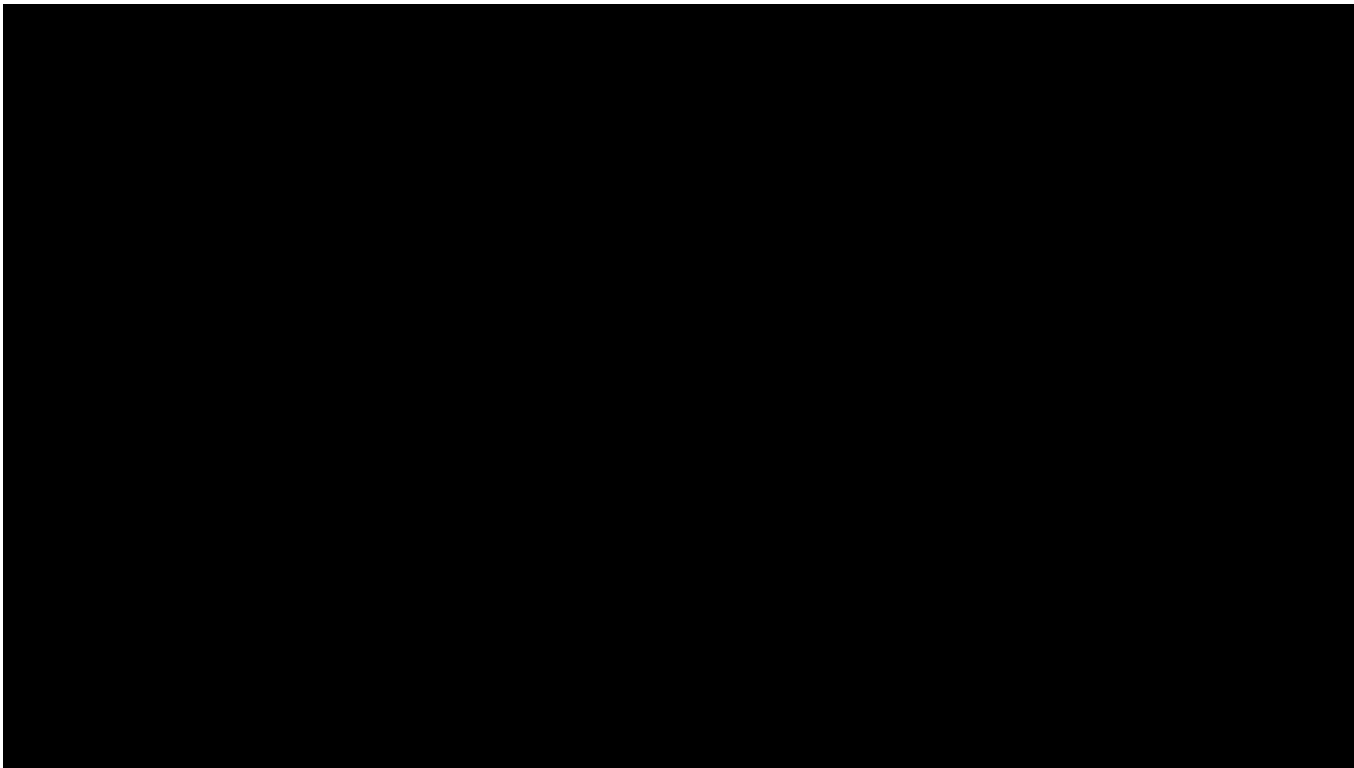
- Unstructured environment
- Obstacles
- Space and distance
- Delicate equipment
- Dust, dark
- Communication



Use Case Description

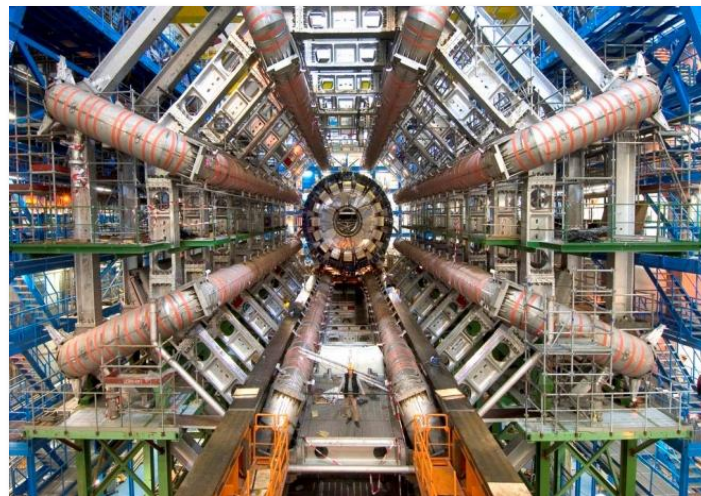


- CERN Accelerators environment challenges: video

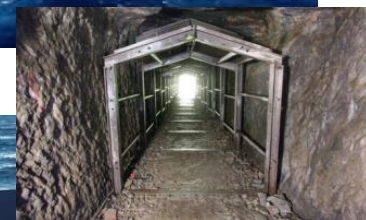
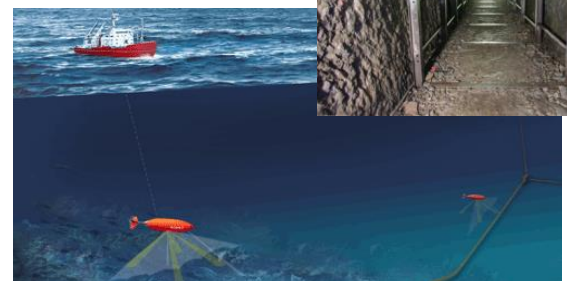


Current status @ CERN

- Inspections are required to investigate environments and fault signals from the underground accelerator tunnels and experimental caverns. For example coolant water leaks or vacuum system leaks
- Or to carry out measurements such as radiation level surveys
- Currently stop the machine and send in technicians



- **Expected impact and benefits for CERN**
 - Increase of personnel safety
 - Reduce time of intervention increasing operational time of multi-billion euro facility (important when competing for future funding)
- **Expected impact for different industrial fields**
 - Techniques learnt at CERN from Euroc could be directly transferrable to other European potentially hazardous industrial environments
 - Inspection (buildings, pipes, offshore facilities)
 - Search and rescue
 - Production environment
 - Medical (carriers of blood, washing, food ...)
 - Logistic
 - Staff localization in harsh environment
 - Human guidance



Thank you