The value of working together on Robotics for Inspection and Maintenance

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RIMA Alliance meeting
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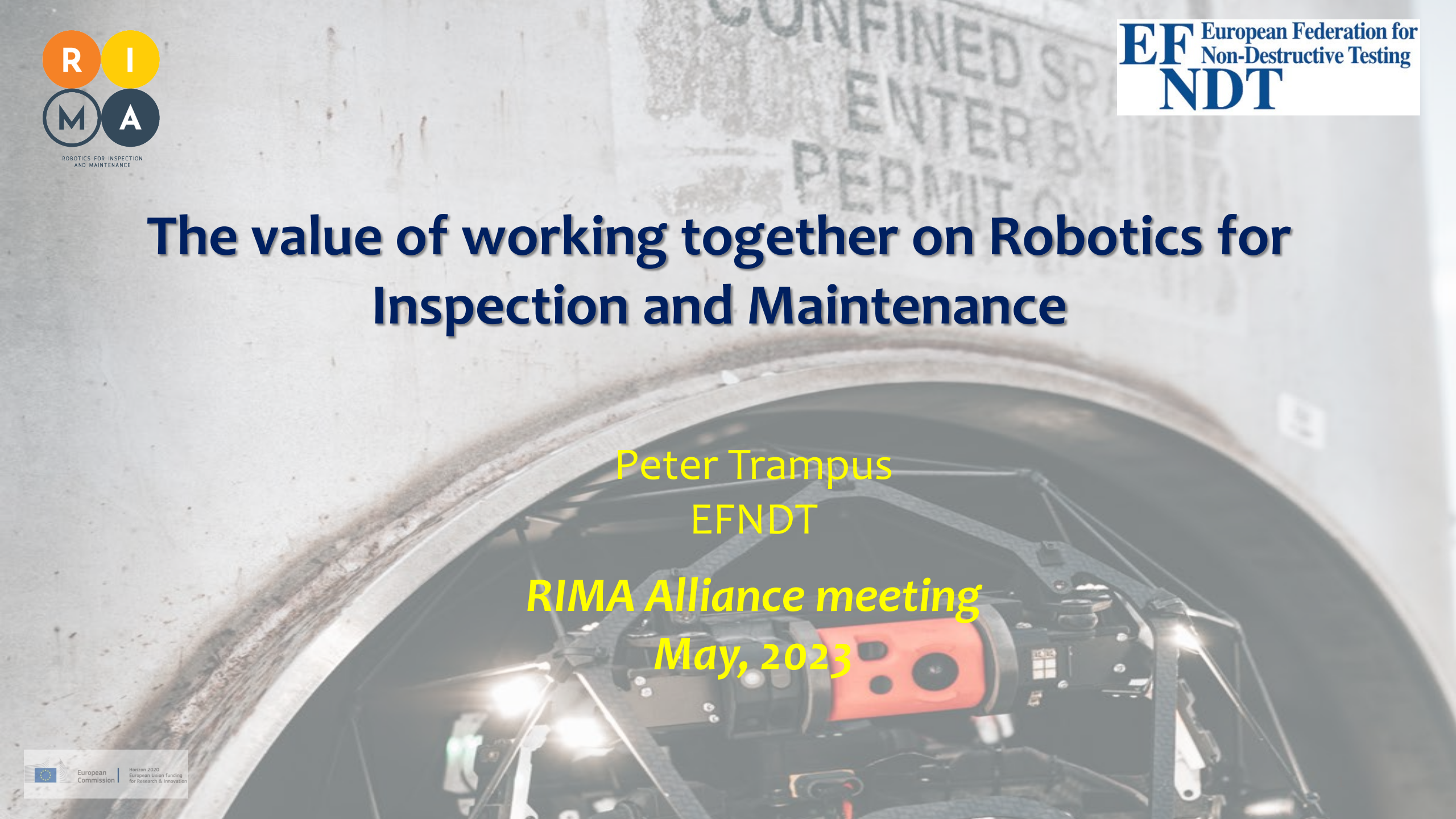


The value of Non-Destructive Testing in robotics solution

Yesterday / today — Non-Destructive Testing (NDT)

Today / tomorrow — Non-Destructive Evaluation (NDE)

- **Overall (most common) goal:**

  Detection of **deviation** from condition suitable for use of engineering components and structures

- **Social value – SAFETY**

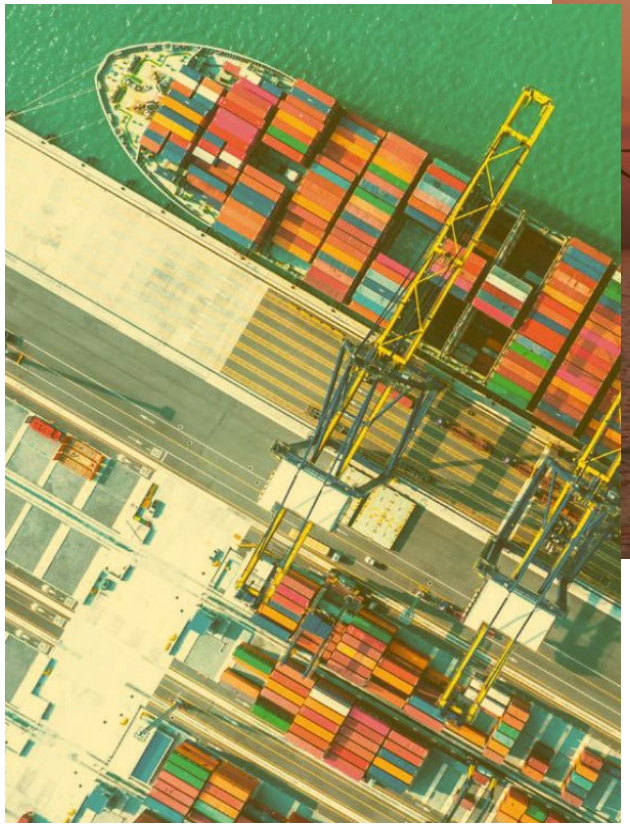
  Saving human, natural and built environment in case a structure fails due to non-detection of a flaw

- **Commercial value – PRODUCTIVITY**

  Optimizing service life and performance of assets being inspected

Industry sectors covered by RIMA

Extremely complex, high-value, high-risk assets



Asset management

Systematic and coordinated activities and practices to optimally manage the physical asset, the associated performance, risks and expenditures over their lifecycle for achieving the organizational strategic plan

Assets are ageing ⟶ Safety margin degrades

Engineering aspects of asset management:

Ageing Management (AM)

In-Service Inspection (ISI)

NDT / NDE

NDT

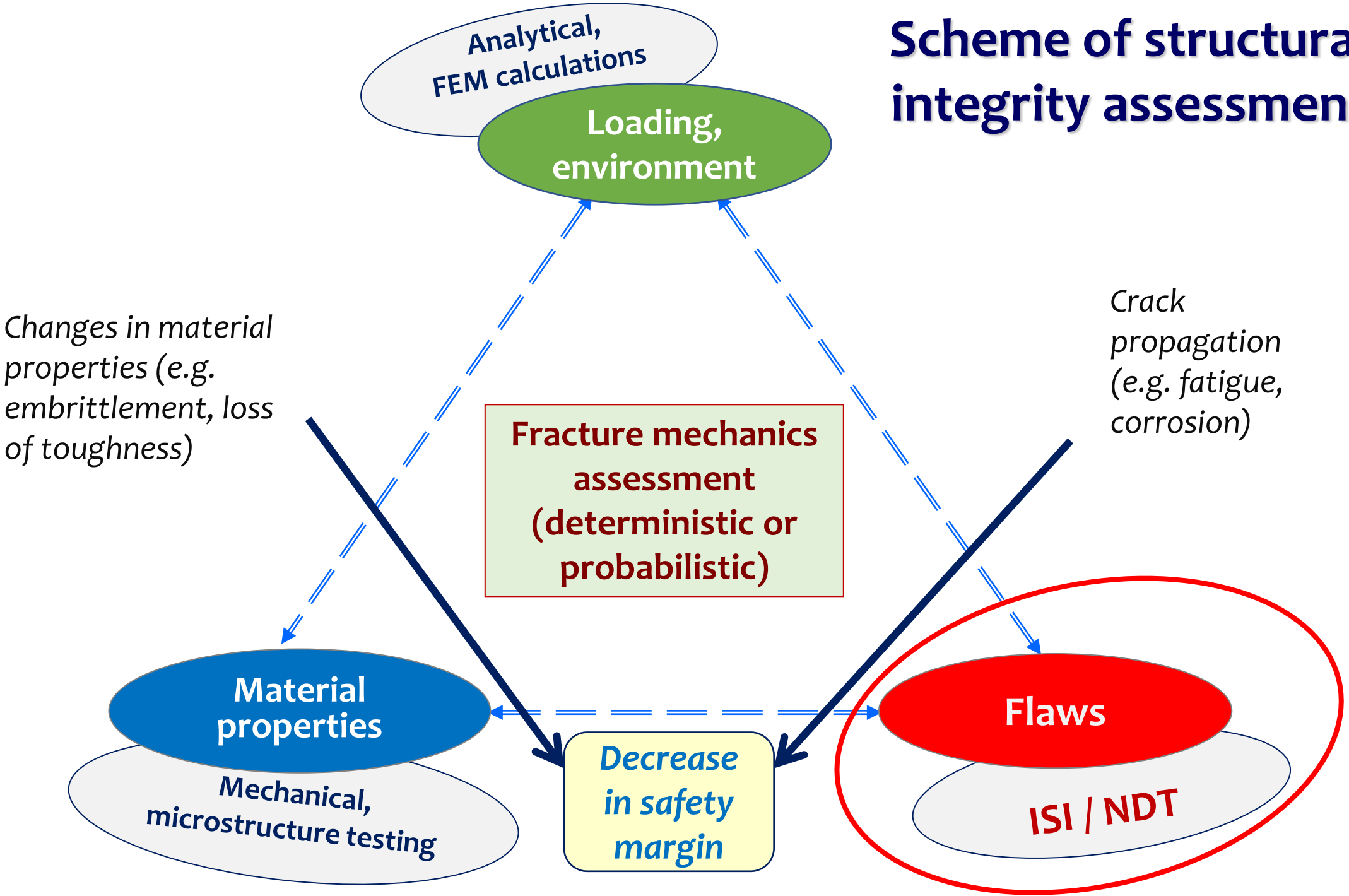
ISI:

- Periodic, robotic driven NDT
- to provide information about the possible ageing degradations and effects
- to determine whether the assets are acceptable for continued safe operation or whether remedial measures should be taken

NDT is the core area of ISI:

- standardized visual (VT), surface (PT, MT, ET) and volumetric (UT, RT) **methods**
- deliver input on existence, size and other characteristics of **flaws**
- to assess the components' **structural integrity** (NDT is not an end but a means)

Scheme of structural integrity assessment



21st century's environment

Determining processes world-wide:

- globalization
- digitalization
- technological revolution (*Industry 4.0*)

NDT must be carried out in an environment of the 21st century:

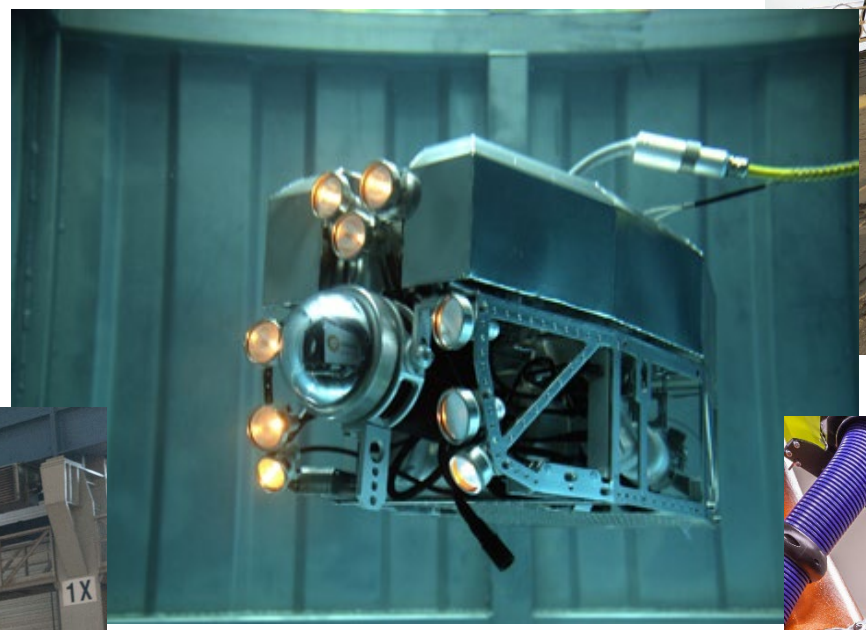
- in harmony of the requirements of the digitalized world (*NDE 4.0*)

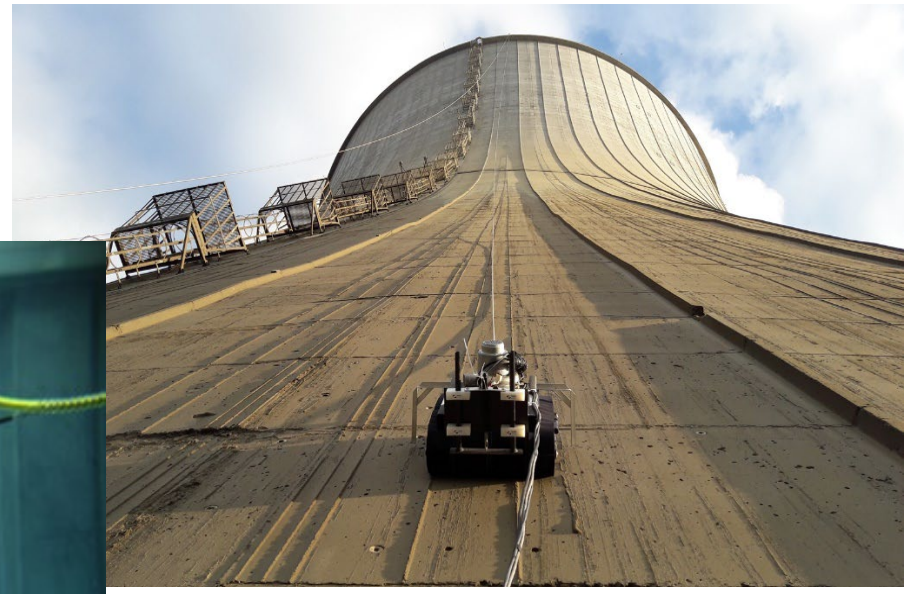
To meet these requirements using robotic solutions are indispensable

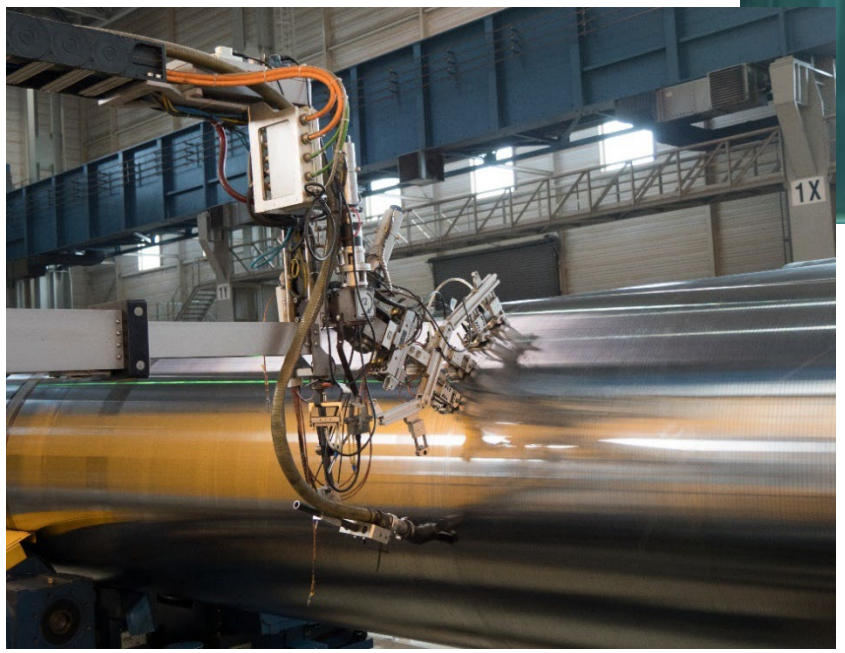
Benefits of robotic solutions

- Increasing the inspection safety and reliability
- Saving the human operators' health,
- Reducing the inspection time especially in harsh environment,
- Allowing accessibility of non-accessible areas
- …

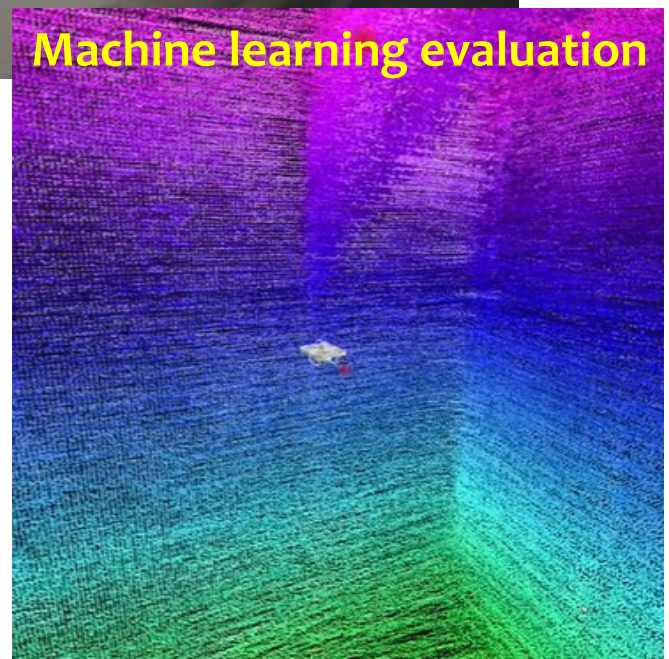
Examples – general







Examples of RIMA Open Calls



Concrete and metallic structures (indoor inspection of water treatment plants)

Laser scanner profilometry data post-processed by specialized software, then transformed into robot motion for UT probes