



## FACTS AT A GLANCE

**Company:** MAJA Consulting Group

**Website:** [www.majaconsultinggroup.com](http://www.majaconsultinggroup.com)

**Description:** MAJA Consulting Group is an organization specializing in functional safety, using the strength of a highly qualified team combined with the most advanced technology on the market, providing intelligent solutions for high risk process industries.

**Industry:** Petrochemical

**Country:** Mexico

## PRODUCTS USED

- Intergraph® CADWorx® FieldPipe

## KEY BENEFITS

- Data accuracy
- Modeling in real time
- Intelligent 3D
- Integration with Leica® CloudWorx®
- Streamlined workflow
- Reduced time and cost

## MAJA CONSULTING INTRODUCES PEMEX TO INTELLIGENT AS-BUILT 3D MODELING

Intergraph® CADWorx® intelligent 3D modeling capabilities help PEMEX to support the substantial renovation and new technological developments regarding facilities and surface processes.

## IDENTIFYING GOALS

Headquartered in Veracruz, Mexico, MAJA Consulting Group S.A. de C.V., provides innovative design and engineering solutions to clients. A major client is Petroleos Mexicanos (PEMEX), in charge of all exploration, production and sales in Mexico. With more than US\$ 106 billion in revenue, PEMEX is one of the largest companies in Latin America.

PEMEX refinery subsidiary's facility in the Madero-Cadereyta corridor is one of the most important installations in northern México. To support a proposed renovation, PEMEX asked MAJA to model these six stations, including mechanical systems, pipelines, instruments, auxiliary services, civil engineering and processes.

## OVERCOMING CHALLENGES

The US\$10 million project would require models of all processes, including twenty turbines, more than seventy pumps, electric motors, seven 200,000 barrel oil storage tanks, twenty-four filtering systems, six sets of instrument air systems, 52,000 meters of pipes ranging from ½ to 36 inches in diameter and more. This would require high levels of detail due to the numerous interconnected systems. Another challenge, for this eight-month project, was the early twenty-eight day window that was set aside for surveying the eighty acres of industrial facilities.

## REALIZING RESULTS

Convinced of the advantages of 3D models, the project's lead engineers, Ana Maria Macías Juárez and Gustavo Juárez Solís, and engineer Emmanuel Vega and his team of specialists, broke paradigms within PEMEX and established for the first time the intelligent 3D modeling of their industrial facilities. Their objective was to develop intelligent 3D models to help PEMEX support the proposed renovation and new technological developments regarding facilities and surface processes. The decision to use the Intergraph CADWorx platform for the intelligent 3D models proved beneficial for all stakeholders.

Using a Laser Scanner HDS 6100, they captured civil work, pipe supports, pipelines, machines and equipment in just one scan with a high degree of accuracy and used CADWorx fieldPipe for Leica fieldPro to model the piping in the field in real time during the surveying. With CADWorx, they captured representative data then developed the entire 3D model, including pipelines, instrumentation, equipment, supports, and other components, interacting easily with Leica CloudWorx data. This required just three survey people in the field using the scanner to capture point cloud data and five specialists building models.



## MOVING FORWARD

This first project for PEMEX using the CADWorx platform delivered great results. Surveying time was reduced by 70%, and they reduced project resources and production costs, completing the models in four months. They also saw improved visual results in the finished model while users reported ease of developing modeling skills and greater versatility in editing components. “We greatly improved our corporate image among clients using 3D modeling technologies,” explained Vega. “We also eliminated the high costs of having dedicated servers to handle the software and removed the specialization of disciplines, with two users working across disciplines at the same time.” These intelligent CADWorx 3D models will help PEMEX optimize operating procedures and the scheduling of maintenance activities. With real information on the state of equipment, decisions are easier regarding risks and the feasibility of upgrades, replacements, and extensions of proposed improvements. With this new perspective of their facilities and projects, PEMEX will have a better way to develop their activities.

## ABOUT INTERGRAPH

Intergraph is the leading global provider of engineering and geospatial software that enables customers to visualize complex data. Businesses and governments in more than 60 countries rely on Intergraph’s industry-specific software to organize vast amounts of data to make processes and infrastructure better, safer and smarter. The company’s software and services empower customers to build and operate more efficient plants and ships, create intelligent maps, and protect critical infrastructure and millions of people around the world.

Intergraph operates through two divisions: Process, Power & Marine (PP&M) and Security, Government & Infrastructure (SG&I). Intergraph PP&M provides enterprise engineering software for the design, construction, operation and data management of plants, ships and offshore

facilities. Intergraph SG&I provides geospatially powered solutions to the public safety and security, defense and intelligence, government, transportation, photogrammetry, and utilities and communications industries. Intergraph Government Solutions (IGS) is an independent subsidiary for SG&I’s U.S. federal and classified business.

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