

# MMT

# Metering

# Management

# Tool



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29<sup>th</sup> January 2026

# Why do we measure



Operational Control



Production Performance



Contractual Targets



Environment



REGULATORY

## MOTIVATION

### Regulatory Requirement

5.1.2. A measurement management system model must be applied in order to ensure the effectiveness and fitness of the systems to the intended use, in addition to managing the risk of incorrect measurement results.  
[3.31]

3.3. \_\_\_\_\_. ABNT-NBR ISO 10012/2004: Sistemas de Gestão de Medição - Requisitos para os Processos de Medição e Equipamento de Medição. Rio de Janeiro, 2004. 16 p.

### GTD Requirement

A measurement management system shall be included and applied on the FPSO according to ISO 10012 "Measurement management systems — Requirements for measurement processes and measuring equipment" in order to assure the effectiveness and adequacy to the intended use, besides managing the risk of incorrect metering results. This system shall be implemented according to Petrobras Standards and recommendations;

### Reference to software use

#### 8. REGISTROS

Os registros das atividades que são executadas nesta instrução de trabalho são indicados na tabela 2.

Tabela 2 – Registros da instrução de trabalho

Identificação	Armazenamento	Proteção	Recuperação	Tempo de retenção	Descarte
Registros da avaliação da incerteza em sistemas de medição de óleo	Sistema informatizado MMS	Acesso concedido ao software	Conforme backup do banco de dados	10 anos	Arquivo morto

### Certification

inspectCertificate

*Client Name and address*

**SBM OFFSHORE DO BRASIL LTDA**

Rua do Passeio 38, Setor 1 Sala 1001 e 1002, Setor 2 sala 1001/1004, centro,  
Rio de Janeiro, RJ, Brasil CEP 20021,290

*Standard*

**NBR ISO 10012:2004**

Measurement  
Management System

## BRAZIL

- Main fleet and strong presence in Brazil
- Closer to oil majors (Petrobras, Shell)
- Strong regulatory watch from Government – **ANP, INMETRO, etc.**

## METERING

- Main Goal to have zero fines from regulators related to Metering
- Dedicated metering team with 7 engineers and 1 analyst managing R1 fleet, reporting to Metering Lead, Maintenance Manager and Asset Integrity Manager
- 22 offshore metering technicians
- Ensure full compliance with strict Metering regulation for all units in R1

## NEW UNITS



FPSO Sepetiba



First Oil

31<sup>st</sup> Dec 23



FPSO Almirante Tamandaré



First Oil

15<sup>th</sup> Feb 25

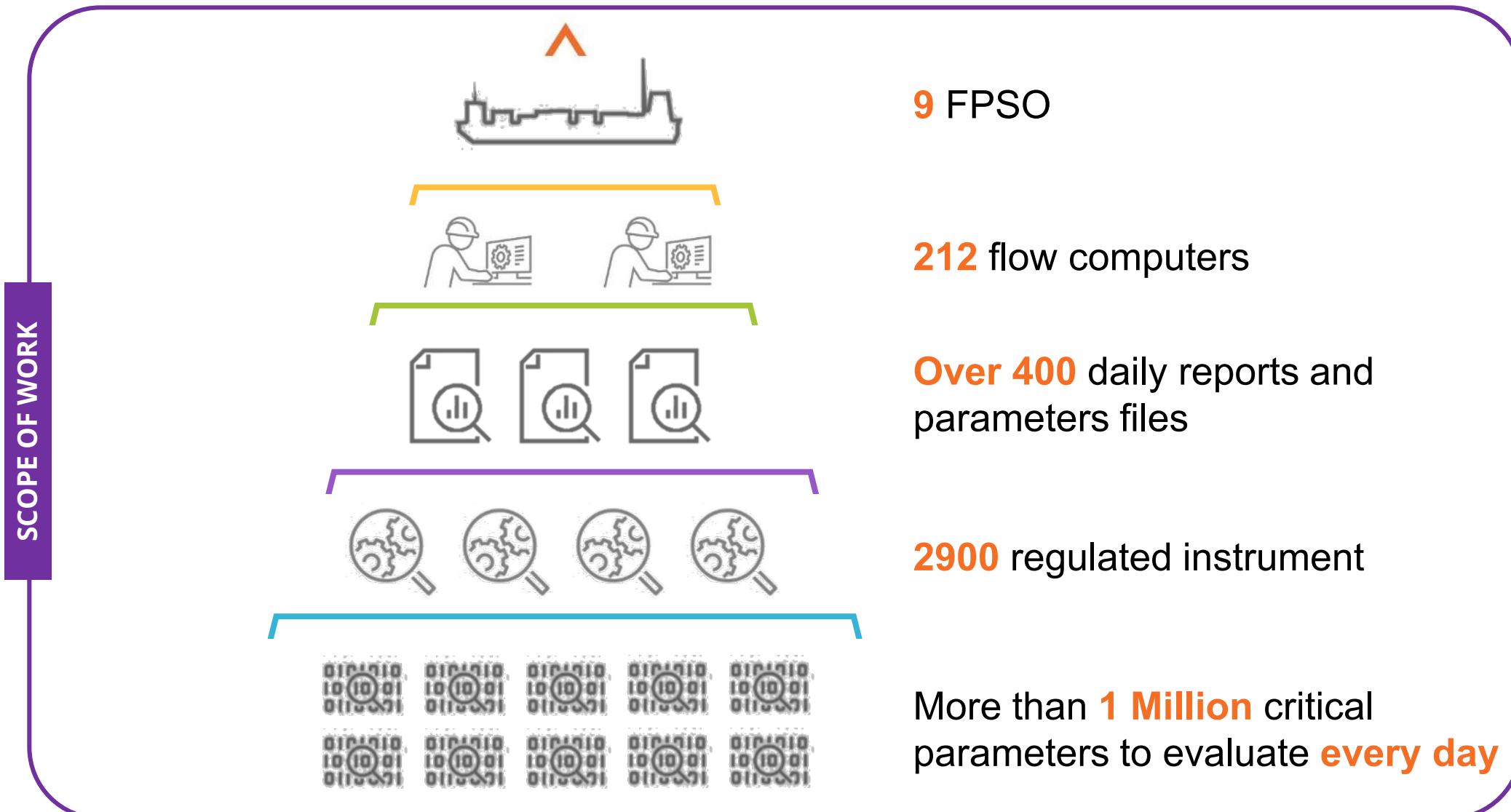


FPSO Alexandre de Gusmão

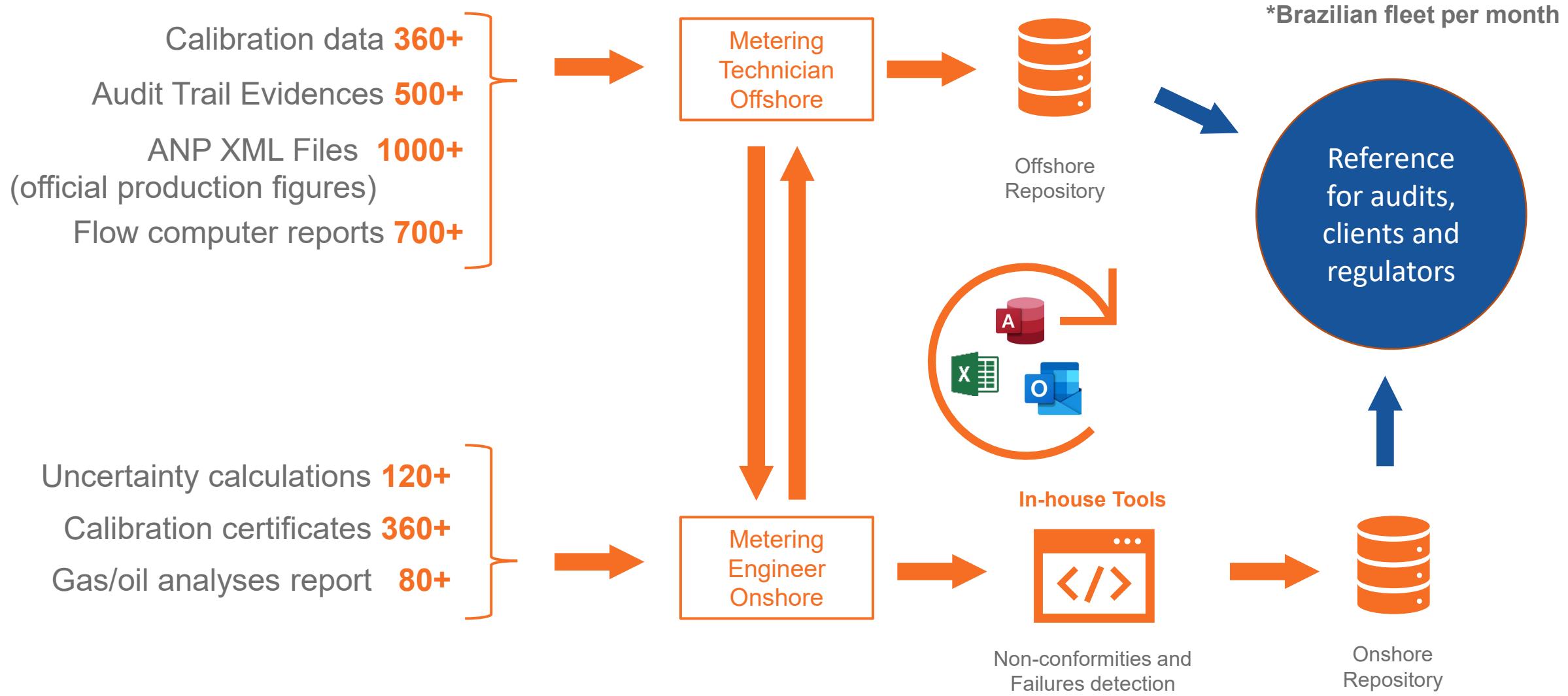


First Oil

24<sup>th</sup> May 25



# Flow of Information – AS-IS





## REGULATORY

ROYALTIES 2025

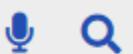
US\$ 11 billion

FINES 2025

US\$ 10 million

 National Agency of Petroleum, Natural Gas and Biofuels

What are you looking for?



Royalties = tax rate x value of production

Production value =  $(V_{oil} \times P_{oil}) + (V_{gn} \times P_{gn})$

# Regulation – Possible Fines

Non-conformity	Cost per event
Serial number incorrectly changed	\$30,000
Incorrectly reported data	\$28,000
Incorrect flowmeter parametrization data	\$225,000 - \$250,000
Calibration completed after due date	\$225,000 - \$250,000
Calibration results implemented after due date	\$225,000
Sampling completed after due date	\$250,000
Sampling report issued after due date	\$225,000
Sampling results implemented after due date	\$250,000
Operate equipment beyond regulatory limits	\$250,000

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Sampling report issued after due date	\$225,000
Sampling results implemented after due date	US\$25,000
Operate equipment beyond regulations	US\$25,000

Average \$2,5 million/year over 13 years

Non-conformity	Cost per event
Marlin Sul	US\$4,000,000
Capixaba	US\$1,000,000
Paraty	US\$200,000
Espírito Santo	US\$27,000,000
Ilhabela	US\$3,600,000
Total	US\$35,800,000

# Regulation – 2025 Possible Exposures / Near Misses



FPSO	Issue	Exposure
CDM	Gas composition updated 6 hours after deadline	US\$120,000 (SBM estimative) US\$1,000,000 (Client estimative)
ATD	Flowmeter calibration curve update after deadline (3 days)	US\$225,000
SEP	Prover calibration results updated after deadline (3 days)	US\$225,000
CDS	Failure notification sent after deadline (72 hours)	US\$30,000 up to US\$1,480,000

TOTAL UP TO US\$1,480,000

# Regulation – 2025 Possible Exposures / Near Misses

OF WORK



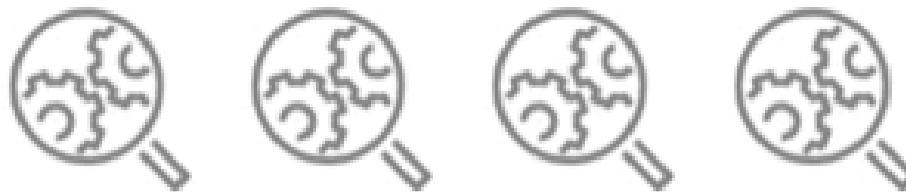
9 FPSO



212 flow computers



Over 400 daily reports and parameters files



2900 regulated instrument



More than 1 Million critical parameters evaluated every day

≡ National Agency of Petroleum, Natural Gas and Biofuels

O que você procura?



## Annual Upstream

Inspection Plan In the case of the E&P segment, 123 field fiscalization actions, 36,444 remote fiscalization actions, 28 inspections, in addition to pre-operational audits in seven units (carried out in a shipyard, still in the construction phase of platforms that will later be installed in Brazilian fields) are planned for 2026.

# Quantifying the Impact: Manual Effort Baseline

## DAILY ACTIVITIES



+2 hours/day

## WEEKLY ACTIVITIES



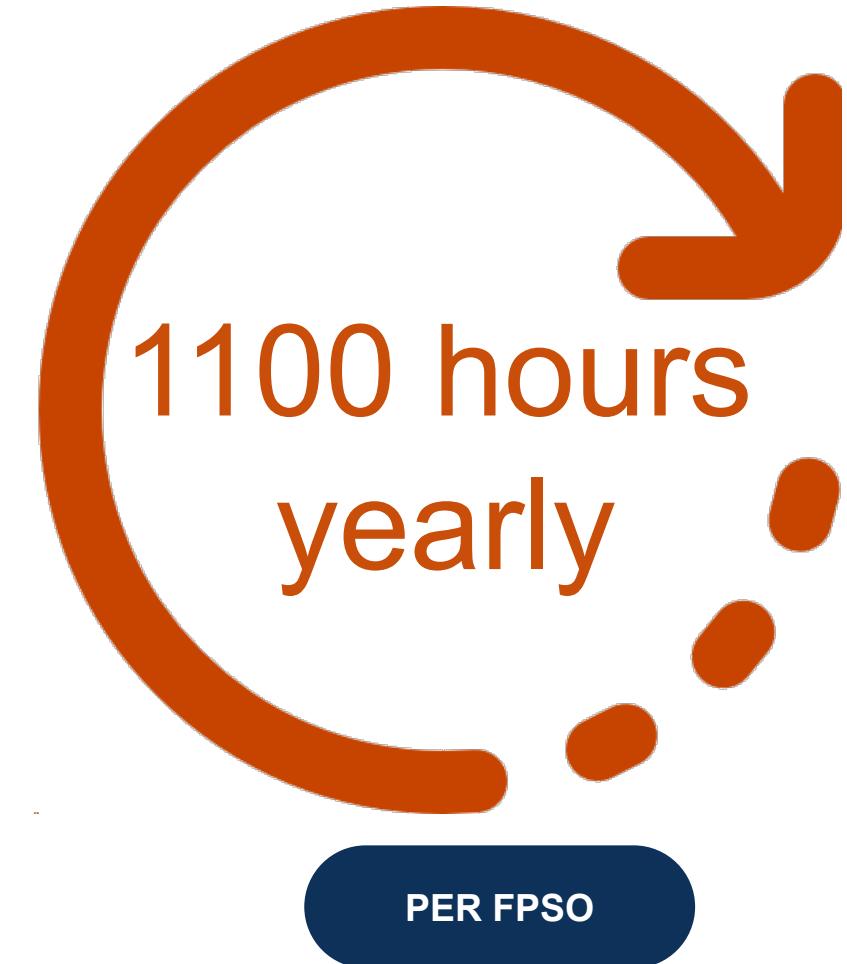
+3 hours/week

## MONTHLY ACTIVITIES



+6 hours/month

- These estimates are based on interviews, procedures and careful assumptions, working closely with operational teams to accurately assess workload.
- Team spent on average 2,5 hours daily per FPSO manually consolidating files, saving reports, generating certificates, validating configuration with three employee involved: Metering engineer, metering analyst and metering technician.
- This baseline highlights the substantial opportunity for efficiency gains through automation. By targeting this manual management, we can unlock considerable capacity.



# R1 Impact – Reallocated Capacity and Savings



Reduced  
exposure to fines

\$1,000,000  
fleet / year



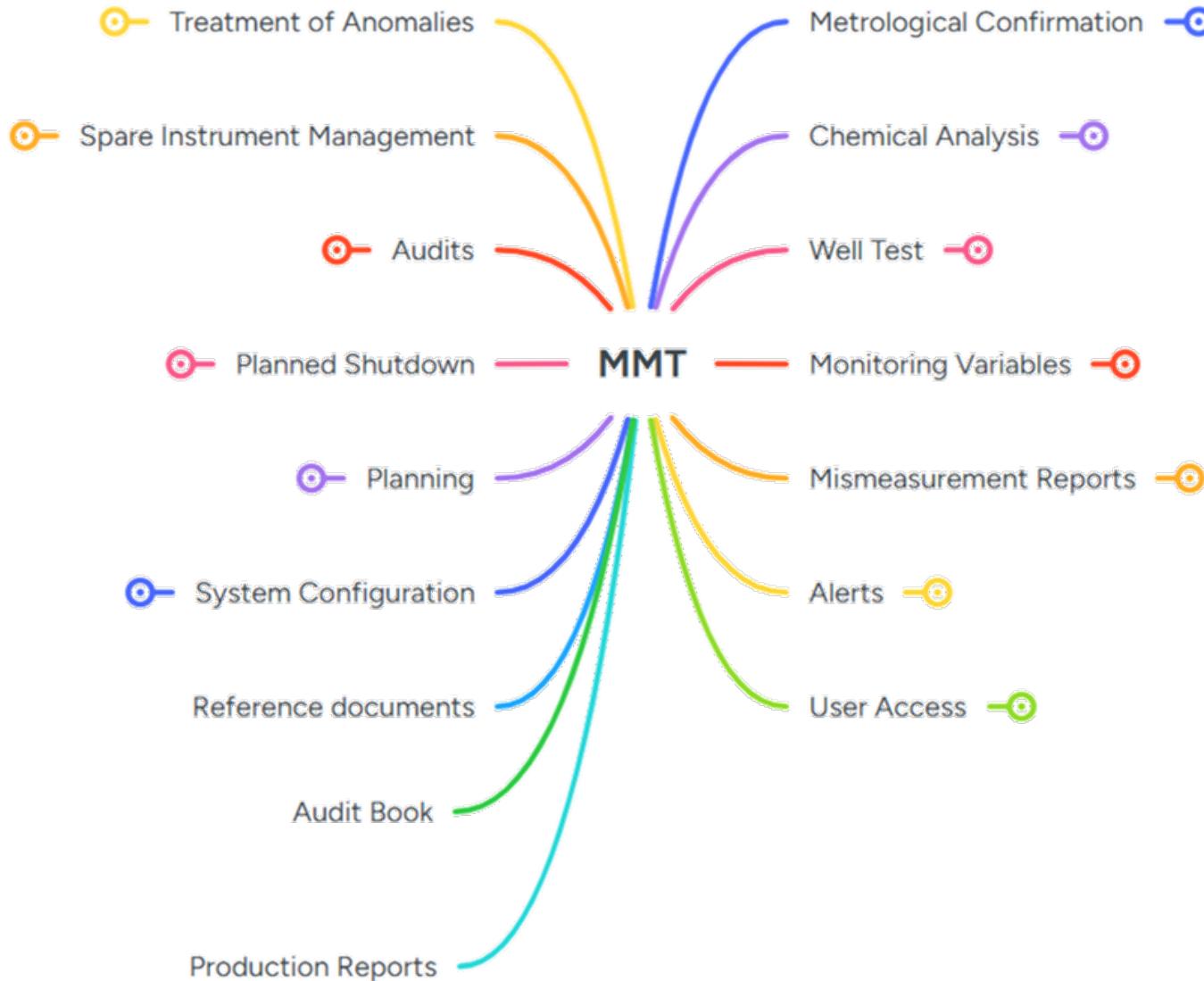
Reduced  
manpower

+4,000 hours  
+\$450,000

Region 1 internal rating: \$116,00  
OKR: >40% internal hours reduction  
OKR: >40% risk exposure of fines

# Future State (TO-BE)

## Concept & Design – Process Incorporated to Tool



2 - Restricted - OFFICIAL COPY - IS93502 - OOSDOMPF550001C1 - PDF Generated on 16-Jul-2024 6:16PM

<b>CLIENT:</b>						
<b>PROJECT:</b>						
Asset Surveillance & Intelligence						
IS93502	OOSDOMPF550001	C 1				
<b>DOCUMENT DESCRIPTION:</b>						
OIPOC METERING MANAGEMENT TOOL FUNCTIONAL SPECIFICATION						
Status / Revision	Date (DD-MMM-YYYY)	No. of Pages	Written by	Checked by	Approved by	EPM Approval for issue
C 1	13-Jun-2024	26	H. MELE	V. CASTILHO T. ALVES	S. KOMAI KOMA	A. ROOS

# Conclusions and Next Steps

- › Go / No-Go under PACE roadmap 2026
- › Framing & Design starting date
- › Framing & Design define MVP scope
- › Development starting date
- › Assign Product Owner and Resources Capability Future Operations & PACE
  
- › Main Project Risks under PACE: Specific knowledge on Metering discipline is not covered by Radix team and SBM Metering Team has a high workload. Proposed mitigations:
  - › Team structure:
    - › Product Owner assignment
    - › Engineer allocated 100% time, preferable with Metering background to facilitate interfaces
    - › Operations SMEs
  - › Agile Methodology
    - › Incremental developments approach



**SPM**  
**OFFSHORE**