Improving environmental performance with a new bleaching plant
Summary

- CENIBRA Overview
- Main Goals
- Project and Erection
- Start Up and Results
- For the near future...
CENIBRA Overview
About CENIBRA

- **LOCATION:** Belo Oriente, Minas Gerais - BRAZIL
- **FOUNDATION:** September 1973
- **START UP:** March 1977
- **SHAREHOLDER:** JBP 100%
  - *(Oji Holdings and Itochu Corporation)*
  - Unlisted Company
- **PRODUCT:** Bleached Eucalyptus Kraft Pulp – ECF
- **CAPACITY:** 1,200,000 adt/year
- **NUMBER OF EMPLOYEES:** 4,197, including all forestry operation.
CENIBRA at a Glance

PRODUCTIVITY: 39 m³/ha/year

- Cultivated: 131,000 ha
- Preservation*: 104,000 ha
- Infrastructure: 19,000 ha
- Total: 254,000 ha

- 85% CNB’s Plantation & 15% Forest Farming Program
- Full compliance with the European Timber Regulation (EUTR) and US Lacey Act.

* CENIBRA holds two forest certifications FSC® and Cerflor/PEFC, with different and specific principles/criteria.
Cenibra In Focus

Mill
- Two Production lines
  - Line 1 – 500,000 adt/y (1977) → 600,000 adt/y (2018)
- New bleaching plant in order to replace Line 1 (2018)
- Approval to renew Bleaching Plant 2 (700,000 adt/year)
- New wood chipping line (2018)

Forest
- Replacement of 19 harvesting machines
- Increase of forestry mechanization (acquisition and testing of new equipment)

New Investments in 2018
> US$ 120 Mi
About PORTOCEL

LOCATION: Barra do Riacho, Espírito Santo - BRAZIL

JOINT VENTURE: CENIBRA 49%

CORE BUSINESS: Pulp Handling and Shipment

97% OF CENIBRA SALES ARE EXPORTED ALL VOLUME VIA PORTOCEL

225,000 tons WAREHOUSING CAPACITY

6 million tons 45.8% OF BRAZILIAN BEKP EXPORT IN 2017

US$25 million INVESTED IN 2017

Warehouses’ improvement, berths reinforcements and dredging.

375km 233 miles DISTANCE
New Bleaching Plant
Main Goals
Main Goals

• Replace old technology – Vacuum filters
  • Reduce energy, water and Chemicals consumption
• Reduce maintenance costs
  • Not easy to find spare parts
  • “Specialists made at home”
• Improve product quality
• Reduce inventory parts
• In spite of being old, the plant availability was close to 96% on a yearly basis.
Bleach Plant Replacement

Bleach Plant (1977 - 2018)

Bleaching Plant (2018 - )
600,000 admty New Bleach Plant Flowsheet
New Bleaching Plant Project and Erection
Lay out - 3D Modelling

Lay Out
Lay Out - Challenge

Highlights
- Small area available
- Old plant running all time
- Railroad interference
- No production losses
- Good HSE results

2019 (Cenibra scope)
- Remove old equipments
- Remove old concrete towers

~ 650 m²
Lay Out - Challenge
Project Schedule

- Eigtheen Months Project
- Planned = Executed
- No “Re-plans”
- Strong synergy between teams
Working Force

**Valmet Scope**
- Engineering
- Equipment & Materials
- Project
- Erection
- HSE
- Commissioning, Start up
- Performance guarantee

**Cenibra Scope**
- DCS work
- HSE
- Integration/interface between Erection and Operation

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<table>
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<td>Man Hour Working</td>
<td>368.823</td>
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<tr>
<td>Man Hour Training</td>
<td>3.353</td>
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<tr>
<td>Number of workers (peak)</td>
<td>441</td>
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Erection Highlights
Erection Highlights
New Bleaching Plant
Start Up and Results
Performance Results (Same Production Base)

Preliminary Performance main achievements

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<tr>
<th>Inputs</th>
<th>Unit</th>
<th>Variation (%)</th>
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<tr>
<td>Power consumption</td>
<td>(kW/adt)</td>
<td>-49</td>
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<tr>
<td>MP/LP Steam consumption</td>
<td>(kg/adt)</td>
<td>-49</td>
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<tr>
<td>Effluent generation</td>
<td>(m³/adt)</td>
<td>-50</td>
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<tr>
<td>HW, Condensate and White water consumption</td>
<td>(m³/adt)</td>
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<td>Chlorine dioxide (ClO₂)</td>
<td>(kg/adt)</td>
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<td>Peroxide (H₂O₂)</td>
<td>(kg/adt)</td>
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<tr>
<td>Caustic Soda (NaOH)</td>
<td>(kg/adt)</td>
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<tr>
<td>Sulphuric acid (H₂SO₄)</td>
<td>(kg/adt)</td>
<td>-45</td>
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Start up and Results

**Schedule**
- “Day One”: Oct 03rd, 2016
- Start Up: Apr 18th, 2018 (18.5 months)
- Provisory Acceptance: Apr 23th, 2018

*96% of nominal capacity in 24 hours*

**Predictability**
- Anticipate & solve problems
- Plug and Play
- No losses during the transition phase

**Performance**
- According to guarantee contract
- Chemicals consumption “on final tuning”
Start up and Results

**Success key factors upon Cenibra point of view**

- Cenibra knew what it was needed
- Valmet worked hard on specification and planning
- High skilled professionals from both sides
- Strong synergy between teams
- A complete water and pulp run were done before start up
- All commissioning, tuning and interlock tests were done before start up
- Safety in first place!
For the near future...
Bleaching Plant 2 - Modernization

Modernization of Bleaching plant 2 by installing two new wash presses in replacement of four atmospheric diffusers

- Project: Approved
- Main goals: almost the same as line 1
- Supplier: Valmet
- Start up: scheduled for December 2019

Other studies ongoing...
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Júlio César Tôrres Ribeiro
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Viena, Austria
October 3-5, 2018