

Vueling's journey with integrating predictive maintenance into airline operations

PREDICTIVE AIRCRAFT CONFERENCE
November 2025



KEY DATA



IAG INTERNATIONAL AIRLINES GROUP

WHO WE ARE?

MISSION

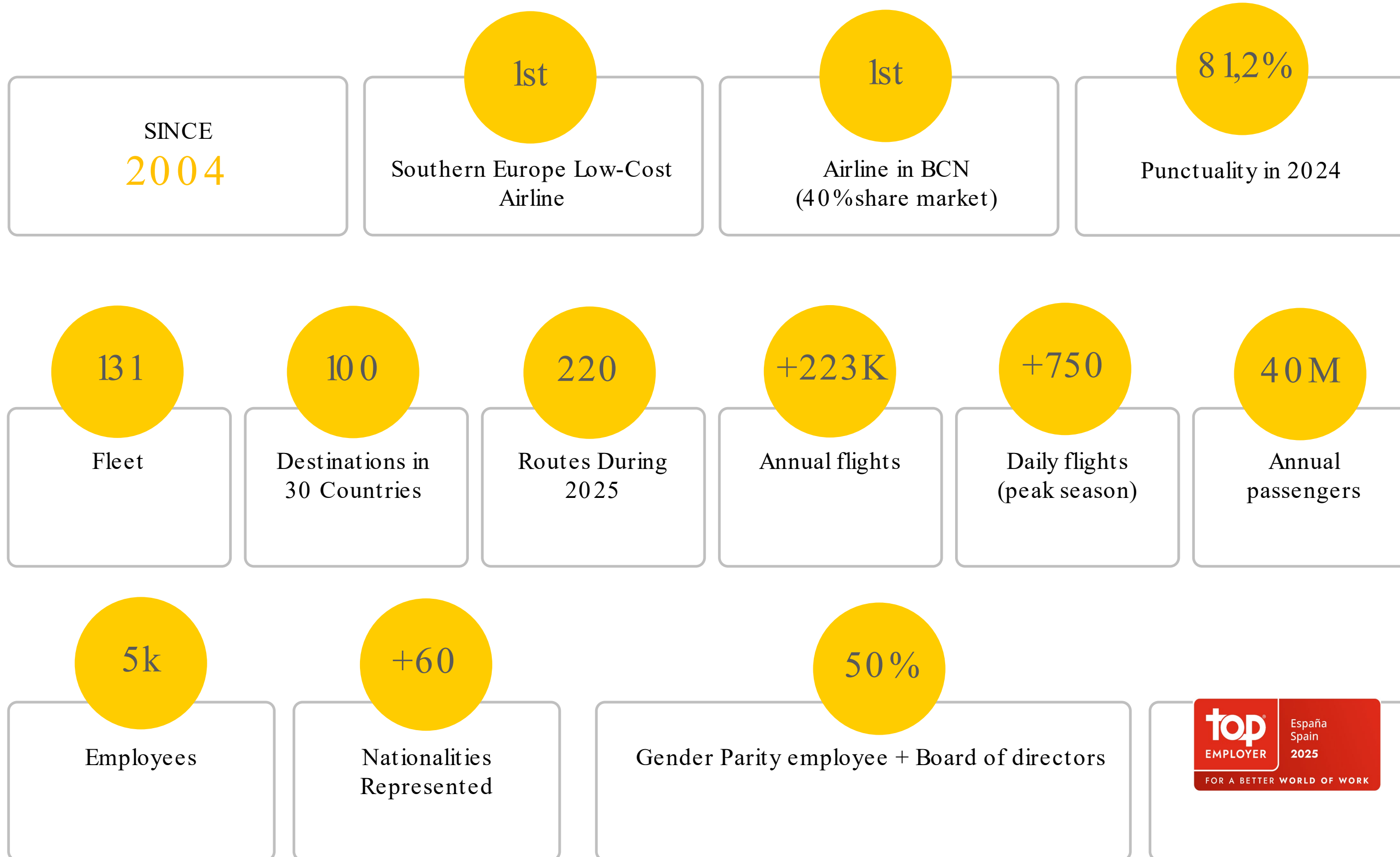
Our passion is to connect people and places, create value for our shareholders, employees, customers, and society, while shaping our future in a sustainable way.

VISION

Together, we will lead the lowcost sector in all the markets where we operate, unlocking our full potential through Vueling Transform.

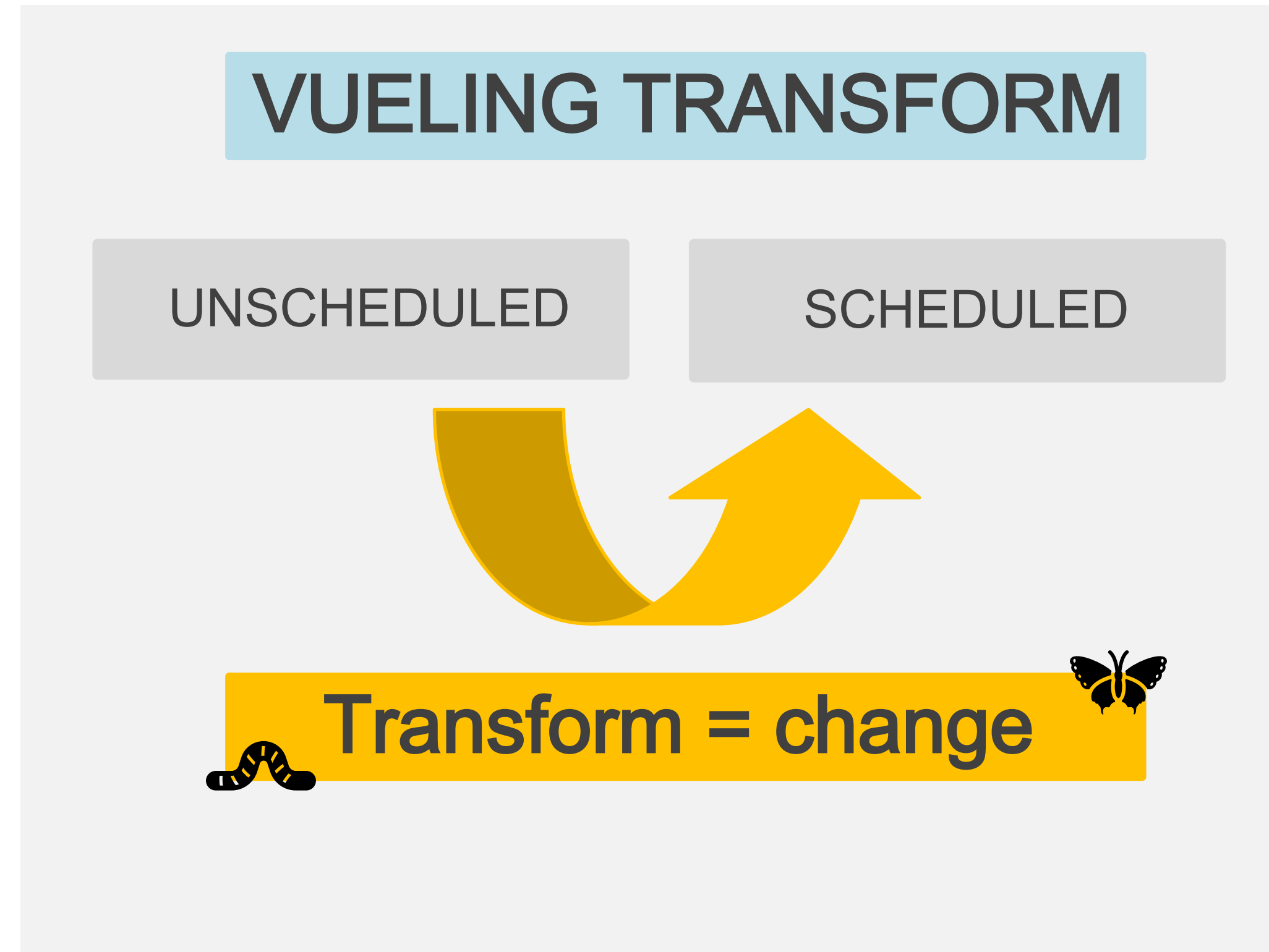
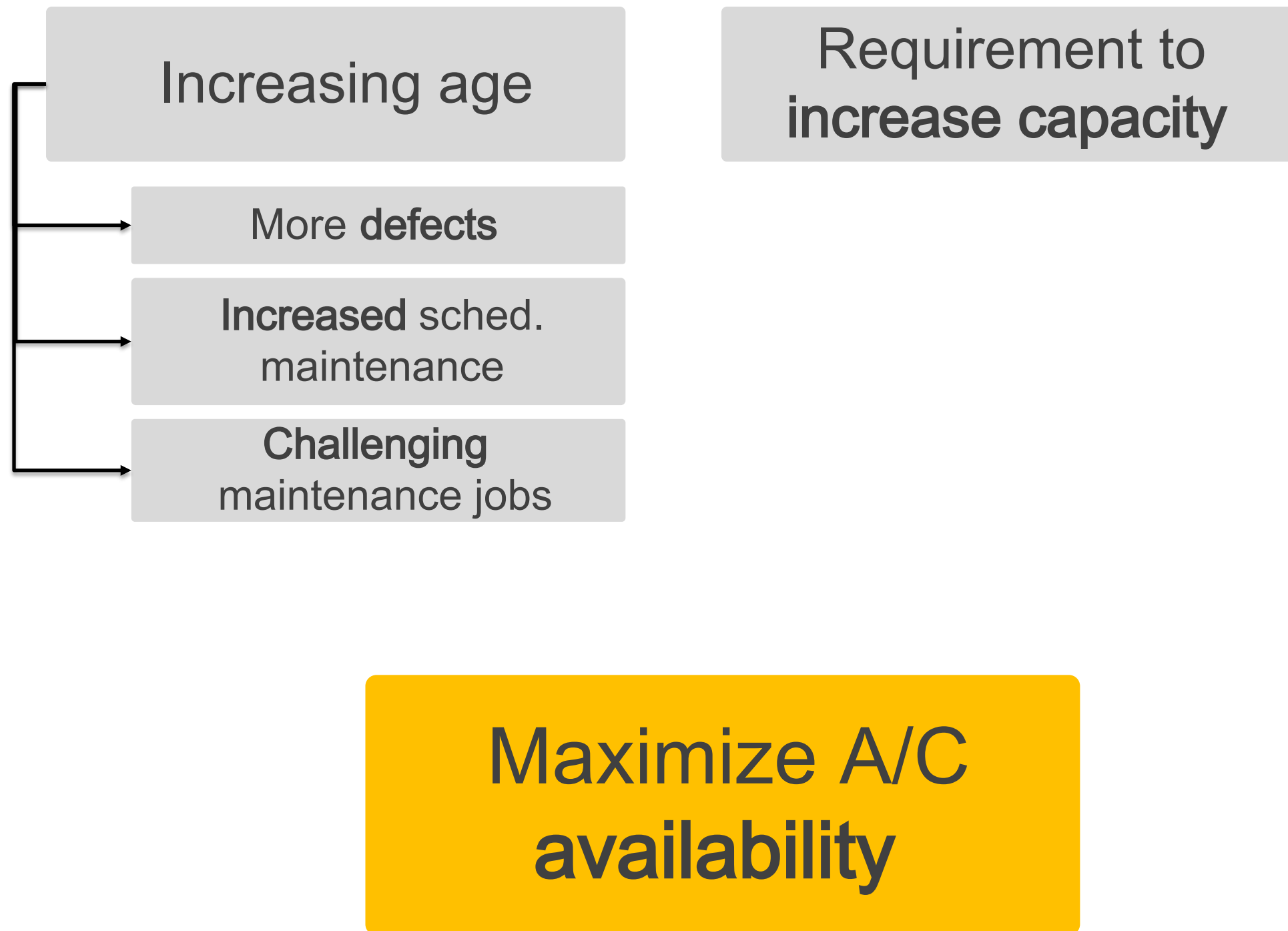
CORPORATIVE VALUES

- Make it happen
- Make it better
- Make it safe
- Make it customer-oriented
- Make it cost-focused
- ... And win together



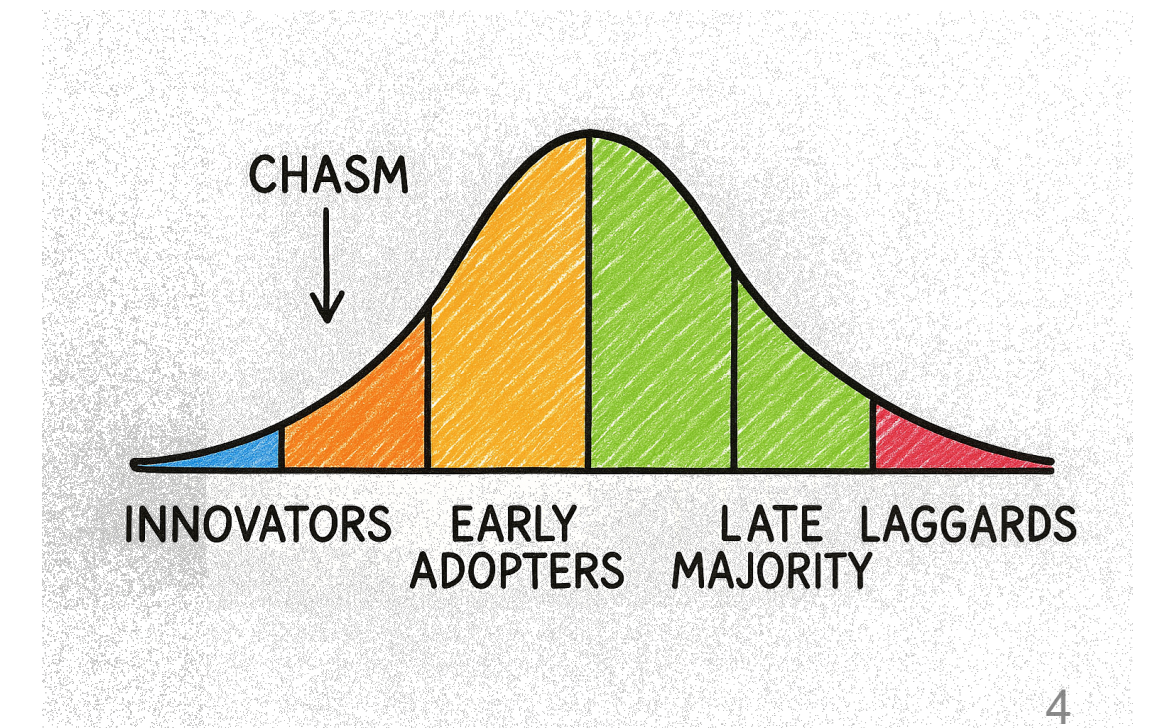
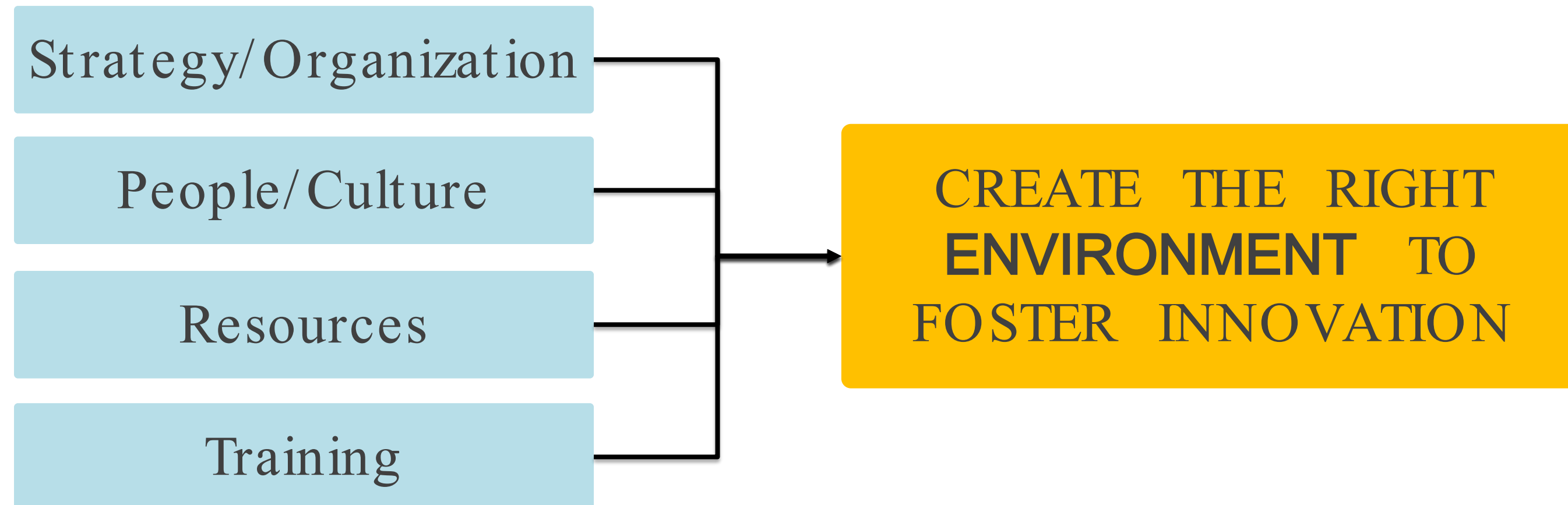
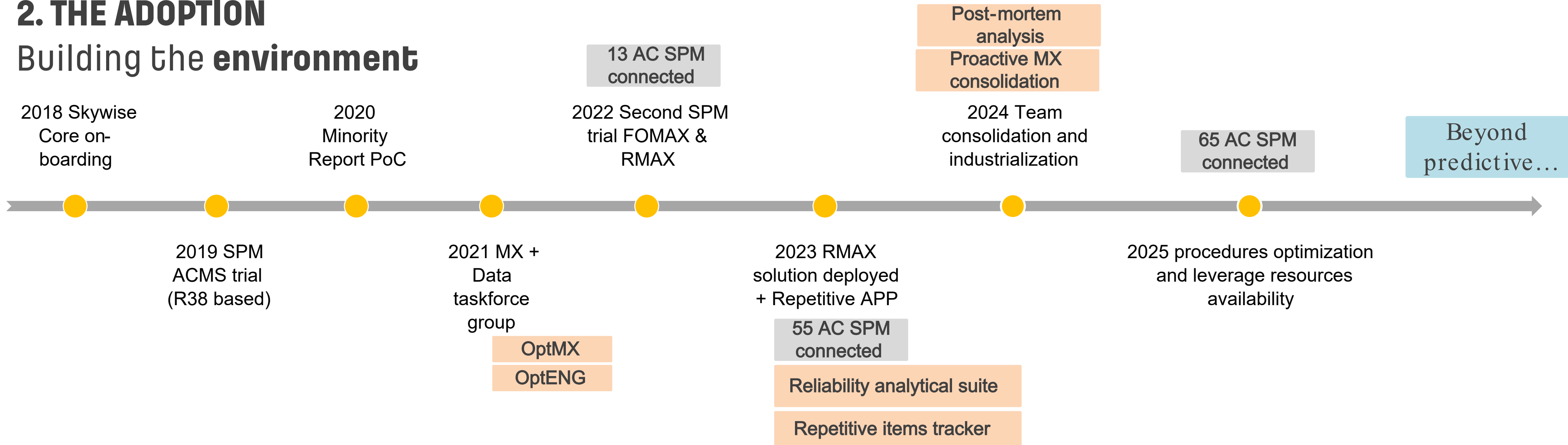
1. WHY TO CHANGE? WHY PREDICTIVE MAINTENANCE?

Maximizing availability through A/C life



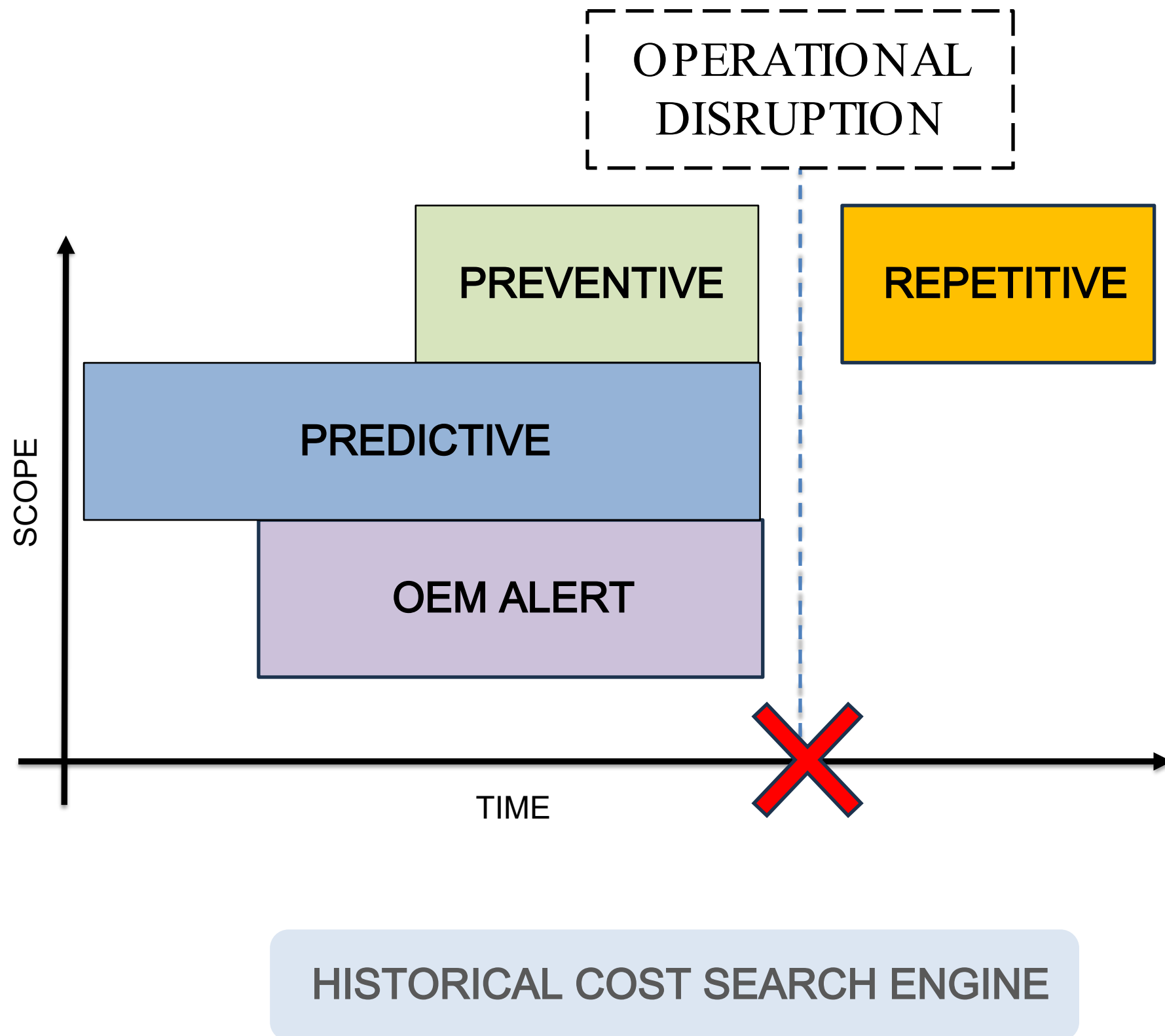
2. THE ADOPTION

Building the environment

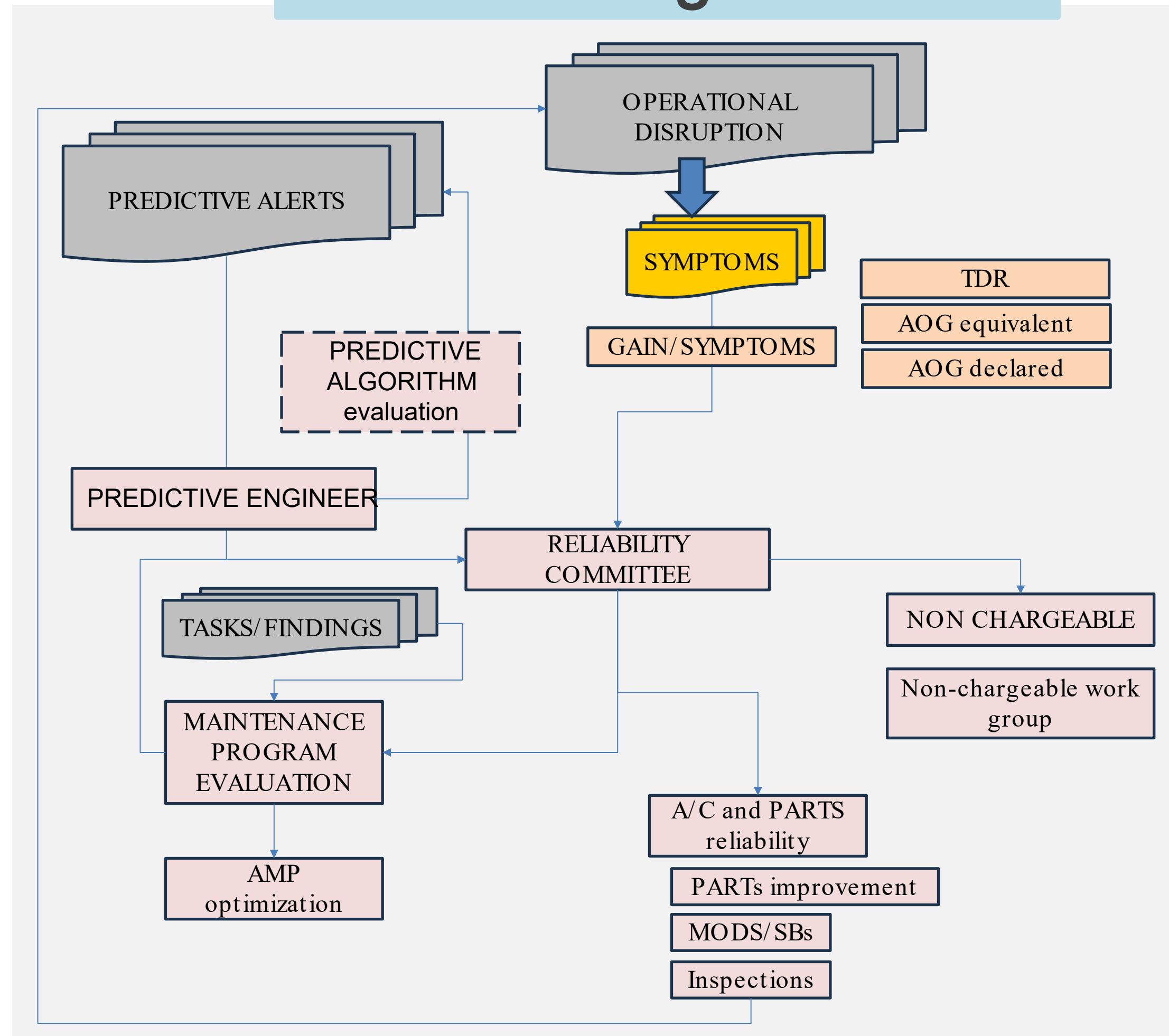


3. THE PLATFORM

Interconnecting the different areas



The integration



4. THE BOUNDARY CONDITIONS

Leveraging resources = surgical interventions

102

Destinations

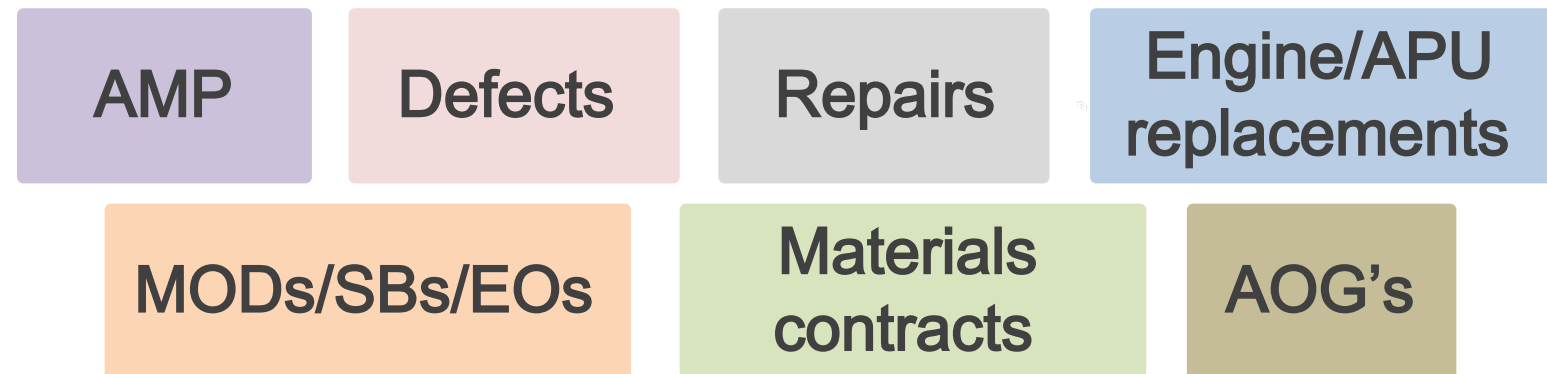
15

Main bases (I, II, III)

MAIN BASE: BCN

PROS: Empowered maintenance center

CONS: Organization tends to depend exclusively in BCN.



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AMP

Defects

Repairs

Engine/APU replacements

MODs/SBs/EOs

Materials contracts

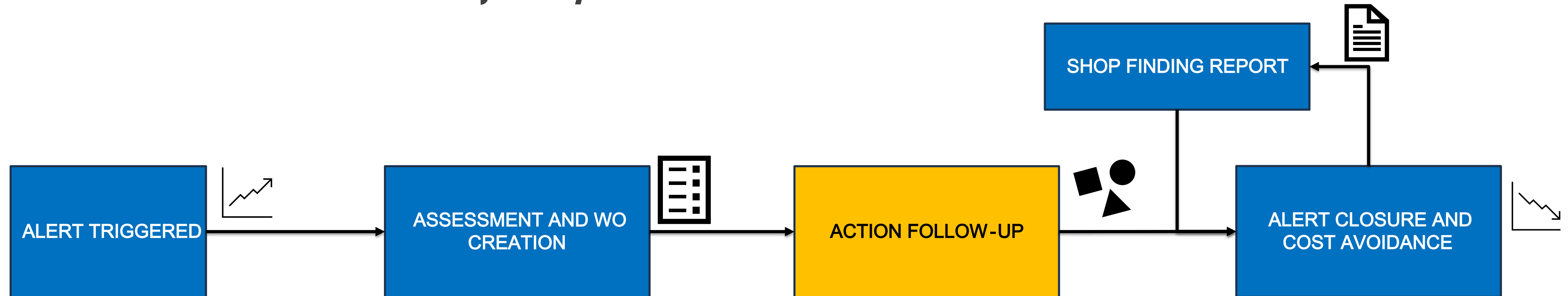
AOG's

Key to find the right balance



5. MEASURE TO CONVINC

Automatic data driven KPIs to **justify investment**



IMPORTANT REMARKS:

- Need **coordination** between on-going failures (MEL) and predictive, preventive and repetitive actions
- Cost avoidance is based on **historical data** .
- Different alert types require **special needs** (fast-track material requests, maintenance stops).

DAILY AUTOMATIC REPORT

Main KPIs

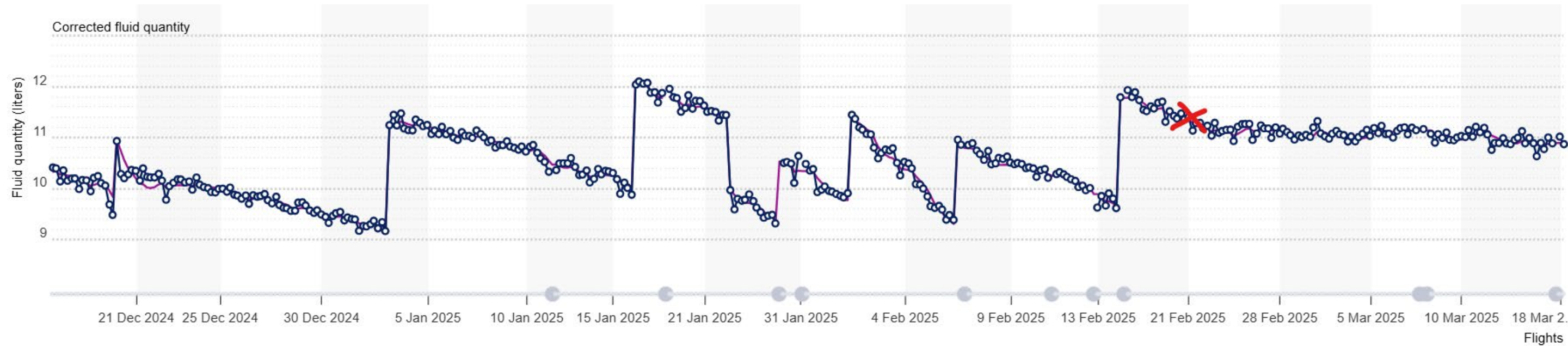
- OI cost avoidance
- Anti-MEL
- Anti-TDR
- Anti-AOG declared

On-going alerts

- Duplicities
- AOG risk tasks

5.1 ALERT ASSESSMENT and BUSINESS CASE

Example: **PREDICTIVE** Alert (ATA 29: HYDRAULIC LEAK)



COMPONENT FEEDBACK:

PIPE D5231003600200 FOUND CRACKED

REAL EXAMPLES:

CASE INFORMATION:

AC: EC-KRH

FAULT: Potential hydraulic leak observed

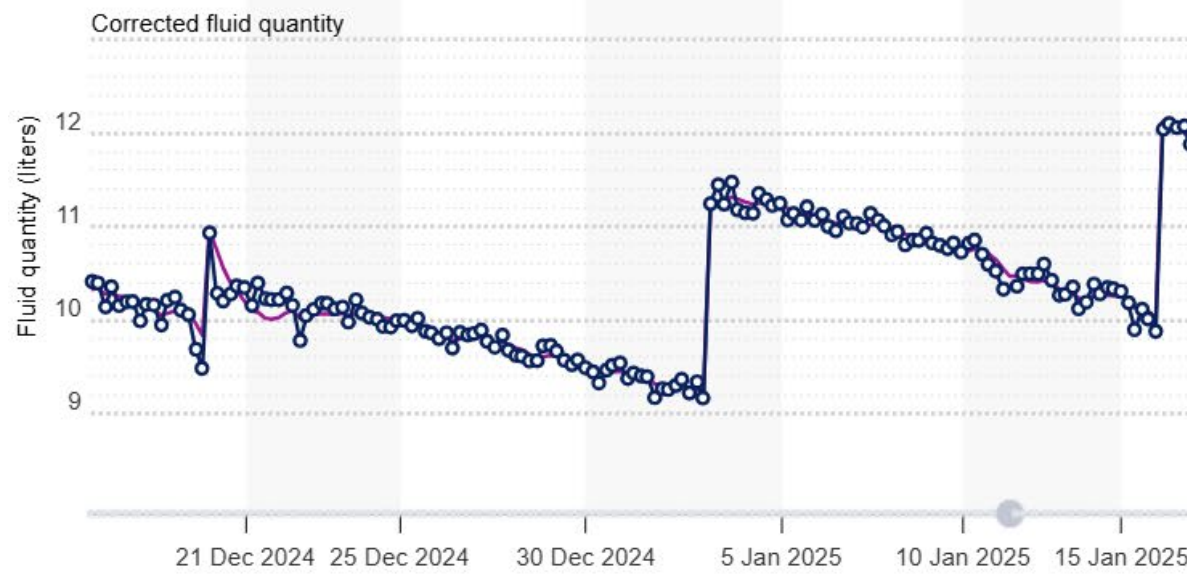
SOLUTION: Pipe D5231003600200 replacement

IMPACT: 5-hour AOG + Delay (68') + Potential cancelled flight

EVENTS: [125290, 126453]

5.1 ALERT ASSESSMENT and BUSINESS CASE

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SOLUTION: Pipe D5231003600200

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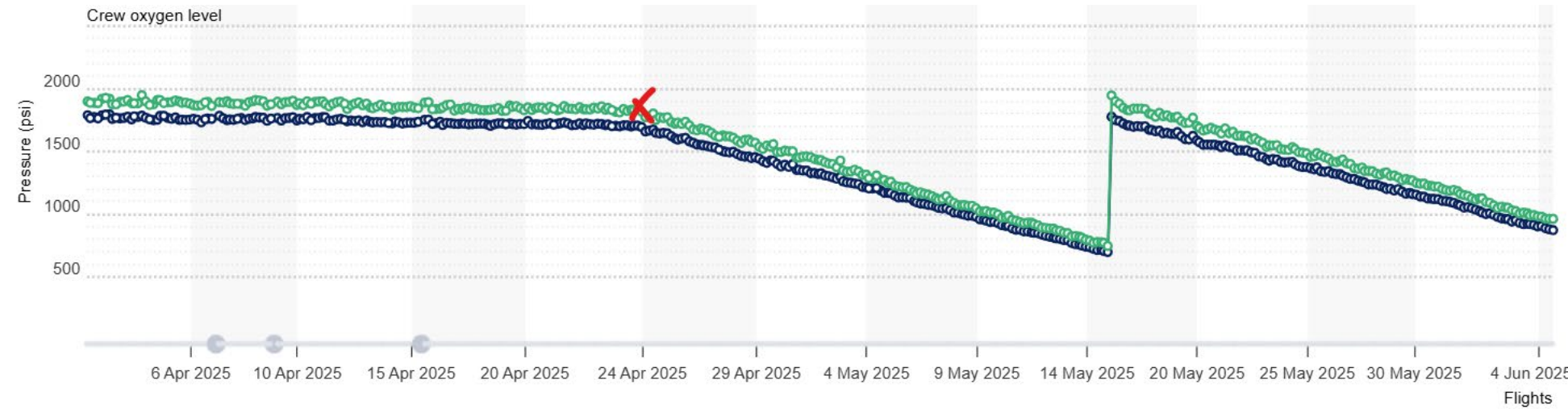
5.1 ALERT ASSESSMENT and BUSINESS CASE

Example: **PREDICTIVE** Alert (ATA 35: OXYGEN LEAK)

COMPONENT FEEDBACK:

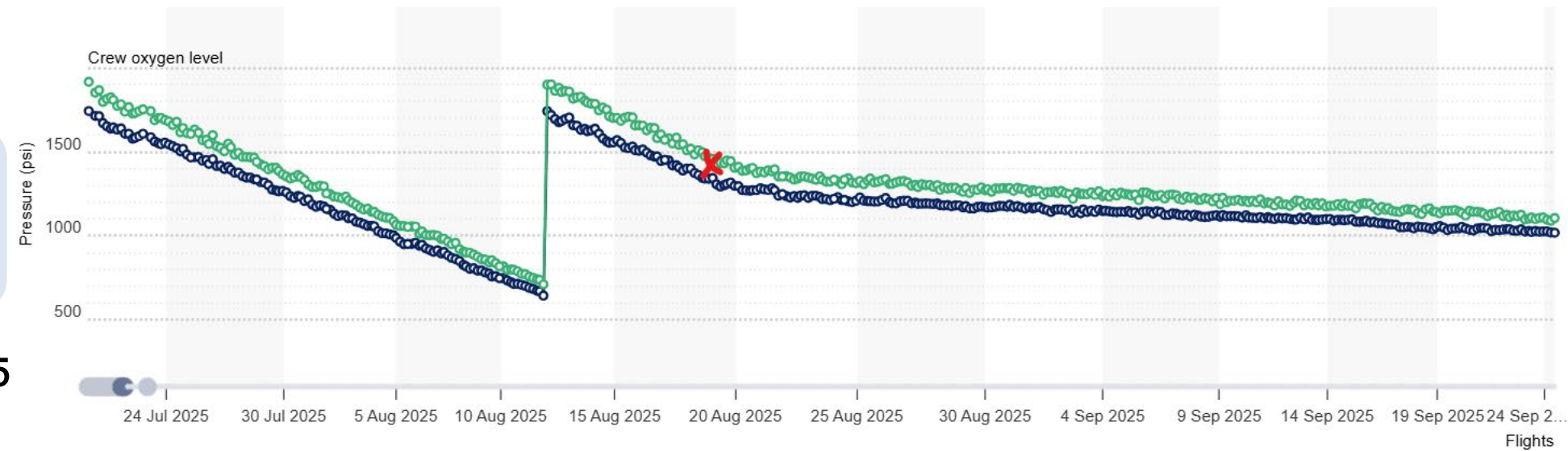
PRE/POST HEAVY MAINTENANCE

OXY BOTTLE LASTS BETWEEN 20-30 DAYS



PRE/POST PdMX ACTION

OXY BOTTLE LASTS 5 MONTHS



CASE INFORMATION:

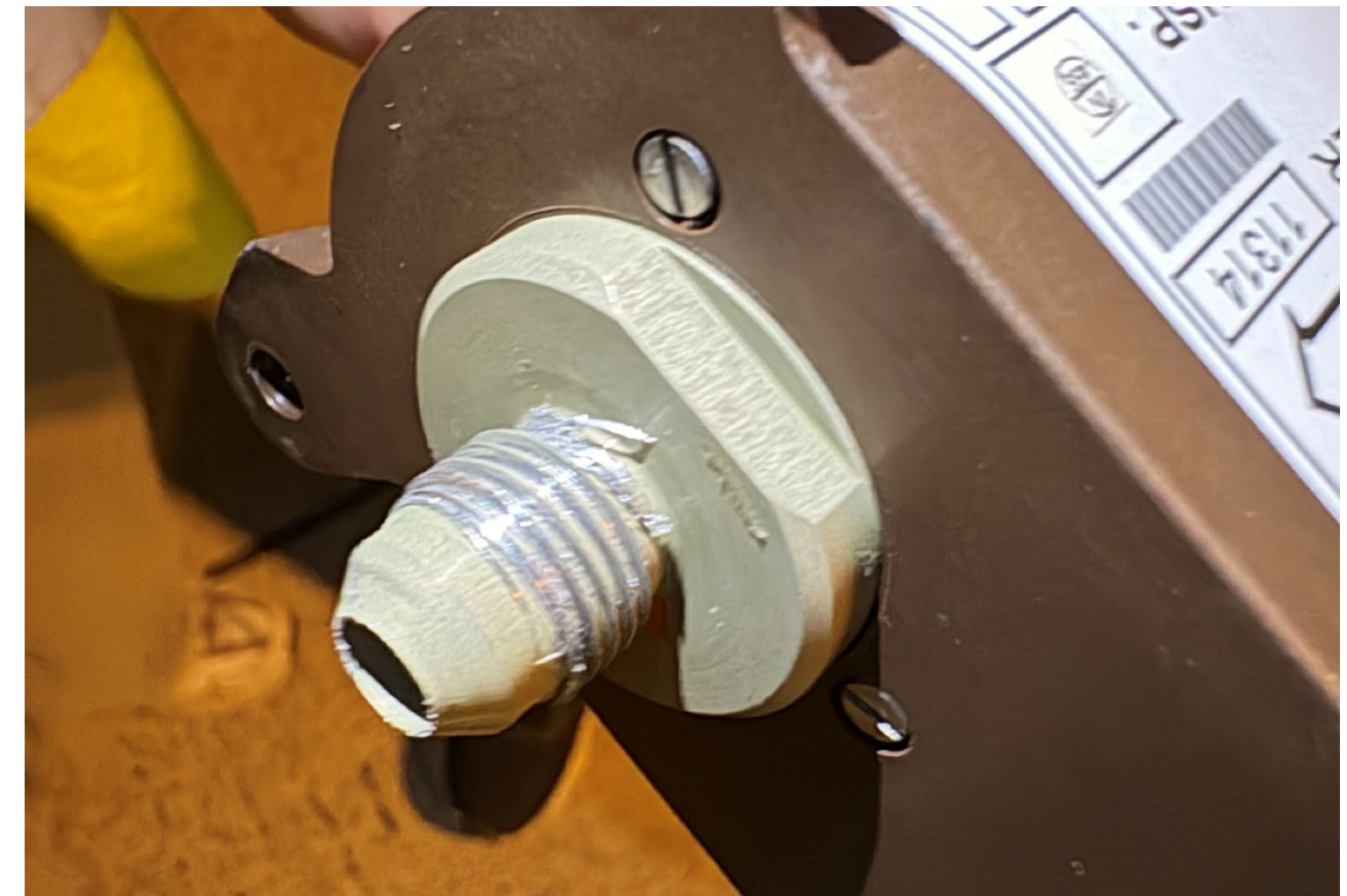
AC: EC-MIQ

FAULT: Increased OXY BOTTLE CONSUMPTION after HEAVY MX

SOLUTION: Solenoid replacement

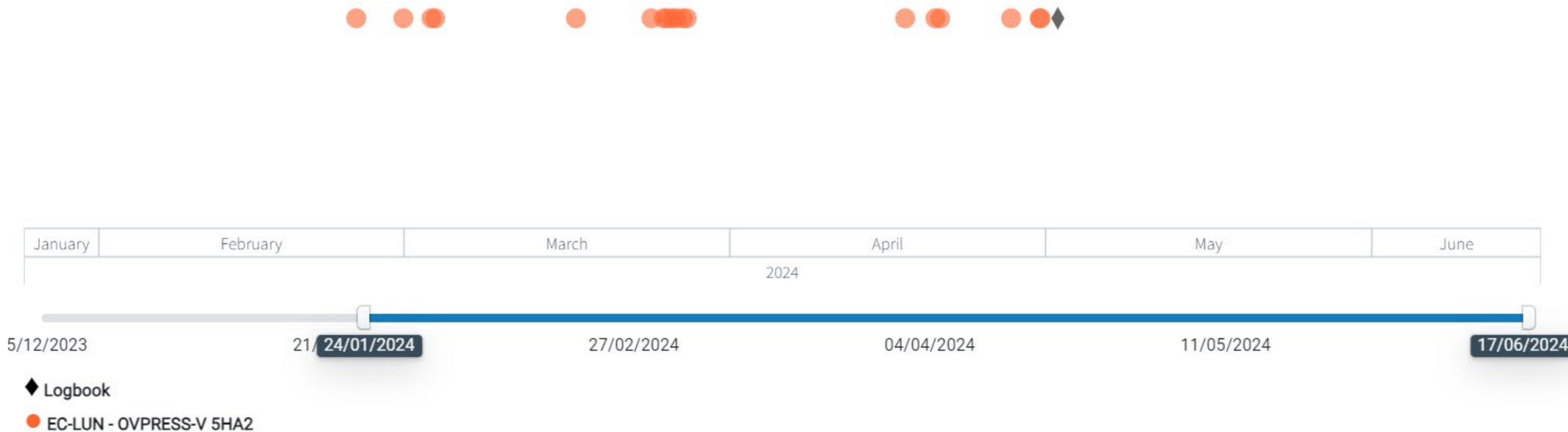
IMPACT: Potential OI avoidance + MH/DD reduction

FOUND IN - AND OUTLET COUPLINGS DAMAGED: OUTLET COUPLING CROSS THREADED AND INLET COUPLING OVERTORQUED



5.1 ALERT ASSESSMENT and BUSINESS CASE

Example: **PREVENTIVE** Alert (ATA 36: OVPRESS VALVE 5HA2)



COMPONENT FEEDBACK:

WORN PARTS:-ALL SEALS AND BEARINGS ARE WORN.-LINKAGDE SUPPORT IS WORN.-BACKNUT IS DAMAGED.

REAL EXAMPLES:

EVENT: [105385, 104748, 104421]

CASE INFORMATION:

AC: EC-LUN

FAULT: OVPRESSV 5HA2 repetitive PFR (PHASE 6)

SOLUTION: Overpressure valve 5HA2 replacement











COST AVOIDANCE: 4-hour AOG + Delay (20') + Flight altitude limitation

5.1 ALERT ASSESSMENT and BUSINESS CASE

Example: **REPETITIVE** Alert (ATA 32: ALTN BRAKE FAULT)

Show All Events at Date: 21.Jun.2024 Quick Search

All Columns: ALT 0 / 5

Flags	ID	Occurred	At	Issuer	A/C	A/C H...	Station	Headline	Flight ...	ATA	Advise	Workorder
 	98316	28.Sep.20...	16:25	AMOS...	EC-...		MAD	ALT BRK FAULT	VLG1...	32-...		-2
 	98611	06.Oct.20...	15:56	ANTR...	EC-...		BIO	BRAKES ALTN BRK FAULT		32-...	A/C R...	61362423
 	98684	09.Oct.20...	00:04	JORBER	EC-...		PMI	MAT - ALTERNATE BRAKE FAULT		32-...	A/C R...	61364195
 	103...	05.Apr.20...	17:55	AMOS...	EC-...		BCN	BRAKES ALTERNATE R RELEASED	VLG1...	32-...		-2
 	103...	07.Apr.20...	14:50	RICM...	EC-...		BCN	ALTERNATE BRAKE FAULT		32-...	A/C R...	0

CASE INFORMATION:

AC: EC-NGB

FAULT: ALTERNATE BRAKE FAULT

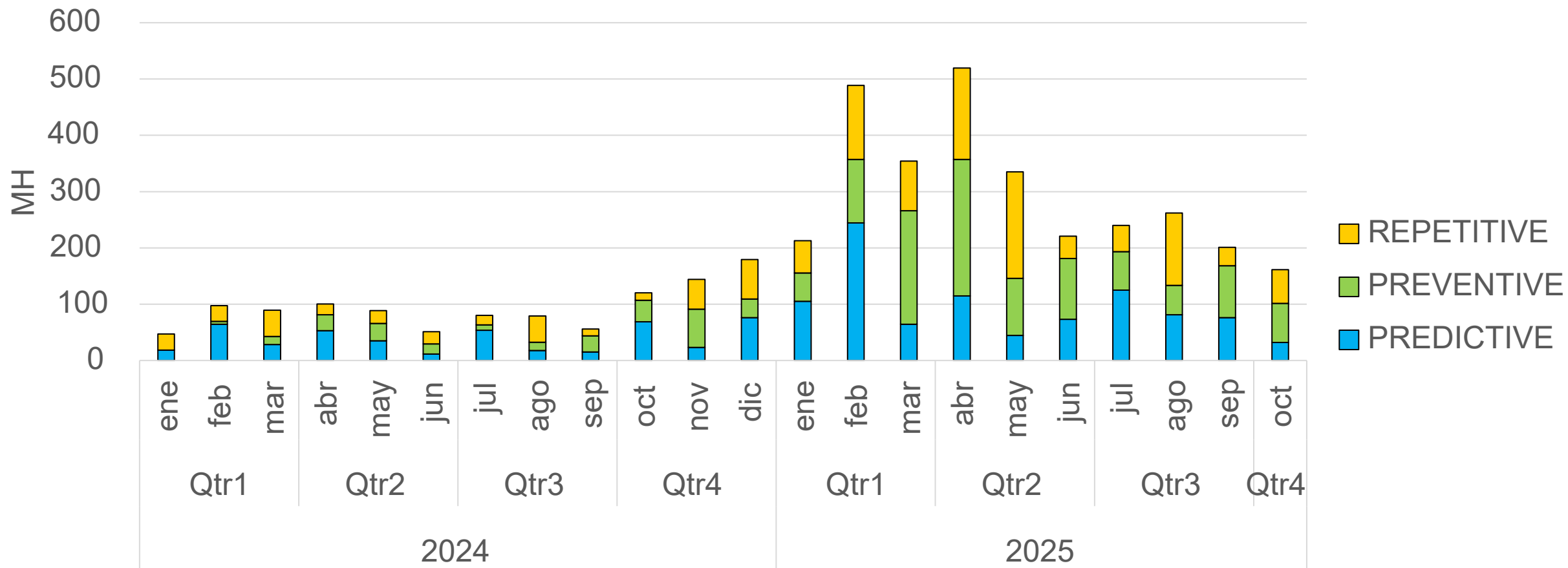
SOLUTION: FOUND CONNECTOR 100GGA WITH HEAVY CORROSION AND ONE PIN (D) IN BAD CONDITION

WO: 61997378

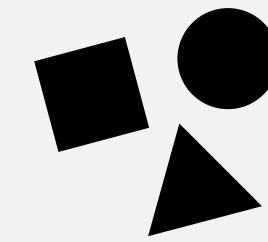
IMPACT: 22' + 9h AOG + 9h AOG + 24' + 2h AOG .

5.2 MAJOR PROACTIVE MX STATS

Productive reported MH (values reported by MRO)



PROACTIVE MX STATS*

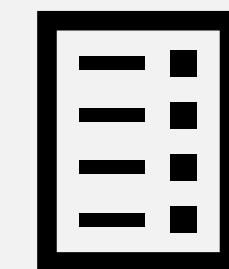


278 components replaced

(93% FF for predictive)



300 monthly MH (avg.)



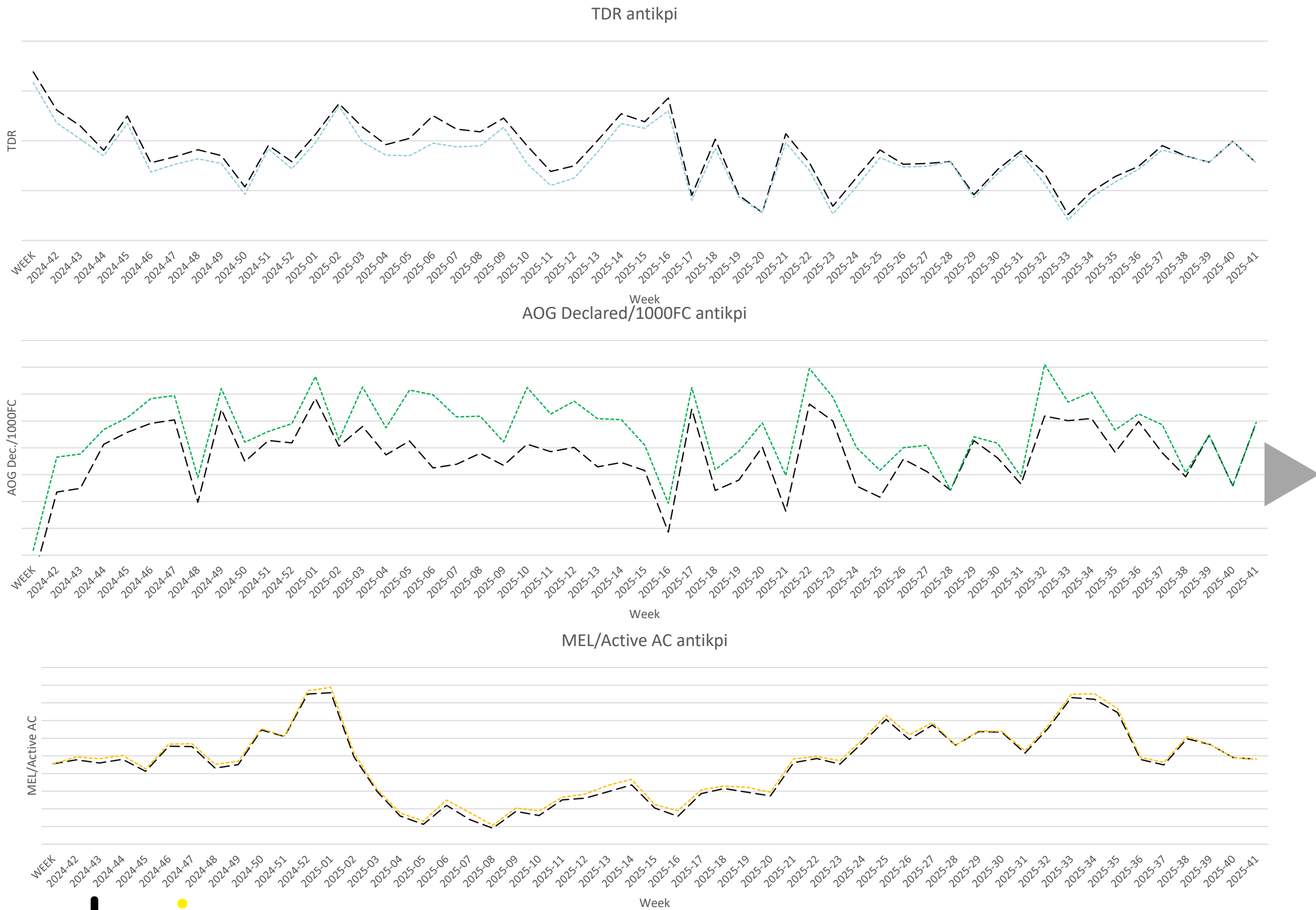
761 WO closed

**2025 data*

KEY TO MAINTAIN CONSTANT EFFORT

5.2 THE HIDDEN ADDED VALUE

Anti-kpi metrics including **all proactive initiatives**



CURRENT POTENTIAL*

TDR:

+0.08 %



+0.12 %

AOG Declared/1000FC 

-17%



-23%

MEL/Active AC

-1.4%

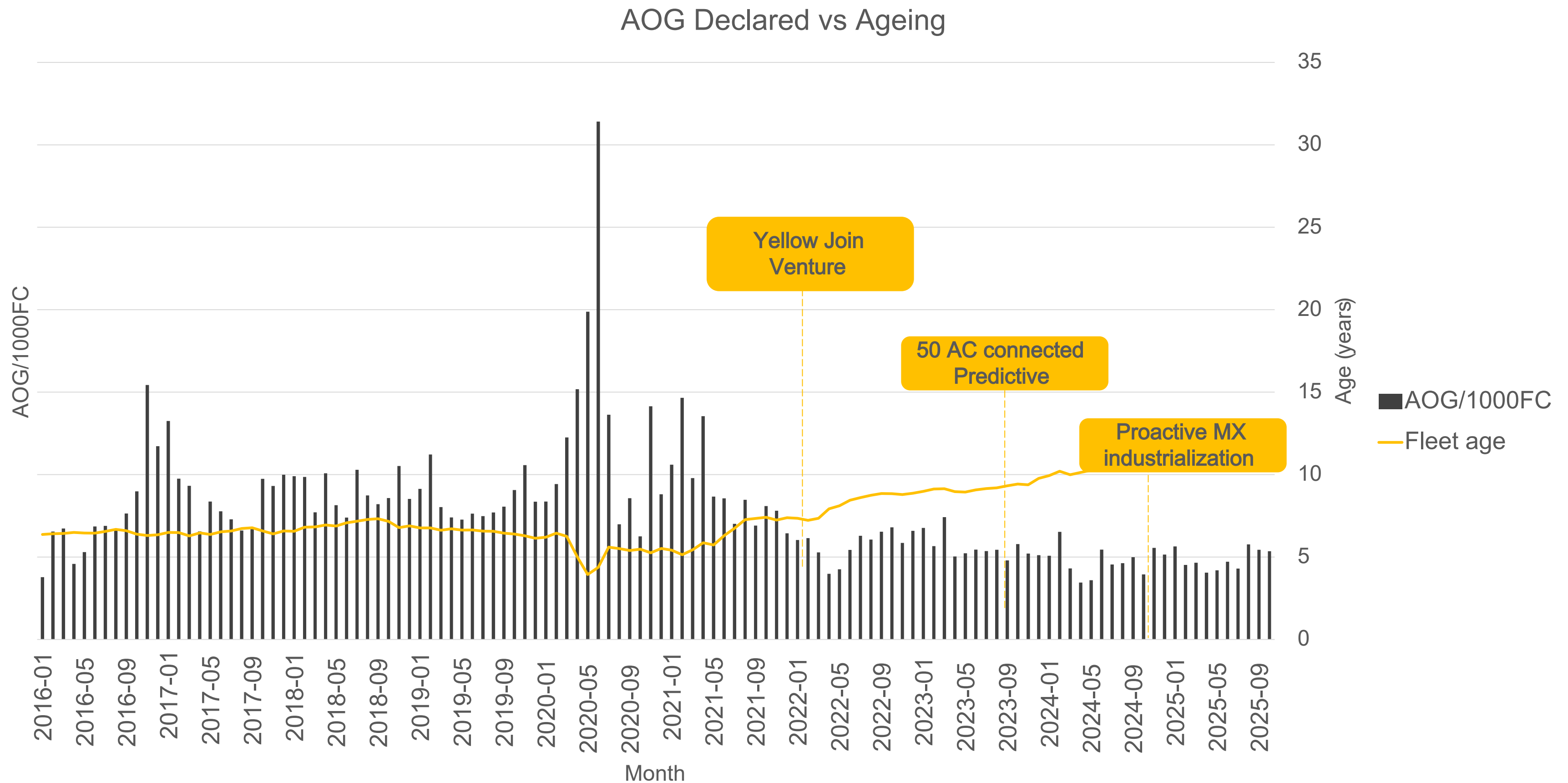


-2.1%

**Estimated values*

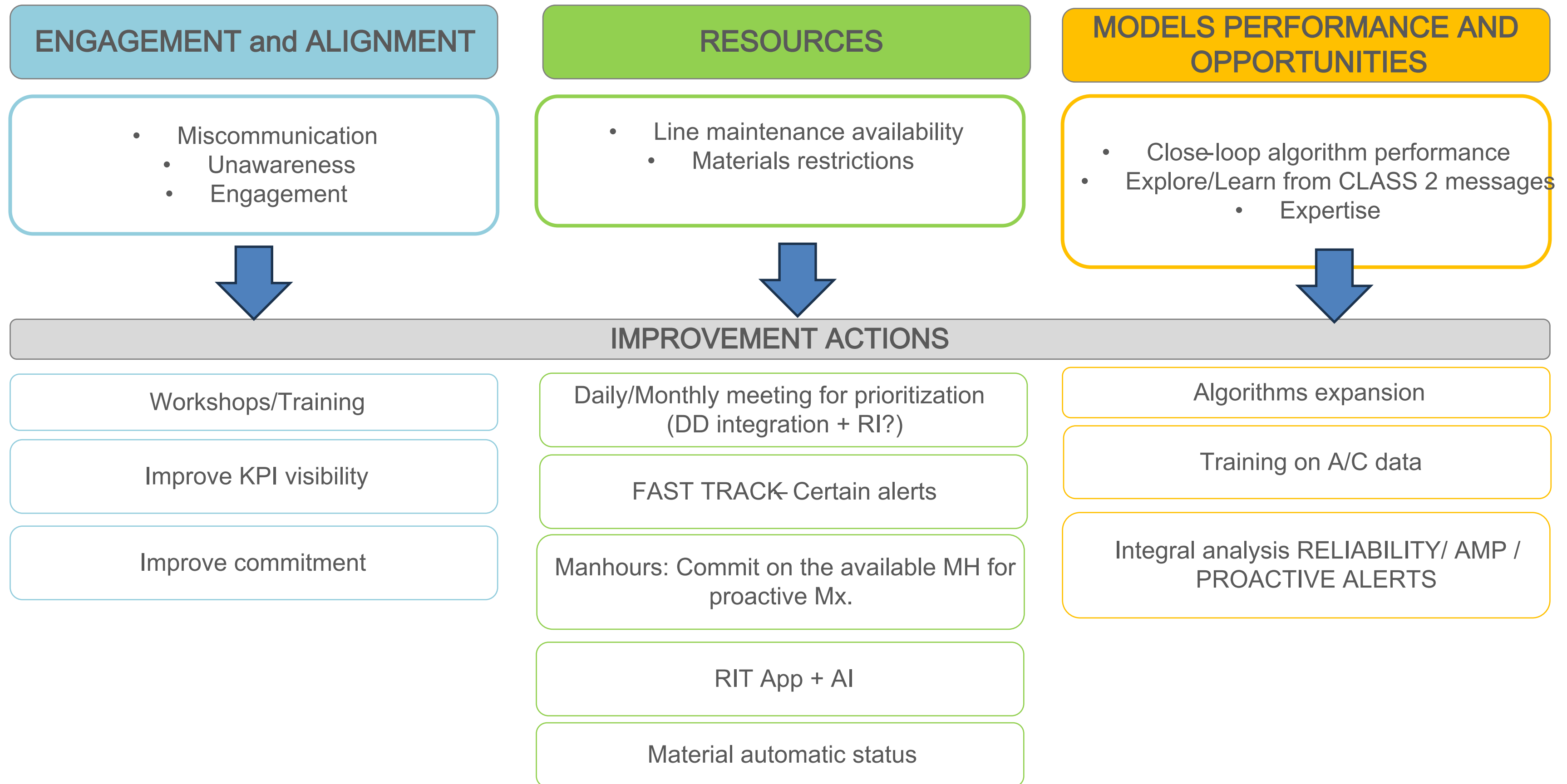
5.2 THE IMPACT OF PROACTIVE MX

Harvesting the benefits of a **long-term commitment**



6. MAIN CHALLENGES and MITIGATING actions

Pushing boundaries to reach **new heights**



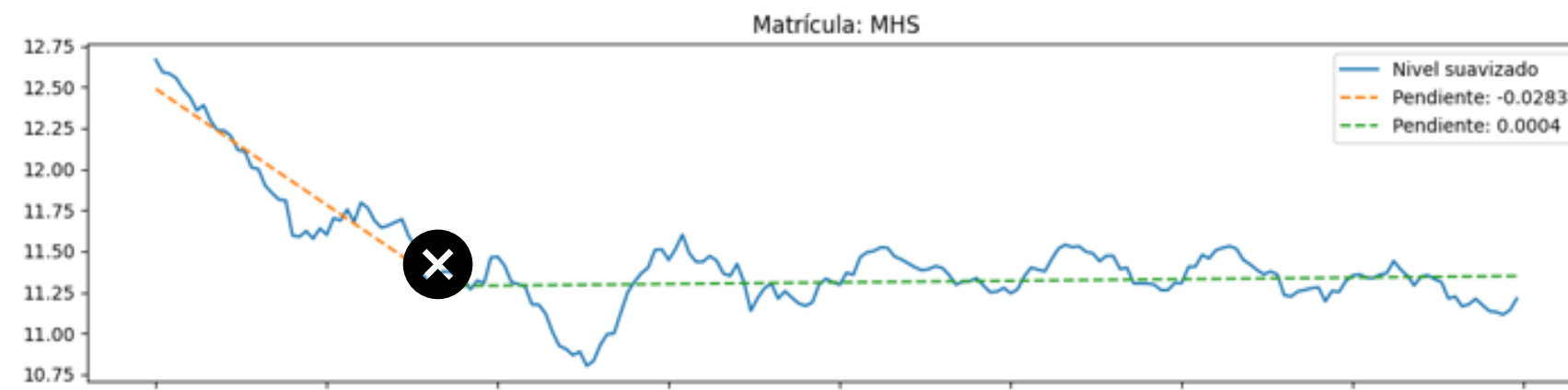
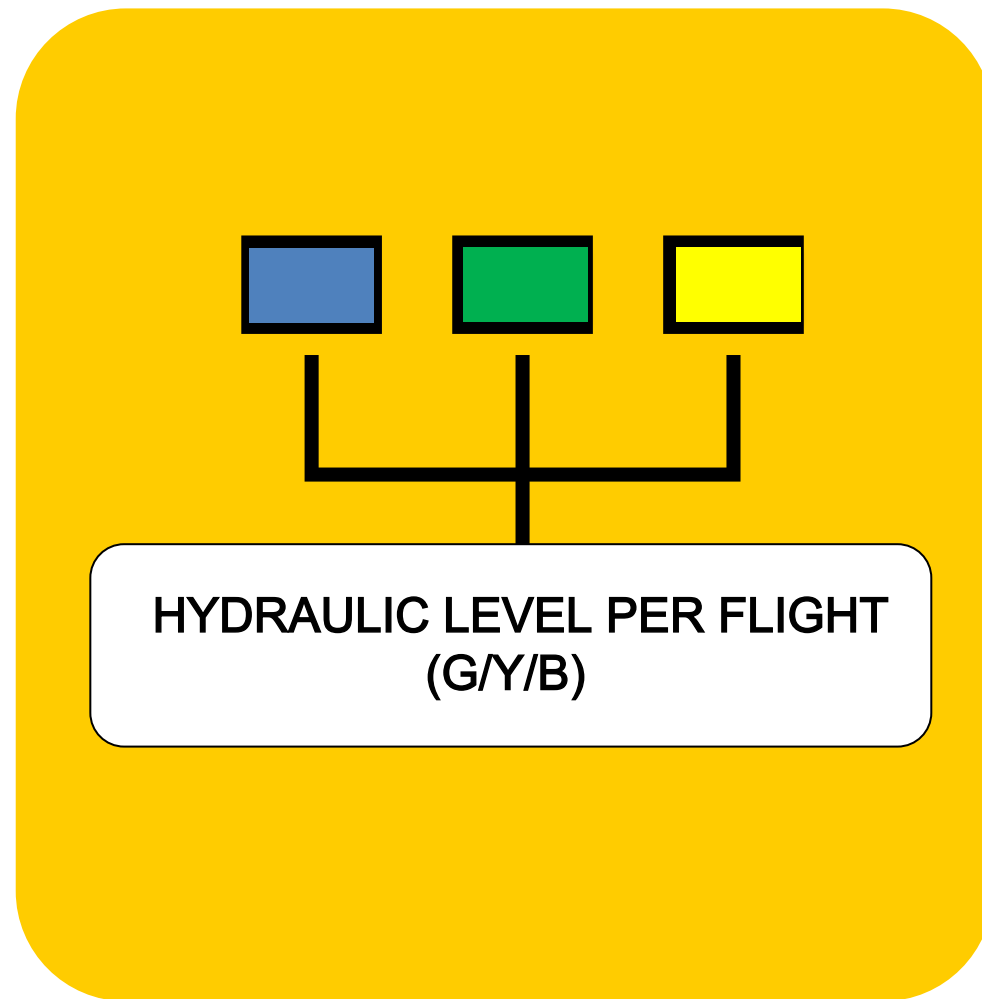
7. BEYOND PREDICTIVE...

IN-HOUSE FAILURES MODELING (ATA 29 – HYDRAULIC LEVEL)

DATA COLLECTION:
Data from a specific phases is extracted and stored.

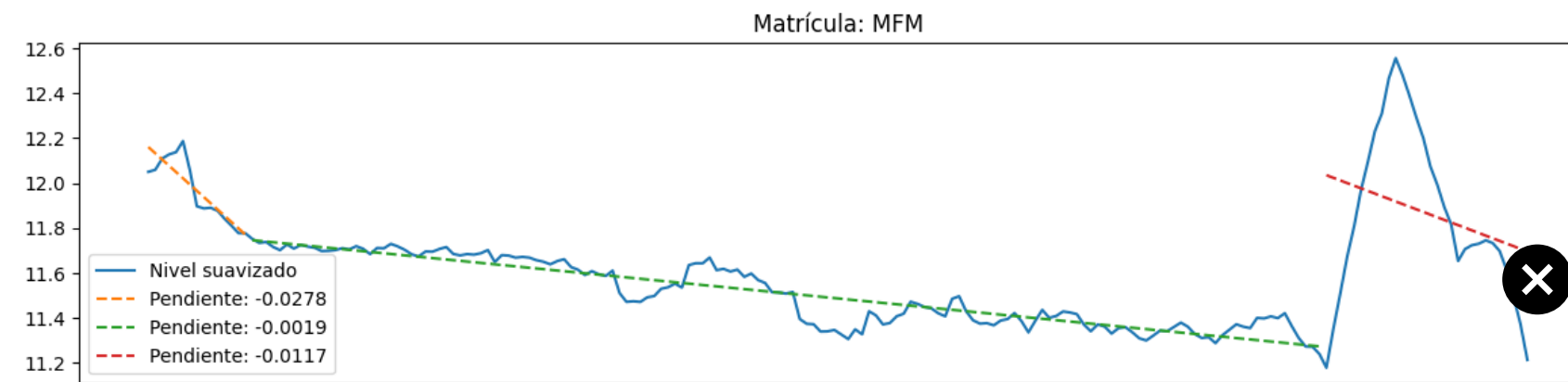
SEGMENTATION:
Signal data is transformed into linear segments

ALERT ISSUE:
Alert logic trigger



Delay reported (ID: 124854, 30 MIN) + MEL C (63785887)

Alert deactivated due stable segment detected

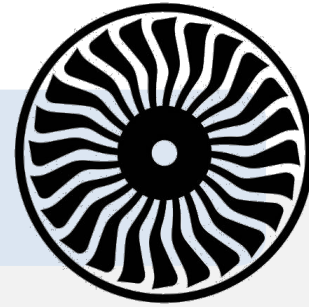


AOG reported (ID: 126165, 3 days)

Alert triggered

7. BEYOND PREDICTIVE...

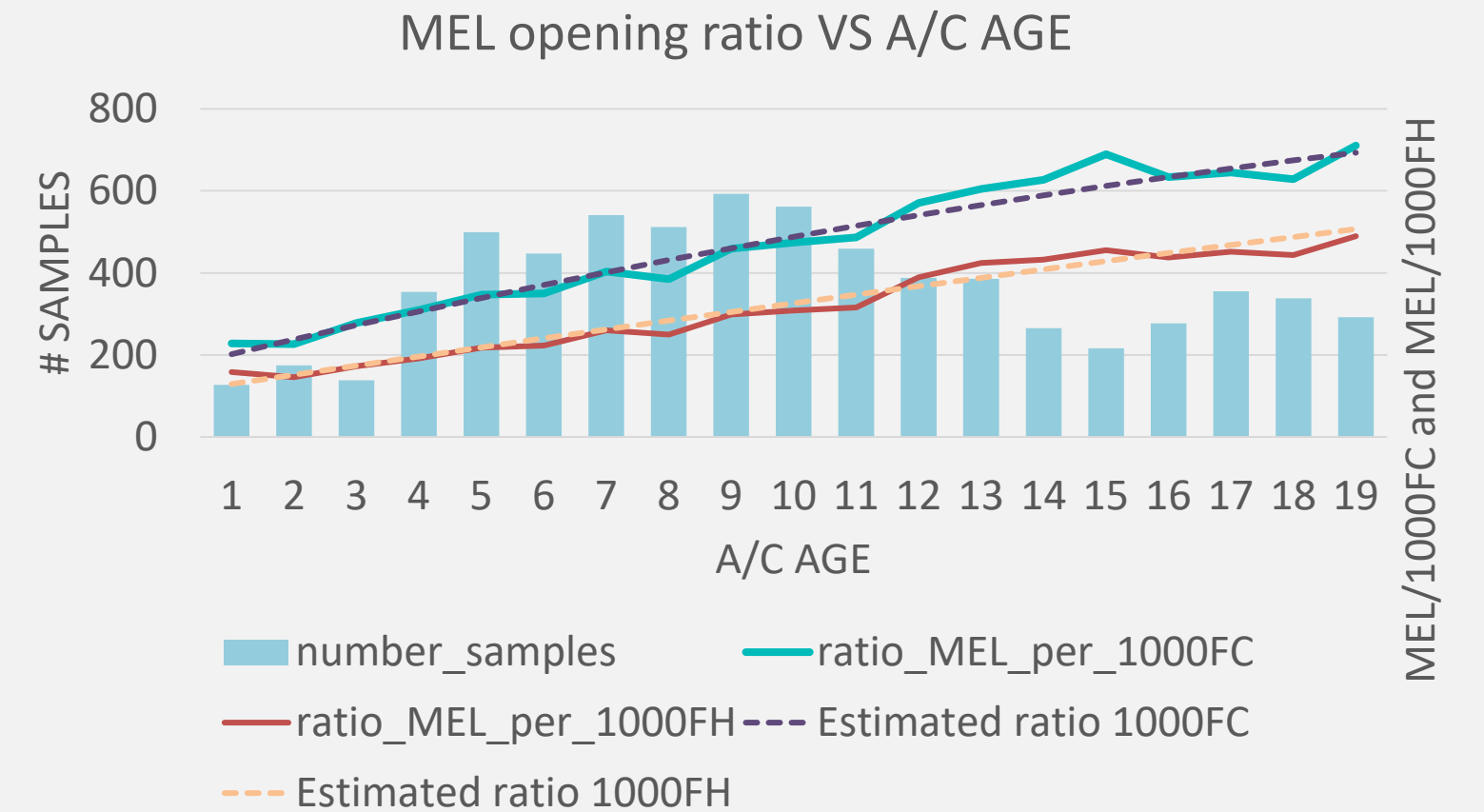
OPTENG + OPTMX



HEAVYMX PERFORMANCE estimator

- Adapt HM calendar based on real expectations
- Negotiate HM slots according to predictions
- Identify/anticipate potential risks for operation

MEL PREDICTOR






Estimation of MEL issued vs A/C AGE

Enabler tools that add enhance predictability of fleet needs

8. WRAP UP and CONCLUSIONS

REQUIREMENTS

- **SPONSORSHIP** is crucial for **SUCCESS** 
- **PROACTIVE MX = SURGICAL and ACCURATE INTERVENTIONS** 
- **ENGAGEMENT and PROMOTION** are key enablers 




ADDED VALUE

- **KPIs improvement (A/C availability)**

TDR	AOG declared	MEL/AC
+0.12%	-23%	-2.1%
- Better **anticipation** for incoming faults
- Enhanced evaluation on Maintenance tasks, improving **SAFETY**
- Improved efficiency

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AC availability is being increased despite ageing effect

vueling



THANK YOU!

 WE
LOVE
PLACES