3D Scanning of a hot cell in the LECA-STAR Facility

S. MARTIN-VIGNERTE - CEA CADARACHE

5 OCT. 2016
Main issue

- Geometrical data in hot cells (equipment / structures / interfaces) are usually not well known. It can lead to:
  - Some mistakes during design of new components (interface boundaries),
  - In case of people access, complicated and / or irradiating operations to perform simple dimensional measurements,

- The goal is to have a reliable geometric reference of a cell in order to give a consolidated environment for equipment design studies.

Technology identified to meet the needs: 3D scanning

- This technology is developing rapidly in conventional industry to characterize civil-engineering structures (interior and exterior),
- Enables rapid and full characterization of an environment,
- -> to be tested on a hot cell.
Operating principles

- Measurement of a distance by laser beam
- Measurement of a vertical angle
- Measurement of a horizontal angle
- -> creation of a point cloud with XYZ coords
- Scanning at ~120 000 dot/s
- Software reconstitution of the point cloud for later use,

Performances (scanner FARO)

- Range from 0.5 à 50 m
- +- 2 mm accuracy at 50 m
- Class 1 laser beam (no need of operator protection),
- remote operable through Wi-Fi. Standalone operation (SD card for data storage)
- Purchased by the LECA-STAR in 2015
Operation achieved on 23\textsuperscript{th} and 24\textsuperscript{th} of September 2015

Devices used

- The scanner was supported by a perch, remotely operable and secured with the crane,

- The perch allowed XYZ movements above the cell from the roof,
preliminary verification of scanner and tools
Scanner protection and fixing on perch
Roof opening
Setting up of the scanner support
Measurement acquisition
Correct functioning of the scanner with a dose rate of 500 µGy/h,
No contamination detected on the scanner,
Support device simple and easy to use
Very good quality and accuracy of results

Scan 3D of other cells on progress