

# NON-ENTRY CHALLENGE KICMPI

Who has the best solutions for non-entry inspections and work in confined spaces?



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# ABOUT THE NON-ENTRY CHALLENGE



## **Safety, quality and efficiency in the process industry**

Confined spaces such as vessels and tanks pose a danger to anyone entering them. For example, there is a risk of suffocation, intoxication, fire and explosion. Yet entering confined spaces is necessary and even until now legally required for inspection, welding and mechanical work. This results in high costs (millions to even billions) and sometimes serious accidents and (fatal) injuries.

Smart Maintenance Labs partners want to achieve a strong improvement in safety, quality and efficiency through the OP Zuid Project 'Smart Maintenance Labs', part 'Maintenance in the process industry'. In the non-entry challenge we are looking for safe and reliable alternatives.

## **3 categories**

Work in confined spaces is diverse. So are the alternative solutions. This challenge is therefore divided into 3 categories: for measuring methods, welding inspections and mechanical machining.

- Category 1 - Measurement Methods: Who can develop a technology for safe and efficient inspection measurements of confined spaces, without having to open these spaces?
- Category 2 - Welding Inspections: Who can provide a method for unmanned welding inspections in confined spaces?
- Category 3 - Mechanical Operations: Who can develop a solution that allows mechanical operations to be performed in confined spaces without entering them?

**Goal**

For each category, the objective is to develop a working prototype within 1 year for the non-entry of the mentioned operations. This prototype should comply with all applicable industry (ATEX) guidelines and certifications. In addition, the methodology of the prototype should be approved by a notified body (a government-appointed inspection or testing institute) and the government itself, so that it may be used in practice. It is also important that the solution, compared to existing methods, increases safety and saves a considerable amount of time and money.

**Contact**

Questions about the challenge? Ask them [here!](#)

# CATEGORIES

Work in confined spaces is diverse. So are the alternative solutions. This challenge is therefore divided into 3 categories: for measurement methods, welding inspections and mechanical machining. Each category has its own challenges and level of development. In short, it comes down to this:

- Category 1 - Measurement methods: Who can develop a technology for safe and efficient inspection measurements of confined spaces, without having to open these spaces?
- Category 2 - Welding Inspections: Who can provide a method for unmanned welding inspections in confined spaces?
- Category 3 - Mechanical Operations: Who can develop a solution that allows mechanical operations to be performed in confined spaces without entering them?

## Explanation of measurement methods



### Challenges

Enclosed spaces, such as tanks and vessels, do not have an infinite life. With aging and degradation comes a point when vessels or tanks must be replaced or repaired. To determine that point of maintenance or end of life, thickness and internal condition measurements are necessary and required by law. The challenge is to be able to make such measurements without having to open up the confined space.

## Developments

Several experiments with drones, robots and cameras are already underway to develop non-entry measurement methods. Attempts are also being made to arrive at reliable conclusions using NDT (Non Destructive Testing) with the aid of sensors on the outside of the equipment in combination with process and laboratory data on temperature changes, pressure and level.

Whatever your solution for a non-entry measurement method is or will be, it doesn't matter if it is in line with existing developments or concerns a completely new approach. The Smart Maintenance Labs partners are receptive to all innovative ideas.

### Asset owner involved in this challenge:

DSM

## Explanation of welding inspections



### Challenges

To ensure the safety of equipment, the law requires that an inspection of the welds be done every 10 years. This concerns flat welds on vertical and horizontal surfaces and fillet welds, in confined spaces. The challenge is to develop a method for both situations to check the welds 100% without entering confined spaces. The inspector must be able to view the results live and/or afterwards. Preferably, the method is additionally provided for dealing with obstacles such as coils and pipes and leaves no contamination.

### Developments

Partners of Smart Maintenance Labs have already made initial inroads into finding a good solution, but these initiatives have not yet been further developed. Whatever your solution for a non-entry weld inspection is or will be, it does not matter if it is in



line with existing developments or concerns an entirely new approach. The Smart Maintenance Labs Partners are open to all innovative ideas.

**Involved asset owner in this challenge:**

Dow Chemical

## Explanation mechanical processing



### Challenge

Mechanical machining must occur regularly in confined spaces. Think of repairing, removing and/or assembling new parts. This involves activities such as grinding, disassembling, removing, tightening and loosening bolts, welding and bricklaying. The challenge of this challenge is therefore to develop a generic platform with interchangeable tools with which the various activities can be carried out with no entry. The solution is aimed at one or, preferably, all of the following 3 areas:

1. Grinding out and/or repairing welds (grinding, welding, applying patch plates)
2. Remove and replace masonry, ceramic components, and cut and repair piping
3. Loosening and tightening bolts and nuts in reactors, etc.

Additional points of attention: the work must be carried out with little emission and dust, the equipment must fit through a passage of 24" and there must be no risk of falling.

### Developments

Although various pilots are already running in the field of inspection, there are no known structural developments in the field of non-entry mechanical processing. So you start with a blank canvas.

**Involved asset owner in this challenge:**

Dow Chemical

# WHY PARTICIPATE?

Participation in this challenge offers you many opportunities to make your idea a reality and a success.

## **This challenge is for you**

This challenge is for you when you think you know the solution to the challenge(s) of one or more categories. It doesn't matter if you are a large established company, SME, startup, engineer or student. However, it is important that you are located in Zeeland or Brabant or that your project has a major impact in these two provinces. Experience in process engineering and industry may seem an advantage at first glance, but perhaps you will prove otherwise by looking at the problems without prejudice and surprising all parties involved with creative solutions.

In short: everyone who knows or thinks they know a solution for one or more categories of this non-entry challenge by Smart Maintenance Labs partners, is welcomed with open arms.

## **Subsidy**

For the development of the prototypes of the full non-entry challenge a total of € 150,000 subsidy is available. Part of this is therefore available for the realization of your idea. The amount of the subsidy per participant in the non-entry challenge will be determined in consultation and will be on a 50/50 basis: the budget required for the realization of the prototype will be made up of 50% own contribution and 50% subsidy.

## **Additional knowledge and expertise in the development**

By participating in this non-entry challenge of Smart Maintenance partners you get access to the advanced testing and development facilities and active support from the network of Smart Maintenance Labs partners. The consulting and educational institutions, asset owners and maintenance contractors involved will be happy to contribute to your innovation with their expertise and facilities. They will help you with the technology, but also with the feasible revenue models and financing options. Together you will tackle this development project and increase your chances of success. Of course, this will always be done in close consultation and with fair and clear contractual agreements about the ownership of the innovation.

## **Successful start thanks to enormous network**

An important, if not the most important step towards a successful launch of your innovation in the market. Through Smart Maintenance Labs Partners this market is within your reach. The parties involved in this large network are more than willing to bring your successful innovation to the attention of their own networks. This gives you an enormous range and a great chance of success.



**What do you need to apply?**

Do you think you have the solution for one or more categories of the non-entry challenge of Smart Maintenance Labs partners? Then send in your idea. If you are selected, you will have to go through a deeper round during the Challenge Weeks to see if you have the right idea and if we can come to an innovation contract together. If you win an innovation contract, you can get started.

# SIGN UP

## Submission

Here's what your submission should meet:

- Description of the concept;
- Description of the pilot;
- Description of your company/team;
- Description why you are participating in the non-entry challenge and what you think you need from Smart Maintenance Labs partners to realize the solution;
- Max 4 pages or 10 slides or a video of max 3 minutes.
- (Optional) Completed concept budget for your initiative (download template in excel here)

## Schedule

- July 1<sup>st</sup> 11:59 PM: Closing date for submissions
- July 5: Invitation of participants to matchmaking
- July 8 and 12: Introductory interviews
- July 13: Announcement of participants who are admitted to round two: the Challenge Weeks
- July 16th: Kick-off event Challenge Weeks
- 17 September: Deadline for submitting project proposal
- 21 Sept: Announcement of the assigned project participants
- 1 October: Award ceremony for winners

**[Click here to sign up](#)**

# ABOUT SMART MAINTENANCE LABS

We mentioned it before: Smart Maintenance Labs partners want to search for solutions for the non-entry challenge in maintenance in the process industry through the OP Zuid Project 'Smart Maintenance Labs'. Below you will find more information about this overall project.

**This project is powered by**



**Europese Unie**

Europees Fonds voor Regionale Ontwikkeling



Ministerie van Economische Zaken  
en Klimaat



**Provincie Noord-Brabant**

## **Project: Maintenance 4.0 in the process industry**

By applying robots and automated processes, maintenance in the process industry can improve significantly in terms of safety, quality and efficiency. This project brings together the demand from the industry with the supply of much knowledge and skills of SMEs in the field of automation, mechatronics and robotics. The project period runs from June 7, 2019 to January 1, 2023.

### **Objective and activities.**

The objective of the project is to realize a new and open innovation system in which Maintenance 4.0 applications (including robotics) are developed that make industry safer, more sustainable and more reliable. This will improve the competitive position of the regional industry (with a strong focus on the process industry) and strengthen the Maintenance cluster.

### **Project content**

In the Smart Maintenance Labs, new products and services are developed and new business is created in the Delta region. We do this by linking the needs and challenges of asset owners to the supply of innovative applications and solutions from SMEs. The necessary facilities will be developed and used to develop, test and demonstrate the applications. Through five concrete projects and about the same number of projects to be defined, value is realized within the project for all stakeholders and validation of the innovation model conducted.

### **5 concrete projects Smart Maintenance Labs**

1. Effective inspection in explosive environments
2. Non-entry maintenance | Launch Platform Development
3. Cleaning & Coating | Increase Crawler Capabilities
4. Activities at height | Drone Deployment
5. Troubleshooting | Augmented- & Virtual Reality Maintenance

**Project partners**

- Avular
- Breda Robotics
- Dockwize
- Draftec
- ExRobotics
- Nobleo Projects
- SieTec Industrial Automation
- Synchron Instruments
- Terra Inspection
- World Wide Automation
- KicMPi

# ABOUT KICMPI

[KicMPi](#) stands for Knowledge and Innovation Center Maintenance Process Industry. This independent cooperative was established in 2011 to stimulate innovation in the industry. It does this by promoting cooperation between asset owners and maintenance contractors and bringing them into contact with external consulting and educational institutions.



KicMPi initiates brainstorming sessions and meetings to arrive at broadly supported problem statements and solutions. The cooperative provides support in determining problem definitions, searching for solutions, developing concepts, supervising innovation projects and offering development and test facilities in the form of Smart Maintenance Labs. Over the past ten years, dozens of projects involving asset life management, circular economy, corrosion prevention, inspection, robotics and more have led to impressive innovations.

KicMPi has about 50 members, from asset owners like Dow Benelux, DSM, BP, Zeeland Refinery and Yara Sluiskil to maintenance and inspection companies like Boskalis, Engie Services, Spie Nederland and Syndus Group. Various consultancy and knowledge institutions are also connected, including HZ University of Applied Sciences and NV Economisch Impuls Zeeland. The powerful network of KicMPi extends far beyond the members through the (board) members. It covers companies and stakeholders worldwide.