NOV/22

# Ensuring safety at water dams using predictive algorithms

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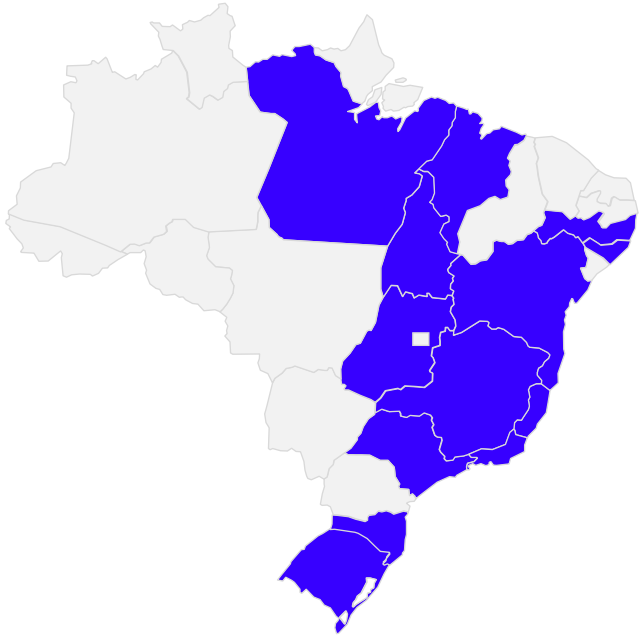
# BRK at a Glance

## Leading platform with a diversified footprint and multiple growth avenues

### Company Overview

- **Leading** water and wastewater platform in Brazil
- **Diversified portfolio** with predictable cash flows
- **Contracted growth** to more than double the Company's EBITDA organically
- **Platform value** arising from **seasoned** management team & **world-class** sponsors (Brookfield and FI-FGTS) ready to tap **inorganic growth opportunities**
- **ESG-oriented** purpose and decision-making

### Largest National Footprint[/1]



### Positive Momentum

- **+R$ 700 bn in investments** to reach universalization
- Private companies with only **42mm inhabitants** (~17% market share[/2])
- Pipeline of new concessions to achieve **+93mm inhabitants[/3]** (~60% total private market share)

**32** Dams

**23** SPEs

**16 mm** Inhabitants

**+100** Municipalities

**13** States

**26-Years** Remaining contractual term[/4]

**63%** of concessions still in high-growth stage[/5]

**~115 k[/6]** Olympic swimming pools of treated wastewater (2021)

**~10 k[/7]** Olympic swimming pools of water saved (2017-21)

*Notes: /1 As per geographical footprint: BRK operates in all 5 Brazilian regions and in 13 States; /2 Internal estimate based on population (2021 YE); /3 BNDES pipeline and internal estimate; /4 Average concession tenor weighted by gross revenue; /5 Includes ramp-up assets and assets under development; /6 287 bn liters; /7 21bn liters*

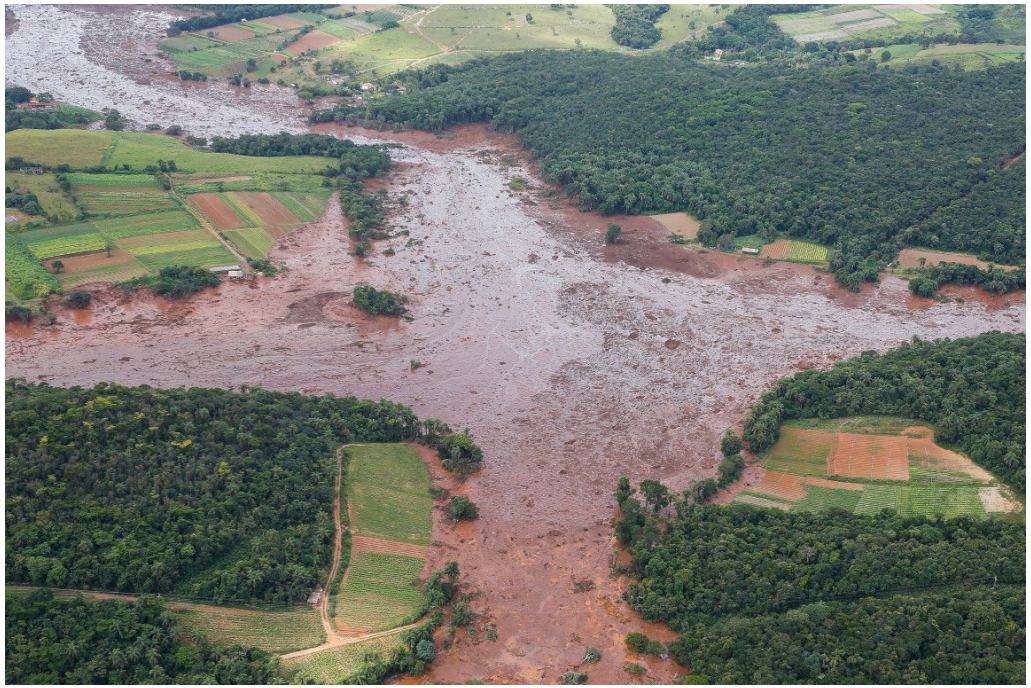
# What are Dams?

- Irrigation
- Drinking water
- Bath, hygiene
- Recreation hydropower
- Flood control

# Importance of Dam´s Security

## Before

## After



# Dams Safety and Hydraulic Structures

## Challenge

- Water shortage problems due to climate changes, dam´s malfunctioning or poor maintenance;
- Overflowing due to sudden elevation in the reservoir level, putting the stability of the structures at risk, which could lead to rupture.

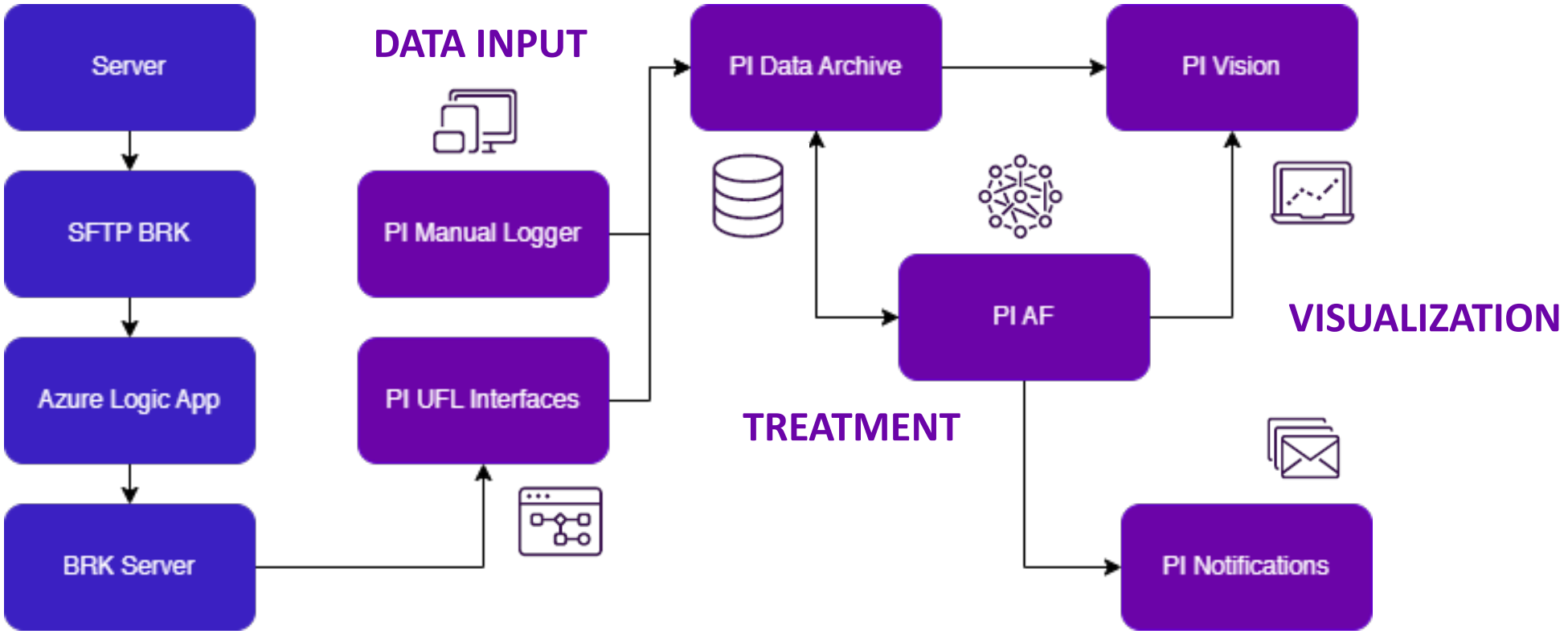
## Solution

- Developed an algorithm that analyzes the behavior of dams based on data from previous years, allowing us to predict possible water shortages and abundance and work with predictive measures.

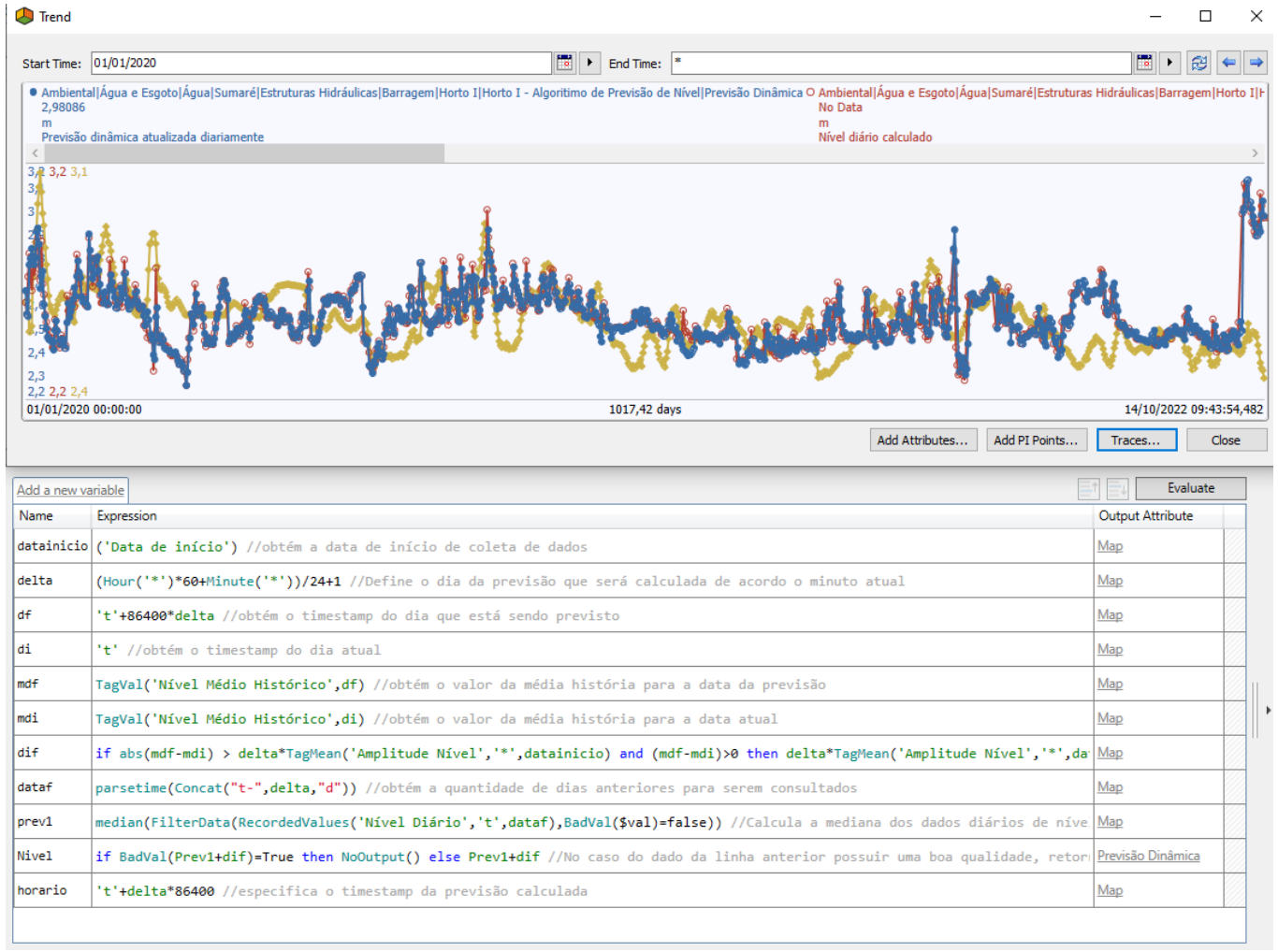
## Benefits

- Increased operational efficiency, reduced costs, mobile inspections;
- Facilitate the delivery and consolidation of data from dams and hydraulic structures to increase Dam´s Water Security;
- Near real-time Monitoring enhancing preventing maintenance;

# AVEVA Product Portfolio use case

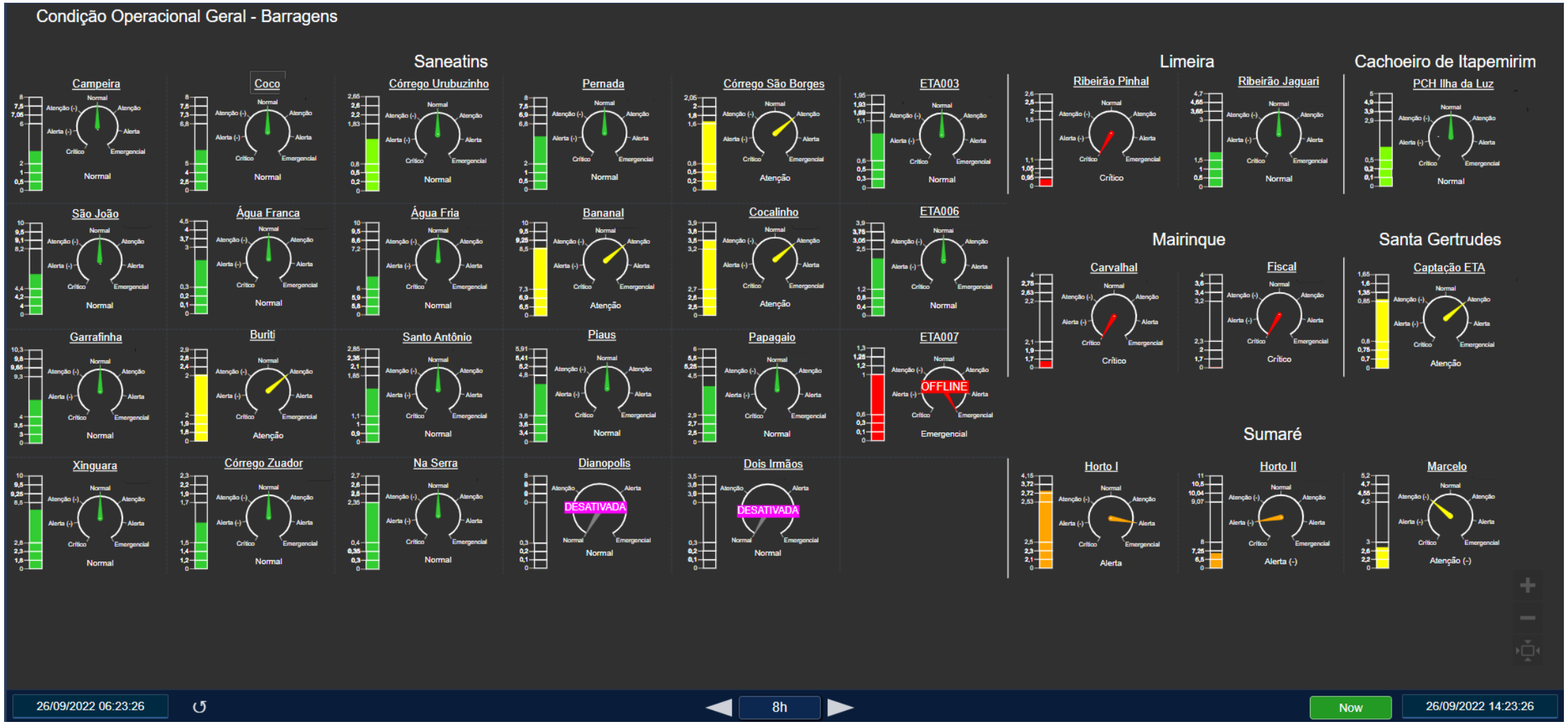


# Implementation details

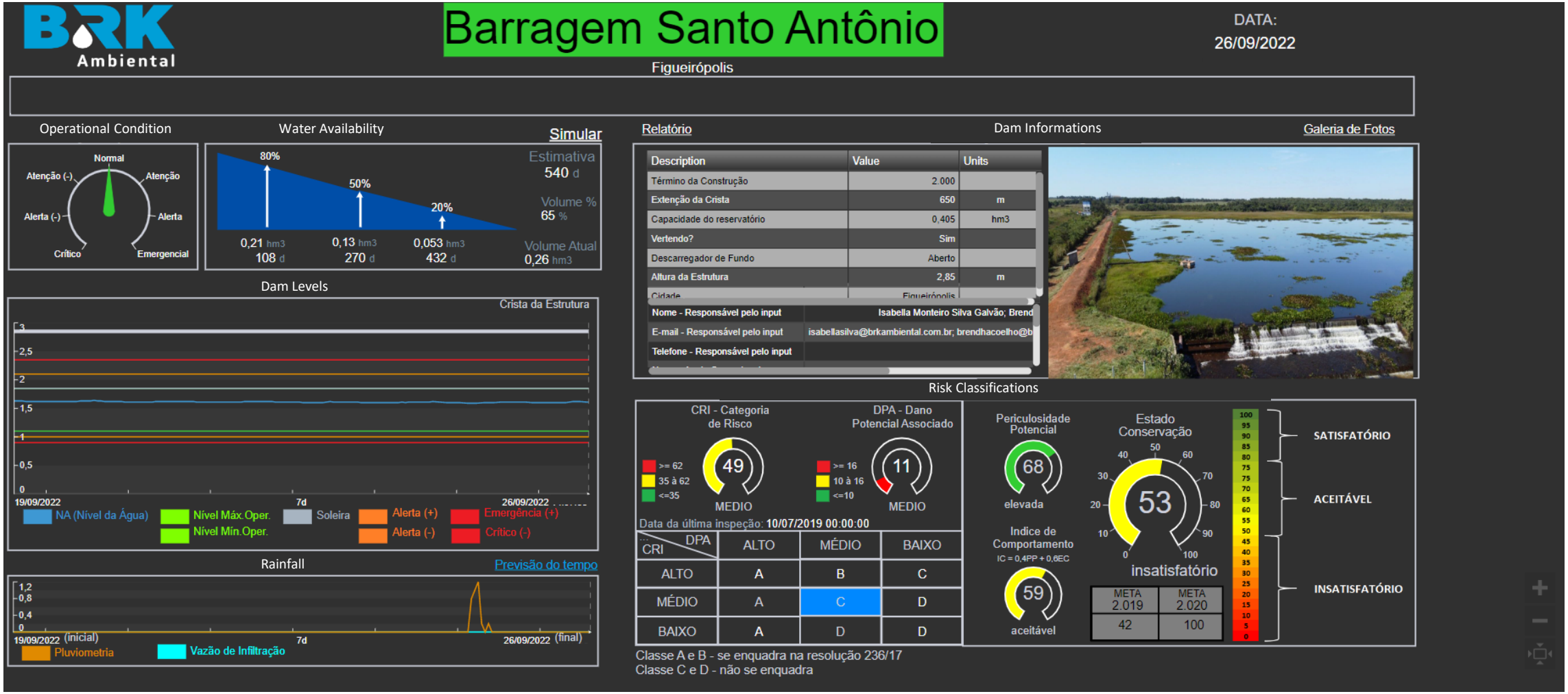



- We use PI AF to prepare data and to predict the behavior of dam levels for the next few days based on historical behavior and the current level.

# Implementation details

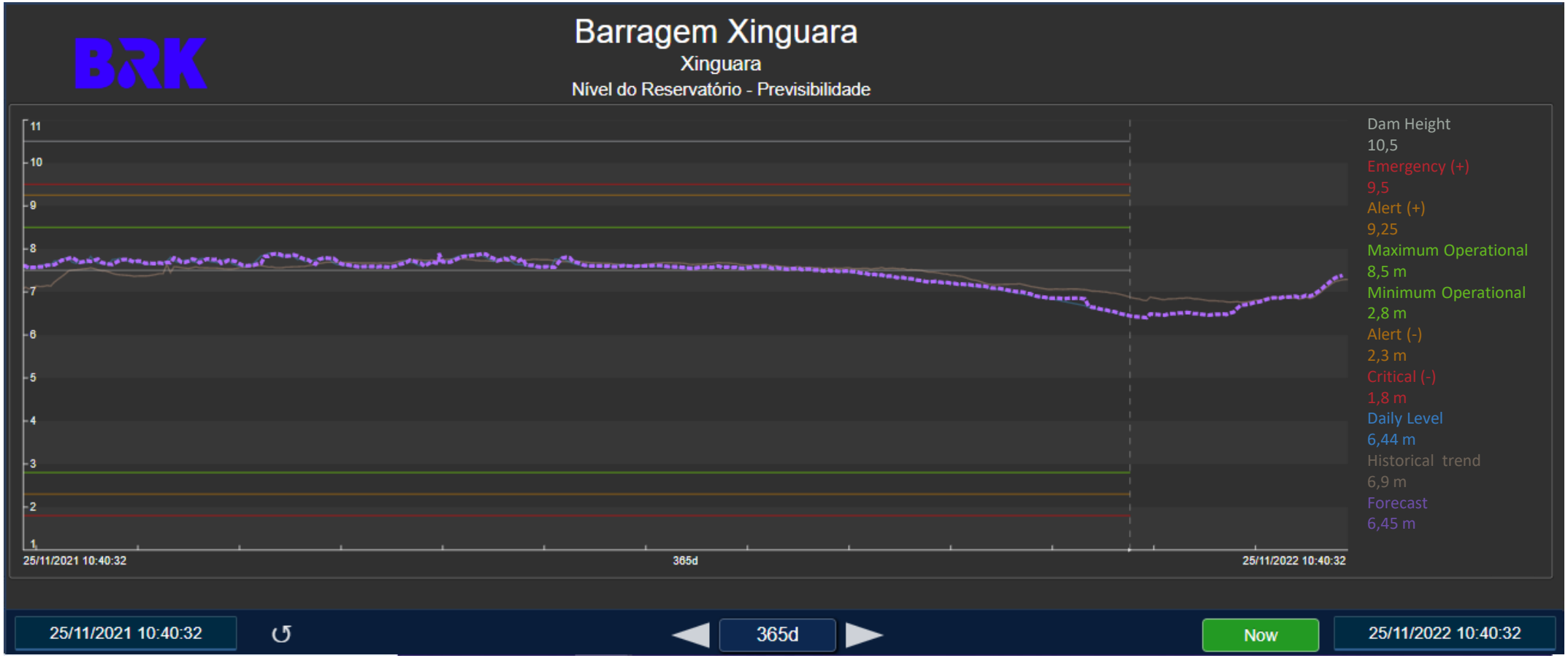


# Implementation details

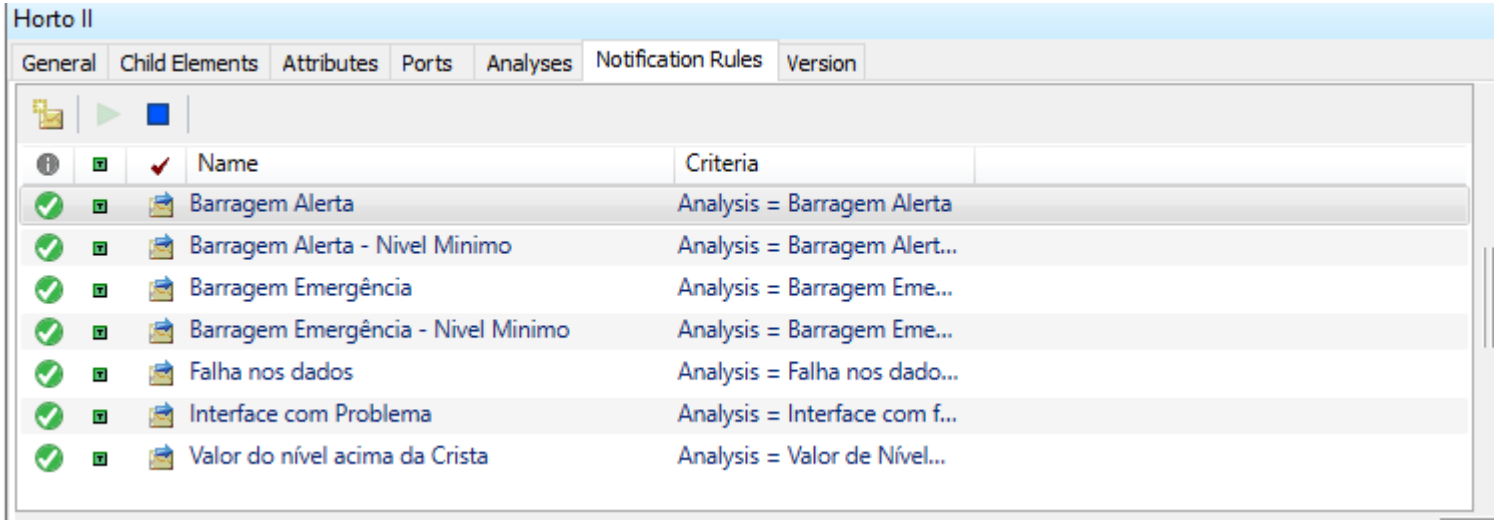


# Implementation details

## Helping with the decision making: drain the water or wait for it to stabilize



# Implementation details




- In case operational limits are exceeded, emails are sent to dams' responsible

**BRK Ambiental - PI System**

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Sumaré -
Horto I atingiu o nível
Alerta às
27/09/2022 14:00:10 E. South America Standard Time (GMT-03:00:00)

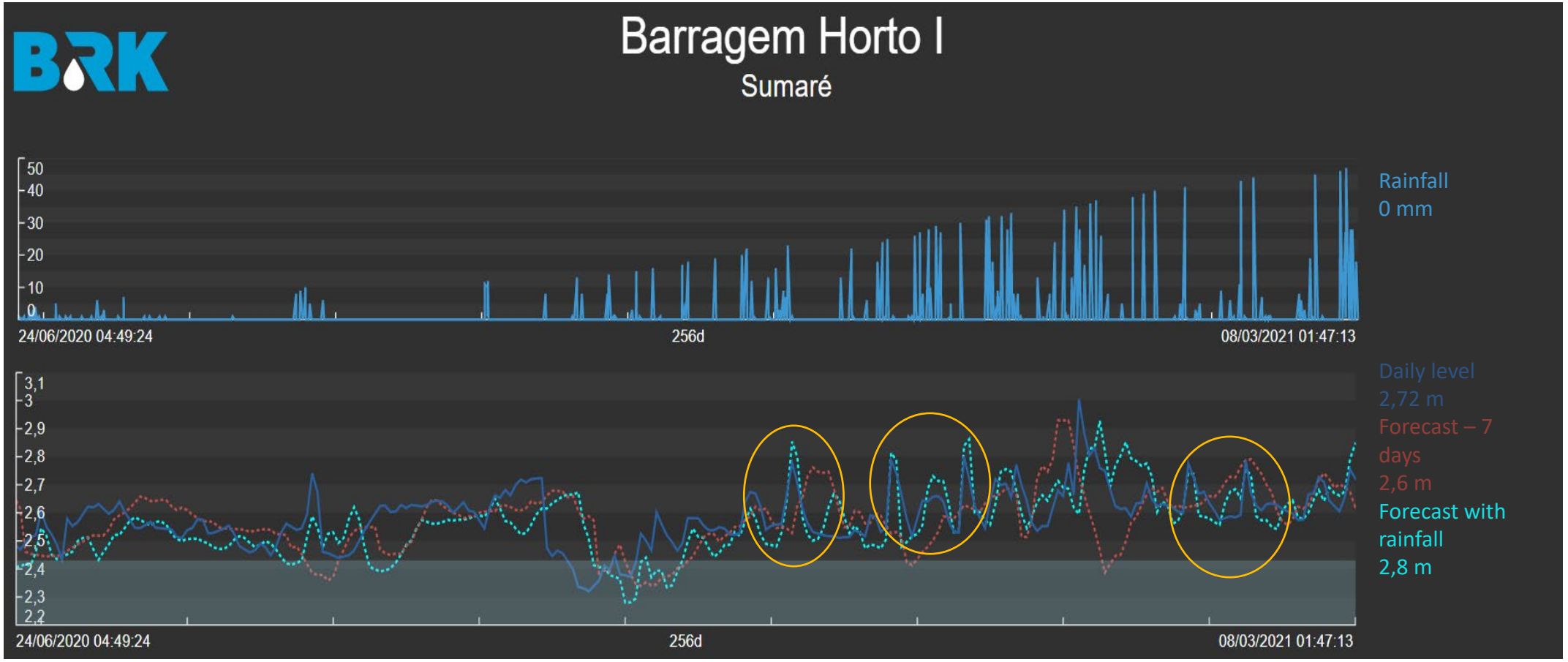
**Informações Relacionadas:**

**Estrutura:**
Horto I
**Cidade:**
Sumaré
**Estado:**
São Paulo - SP
**Horário:**
01/01/1970 00:00:00 E. South America Standard Time (GMT-03:00:00)
**Condição Operacional:**
Alerta
**Nível:**
3,14
m
**Altura da Crista:**
4,15
m

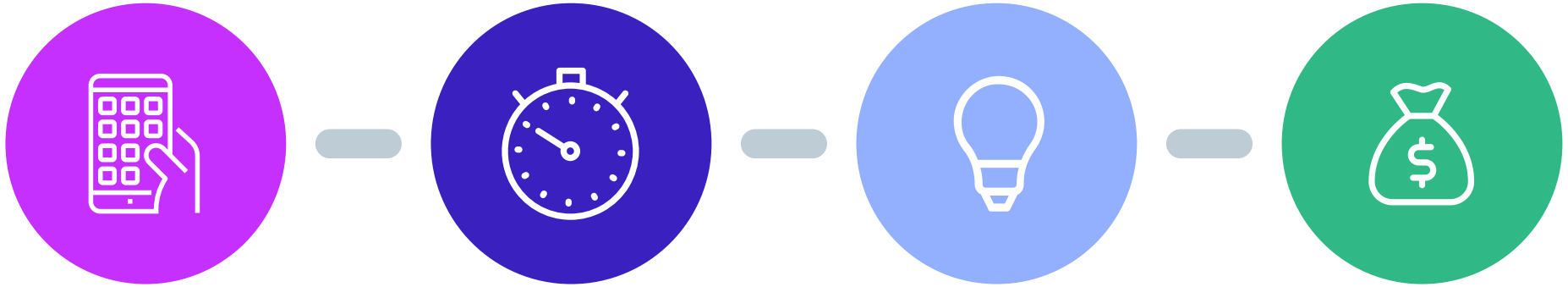
*** Favor verificar e realizar a leitura a cada 2 horas. ***

# Implementation details

- The use of rainfall data allows greater assertiveness in level peaks



# Benefits & Savings



## Data

Facilitate the delivery and consolidation of data and store in historical database to increase dam´s water security

## Near Real Time

Near Real-Time Monitoring enhancing preventive maintenance

## Analytics

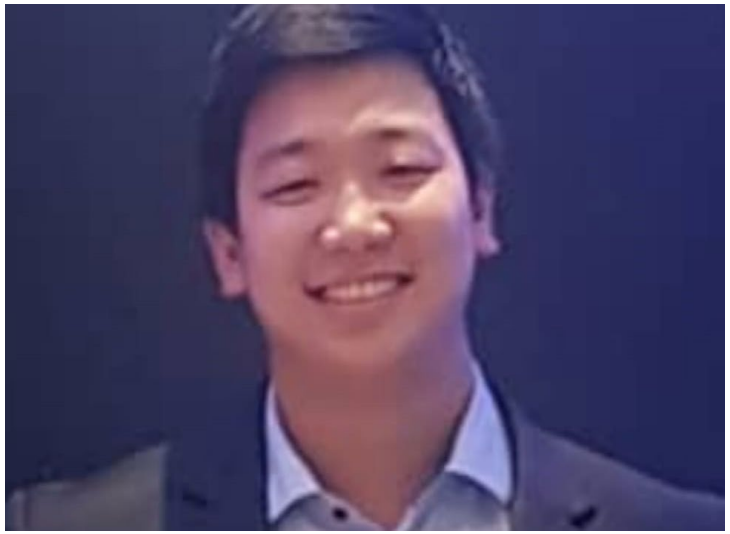
Analytics to help Quick Decision Making to help prevent any ruptures or overtopping at dams

## Avoided Costs

**$ 20 Million** for all 32 dams

# Conclusion

- With PI System we were able to facilitate the access to all the information necessary for the operation;
- We seek to increase the use of the data we collect in order that our projections become more assertive and we can have more confidence in decision making.
- The solutions implemented make it possible to have more security in the structures and greater guarantee in the availability of water supply.



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# Questions?

Please wait for the microphone.

State your name and company.

# Please remember to…

Navigate to this session in the mobile app to complete the survey.

# Thank you!



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