

Workshop on structural integrity, NDT and CM requirements for Industry 4.0
18-19 May 2022
 Manufacturing Technology Centre (MTC), Coventry, UK

Rescheduled from 19-20 October 2021

Industry 4.0 Workshop

BINDT
 THE BRITISH INSTITUTE OF NON-DESTRUCTIVE TESTING

...engineering safety, integrity & reliability

Day one – Wednesday 18 May 2022		
09.30-10.00	Registration	
10.00-10.15	Welcome and introduction	<i>Robert Smith, RCNDE</i>
	Session 1: Understanding Industry 4.0 – high-level objectives/aspirations, drivers, business, risk, dynamics and tensions	Chair: Robert Smith, RCNDE
10.15-10.45	Introduction to Industry and NDE 4.0	<i>Nick Brierley, Simon Mills and Robert Smith, BINDT</i>
10.45-11.00	Overview of essential topics for workshop	<i>Pete Loftus and Paul Wilcox, RCNDE</i>
11.00-11.20	'Bigger picture' view of benefits of Industry 4.0 in broader asset management	<i>Martin Wall, HOIS Digitalisation Forum, ESR Technology</i>
11.20-11.40	Coffee break	
11.40-12.00	Structural integrity (SI) – how will this change and what will NDE/CM/SHM have to provide?	<i>Jim Skelton, Jacobs</i>
12.00-12.20	Drivers for designers and asset owners with Industry 4.0 – SI, lifing, past and current philosophy and potential future philosophy	<i>David Wright, Rolls-Royce plc</i>
12.20-13.00	Lunch break	
	Session 2: NDE/CM/SHM for SI through the Industry 4.0 life cycle	Chair: John Sharples, Jacobs and FESI
13.00-13.20	Probabilistic SI and lifing	<i>Michael Martin, Rolls-Royce plc</i>
13.20-13.40	Regulatory/liability viewpoint on artificial intelligence (AI)/machine learning (ML) automated decision-making within the NDE/CM/SHM part of the SI process	<i>Richard Hyde, University of Nottingham</i>
13.40-14.00	NDE/CM/SHM data and digital twins – data that needs to be open versus data that must be private	<i>Richard Rheume, Ondia NDE</i>
	Session 3: Skills	Chair: Simon Mills, BINDT
14.00-14.15	Skills, training and qualification implications of NDE 4.0	<i>Nick Brierley, diondo GmbH and Chair of BINDT NDE 4.0 Group</i>
14.15-14.30	Metrology skills framework – national metrology alliance	<i>Pete Loftus, RCNDE</i>
14.30-15.00	Coffee break	
	Session 4: Breakout session on SI objectives	Chair: Robert Smith, RCNDE
15.00-16.10	1. Challenges and opportunities from improved NDE/CM/SHM capability	
	2. NDE/CM/SHM for self-verifying assets? On-the-fly SI calculations based on digital twins	
	3. Requirements and barriers for the use of AI/ML in the NDE/CM/SHM SI process	
	4. Communicating – persuading industry of requirements on NDE/CM/SHM to gain commitment	
	5. Interpretation of NDE/CM/SHM information. Better understanding by users. Dissemination	
	6. Who is taking the initiative? Should this change? Is there an economic benefit that will ultimately drive it? Do we need an intervention?	
16.10-16.40	Breakout session debrief	
16.40-17.00	Discussion and requirements capture	
17.00-18.15	Networking event in the exhibition	
18.15	Close of day one	

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Day two – Thursday 19 May 2022

08.45-09.00	Registration	
09.00-09.10	Welcome and introduction	
	Session 5: Benefits beyond maintaining SI	Chair: Nick Brierley, diondo GmbH and Chair of BINDT NDE 4.0 Group
09.10-09.30	Evaluating the microstructure of additively-manufactured components and its effects on performances and integrity	Joe Grimwood, TWI
09.30-09.50	NDE challenges for future zero-carbon emissions aircraft	Katy Milne, FlyZero
09.50-10.10	Meeting environmental requirements	Marie Wells, MTC
10.10-10.30	The use of robotics for remote NDE in the offshore wind sector – remote NDE	Hamish MacDonald, ORE Catapult
10.30-10.50	Risk-based asset management and the connection with NDE 4.0	Ujjwal Bharadwaj, TWI
10.50-11.10	Coffee break	
	Session 6: Greater collaboration between NDE and communities such as metrology and materials	Chair: Pete Loftus, RCNDE
11.10-11.30	Advances in metrology for Industry 4.0	Adam Thompson, University of Nottingham
11.30-11.50	Materials 4.0	Iain Todd, University of Sheffield
	Session 7: NDE experiences from the field – NDE 4.0 in the present	Chair: Pete Loftus, RCNDE
11.50-12.10	Practical examples of NDE 4.0 supplying commercial benefit in advanced manufacturing	Tom Martin, JetSoft
12.10-12.30	Case studies on decision making enabled by insights from continuous corrosion monitoring data	Jon Allin and/or Atilla Gajdaszi, Permasense
12.30-12.50	Initiative to explore the state-of-the-art of AI-assisted corrosion detection in pipelines – where digital/intelligent methods are being used to benefit the inspection and CM purposes	Borja Martinez and Juergen Moors, Sprint Robotics
12.50-13.15	Lunch break	
	Session 8: Current research/work for potential future improvements	Chair: Paul Wilcox, RCNDE
13.15-13.30	Summary of UK research for NDE/CM/SHM for Industry 4.0	Paul Wilcox, RCNDE
13.30-13.50	Digital fusion of NDE and SHM via Industry 4.0 – a researcher's shopping list	Fred Cegla, Imperial College London
13.50-14.10	Laser ultrasonics for non-contact, in-process NDE during manufacturing in extreme environments	Teti Stratoudaki , University of Strathclyde
14.10-14.30	Model-based definition driven digital thread for NDT inspection	Nathanael Turner, MTC
14.30-15.00	Coffee break	
	Session 9: Breakout session based on BINDT high-level NDE 4.0 aims	Chair: Robert Smith, RCNDE
15.00-16.00	1. Improved asset performance (through-life)	
	2. More efficient production, including of new products	
	3. Better/faster/cheaper NDE/CM/SHM (incremental improvement, includes less frequent)	
	4. Efficient quality control for customised products, for example additively manufactured products	
	5. Reduced need for personnel being in harm's way/travelling	
	6. Efficient quality control for decentralised production	
16.00-16.30	Breakout session debrief	
	Session 10: Panel session	Chair: Robert Smith, RCNDE
16.30-17.00	Discussion and requirements capture	
17.00	Close of day two	