



IKATAN AHLI FASILITAS PRODUKSI  
MINYAK DAN GAS BUMI INDONESIA

2023

**FFPM**  
**FORUM**  
**FASILITAS**  
**PRODUKSI**  
**MIGAS**

**29-31 AGUSTUS 2023**  
**YOGYAKARTA**

# Operations Going Digital

Wimbuh Nawa Nugroho





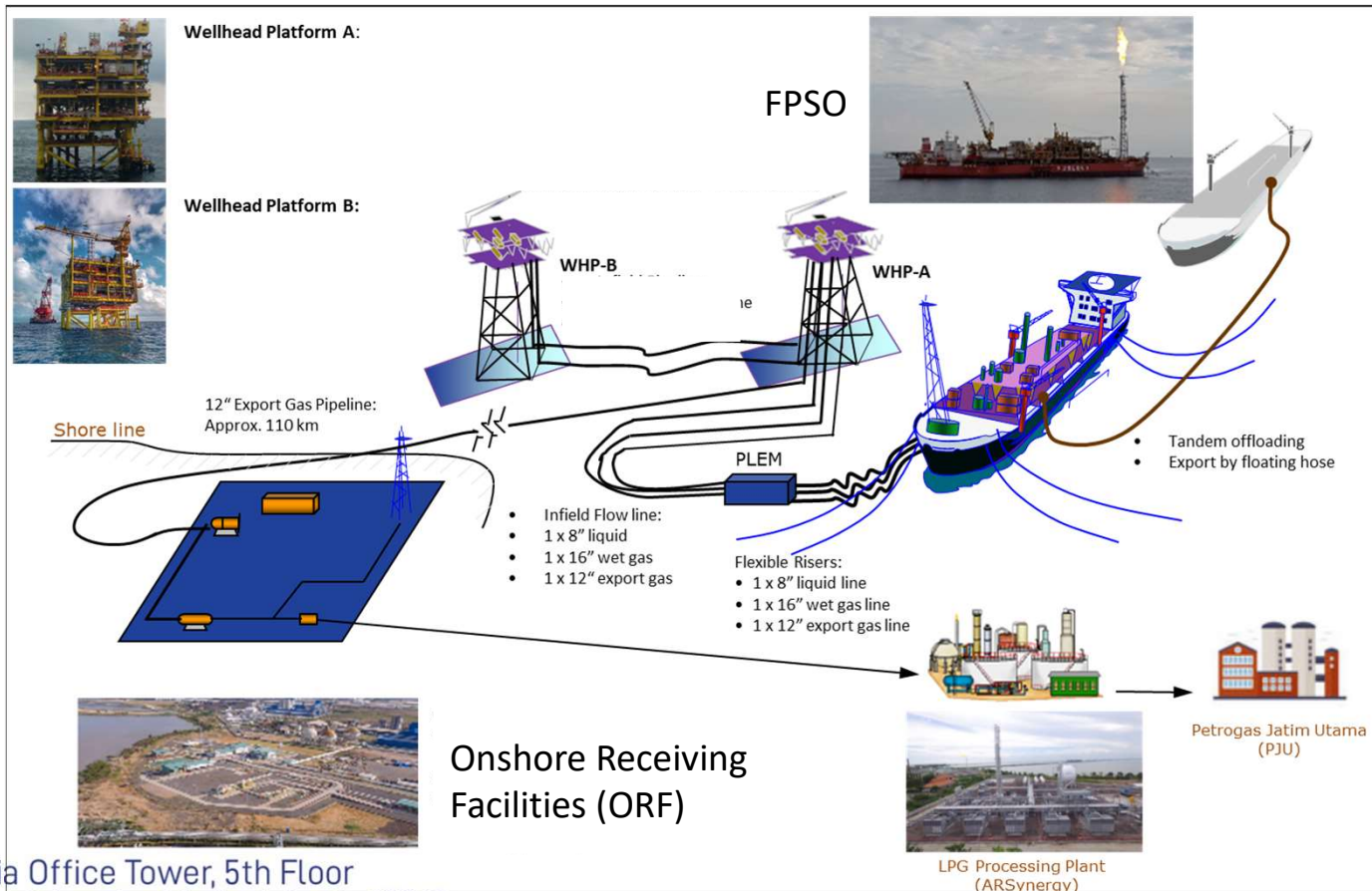
# Content

- Bukit Tua Operations
- Why is Digital So Important?
- Our Digital Road Map
- Our Main Digital System
- Value Added Creation
- Case Study
- What to Improve

Gandaria Office Tower, 5th Floor  
Jl. Sultan Iskandar Muda, Jakarta 12240



# Bukit Tua Operations



Gandaria Office Tower, 5th Floor  
Jl. Sultan Iskandar Muda, Jakarta 12240



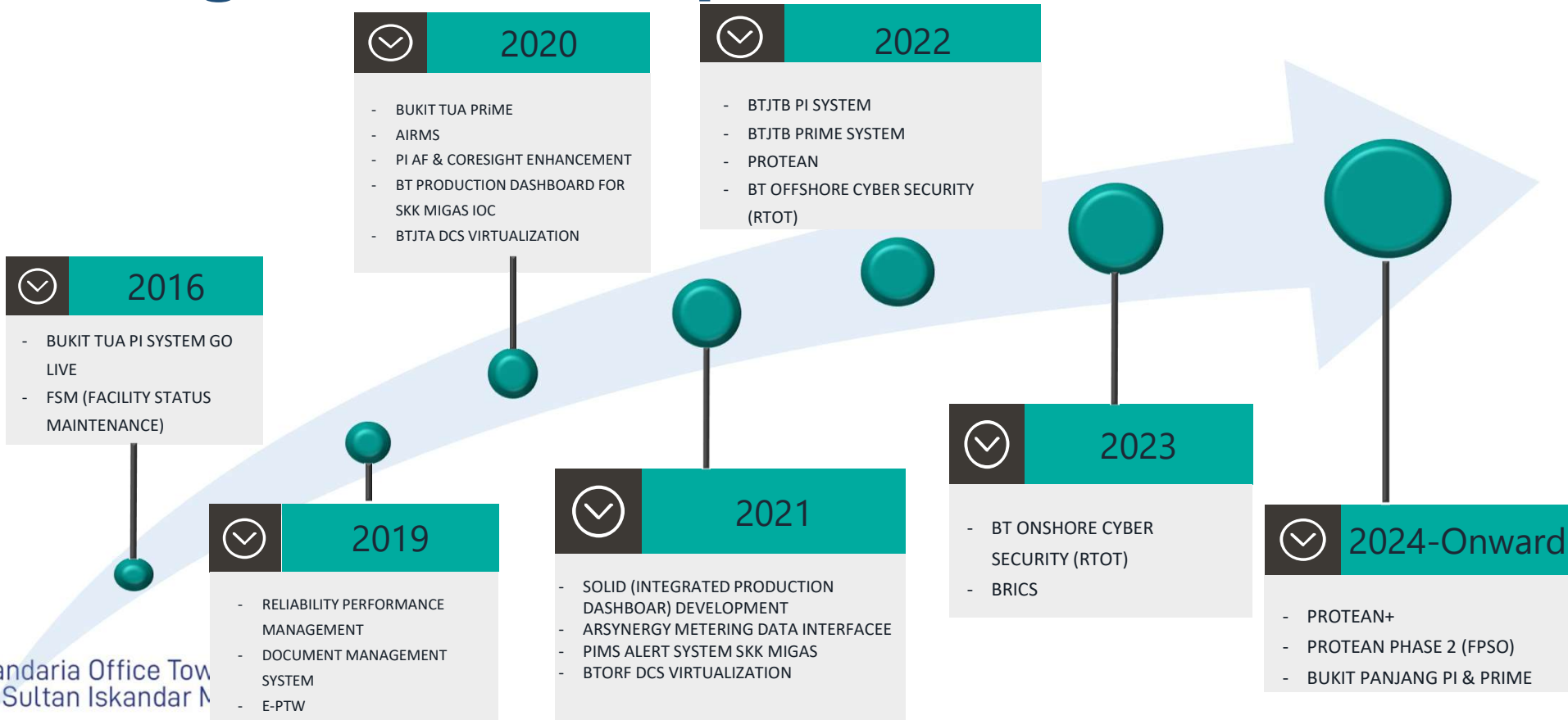
# Why is Digital So Important

Digitalization in Energy means converting physical parameter into virtual data, so that they can be displayed and studied using computer tools

- Boost operational efficiency and productivity
- Increase workplace safety
- Data-led insights
- Respond in real-time to new challenges
- Minimize the carbon footprint of the industry



# Our Digital Roadmap



Gandaria Office Tower  
Jl. Sultan Iskandar No. 1



# Our Main Digital System

## PI System

Production Facilities  
Monitoring & Analysis  
Tools



## E-PTW

Online Permit To  
Work System



## RTOT

A real time monitoring  
and cyber security  
management system  
for Operational  
Technology (OT)



## BRICS

Safety Critical  
Equipment Status and  
Management



## AIRMS

Asset Reliability &  
Integrity  
Management System



## PRiME

Plant Instrumentation  
& Process Safety  
Performance  
Monitoring & analysis



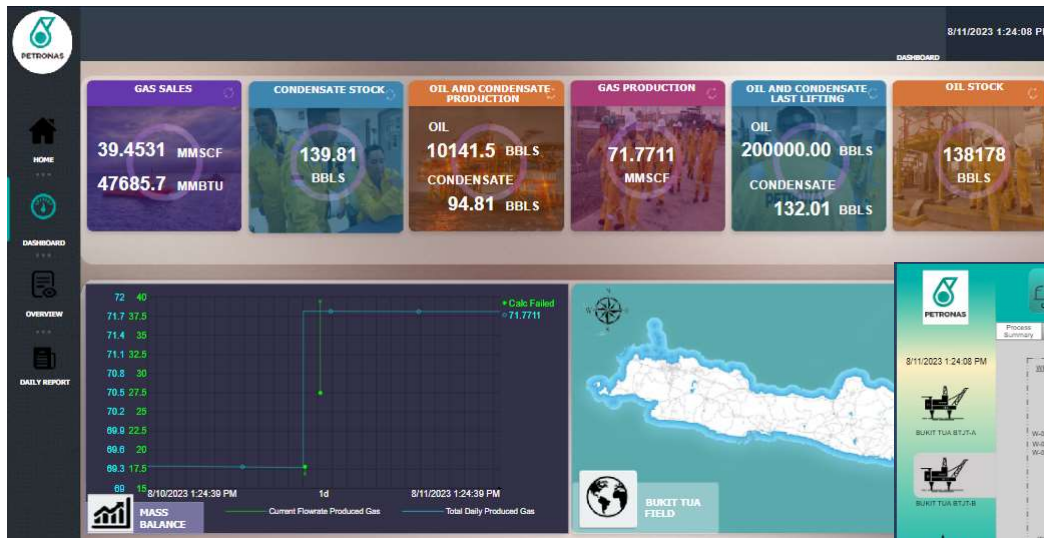
## PROTEAN

A Monitoring System  
to measure  
Healthiness of  
Turbomachinery  
Equipment

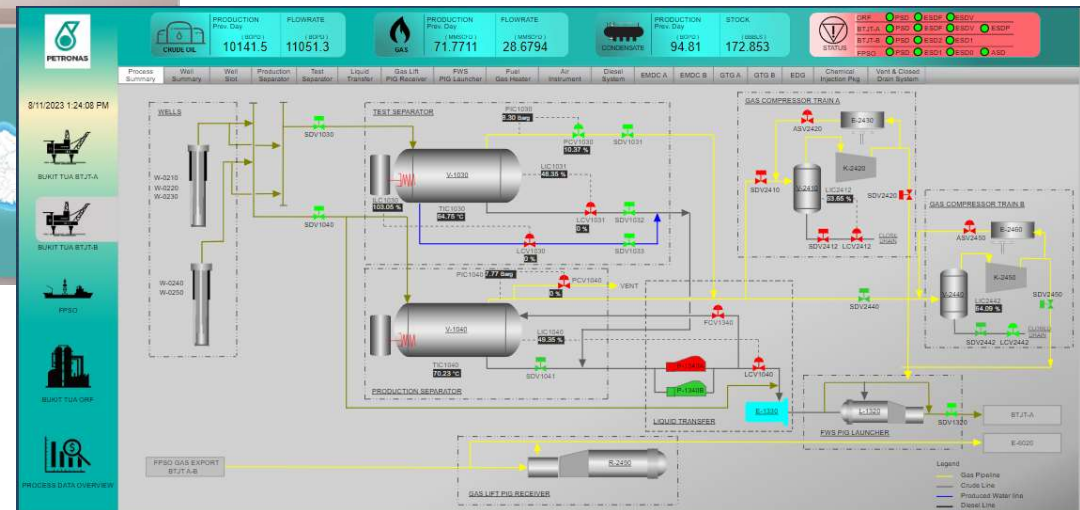
Gandaria Office Tower, 5th Floor  
Jl. Sultan Iskandar Muda, Jakarta 12240



# Our Main Digital System



Plant Information System



Gandaria Office Tower, 5th Floor  
Jl. Sultan Iskandar Muda, Jakarta 12240



# Our Main Digital System

The screenshot shows the E-PTW system interface. At the top, there is a navigation bar with a 'Create' button and a user profile icon. Below the navigation bar is a search bar with the text 'Enter PTW No.' and a 'Search' button. The main content area displays a table of PTW records. The table has columns for PTW No., Asset, Site, Area/Unit, Sub Area, Applicant Name, Company, Start Date, End Date, Status, and Actions. The records are color-coded: red for 'Hot Work' and green for 'Cold Work'.

PTW No.	Asset	Site	Area/Unit	Sub Area	Applicant Name	Company	Start Date	End Date	Status	Actions
0001508	INO	ORF	PROCESS AREA	Fuel Gas Package Area	Arief Budiman	PT DEPRIWANGGA OM	14 Aug 2023	20 Aug 2023	Approved	
0001492	INO	ORF	PROCESS AREA	Condensate Evacuation Area	Muhammad Rozkin	PT Intrafood Citarasa Nusantara	09 Aug 2023	15 Aug 2023	Pending Revalidation by WL	
0001509	INO	ORF	BUILDING AREA	Admin Building	Iman Hadi Nugraha (INO/Upstream)	PETRONAS Indonesia Operations	14 Aug 2023	20 Aug 2023	Pending Joint Site Visit	
0001510	INO	ORF	PROCESS AREA	Pig Receiver Area	Syaifuddin Zuhri	PT Depriwangga Cabang Surabaya	14 Aug 2023	20 Aug 2023	Approved	
0001505	INO	ORF	BUILDING AREA	PLN Build	Budi Ono	PT Depriwangga Cabang Surabaya	14 Aug 2023	20 Aug 2023	Approved	
0001502	INO	ORF	BT-ORF	BT-ORF All Area	Nanang Arias Cahyono (IDN/PCOSB)	PETRONAS Indonesia	14 Aug 2023	20 Aug 2023	Approved	

## E-PTW

### Electronic Permit To Work

The screenshot shows the 'I want to create...' section of the E-PTW system. It displays a grid of certificate types with icons and names. The certificates are:

- PTW: Permit to Work
- JHA: Job Hazard Analysis
- LC: Lifting Certificate
- DC: Diving Certificate
- EIC: Electrical Isolation Certificate
- VEC: Vehicle Entry Certificate
- LOEAC: Limit of Electrical Access Certificate
- SSBOC: Safety System Bypass Override Certificate
- PETI: Portable Electrical & Temporary Installation Certificate
- RC: Radiation Certificate
- EC: Excavation Certificate
- ROC: Road Obstruction Certificate
- CSE: Confined Space Entry Certificate
- PIC: Physical Isolation Certificate
- WAH: Working At Height
- Audit Checklist: PTW Audit Checklist
- PHC: Pressurized Habitat Certificate

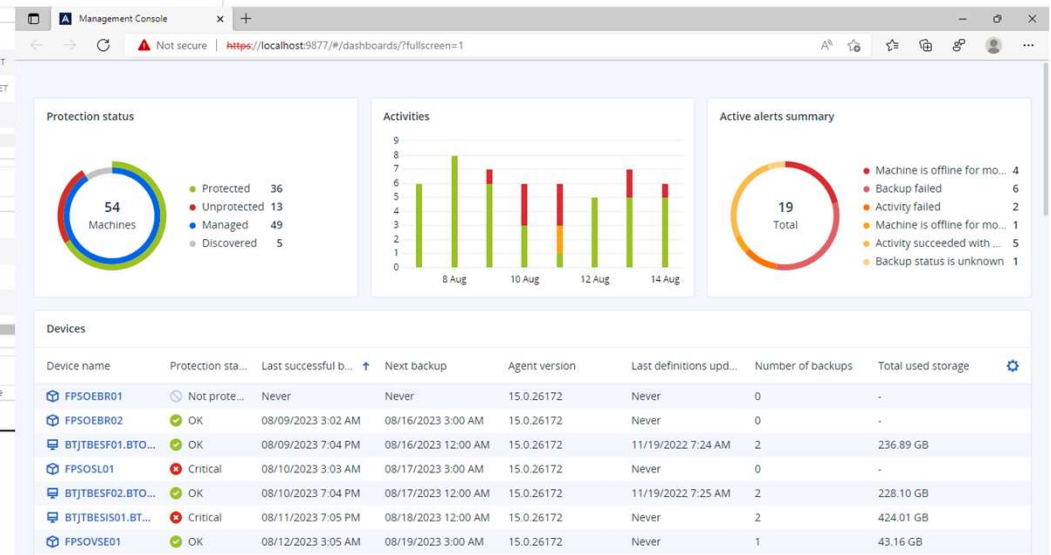
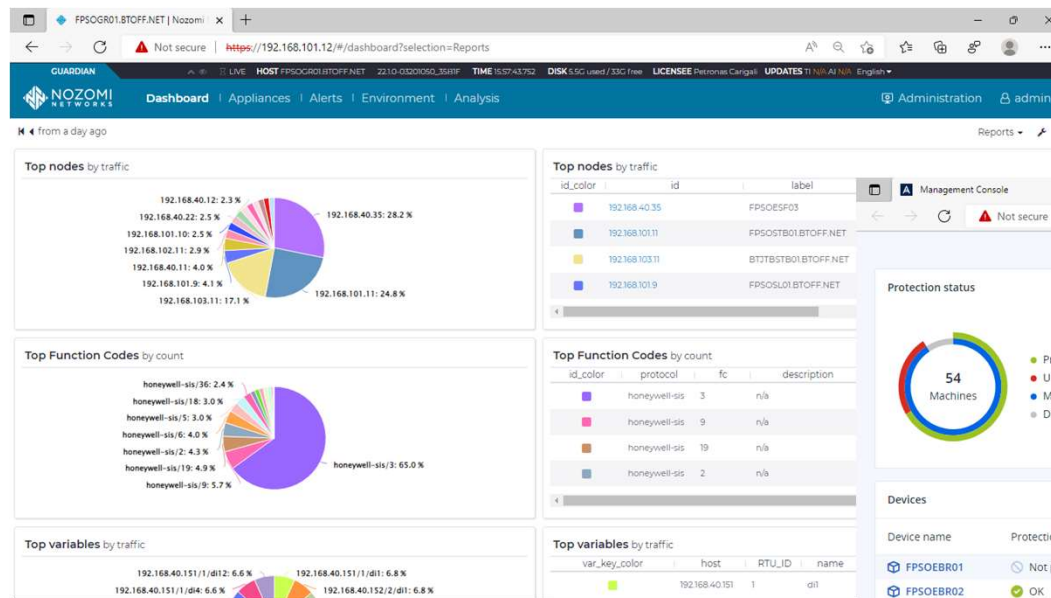
A 'Close' button is located at the bottom right of the grid.

Gandaria Office Tower, 5th Floor  
Jl. Sultan Iskandar Muda, Jakarta 12240



# Our Main Digital System

RTOT  
Real Time Operational Technology

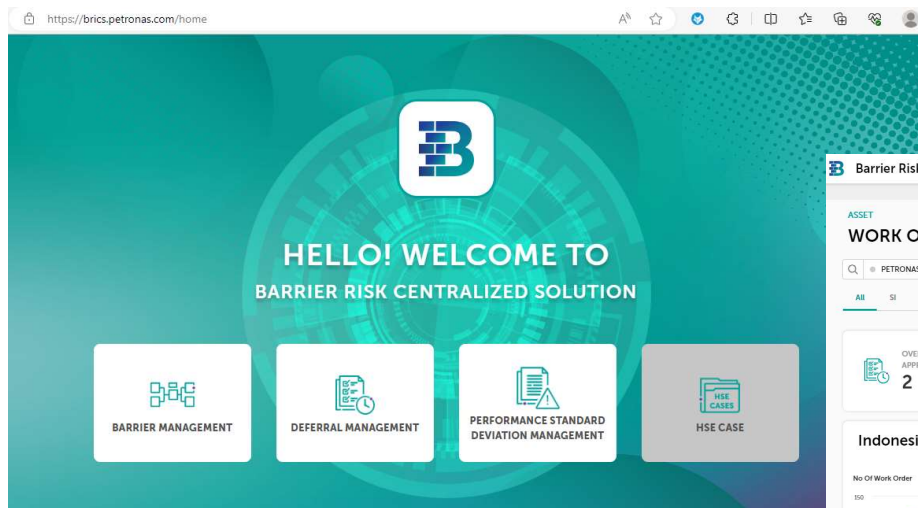


Gandaria Office Tower, 5th Floor  
Jl. Sultan Iskandar Muda, Jakarta 12240

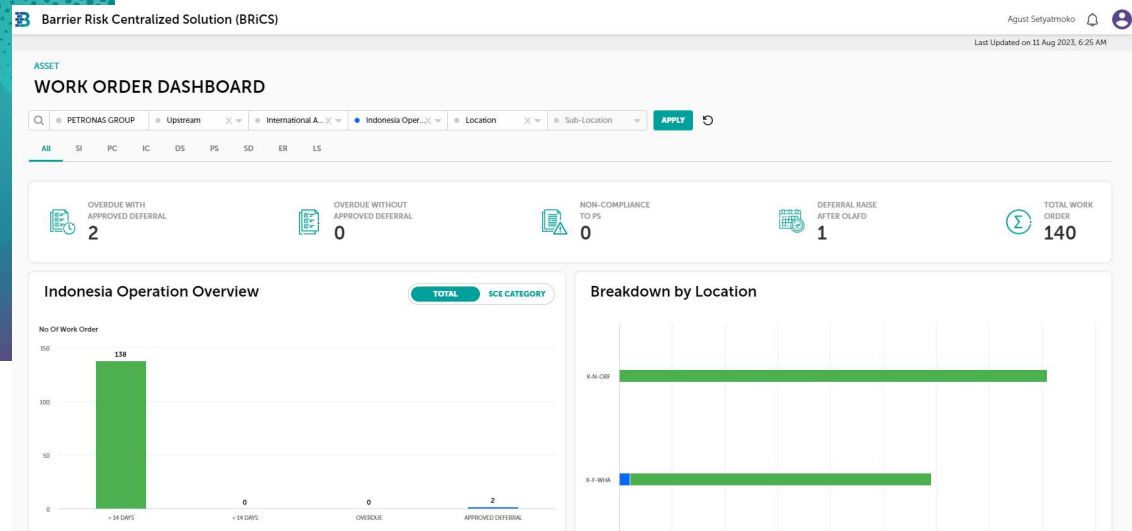
Open



# Our Main Digital System



## BRICS Barrier Risk Centralized Solution

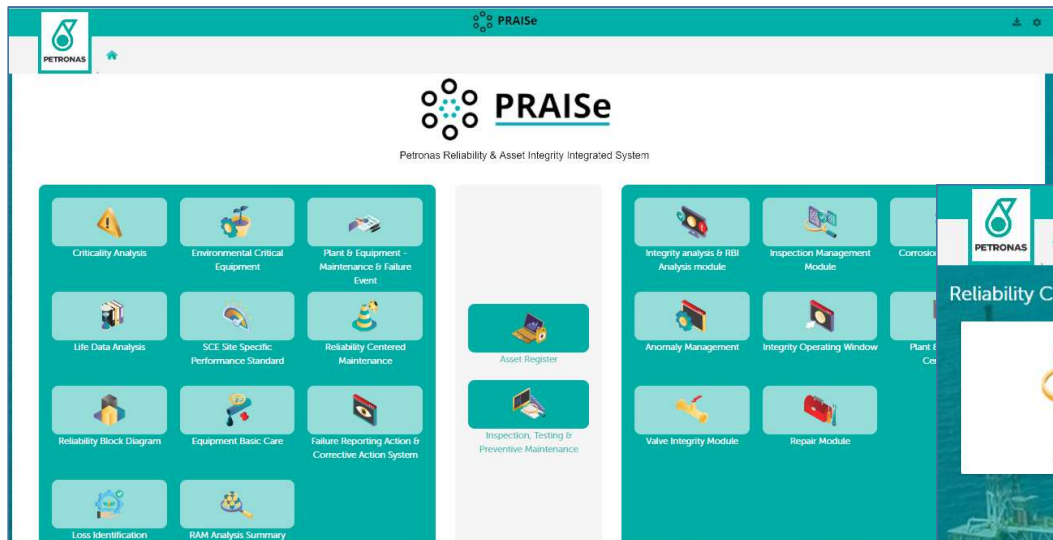


Gandaria Office Tower, 5th Floor  
Jl. Sultan Iskandar Muda, Jakarta 12240

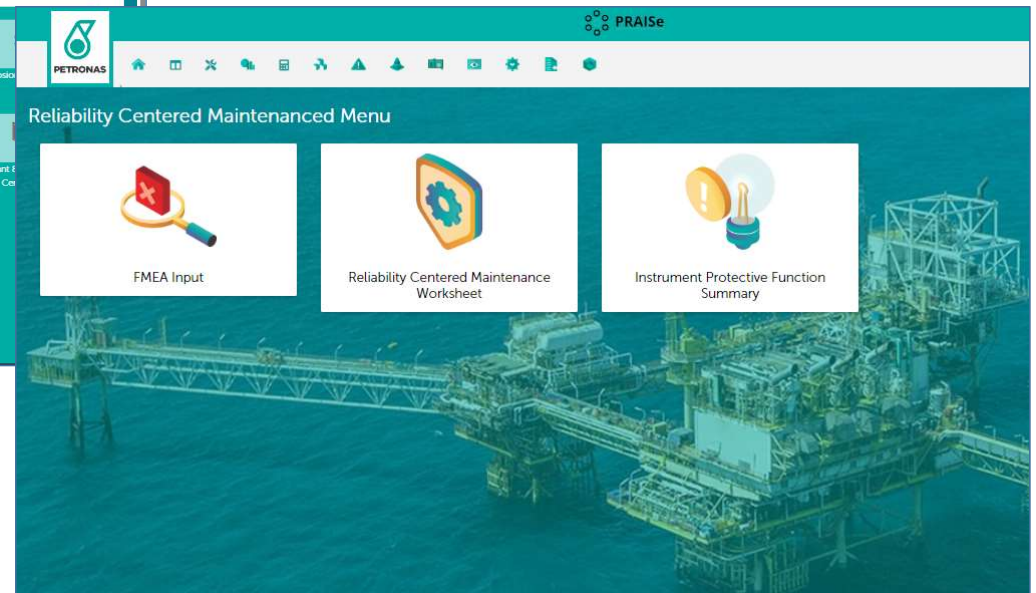
Open



# Our Main Digital System



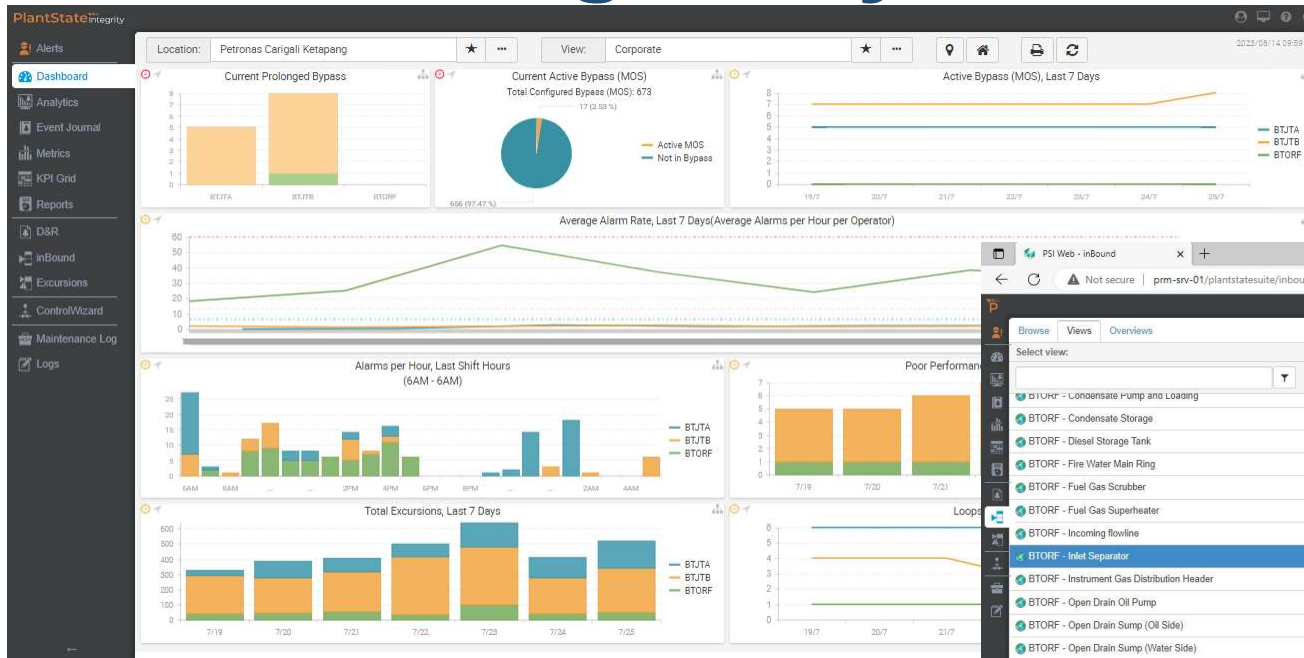
**AIRMS**  
*Asset Integrity Reliability Management System*



Gandaria Office Tower, 5th Floor  
Jl. Sultan Iskandar Muda, Jakarta 12240

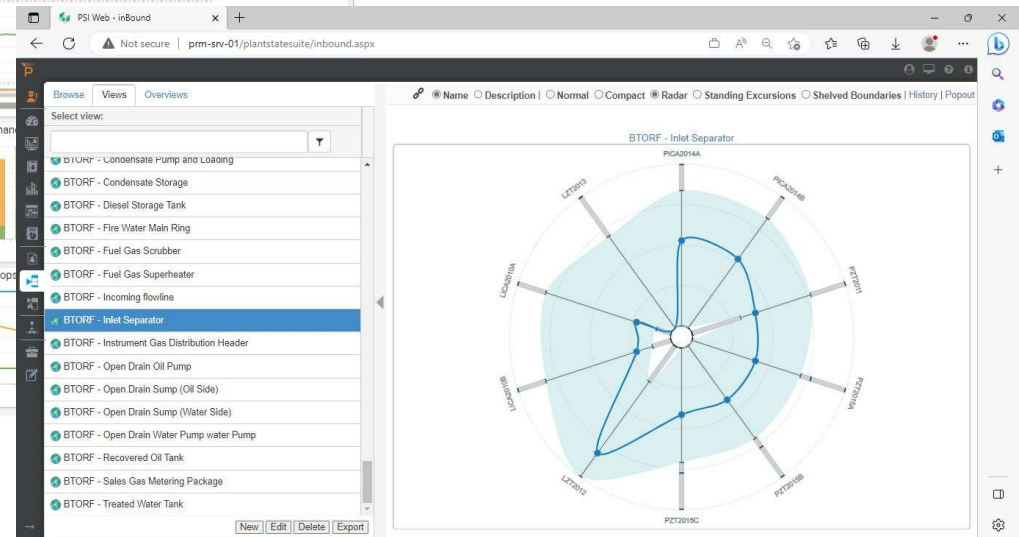


# Our Main Digital System



**PRIME**

*Predictive Revitalization of  
Instrument to Maximize Efficiency*

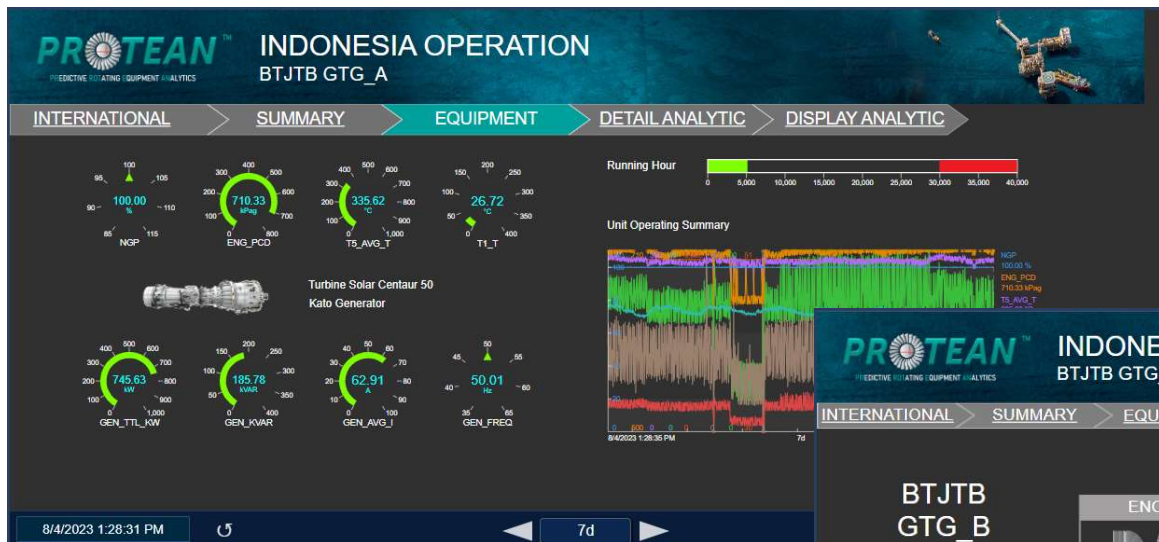


Gandaria Office Tower, 5th Floor  
Jl. Sultan Iskandar Muda, Jakarta 12240

Open



# Our Main Digital System



**PROTEAN**  
*Petronas Rotating Equipment Analytics*



Gandaria Office Tower, 5th Floor  
Jl. Sultan Iskandar Muda, Jakarta 12240

Open



# Value Added Creation

## HSE

- Improve safety & risk management,
- Maintain & Validate instrument & process safety integrity by means of data trending, analytics & performance management

## Production & Maintenance

- Minimize UPD & enhance performance contributing to cost optimization
- Reduce unplanned shutdown, trip and unplanned maintenance of the rotating equipment
- Contribute towards the reduction of operational and maintenance cost
- Better maintenance planning

## Enhanced Connectivity

- Reduce the requirement to have subject material experts on board to troubleshoot and diagnose a technical problem related to equipment
- Improve interaction and collaboration among technical disciplines, operation and maintenance team

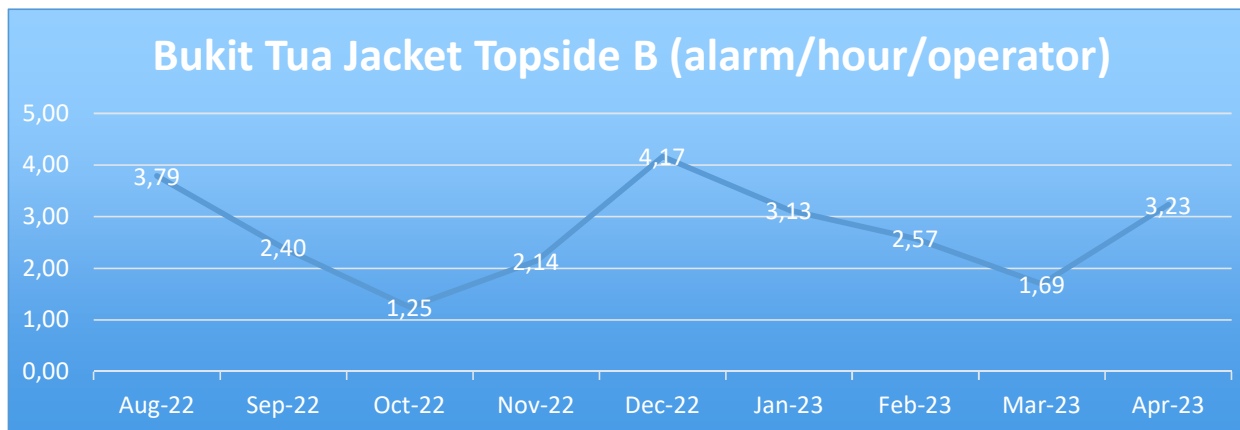
## Cyber Security

- Reduced risk of security breaches at OT which could result in commercial, physical and reputational damage



# Case Study

## Alarm Performance Using PRIME Application



OPU TARGET	ACCEPTABILITY CATEGORIZATION	PERFORMANCE & RISK
6	Very likely to be acceptable	Efficient / Low Risk

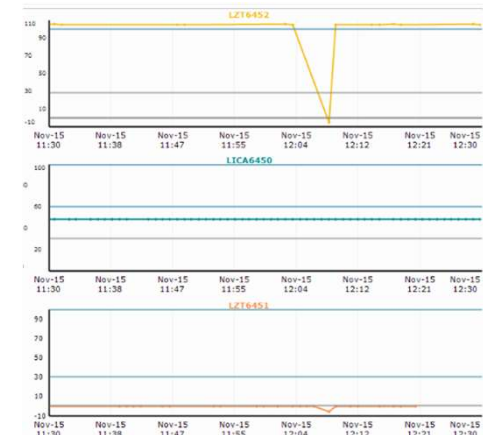
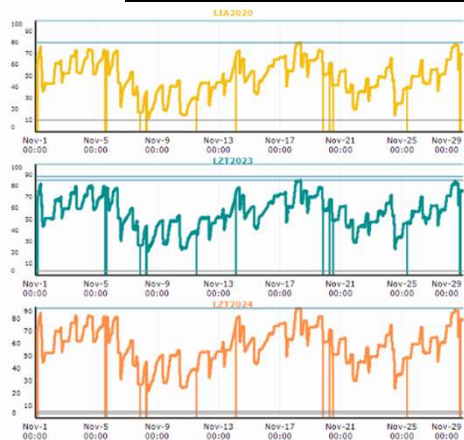
Gandaria Office Tower, 5th Floor  
Jl. Sultan Iskandar Muda, Jakarta 12240



# Case Study

## NEL Excursion using PRIME - Lightning Strike Effect on Transmitter

Boundary	Point Description	Group	Boundary Type	PRIME Count	Date	Remarks
LZT2023.NEL-HH	Condensate Storage V2020	Condensate Storage	Never Exceed Limit	23	18 Nov 8.06 AM	
LZT2012.MDL-LLL	Inlet Separator V-2010	Inlet Separator	Mechanical Design Limit	9	5 Nov 1.17 PM	5, 7, 8, 15 Nov Level Spike down in a very short duration. Potentially due to lightning
LZT2012.COP-LL	Inlet Separator V-2010	Inlet Separator	Never Exceed Limit	9	7 Nov 12.22 PM	
LICA2010B.MDL-LLL	Inlet Separator V-2010	Inlet Separator	Mechanical Design Limit	6	8 Nov 7.34	counted as 1 with LZT2012
LICA2010A.MDL-LLL	Inlet Separator V-2010	Inlet Separator	Mechanical Design Limit	5	8 Nov 7.34	counted as 1 with LZT2012
LZT6452.MDL-LLL	Closed Drain / Vent Scrubber Vessel	Closed Drain/Flare Knock Out Drum	Mechanical Design Limit	1	15 Nov 12.08 PM	15 Nov Level Spike down in a very short duration
LZT6452.COP-LL	Closed Drain / Vent Scrubber Vessel	Closed Drain/Flare Knock Out Drum	Never Exceed Limit	1	15 Nov 12.08 PM	
LZT6451.MDL-HHH	Closed Drain / Vent Scrubber Vessel	Closed Drain/Flare Knock Out Drum	Mechanical Design Limit	1	15 Nov 12.08 PM	



Gandaria Office Tower, 5th Floor  
Jl. Sultan Iskandar Muda, Jakarta 12240



# Case Study

## *NEL Excursion using PRIME - Lightning Strike Effect on Transmitter*

Multiple BTORF shutdown avoidance due to PRiME system identification of the problem with approximate potential LPO of:

Gas = 40 MMscfd x 4 times of potential shutdown (@ 4 hours)

Gas LPO in \$ =  $40 \times 7.2 \text{ usd} \times 1165 \text{ mmbtu/scf} \times 4 \times 1/6 = \underline{\text{USD } 223,680}$

Condesante = 200 bpd x 4 times of potential shutdown (@ 4 hours)

Condesate LPO in \$ =  $200 \times 51 \text{ usd/barrel} \times 4 \times 1/6 = \underline{\text{USD } 6,800}$

Gandaria Office Tower, 5th Floor  
Jl. Sultan Iskandar Muda, Jakarta 12240



# What to Improve?

- Reduce cybersecurity and data privacy risk in an increasingly complex environment
- Building a digital-savvy workforce
- Improve digital system usage across operations



# Thank You

“Data is the most valuable resource in this digital age, the driving force behind growth and change,”

Wan Shamilah Saidi, PETRONAS’ Chief Digital Officer

**PETRONAS**  
*Passionate about Progress*

Gandaria Office Tower, 5th Floor  
Jl. Sultan Iskandar Muda, Jakarta 12240