Soybean Oil Extraction and Biodiesel

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Summary

1. Intecnial & eTech
2. BSBios
3. Productive Process
4. Pictures
5. BSBios History
6. PlantPAX - Process Automation System
7. Compensations
### Activities
- Electrical Manufacturing
- Electrical Assembly
- Mechanical Manufacture
- Mechanical Assembly
- Services

### Segments of the Company
- Animal Nutrition
- Automotive
- Biodiesel
- Chemical
- Conveyors
- Naval
- Nutritional
- Petrochemical
- Port
- Pulp and Paper
- Vegetable Oils
- Tobacco

### Segments of the Company
- Diagnosis
- Electrical
- Home and Build Automation
- Industrial Automation
- Instrumentation
- Network
- Otimização Process
- Project Management
- RFID
BSBios plant located in Brazil with Rockwell solution highlighting integration to all areas of the enterprise.

Solution fully integrated between the following levels:

**Level-0** - Instruments, MCCs and RFID
**Level-1** - Control
**Level-2** - Supervisory
**Level-3** - PIMS and MES
**Level-4** - ERP
• Founded: April of 2005

• Location: Passo Fundo – RS – Brazil (300Km far Porto Alegre)

• Shareholders: [BR Petrobras]

• Activity: Biodiesel and sub-products, soy meal

• Production: 345m³/day of Biodiesel – crushing 2500ton/day of soybean

• Operations: 24h x 365d/y
Productive Process
Productive Process

- **Truck Access:**
  - RFId Technology – Radio Frequency Identification

- **Storage:**
  - 120,000 ton of seeds and 66,000 ton of soy meal

- **Preparation:**
  - Bean Heater - 8 heating sections
  - Crackers - 4 x 625ton/day
  - Flakers - 5 x 500ton/day

- **Extraction:** (Classified Area - Zone 1 – Hexane)
  - Extractor - Horizontal continuous loop of 2500 ton/day

- **Biodiesel:** (Classified Area - Zone 1 - Methanol)
  - Continuous Standard Oil & Fat Pretreatment
  - Continuous Transesterification Process
  - 345m³/day of biodiesel

- **Boilers:**
  - 1x 12T/h, 15 kgf/cm²
  - 1x 30T/h, 15kgf/cm²
Pictures

Seeds Storage
Pictures

Preparation and Extraction

Meal Storage
Pictures

Control Room

Biodiesel

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BSBios History

• Intecnial and Crown Iron Works built the BSBios Biodiesel Project
• Operations started in 2005 with BSBios buying soybean oil and producing Biodiesel
• Started only with biodiesel process / pretreatment and single controller
• There were 3 operation workstations, without engineering and maintenance workstations. The access to data was done through paper registers and MSExcel spreadsheets.
• Historical data was manually collected with missing process engineering data inserted later to further analysis.

Later…

• BSBios decided to produce degummed own soy oil from soybean seeds.
• Intecnial built the entire project - "Project Turnkey“
• In 2010, started the new complex BSBios - storage and crushing of soy
PlantPAx - Process Automation System

Supervisory

- 15 Operator Stations
- Engineering Station
- 2 redundant servers
- 1 Historian Server
- Unlimited screen license
- FTHistorian with 5000 tags
- FTAssetCentre with 1500 assets

I/O

- 5 ControlLogix L63 controllers, linked through fiber optic ring architecture
- Using 1797 FlexEx I/O (Intrinsically Safe) with ControlNet
- 1000 DI, 24Vdc
- 300 DO, 24Vdc
- 250 AI, 4-20ma+HART
- 100 AO, 4-20ma+HART
- 450 Starters with DeviceNet
- 150 control loops

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BSBios Today - Optimized with PlantPAx Control

The system was developed using the best products and definitions of architecture. The architecture is defined based on:

1. Fiber optic rings
2. Control Room – Local
3. Control Room – General
4. Redundant Servers
5. History of alarms, events and commands
6. Station Engineering and Asset Management
7. Intelligent MCCs (DeviceNet)
8. Intelligent Instruments (HART)
9. Integration with ERP
10. Integration with RFID
11. Balance of plant
PlantPAx - Process Automation System

BSBios Today - Optimized with PlantPAx Control

• Automated process - independent of operators. Over 95% of control loops in automatic mode.
• Intuitive interface to the operator indicating the process interlocks.
• A fully integrated system for all subsystems using fiber-optic ring 1Gbps based on Stratix8000 switches
• Hot swap capability for all new I/O modules
• Operation from a centralized control room, with web access to top management using FactoryTalk ViewPoint and FactoryTalk VantagePoint
• Modular, Available system and seamless connection to business systems (SAP)
• FactoryTalk Historian, FactoryTalk AssetCentre, FactoryTalk View, FactoryTalk ViewPoint

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PlantPAx - Process Automation System
PlantPAx - Process Automation System
Compensations

Compensations Until Now

- Rapid access to production information and management
- Diagnostics of Instruments
- Diagnostics of MCCs
- Diagnostics of controllers and switches
- Fast training of operator and maintenance techs
- Quick access to diagnostics of OPERATION
- Process traceability: In Accordance with international rules and main customer requirements.
- Unplanned shutdowns DECREASED.
- Operators do not need to go to the plant floor and MCCs: In Accordance with Brazilian standard NR-10
Compensations

Compensations Until Now

- Balance of Plant (BOP) - ensuring supplies and commercial departments real-time information about cost of production, inventory of raw material

- Real-time reports for decision making.

- MES based on FactoryTalk suite for total integration between the plant floor and business systems

- Predictive information, historical data and traceability were key metrics for competing against others companies

- Traceability and SPC - Statistical Process Control ensuring final product quality and cost of inputs.
Questions?

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