

## PROJECT REFERENCE LIST :

This list provides a small selection of the many different laser scanning projects and customers that LODAHL has been involved with since the introduction of laser scanning in 2001 .

### Customer:

Oestre Gasvaerks Theatre.

### Project:

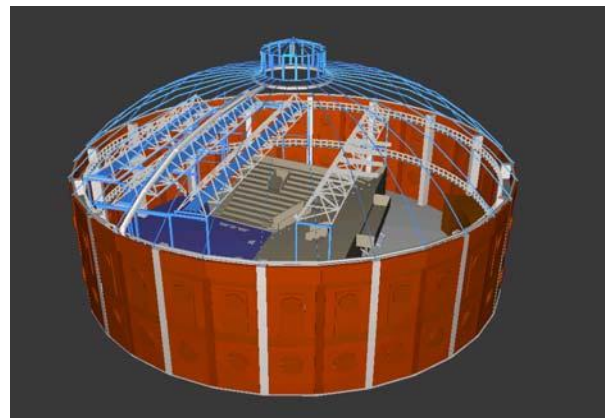
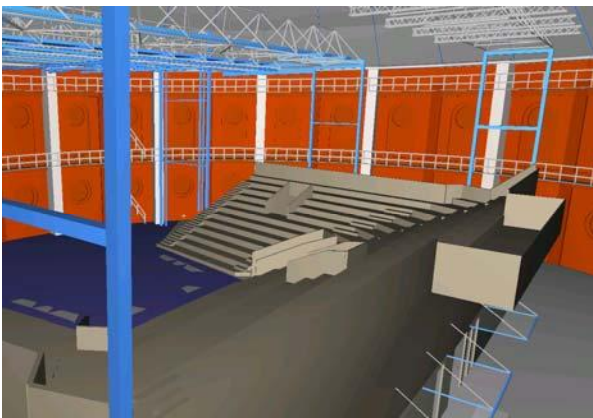
Inside scan building.

### Purpose:

Mapping of stage and audience area..

### Delivery:

3D CAD model.



The customer asked for an accurate CAD model that included the full interior surrounding the stage, including the load bearing steel structures for lighting, sound, and scenery. With the 3D model it is now possible to virtually visualize the stage technique and setup “in the stands” before the setup and scenery production has been initiated

## Customer:

(Burmeister & Wain Scandinavian Contractor A/S)  
(Bahamas Electricity Corporation).

## Project:

A remote scan design project from Denmark.

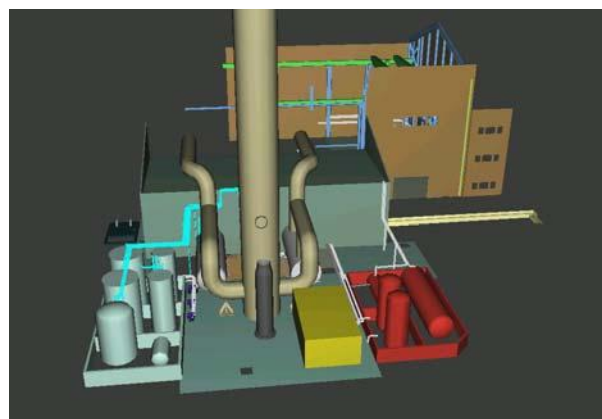
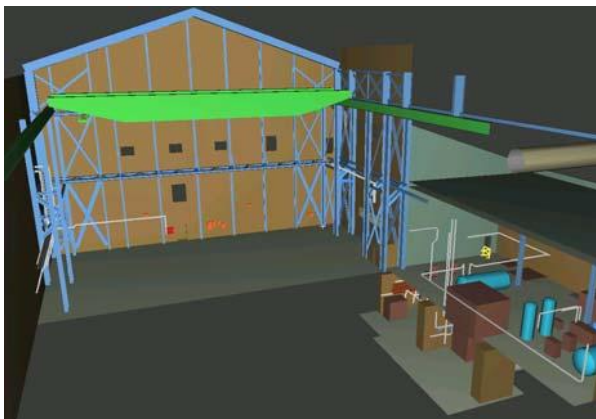
## Purpose:

In connection with an increase in capacity there was a need for an “as built” model of the existing installation..



## Delivery:

3D CAD model.



The extension of the power plant, with an additional diesel generator meant some work with space management to classify the new equipment and piping. In addition, the customer wanted a high degree of prefabrication before the actual installation.



**Customer:**

Statoil refinery in Kalundborg.

**Project:**

Continuous scanning of the processing plants with various alterations.

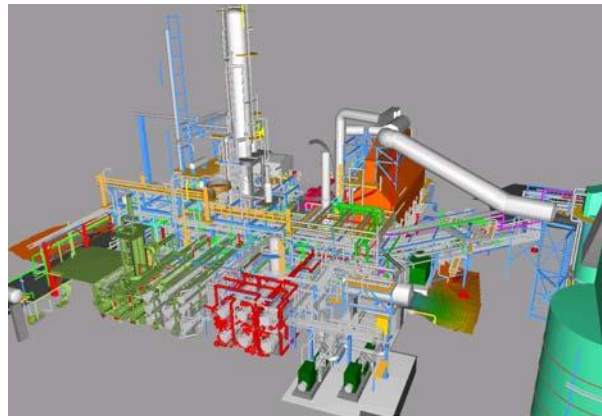
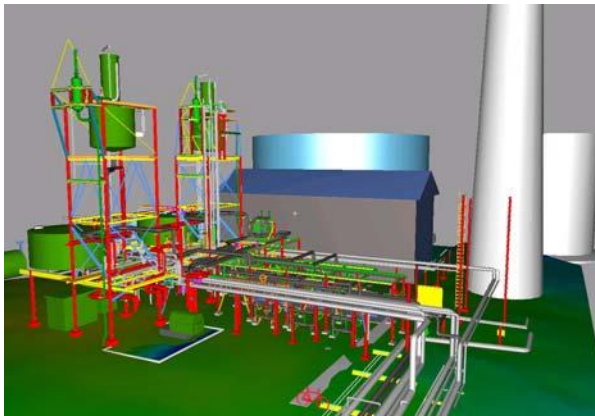
**Purpose:**

To ensure proper design and fabrication, and to reduce the shutdown period of the system during the assembly process.



**Delivery:**

3D CAD model.



Statoil has used 3D laser scanning since its introduction in 2001, and it has become a fully implemented design tool for the company. Overall, 30,000 objects have been modeled from point clouds.



**Customer:**

DONG Energy (ENERGI E2)

**Project:**

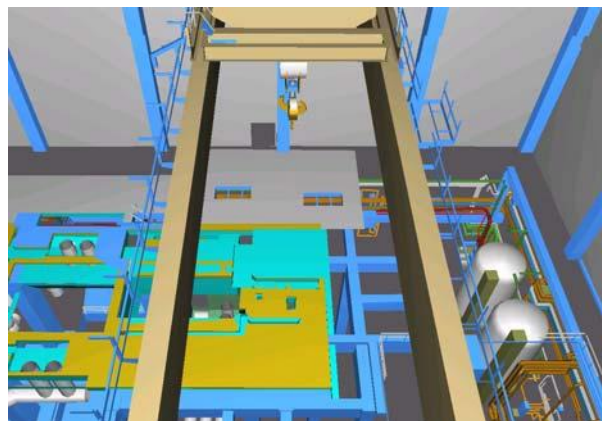
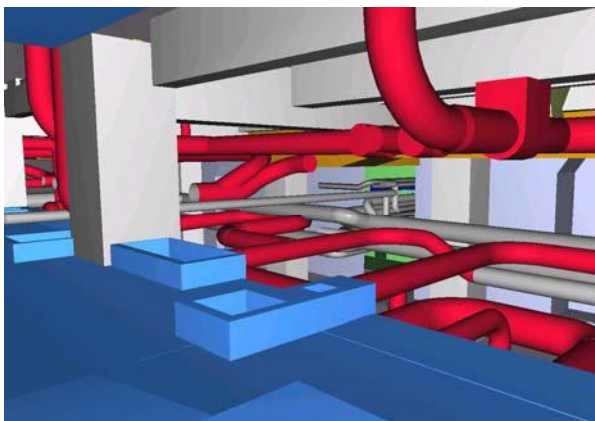
Continuous scanning of power plants.

**Purpose:**

To use 3D laser scanning for space management tasks and modeling of their existing buildings and structures for use by both the builders and subcontractors.

**Delivery:**

Registered point cloud/ 3D CAD model.



LODAHL has an ongoing collaboration with DONG Energy (formerly E2) utilizing 3D surveying, scanning, and modeling. Since the introduction of 3D laser scanning, DONG Energy has used this technology for all relevant tasks of a certain size. It is used partly for 3D modeling and partly for space management tasks. Point clouds are used to check the new designs.

## Customer:

Maersk Oil & Gas.

## Project:

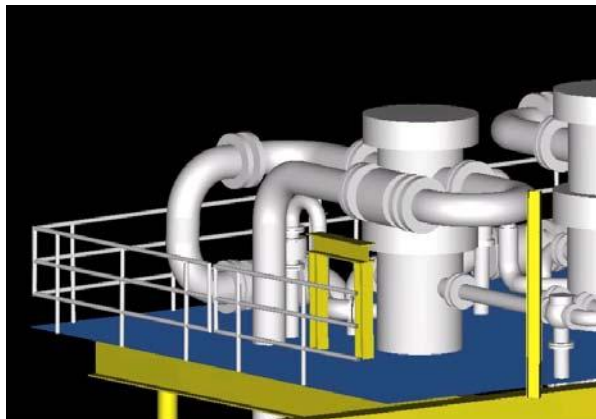
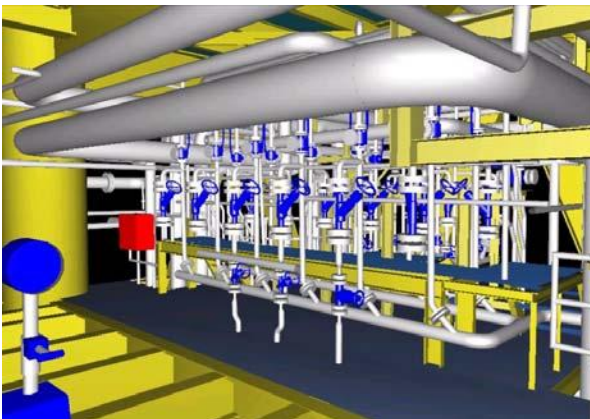
Continuous scanning of platforms and devices, both on and offshore.

## Purpose:

To use point clouds to control particular designs as the basis for the design and for compatibility checks.

## Delivery:

Registered point cloud/ 3D CAD models.



Maersk Oil has, with its highly complex pipe systems and compact design, the great benefit of being able to ensure the design geometry, even before it is put into production. 3D laser scanning is often used in combination with 3D dimensional control in close client collaboration.



**Customer:**

Novo Nordic Engineering (Pfizer, Stockholm), (Novo Nordic, Gentofte).

**Project:**

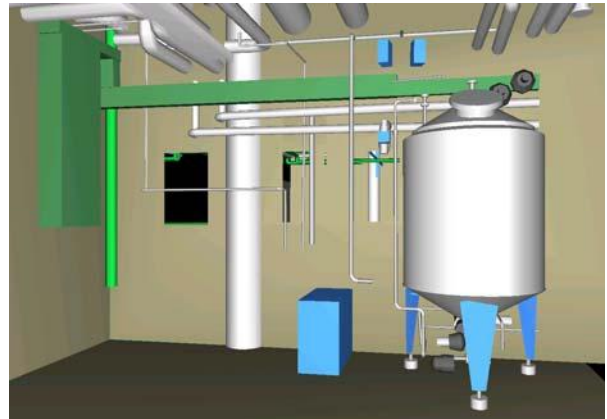
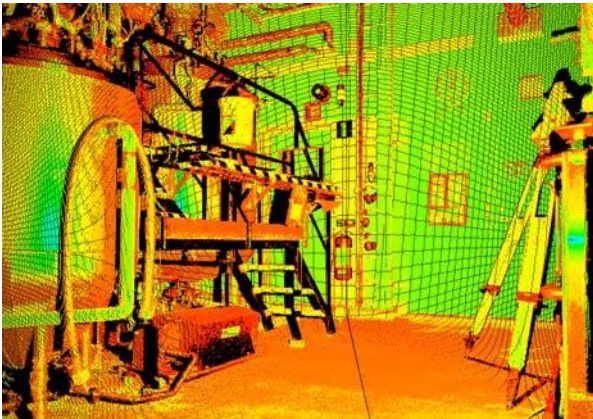
Scanning processing plants.

**Purpose:**

To use the registered point cloud to form the basis for remote design.

**Delivery:**

Registered point cloud/ 3D CAD model.



(Left picture) LODAHL performed laser scans for NNE of selected areas on the Pfizer pharmaceutical factory in Stockholm. Pass is a registered point cloud by which NNE can the program Cloud Works. (an add on for AutoCAD).

(Right picture) When converting a sterile room, Novo Nordisk Gentofte chose laser scanning as a design tool. When the room was scanned, an accurate design and the correct prefabrication was performed with virtually no access to this space.

**Customer:**

Ramboell (Amersham Health AS).

**Project:**

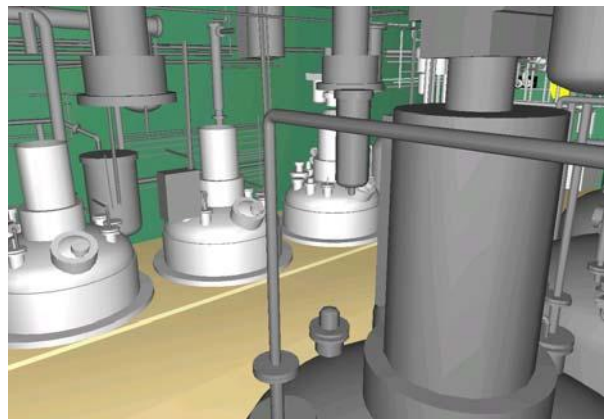
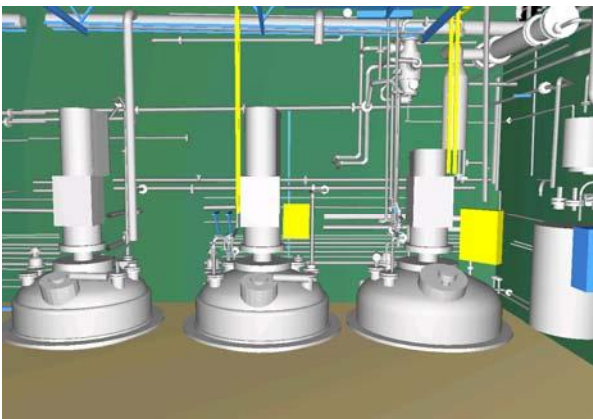
Precise modelling of the processing plant from point cloud provided by the customer.

**Purpose:**

To use the modeled 3D CAD elements to form the basis for the remote design.

**Delivery:**

3D CAD model.



Lodahl assisted Ramboll in the designing of the expansion of Amersham Health A/S using modelling of point clouds provided by Ramboll. The extensive scanning allowed the redevelopment to be made from Denmark. Overall, 12,000 objects were modelled from 3D laser scanning.



**Customer:**

Haldor Topsøe (JSC "AZOT", Cherkassy Ukraine).

**Project:**

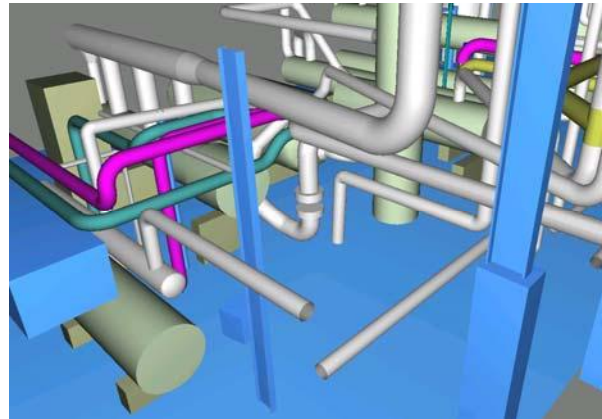
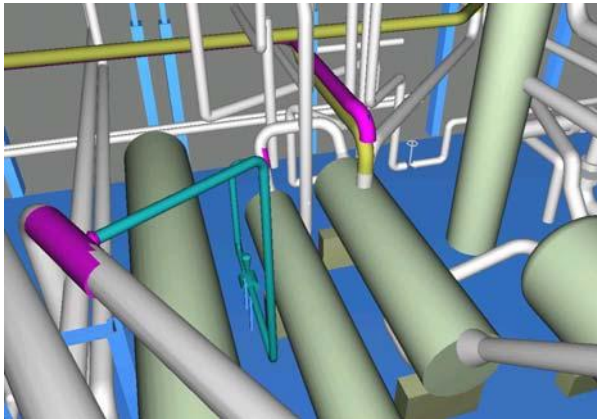
Scanning the processing plants located in the fertilizer plant.

**Purpose:**

To use the registered point cloud to form the basis for the correct remote design.

**Delivery:**

3D CAD model.



This was considered a “revamp” project, and the customer wanted to know the calculations and design for such a number of new high pressure pipes. LODAHL provided an “as built” 3D CAD model to Haldor Topsoe, and the result was responsible for the new design.

Finally, a compatibility check of the new design implemented in the point cloud and individual tubes course was addressed.

The technology of the 3D laser scanning in the Ukraine sparked great interest amongst a group of factory engineers.





**Customer:**

DONG (Danish Oil and Natural Gas).

**Project:**

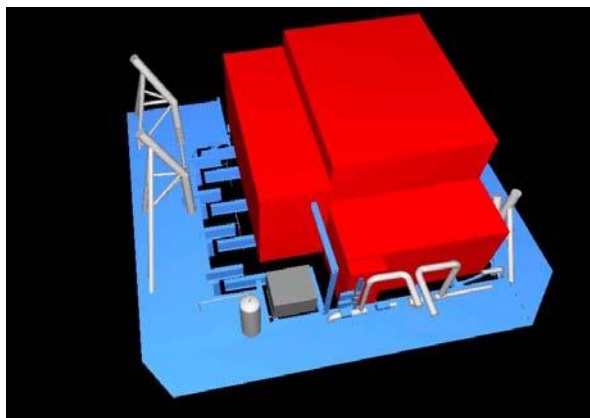
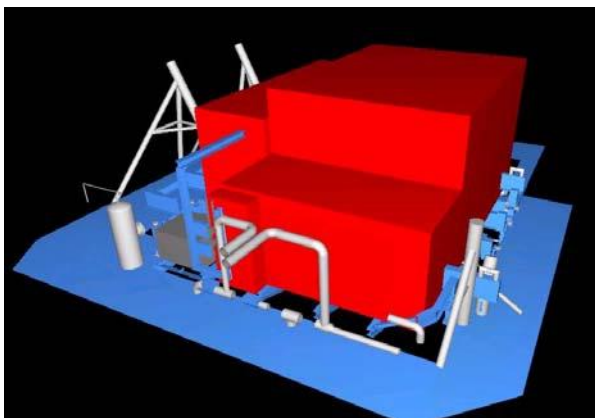
3D surveying and laser scanning of a new compressor deck to the Siri platform.

**Purpose:**

To provide continuous control of the design as well as compatibility checks.

**Delivery:**

3D CAD model / simulation of the installation.



During LODAHL contributed throughout the cycle of the project with continuous dimension control, marketing of holes, checks to subcontractors, etc.

The assembled compressor deck was scanned onshore, and the hole in which the tire was to be installed was scanned on the Siri platform in order to check compatibility. Detailed modeling of the critical areas on the platform were made, and then it became a simple “volume model” of the compressor cover (red model).

This was successfully simulated in place on the platform model. During this simulation two minor collisions were found: a cable tray and a valve.