

AI/ML for DMW UT Analysis

A graphic element on the right side of the slide. It consists of a dark blue rounded rectangle containing a lighter blue rounded rectangle. Inside the lighter blue rectangle is a white square with the word "Nuclear" in blue text. The background of the slide features a faint, blue-tinted image of a nuclear power plant.

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Senior Principal Technical Leader

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Thursday, 23 January, 2025 – NRC Headquarters, Rockville, MD

AI for DMW Examinations

- Training based on *open* PDI inventory
 - No field data available
- Assessment on *blind* PDI inventory

Field trials are paramount

Indication #1
Longitudinal: 48.1 – 59.5 mm
Transverse: -12.8 – 9.1 mm

Indication #2
Longitudinal: 67.2 – 86.2 mm
Transverse: -11.8 – 6.2 mm

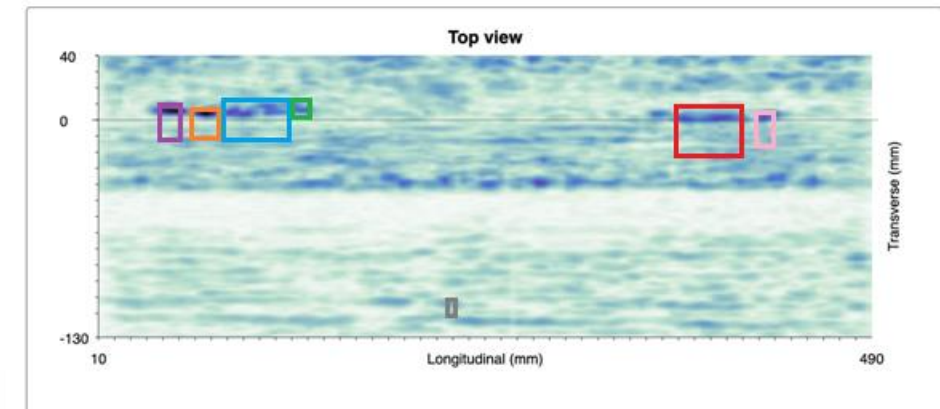
Indication #3
Longitudinal: 86.2 – 128.1 mm
Transverse: -11.8 – 12.1 mm

Indication #4
Longitudinal: 128.1 – 139.5 mm
Transverse: 2.1 – 12.1 mm

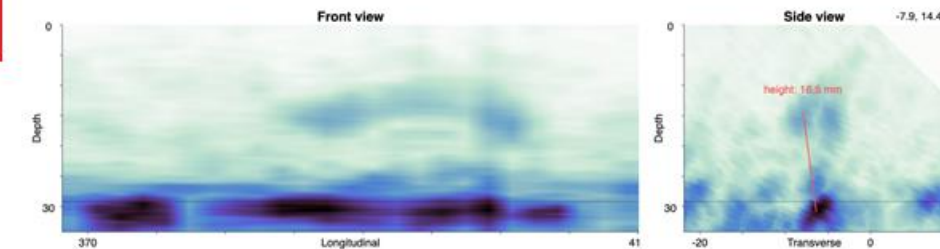
Indication #5
Longitudinal: 227.2 – 231.0 mm
Transverse: -118.9 – -111.9 mm

Indication #6
Longitudinal: 368.1 – 410.1 mm
Transverse: -21.8 – 8.7 mm

Indication #7
Longitudinal: 417.7 – 429.1 mm
Transverse: -16.8 – 4.1 mm



Azim. R: 45.00 S: 0.00



DMW Field Trial (Fall 2023)

- 25 welds inspected
- ✓ Essential variable check trialed with success
 - Value added
 - Extended to more variables & applications
- ✓ Good performance for circumferential flaws
 - Tuning based on field observations
 - Better data quality ⇒ better results

Model	Previous Outage	2023 Outage
Baseline	~9-10 call/weld	~4 call/weld
Tuned	~5-6 call/weld	~2 call/weld

- ✗ Excessive calls for axial flaws
 - Need for a dedicated model

TF

TRUEFLAW

Essential settings report

EPRI

45 LW:Azim. R: 45.00 S: 0.00

Longitudinal wave speed

Shear wave speed

Digitizing frequency

Averaging type

Recurrence

Synchro

Compression

Configuration

Voltage

Pulse width

Scale type

Rectification

Input filter

Smoothing

Wave type

Scan axis step

Procedure

Values Here

For

Validation

OK

OK

OK

OK

OK

OK

OK

OK

OK

OK

OK

OK

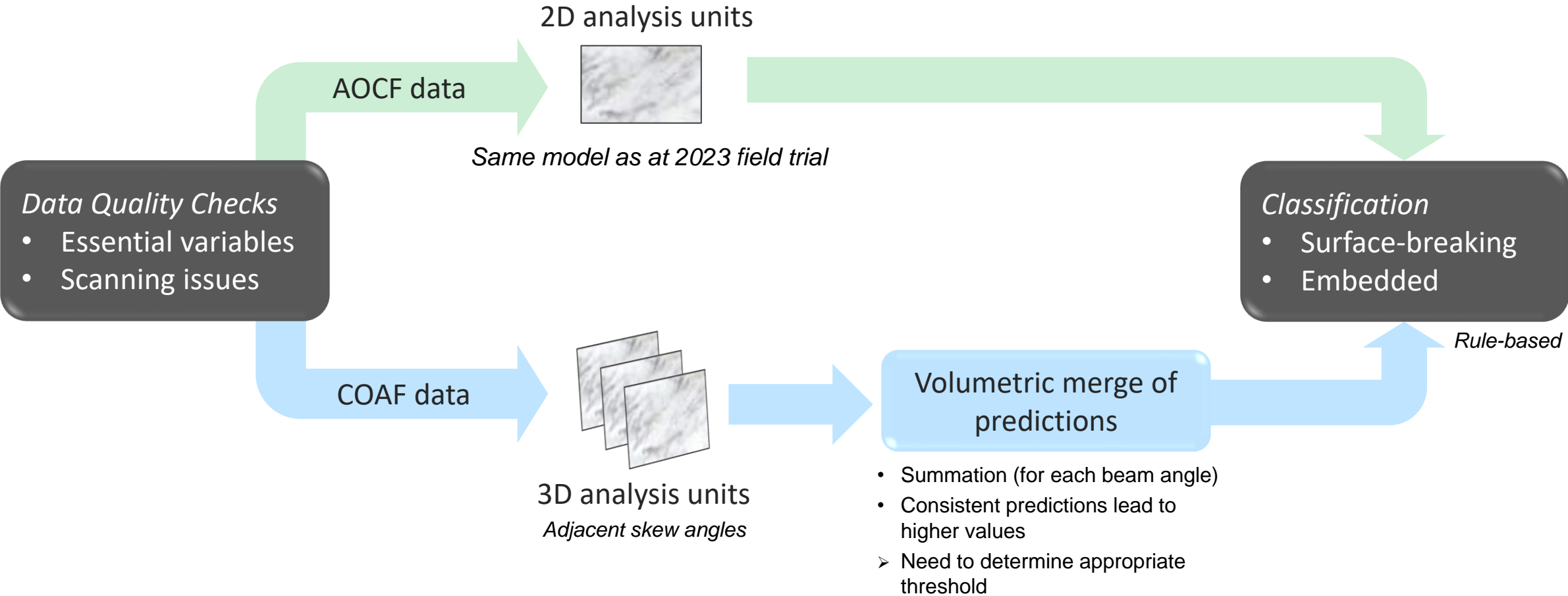
Fail

Fail

OK

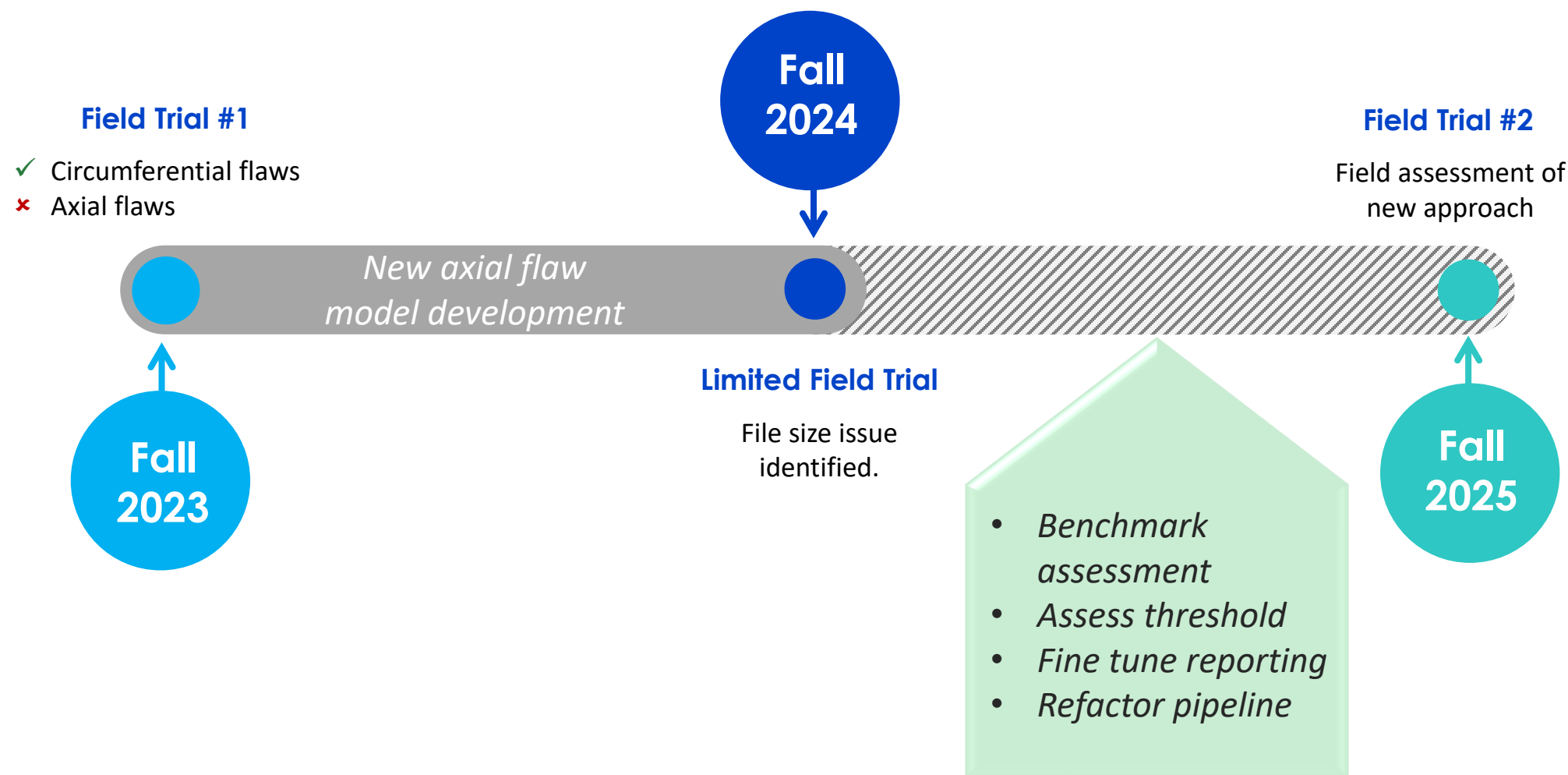
OK

Lessons Learned → New Process



Proposed New Approach

Activity Summary





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