



WEBINAR OSISOFT & COMPESA

O uso do PI System na Indústria de Águas & Saneamento

INICIAREMOS ÀS 10:00 AM



WEBINAR OSISOFT & COMPESA

O uso do PI System na Indústria de Águas & Saneamento

INICIAREMOS EM INSTANTES



BEM-VINDOS

Claudio Muller, Account Manager, OSIsoft

OSIsoft e a Indústria de Águas & Saneamento

Bruno B. Squassoni | Pre-Sales Engineer

Outubro de 2020



Desafios do Setor

Equilibrando ROI e Risco para Operações Proativas e Eficientes

Infraestrutura
Envelhecida

Mudança de
força de
trabalho

Segurança
Hídrica

Custos
Crescentes

É Hora de Encontrar uma Nova Maneira de Trabalhar



Onde Empresas de Água Encontram Valor?

EFICIÊNCIA ENERGÉTICA

- Custos de Energia de Bombeamento e Tratamento
- Gerenciamento de Dados do Medidor

PRODUTIVIDADE DO PROCESSO

- Água não lucrativa (por exemplo, vazamentos)
- Ruptura de Canos
- Transbordo de Esgoto
- Custos / Otimização

SAÚDE DO ATIVO

- Paradas & Tempo de Inatividade
- Manutenção Baseada na Condição (CBM)
- Envelhecimento da Infraestrutura

QUALIDADE, SEGURANÇA E RELATÓRIOS

- Qualidade da água
- Abastecimento Seguro
- Contaminação
- Regulamentações Ambientais e Sanitárias

Resultados de Negócios Possibilitados pelo PI System

EFICIÊNCIA
ENERGÉTICA



YorkshireWater

PRODUTIVIDADE
DO PROCESSO



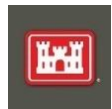
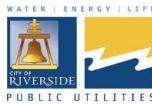
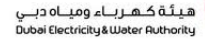
SAÚDE DO
ATIVO



QUALIDADE,
SEGURANÇA E
RELATÓRIOS



Cientes da Indústria de Água e Saneamento





Water

Mais de 150 concessionárias
atendendo a mais de
250 milhões de clientes
em **25 países**
contam com o PI System

- Por 25 anos e contando, as concessionárias de água têm usado o PI System para extrair centenas de milhões de dólares de valor dos dados
- Casos de uso expandidos - eficiência energética, produtividade de processo, saúde de ativos, controle de qualidade, segurança, conformidade e relatórios
- Mais de 300 parceiros da OSIsoft para soluções ponta a ponta

Resultados de clientes

Integration of Business Process Information

[Link to their presentation](#)

CHALLENGES

Integrate diverse systems and build an environment where the user has quick and reliable access to all information in a friendly interface.

SOLUTION

- Use the PI Asset Framework's native tools integrated with the PI System's client tools
- Training of key users for knowledge replication and learning culture

BENEFITS

- Customer satisfaction increased 20%
- Awarded as the 2nd most reliable public company in São Paulo, 2018 – IBOPE
- Decreased energy usage by 9%



We now have easy and continuous access to field information, enabling proactivity and preventive action.



Silvana C.S.S. Franco, Manager of Supply Control, Sabesp

PI PB - Main Display: SCOA Portal

Where SCOA Implementation is more “visible”



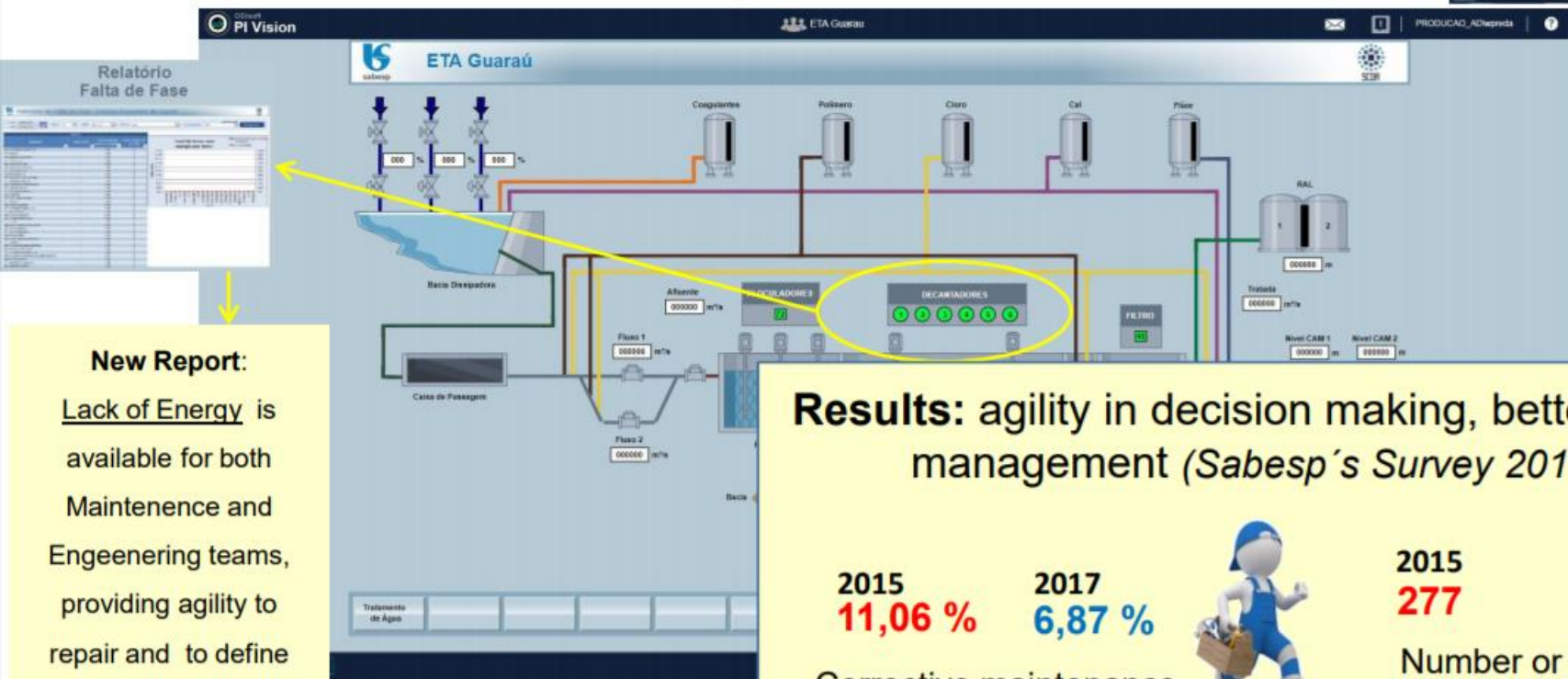
Business Process Integration
(Sabesp's Intranet)

Friendly interface, providing quick and reliable access to all information from infrastructure

Alarms and Reports supporting Engineers and maintenance team, minimizing problems (**Predictives and Preventives actions**)

PI PB - Water Treatment Plant

Challenge: maximize water production



New Report:

Lack of Energy is available for both Maintenance and Engineering teams, providing agility to repair and to define preventive actions

Results: agility in decision making, better asset management (*Sabesp's Survey 2018*)

2015
11,06 %
Corrective maintenance

2017
6,87 %



2015
277
Number of field equipment monitored

2017
2681

PI PB - Water Transportation and Distribution

IRA KPI Report, GIS Integration => support Loss Program continuously

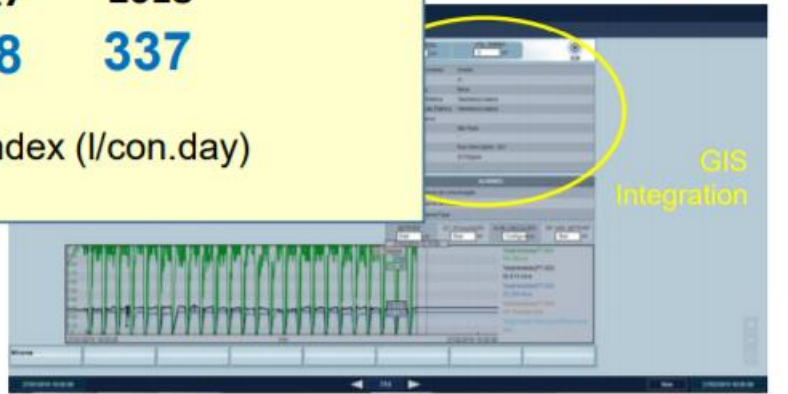
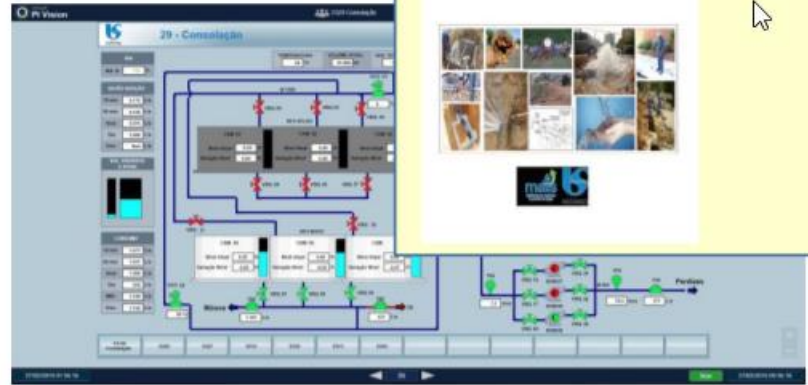


Results: Increase in billing, improve operational process and service quality
(Sabesp's Loss Program - 2019)

Programa Corporativo de Redução de Perdas de Água
Relatório de Acompanhamento
02/2019

Year	Loss Index (l/con.day)
2017	348
2018	337

Loss Index (l/con.day)



Dams Safety and Hydraulic Structure

[Link to their presentation](#)

CHALLENGES

- Distribution geography of structures
- Long time to consolidate and make information available
- Inconsistency of data
- Decision making considering small database information
- 80% time formatting data and 20% analyzing

SOLUTION

- PI Manual Logger to input structures data periodically, building a historical database
- Monitoring the operational condition of the structures with PI Vision
- Alert those responsible for the deviations of structures behavior with PI Notifications

BENEFITS

- Agility of decision making to carry out interventions at risk situation
- Increased reliability of data
- Decreased 8 times the time spent to collect and analyze the data
- Greater operational reliability



We are knowing the behavior of our structures. The PI System helps us to calibrate the theorists curves of behavior.

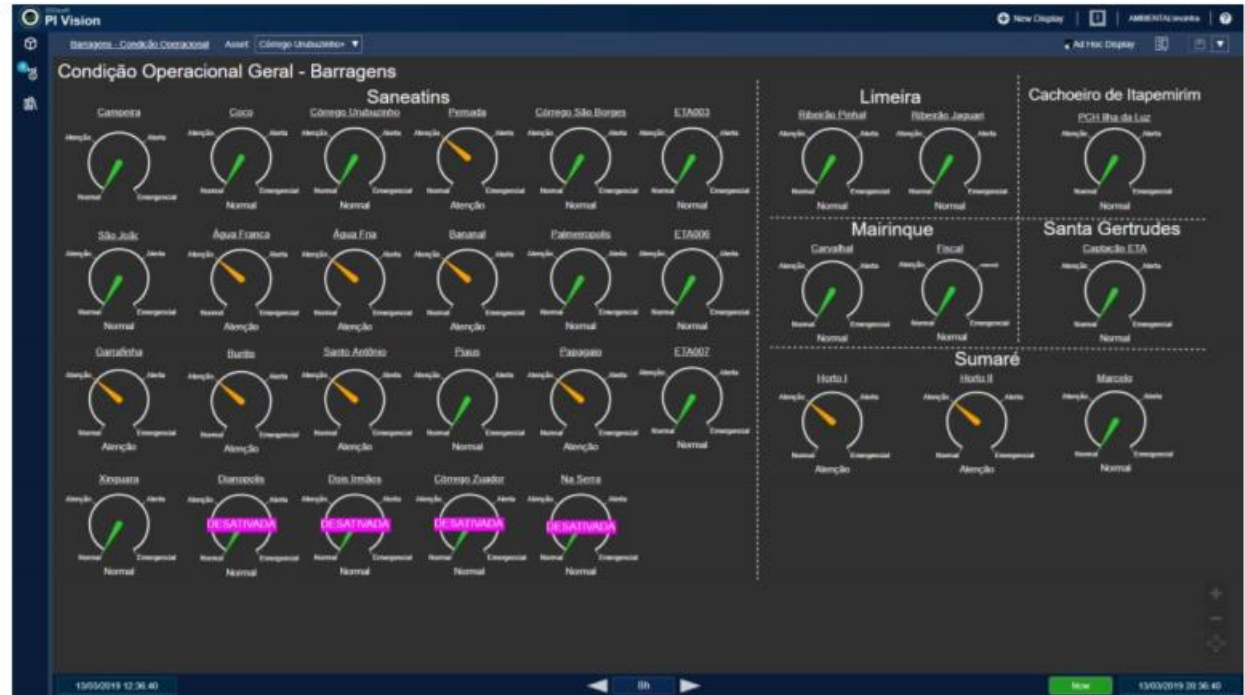


Wagner Ferreira, Area Manager of Dams Safety and Hydraulic Structure, BRK Ambiental



PI Vision

- Overview of the operational condition of all dams and hydraulic structures
- Displays the Criticality Index information



Leakage Prediction

[Link to their presentation](#)

CHALLENGES

- Leaks were being dealt with reactively, not proactively
- Long repair times drove up costs
- Customer service an issue

SOLUTION

- Asset Framework and PI Vision
- More sensors
- Machine learning delivers early-warning leak alarm system

BENEFITS

- Early warning of leaks based on statistical analysis of hourly use
- Reduced nuisance alerts
- Decreased repair time



A 30-day turnaround which we would normally take to dig and repair a leak, we can now turn that down to less than 10 days.



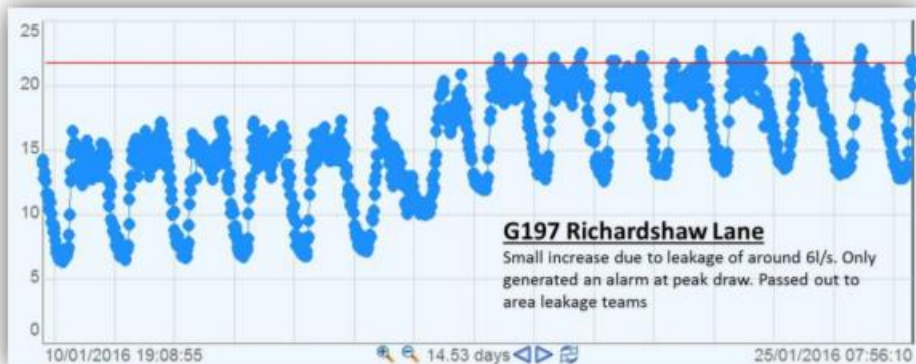
Andrew Sewell, Telemetry Manager, Yorkshire Water

User Interface – Leakage Event Viewer

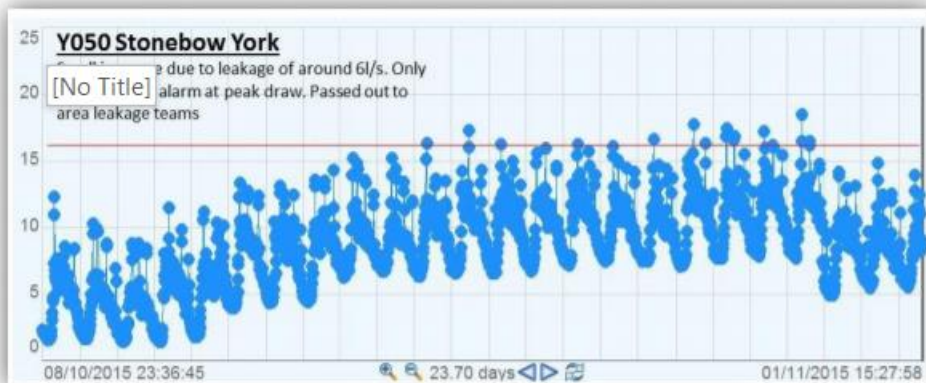
- Global trending allows readings from across the network to be compared
- Profile allows configuration, visualisation and simulation of an instrument



Early Warning Results



- With Profile Alarms, this event would have been identified almost as soon as it started, a full day and a half before the standard threshold alarm identified it



- This shows a gradually increasing leak that took the threshold alarm over 6 days to detect. A profile alarm would have detected this within the first day

[Link to their presentation](#)

CHALLENGES

- Disparate data sources
- Need for predictive analytics
- Detect leaks and water use

SOLUTION

- PI System as a central hub for real-time metering and weather
- Azure Machine Learning for predictive analytics

BENEFITS

- Saved 500,000 liters of water in 6 months
- Decreased fault detection time and downtime
- Predictive analysis



OSisoft's PI System has enabled convergence for IT and OT systems, for real-time data access, for analysis, for visualization.



Michał Ślósarz, IT Manager, MPWik

PI System to connect all real-time data sources

- Water Production
- Water Network – 60.000 Flow Meters
- Pressure Meters
- Noise loggers
- Weather Station
- Sewage well level sensors
- Piezometers

Together 200.000 variables

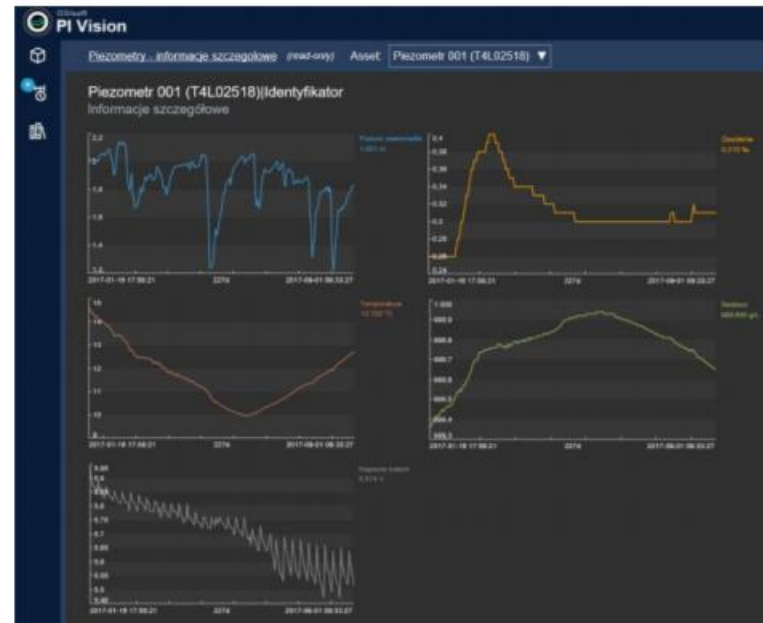
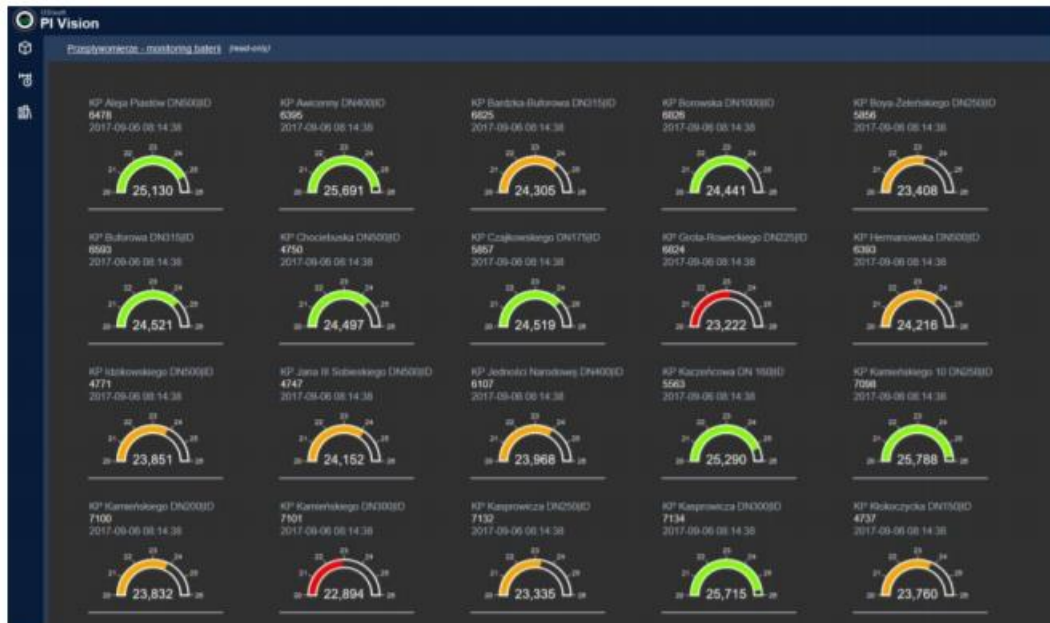


**Connect
Point**



OSIsoft.

PI System Visualization



Improved Reaction Times

[Link to their presentation](#)

CHALLENGES

- Biologists need to quickly respond to hazards
- Manual system depended on operators noticing alerts during heavy weather

SOLUTION

- Automated process of hazard detection, analysis and notification via PI System
- Phone and email notifications sent for hazards

BENEFITS

- Biologists on the road within minutes, informed of incident details
- Improves response time, eliminates confusion about who is responding



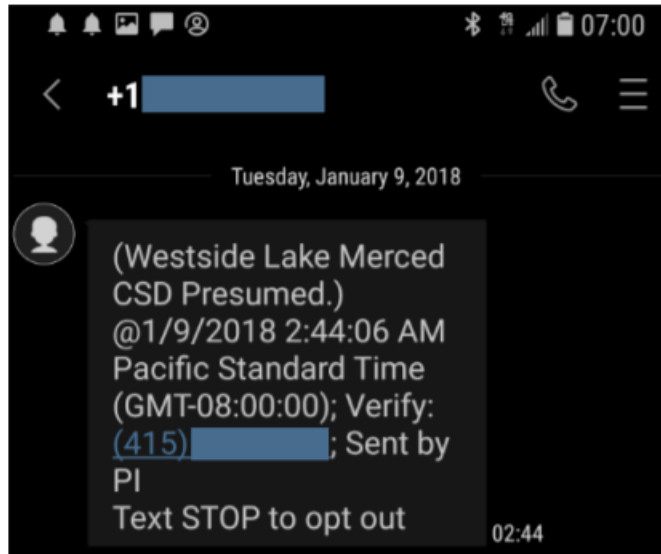
Ultimately, we want to make life easier for our operators.

Max Chung, DCS Engineer, SF PUC

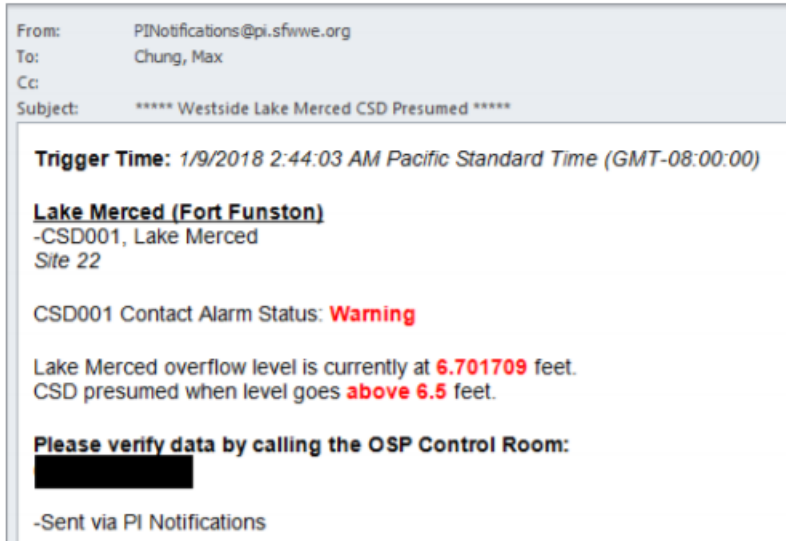


Decision: Two notifications!

Smart Phone



Email notification



Actionable Intelligence

[Link to their presentation](#)

CHALLENGES

- Opaque systems, people-dependent processes
- >8 hours/week spent compiling data and reports

SOLUTION

- Implementation of PI connected >10 enterprise systems and applications
- Automated processes and streamlined reporting

BENEFITS

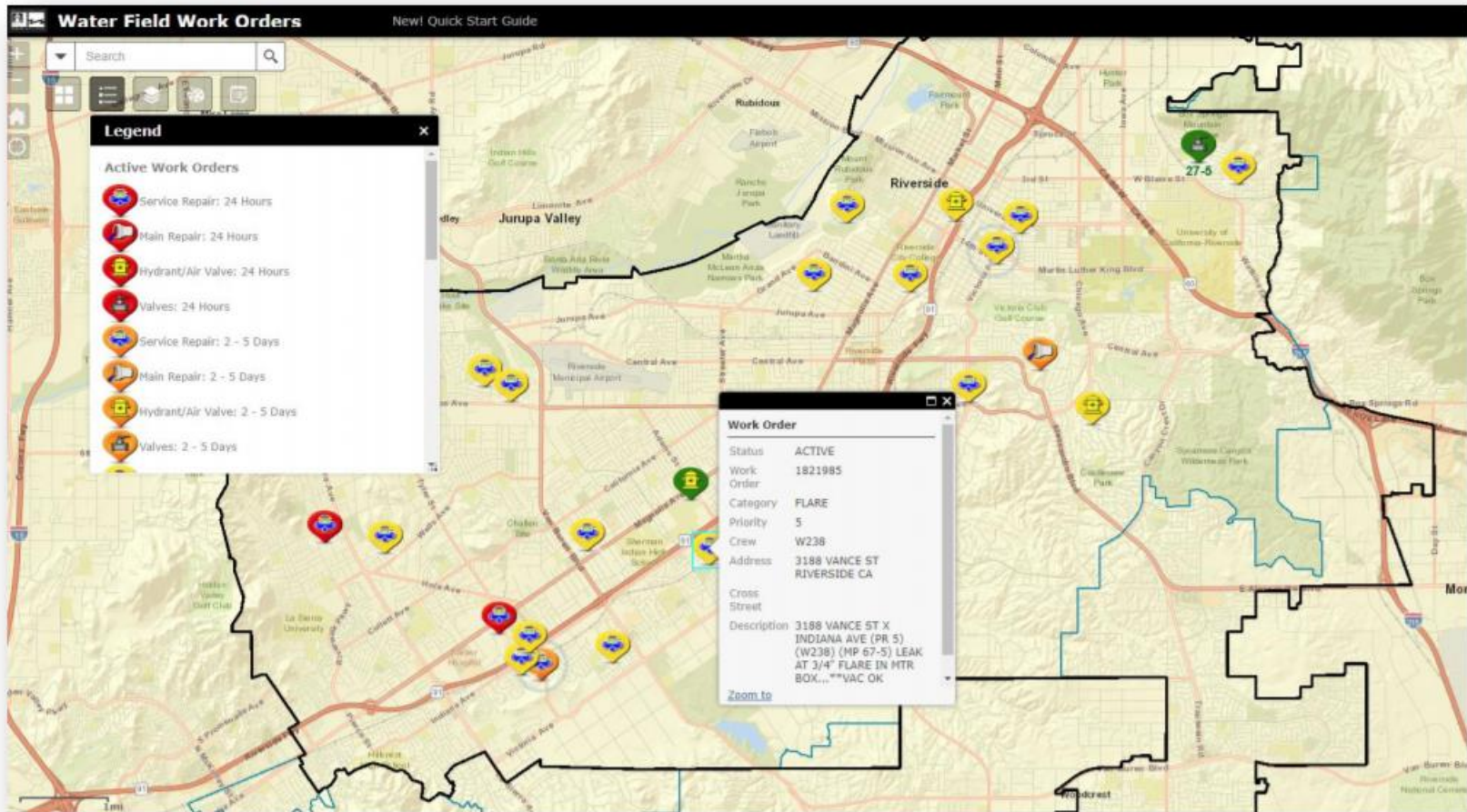
- Cultural shift toward a data-driven, transparent utility
- ROI of >\$3 million in 3-5 years from process automation alone



Now instead of driving the entire line and trying to find a grid sensor blinking, they can see it on a map on their iPhone or iPad.

CJ Smith, Project Manager, Operational Technology, Riverside Public Utilities



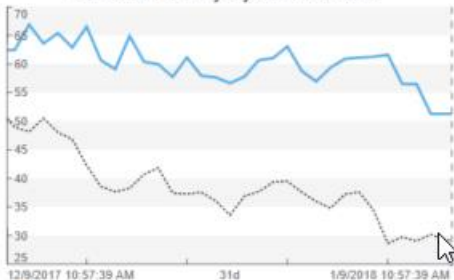




Water Operations Dashboard

Home / Water / Water Operations

Cumulative Daily System Demand

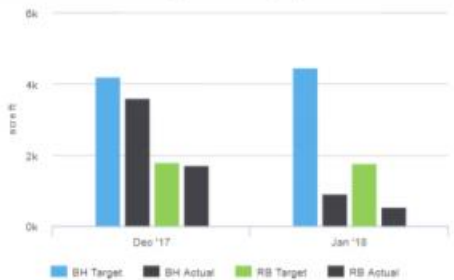


12/9/2017 10:57:39 AM 31d 1/5/2018 10:57:39 AM

■ Prev Day System Demand ■ Last Years System Demand

Monthly Bunker Hill & Riverside Groundwater Production

Target vs Actual (AF)



■ BH Target ■ BH Actual ■ RB Target ■ RB Actual

Today's High Temp Forecast

60 F

Today's Current Temperature

54 F

Current Water Production

44.5MGD

YTD Prod. Potable Water 2018

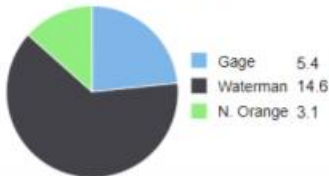
492.7 MG

% Diff 76.0 ▲

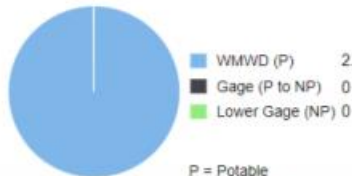
Total 2017

23.4 BG

Production (MG) by Transmission Line

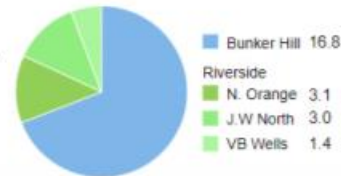


Water Delivery (MG) Potable & Non Potable

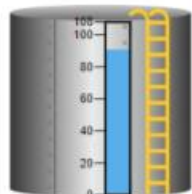


P = Potable
NP = Non Potable

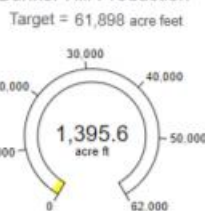
Potable Production (MG) by Basin



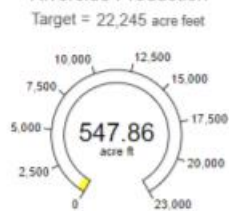
Reservoir Level 90.8 MG



Bunker Hill Production



Riverside Production



WMWD Potable Delivery



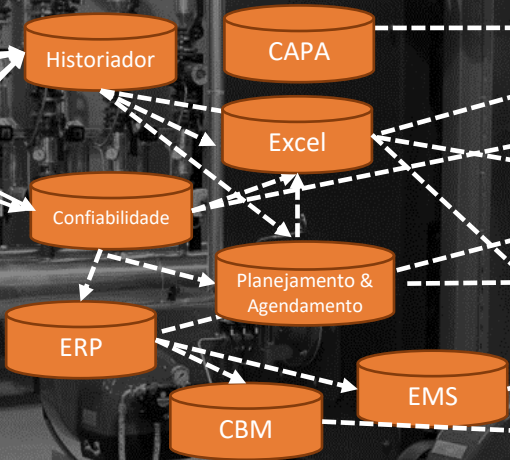
Dados Operacionais são Complexos

Dados Operacionais

Complexidade

Pessoas

PLC 1 → SCADA 1
PLC 2 → SCADA 2
DCS 1
DCS 2
DCS 3
Instrumento → Manual 1
Instrumento → Manual 2
Controller

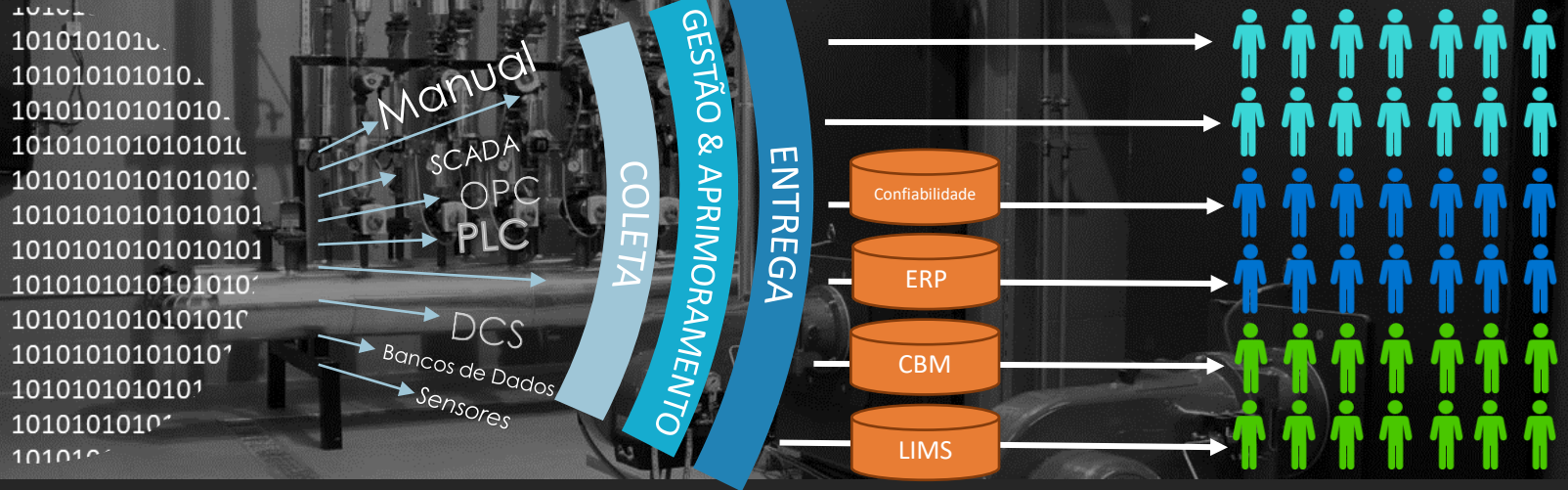


Uma Infraestrutura de Dados Operacionais

Dados Operacionais

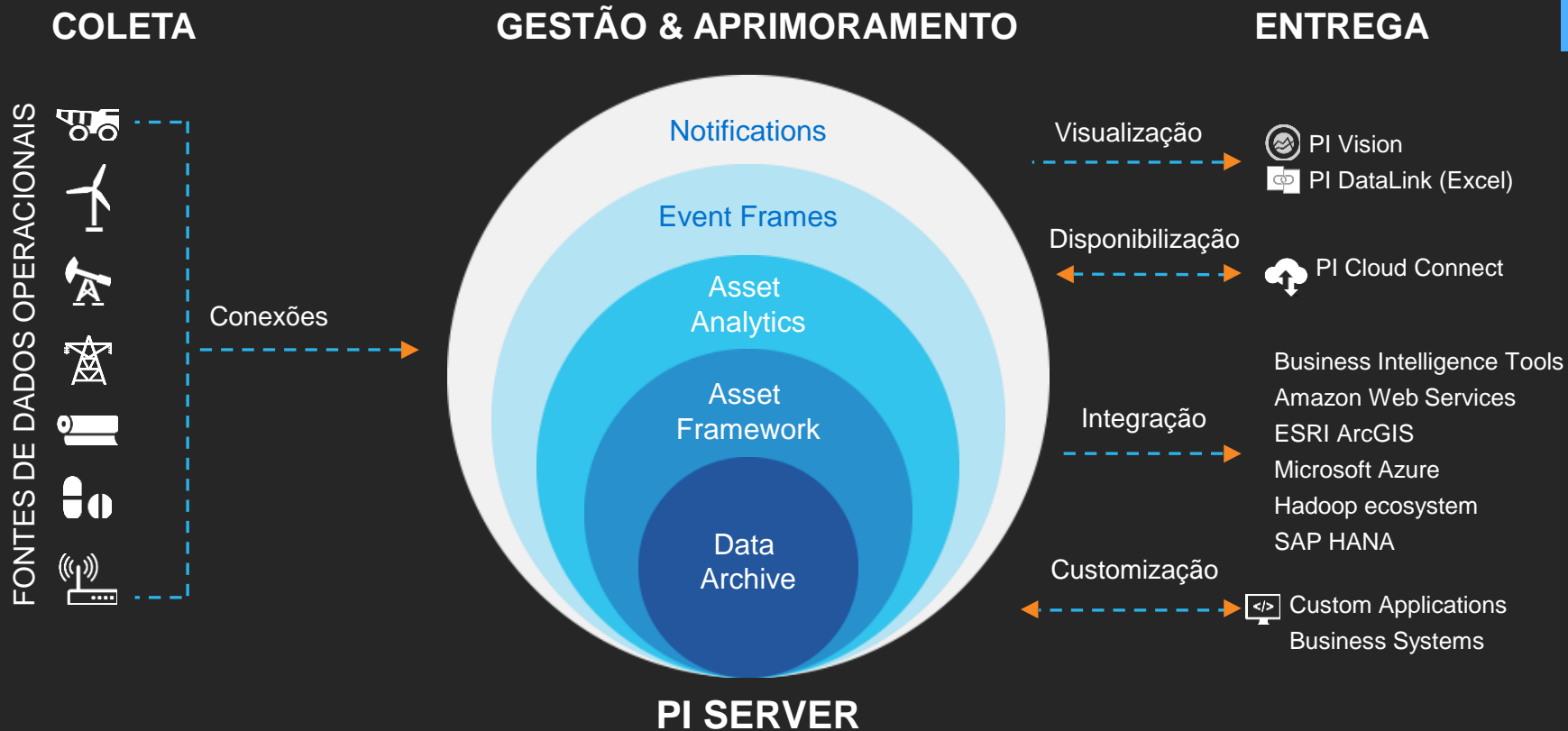
Simplicidade

Pessoas



PI SERVER

Como funciona o PI System?



OBRIGADO



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OSIsoft®

Portal Cooperação

Gestão, controle e segurança operacional no Saneamento utilizando o PI System



Transparente
como tem que ser.

Secretaria de
Infraestrutura
e Recursos Hídricos



GOVERNO DO ESTADO
PERNAMBUCO
MAIS TRABALHO, MAIS FUTURO.

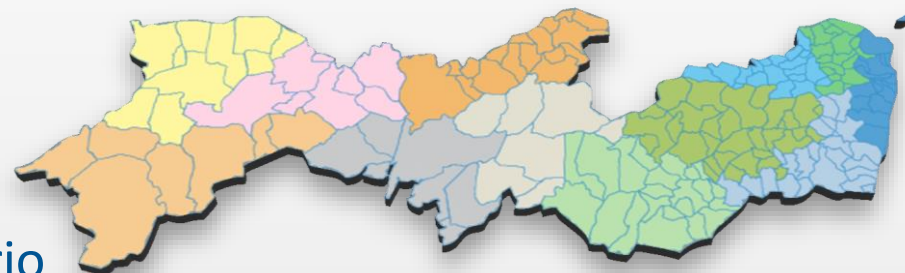


Compesa

A empresa e o saneamento no estado de Pernambuco

Pernambuco

- Área: 98.312 km²
- População PE: 9.557.071 hab
- 90% região semi-árida
- 80% da água em 10% de território
- Menor disponibilidade hídrica do país



- PE: 1.270 m³/hab/ano
- SP: 2.209 m³/hab/ano
- BR: 35.000 m³/hab/ano


Classificação ONU – Crítico: <1.500 m³ hab/ano



compesa

- Fundada em 29/jun/1971
- 49 anos
- Economia Mista de Direito Privado
- 6.000 colaboradores



- 
- 175 municípios + Fernando de Noronha
 - Água: 2,3 Milhões domicílios
 - Esgoto: 600 mil domicílios
 - População atendida: 6,9 Milhões



Mananciais



238

Poços



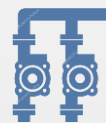
200

Estações de
Tratamento de



234

Estações de
Bombeamento



500

Reservatórios



519

Rede



19 Mi

Variáveis
telemidas



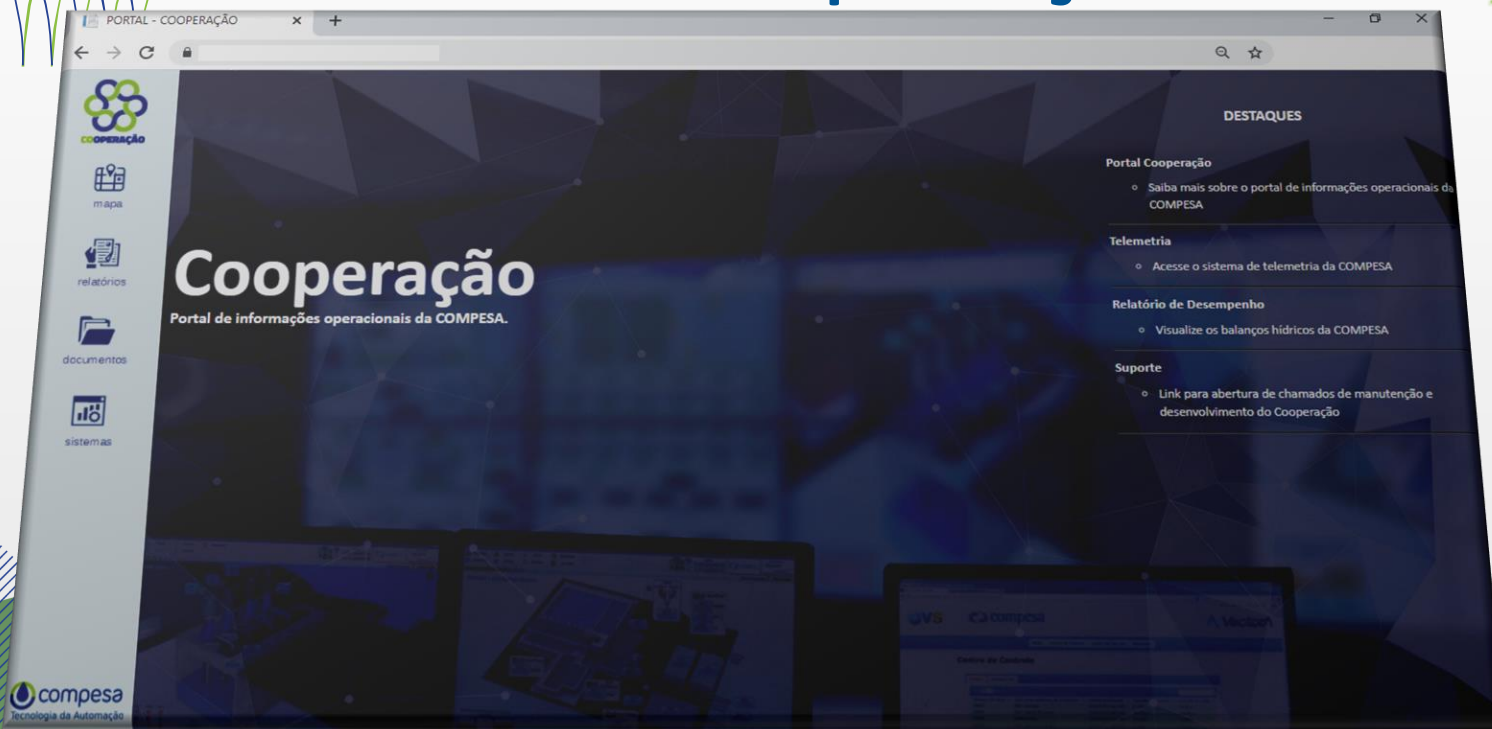
5.300

Portal Cooperação

Tecnologia para operação



Portal Cooperação



The image shows a screenshot of a web browser displaying the 'Portal Cooperação' website. The browser's address bar shows 'PORTAL - COOPERAÇÃO'. The website has a dark blue background with a geometric pattern. On the left side, there is a vertical navigation menu with icons and labels: 'cooperação' (with a logo), 'mapa', 'relatórios', 'documentos', and 'sistemas'. The main content area features the title 'Cooperação' in large white letters, followed by the subtitle 'Portal de informações operacionais da COMPESA.' Below this, there are three computer monitors displaying various data visualizations. On the right side, there is a 'DESTAQUES' (Highlights) section with four items:

- Portal Cooperação**
 - Saiba mais sobre o portal de informações operacionais da COMPESA
- Telemetria**
 - Acesse o sistema de telemetria da COMPESA
- Relatório de Desempenho**
 - Visualize os balanços hídricos da COMPESA
- Suporte**
 - Link para abertura de chamados de manutenção e desenvolvimento do Cooperação

In the bottom left corner of the website, there is a logo for 'compesa tecnologia da Automação'.

Portal Cooperação

Cadeia de Valor do Dado

Portal



Sist. WEB



BI



PIMS

Supervisório



IoT



SCADA - PES



CLP e REM



SCADA - VectoraSYS



DLG e CVRP



SSC



Sistemas de Monitoramento

Operação em tempo real



Monitoramento de Barragens

Cooperação > Relatórios > Relatórios de Barragens - Acompanhamento de Barragens Diário

Diretoria: DRM | Data: 29/09/2020

Atualizar Mapa

Cooperação > Relatórios > Relatórios de Barragens - Modelo Hidrológico de Barragem

Modelo Hidrológico

Lista de Barragens: Botafogo

Enviar

Data Inicial: 30/09/2020 | Data Final: 30/09/2021

Tipo de dados para realizar os cálculos: Pluviometria e Fluviometria na média histórica

Cota Talvegue (m)	Volume Morto (m³)	Volume Máximo (m³)	Volume Inicial (m³)
41,00	799.015,00	27.689.504,00	

Vazão Objetivo (m³/s): Processamento pelo percentual final

Curva Cota x Área	Bv
Av: 58.052,00	1,27

Curva Cota x Volume	Bv
Av: 40.084,00	2,11

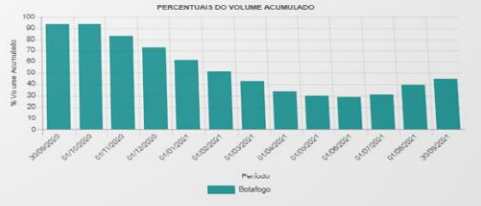
Processar Modelo Hidrológico

Resultado do Modelo Hidrológico
Pluviometria e Fluviometria na média histórica

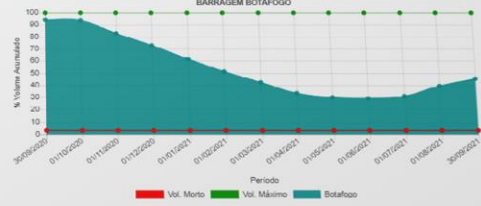
Exportar resultado

Informação de Entrada | Resultado Preditivo | Gráfico

PERCENTUAIS DO VOLUME ACUMULADO



BARRAGEM BOTAFOGO



Período: Vol. Morto, Vol. Máximo, Botafogo

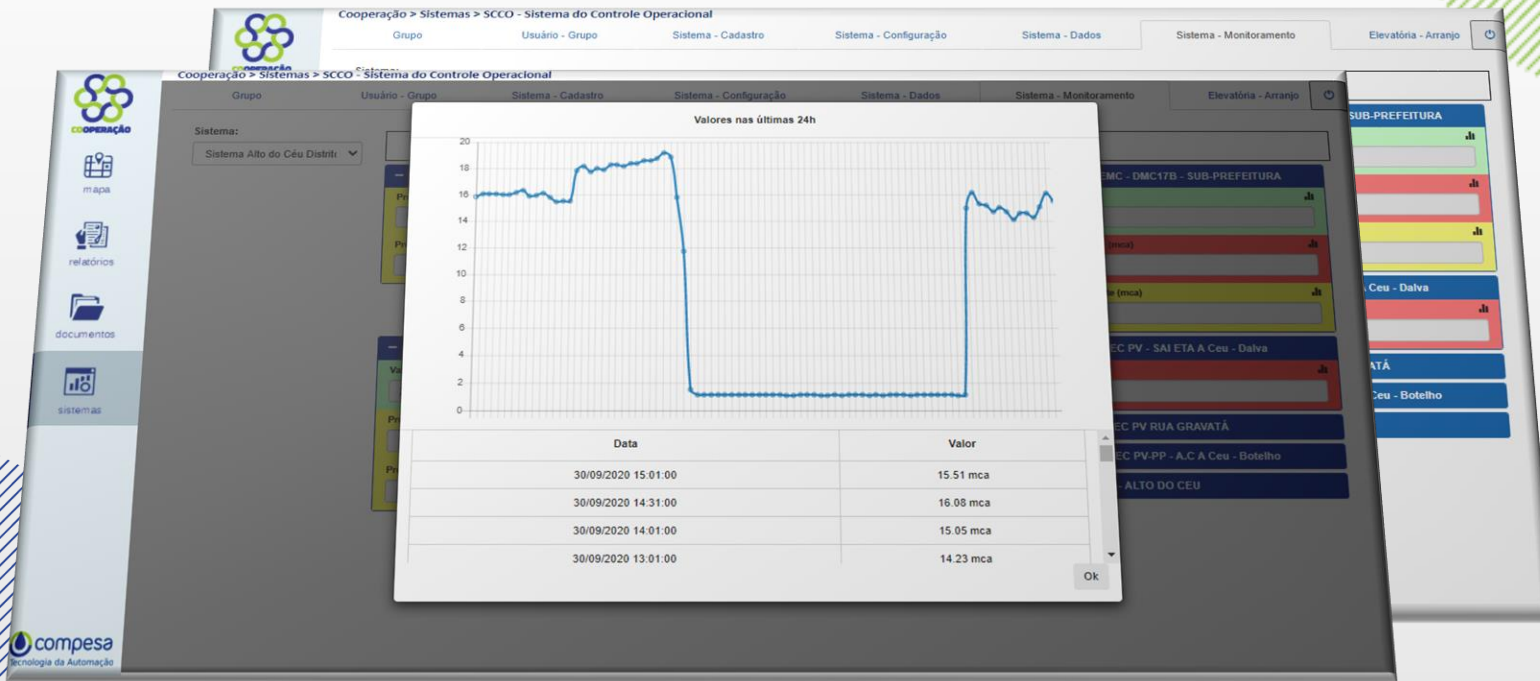


Sistemas de Alarme

Monitoramento e segurança operacional



Visualização de alarmes



The screenshot displays the SCCO - Sistema do Controle Operacional interface. A central window titled "Valores nas últimas 24h" shows a line graph of data points over time. The y-axis represents a value ranging from 0 to 20. The data shows a steady increase from approximately 15 to 18, followed by a sharp drop to near 0, and then a recovery to about 15. Below the graph is a table with the following data:

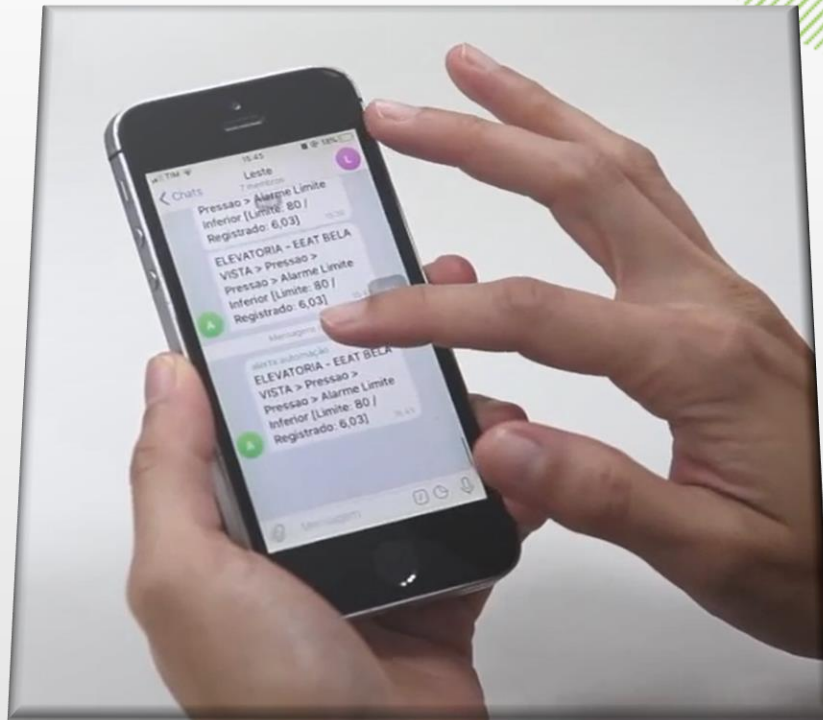
Data	Valor
30/09/2020 15:01:00	15.51 mca
30/09/2020 14:31:00	16.08 mca
30/09/2020 14:01:00	15.05 mca
30/09/2020 13:01:00	14.23 mca

The interface also includes a sidebar with navigation icons for "mapa", "relatórios", "documentos", and "SISTEMAS". The top navigation bar includes options like "Grupo", "Usuário - Grupo", "Sistema - Cadastro", "Sistema - Configuração", "Sistema - Dados", "Sistema - Monitoramento", and "Elevatória - Arranjo".

Envio automático de alertas

Alarmes

- Nível
- Pressão
- Vazão
- Falha de Comunicação
- Chuvas
- Fator de potência
- etc





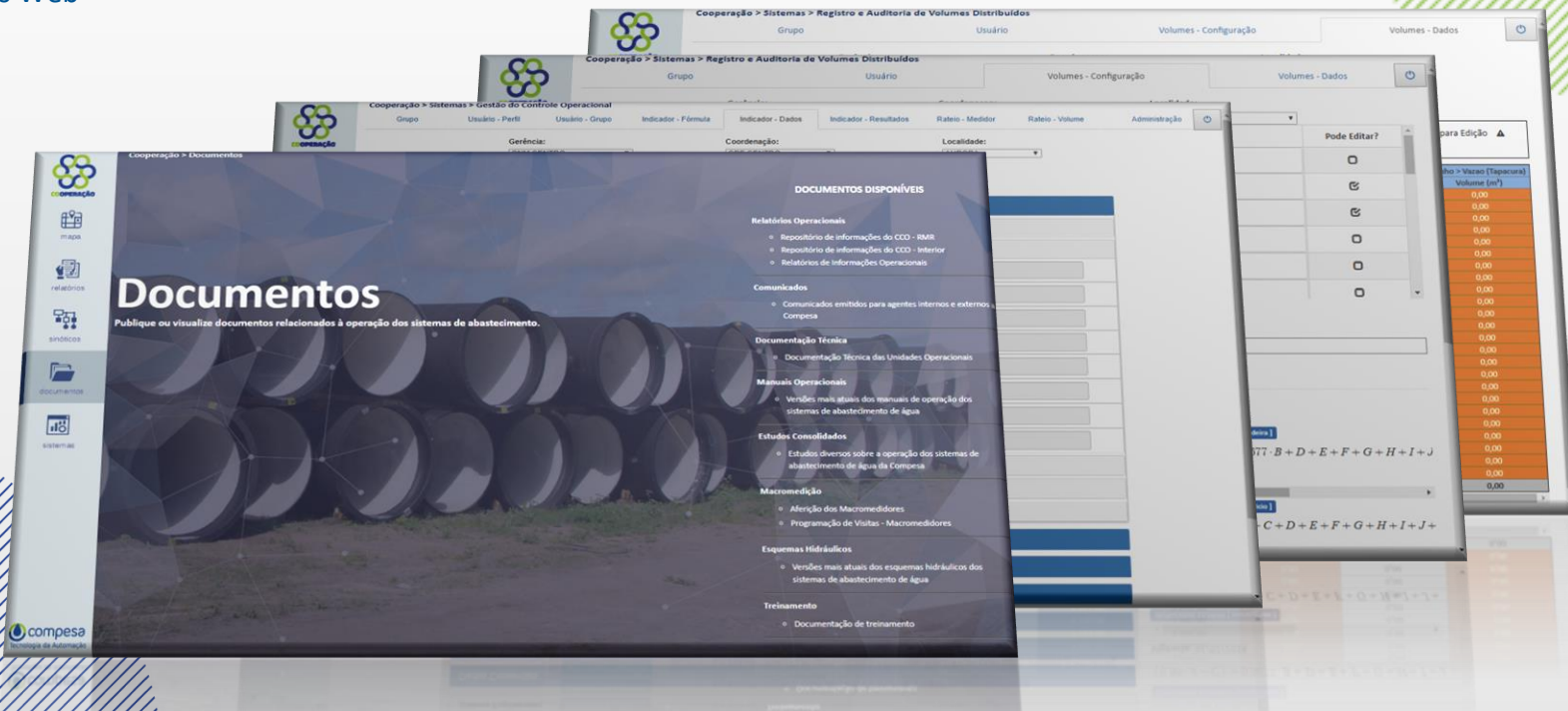
Sistemas de Gestão

Informações consolidadas sobre produção e distribuição de água



Sistemas de gestão

Sistemas Web



The image displays a web-based management system interface for water supply systems. The main focus is a 'Documentos' (Documents) page, which features a sidebar with navigation icons for 'MAPAS', 'RELATÓRIOS', 'SERVIDIÇOS', 'DOCUMENTOS', and 'SISTEMAS'. The main content area is titled 'DOCUMENTOS DISPONÍVEIS' and lists various document categories:

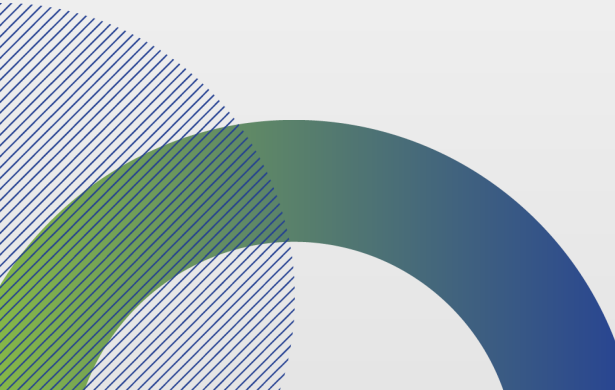
- Relatórios Operacionais**
 - Repositório de informações do CCD - RMIR
 - Repositório de informações do CCD - Interior
 - Relatórios de informações Operacionais
- Comunicações**
 - Comunicações emitidos para agentes internos e externos, Compesa
- Documentação Técnica**
 - Documentação técnica das Unidades Operacionais
- Manuais Operacionais**
 - Versões mais atuais dos manuais de operação dos sistemas de abastecimento de água
- Estudos Consolidados**
 - Estudos diversos sobre a operação dos sistemas de abastecimento de água da Compesa
- Macromedição**
 - Aferição dos Macromedidores
 - Programação de Visitas - Macromedidores
- Esquemas Hidráulicos**
 - Versões mais atuais dos esquemas hidráulicos dos sistemas de abastecimento de água
- Treinamento**
 - Documentação de treinamento

In the background, several other system windows are visible, including 'Registro e Auditoria de Volumes Distribuídos' and 'Gestão do Controle Operacional'. These windows show data tables with columns for 'Grupo', 'Usuário', 'Indicador', 'Fórmula', 'Resultado', 'Medidor', 'Volume', and 'Dados'. Some tables include mathematical formulas like $T = B + D + E + F + G + H + I + J$ and $C + D + E + F + G + H + I + J$. A table on the right shows a list of volumes with values of 0,00.



Integração com BI (*Business Intelligence*)

Transformando dados brutos em
informação gerencial



Integração com BI



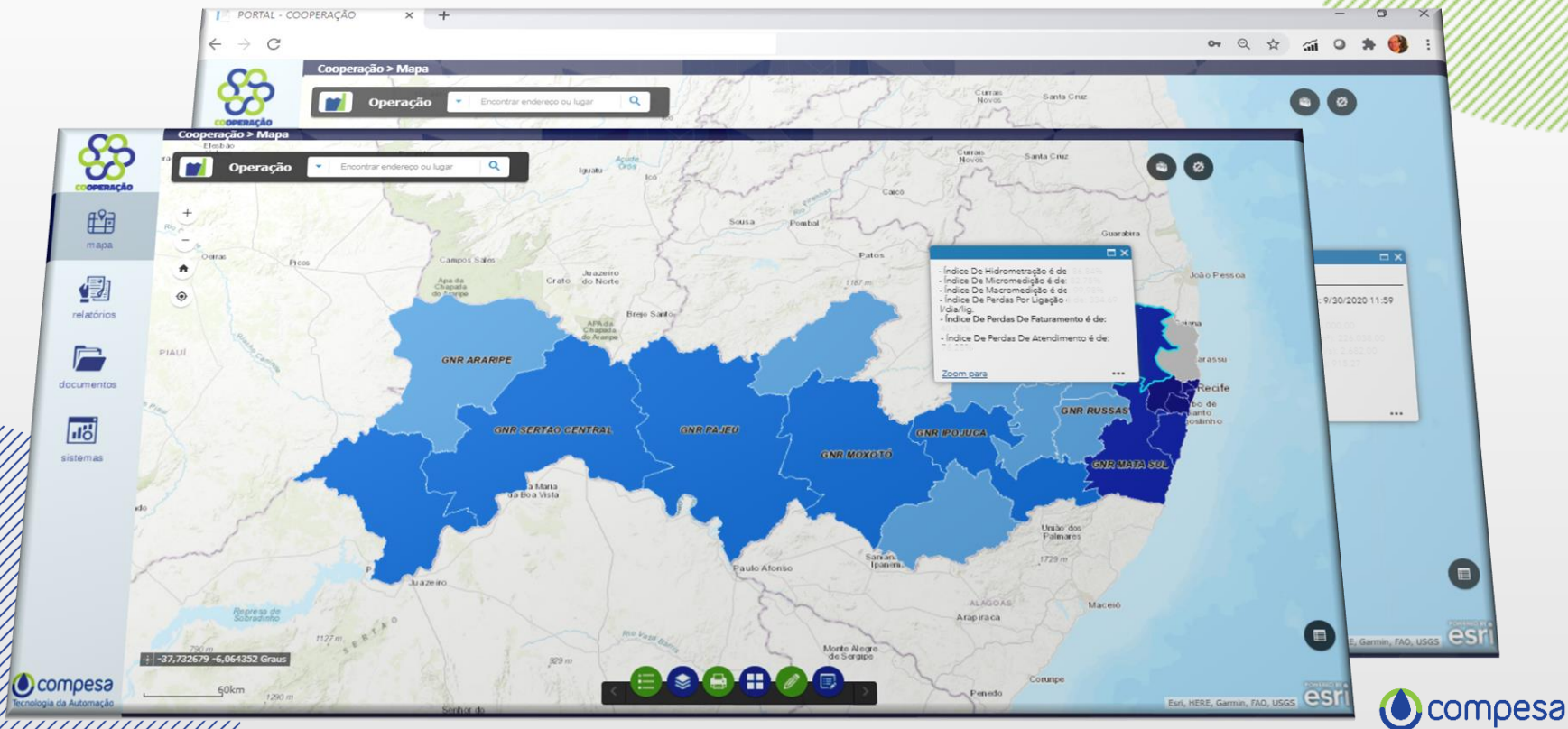


Integração com o GIS (*Geographic Information System*)

Espacializando os dados



Integração GIS



Cooperação

- Velocidade
- Rastreabilidade
- Integração
- Confiabilidade
- Disponibilidade
- Direcionamento

Obrigado pela Atenção!

Gerência de Automação

automacao@compesa.com.br

(81) 99491-3297 Antônio Lucena – Gerente

(81) 99737-6474 Fábio Lima – Analista de Saneamento



*Transparente
como tem que ser.*

Secretaria de
Infraestrutura
e Recursos Hídricos



GOVERNO DO ESTADO
PERNAMBUCO
MAIS TRABALHO, MAIS FUTURO.



Sessão de Perguntas & Respostas



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