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## Smar and Petrobras runs together Pegaso Project

As a result of Petrobras commitment to the environmental excellence procedures, an Environmental Management and Operational Safety Program called Pegaso was created, based on significant environmental issues. According to Mr. Philippe Reischtul, Petrobras President, "The question of operational safety and the preservation of the environment are crucial for our company. It is impossible to be a competitive energy company if we do not place in the same level of priority, the challenge to find oil and the preservation of the environment."

One of the goals is to have all of Petrobras' facilities ISO 14001-certified in the medium term, which will allow the company to reach the level of quality in environmental protection that it has reached in its deep-water oil production technology. Petrobras will invest US\$1 billion between now and 2003 to obtain the ISO and other certifications including BS (British Standard) 8800 and ISM (International Safety Management Code).

The vast pipeline network of 14,000 km throughout Brazil can be viewed as potential risk for oil spills and requires constant monitoring and upgrade.



This is why Petrobras has developed together with Smar the Leak Detection System for three of its most important pipelines. Expected to be in operation in

the third quarter of 2001, these systems will be protecting installations in Alagoas, Sergipe, Bahia and Espirito Santo. The systems consist of UTR's based on Smar LC700, the modern and powerful Programmable Controller and also the family of field instruments.

For the supervisory software, the multi-phase

flow applications will be developed in a partnership to ASI (Acoustic System Incorporated) that uses ALDS (Acoustic Leak Detection System) technology. The single-phase system will be using the Simulations, a Canadian specialists for flow supervision.

**"We have involved the company in a true environmental revolution. We want to have an exemplary environmental management. Everybody will be proud of the environmental policy of Petrobras in the future".**

*Mr. Philippe Reischtul, Petrobras President.*

# Syncrude - another good result for interoperability

The Syncrude Research Center located in Edmonton, Alberta Canada successfully conducted a test to evaluate the operating requirements and economic benefits of a FOUNDATION™ fieldbus system.

"Essentially, what we have is a plug-and-play system for process control. Whomever we buy our equipment from in the future, we simply set up the control strategy and the equipment introduces itself to the system through the agreed protocol, saving set-up costs. This is a tremendous advantage because even a short shutdown is a huge expense. Now, we will have all parts of the system working together and we can minimize downtime. Instead of having unscheduled repairs we're looking at predictive maintenance. It's a different philosophy and a good one," says Ian Verhappen, co-leader of the test program

"In part, what Syncrude is doing is defining engineering standards for the future," says Verhappen. "We are the first to connect control devices from different suppliers through this independent test. Our findings will advance the widespread adoption of this technology by at least a year. And in five years we will wonder how we ever worked without this system," he says.

Syncrude says that a door has been opened to a new way of doing business in the new millennium and they will gain vital strategic advantages including reduced infrastructure requirements, better asset management, improved diagnostics and easier predictive maintenance.

The test included different host systems and associated communications stacks. A Smar SYSTEM302 was one of the systems commissioned. This is the first installation to test host communications - the final link between the



field and process or panel operator. All of the test participants showed their eagerness to make this technology ready for the market by 'pre-testing' their equipment in laboratory environments, prior to bringing it to the Syncrude test facility.

"By taking an active role in the early implementation of FOUNDATION™ fieldbus, Syncrude hopes to gain vital strategic advantages, such as reduced infrastructure requirements, better asset management, improved diagnostics, and easier predictive maintenance. We also believe the system will improve safety and reliability. The resulting cost savings will significantly benefit the company's bottom line", explains Aris Espejo, Syncrude Section Head, Extraction Process Control and Systems

The first site-based application being proposed by Syncrude for fieldbus technology is an installation on a base extraction plant scheduled for completion in early 2000. This installation will be part of the process of preparing the operation for the expansion required to accommodate additional production from the new remote mining facility. An estimated 200 input/output points will be required for this migration.

## ONIP: The Brazilian effort for the Oil and Gas market development

The forecasts indicate that the Brazilian Oil and Gas Production will double within the 5 to 7 years to come, implying in a US\$70 to 80 billion investments, which makes the segment one of the most dynamic in the Brazilian economy and most attractive for investments worldwide.

Among all the strategic initiatives to develop this segment in Brazil, **ONIP**, the Oil Industry National Association, created on 1999, is an

institution that has for main purpose to act as articulator between the investors, supplying companies, governmental agencies, searching the Oil & Gas market growth.

Our Vice President, Mr. Carlos Liboni, as a member of its Executive Committee, says: "ONIP is a very appropriated gate to the Brazilian opportunities for the international investors."

Take a look at [www.onip.org.br](http://www.onip.org.br)

# Petrobras installs Fieldbus Foundation Systems on its Oil and Gas Offshore Platform

In the second quarter of 2000, Petrobras (Brazil's National Oil Company), launched their first Foundation Fieldbus system on an offshore oil platform. The platform, Namorado 1 Gas-Lines Process Platform, will be located at Bacia de Campos - Rio de Janeiro.

Smar International Corp. was chosen to provide their SYSTEM302 Foundation Fieldbus Control System for the platform. The system includes 21 instruments connectal to 6 bridges for Fieldbus (DFIs), in redundancy. These are monitored centrally by a supervisory software system (InTouch, by Wonderware). In the projects initial phase, two engineering stations and two operation stations will be hardwired with Ethernet utilizing fiberoptics.

According to Marco Antonio Alves Pereira, Petrobras Product Engineer, gas-line pressure control is based on two transmitters and a valve. One transmitter will be installed upstream and the other downstream of the valve.

Each control loop is implemented utilizing Foundation Fieldbus Function Block programming. Two PID's located on the Field Devices are linked to an input signal selector function block that provides the output for the control valve. "By doing so, we control the input pressure for the gas-lines and at the same time limit the pressure variations in the internal header", says Meira.

## Modern architecture and distributed control.

"The culture at Petrobras typically utilizes PLC's for production areas. However, we are always attempting new technologies such as Fieldbus", explains Carlos Henrique Wildhagen Moura, Petrobras Automation Engineer. Some onshore plants currently operate with Fieldbus Technology therefore; implementing the first offshore installation was not a difficult decision.

The decision for Fieldbus Foundation Technology was made by EPBC (Exploracao e Producao da Bacia de Campos), an agency that initiated the design and detailed the architectural concept. The decision to use Foundation Fieldbus products involved a series of essential criteria used by the oil industry. In addition, Petrobras's rules required either a reduction in the cost of implantation, ease of expansion, and system interoperability. Foundation technology was also chosen due to its easy-integration of all instrument information generated by each of the systems instruments. Had this been done with existing smart technology, additional hardware would have been a requirement.

The choice of Fieldbus Foundation products was also influenced by its modern architecture,



where control via function blocks is distributed and located inside field devices. Therefore, the requirement to use a PLC, or SoftPLC to execute simpler control functions is eliminated. This architecture is proposed for the Namorado 1 Platform, where distributed PID algorithms will do approximately 100% of its control.

"Another flexibility that Fieldbus Foundation brought us, was the interoperability and interchangeability among the instruments. This is the single largest advantage", comments Vitor Lisboa - Petrobras Industrial Automation Manager.

## Guaranteed Stability

"There are two control loops controlling the deaeration system for the water injection. These control loops are running in the DFI installed in the control room. The architecture system is designed to have all Fieldbus gateway nodes installed on pressurized panels in the field and interconnect to the control room via fiber optics"; says Meira.

"The plants are operating extremely well and with an incredible stability. In the past, when we operated our offshore plant using conventional instrumentation, there was a tremendous variation, around 20% to 30%. Sometimes this would jump to 40% in the deaerator vases level control. Today this percentage does not pass 1% or 2%"; comments Vanderlei Gonçalves - Assembly and Installation Technician.

According to the Carlos Henrique - "As this was the first project in this area, the company focused special attention on the modus operandi of the proponents. We looked to nullify all questions related to eventual new activities in the process, since we were acquiring and consolidating part of an existing system. We also contemplated some additional development. The supplier definition was based on commercial and technical criteria and the companies had many similarities. The final definition was based on adequacy of the system to the necessities of the specified project".

## Smar installs leak detecting SYSTEM at Urucu Natural Gas Station

Smar is installing at the Natural Gas Exploration and Production Plant at Urucu a system by Acoustic System Inc. to detect leaks. The Smar's remote communication system will send signals through Radio link to the main monitoring station in case of a leak.

The complex where the leak detecting system is being installed will generate 930 MW of energy using 5 Million m3 of natural gas per day. The gas is produced at the Campos de Urucu and Juruá in the Amazon and will be transferred to Coari in the Rio Solimões through a gas pipeline. The gas pipeline measuring 500 km is the part of the complex. The pipeline runs from Urucu to

Porto Velho in Roraima State

The natural gas project has been implemented by the State owned Petrobras, Gaspetro, BNDES, Companhia de Gas do Amazonas and by the Ministry of Mines and Energy. The cost of energy will be approx. half as compared to the actual prices.



Urucu Natural Gas Station

## Smar joins hands with "Simulations" to detect leakage in the oil ducts

Smar as a Specialist in automation has joined hands with "Simulations" who are specialists in detecting leakage in the oil carrying ducts. This "hand shake" contemplates software from Simulation and instruments from Smar.

The Smar instruments which are going to be integrated into the system will remotely transmit the data from the oil ducts and log in to the software for analysis and detection of a leak.

This software which is being used for the first time in Brazil is capable of detecting the size and the position of the leakage very

quickly. This helps in avoiding damage to the ecology and huge losses to the oil producers.

"Simulations" is a Canadian company with over 25 years of activity. Its software is in operation in the world's largest oil companies like Shell, Esso, Ipiranga etc. At the present moment there are about 25000 km of oil ducts being monitored by this software world wide.

Smar and Simulation are working together on bids for the supply of packages involving Engineering and Software in several projects.

# Producing 790 000 kW with SYSTEM302 in Mexico

Mexico has more than 15 SYSTEM302 installed and running today, but one of the most important applications yet is at the power generation. In 1997 the first fieldbus system in Mexico started operations at the Mazatlan thermoelectric Power Plant of the Comision Federal de

Electricidad. Untill today this system has been working continuously for more than 36 months without any shutdowns nor problems of any kind. After a long time evaluating SYSTEM302 performance, in 1998; the plant management decided to install a second system for the unit 2 with



Electricidad located in the northeast of Mexico. This plant is part of the power generation system in Mexico and it has 3 power units. The units 1 & 2 have a capacity of 158 000 kW each and the unit 3 has 316 000 kW.

The unit 1 is powered by a high pressure boiler producing 600 Ton/hr steam at 150 Kgs/Cm2, The SYSTEM302 handles:

- Master pressure control
- Fuel flow control (Crossed limits)
- 2 Air dampers with balance station
- Oxygen trim
- Drum level (3 elements) control
- Feed water flow control
- 1 Deareator level control
- Steam flow (as feedforward)
- LC700 Interlock and alarming

same capacity and control loops. As expected the new SYSTEM302 installed works just like the first one, but now with a new record of 1 week installation time, so far no maintenance is yet required in any of the two systems. This allows maintenance department to focus on other maintenance problems in the plant, which some years ago was just impossible.

In December 1999, a new SYSTEM302 was added to the list. The thermoelectric power plant at Guaymas succeeded the start up of their first SYSTEM302. The Unit 1 of this plant is also 158 000 kW. In this application the LC700 is responsible of the start and shutdown sequences for the boiler.

To date a total of 790 000 kW is being produced in Mexico using Smar Control Systems.

Power is easier when using SYSTEM302!

## PDVSA approves Smar Series 301 transmitters for aggressive areas

The largest oil company of the Latin America PDVSA in Venezuela has selected Smar's series 301 transmitters for the control of the process in aggressive ambient applications. The Venezuelan company acquired in January 2001 one hundred and seventy (170) Pressure and Temperature Transmitters to be used in high salinity areas.

With the investment of 150 000 US\$ PDVSA hopes to improve reliability of the Control System by utilizing Smar's Series 301 which has high resistance to adverse atmospheric conditions. Apart from the Transmitters PDVSA will also be using the industry proven CD600 Smar's Multi-loop controller. The CD600 can simultaneously control four loops.

In the year 2001 PDVSA plans to substitute 20% of all their transmitters used presently in

their operations in Venezuela. No doubt Smar will be their main supplier which is helped by Smar's strong technical support and high resistance of Smar Transmitters to the aggressive ambient conditions.



## Smar & ABB together in Pemex Refinery Project

ABB & Smar México will supply the largest Foundation Fieldbus installation in Mexico to Pemex Refinación in 2001. This project includes the

modernization of 6 plants at the Refinery "Gral. Lázaro Cárdenas Del Río" located in southeastern Mexico. Pemex is Mexico's State



owned Oil Company, and ranks #15 worldwide. 651 Smar Foundation Fieldbus Devices will be in charge of the refineries most critical processes. These field devices will communicate with ABB's Freelance control system.

All process control and calculation function blocks will be executed at the field level. Instantiation capability and the variety of Smar Devices available, were key to our selection on this project. This reflects Smar technology leadership, even when competing against major players.

This success reflects more than 2 years of

effort. Technology introduction, specification development, and the invitation to bid were all a part of this process.

"This success proves that Smar is heading in the right direction. The size of our competition is unimportant." Says Ricardo Castañeda of Smar México.



Pemex Refinery

# SYSTEM302 passed successfully Elf Foundation interoperability tests

Elf Atochem, one of the most important French group of refinery/chemistry, has been following for the past 9 months Fieldbus Foundation interoperability tests.

On June the 9th and 10th, 1999 at its Technical Center in Lyon, Mr Dransart (CTA), Elf coordinator for these tests, asked five of its suppliers (Smar, National Instruments, Fisher Rosemount, Honeywell and Yokogawa) to submit their equipment to a series of tests designed by Elf. Eight different field devices

from Smar, Fisher Rosemount, Honeywell and Yokogawa were submitted successively to configure over 3 FF hosts systems: SYSTEM302 from Smar, Nilbus from National Instruments and DeltaV from Fisher Rosemount.

The objective was to check the capability of these hosts systems to configure and operate any FF certified device with an interoperable process control strategy defined by Elf.

## Interoperability enables to:

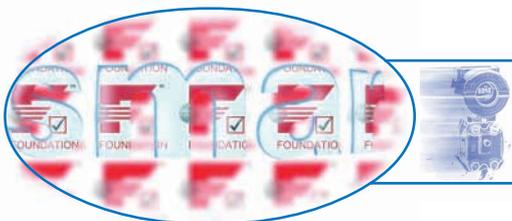
- read/write all parameters from the hosts system
- use all designed Function Blocks in the devices
- have a real time operation of the process control system between devices
- at the level of technical features, SYSTEM302 was the only one to have both Off-line configuration and function blocks instantiation. It has also the biggest number of FF function blocks (17 different possible in the devices).

## The following tests were performed:

- to configure a process control with 12 function blocks
- to check that all links are working properly
- to check that all function blocks are operating

SYSTEM302 was the only host system to completely succeed at the tests following the strategy designed by Elf. All devices from the 4 different suppliers were fully configured by Smar system and all links and function blocks of the process control were working properly.

Elf thanked Smar for its active support and its very positive results. These tests were also very instructive for Smar and are a good signal for many future interoperable SYSTEM302. We thanked very much Elf for this initiative and their warm welcome.



# Smard develops System with Radio Communication to Control Oil Ducts

**S**mar has developed for an Spanish client Fondon Redes & Fluids specialized in integrating systems for oil industry a system never used before to communicate through radio signals synchronously between PLC and Central Control Station to supervise oil ducts.

The system integrator Fondon Redes & Fluids from Gijon Spain were asked to resolve a problem involving safety of 10 oil ducts. The main obstacle was that the communication had to be with radio signals using a MODBUS protocol. This was not compatible with the PLCs available in the international market.

To resolve the problem, Smar developed, in a record time, a Radio/ PLC interface which permitted exchange of synchronized data through MODBUS between the Smar PLC the LC700 and the radio SR500 installed on the ten Oil ducts with the SYSTEM302 .

The solution comprised of the Smar's SYSTEM302 and twelve LC700 equipped with synchronous communication interface on all the operating stations situated at the ten Oil Ducts plus the central control station to monitor the entire application.

With this solution by Smar, Fondon Redes were able to control all the variables which have an effect on the safety of oil ducts. The total investment was about 800,000 US\$ which, apart from safety feature, provided much more information at the central control station due to the use of the SYSTEM302.



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