

## FM4017 Project

**Title:** Development of an automation tool to report process data to WATS in real time during machines operation

**USN supervisor:** Hans-Petter Halvorsen

**External partner:** Inission Løkken

### **Task background:**

Currently, Inission Løkken has unused data from Automated Optical Inspection (AOI-Pre and AOI-Post) and Solder Paste Inspection (SPI) machines. The aim is to integrate this data into WATS (a cloud-based test data management solution by Virinco designed for the electronics industry), a statistical tool and database to support process capability metrics including Cp and Cpk calculations (process capability and process capability index respectively), enabling statistical analysis of process performance.

In addition to near real-time reporting, historical data will be integrated to establish baseline capabilities into WATS. The overall goal is to develop an automation tool that reports process data to WATS near real-time during machine operation. Another objective is to create an Operations User Interface (Ops UI) dashboard that uses the process data collected and displays findings from the three inspection processes, enabling traceability across process stages and easier identification of correlations between deviations and process variations, as well as root causes and process errors detected later in production.

The project focuses on the primary production line for Surface-mount Technology (SMT), which represents a standardized manufacturing environment suitable for initial implementation and validation of the WATS integration framework.

### **Task description:**

- Provide an overview of WATS and explore relevant use cases for process monitoring and quality improvement.
- Assess the three existing process data sources:
  - SPI (Solder Paste Inspection)
  - AOI-Pre (Pre-Reflow Automated Optical Inspection)
  - AOI-Post (Post-Reflow Automated Optical Inspection)
- Evaluate available integration approaches, tools, frameworks, and programming languages suitable for data collection, integration, and dashboard development.
- Develop an automation tool that retrieves process data from available internal sources and reports it to WATS near real-time during machine operation.
- Create an Ops UI dashboard within the WATS platform that displays process data from the three sources (SPI, AOI-Pre, AOI-Post), enabling both internal process monitoring and customer-facing quality transparency through traceability and process capability metrics.
- Identify potential challenges in the current source data that could hinder integration with WATS, affect statistical validity or reduce the usefulness of the combined dataset.
- Deliver a final project report in accordance with USN guidelines.

**Student category** ITA<sup>1</sup> - The project is reserved for online student employed by the company Inission Løkken.

**Is the task suitable for students not present at the campus (e.g. online students)?** Yes

**Practical arrangements:** None

**Signatures:**

Supervisor (date and signature):

Hans-Petter Halvorsen

Hans-Petter Halvorsen – 2025.10.24

Students (date and signature):

VIACHESLAV  
DEMUSHKIN Demushkin

Viacheslav Demushkin – 2025.10.27

---

<sup>1</sup> Select one or more of the following categories: EET-ET = EET, specialization *Energy Technology*, EET-HT = EET, specialization *Hydrogen Technology*, PT = Process Technology, EPE = Electrical Power Engineering, ITA = IT and Automation