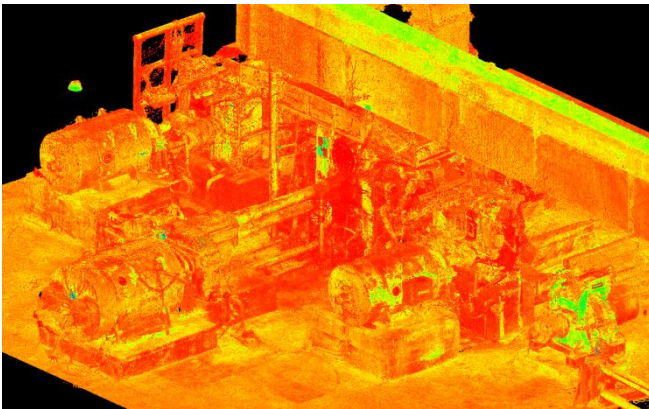




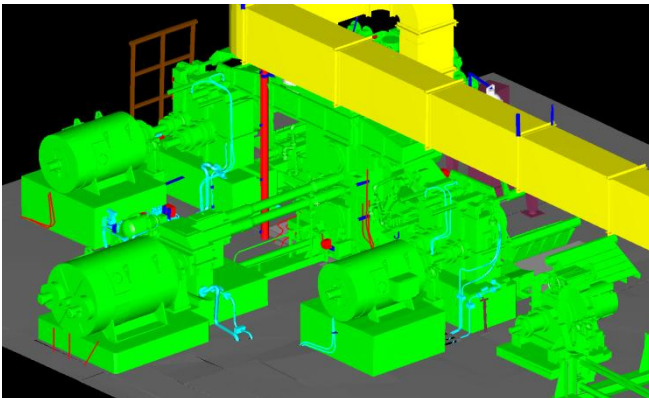
## 3D SCANNING / 3D MODELING OF INDUSTRIAL INSTALLATIONS



View of the industrial installation



Initial data (point cloud)



3D model, final deliverable

### Introduction

As accuracy is critical in the revamp process of new production facility systems, our team was contracted to realize a series of 3D scanning measurements of the industrial area with the main purpose the creation of 3D models.

For the production of the accurate 3D model of the infrastructure, our team used the powerful Leica Scanstation P40 to collect 3D Point Cloud data which were used for the production of a detailed 3D model of the unit (Infrastructure Model).

The method (laser scanning) has a positive impact in the project including:

- elimination of field interferences
- less rework
- increased productivity
- fewer requests for information
- less cost growth, and
- decrease in time from start of construction to facility turnover

### Utilised Geodetic Instrumentation

- Laser Scanner Leica P40
- Laser Scanner Registration Targets
- Firmware
- Leica Cyclone 9.2.1

### Deliverables

- 3D model of the industrial installation

### Difficulties

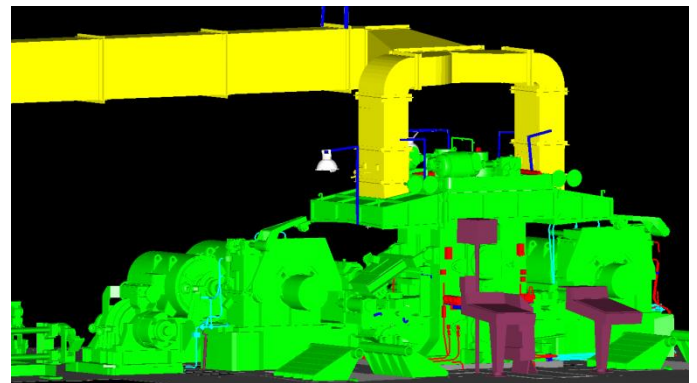
- The daily working schedule of the plant
- The complexity of the installation
- Elimination of movements/ vibration
- Cleaning condition of the external surfaces



## Measurement series 1

The first action was to place adequate number of black and white targets all around the installation. Targets were well recognizable and they had a size of an A4 paper. Additionally, 4 smaller targets were used in order to offer additional constraints. The whole installation was covered through 47 setup positions of laser scanner with over of 2 billion of points.

After measurement series completion, all data were loaded to the Leica Cyclone 9.2.1 software for further processing. Then the point clouds were registered by using the mathematical algorithm for the 100% of the common part between two point clouds. After the connection of all point cloud the final unified point cloud was ready to be cleaned of all irrelevant objects captured during scanning. After that the creation of the model begun. All objects of the installation were drawn with the use of geometric primitives. The accuracy of the object is better than 5mm. The deliverables (3D model) were delivered for the design and installation of the system.



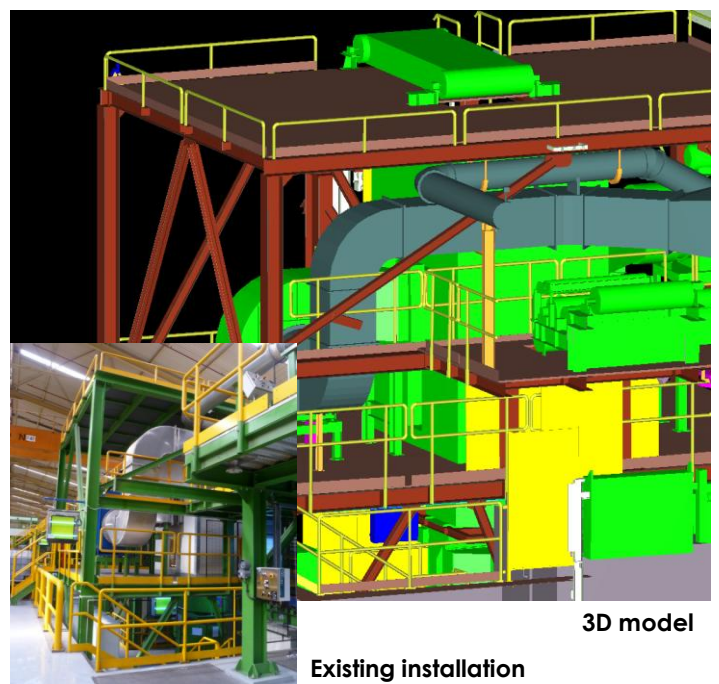
**Production facility system / 3D model** Field Work : 1 day / 1 staff member, Office Work: 10 days / 1 staff member

## Measurement series 2

The same procedure was followed for the 3D scanning and 3D modelling of a different type of production facility system.

**Field Work :** 1 day / 1 staff member  
**Office Work:** 10 days / 1 staff member

Difficulties that can be dealt with, are mainly due to the variety of materials and their reflection coefficient, oily or unclean external surfaces and accessibility.



Existing installation

3D model