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| **Project Name:** | Chicago Heights Chemical Plant As-built |
| **Project Description:** | Creating guick, accurate Inspection ISO's of an old plant for OSHA 1910 Section J compliance |
| **Scope:** | 30′ x 100′ tank farm and indoor reactor system |
| **Owner:** | Rohm and Haas |
| **Project Date**: | November, 1999 |

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*"This old plant, which we acquired in 1991 and subsequently added new process piping to, had only outdated documentation. When we undertook the UV testing of pipes to comply with OSHA 1910, we needed precise and reliable as-builts of the piping in order to establish repeatable measuring points for future retesting. With Cyrax we accomplished this goal faster and safer than we would have using manual walkdowns as the alternative."*

**Ron Martin, Project Engineering Maintenance Manager**
**Rohm and Haas Company**

**BACKGROUND:** Rohm and Haas Company acquired a small chemical process plant in Chicago Heights that produced emulsions used in house paints. Even though additional piping had been added after the acquisition, the plant lacked up-to-date, reliable documentation. When compliance with OSHA 1910 Section J requirements made such documentation necessary, Rohm and Haas hired the Benham Companies (now part of W.S. Atkins Benham) to survey the plant using their *Cyrax* system and to produce reliable ISO drawings.

**PROJECT DESCRIPTION:** The project involved two areas of the chemical plant; an outdoor tank farm with 4 underground tanks; and an indoor reactor system with dense and hard to reach piping. Some areas were classified as highly flammable and required extra caution.

Rohm and Haas has undertaken periodic UV checking of the pipes to ensure that pipe thickness was compliant with safety as mandated by OSHA. (Pipes, depending on classification need to be checked either every 10 years or every 5 years). In order to ensure that pipes will be measured at the same points time and time again, there was an immediate need for a reliable and up-to-date set of isometric drawings. The company first looked at using a traditional, walk-down type of survey but rejected it because it would have been too slow. There were also safety issues, as the dense piping in the indoor portion of the plant made access hazardous.

The Benham Companies was chosen as a contractor to create the as-built drawings because, with the use of the *Cyrax* system, they could perform the task faster and cheaper than the walk-down alternative. Using the *Cyrax* scanner Benham produced 70 scans in 4 days at the project site. The scanning was followed by modeling at Benham offices in St. Paul, Minnesota. Ultimately, the 3D models were used to produce 2D plan and section views as well as elbow-to-elbow isometric views of the piping. The final deliverable was a set of drawings printed either directly from Cyra Software or using exported files printed from AutoCAD®.

**BENEFITS:** According to Ron Martin, Rohm and Haas Project Engineering Maintenance Manager, using *Cyrax* was a very positive experience. He estimated that using a manual walkdown would have taken 5 to 10 times longer than the 4 days spent on scanning. In addition, he sees a benefit of the *Cyrax* system's ability to remotely survey hard to access areas such as the very dense piping in the reactor building. Accuracy was another gain, as using the scan data resulted in a higher degree of accuracy in the plans compared with manual measurements.

**PROJECT FACTS**

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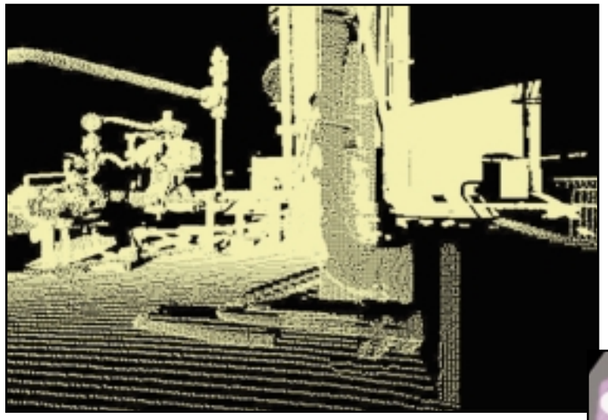
| Field scanning: | 4 days |
| Crew: | 1 |
| Number of scans taken: | 70 |
| Modeling time: | 5-6 weeks |
| Conventional method: | 10 weeks est. |

**CYRAX BENEFITS**

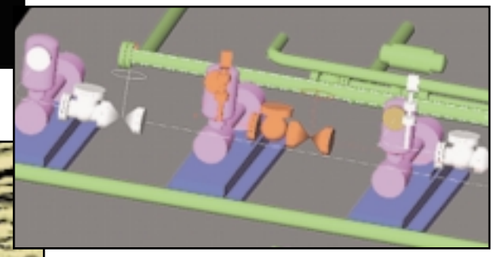
- 5–10 times faster than manual walk-down
- Safer measurment due to remote scanning
- Increased accuracy over traditional methods
- Less costly than manual walk-down

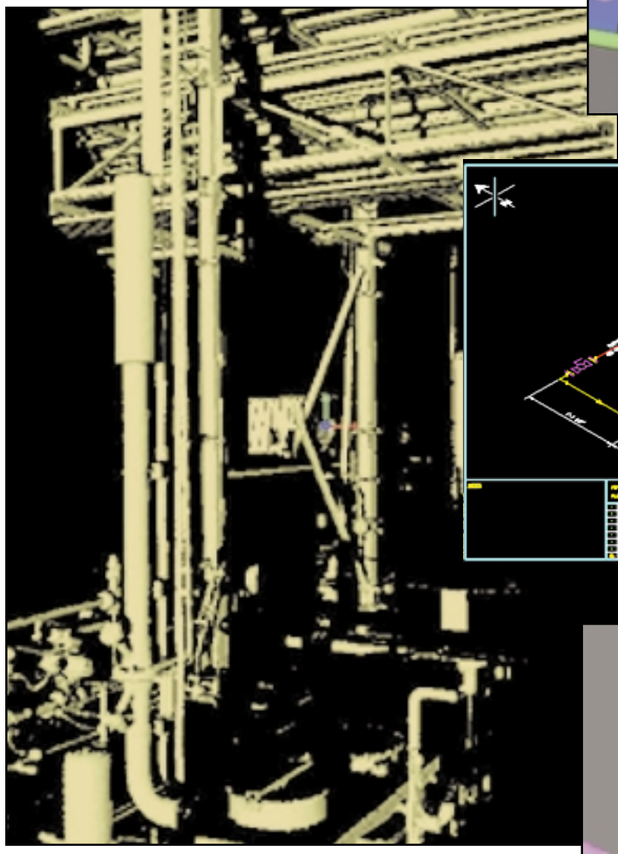


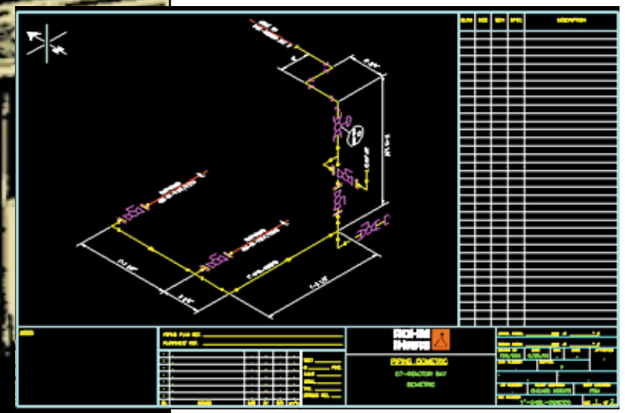


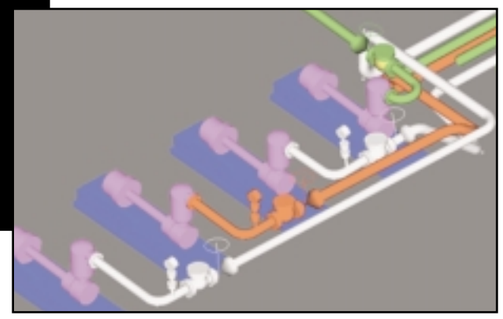


*Original point-cloud of plant (left) were converted first to a 3D model using Cyra software (below).*









*A "sbrinkwrap" view of the tank farm can be used to better visualize the piping (above) and converted into a centerline diagram as shown in a finished AutoCAD® drawing (right).*

CYRA CASE STUDIES

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