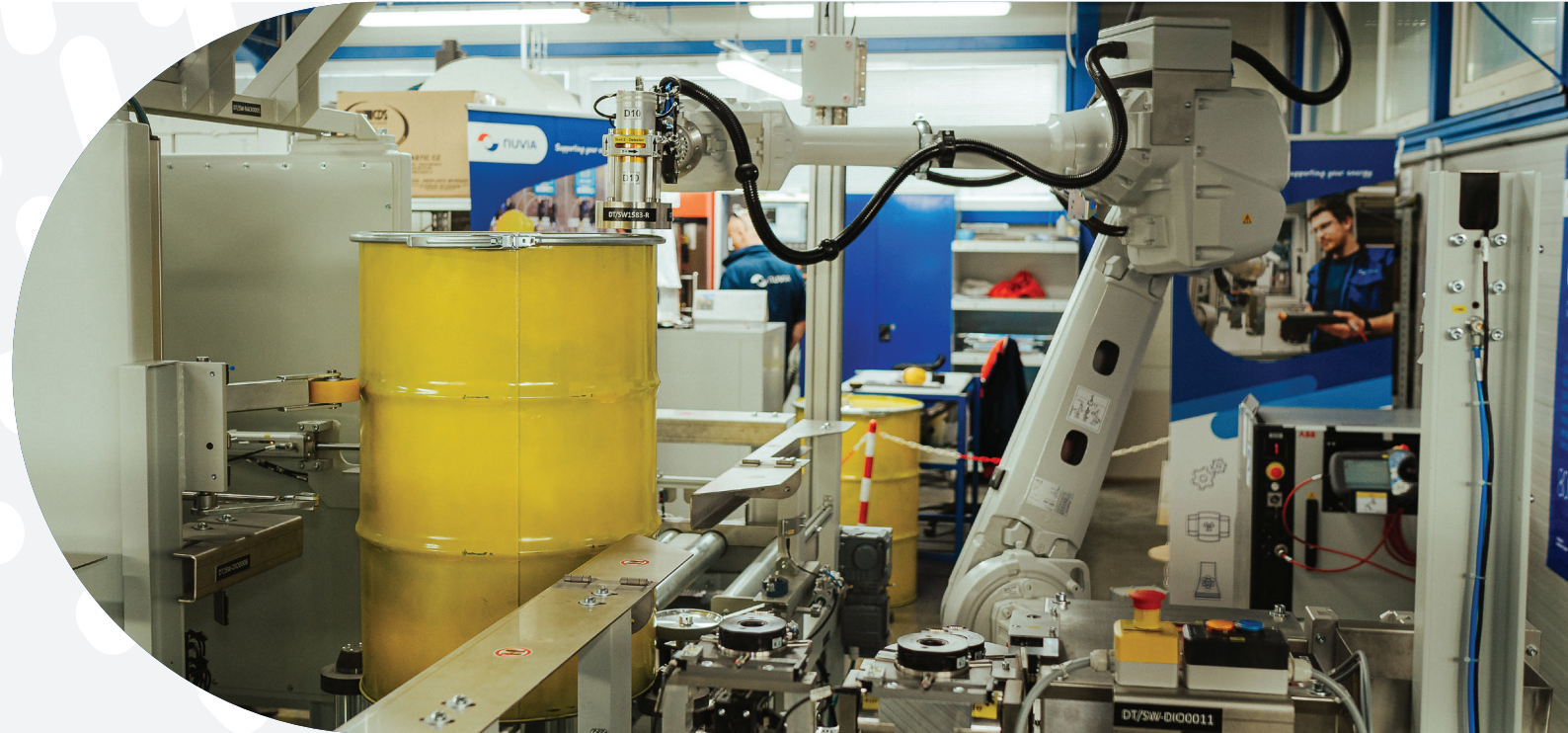


Automated Waste Characterization System



This project is intended to automate the characterization of radioactive waste at Nuclear Plants, and make the characterization process more effective, safer for operators and more reliable due to process repeability. The aim of the project was design, software development, manufacturing, installation on site and commissioning of two different systems.

Scope

- Two fully automatic systems to characterize solid waste stored in 200l and 400 l drums.
- Pseudo-contact gamma dose rate measurement on 100% of the surface performed by custom-designed detector fitted to industrial 6-axis robot.
- Surface alpha + beta contamination monitoring performed on predefined areas – automatic manipulation with wipe by custom-designed exchangeable robot tool.
- HPGe detector and software package for precise nuclide activity determination.
- All levels of software (from system control to data analysis, archiving and reporting) integrated in a single software solution.
- Fully automatic daily QA control performed by robot with test sources (alpha, beta, gamma).

CHALLENGES

Integration of various approaches to fully automate the process.
 Interdisciplinary cooperation combining of automation, radiometric systems, software development, detectors technology.
 Tailor-made solution based on customer requirements.

KEY FIGURES

Characterization of 10 pcs 200l drums/8 hours
 Characterization of 1 pc 400l drum/hour

PROJECT TIMELINE

Beginning of project – 06/2022
 Site acceptance test, yellow drums – 02/2024
 Site acceptance test, black drums – 04/2024

TECHNICAL SOLUTIONS

Unconditioned waste

- Transported in 220l yellow drums
- Contact dose rate < 2mSv/h
- Weight up to 400kg
- Non-treated

The system consists of:

- Automated U-shaped roller conveyor
- 6-axis industrial robot (including 4 interchangeable tools)
- Electrically cooled HPGe detector
- Dose rate detectors
- Fully automated surface contamination measurement
- Integrated weighing system
- Software

Conditioned waste

- Transported in 400l black drums by AGV's Automatic Guided Vehicles
- Contact dose rate up to 1Sv/h
- Weight up to 1500kg

System consists of:

- Automatic frame for lifting and handling the barrel to the defined position for measurement
- 6-axis industrial robot (including 4 interchangeable tools)
- Electrically cooled HPGe detector
- Dose rate detectors
- Fully automated surface contamination measurement
- Software
- The design includes an independent emergency control system release and release of the drum from the structure

