

AI/ML for Manual UT and Other Future Projects

A graphic on the right side of the slide featuring a blue rounded rectangle with a white border. Inside, there is a blue square with the word "Nuclear" in white text. Above the blue square is a grayscale image of a nuclear explosion or mushroom cloud.

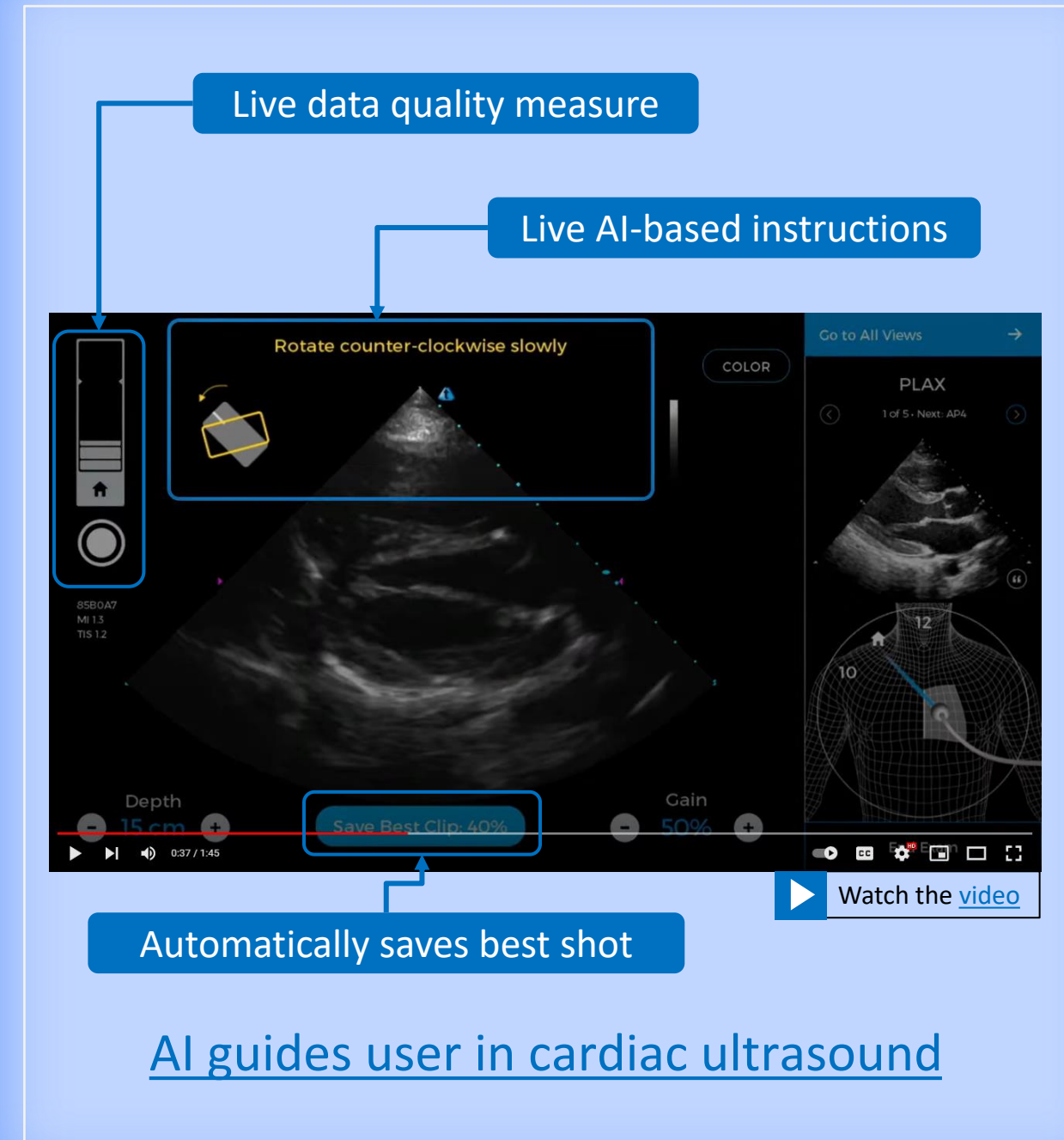
Nuclear

Thiago Seuaciuc-Osorio
Senior Principal Technical Leader

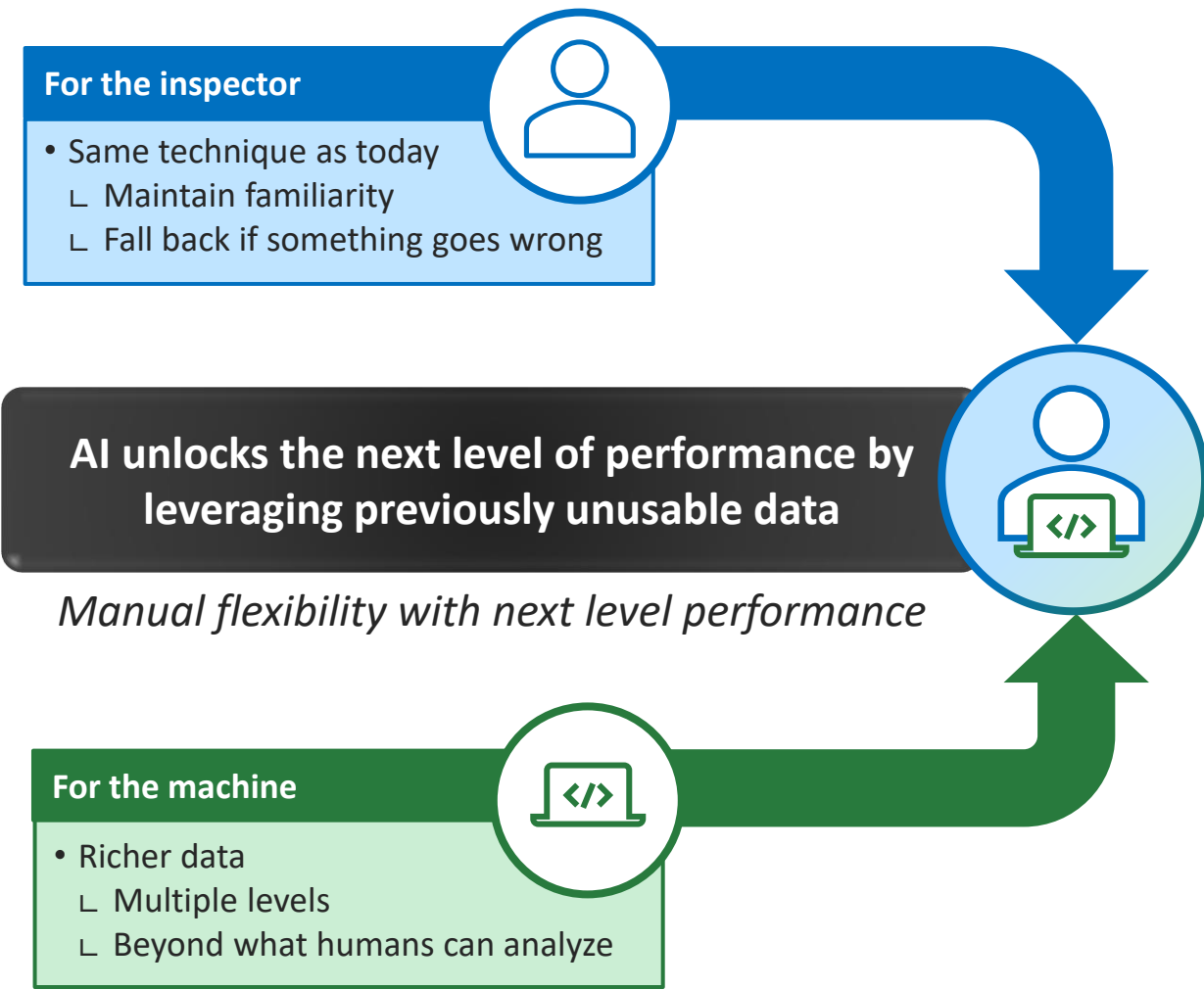
Annual NRC-Industry NDE Technical Information Exchange Meeting
Thursday, 23 January, 2025 – NRC Headquarters, Rockville, MD

AI for Manual UT: Motivating Vision

- Live guidance
- Alarms
- Real time feedback on data quality
- Speed monitoring
- Real time coverage assessment
- Recorded data for posterior review



Next Generation of Manual UT Scans



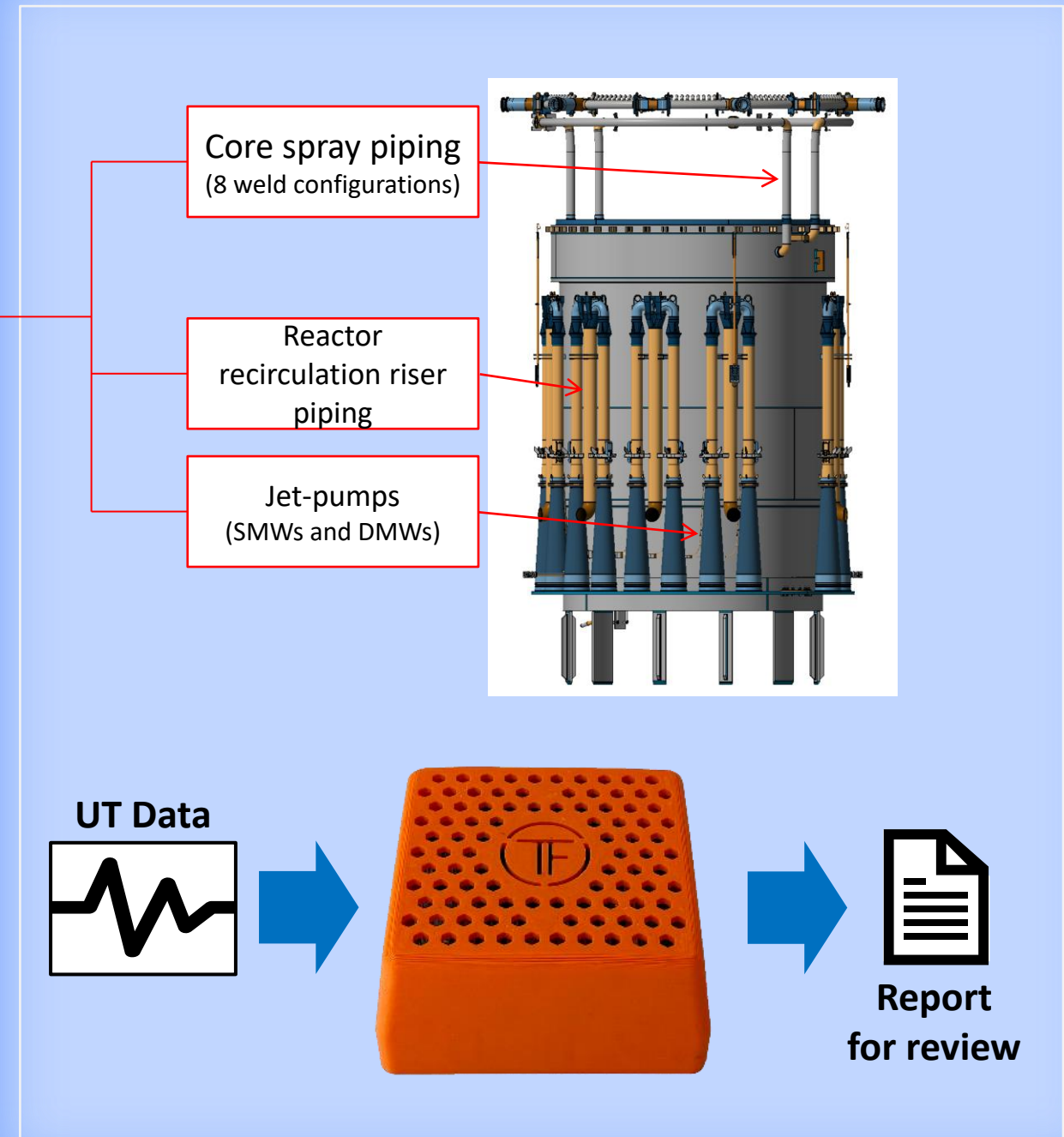
Key feature: *Auto encoding*

3	Full 3D Reconstruction	<ul style="list-style-type: none">• Save full data volume• Potentially additional ML layer
2	Live Scan Line	<ul style="list-style-type: none">• More robust ML• Live scanning guidance• Potential to save images
1	Live Single Shot	<ul style="list-style-type: none">• No encoding needed• Immediate feedback / alarm
UT encoding is the gatekeeper		

Increasing capability

AI for UT Inspections of In-Vessel Components

- Targeted in-vessel components
 - Thin-walled: only detection + length-sizing
- These inspections yield large amounts of data
 - Time consuming to analyze, many SCC flaws
 - Human-factor variation in length-sizing when trending flaws
- AI may be able to perform entire analysis
 - Entry point for fully-automated analysis
 - Saves time
 - Removes human factor variation in length-sizing
 - Data quality checks a must



Benchmarking Tool for AI Solutions

- Platform for:
 - Data sharing
 - Benchmarking

Enable independent development

Common & relevant assessment

Generate interest

Precursor to “PDI” for AI4NDE

■ Data Sharing Committee

EPRI		2
Participants	Org	Country
Thiago Seuaciuc-Osorio	EPRI	US
Leif Esp	EPRI	US
UTILITIES		4
Participants	Org	Country
Ignacio Real	Iberdrola	Spain
Quentin Mistral	EDF	France
Michael Salley	Constellation	US
Damon Priestley	TVA	US
VENDORS		4
Participants	Org	Country
Ilkka Virkkunen	Trueflow	Finland
Eleftherios Anagnostopoulos	Framatome	France
Javier de la Morena	Westinghouse	Spain
Tony Cinson	Framatome	US
REGULATORS/QUALIFICATION BODIES		1
Participants	Org	Country
Chris Curtis	IVC	UK
ACADEMIA/RESEARCH/SUPPORT		2
Participants	Org	Country
Pradeep Ramuhalli	ORNL	US
Anthony Croxford	University of Bristol	UK



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