

# Sixteen years of fieldbus technology application in petrochemical plants and a whole new outlook for production challenges.

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## ***Deten Química S.A. and its second generation of fieldbus system.***



### **Preface**

Located at an important Brazilian Petrochemical Pole, Deten Química SA, started its activities in 1981 producing LAB - Linear alkyl benzene and LAS - Linear alkyl benzene Sulfonic Acid, introducing Brazil to the era of biodegradable detergents. Its current annual production capacity is 220,000 tons of LAB and 80,000 tons of LAS.

Today the ownership structure of Deten is a compound of 2 petrochemical world-class companies: 72% from CEPISA Química SA and from Petrobras Química SA (28%).

Deten is one of the first companies in the world to install and operate a Fieldbus-based control system (ISP-50), even before the Foundation Fieldbus final standard was established. All of Deten's production comes from two identical plants, Deten I and II. At the time Fieldbus technology was installed, both plants were 15 years old and a large part of the instrumentation was still pneumatic.



### **Challenges**

Deten's chemical process requires a high degree of reliability and flexibility, as well as both short- and long-term economic benefits. The operation involves critical applications such as reactors, batches, and boiler and compressor control.

After 15 years of operation, the company has prepared a re-vamp process for its obsolete and hard to maintain control system. With important goals to reach: reduced capital to invest and the willing of a faster upgrade process, SYSTEM302 field based control system from Smar appear as the state of the art in distributed control architecture.

### **Solution**

In December 1994, Deten commissioned a Fieldbus pilot project to partially test the technology on its facilities. The controls upgrade involved the addition of a process optimization unit to one of the plants, as well as a digital control system based on Smar intelligent transmitters and multi-loop controllers. The second unit also received an optimization unit, but it was implemented with Fieldbus technology from the beginning.

The installation encompassed thousands of field devices, including pressure transmitters, temperature transmitters, flow equipment, level measuring devices, conventional signal converters to Fieldbus and I/O discrete conventional points. Plant supervision was distributed among 12 operator stations.

On the basis of the successful execution of this project over more than 12 months, Deten undertook its largest project in 1996, one that increased the number of Fieldbus devices.

For Deten, the project cost reduction

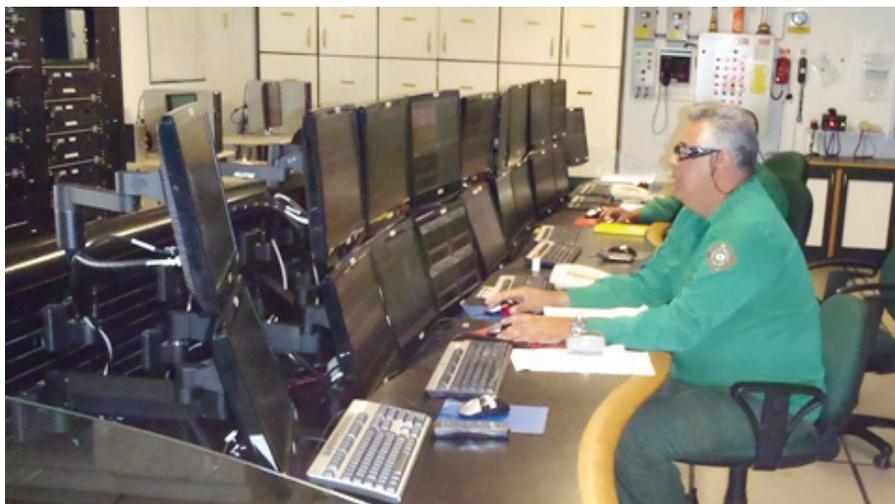
and installation/startup improvements provided by fieldbus delivered significant economic gains. The company calculated overall savings of 32 to 45 percent on the project. This included approximately 97 percent costs saving on cables. Other savings were realized through the reduction of cable trays and panel costs.

After almost 15 successful years of fieldbus ISP-50 technology use, Deten Química through its multidisciplinary group composed of AT & IT (Automation & Information Technologies) engineering and instrumentation teams started another upgrade plan aiming several improvements that could be reached with Foundation Fieldbus technology: installation costs reduction, new advanced control strategies implementation, DCS modularity and information quality.

## Results

By that time, all Deten's and Smar's teams have increased their expertise in fieldbus implementation. That knowledge joined with well-planned Factory, Site and Integration tests (FAT, SAT and SIT) made the migration path easier and faster.

The new version of SYSTEM302 has provided open, scalable and redundant Fieldbus solution that has created unthinkable facilities to the end users of the company. It can be mentioned measurable aspects as the project reduced timetable, the control strategies compliance and reduction of unexpected plant's shutdowns by adding redundancy in all levels. Other aspects that are pointed out in this case are the non-measurable benefits such as improved security for the operation and maintenance teams. Besides the high integrated client/server Ethernet architecture provides information integrity in a multi-user environment.



## Project Summary:

- Engineering Stations: SYSTEM302 version 7 (FF)
- Operation Station: ProcessView version 9
- Maintenance Station: AssetView Web tool
- Numbers:
- Communication Servers: 10;
- Foundation Fieldbus/HSE controllers: 110 (55 redundant Link Devices pairs);
- HSE Controllers: 16 (8 redundant PLC pairs);
- Supervision points: 30.000;
- Foundation Fieldbus devices: 1.566;