



Commission V

NDT and Quality Assurance of Welded Products

Draft Agenda, Annual Assembly 2025

V-2011r1-2025

Author: Robert E. Shaw, Jr., Chair, WG-TCOM

Convenor: Dr. Giacomo Berisso

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Comments: Monday, 23 June 2025, 08.30 to 12.30, Room "Aliseo"

Meeting to be held in person only, not hybrid

Members are asked to review all documents prior to the meeting.

1. Agenda

08.30	1. Introduction		
	1. Welcome and apologies		Shaw, Berisso
	2. Approval of Agenda	V-2011-2025	Motion required
	3. Code of Conduct	V-2015-2025	information
	4. Antitrust Statement	V-2016-2025	information
	5. Confidentiality Statement	V-2017-2025	Information
	6. Review of Terms of Reference	3 Terms of Reference	Information
	7. Roll Call of Delegates		Shaw
8:40	2. Election for Chair of C-V (2025-2028)		Secretariat
8:45	3. V-A Radiographic based weld inspection techniques -		Uwe Zscherpel
9:05	4. V-C Ultrasonic Based Weld Inspection Techniques		
	V-2012-2025 Feasibility of Non-Destructive Testing (NDT) in welding process using laser-induced phased array ultrasound Authors: To Kang (presenter), Soonwoo Han, Kyung-Mo Kim, Hum-Hee Kim Abstract: Laser ultrasound has been extensively employed in applications involving Lamb and Rayleigh waves due to its superior signal-to-noise (S/N) ratio compared to bulk waves. However, the utilization of laser-generated bulk waves has been relatively limited, primarily due to their inherently low S/N ratio. Recent advancements in laser-induced phased array ultrasound, integrating the Total Focusing Method (TFM) with Full Matrix Capture (FMC) data, have addressed this limitation, facilitating the effective detection of bulk wave signals with enhanced clarity and resolution. Moreover, laser ultrasound, characterized by its small beam spot size, enables the precise inspection of narrow zones within target structures. The detection of defects in the welding process poses significant challenges due to the complex geometry and irregular surface roughness of welds. Additionally, conventional contact-based ultrasonic inspection methods are impractical in welding environments due to the harsh conditions. To overcome these challenges, a novel non-contact inspection technique is required for the effective detection of defects, particularly in regions with restricted access due to the nature of the welding process. Laser-induced phased array ultrasound presents a promising solution, demonstrating the capability to detect		

	defects with high precision. Its effectiveness has been validated through the successful detection of root cracks in welding process samples.		
9:25	V-C Ultrasonic-Based Weld Inspection Techniques (continued)		
	V-2013 2025 Intermediate inspection of multi-pass welding Authors: Marcello Consonni (presenter), Channa Nageswaran Abstract: Inspection of multi-pass arc welding at the intermediate stages of deposition can provide improved quality joints and economic benefits. For these reasons several industries have developed procedures to assess the joints at early stages, in particular where there is a need for rapid fabrication (such as offshore pipe laying) and when joining thick sections (such as nuclear components). A notable issue with inspection at intermediate stages of welding is the elevated temperatures that require suitable equipment and prevent the pollution of the joint by the inspecting systems. In addition to addressing these challenges, TWI is undertaking exploratory work to design appropriate data processing systems, making use of modern AI/ML technology that can provide a rapid and accurate assessment of the joint condition, specifically targeting the detection of imperfections that would fail the weld at the final inspections to meet fabrication standards. Early detection of such imperfections will allow for repair operations that are safer for the joint, reduce overall fabrication times and costs. This talk will present this ongoing work on automating data processing, highlighting the technologies and approaches being investigated.		
9:45	V-C Ultrasonic-Based Weld Inspection Techniques (continued)		
	V-2014-2025 “In-Process Ultrasonic Inspection during Fusion Welding” Author and Presenter: Charles N. MacLeod Abstract: Traditionally, welding and inspection of the welds are distinctly separate manufacturing processes. This ultimately limits productivity and throughput, along with increased re-work if defects are detected post-build. This presentation introduces ultrasonic inspection directly at the point of welding to allow detection of imperfections and flaws as they occur, thus reducing rework, repair, and removing redundant mid-stage inspections, delivering high-quality welds right, first time. High-temperature dry-coupled Phased Array Ultrasonic Testing (PAUT) is introduced directly during multi-process arc welding deposition. A novel automated roller probe for weld inspection is introduced and presented alongside imaging algorithms to compensate for the effect of negative process parameters such as temperature gradients, thickness variations, and Electromagnetic Noise Interference (EMI). The development and results of this work are presented on sub-scale plate and pipe demonstrators with intentionally controlled defects. The capability of the inspection system and step-change potential in confidence of post-weld quality is highlighted, reducing rework, emergent schedule slippage, and cost.		
1015	Break (30 minutes)		
10:45	5. V-C Ultrasonic-Based Weld Inspection Techniques		
	Working Group C-V-C-c “Revision of the “Austenitic Weld Inspection Handbook”	Channa Nageswaran	
	Working Group C-V-C-a “Development to see FMC and TFM for field inspections”	Daniel Chauveau	
	6. V-E Optical and Active Thermography Techniques (formerly Weld inspection based on Electric, Magnetic, and Optical Techniques)	Casper Wassink	
	Working Group C-V-E-c “Eddy current arrays”	Casper Wassink	

11:05	7. Working Group C-V-E-b “Revision of ISO 24497”		Uwe Zscherpel
	ISO 24497-1:2020 Non-destructive testing — Metal magnetic memory Part 1: Vocabulary and general requirements	Systematic review, stage 90.20	Eric Sjerne Andrew Davis
	ISO 24497-2:2020 Non-destructive testing — Metal magnetic memory Part 2: Inspection of welded joints		
11:25	8. V-F NDT Reliability Including Simulation of NDT Techniques		Pierre Calmon
11.45	9. Welding in the World Presentation and Discussion		Thomas Kann
12.00	10. Commission Business		Shaw, Berisso
	1. Updates to Terms of Reference		
	2. Intermediate Meeting(s)		
	3. Resolutions and Actions		
	4. Closing Remarks by the Convenor		
	5. Address by the incoming Chair of V		
12:30	10. Adjournment		Motion required

2. Commission Leadership

V	NDT and Quality Assurance of Welded Products	CH	vacant	
		VCH	<i>Pierre CALMON</i>	pierre.calmon@cea.fr
V-A	Radiographic-based weld inspection techniques	CH	Uwe ZSCHERPEL	uwez@bam.de
V-C	Ultrasonic-based weld inspection technique	CH	Channa NAGESWARAN	channa.nageswaran@twi.co.uk
V-D	Structural health monitoring	CH	Bastien CHAPUIS	bastien.chapuis@cea.fr
V-E	Weld inspection based on electric, magnetic, and optical techniques	CH	Casper WASSINK	C.H.P.Wassink@gasunie.nl
V-F	NDT-Reliability including simulation of NDT techniques	CH	Pierre CALMON	pierre.calmon@cea.fr

3. Terms of Reference

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Commission V oversees international standardization activities related to non-destructive testing (NDT) and evaluation of welded structures, with specialist groups focusing on radiographic, ultrasonic, electric/magnetic/optical, and reliability aspects. NDT plays a crucial role in ensuring the integrity of components, especially in detecting material defects and assessing mechanical conditions without causing damage. The commission emphasizes adapting to advancements in NDT techniques, with a current focus on preparing a new edition of the Ultrasonic Handbook for austenitic materials. The transition from film-based radiography to digital detectors, led by sub-commission CV-A, highlights the importance of standardization in technological shifts. The trend in NDT is moving towards 3D imaging inspection, supported by methods like total focusing method (TFM), with Commission V experts contributing to ISO standards in this area. Additionally, the commission addresses structural health monitoring (SHM) and is involved in revising standards like ISO 18211 for Guided Wave Testing.

Terms of Reference (V-1981-2023)

1. Scope and objectives

Commission V offers a platform for international experts for the dissemination, transfer, and exchange of state-of-the-art knowledge on Nondestructive Testing and structural health monitoring of welded products. The overall aim of these activities is to assure and improve the actual state of knowledge to meet industrial and societal requirements, to reduce the risk of catastrophic failure of components, and thus contribute to a higher level of safety in technical systems. These objectives are achieved by

- a. the discussion of the use of new developments in physics, chemistry and engineering in NDT applications
- b. the transfer of relevant new scientific knowledge into the development of new testing methods
- c. the multidisciplinary cooperation with other IIW commissions to enhance the mutual understanding between design, fracture mechanics, and NDT
- d. the cooperation with further national and international NDT-societies and the community to coordinate activities
- e. the preparation of industrial standards, where rules on how to apply a method are still missing
- f. publishing the results in scientific peer-reviewed articles (such as *Welding in the World*) or other publications.

This is achieved through a number of Commission, sub-commission, and Working Group meetings, conducted worldwide, where actual research results are presented and discussed.

2. Key Objectives and deliverables

Key objectives of Commission V are:

- Attract high-impact NDT and SHM experts to participate in Commission V meetings.
- Initiate new working groups to improve the level of current technological knowledge.
- Initiate joint sessions to improve the level of current technological knowledge between different disciplines.
- Draw up new international standards and Best Practice Documents.
- Support the publication of high-quality manuscripts in *Welding in the World*
- Support the participation of young professionals in Commission V activities.
- Attract new members from industry

4. List of Delegates assigned Voting Rights for Commission V Business

The persons listed below are currently listed as the voting DELEGATES to Commission V, with the responsibility and sole right to vote on behalf of their National Delegation on specific business items. These items include:

- Election of the Chair of C-V
- Recommendations to forward a paper to be considered for publication in Welding in the World
- Decisions regarding initiation, revision, or approval of ISO standards under the jurisdiction of C-V

Updates to this list, including changes in the voting Delegate or the addition of a Delegate for those where no Delegate is shown, are to be handled by the Representative for the Responsible Member Society, with direct communication with the IIW Secretariat. See <https://iiwelding.org/iiw-members/> for the name and contact of the Representative to submit, to the Secretariat, any additions, deletions, or corrections to this list.

The current list is based upon previous C-V meetings where Delegates had been assigned to C-V. If your Country is not listed below, contact your Representative to have both your Country and the Delegate's name added.

DELEGATE NAME	COUNTRY	DELEGATE NAME	COUNTRY
David LAKE	AUSTRALIA		REPUBLIC OF KOREA
Norbert ENZINGER	AUSTRIA		ROMANIA
Staf HUYSMANS	BELGIUM		SERBIA
Narin BARNES	CANADA	Lubos HEGEDUS	SLOVAKIA
Dezhi MA	CHINA	Milos JOVANOVIC	SLOVENIA
	CROATIA	Fernando MAÑAS ARTECHE	SPAIN
	CZECH REPUBLIC		SWEDEN
	DENMARK	Daniela GRUTTER	SWITZERLAND
Kai RUOTSALAINEN	FINLAND		THAILAND
	FRANCE		THE NETHERLANDS
	GERMANY	Ugur GUROL	TURKEY
	HUNGARY	Channa NAGESWARAN	UK
Rituraj BOSE	INDIA	Peng (Edward) WANG	USA
Stefano BOTTA	ITALY		
	JAPAN		
	PORTUGAL		