

### Registration

by **August 7, 2017** via [www.nde-reliability.de](http://www.nde-reliability.de)

### Fees

Registration Fee	650.00 €*
Presenting Authors (only one person per paper)	490.00 €*
Students	80.00 €*
Tutorial: NDE Reliability for Practitioners	250.00 €
Additional Workshop Dinner	60.00 €

\* including all workshop activities (except tutorial), workshop material, workshop dinner, coffee breaks and lunch

### Cancellation

until July 24, 2017: 50 % of participation fee  
from July 25, 2017: no refund possible

### Payment

The payment of the participation fee is requested only in EUR and has to be done after receipt of invoice.  
All payments have to be done before the beginning of the workshop (receipt at DGZfP). Later payments have to be done onsite at the registration desk (cash or by credit card).

### Call for Posters

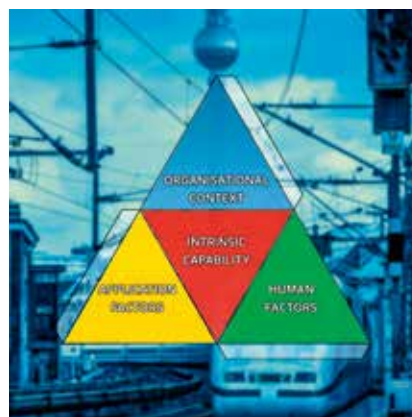
All workshop participants are welcome to contribute posters that are associated with relevant topics on Reliability of NDE. Posters will be displayed during the whole workshop and at the poster evening on September 5, 2017. A short abstract (max. 2,300 characters) is required for submission. This abstract or a full paper (about 8 pages) will be published in the workshop proceedings as well. For poster submission please see the website [www.nde-reliability.de](http://www.nde-reliability.de)

Deadline for submission of poster abstracts:  
July 31, 2017



## INVITATION | PROGRAM + CALL FOR POSTERS

### 7<sup>th</sup> European-American Workshop on Reliability of NDE



September 4 – 7, 2017, Potsdam, Germany  
[www.nde-reliability.de](http://www.nde-reliability.de)

## Germany

Marija Bertovic, BAM, Berlin

Mato Pavlovic, BAM, Berlin

Uwe Ewert, BAM, Berlin

Daniel Kanzler, Applied Validation of NDT (AV-NDT), Berlin

Ralf Holstein, DGZfP Education and Training, Berlin

Martin Spies, Fraunhofer IZFP, Saarbrücken

Jochen Kurz, DB Systemtechnik, Brandenburg-Kirchmöser

## USA

Greg Selby, EPRI, Charlotte, NC

David S. Forsyth, TRI, Austin, TX

Leonard Bond, Iowa State University, Ames, IA

Lloyd Schaefer, Blue Origin, Kent, WA

Stephen Cumblidge, US NRC, Washington, DC

Amy L. D'Agostino, US NRC, Washington, DC

## UK

Bernard McGrath, Amec Foster Wheeler, Warrington

Russ Booler, Office for Nuclear Regulation, Bootle

## France

Etienne Martin, EDF, Paris

Pierre Calmon, CEA, Saclay

## Italy

Michele Carboni, Politecnico di Milano, Milan

## Sweden

Ulf Ronneteg, SKB, Oskarshamn

## Finland

Ari Koskinen, VTT Technical Research Centre of Finland, Espoo

## Switzerland

Sascha Feistkorn, SVTI, Wallisellen

## Workshop Venue

Kongresshotel Potsdam

Am Luftschiffhafen 1 | 14471 Potsdam, Germany

[www.kongresshotel-potsdam.com](http://www.kongresshotel-potsdam.com)

## Language

All technical papers will be presented in English, simultaneous translation will not be provided.

## Website

The [www.nde-reliability.de](http://www.nde-reliability.de) website has been prepared for the workshop. All news and changes will result in an update of this page.

## Proceedings

The proceedings will be published on the workshop website and will be available after the workshop.

## Workshop Secretariat

German Society for Non-Destructive Testing (DGZfP e.V.)

Steffi Dehlau | Max-Planck-Str. 6 | 12489 Berlin, Germany

Phone: +49 30 67807-120 | Fax: +49 30 67807-129

E-mail: [tagungen@dgzfp.de](mailto:tagungen@dgzfp.de)

## Hotel Reservation

We have special conditions in the conference hotel (until August 6, 2017):

Reservation code: EAW Reliability of NDE

Single room, Sept. 3 – 4, 2017: 87.00 € per night

Single room, Sept. 4 – 8, 2017: 95.00 € per night

Your reservation please send to

E-mail: [info@hukg.de](mailto:info@hukg.de)

Fax: +49 331 90770-777

More hotels can be found at the Potsdam Tourism website:

[www.potsdam-tourism.com/hosts/search-book.html](http://www.potsdam-tourism.com/hosts/search-book.html)

## Social Programme

- Poster Evening and Get-Together:  
September 5, 2017, 18:00 – 20:00 h
- Workshop Dinner:  
September 6, 2017, 19:00 – 23:00 h  
at Biosphäre Potsdam  
(Bus transfer from workshop venue starts at 18:30 h)

We cordially invite all NDE practitioners, scientists and early-career colleagues – active or interested in the field of NDE reliability – to attend the 7<sup>th</sup> European-American Workshop on Reliability of NDE (7<sup>th</sup> EAW). Although called “European-American”, the Workshop has drawn substantial international attention over the years and the interest spans over several continents – a tradition we wish to keep and pursue.

The aim of this Workshop is to acquire a deeper understanding of factors influencing NDE reliability and of their interplay in NDE practice. Furthermore, we wish to open a dialogue about reliability between scientists and practitioners in order to advance the field as a whole. The topic in focus is the discussion of interconnections and dependencies between different influencing factors. Thereby, we aim to:

- Understand how the influencing factors are interconnected and how this knowledge can be used to increase the NDE reliability in practice
- Discuss the role of POD in relation to fracture mechanics for the entire component safety and integrity assessment and associated risks
- Develop approaches for
  - the reliability assessment of structural health monitoring
  - the capability of NDT to size defects
- Address new challenges associated with composites and strongly scattering media
- Develop POD modelling approaches, with the special focus on how human factors can be taken into account
- Explore new application domains, such as the railway
- Deepen the understanding of the human and organizational factors affecting NDE reliability
- Develop strategies for
  - transferring human factors knowledge into practice
  - promoting the positive side of human factors
- Identify the responsible parties and activate them to take reliability and human factors as their priority



Dr. phil. Marija Bertovic  
BAM Federal Institute for  
Materials Research and Testing



Dr.-Ing. Matthias Purschke  
German Society for  
Non-Destructive Testing

September 4 – 5, 2017

## **Tutorial: NDE reliability for practitioners**

This tutorial offers a wide range of reliability topics and is intended not only for colleagues, who are not yet familiar with reliability as a topic, but also for regulators, service providers, end-users, and scientists, who encounter reliability-related problems in their daily practice and wish to obtain skills that will serve as a starting point in overcoming those problems.

### **Description**

The tutorial will start with an overall introduction to NDE reliability (motivation, role of reliability), highlighting the factors relevant to reliability, i.e. intrinsic capability, application factors, human factors and the organizational context.

### **The tutorial is divided into three parts:**

1. Basic principles of the probability of detection (POD) and the problem of real defects:
  - Introduction to the reliability and its need
  - Statistical basics for the evaluation of POD and alternatives
  - Approaches in the field to evaluate real defect data
2. Advanced principles of POD: Multi-parameter POD for industrial systems:
  - Limitations of the conventional signal-response model
  - Multi-parameter POD
  - Volume POD
3. Human and organizational influences on NDE reliability:
  - NDE reliability in the daily practice (influence of management and society)
  - Introduction to human factors (definition, human error)
  - Methods for assessment of human factors (e.g. risk assessment methods)
  - Human factors in theory and practice (examples from studies and practice)
  - Implications for the NDE practice (optimization strategies, procedure writing guidelines, etc.)

*The tutorial is bookable in addition to the workshop program.*

13:00 – 15:00	<b>Opening and Keynote Presentations</b> <i>M. Bertovic, BAM, Berlin, Germany</i>	Tuesday, September 5, 2017
15:30 – 17:30	<b>Session 1 – General Reliability</b> <i>R. Holstein, DGZfP Education and Training, Berlin, Germany</i>	
18:00	<b>Poster Evening – Get-Together</b>	

08:30 – 10:10	<b>Session 2 – Human Factors</b> <i>A. D’Agostino, US NRC, Washington, USA</i>	Wednesday, September 6, 2017
10:30 – 12:10	<b>Session 3 – Model-Assisted POD</b> <i>M. Spies, Fraunhofer IZFP, Saarbrücken, Germany</i>	
13:15 – 15:30	<b>Break-Out Session</b> <i>Group discussion on Reliability</i>	
16:00 – 17:20	<b>Session 4 – Model-Assisted POD</b> <i>D. Forsyth, TRI, Austin, USA</i>	
19:00	<b>Workshop Dinner at Biosphäre Potsdam</b>	

08:30 – 10:10	<b>Session 5 – Applications in Industry</b> <i>U. Ewert, BAM, Berlin, Germany</i>	Thursday, September 7, 2017
10:30 – 12:10	<b>Session 6 – Reliability Parameters</b> <i>M. Pavlovic, BAM, Berlin, Germany</i>	
13:15 – 15:30	<b>Break-Out Session</b> <i>Group discussion on Reliability</i>	
15:50 – 17:10	<b>Session 7 – Applications in Industry</b> <i>L. Schaefer, Blue Origin, Kent, USA</i>	
17:15	<b>Closing</b>	

# PROGRAM

Tuesday, Sept. 5

13:00 OPENING AND KEYNOTE PRESENTATIONS

*Chair: M. Bertovic, BAM, Berlin, Germany*

13:20

**Reflections on 25 Years of Contributions to NDE Reliability by Dr. Christina (Müller) Zanotelli**

*U. Ewert<sup>1</sup>, L. Schaefer<sup>2</sup>, M. Pavlovic<sup>1</sup>*

*<sup>1</sup> BAM, Berlin, Germany; <sup>2</sup> Blue Origin, Kent, USA*

14:00 1

**Automatization in Complex Socio-Technical Systems: Man as a Hazard, Man as a Hero**

*H. Schaub<sup>1</sup>*

*<sup>1</sup> IABG, Ottobrunn, Germany*

14:30 2

**Quality in Computer-aided Surgery**

*F. Stocker<sup>1</sup>*

*<sup>1</sup> fiagon, Henningsdorf, Germany*

15:00 Break



**Session 1**

**GENERAL RELIABILITY**

*Chair: R. Holstein, DGZfP Education and Training, Berlin, Germany*

15:30 3

**State of the art of the discussion on reliability: Where are we now and where we are heading?**

*M. Bertovic<sup>1</sup>, G. Selby<sup>2</sup>, R. Holstein<sup>3</sup>, D. Kanzler<sup>4</sup>, M. Pavlovic<sup>1</sup>*

*<sup>1</sup> BAM, Berlin, Germany; <sup>2</sup> EPRI, Charlotte, USA;*

*<sup>3</sup> DGZfP Education and Training, Berlin, Germany;*

*<sup>4</sup> Applied Validation of NDT, Berlin, Germany*

15:50 4

**From State of Science to State of the Art Reliability**

*D. Kanzler<sup>1</sup>*

*<sup>1</sup> Applied Validation of NDT, Berlin, Germany*

Tuesday, Sept. 5

16:10 5

**15 Years of NDT Reliability Studies – What to do with it?***U. Ronneteg<sup>1</sup>, M. Pavlovic<sup>2</sup>, M. Bertovic<sup>2</sup>, D. Kanzler<sup>3</sup>**<sup>1</sup> SKB, Oskarshamn, Sweden; <sup>2</sup> BAM, Berlin, Germany;**<sup>3</sup> Applied Validation of NDT, Berlin, Germany*

16:30 6

**UK Nuclear Regulation, NDE Reliability and Challenges to the NDE Community***R. Booter<sup>1</sup>**<sup>1</sup> Office of Nuclear Regulation, Bootle, UK*

16:50 7

**Research by the U.S. Nuclear Regulatory Commission on the Effects of Human Factors on Ultrasonic Examinations***A. D'Agostino<sup>1</sup>, S. Cumblidge<sup>1</sup>**<sup>1</sup> US Nuclear Regulatory Commission, Washington, USA*

17:10 8

**A Proposal to Enhance the Importance of Reliability in the Application of NDE and SHM***B. McGrath<sup>1</sup>, D. Gilbert<sup>2</sup>**<sup>1</sup> AMEC, Warrington, UK; <sup>2</sup> BINDT, Northampton, UK*

18:00

**Poster Evening – Get-Together**

Wednesday, Sept. 6

**Session 2****HUMAN FACTORS***Chair: A. D'Agostino, US NRC, Washington, USA*

08:30 9

**Human Factors guidance to improve reliability of non-Destructive testing in the Offshore Oil and Gas Industry***M. Wall<sup>1</sup>**<sup>1</sup> ESR Technology, Abingdon, UK*

08:50 10

**Human Factors Engineering in Manual Ultrasonic Testing**

*M. Dunlap<sup>1</sup>*

<sup>1</sup> EPRI, Charlotte, USA

09:10 11

**Assessment and Treatment of Risks in the Inspection of Hollow Railway Axles: Implications for the Personnel Training**

*M. Bertovic<sup>1</sup>, R. Holstein<sup>2</sup>*

<sup>1</sup> BAM, Berlin, Germany; <sup>2</sup> DGZfP Education and Training, Berlin, Germany

09:30 12

**Effect of Feedback and Variation on Inspection Reliability**

*I. Virkkunen<sup>1</sup>, J. Haapalainen<sup>2</sup>, S. Papula<sup>3</sup>, T. Sarikka<sup>3</sup>, J. Kotamies<sup>4</sup>*

<sup>1</sup> Trueflaw, Espoo, Finland; <sup>2</sup> VTT, Espoo, Finland; <sup>3</sup> Aalto University, Espoo, Finland; <sup>4</sup> Metropolia University of Applied Sciences, Helsinki, Finland

09:50 13

**Addressing Human Factors in NDE by Using Remote NDE – Including Extern Experts in the Inspection Process Online for Enhancing Reliability in Today's NDE Challenges**

*N. Meyendorf<sup>1</sup>, R. Schallert<sup>2</sup>, S. Paul<sup>1</sup>, L.J. Bond<sup>1</sup>*

<sup>1</sup> Iowa State University, Ames, USA; <sup>2</sup> Fraunhofer IKTS, Berlin, Germany

10:10 Break



**Session 3****MODEL-ASSISTED POD**

*Chair: M. Spies, Fraunhofer IZFP, Saarbrücken, Germany*

**10:30 14****Achieving a more comprehensive POD using both simulation and measurements**

*M. Pavlovic<sup>1</sup>, A. Gianneo<sup>2</sup>, D. Kanzler<sup>3</sup>*

*<sup>1</sup> BAM, Berlin, Germany; <sup>2</sup> Politecnico di Milano, Italy;*

*<sup>3</sup> Applied Validation of NDT, Berlin, Germany*

**10:50 15****Development of a Protocol for the Acceptance of New NDT Capability in the Air Domain**

*C. Schneider<sup>1</sup>, A. Ballisat<sup>2</sup>, E. Tarrant<sup>3</sup>, P.I. Nicholson<sup>4</sup>,  
R. Smith<sup>2</sup>, D. Hallam<sup>5</sup>*

*<sup>1</sup> TWI, Cambridge, UK; <sup>2</sup> University of Bristol, UK;*

*<sup>3</sup> TWI, Middlesbrough, UK; <sup>4</sup> TWI, Port Talbot, UK;*

*<sup>5</sup> Dstl, Salisbury, UK*

**11:10 16****Image Based Surface Microgeometry Reconstruction – Modeling and Validation**

*M. Rauhut<sup>1</sup>, P. Gospodnetic<sup>1</sup>, M. Spies<sup>2</sup>*

*<sup>1</sup> Fraunhofer ITWM, Kaiserslautern, Germany;*

*<sup>2</sup> Fraunhofer IZFP, Saarbrücken, Germany*

**11:30 17****Simulation of POD curves in the context of justification Risk Reduction through In-Service Inspection**

*P. Calmon<sup>1</sup>, X. Artusi<sup>1</sup>, P. Dillström<sup>2</sup>, J. Gunnars<sup>2</sup>*

*<sup>1</sup> CEA LIST, Gif-sur-Yvette, France; <sup>2</sup> INSPECTA Technology, Stockholm, Sweden*

**11:50 18****Practical Considerations for Performing POD Studies**

*D. Forsyth<sup>1</sup>*

*<sup>1</sup> TRI, Austin, USA*

**12:10 Lunch**

# PROGRAM

Wednesday, Sept. 6

13:15

**Break-Out Session:**  
GROUP DISCUSSION ON RELIABILITY

15:30

Break



**Session 4**  
MODEL-ASSISTED POD  
*Chair: D. Forsyth, TRI, Austin, USA*

16:00

19

**Minimising the Number of Simulations in Model Assisted Qualification**

*A. Ballisat<sup>1</sup>, P. Wilcox<sup>1</sup>, R. Smith<sup>1</sup>*

*<sup>1</sup> University of Bristol, UK*

16:20

20

**Semi-empirical Determination Method for POD in NDT-ET Application**

*A. Gomis<sup>1</sup>*

*<sup>1</sup> Safran Aircraft Engines, Réau, France*

16:40

21

**Assessment of the Reliability of Phased Array NDT of Coarse Grain Component Based on Simulation**

*G. Ribay<sup>1</sup>, S. Mahaut<sup>1</sup>, G. Cattiaux<sup>2</sup>, T. Sollier<sup>2</sup>*

*<sup>1</sup> CEA, Gif-sur-Yvette, France; <sup>2</sup> IRSN, Fontenay-aux-Roses, France*

17:00

22

**MAPOD case study – EDF feedback and perspectives**

*F. Billy<sup>1</sup>, L. Le Gratiet<sup>2</sup>, Y. Gelebart<sup>1</sup>, L. Granal<sup>1</sup>*

*<sup>1</sup> EDF, Saint-Denis, France; <sup>2</sup> EDF, Chatou, France*

19:00

**Workshop Dinner at Biosphäre Potsdam**  
(Bus transfer from workshop venue starts at 18:30 h)

**Session 5****APPLICATIONS IN INDUSTRY***Chair: U. Ewert, BAM, Berlin, Germany*

08:30 23

**Reliable Quantification of the Performance of SHM Systems***P. Cawley<sup>1</sup>, S. Heinlein<sup>1</sup>, C. Liu<sup>1</sup>**<sup>1</sup> Imperial College London, UK*

08:50 24

**Reliability Measurement Studies Using EMATs for Circumferential Welds in API Carbon Steel Gas Transmission Piping***L. Schaefer<sup>1</sup>**<sup>1</sup> Blue Origin, Kent, USA*

09:10 25

**Determination of Defect Sizes with the help of Structural-Health-Monitoring Methods based on Guided Waves***K. Tschöke<sup>1</sup>, B. Weihnacht<sup>1</sup>, T. Gaul<sup>1</sup>, E. Schulze<sup>1</sup>,**L. Schubert<sup>1</sup>, R. Neubeck<sup>1</sup>**<sup>1</sup> Fraunhofer IKTS, Dresden, Germany*

09:30 26

**Acoustic Emission (AE) in Monitoring Diesel Engines Using Demodulated Frequency Analysis and Canonical Correlation***W. Abdou<sup>1</sup>, B. Reuben<sup>2</sup>**<sup>1</sup> University of Wolverhampton, Telford, UK; <sup>2</sup> Heriot-Watt University, Edinburgh, UK*

09:50 27

**A Reliability Study of Phased Array Ultrasonic Inspections Applied to Aluminothermic Welds in Rails***M. Carboni<sup>1</sup>, A. Gianneo<sup>1</sup>**<sup>1</sup> Politecnico di Milano, Italy*

10:10 Break

# PROGRAM

Thursday, Sept. 7



## Session 6

### RELIABILITY PARAMETERS

*Chair: M. Pavlovic, BAM, Berlin, Germany*

10:30 28

#### **Real Defects as the Major Challenge of Useful POD Evaluations**

*D. Kanzler<sup>1</sup>, M. Pavlovic<sup>2</sup>*

*<sup>1</sup> Applied Validation of NDT, Berlin, Germany; <sup>2</sup> BAM, Berlin, Germany*

10:50 29

#### **NDE Reliability using Laboratory Induced Natural Fatigue Cracks**

*V.K. Rentala<sup>1</sup>, P. Mylavarapu<sup>2</sup>, J.P. Gautam<sup>1</sup>, V. Kumar<sup>2</sup>*

*<sup>1</sup> University of Hyderabad, India; <sup>2</sup> Defence and Metallurgical Research Lab, Hyderabad, India*

11:10 30

#### **A Multi-Parameter Probability of Detection (POD) Model for Flash Thermography**

*C. Maierhofer<sup>1</sup>, N. Rothbart<sup>2</sup>*

*<sup>1</sup> BAM, Berlin, Germany; <sup>2</sup> DLR Institute of Planetary Research, Berlin, Germany*

11:30 31

#### **Achieving Reliability in Gamma Scanning through Effective Selection of Test Parameters**

*R. Mokkarala<sup>1</sup>, P. Raghavendra<sup>1</sup>, D. Kothari<sup>1</sup>*

*<sup>1</sup> Larsen & Toubro, Surat, India*

11:50 OPEN DISCUSSION

*Moderator: G. Selby, EPRI, Charlotte, USA*

12:10 Lunch

13:15 **Break-Out Session:**  
GROUP DISCUSSION ON RELIABILITY

15:30 Break



### Session 7

#### APPLICATIONS IN INDUSTRY

Chair: *L. Schaefer, Blue Origin, Kent, USA*

15:50 32

#### Reliability of Eddy Current Testing in Heat Exchanger Tube Inspection

*R. Pemmaraju<sup>1</sup>, S. Sarath<sup>1</sup>*

<sup>1</sup> *Larsen & Toubro, Surat, India*

16:10 33

#### Concrete Test Specimen for NDE Reliability Demonstration

*S. Keßler<sup>1</sup>*

<sup>1</sup> *TU München, Germany*

16:30 34

#### Considerations of Probability of Detection in Fracture-critical Inspections for Sport Forged Draglite Polished Car Rims

*B.R. Mabuza<sup>1</sup>*

<sup>1</sup> *Vaal University of Technology, Vanderbijlpark, South Africa*

16:50 35

#### Essential Parameters for the Visibility of IQIs and Small Indications in Digital Radiography

*U. Ewert<sup>1</sup>, U. Zscherpel<sup>1</sup>, J. Vogel<sup>1</sup>, F. Zhang<sup>2</sup>, N.X. Long<sup>3</sup>, T.P. Nguyen<sup>3</sup>*

<sup>1</sup> *BAM, Berlin, Germany*; <sup>2</sup> *Dresden International University, Germany*; <sup>3</sup> *VINATOM, Hanoi, Vietnam*

17:15

Closing

POSTERS

P1

#### Considerations for Aperture in Determining the Reliability of Guided Wave Measurement of Public Utility Casing Pipe

*L. Schaefer<sup>1</sup>*

<sup>1</sup> *Blue Origin, Kent, USA*

P2

#### Field Reliability Measurements for Saturated Low Frequency Eddy Current Assessment of Gas Transmission Piping

*L. Schaefer<sup>1</sup>*

<sup>1</sup> *Blue Origin, Kent, USA*

- P3**      **Enhancement of Detection Probability of Defects in Carbon Fiber Reinforced Plastics by a Methodical Parameter Study of Air-coupled Ultrasonic**  
*G. Schober<sup>1</sup>, C. Kolb<sup>1</sup>, S. Kremling<sup>1</sup>, M. Werner<sup>1</sup>, T. Hochrein<sup>1</sup>*  
<sup>1</sup> SKZ – Das Kunststoff-Zentrum, Würzburg, Germany
- P4**      **POD Improvement of Defects in Fibre Reinforced Plastics by Use of Multiply Flash Thermography with Variable Pulse Parameters**  
*G. Schober<sup>1</sup>, C. Kolb<sup>1</sup>, S. Kremling<sup>1</sup>, M. Werner<sup>1</sup>*  
<sup>1</sup> SKZ – Das Kunststoff-Zentrum, Würzburg, Germany
- P5**      **A Concept for a Holistic Risk-based Operation and Maintenance Strategy for Wind Turbines**  
*C.T. Geiss<sup>1</sup>, C.U. Große<sup>2</sup>*  
<sup>1</sup> IABG, Ottobrunn, Germany; <sup>2</sup> TU München, Germany
- P6**      **Application of the main provisions of the interstate standards GOST 33514-2015 „Production of Railway Applications. The Procedure for Verification of Non-destructive Testing Methods“**  
*V. Konshina<sup>1</sup>, G. Dymkin<sup>1</sup>, A. Shevelev<sup>2</sup>*  
<sup>1</sup> PSTU, St. Petersburg, Russia; <sup>2</sup> Inst. for bridges & NDT, St. Petersburg, Russia
- P7**      **Field Reliability Trials – How Well Does Our Magnetic Particle Inspection Work in the API/ASME Requirements Space**  
*L. Schaefer<sup>1</sup>*  
<sup>1</sup> Blue Origin, Kent, USA
- P8**      **Validation Techniques and Outcomes for 2d and 3d Measurements of Internal and External Corrosion Using Triangulated Lamb Waves**  
*L. Schaefer<sup>1</sup>*  
<sup>1</sup> Blue Origin, Kent, USA
- P9**      **Assessing the Performance of X-ray Computed Tomography**  
*N. Brierley<sup>1</sup>, F. Hiersemenzel<sup>1</sup>, N. Turner<sup>1</sup>*  
<sup>1</sup> The Manufacturing Technology Centre, Coventry, UK
- P10**     **Welding Defects Detection and Classification by Using Eddy Current Thermography Non-Destructive Evaluation**  
*B. Bahramimianrood<sup>1</sup>*  
<sup>1</sup> Sichuan University, Chengdu, China