

Laser Scan Space Manager LSSM PanoMap

*Provide comprehensive lifecycle
support for nuclear facilities*

Key Advantages

- Manage scans as a large-scale 3D Model
- Multiple output formats:
 - Panoramic 3D Bitmap
 - 3D Surface Model
 - Library-based Intelligent 3D Model
- Available extensive libraries of intelligent 3D objects
- Extensive experience with interfaces and conversions to other CAD systems

Nuclear Plant Application

- Support dose reduction initiative
- Permanent shielding design
- Strainer design and installation
- Steam generator replacement
- Equipment removal/replacement projects

Nuclear Plant Application

(continued)

- General engineering mods
- Scaffolding design/installation support
- Access to radiation data
- Training

Nuclear Plant Application (continued)

- Real-time display from permanent radiation monitors
- Gamma scanning integration
- Replacement of surrogate travel applications
- Outage planning support – refueling floor management

Nuclear Plant Application (continued)

- As-built plant documentation
- Piping insulation replacement
- Pre-job briefings
- Alloy 600 mitigation

Nuclear Plant Application (continued)

- NRC GL 2008-01 pipe slope
- Emergency response
- Tribal knowledge retention/transfer
- Interface to documents

Laser Scan Space Manager LSSM PanoMap

- Integrates all scan data
- Powerful registration capability, automatic registration support
- No limit to number of scans
- Scans are object-oriented

Laser Scan Space Manager

LSSM PanoMap *(continued)*

- Integrates with CAD design software
- Variety of output formats
- Priority is given to automatic conversions

Laser Scan Space Manager

LSSM PanoMap *(continued)*

- Data generated can be used directly for project applications
- The scan format used is much smaller than “Point Cloud Data”
- Works with any laser scanner

LSSM Modules

- PanoMap
 - ◆ Lite
 - ◆ Full (Modeling and other advanced functions)
- Scan Manager
- Related Applications
 - ◆ Model Review
 - ◆ MacroCAD
 - ◆ Plant/CMS Applications

LSSM Functions

- Project set-up
- Management of scan database
- Registration of scans
- Integration with 3D plant model

PanoMap Functions

- Powerful 3D viewer of scan data in photo-realistic format
- Review of scan data
- Redlining and annotations
- Dimensioning
- Overlay digital photographs

PanoMap Functions

(continued)

- Intelligent model conversion
- Access to Asset Management Database
- Conversion to 3D surface model
- Creation of 3D intelligent model

Dose Reduction Tool

- Reduction of time spent in radiation areas
- Major support for plant walkdowns
- Better planning

Dose Reduction Tool

(continued)

- Improved training for the construction crews
- Reduction of design errors
- Minimize surprises
- River Bend OE Report

Plant/CMS Support

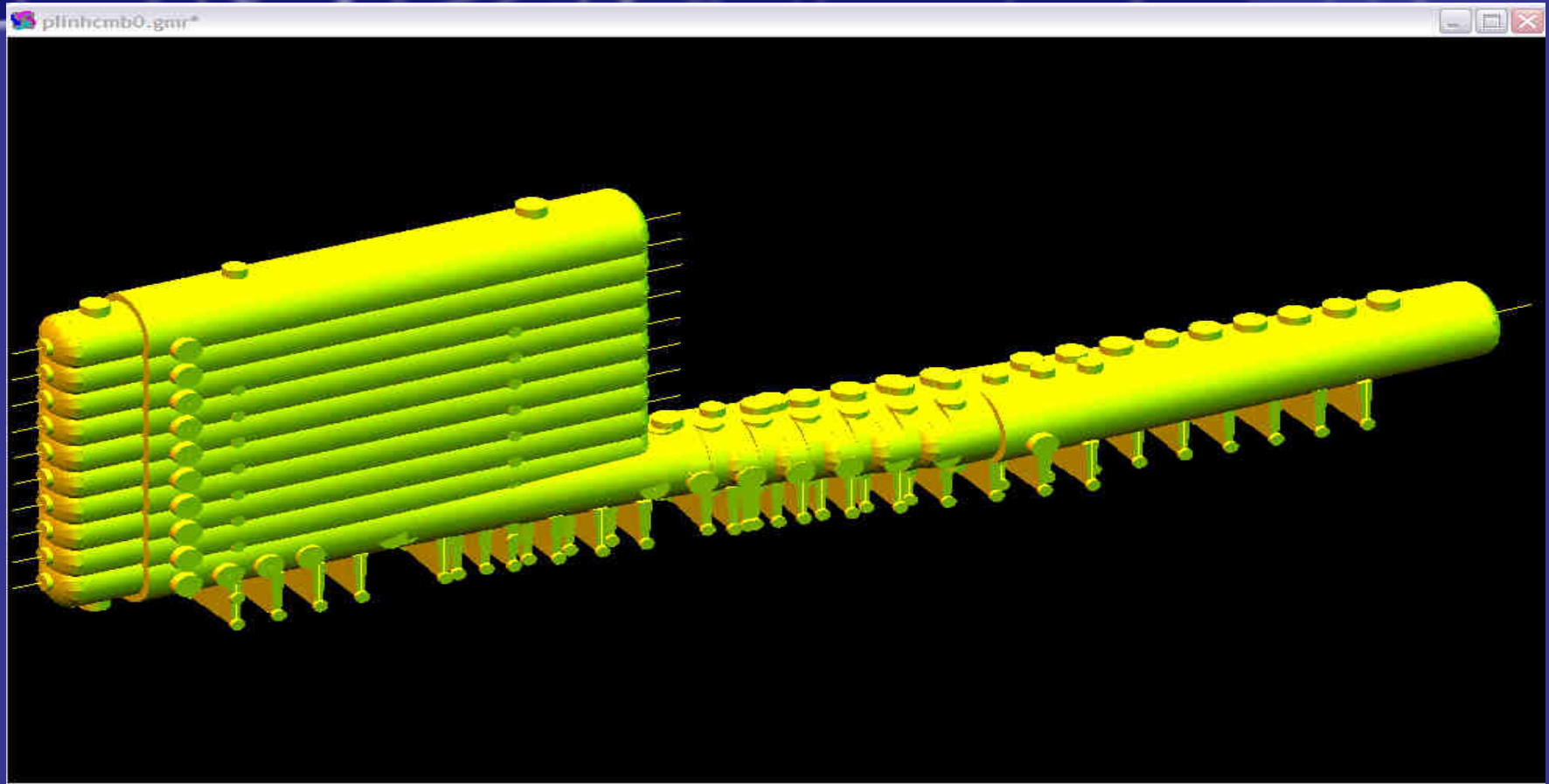
- Interference checking
- Conversion to other CAD systems
- Drawing production

Plant/CMS Support

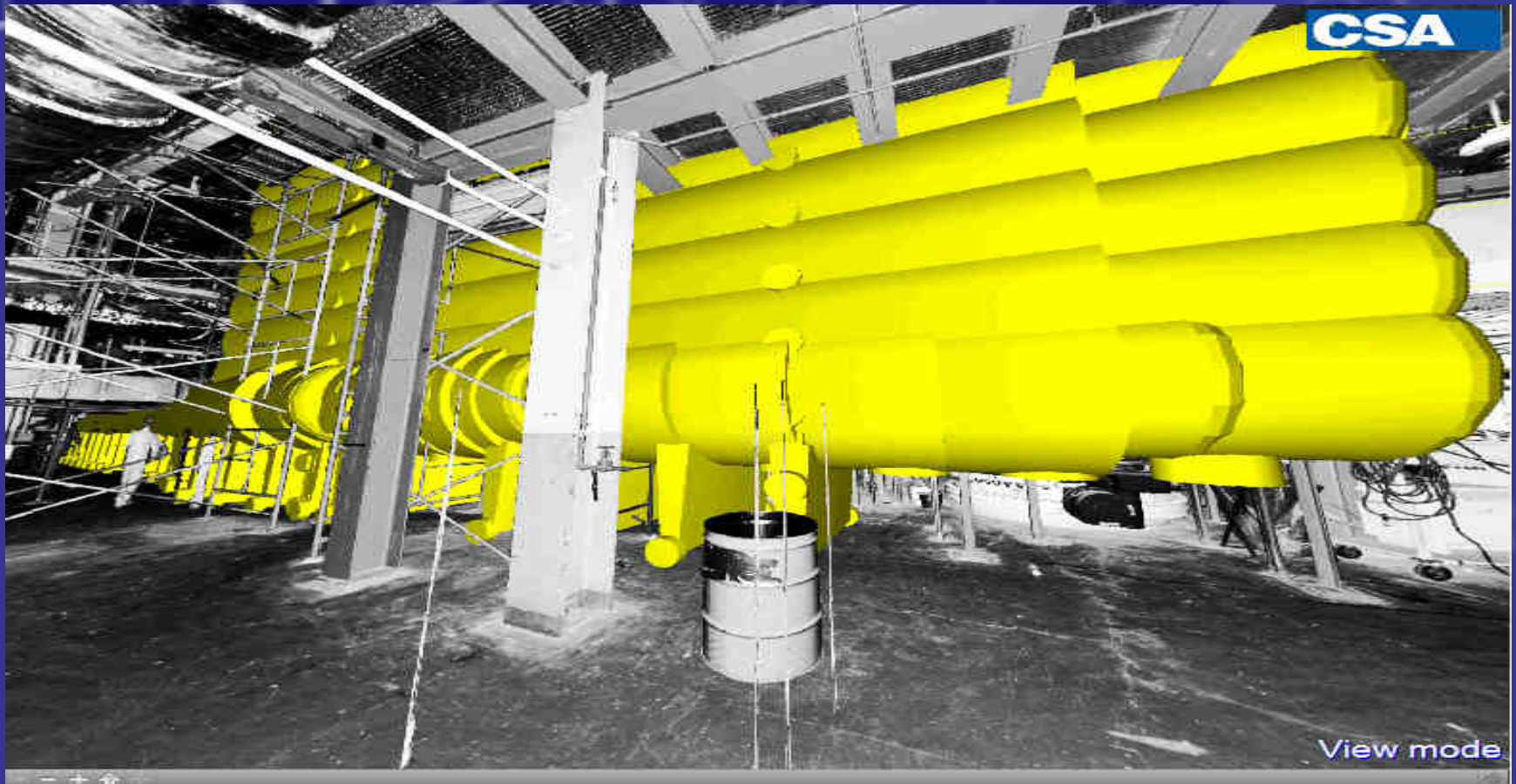
(continued)

- Integrated review of scan models and 3D models
- Access to information asset data
- Access to documents

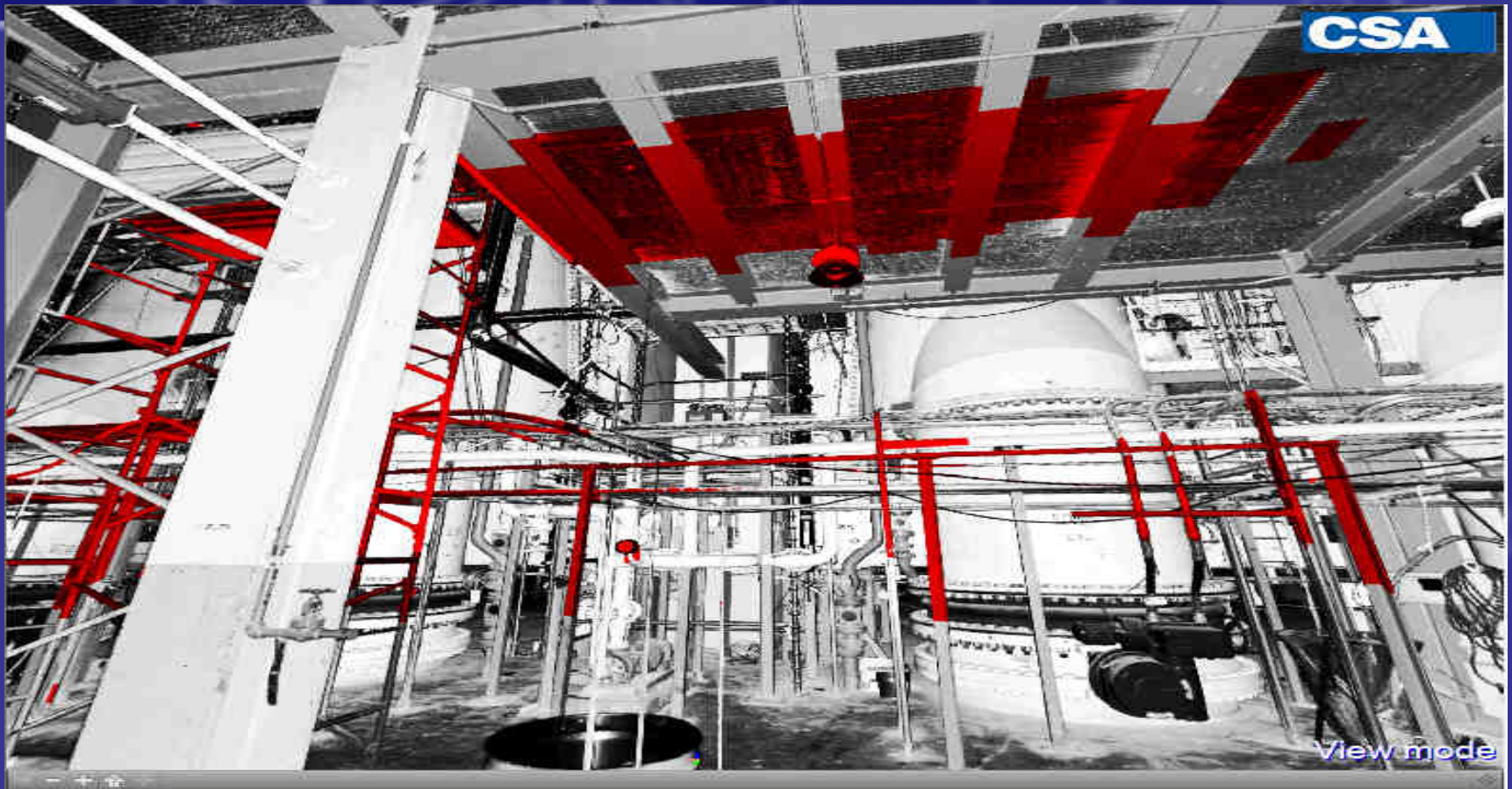
Equipment Removal Simulation



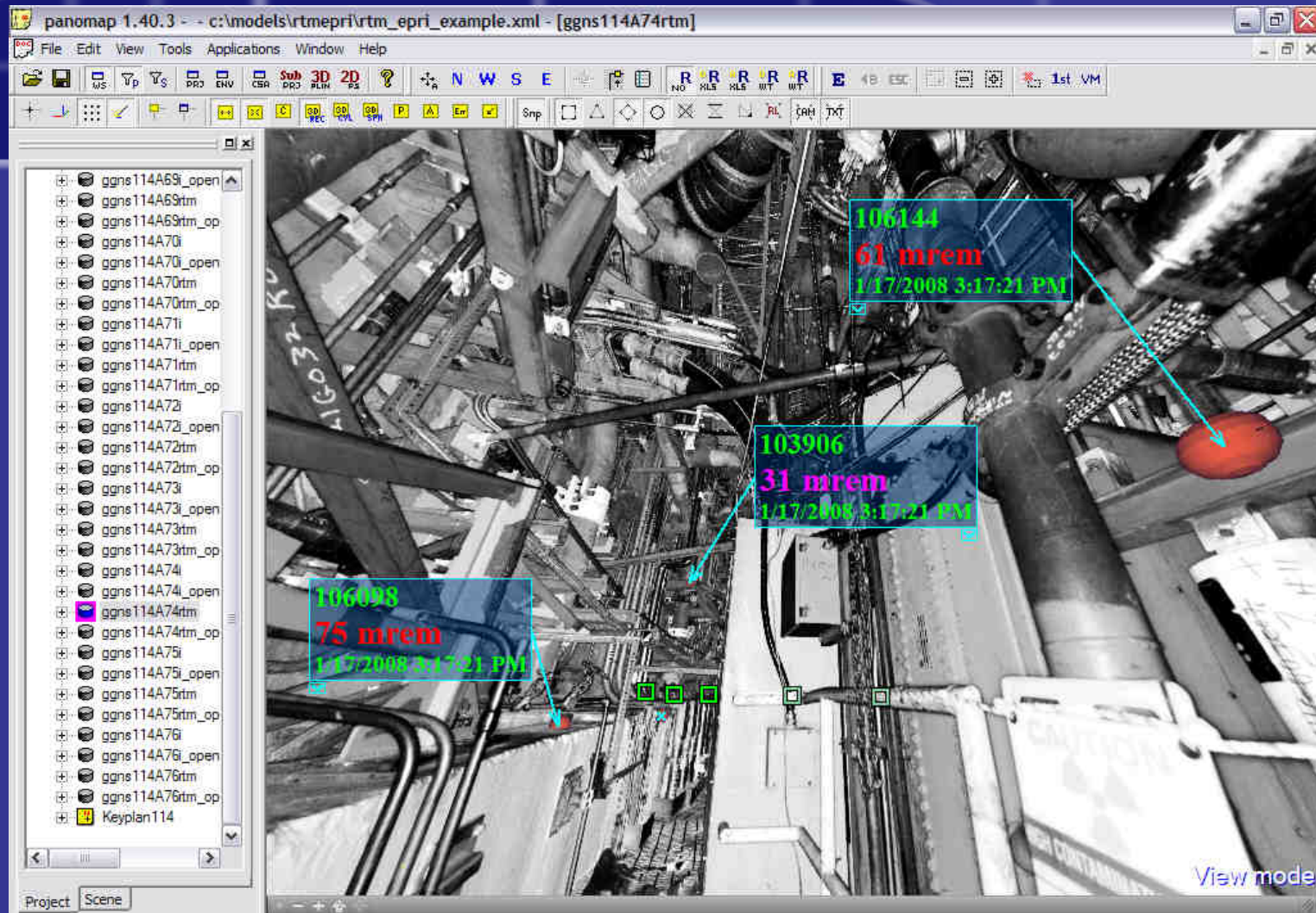
Equipment Removal Simulation



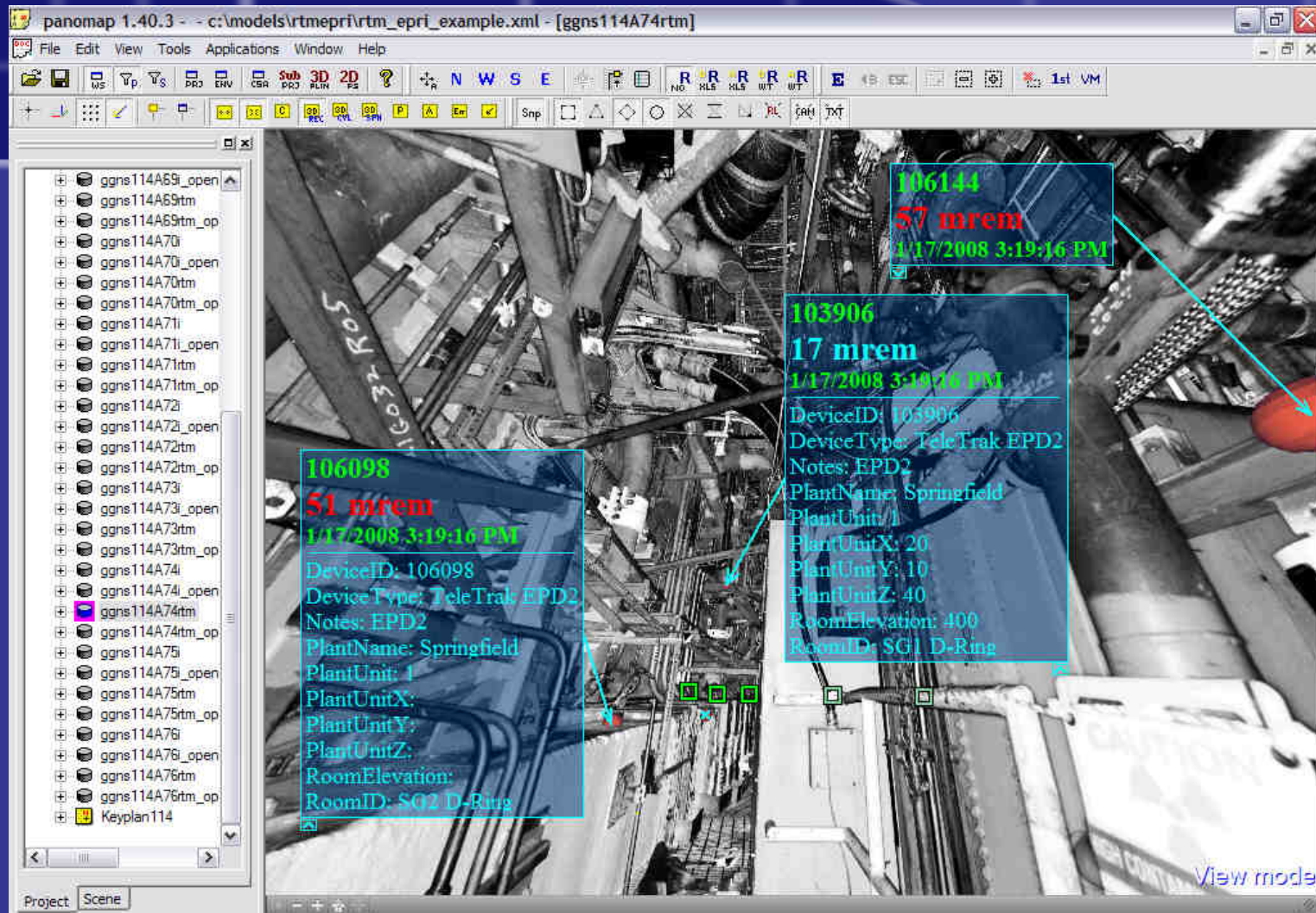
Equipment Removal Simulation



Integration with Radiation Data



Integration with Radiation Data



Integration with Radiation Data

PanoMap DB QUERY: h:\models\BryFerry\REVIEW.MDB

Review.tbl - DRAWINGS AND IMAGES

	A DOC TYPE	B DWG NO.	C SHT NO.
1	SURV	031604-15/MO152	
2			
3			
4			

PROTECTED VALUE

Document Review

Adobe Reader - [DW584.pdf]

File Edit View Document Tools Window Help

Share photos like a pro

47%

Browns Ferry Radiological Survey

MO152.001 - MO152 Unit 1 Drywell 584" Survey #031604-15 Date/Time: 3/16/2004 13:00

N-1 and N-2 nozzle post HRA and CAUS Penetration

AX VESSEL

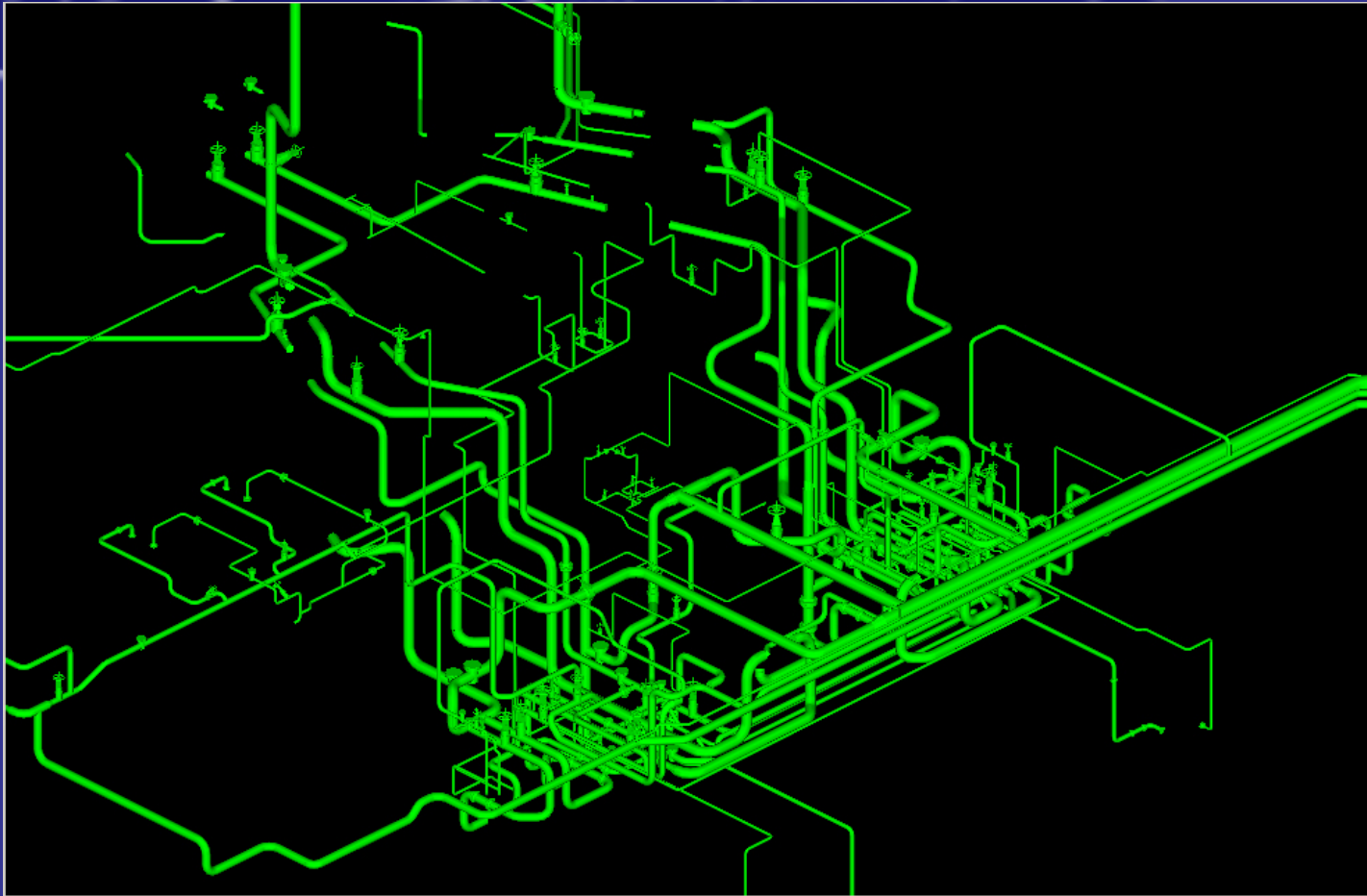
Summary of Highest Readings

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02 -1000 DP6103 and	02
03 -1000 DP6103 and	03
04 -1000 DP6103 and	04
05 -1000 DP6103 and	05
06 -1000 DP6103 and	06
07 -1000 DP6103 and	07
08 -1000 DP6103 and	08
09 -1000 DP6103 and	09
10 -1000 DP6103 and	10
11 -1000 DP6103 and	11
12 -1000 DP6103 and	12
13 -1000 DP6103 and	13
14 -1000 DP6103 and	14
15 -1000 DP6103 and	15
16 -1000 DP6103 and	16
17 -1000 DP6103 and	17
18 -1000 DP6103 and	18
19 -1000 DP6103 and	19
20 -1000 DP6103 and	20

8.5 x 11 in 1 of 3

View mode

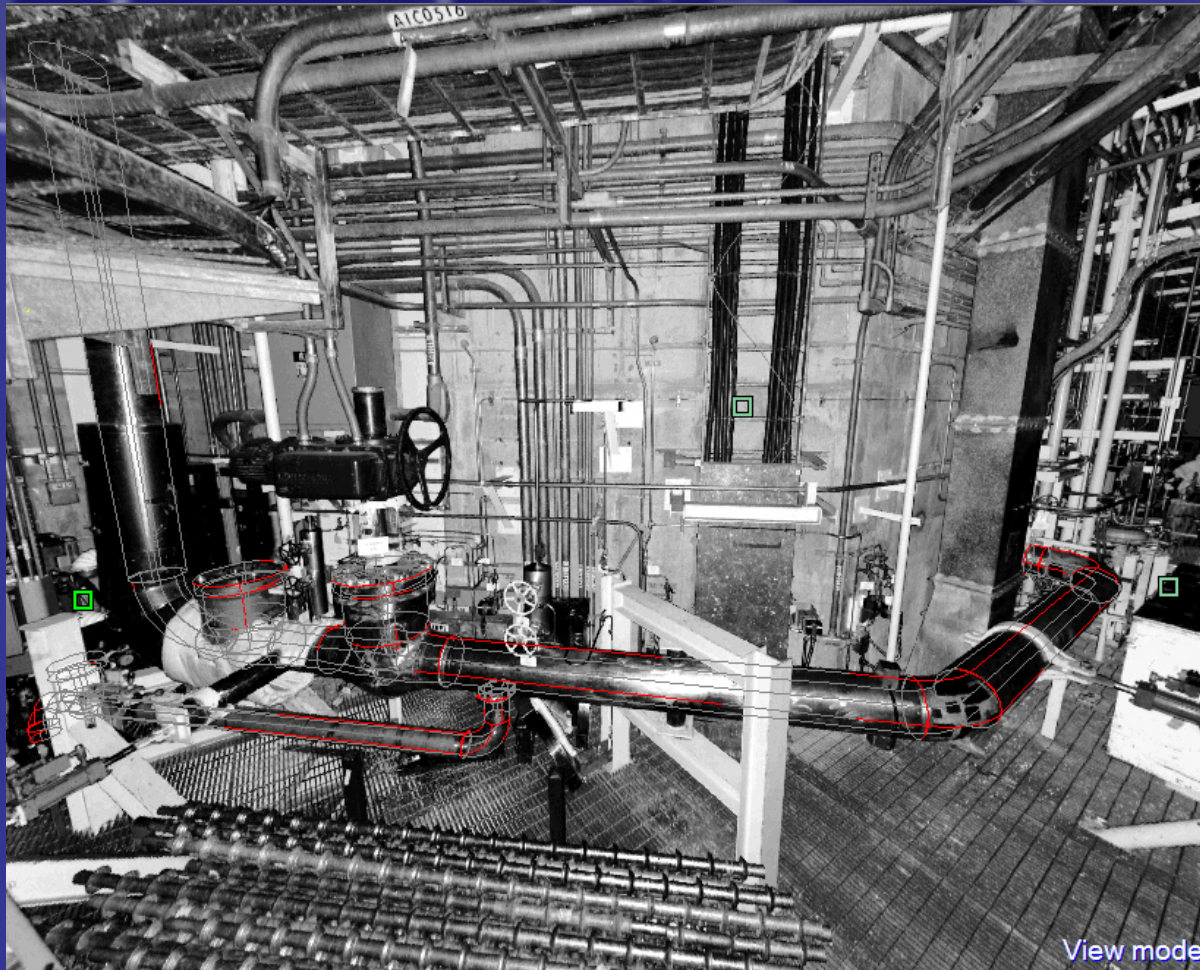
Pipe Slope NRC GL 2008-01



Pipe Slope NRC GL 2008-01



Pipe Slope NRC GL 2008-01



Pipe Slope NRC GL 2008-01

Microsoft Excel - SlopedPipe_risol.xls

File Edit View Insert Format Tools Data Window Help

Type a question for help

	A	B	C	D	E	F	G
1		CSA Plant CMS					
2		PERRY					
3		Summary of Processed Pipe Lines and Objects					Date: Dec 02 2008
4							Rev No: 1
5							
6							
7		OBJECT	PIPELINE	ACAD DRAWING	SNAP SHOT OF DWG	ISO DRAWING	
8							
9		PLHPC001	4"-D1-2-001	XPLHPC001.dwg	XPLHPC001_Mode slope, air pocket	\304-0701-00101.TIF	
10		PLHPC002	10"-L2-4-002	XPLHPC002.dwg	XPLHPC002_Mode slope	\304-0701-00102.TIF	
11		PLHPC003	16"-D1-2-003	XPLHPC003.dwg	XPLHPC003_Mode slope, air pocket	\304-0701-00103.TIF	
12		PLHPC004	6"-L1-2-004	XPLHPC004.dwg	XPLHPC004_Mode slope	\304-0701-00105.TIF	
13		PLHPC005	6"-D1-2-005	XPLHPC005.dwg	XPLHPC005_Mode slope	\304-0701-00105.TIF	
14		PLHPC006	16"-L1-2-006	XPLHPC006.dwg	XPLHPC006_Mode slope	\304-0701-00106.TIF	
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16		PLLPC002	24"-L1-2-001	XPLLPC002.dwg	XPLLPC002_Mode slope	\304-0705-00101.TIF	
17		PLLPC003	24"-L1-2-003	XPLLPC003.dwg	XPLLPC003_Mode slope	\304-0705-00102.TIF	
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19		PLLPC005	4"-G1-2-005	XPLLPC005.dwg	XPLLPC005_Mode slope	\304-0705-00103.TIF	
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21		PLLPC007	14"-G1-2-007	XPLLPC007.dwg	XPLLPC007_Mode slope, air pocket	\304-0705-00105.TIF	
22		PLLPC008	12"-G1-2-007	XPLLPC008.dwg	XPLLPC008_Mode slope	\304-0705-00105.TIF	
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24		PLRHR002	18"-G1-2-002	XPLRHR002.dwg	XPLRHR002_Mode slope	\304-0641-00106.PDF	
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26		PLRHR004	18"-G1-2-004	XPLRHR004.dwg	XPLRHR004_Mode slope, air pocket	\304-0641-00107.PDF	
27		PLRHR005	18"-G1-2-005	XPLRHR005.dwg	XPLRHR005_Mode slope	\304-0641-00110.PDF	
28		PLRHR006	18"-G1-2-006	XPLRHR006.dwg	XPLRHR006_Mode slope	\304-0641-00111.PDF	
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32		PLRHR010	18"-G1-2-010	XPLRHR010.dwg	XPLRHR010_Mode slope	\304-0641-00114.PDF	
33		PLRHR011	24"-G1-2-011	XPLRHR011.dwg	XPLRHR011_Mode slope	\304-0641-00119.PDF	
34		PLRHR012	6"-G1-2-012	XPLRHR012.dwg	XPLRHR012_Mode slope	\304-0641-00116.PDF	

Ready

Pipe Slope NRC GL 2008-01

Microsoft Excel - SlopedPipe_risol.xls

File Edit View Insert Format Tools Data Window Help

Type a question for help

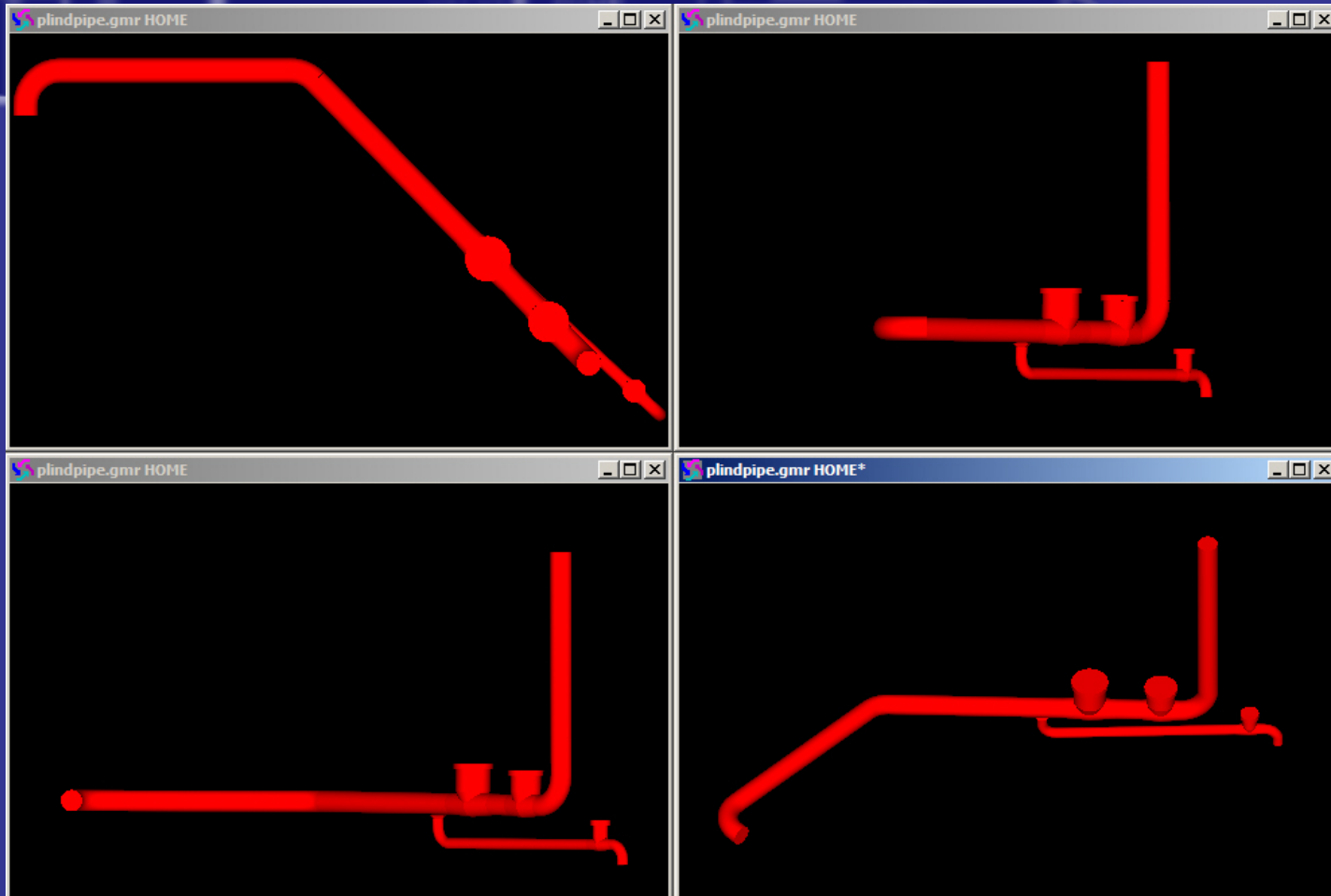
A1 Back

1	CSA Plant CMS												
2	PERRY												
3	PIPE SLOPE REPORT											Date: Dec 02 2008	
4												Rev No: 1	
5												Page No: 1	
6	16"-L1-2-004			PLLPC004									
7	XPLLPC004.dwg			XPLLPC004_Model.tif									
8	1304-0705-00102.TIF												
9	FROM WORK POINT			TO WORK POINT			SEGMENT		SEGMENT SLOPE		REMARKS		
10	NO.	EL. (in)	TYPE	PIECE	NO.	EL. (in)	TYPE	PIECE	LENGTH (in)	(%)		(deg)	
11													
12	1	6874.53	PIPE	1	2	6934.52	PIPE	3	60	Vertical	89		
13	2	6934.52	PIPE	3	3	7008.34	ELL	6	73.82	Vertical	90		
14	3	7008.34	ELL	6	4	7007.3	PIPE	8	60	-1.74%	-1 Pocket on node 3		
15	4	7007.3	PIPE	8	5	7007.25	PIPE	0B	60	-0.08%	-0.044		
16	5	7007.25	PIPE	0B	6	7007.43	ELL	0D	60.63	0.28%	0.16		
17	6	7007.43	ELL	0D	7	6950.86	FL	0G	56.57	Vertical	-90		
18	7	6950.86	FL	0G	8	6945.1	FL	0H	5.76	Vertical	-90		
19	8	6945.1	FL	0H	9	6926.84	FL	0J	18.26	Vertical	-90		
20	9	6926.84	FL	0J	10	6923.96	FL	0K	2.88	Vertical	-89		
21													
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PLRHR002 PLRHR001 PLLPC008 PLLPC007 PLLPC006 PLLPC005 PLLPC004 PLLPC003

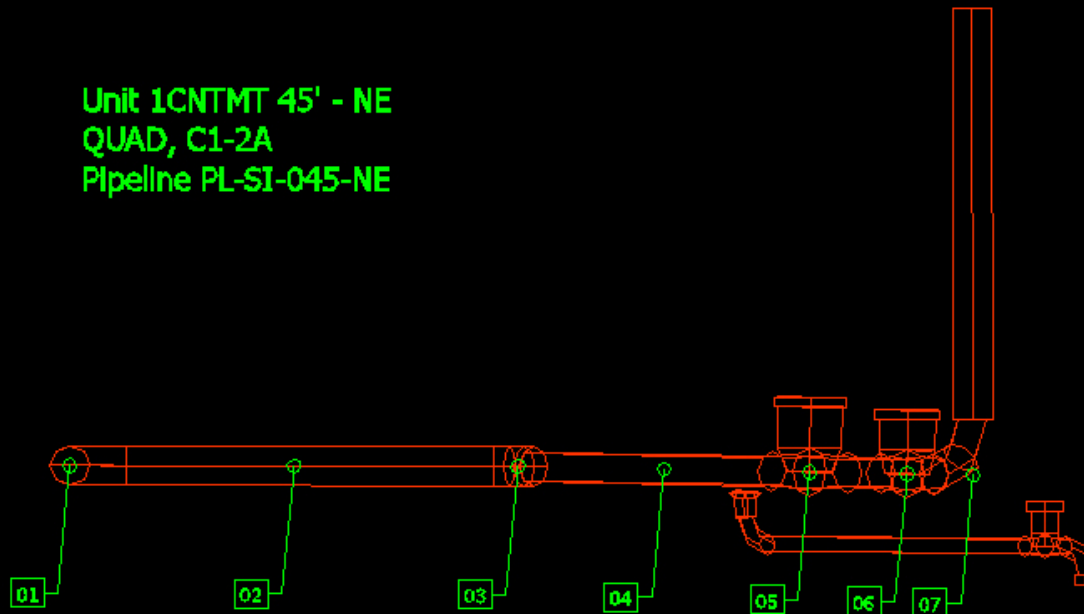
Ready

Pipe Slope NRC GL 2008-01

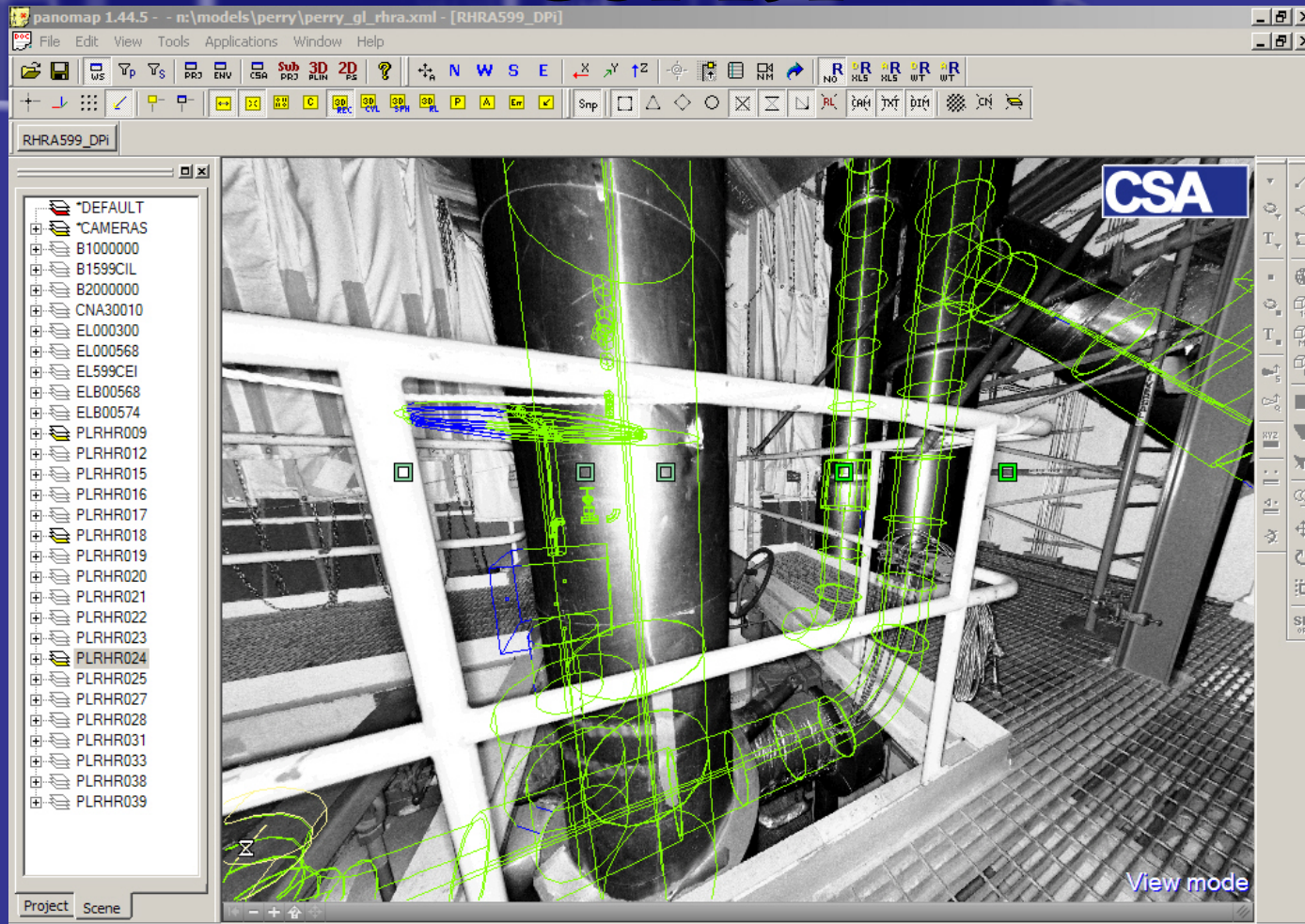


Pipe Slope NRC GL 2008-01

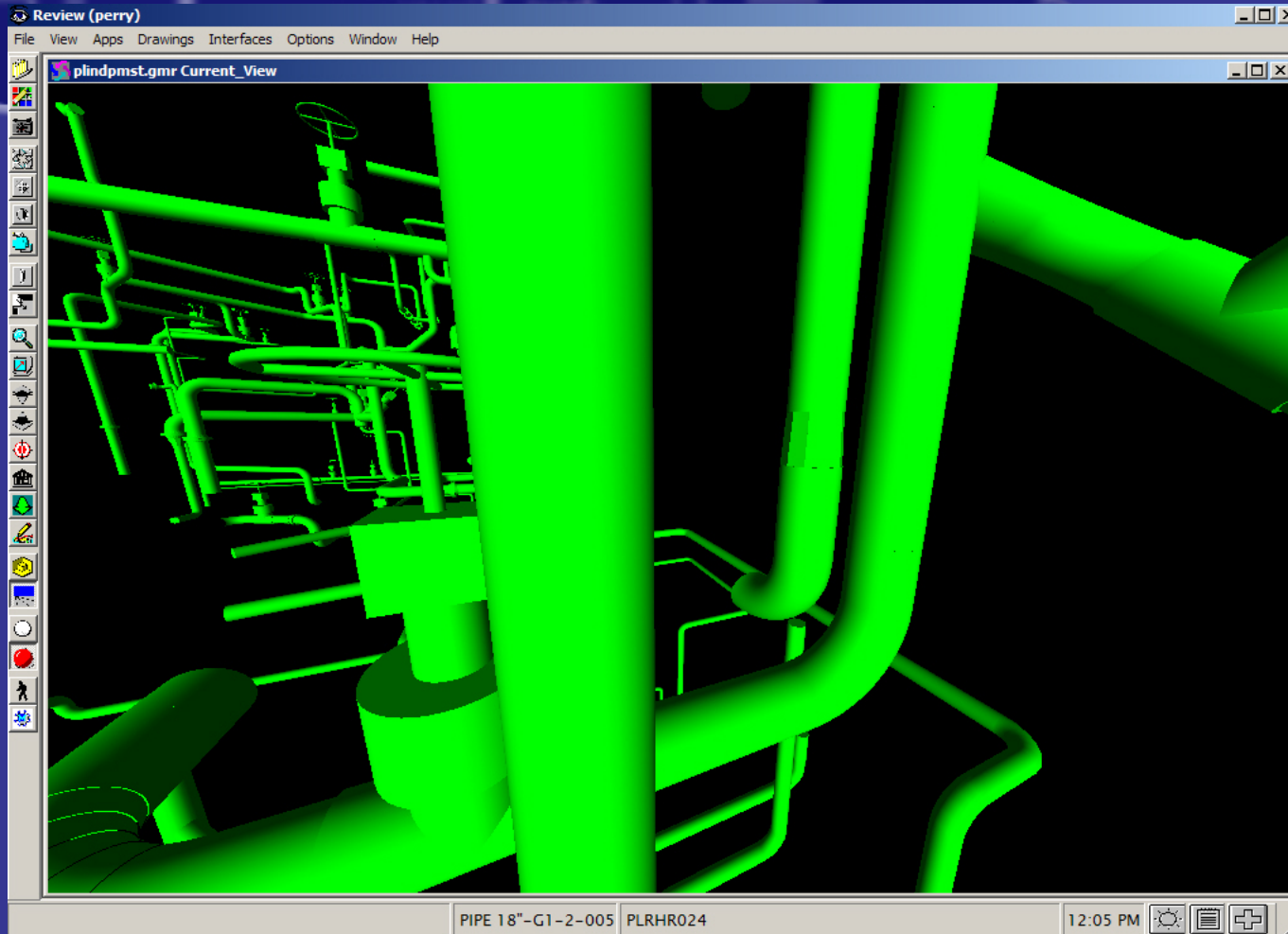
Unit 1CNTMT 45' - NE
QUAD, C1-2A
Pipeline PL-SI-045-NE



Piping Insulation Replacement GSI-191



Piping Insulation Replacement GSI-191



Piping Insulation Replacement GSI-191

panomap 1.44.5 - g:\models\bvr2\bvu2.xml - [CCUBE738_29i]

Microsoft Excel - Sump Reference App.xls

File Edit View Insert Format Tools Data Window Help Type a question for help

E222 Drawings\0000550.pdf

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CSA LINENUMBER_DRAWINGS / CSA LINENUMBER_DATA / CS

Filter Mode

Document Excel Review View mode

Project Scene

2BDG-466

CSA

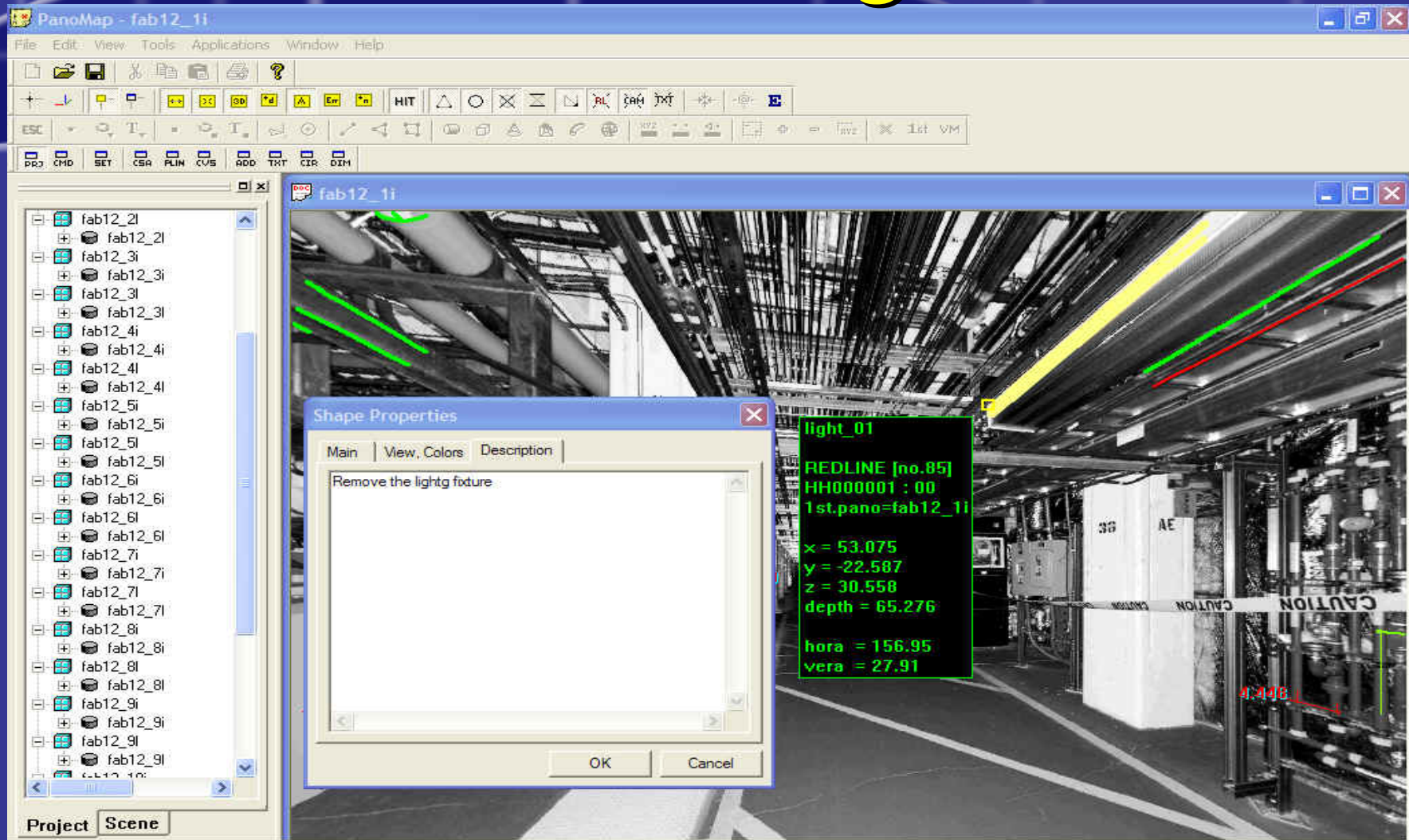


Piping Insulation Replacement

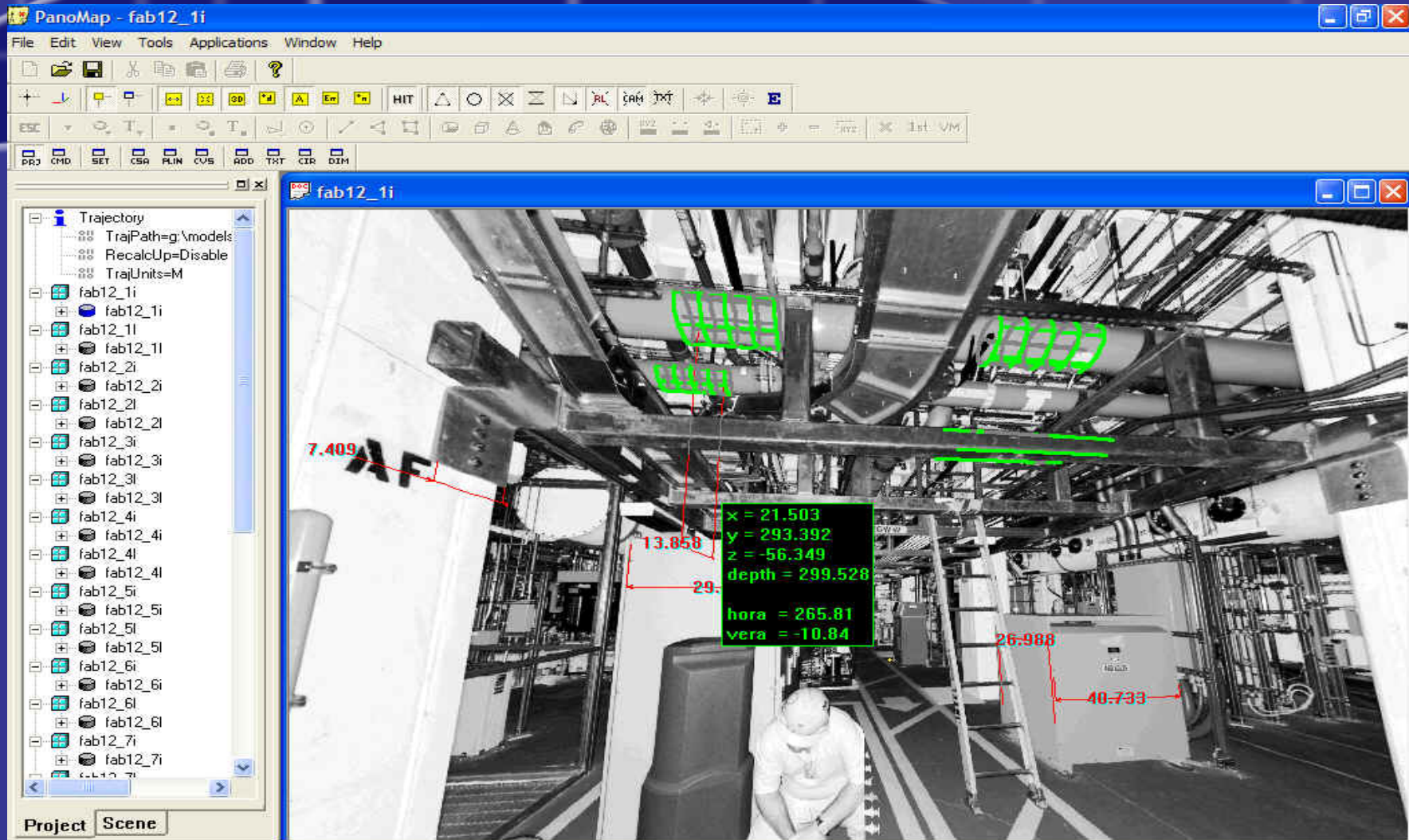
GSI-191

CONSTRUCTION SYSTEMS ASSOCIATES, INC. TVA				PLANT CONFIGURATION MANAGEMENT SYSTEM Sequoyah				PAGE: 1 DATE: 01-30-2008		
PIPING BILL OF MATERIAL							REV. NO: REV. DATE:		STATUS: STATUS DATE:	
ISO NUMBER : *ISORI_2007										
ITEM	NOMINAL SIZE	DESCRIPTION	CODE	TYPE	SCHD	END PREP	PIPE LENGTH FT	QUANTITY	TAG	NUMBER
MATERIAL: C0										
1 3	X 2"	SCH.80 BW CONC. RED.	RD	CONC2	80	BW		1		
2 3		SCH.80 BW TEE	TEE	S	80	BW		1		
MATERIAL: CA										
3 2		SCH.80 SR 90DEG. BW ELL	ELL	90S	80	BW		2		
MATERIAL: J5 C STL,ASTM A105,ANSI B16.36										
4 2	2"	FORGED SLIP-ON FLG (PAIR)	FL	ASSEMBL FLANGE	50	FL		2		
MATERIAL: L7 C STL,SMLS,ASME SA234 GR WPB,ANSI B16.9										
5 3		SCH.80 LR 90DEG. BW ELL	ELL	90L	80	BW		3		
MATERIAL: MC										
6 2		METAL HOSE 2" -WELD NIPPLE	FL	UNAFLEX				2		
MATERIAL: P7 ASTM A106 GR B										
7 3		SCH.80 PIPE	PIPE		80	BW	24'-11.31/32"	4		
MATERIAL: PL 1.25 CR-.5 MO,SMLS,ASTM A335 GR P11,ANSI B36.10										
8 2		SCH.80 PIPE	PIPE		80	BW	1'-6.7/64"	6		

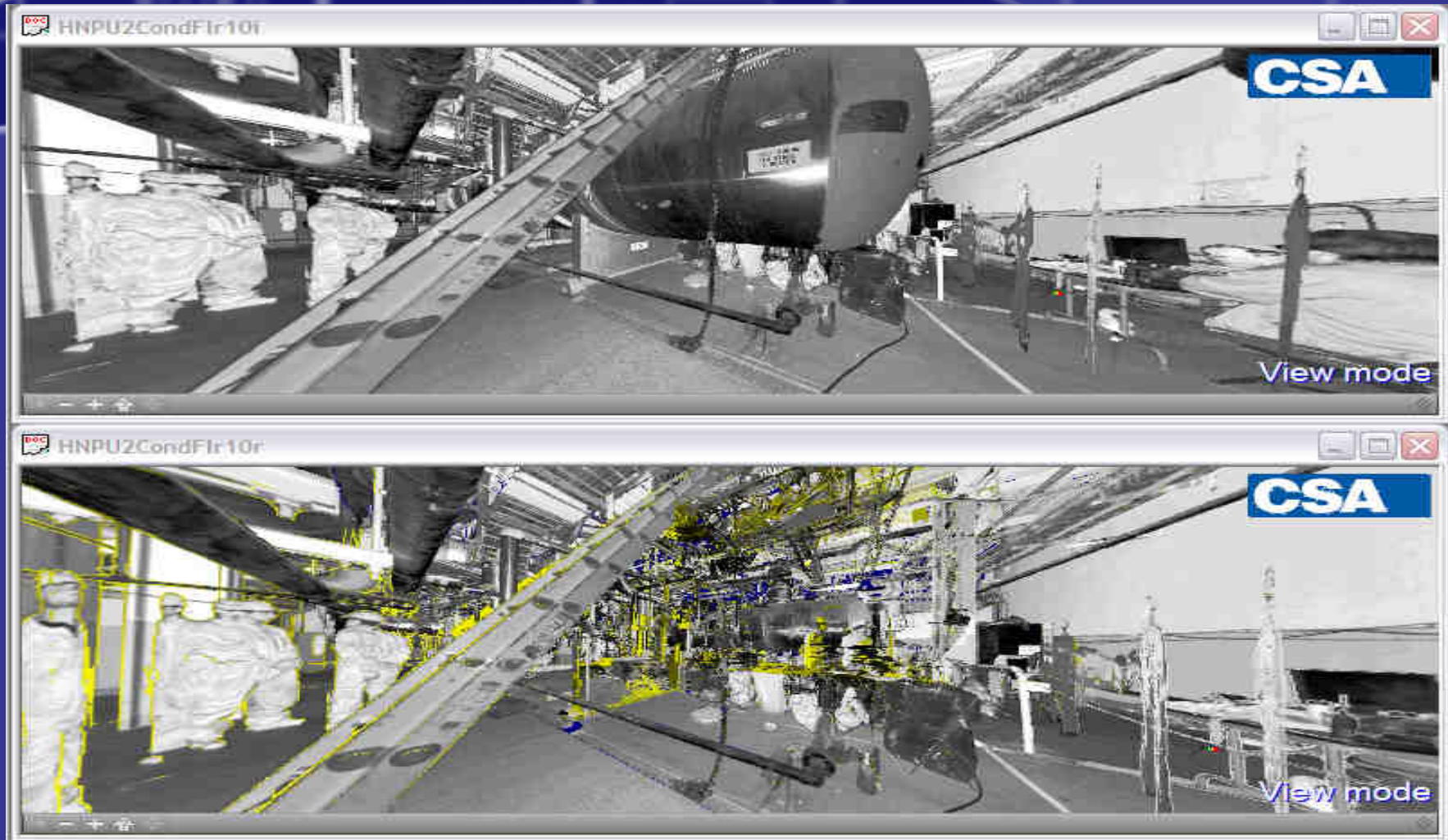
Redlining



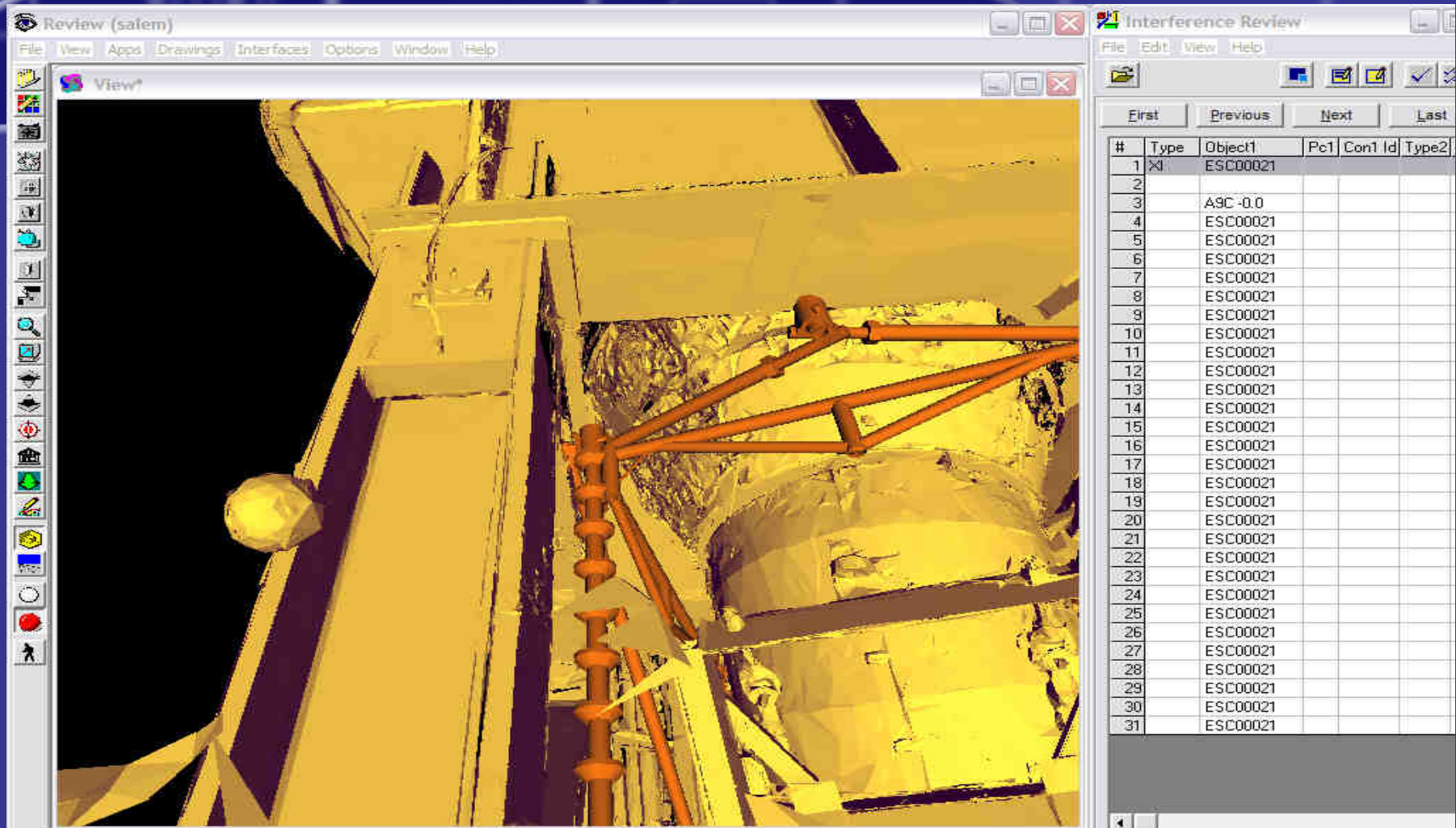
Dimensions



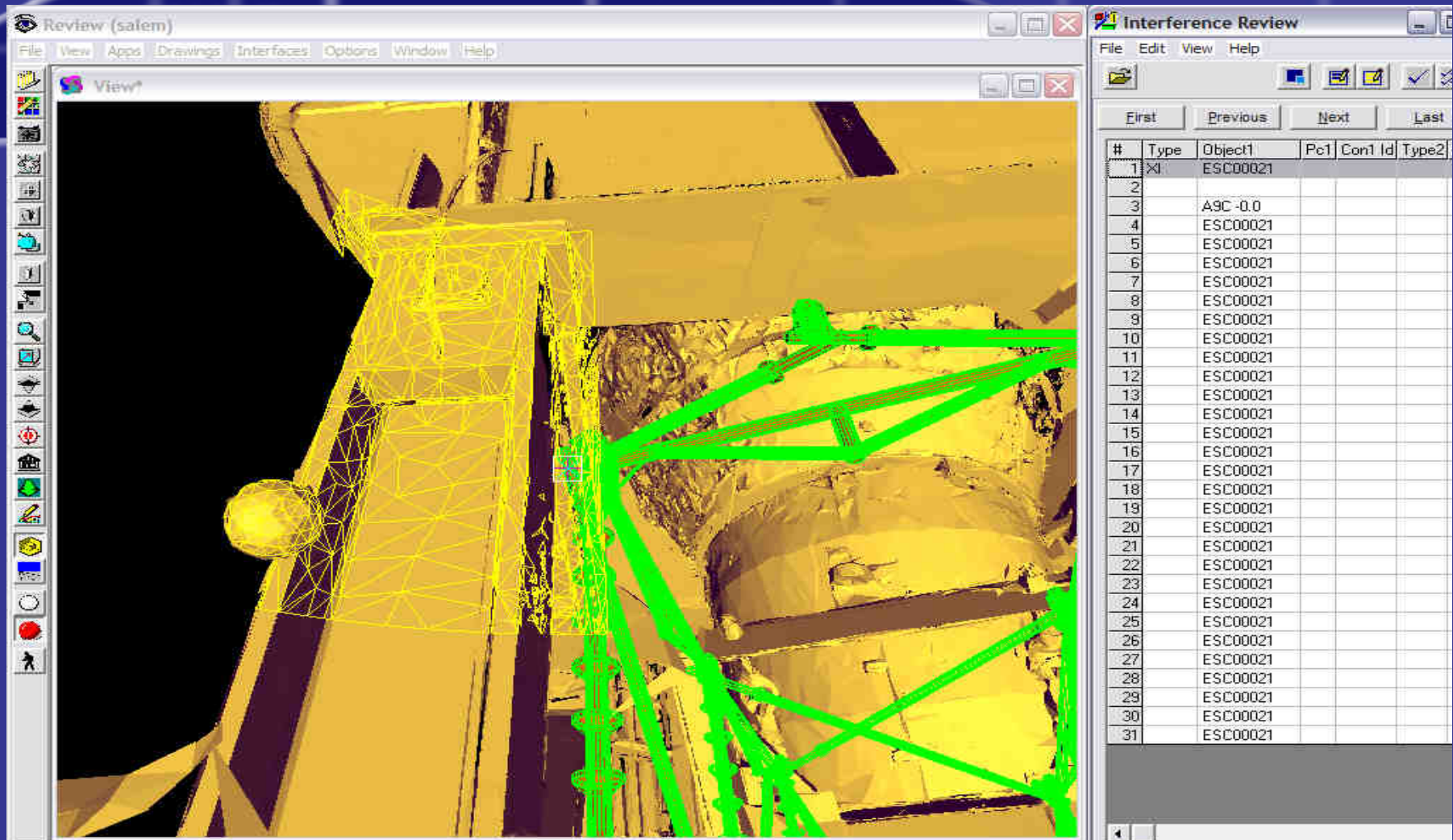
Component Removal



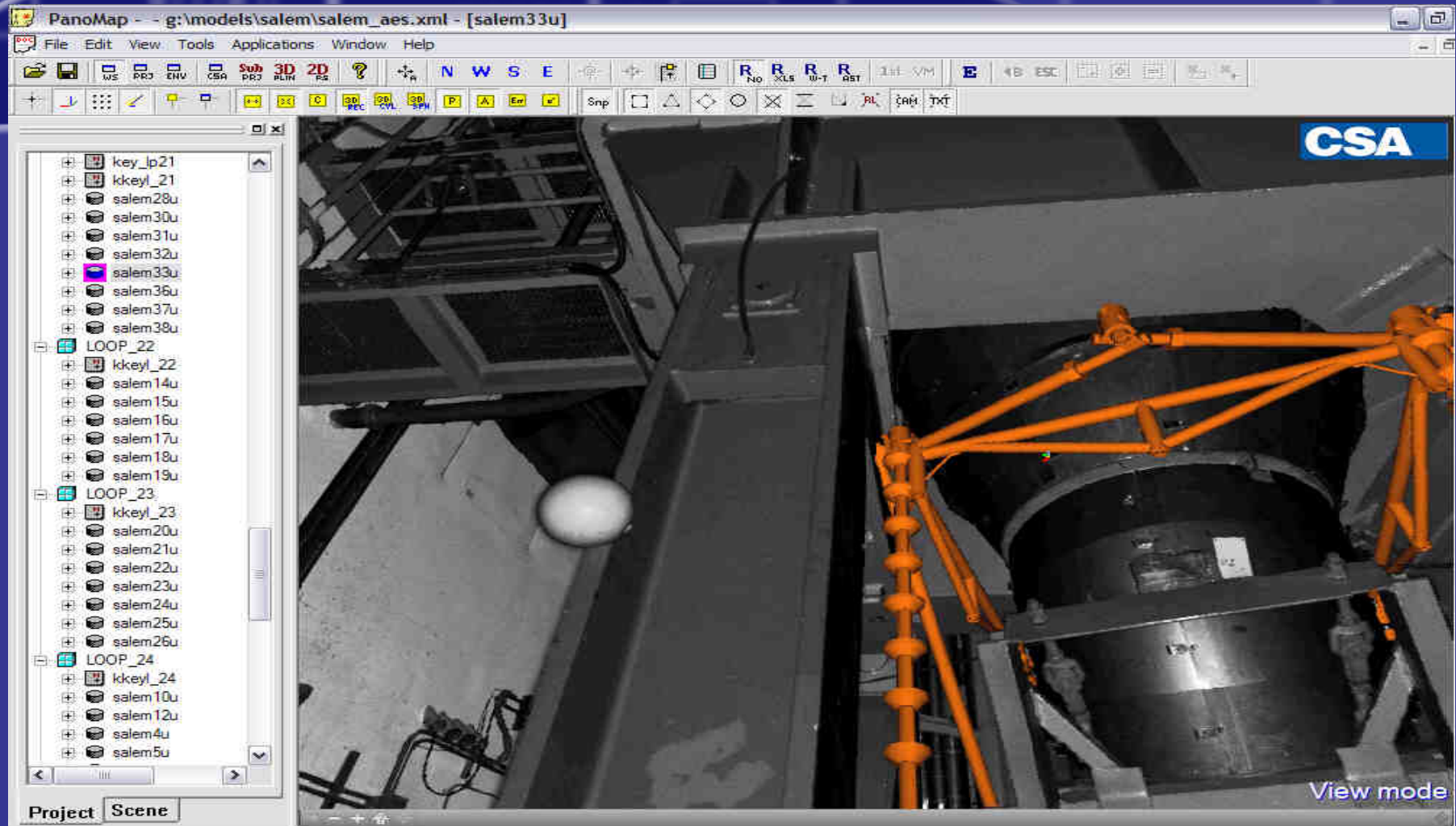
Interference Review



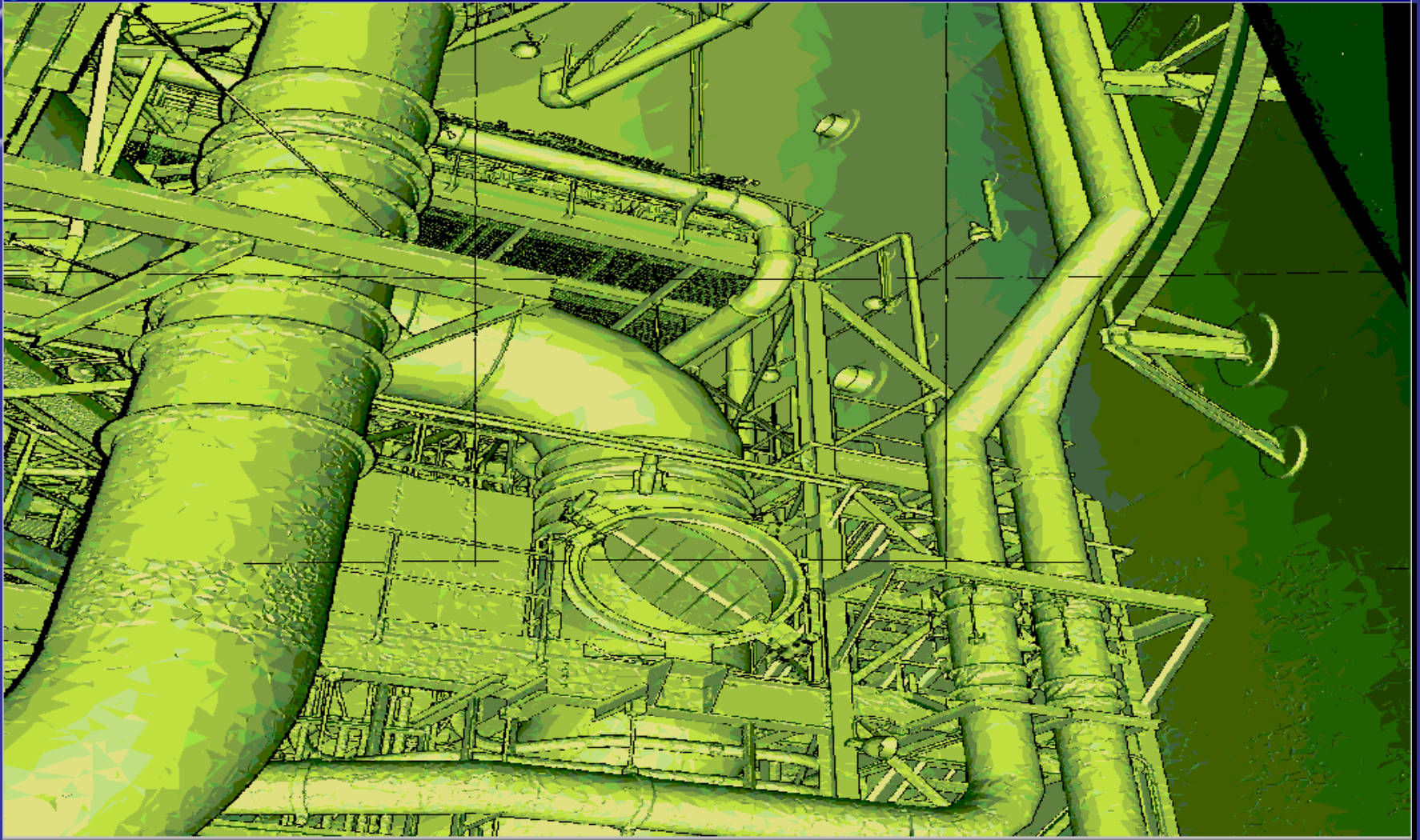
Interference Review



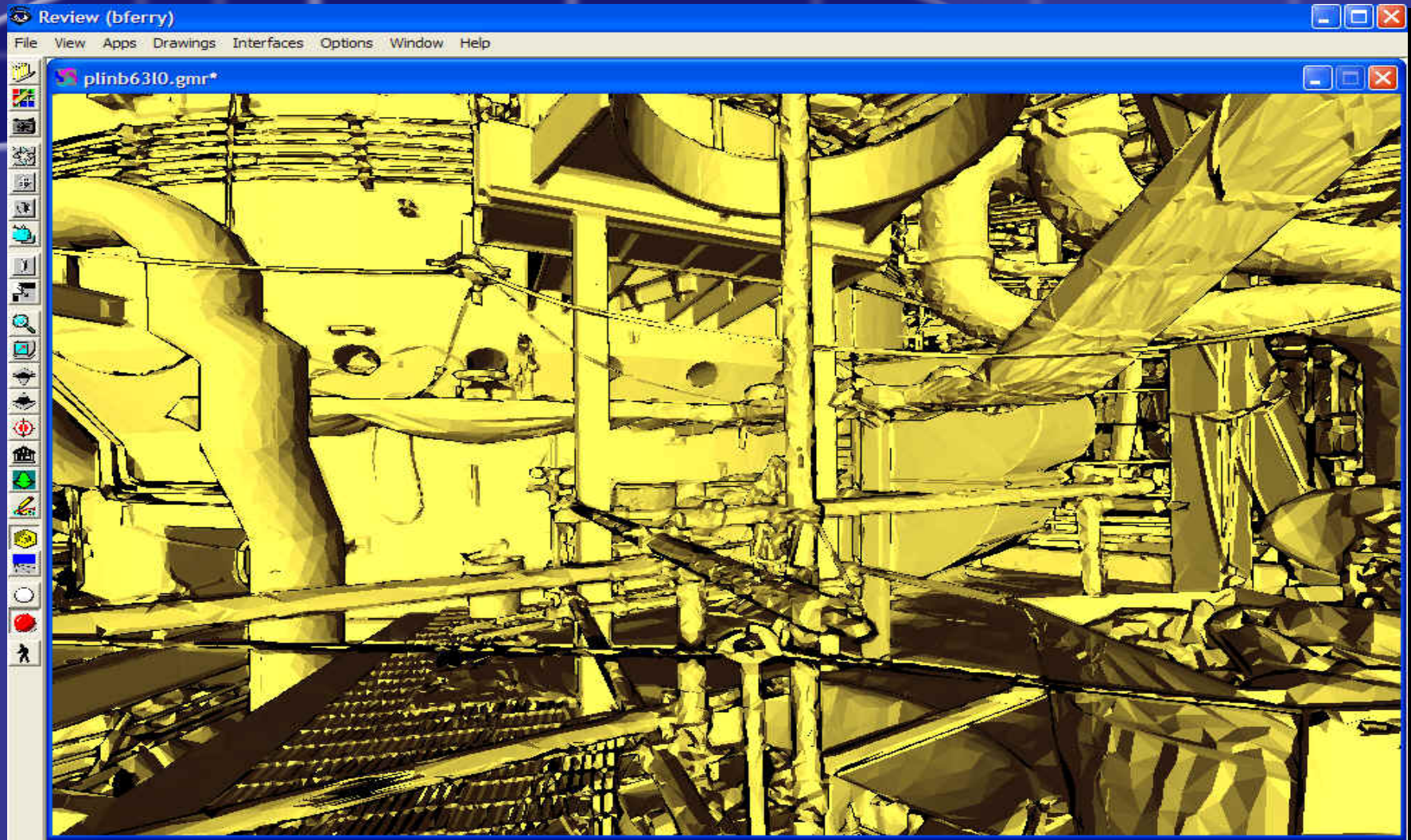
Interference Review



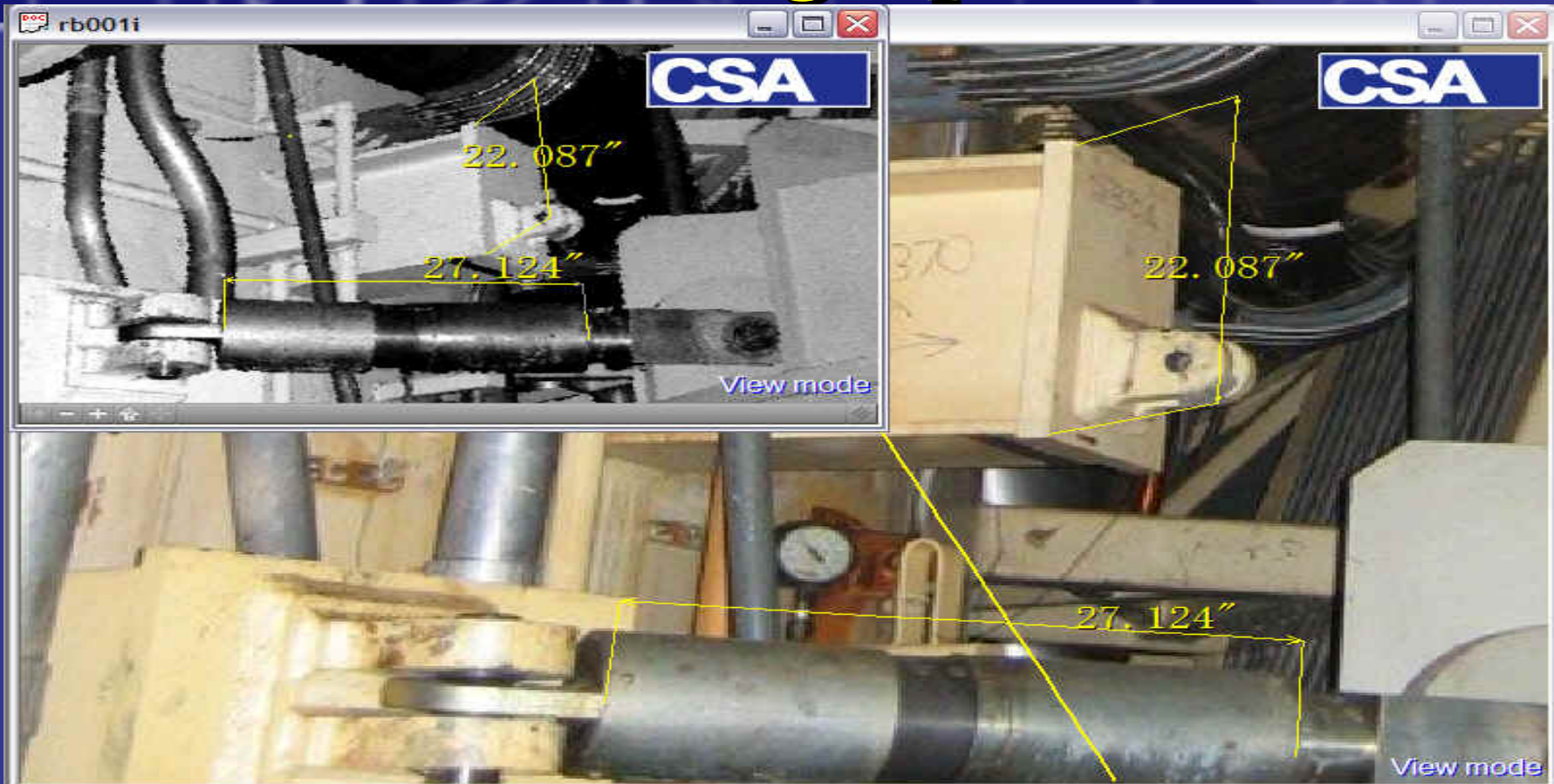
Surface Model



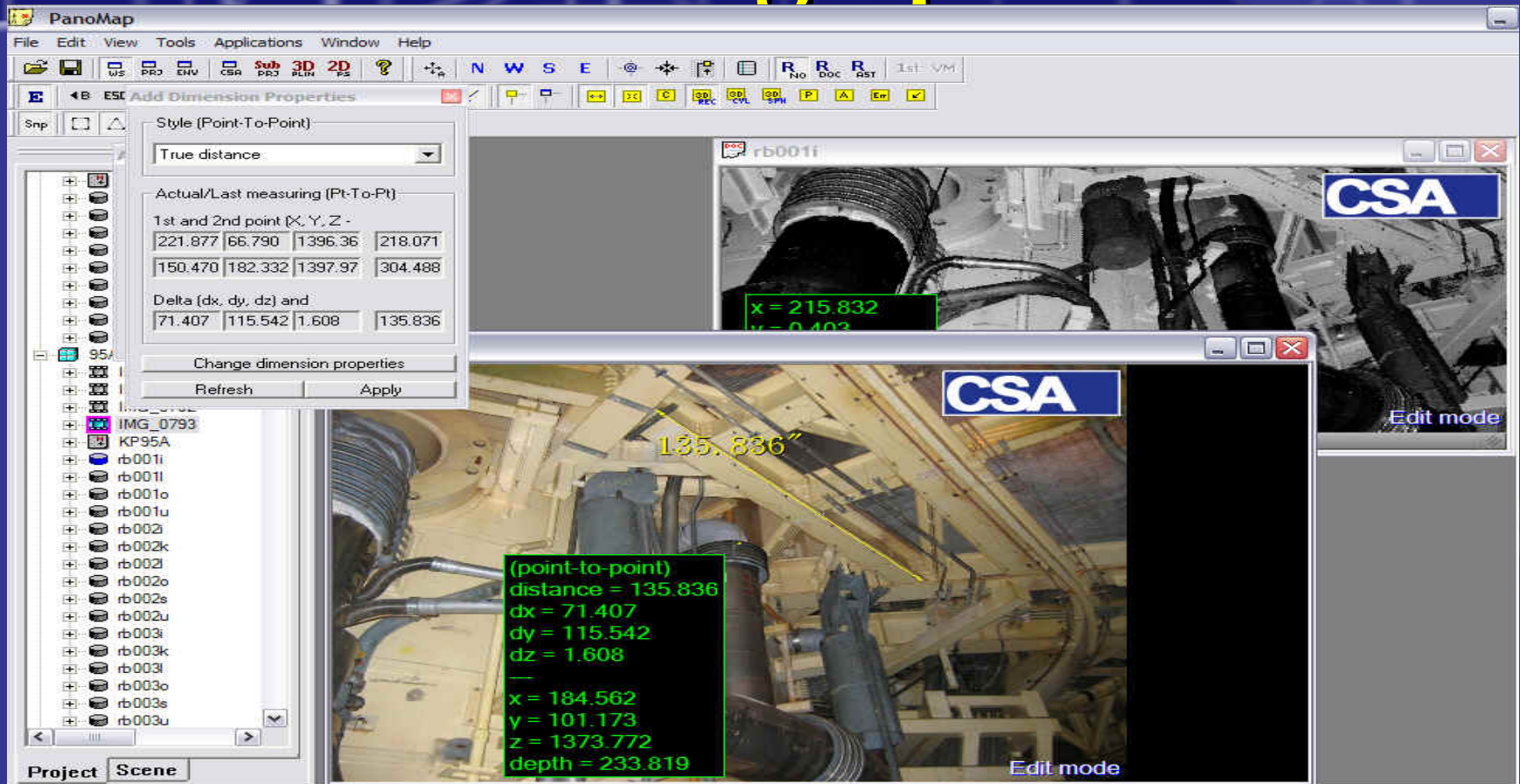
Surface Model



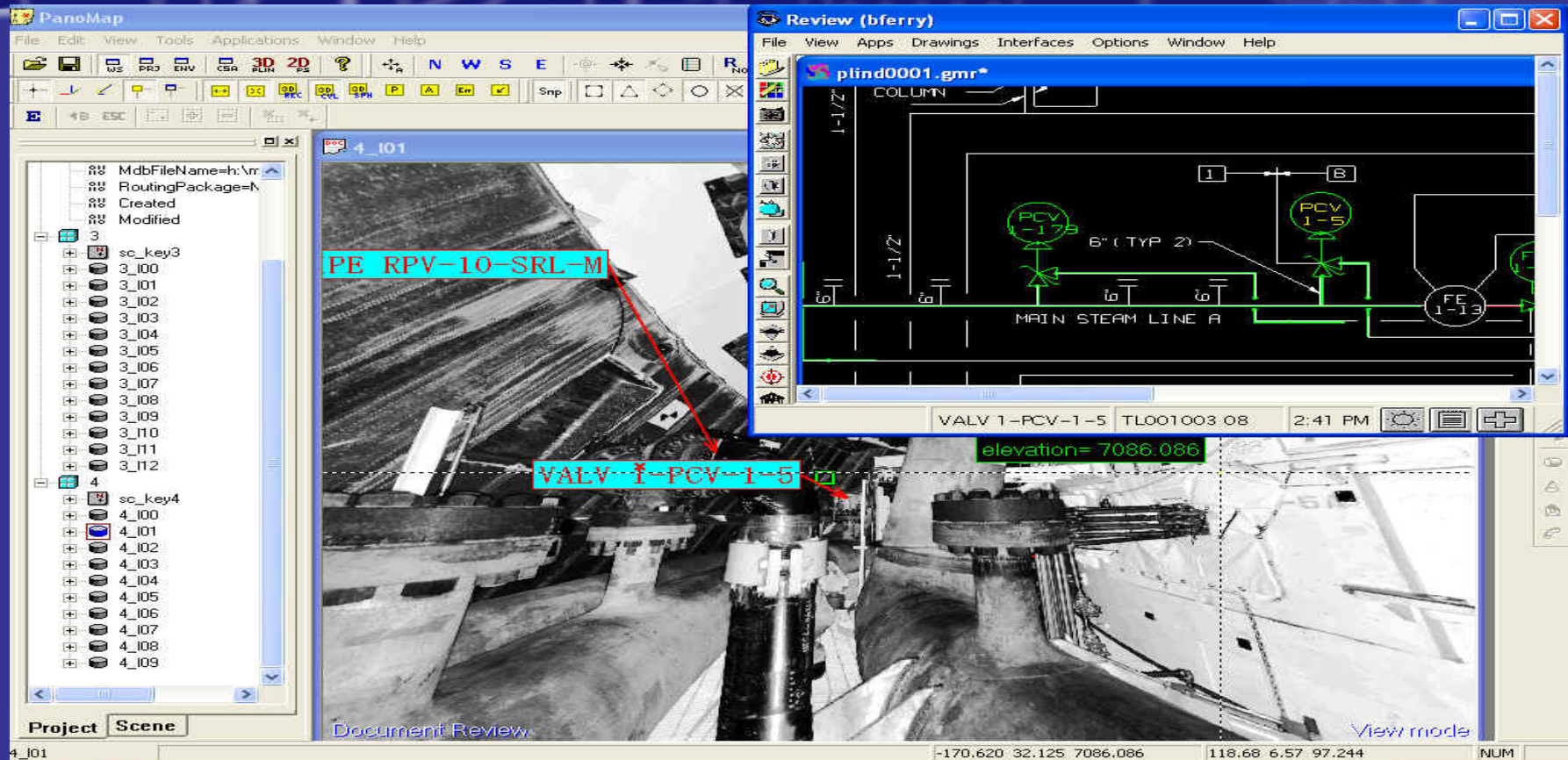
Integration with Digital Photographs



Integration with Digital Photographs



Access to Documents P&IDs



Access to Documents P&IDs

PanoMap

File Edit View Tools Applications Window Help

4_I01

Review (bferry)

File View Apps Drawings Interfaces Options Window Help

VALV 1-PCV-1-5

Review.tbl - DRAWINGS AND COMPONENTS

File Edit Applications Format Tables Tools Reports Help Pull

	A DOC TYPE	B DWG NO.	C SHT NO.	D REV	E COMPONENT
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4	TVA	BFN1CEB0010201R1-SK*		-	VALV/1-PCV-1-5
5	TVA	BFN1CEB0010201R3-SK*		-	VALV/1-PCV-1-5
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PROTECTED VALUE

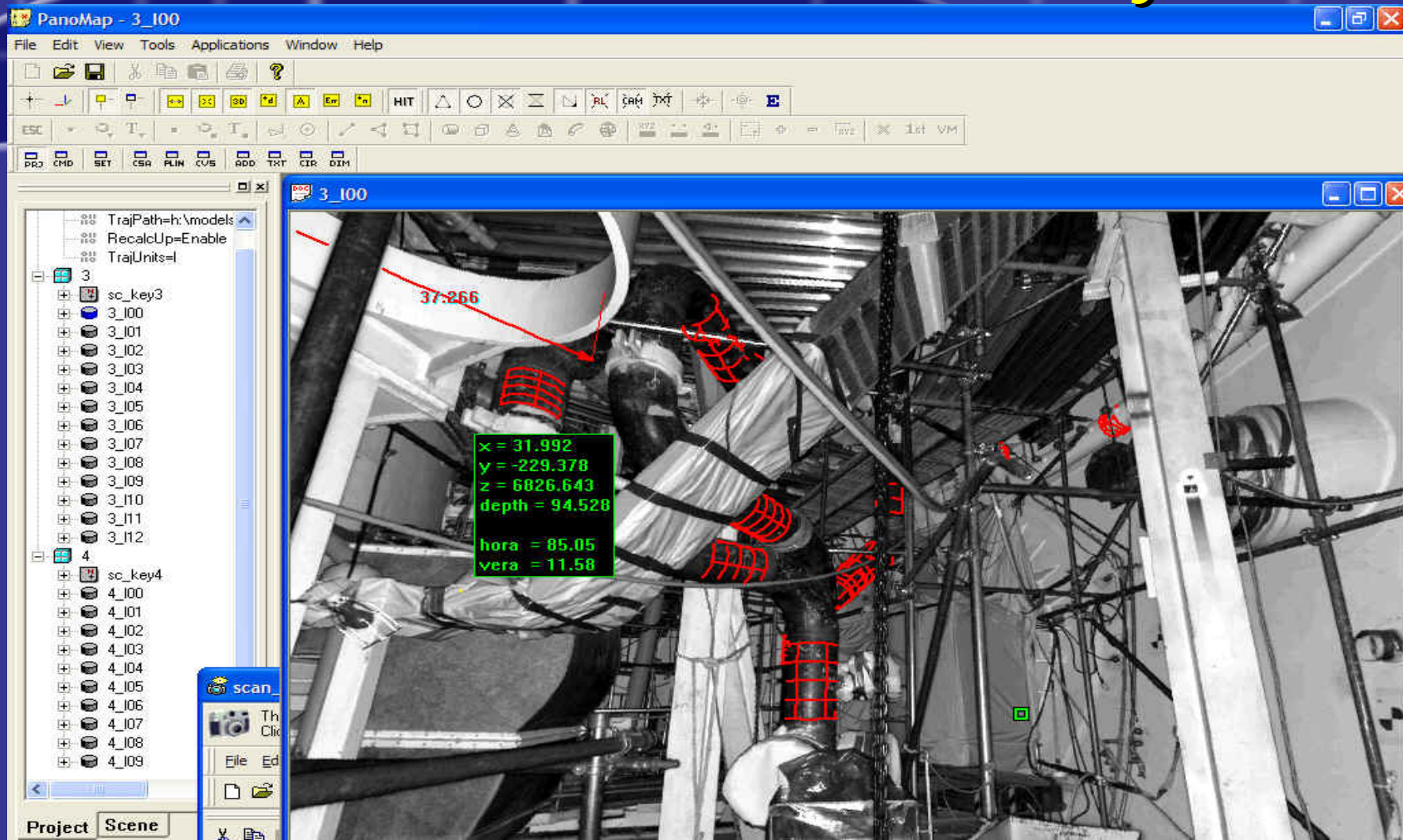
Freeze First Column

Project Scene

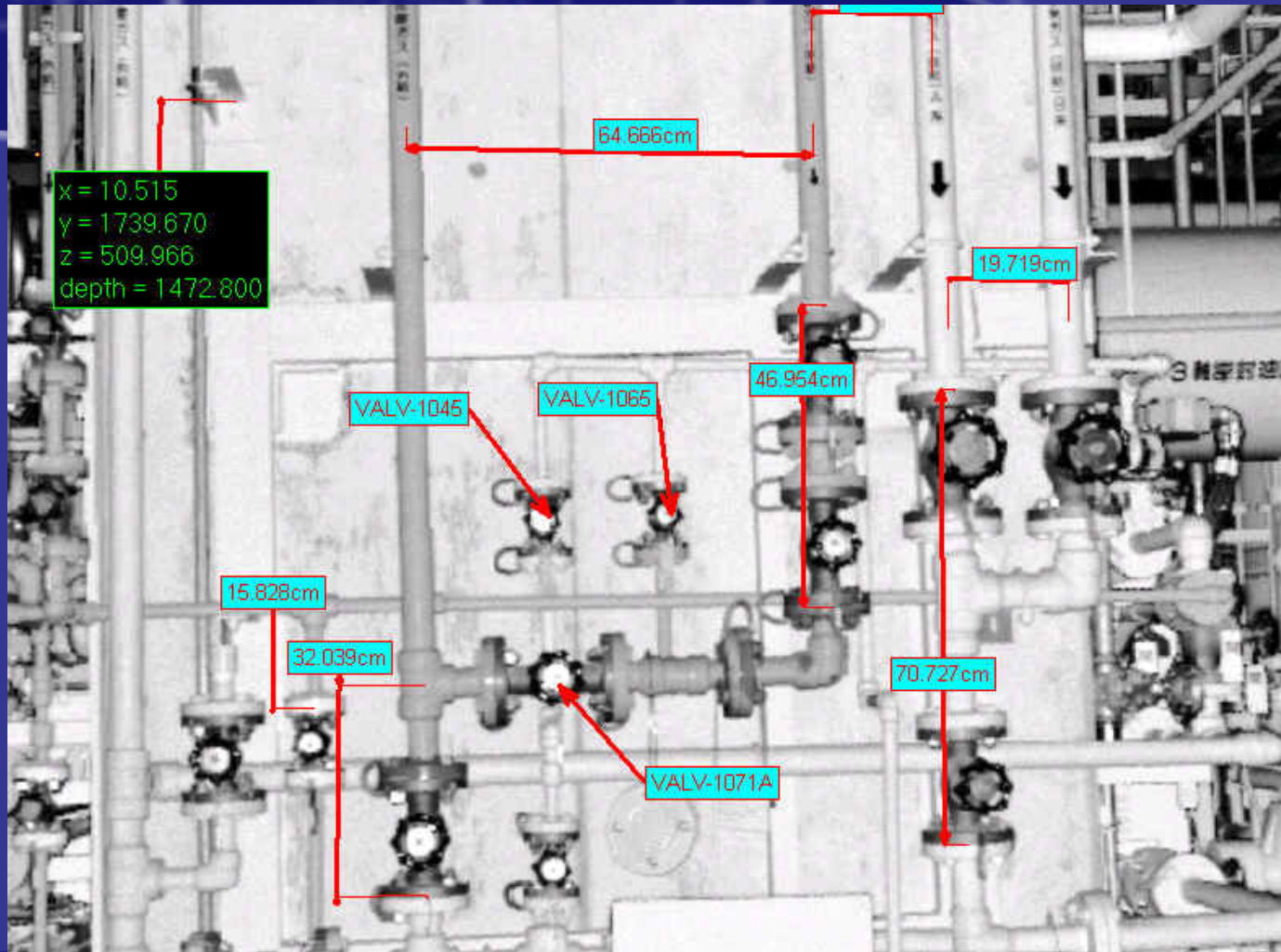
4_I01

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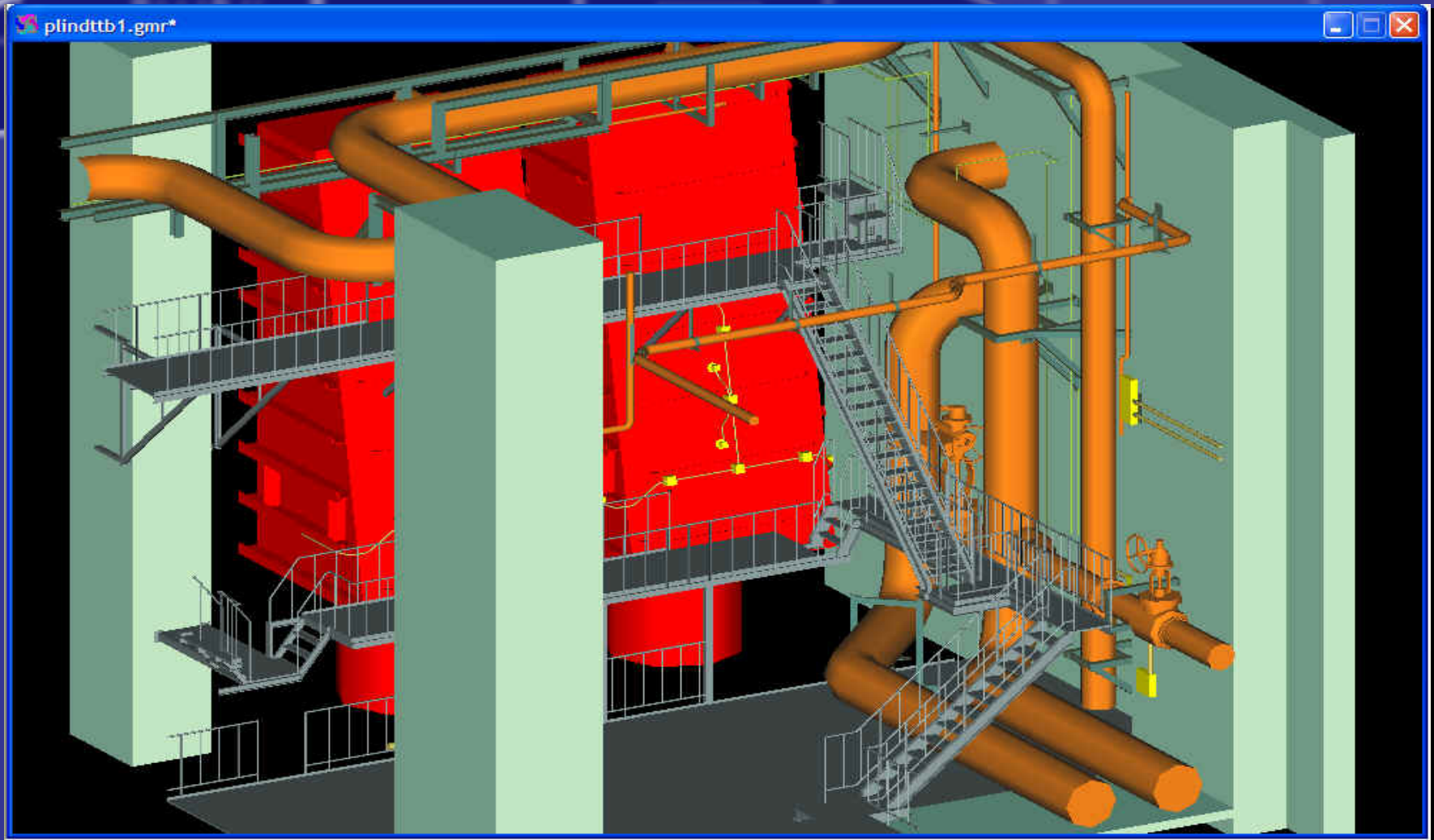
Modeled Geometry



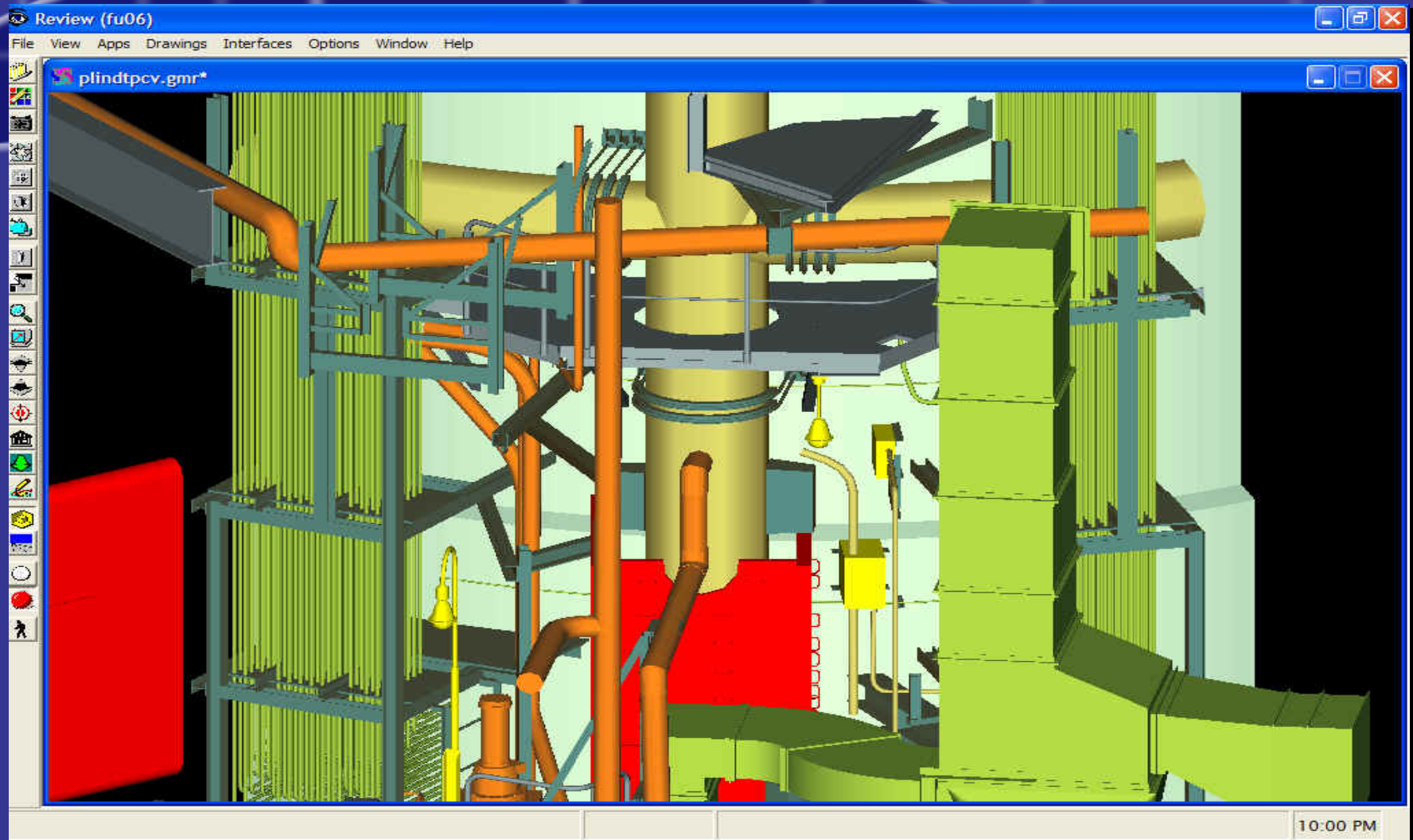
Access to Asset Database



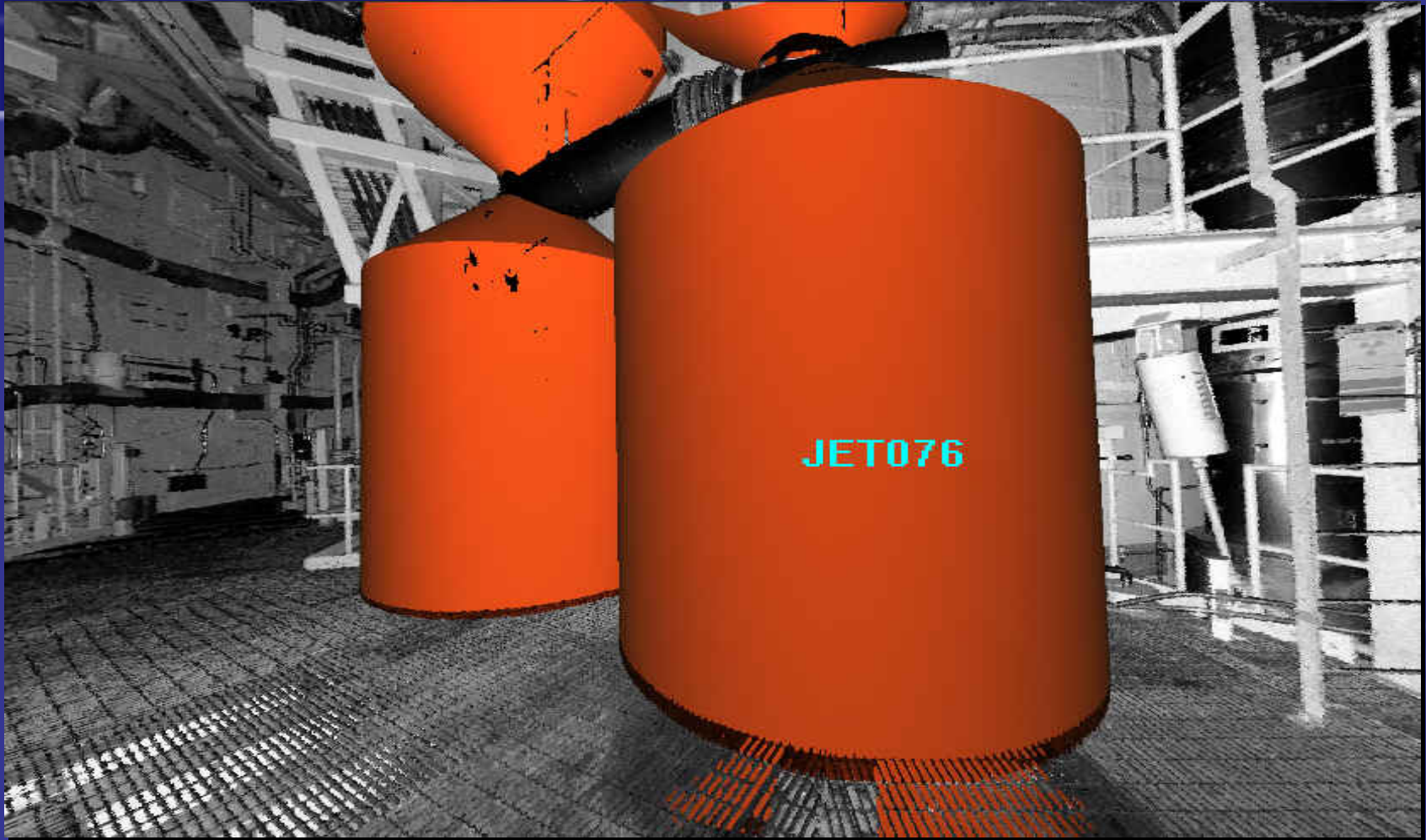
Model from Scan Data



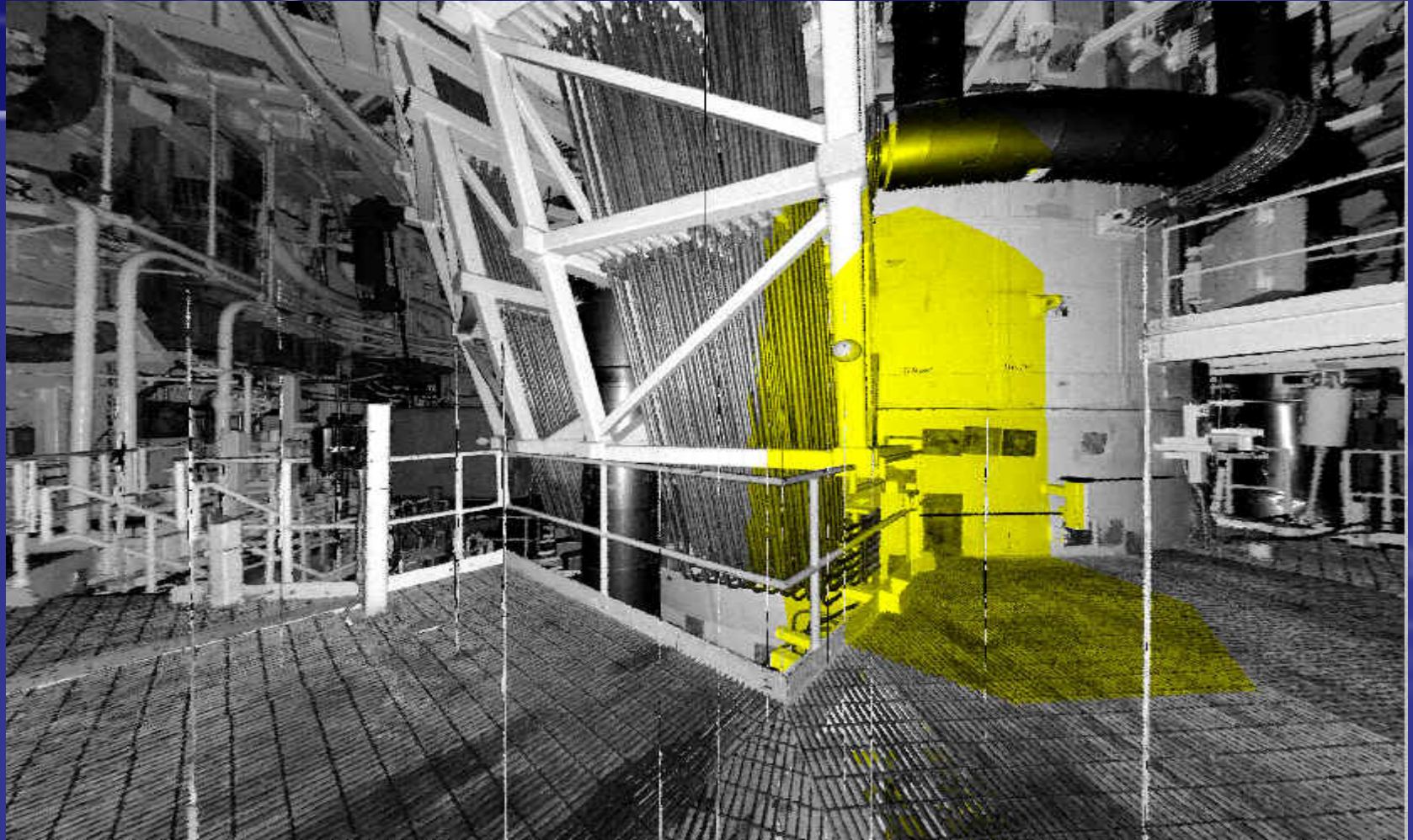
Model from Scan Data



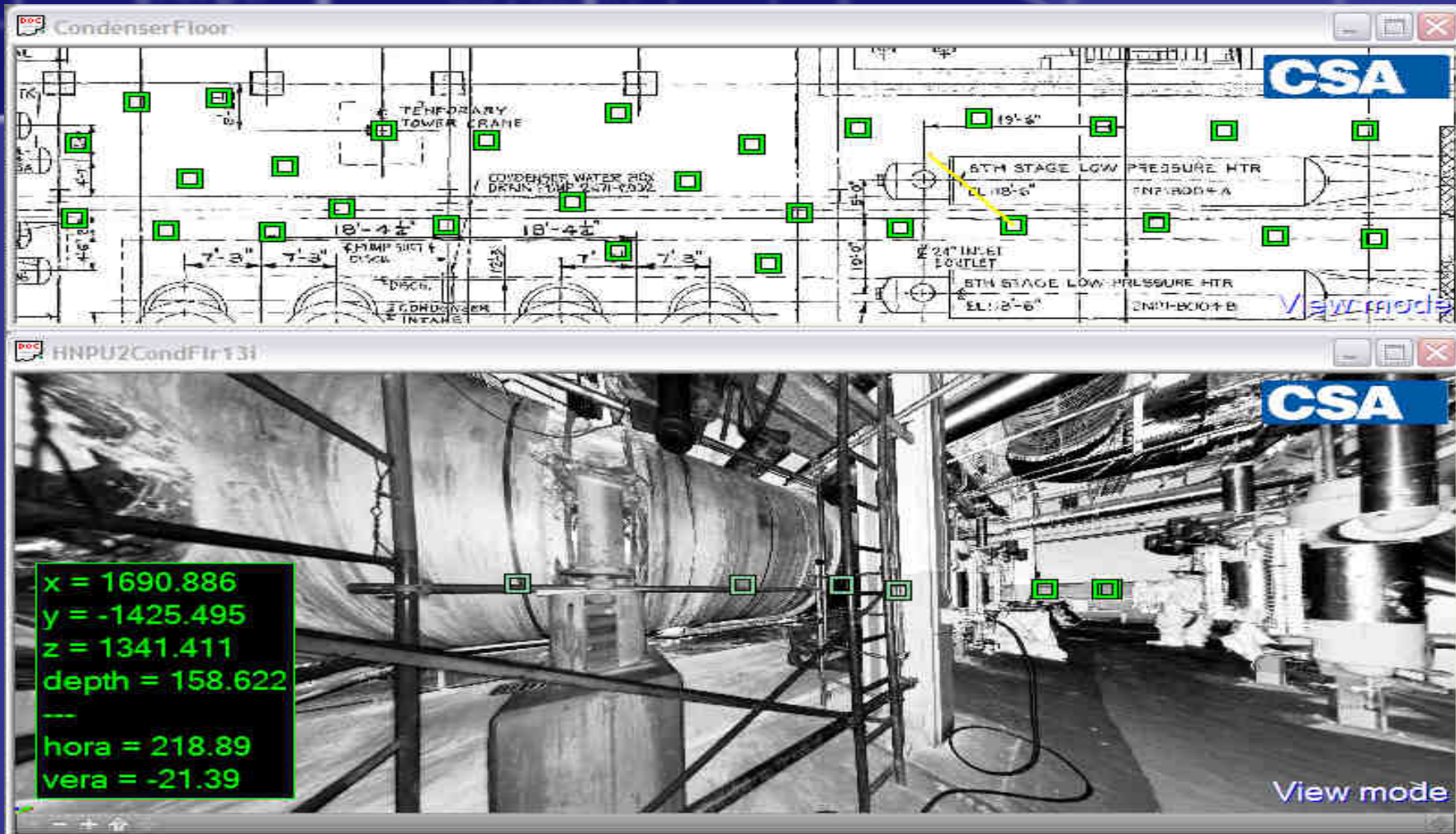
Jet Impingement Analysis



Jet Impingement Analysis



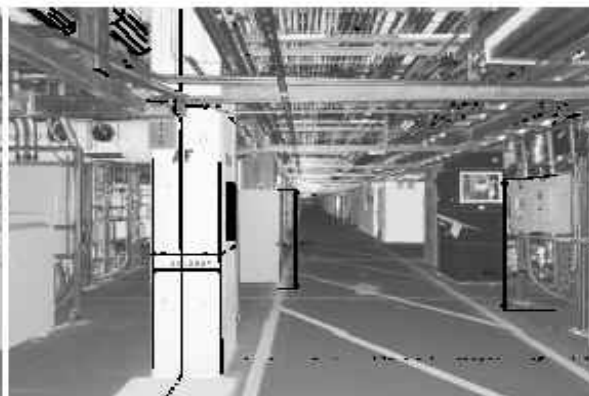
PanoMap Keyplan Access



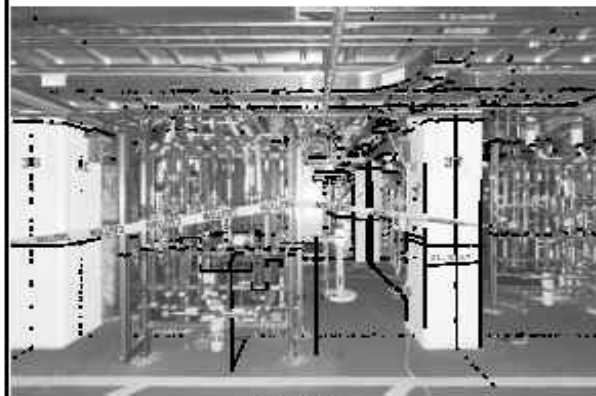
Drawing Production



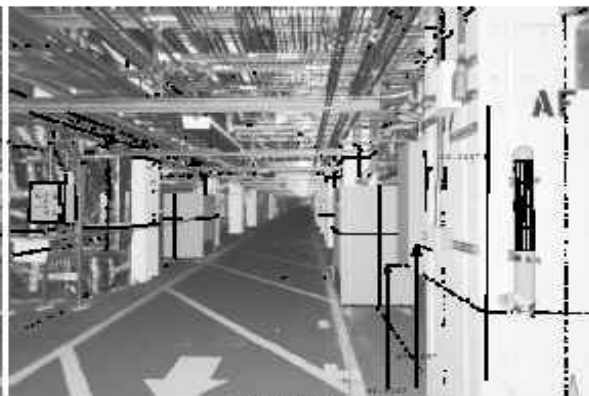
NORTH VIEW



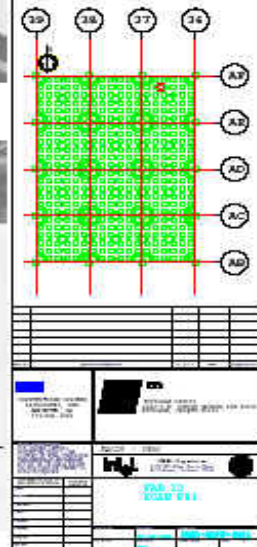
EAST VIEW



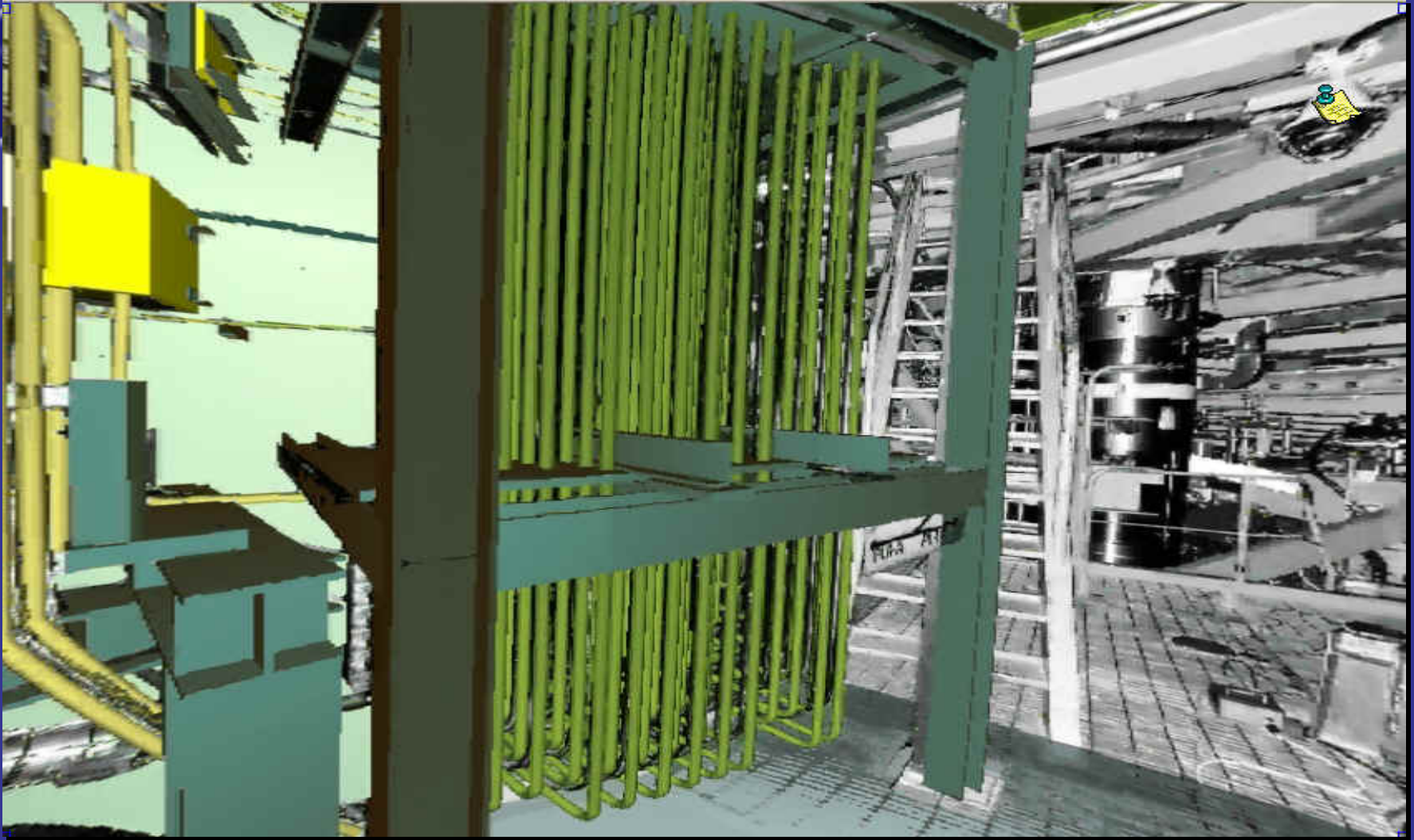
SOUTH VIEW



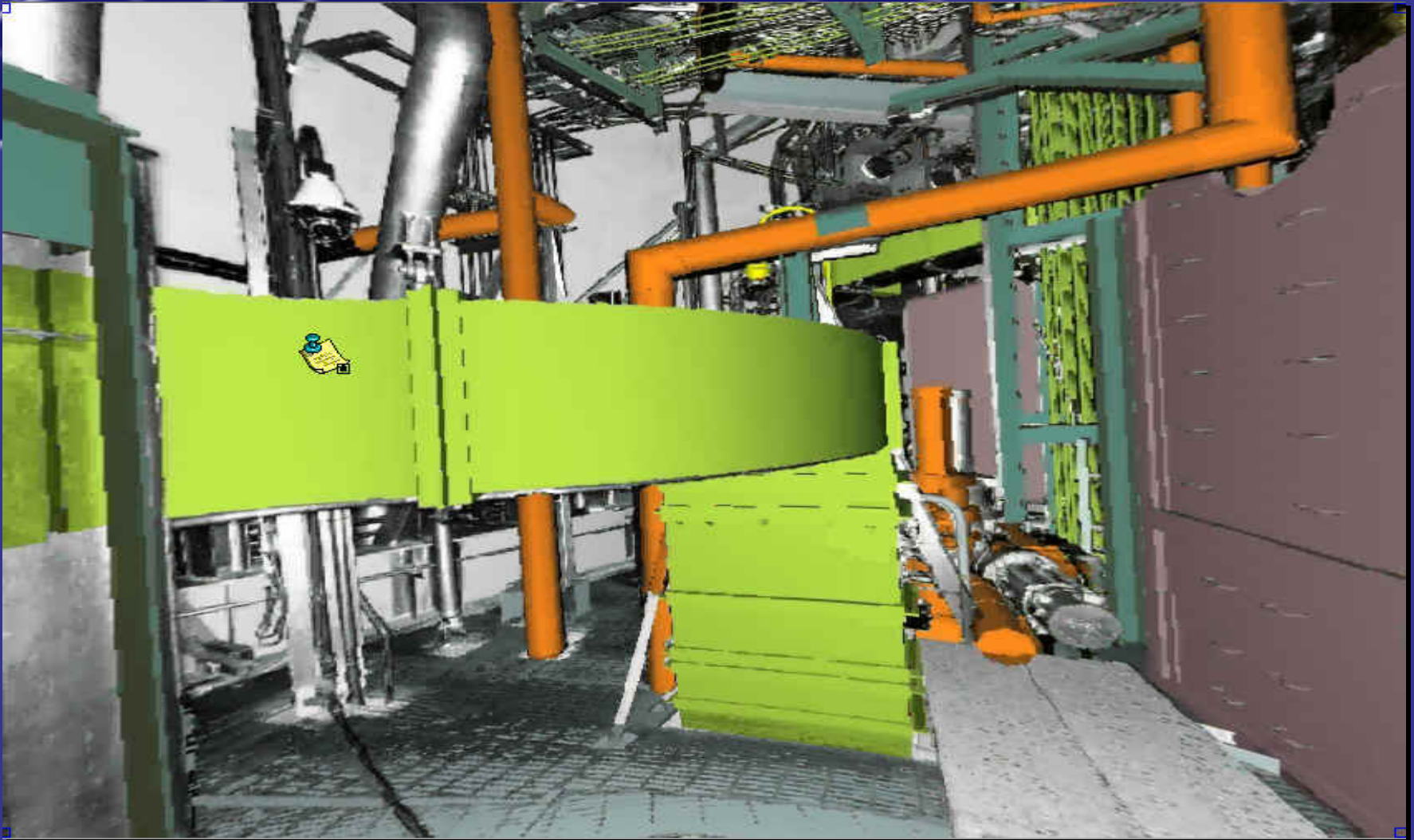
WEST VIEW



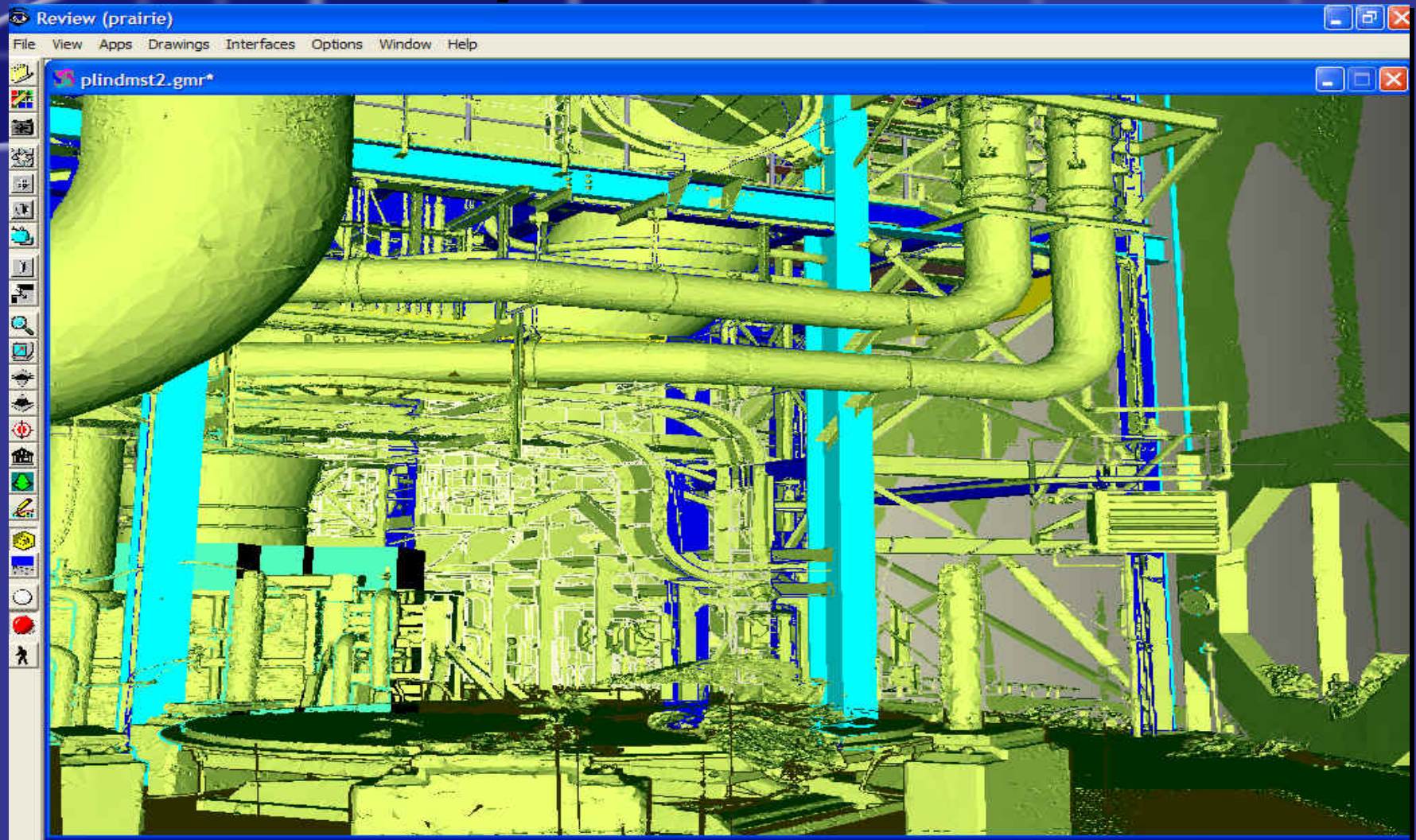
CAD/Scan Integration



CAD/Scan Integration



CAD/Surface Model



Engineering Services

- Creation, maintenance of Integrated Scan Model
- Conversion to other CAD formats
- Export redlining and dimensioning data

Engineering Services

(continued)

- Integration with new CAD designs
- Import most popular scan formats
- Registration of scan data

Software Support

- Software License
- Training and Implementation
- Project consulting
- Custom development

Typical Project Implementation

- Field scanning work
- Creation/organization of scanning database
- Transform point clouds into PanoMap format

Typical Project Implementation

(continued)

- Scan registration
- Generate surface model
- Create intelligent model *(optional)*
- Transfer to other CAD systems

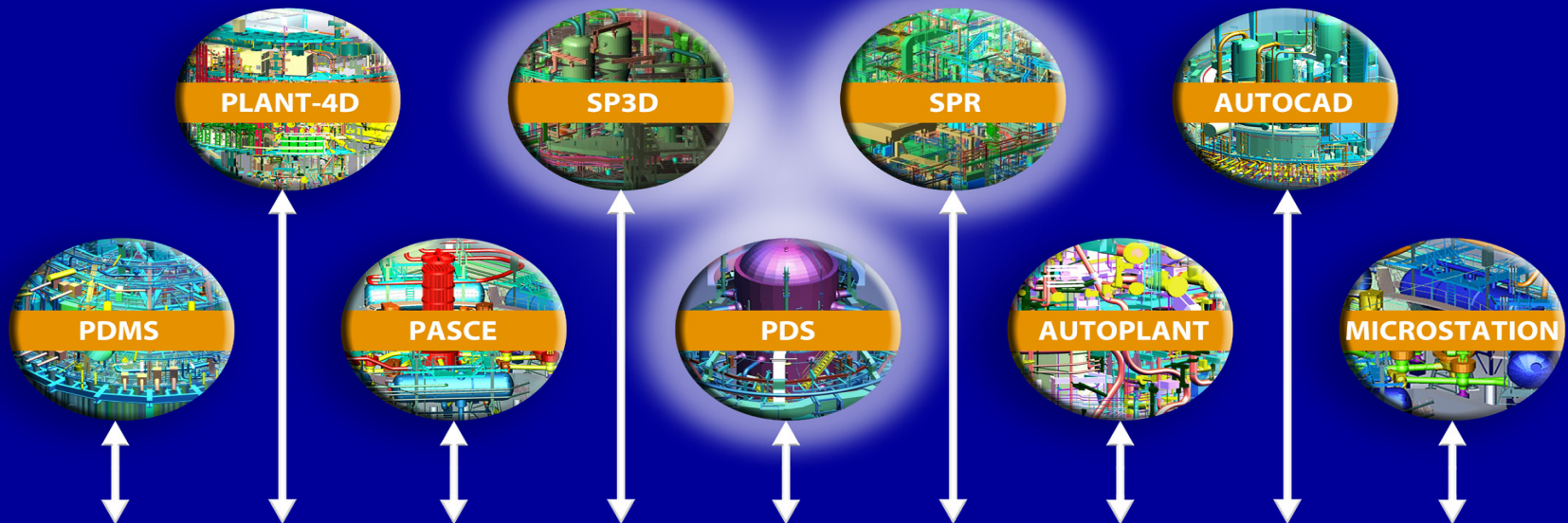
Plant/CMS Integration

- Full Plant/CMS Compatibility
- Object-oriented
- Single, unified plant database
- Interfaces to other CAD systems

Plant/CMS = Plant Configuration
Management System

CAD Conversions

LEGACY PLANT CONVERSIONS



Component
Data

Libraries
Parametric
Macros

PLANT|CMS

Geometry

Specifications

Attributes

Verification
& Checking

Corrections

Library
Substitutions

Upgrades &
Enhancements

Diagnostics

**We appreciate your interest in
CSA's technology.**

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CSA