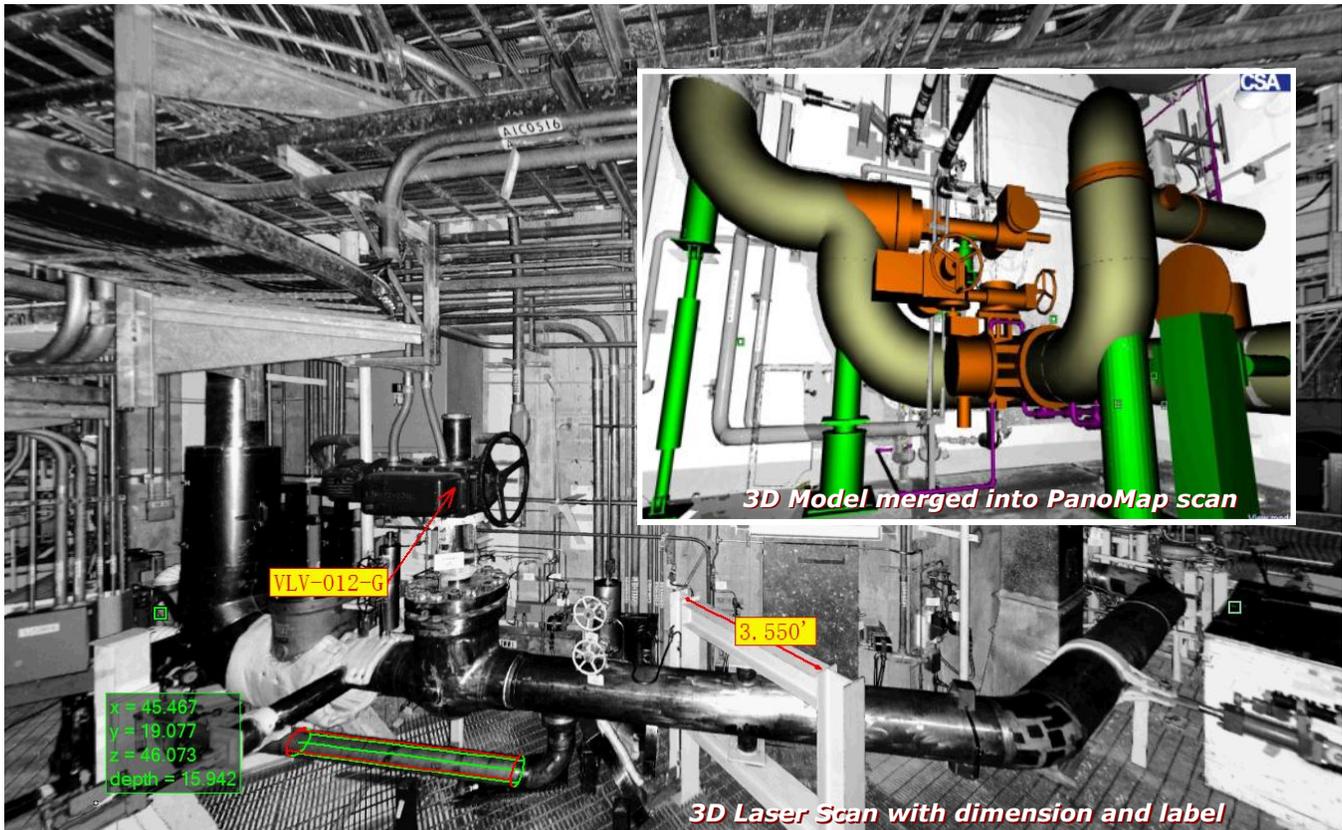


Laser Scanning Technology



Use PanoMap for:

- **Clash Detection between Scans and 3D Model, and Dimensioning**
 - **Equipment Removal/Replacement**
 - **Intelligent Labels to Access Drawings and Documents**
 - **Photorealistic Scan Data Viewing**
 - **Merging 3D Models with Scans**
 - **Accessing Large Scan Databases**
 - **Intelligent Modeling Functions**
-
- **iPanoMap™** Laser Scans on a Tablet
 - **PanoMapPhoto™** Interface to Plant Photographs/Drawings/Documentation
 - **PanoRem™** for Dose Estimation and Work Management

The scope of projects handled by PanoMap can range from **project support scanning** (as few as 30 scans), to a **complete plant scanning** of 7,000 laser scans or more.

CSA maintains one laser scan database for each nuclear unit. Scans from new projects can be added to the database, and each scan is uniquely identified with attributes including date/time stamp, operator, and scanner used.

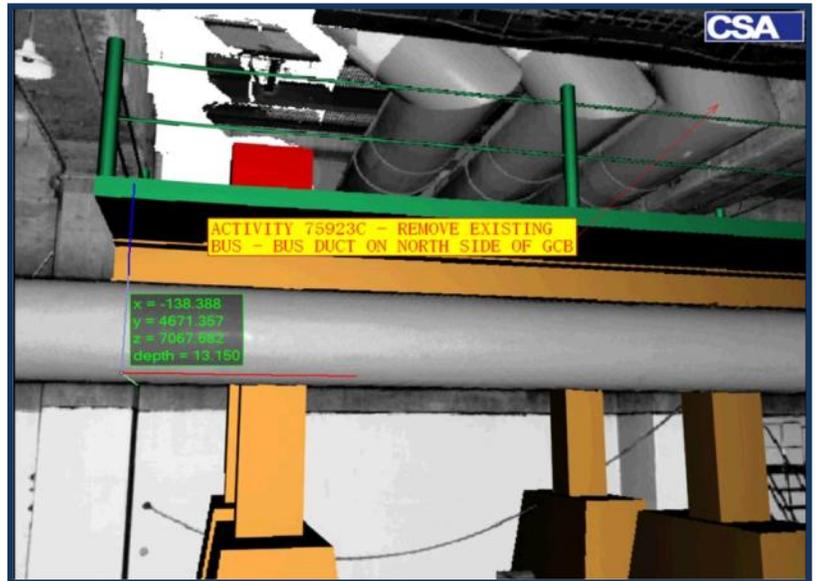
CSA also maintains an archive of all of its scanning projects. PanoMap provides comprehensive support from simple review/ measurement applications to complex modeling and plant support applications.

Why do it the hard way?

CSA's proven solutions include:

Equipment Removal/ Replacement—Clash Detection

Integrating 3D models within PanoMap allows for interference verification directly against as-built laser scans. The interfering surfaces within the scans are automatically detected and colored in red. A clash detection report is produced. The validated interfering objects can be removed from the scans. This iterative process determines the optimal removal/replacement path and serves as a communications tool. Simulation videos are produced after the removal/replacement plan has been finalized.



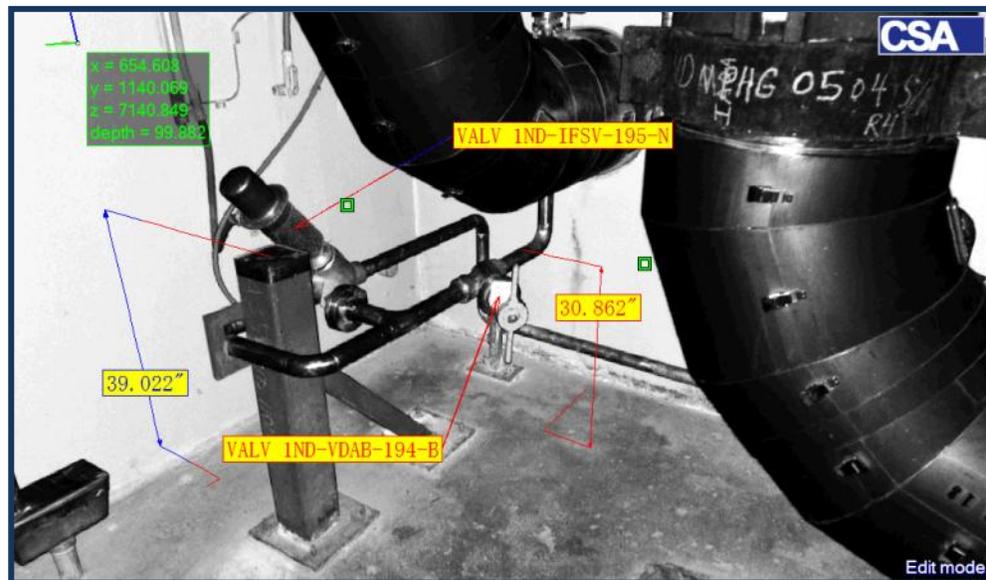
Storyboard of planned construction activity

Engineering Changes

New design changes are represented by a 3D CAD model. Existing components and structures can be removed from the scans. The new design in 3D CAD format is merged into the scans, and an interference check is automatically produced.

Construction Planning and Storyboarding

Equipment removal/replacement and engineering change activities can be displayed as labels on individual components within scans. These scans can be combined within the 3D model. A storyboard, with individual construction/project activities listed, can be produced to better organize the process. This tool aids in planning reviews, as well as crew training. The review of this storyboard provides valuable feedback to improve planning, scheduling, and construction processes.



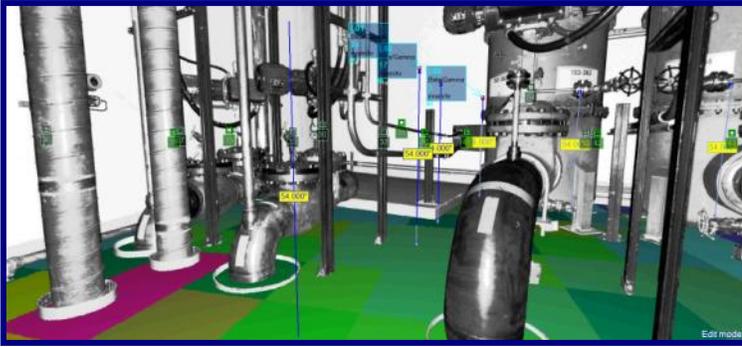
Equipment labeling within 3D scan

Permanent Platforms and Rigging Structures

3D models of permanent platforms can be placed within the scans. Interferences are detected and displayed as red. The platform location, structure, and clearances can be reviewed and verified by all end users, engineering, and operations prior to erection.

The same process can be used for rigging and other temporary or permanent structures used to support work activities.

ALARA Applications



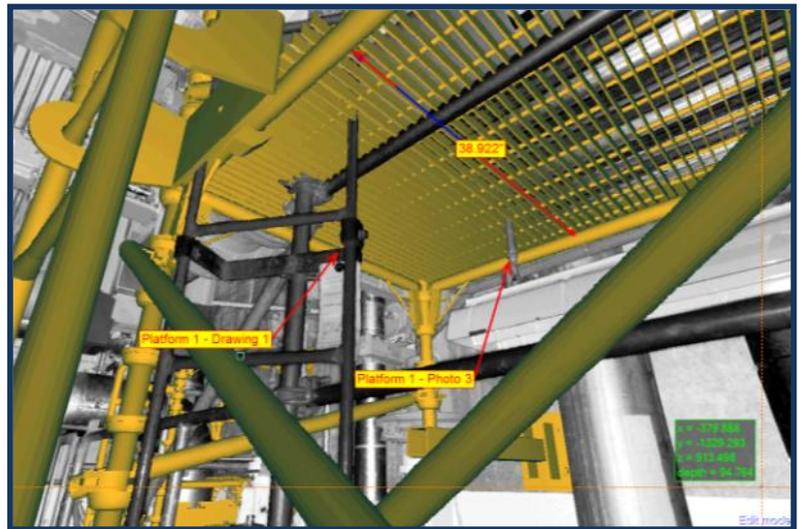
PanoRem™ Rad survey data in scan

The **PanoRem™** application suite is both a dose and work management tool. Permanent or temporary monitors can be merged within the laser scan database for a real-time display of data. The resulting database can be used to evaluate live radiation field or airborne data, and to improve the planning process, including worker location, dose estimating, etc. The scans can provide a very effective tool for pre-job briefings to identify areas to avoid and low dose waiting areas, and to illustrate work activities and worker

location. The dose reduction is also achieved by improved design, simulation activities, and better training of people using the laser scan database. For example, a simulated database can be used to create emergency plan drill scenarios with "live-time" dose rate displayed in the target plant or equipment locations.

Response to Unexpected Conditions

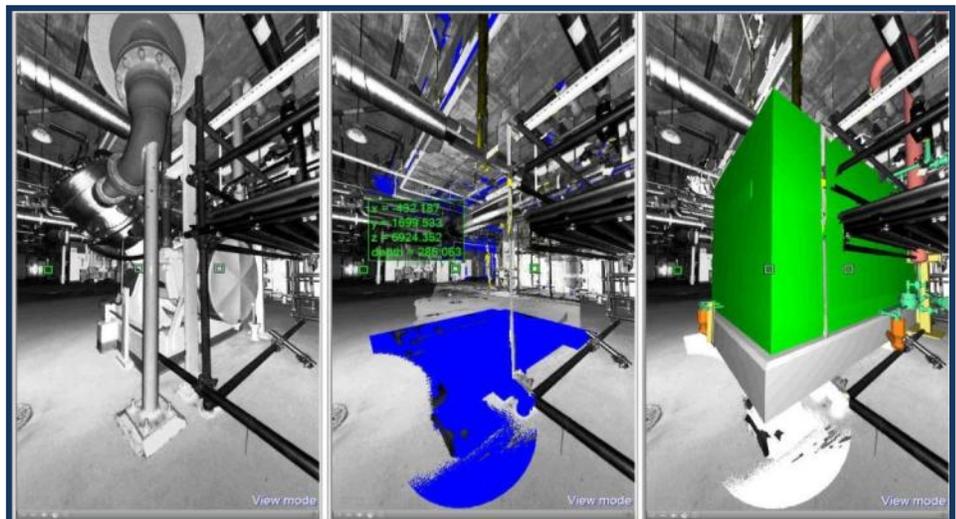
High quality digital representation of the plant and live radiological condition data provide critical support to mitigate accidents and any unexpected conditions. The laser scan database can be analyzed by personnel at multiple locations. A rapid, accurate response will reduce cost and time associated with unplanned events.



3D model of permanent platform merged with PanoMap scan

Final As-Built Documentation and Updates

After the uprate is completed, affected areas can be re-scanned to provide final as-built documentation. Minor changes can be supplemented with a 3D model. This database, in conjunction with the engineering documentation, provides an accurate representation of plant changes for future reference and/or regulatory review. The resultant PanoMap scans can be used in conjunction with plant operating and maintenance databases (e.g., Maximo, Passport), and used for other plant applications.



Original equipment in scan

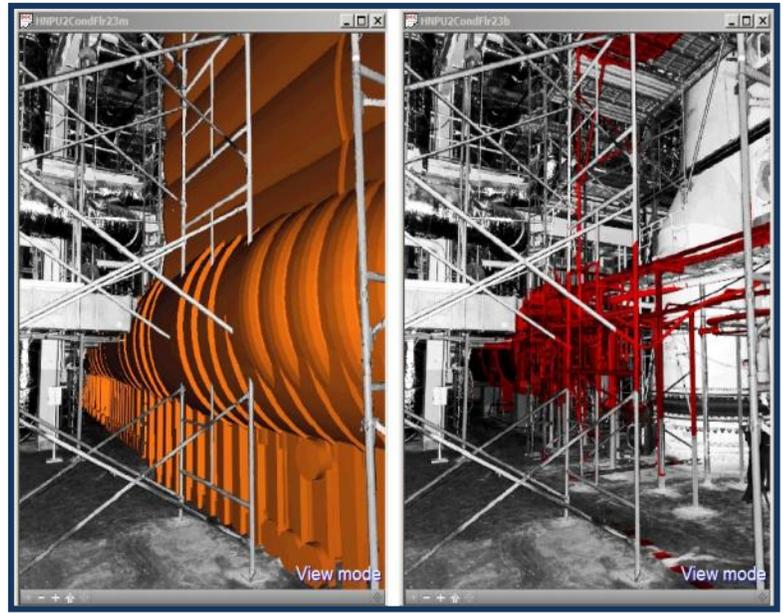
Equipment removed from scan

3D model in scan

What's unique about PanoMap?

All collected data resides in a single database with:

- No database size limit – our largest project to-date has over 7,000 laser scans
- Very fast, simple database access – four clicks to any part of the plant
- Very user-friendly interface – no CAD experience required
- High resolution visual and 3D representation
- Interface to/from all major CAD systems
- Server database– easy access and fast processing by all personnel, from any PC



Equipment removal sequence simulation

Interferences shown in red

PanoMap benefits include

Reduction in errors and schedule delays

Ability to analyze alternative methods

High quality final as-built documentation

Documented regulatory compliance

Improvement in:

- Planning and scheduling
- Simulation of activities – done right the first time
- Predictability of construction activities
- Personnel training
- Response to unexpected conditions
- Communication between project team members

iPanoMap™

on a tablet/smartphone—for plant management & more

iPanoMap is now available for Android-based devices, providing 360° laser scan views of your plant. It is an indispensable tool for a variety of applications including plant walk-downs, inspections, and pre-job briefings.

Now your mobile device can include original scans, as well as 3D CAD models merged into the scans.

Measurements and **smart labels**, which can represent survey data, audio, photos, drawings, and other files, with critical, conveniently placed information, can be added.



iPanoMap 3D laser scan library on tablet