IMPROVE PLANT EFFICIENCY BY EFFECTIVELY MANAGING YOUR WATER

TAPPI Webinar
September 15, 2020
Agenda

1. Introduction
2. Common water challenges
3. Solutions to optimize water management
4. Pulp & Paper case study examples
5. Questions & Answers
1. Introduction
Our speakers & our business
Introduction

OUR SPEAKERS

SCOTT WHITTAKER
MODERATOR & SPEAKER
31 years water treatment experience

FRANCIS VAILLANCUROUJT
GLOBAL LEADER, SERVICES,
P. ENG. M.A.SC. MBA
15 years water treatment experience

JOSEPH WOLKOW
TECHNICAL SALES MANAGER, B.SC.
32 years experience in Pulp & Paper with past 20 years in P&P water treatment at SUEZ
SUEZ – Water Technologies & Solutions

TRUSTED PARTNER. PROVEN RESULTS.

• We’re dedicated to taking on the world’s toughest water and process challenges.
• We work closely with customers to determine and deliver the products, processes and solutions that meet the task at hand.
• 10,000+ employees worldwide
• 50,000+ industrial and municipal customers worldwide
• 10,000+ combined technologies

301 million gallons of water treated every day
a unique integrated offering

Complete solutions to design, build, and operate at existing and new production facilities
Our solutions at a glance

1. Cooling circuit water treatment & chemical services
2. Boiler feed water treatment & chemical services
3. Process water treatment
4. Hard COD & micropollutants removal
5. Advanced waste water treatment
6. Design & build of water plants
7. Temporary mobile water solutions
8. Ecoflow asset sharing / effluent collection
9. Digital water monitoring / Memboard
10. Water filtration units
11. Water chemical services for process (foam, corrosion, scale, fouling control)
12. Sludge reuse and recovery
13. Color removal
14. Pulp bleaching
15. Water reuse / ZLD
16. Waterlily, water footprint assessment
17. Laboratory services
18. Smart metering for water
19. Operation & Maintenance / EDO
20. Network management
21. Well management
In 2017, Water intake of 2.15 billion US gallons per day for the Pulp and Paper Mills of USA while the New York water system provided over 1.2 billion US gallons (4,500,000 m³) per day of drinking water to more than eight million city residents, and another one million users in four upstate counties bordering on the system.

Making paper is water intensive

Water Consumption in Billions gallons per day

P&P industry in the USA

City of New York

5,500 P&P facilities in the USA

2.15 BGD

1.20 BGD
2. Common water challenges
Some of the challenges

Changes in the industry

environmental constraints

Production continuity & safety
Growth in the P&P industry is largely driven by the packaging and tissue paper segments.

Decline in graphic paper due to growing trend in digital communications. As a result, many companies have shifted production into other areas; causing oversupply in packaging.

Turbulent market expected for the short to medium term.
Macroeconomics are influencing fiber sourcing:

- **Asian countries restricting import of recovered fiber**
- **Uncertainties about supply chain in southern hemisphere**

Resulting in a push towards changing from Virgin pulp to recycled.

*Source: Graph by POYRY 2016*

Cheap fiber source needed to remain competitive.
Environmental constraints

Changing feed water quality due to Climate change

Deteriorating raw water quality can impact equipment output.

Stronger regulations & Environmental discharge restrictions

New Challenging parameters & reduced limits on others
Production continuity & safety

Older infrastructure not adequate for current challenges
- Risk of downstream impact & non-compliance
- Risks of shutdown & breakdown

Long transition period when new equipment is installed
- Commissioning new equipment, removal of older
- Ramp up of new process

Did you know?
Monadnock Paper Mills, Inc.
Bennington, New Hampshire

Monadnock is the oldest continuously operating paper mill in the US.

Founded in 1819, the mill celebrated 200 years of papermaking in January 2019.

How old is your plant?
Knowledge & Technology Transfer

- New technologies added to address emerging problems
  - Preventative maintenance instead of troubleshooting
  - Less intuitive, data driven operation

- Knowledge transfer with changing workforce.
  - Digital tools and monitoring
  - “On the fly” adjustment
  - Tacit and hard to articulate experience-based knowledge
  - Employee’s health and safety around new equipment.
3. Solutions to optimize water treatment
# Customer purchasing options

<table>
<thead>
<tr>
<th>Options</th>
<th>Owner Buys Equipment &amp; Operates</th>
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<tbody>
<tr>
<td>Scope for owner</td>
<td>Equipment + optional installation, labor &amp; engineering.</td>
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<td>Operation &amp; Maintenance</td>
<td>Owner</td>
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<td>Guarantees</td>
<td>Performance test</td>
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*Not every supplier takes on Performance Guarantee*
## Customer purchasing options

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<th>Owner Buys Equipment &amp; Supplier Operates</th>
<th>Supplier Builds, Owns &amp; Operates</th>
<th>Owner Buys Equipment &amp; Operates with Supplier guidance</th>
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<td><strong>Reason to buy</strong></td>
<td>Customer’s expertise, supply chain &amp; engineering is sufficient</td>
<td>Peace of mind</td>
<td>Peace of mind + Return on Experience</td>
<td>Process &amp; KPI guarantees along with asset protection.</td>
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*Not every supplier takes on Performance Guarantee*
Capex vs OPEX

- Infrastructure / Equipment investment
- Operation & Maintenance Costs
- Fixed Opex Model
- Total Cost

Pay as you go model frees up capital for assets in core business

Industry standard Operation & Maintenance costs (O&M)
Capital system lifecycle
Typical performance & maintenance cost trends

Drop in performance is typically due to delayed repairs and/or delayed capital spending

*System performance could mean capacity, quality or both
Supplier Build, Own & Operate
Typical performance & maintenance cost trends

*System performance could mean capacity, quality or both.
Even for a constant flow throughput, a changing raw water source means changing demand.

**Infrastructure investment & Demand prediction**

- **Water Demand / Capacity**
  - Demand Exceeds Infrastructure
  - Equipment malfunction
  - Opportunity Cost

**Time**

- Demand prediction
- Capex Expenditure
- Actual demand

Even for a constant flow throughput, a changing raw water source means changing demand.
Elastic Capacity

Scale down investment to increase utilization rate
- Short term mobile units for emergencies & transition (bridge) periods
- Long term assets for coping with demand variation

Graph showing:
- Water Demand / Capacity over Time
- Demand prediction
- Capex Expenditure
- Actual demand
- Fleet of mobile and semi-mobile units
Additional benefits

**STAFFING**
- Gain expertise from experts worldwide
- Secure production continuity with knowledge transfer

**OPERATIONS**
- Eliminate risk of downstream impact & non-compliance
- Partner to help for unforeseen problems

**COST**
- Reduces overall cost of ownership
- Fixed Opex

**ASSETS**
- Protect asset life and prevent unplanned downtime

Capex vs Opex
4. Pulp & Paper case studies
Challenge – white water clarification/wastewater treatment

Solution – Poseidon* Dissolved Air Flotation

*Trademark of SUEZ; may be registered in one or more countries.
SUEZ’s POSEÍDON DAF Clarifiers
Pulp & Paper applications

- Mill water
- Deinking and recycling plant process water
- Paper Machine White Water for water/fiber recovery and/or energy savings
- Primary effluent clarification
- Secondary effluent clarification after biological treatment (examples: activated sludge, MBBR, aerated lagoon, etc.)
- Tertiary clarification
- Any application requiring clarification of water from fiber or other suspended solids
- Close to 700 P&P DAF installations worldwide
SUEZ’s POSEIDON DAF Clarifiers – PPM Model

White water treatment, deinking, paper machine
SUEZ’s POSEÏDON DAF Clarifiers
Biotreatment DAF Installation
SUEZ’s POSEÏDON DAF Clarifiers – Saturn Model
White water treatment, primary effluent treatment
SUEZ’s POSEÏDON DAF Clarifiers
Mobile Rental DAF Service
Secure, continuous operation / production
Temporary water treatment bridge solutions

OBJECTIVES
Mobile solutions to replace or complement permanent water treatment facilities in case of emergency, schedule maintenance operation, or specific long-term need

EXAMPLE – bridge system deployment at Customer Manufacturing Dissolved Grade Pulp

The 4 Mobileflow pressure filters were used to supply the mill with 2300 gpm process feed water as well as boiler feed water. The pulp mill was able to complete the necessary gravity filter repairs in 4 weeks while keeping the mill operational saving millions of dollars in lost pulp production.

The right water at the right time.

BENEFITS
• Secure safe water production continuity
• Guarantee water quality and quantity
• Cover temporary or seasonal needs
• Minimise installation & commissioning time: plug & play technology
OBJECTIVES
Customers focus on their core business while SUEZ owns, operates and maintains their water treatment facilities

EXAMPLE – LTSA, 10-year service contract at Customer Manufacturing Containerboard

Scope: Softener / RO / EDI / MB / Pumps/ CIP/ Instruments / FSR
Capacity: 1800 gpm, <0.1 μS/cm, <10 ppB SiO2
Customer solution needed:
- Design & supply 1800 gpm system capable to replace current SUEZ’s equipment and customer’s cation/anion/mixed bed IX systems.
- Reduce water demand to increase condensate return, which reduced the water demand and improved heat recovery.
- Eliminated acid/caustic storage along with labor costs associated with chemical handling.

BENEFITS
By offering LTSA contracts, SUEZ assists customers with their plant’s daily water operations
- SUEZ ensures that the required quantity and quality of product water is delivered to customers water tank or process
- SUEZ’s offerings are backed up with the most comprehensive set of mobile equipment that is digitally enabled to help manage and optimize water resources while overcoming any pressing challenges
- Partnering with industry leader. SUEZ owns and successfully operates hundreds of industrial plants ranging from 20 to 160 MGD

Guaranteed quantity and quality of water needed.
THANKS – QUESTIONS?