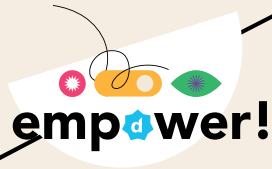


Welc**d**me



[YOUR TRAINER THIS SESSION]

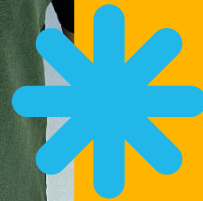
PO Data Analytics



Dennis
Dreesen

Dennis.Dreesen@skyline.be




[PRESENTING IN THIS SESSION]



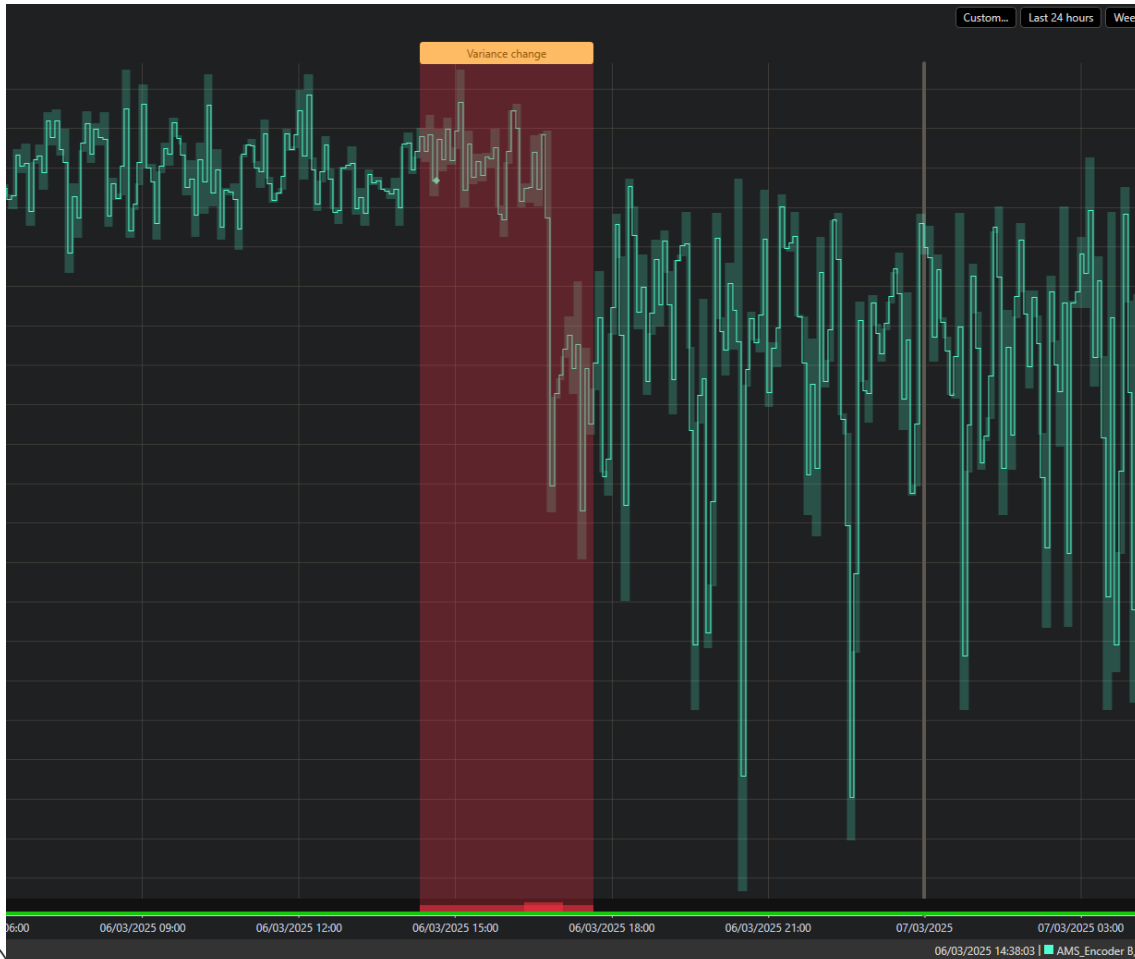
**Chris
Jones**

Arqiva



AI
Using — Relational 
 Anomaly
Detection 

Behavioral Anomaly Detection



- We monitor your trended metrics, looking for unexpected behavior.
- Configure as you please!
- Give feedback to improve your detections!
- Patented
- Check out Tobe's session on "Enhancing DataMiner AI with human feedback" @empower!
- **But...**
- It doesn't see outside the behavior of a single metric.
- Only looks at single metrics, individually.



Relational Anomaly Detection: use cases?

What can I do with RAD?

Channel Sync Monitoring

Ensures main and backup channels are synchronized for reliability.

Bonded Interfaces Monitoring

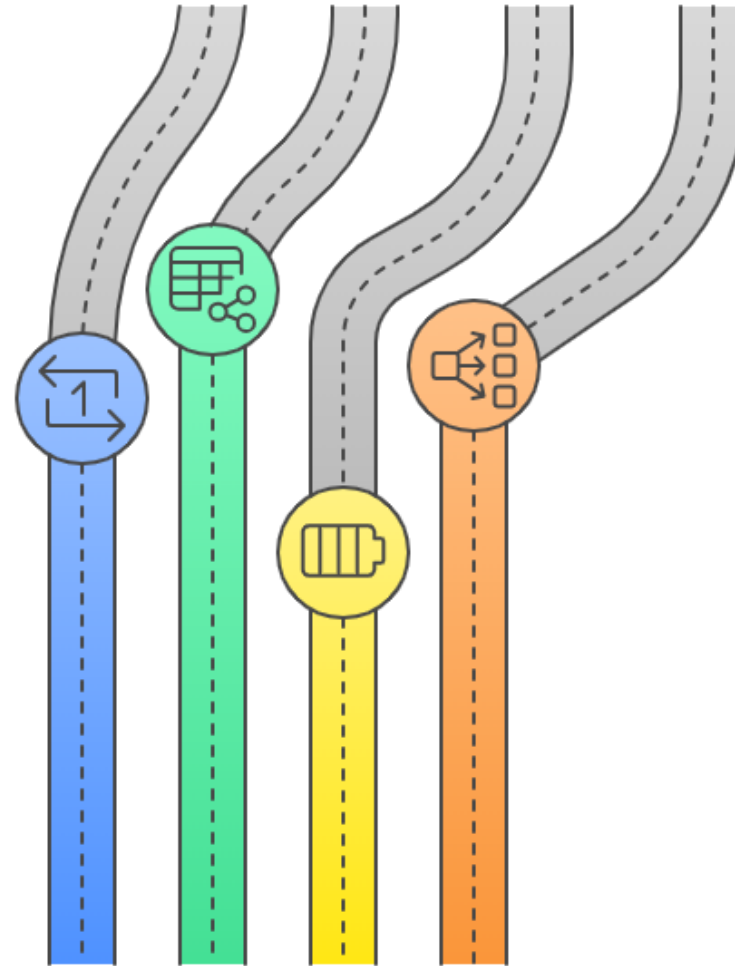
Monitors network's bonded interfaces for optimal performance.

Battery Cell Monitoring

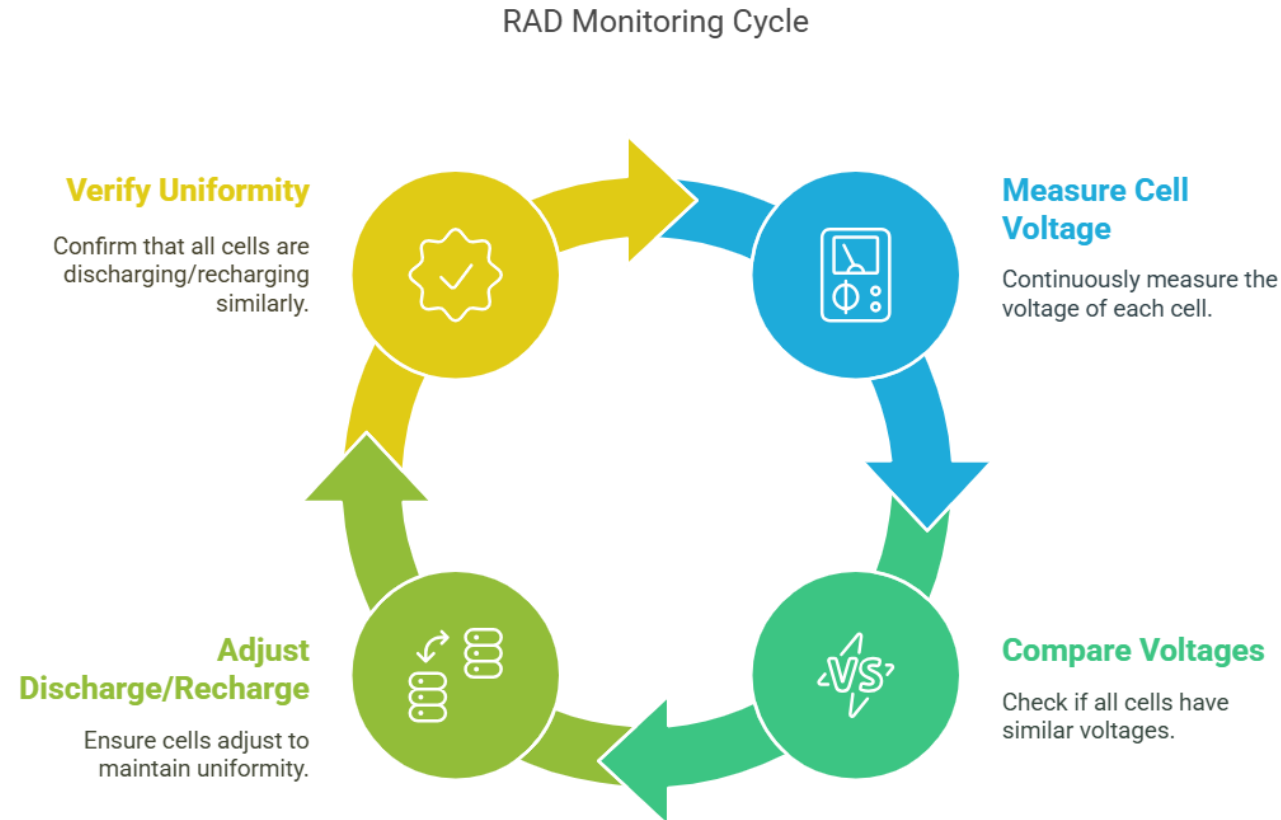
Tracks individual battery cells to maintain health and efficiency.

Load Balancing Use Cases

Facilitates effective load balancing across systems.



Relational Anomaly Detection: why not thresholds?



In collaboration with users!



Arqiva – What do we do?

- We operate multiple Class 4 teleports as part of our Global Multiplexing and Media Distribution business
- We manage Smart Metering networks delivering over 50M data points every day
- We transmit TV and Radio from ~1450 sites across the UK
- We have a long-standing history of partnership and collaboration with Skyline, pushing the boundaries of DataMiner, including:
 - Developed SRM-based solutions before it was productised
 - Flatline detection – announced at DataMiner Inspire in 2022
 - Using Apps functionality to deliver Manager of Managers for DAB Coding & Multiplexing
 - Collaborating with our real-world data and use cases to help Skyline develop its RAD AI capabilities

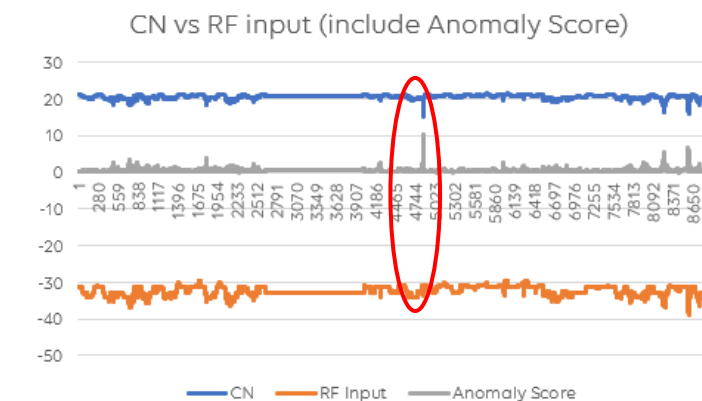
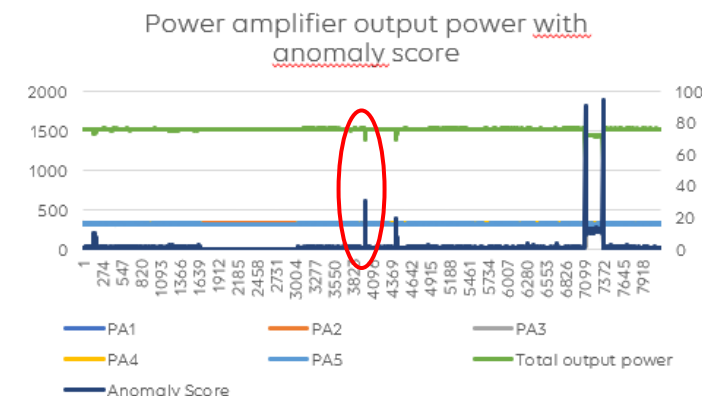


Arqiva – Applying Relational Anomaly Detection

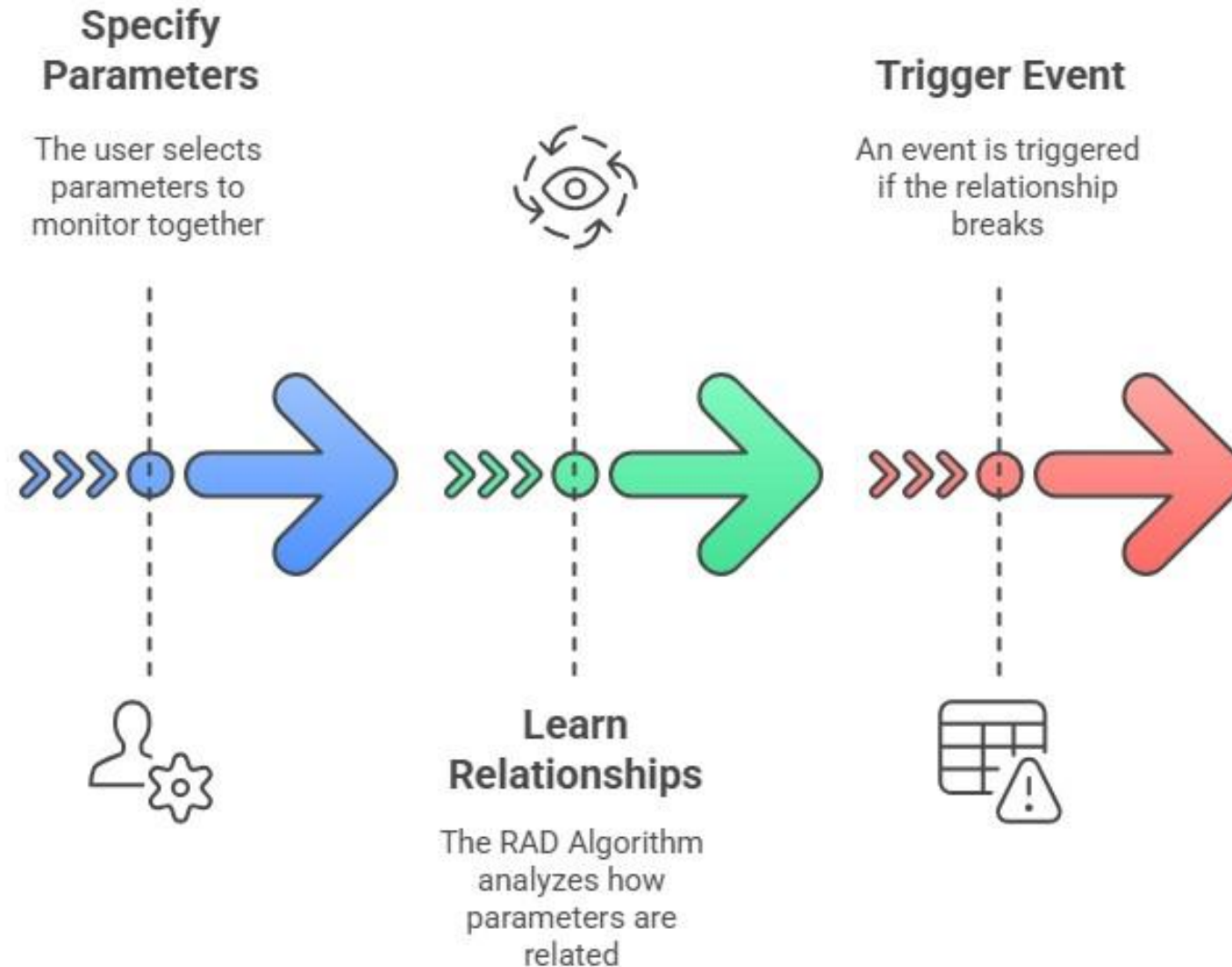
- **The problem:** We spend a lot of time and money on preventative maintenance, but do we get value for money? Can we use DataMiner to identify & highlight anomalies, enabling us to identify & fix issues before they become incidents?

- We started by using DataMiner dashboards
 - Visualising data from many devices of the same type – e.g. Temperature v Fan Speed
 - Also showing alarm data
- ...but we wanted to go further

- Use RAD to highlight anomalies to 2nd & 3rd Line Engineers for investigation and action
 - Aiming to reduce workload on 1st Line Operations Centres by reducing fault incidents
 - Enable Field Operations teams to schedule fixes, instead of having to react immediately to an incident
- Some Use Cases for RAD:
 - Compare power values of amplifiers within a transmitter
 - Looking at forward and reverse power in an antenna to detect signs of water ingress
 - Comparing temperature values across site areas
 - Checking for RF interference

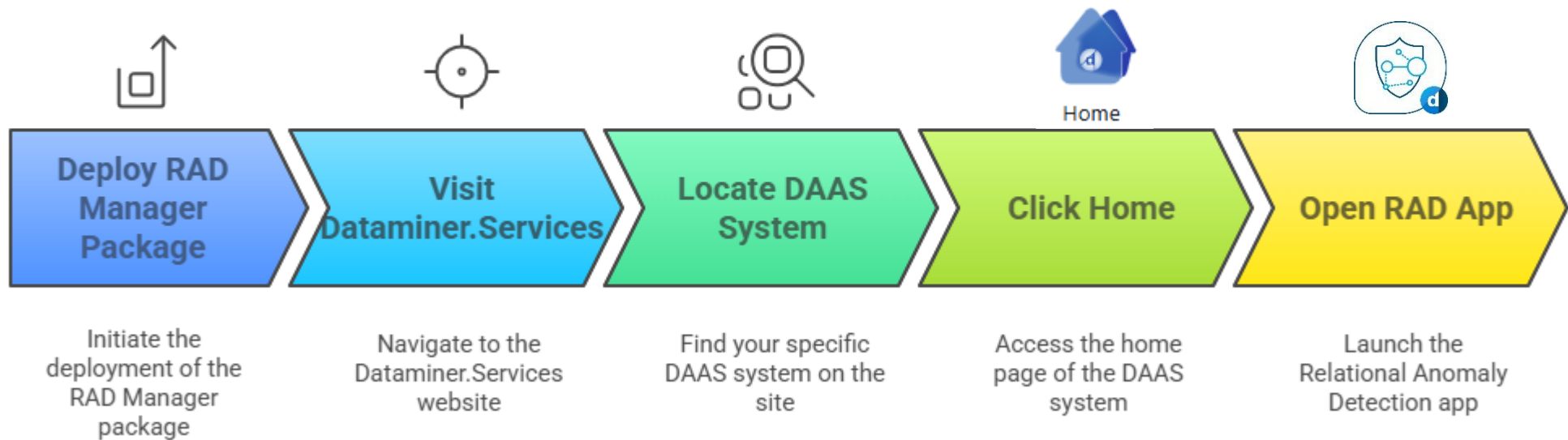


Relational Anomaly Detection: hands-on!



Let's get our hands dirty

Deploy and Access RAD Manager



Exercise 1: Monitoring the PAs of a DAB Transmitter

Root View | Dat... | Empower 2025 | Using Relational Anomaly Detection | LON | Empower 2025 - AI - Commtia LON 1

Search

Amplifier

Amplifier

SCU

PA

Amplifier Config

Demo Control

ALARMS

REPORTS

DOCUMENTS

NOTES

GENERAL PARAMETERS

Tx Amplifier

| | |
|------------------------------------|----------|
| Tx Amplifier Output | OK |
| Tx Amplifier SWR | Ok |
| PAs To Max Power (Emergency Mode) | Off |
| Tx Amplifier Output Power | 739 W |
| Tx Amplifier Relative Output Power | 0.5 dB |
| Tx Amplifier Reflected Power | 27.12 dB |
| Number Of PAs | 3 |

Amplifier Config ...

PA

Root View | Dat... | Empower 2025 | Using Relational Anomaly Detection | LON | Empower 2025 - AI - Commtia LON 1

Search

Up to "Amplifier"

PA Alarm Status

| PA | Comms | Input | Output | SWR | Temperature | Fan System | DC Supply | AC Supp |
|-----|-------|-------|--------|-----|-------------|------------|-----------|---------|
| PA1 | Ok | Ok | Ok | Ok | Ok | Ok | Ok | Ok |
| PA2 | Ok | Ok | Ok | Ok | Ok | Ok | Ok | Ok |
| PA3 | Ok | Ok | Ok | Ok | Ok | Ok | Ok | Ok |

PA Measurements

-37.0 dBm | 838 W | 67.5 dB | 123 deg C | 96 deg C

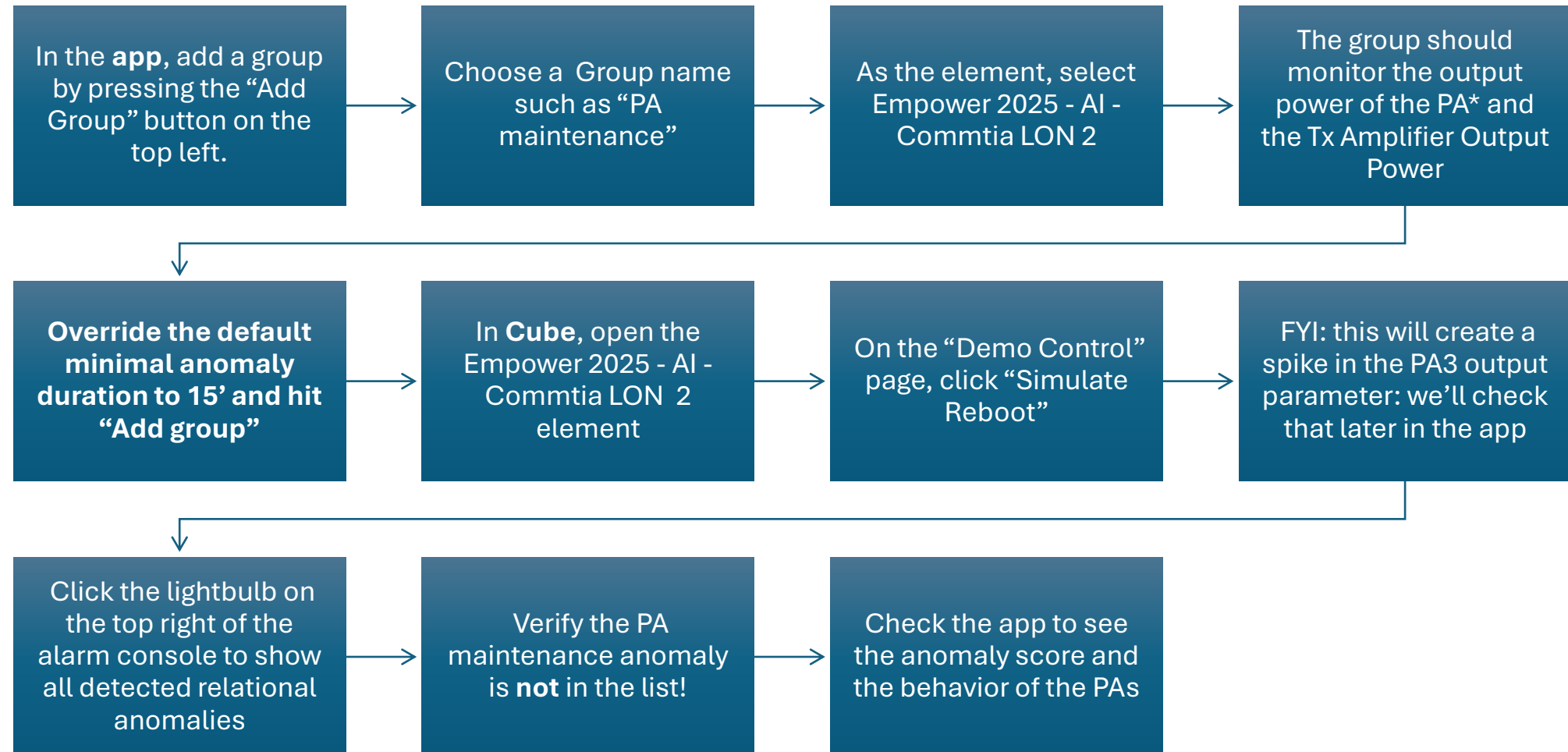
| PA | Input Power | Output Power | Reflected Power | Amp Temp | Inlet Temp |
|-----|-------------|--------------|-----------------|----------|------------|
| PA1 | -12.3 dBm | 277 W | 24.4 dB | 40 deg C | 31 deg C |
| PA2 | -12.1 dBm | 278 W | 19.8 dB | 41 deg C | 33 deg C |
| PA3 | -12.0 dBm | 283 W | 23.3 dB | 42 deg C | 32 deg C |

PA Hardware Status

60 % | 20.6... | 20.6... | 20.6... | 0.0 V | 0.0 A | 0.0 V | 0.0 A

| PA | PWM 1 | Fan 1 | Fan 2 | Fan 3 | PS1 V Amp | PS1 I Amp | PS2 V Amp | PS2 I Amp |
|-----|-------|----------|----------|----------|-----------------|-----------------|-----------------|-----------------|
| PA1 | 20 % | 6739 rpm | 6739 rpm | 6739 rpm | Not initiali... | Not initiali... | Not initiali... | Not initiali... |
| PA2 | 20 % | 6866 rpm | 6894 rpm | 6937 rpm | Not initiali... | Not initiali... | Not initiali... | Not initiali... |
| PA3 | 20 % | 7009 rpm | 7009 rpm | 7008 rpm | Not initiali... | Not initiali... | Not initiali... | Not initiali... |

Exercise 2: don't detect the reboot!



Exercise 3: how can you use this on your system?

Discuss Use Cases

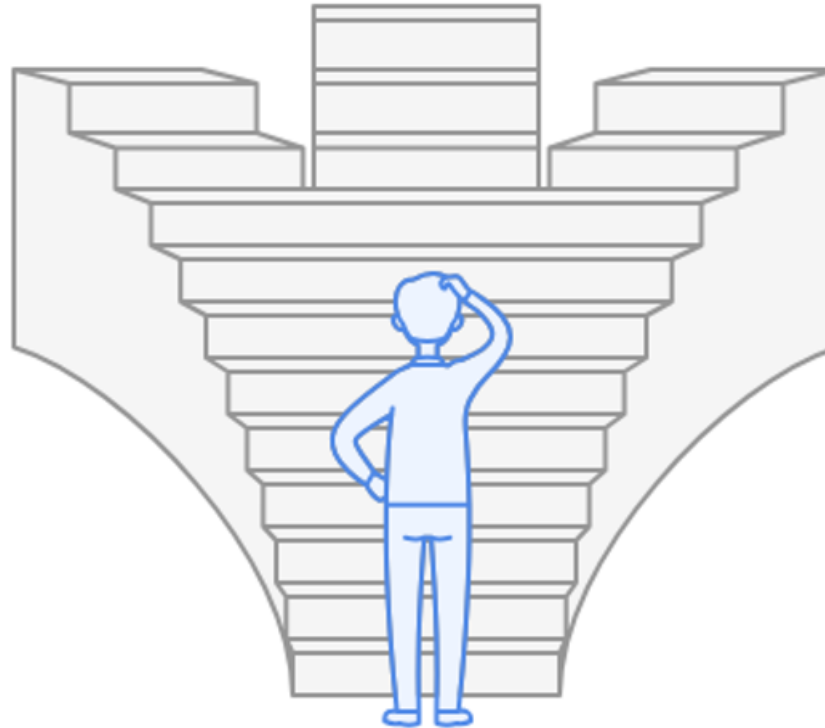
Discuss with your colleagues!

Submit Ideas: ai@skyline.be

Ensure your use case is considered in algorithm development.

Earn 75 Devops Points

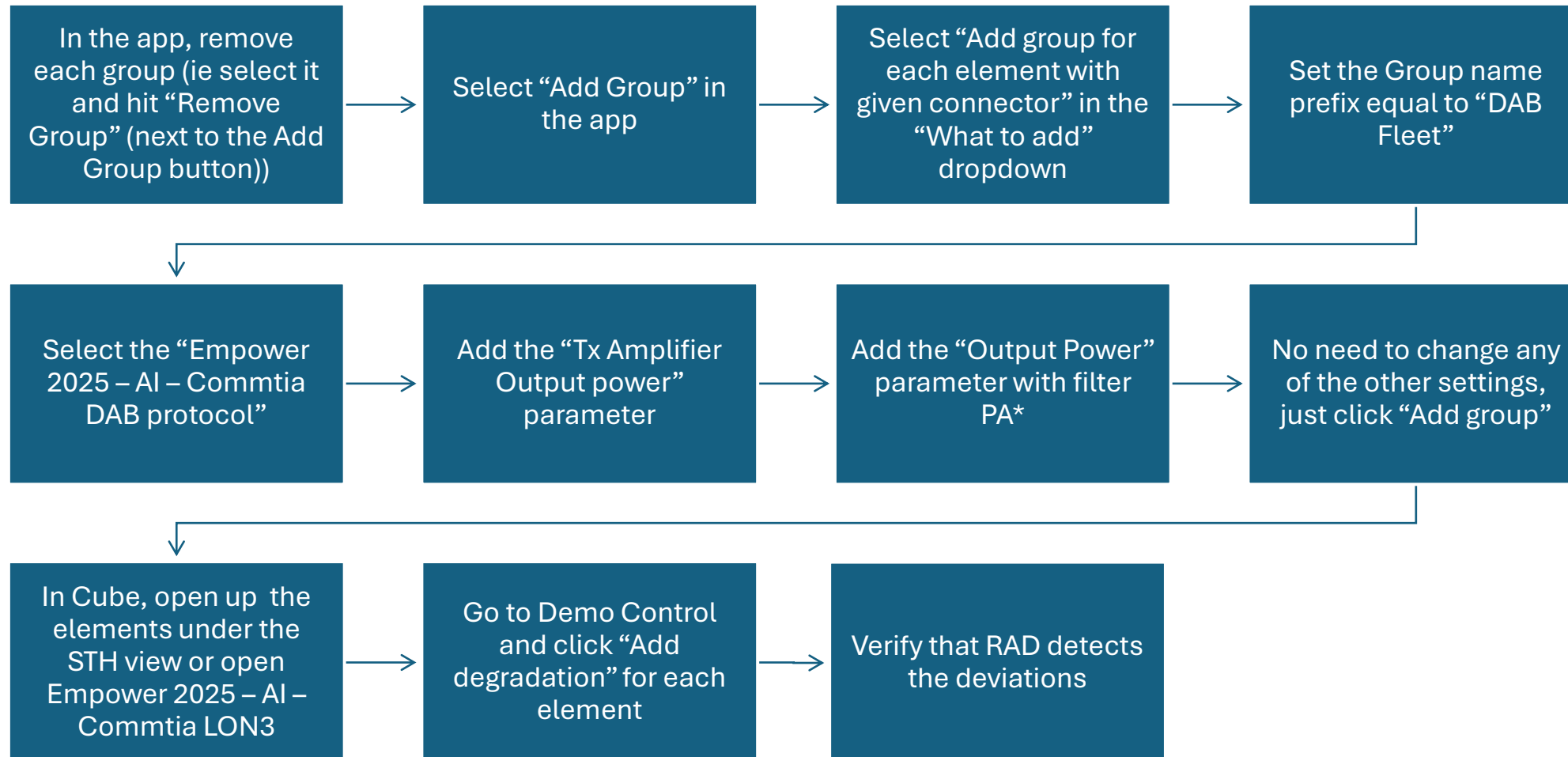
Mention your dojo user names!



Exercise 4: a fleet of transmitters



Exercise 4: A fleet of devices!



Optional: don't touch my stuff!

Configuring the Southampton equipment only



Use the RAD API!

```
public class MADGroupInfo
{
    public string Name { get; set; }

    public List<ParameterKey> Parameters { get; set; }

    public bool UpdateModel { get; set; }

    public double? AnomalyThreshold { get; set; }

    public int? MinimumAnomalyDuration { get; set; }
}

public AddMADParameterGroupMessage(MADGroupInfo groupInfo)

public RemoveMADParameterGroupMessage(string groupName)
```



[ASK AWAY]



Questions?