



11th IFAC Conference on  
**Manufacturing Modelling, Management and Control**  
 Trondheim, Norway, 30 June - 3 July 2025

*Be the Impact! Make a better world.*

**Invited Session:**

**Quality Management in Re-Manufacturing: Challenges and Opportunities in remanufacturing from a quality perspective; Zero defect re-manufacturing** **Code: 517wm**

**Organizers**

Sotirios Panagou	NTNU	<a href="mailto:sotirios.panagou@ntnu.no">sotirios.panagou@ntnu.no</a>
Foivos Psarommatis	University of Oslo	<a href="mailto:foivosp@ifi.uio.no">foivosp@ifi.uio.no</a>
Fabio Sgarbossa	NTNU	<a href="mailto:fabio.sgarbossa@ntnu.no">fabio.sgarbossa@ntnu.no</a>
Fabio Fruggiero	Unibas	<a href="mailto:fabio.fruggiero@unibas.it">fabio.fruggiero@unibas.it</a>

**General Theme: Zero Defect Re-Manufacturing (ZDRM)**, focuses on the principles of Zero Defect Manufacturing (ZDM), to address the challenges of remanufacturing under uncertainty, particularly concerning the quality and condition of returned products and components. In remanufacturing, where there is significant variability in the quality of End-of-X life of the product, maintaining high-quality production processes becomes a major challenge especially when implementing circular approaches such as remanufacturing. Unlike traditional manufacturing, remanufacturing deals with a wide range of product conditions, where returned products may have been subjected to varying degrees of use, wear, and damage. The uncertainty surrounding the quality of these returns directly impacts the remanufacturing process, making it difficult to maintain defect-free production.

This session will focus on strategies to manage these uncertainties to achieve zero defects in remanufacturing operations and the need for advanced techniques to **assess the quality of returned components** and make informed decisions that drive efficiency and quality in remanufacturing processes. Participants in this session will explore solutions to mitigate risks such as **Inconsistent product quality**, leading to challenges in maintaining zero-defect production, **Excessive waste or rework**, resulting from unforeseen defects in returned products, or **Variability in production outcomes**, driven by the condition of the remanufactured components.

**Topics to be covered in this session include but are not limited to:**

- Quality management practices for re-manufacturing.
- Managing uncertainty in returned products and components quality and condition in remanufacturing.
- Zero Defect Manufacturing principles applied to remanufacturing with variable-quality inputs.
- Lifecycle-based approaches to assess and improve the quality of returned products using Digital Product Passports (DPP).
- Decision-making frameworks for determining whether to repurpose, reuse, recycle, or dispose of returned products.
- Reverse logistics and its role in ensuring the quality of remanufactured goods.
- Strategies to minimize defects in remanufacturing due to inconsistent quality of returned components.
- The role of advanced technologies (e.g., IoT, AI) in assessing and improving the quality of remanufactured components.