

# Project management services support equipment deliveries

## Systematic change management streamlines work



The battery chemical plant is located in the Terraframe factory area

## Terrafame

Terrafame Ltd is a multi-metal company producing nickel, zinc, cobalt and copper at its mine and metals production plant located in Sotkamo, Finland. Company's aim is to conduct environmentally sustainable, safe and profitable operations.

**Endress+Hauser provided comprehensive project management services to the battery chemicals plant, completed in spring 2021, to support the project's large-scale equipment deliveries. Systematic management of project changes made the customer's and the designer's work easier and enabled flexible customization of solutions.**

The future of electric cars is being built in Sotkamo. Completed in spring 2021, Terraframe's battery chemical plant will produce nickel and cobalt sulphate for the manufacture of electric car batteries.

– It is a battery chemicals plant that consists of three phases. First, metal is dissolved at a high temperature and pressure (pressure oxidation, POX). At the extraction stage (SX), impurities, nickel sulphate and cobalt sulphate are separated. Finally, the end products are crystallized at the crystallization plant (CRY).

The aforementioned processes require different types of water (cooling water, raw water, chemically purified water, and demineralized water), which are produced by a water plant (WT2), and oxygen, which is provided by Air Liquide's oxygen plant. These processes also require steam, which is supplied by Adven's steam power plant. In addition, the processes require chemicals, such as ammonia. For this purpose, Terraframe has built an ammonia terminal (AT), which operates as an ammonia reception unit, explains **Seppo Reijonen**, Automation Manager in Terraframe's battery chemicals plant construction project.

The project involves several challenging processes and requires a great deal of instrumentation in the field. Endress+Hauser has supplied most of the project's field devices – for almost one thousand measurement positions.

Endress + Hauser 

People for Process Automation

Endress+Hauser won the competitive bidding to be the new plant's equipment supplier thanks to its synergy benefits and wide range of equipment. Endress+Hauser and Terrafame had been working closely together before the launch of the project, and many other plants in the region also use equipment supplied by Endress+Hauser.

– This was a major project with a tight schedule. We wanted to find the best possible solution and the most reliable supplier. We selected all the solutions that Endress+Hauser could provide for each position at a reasonable price, says Reijonen.

### Project management and expert knowledge

The project began in fall 2018 and the field device procurement process started in summer 2019. Endress+Hauser submitted its tender when the project plans were still unfinished, and it knew that changes in equipment procurement were inevitable. Endress+Hauser identified a need for comprehensive project management and offered a project management service to Terrafame, in addition to the delivery of equipment.

In October 2019, Project Manager **Tapio Vesiluoma** from Endress+Hauser joined the project to manage the large equipment base and the project processes.

– My role is to ensure that we find equipment that is best suited for the needs of the customer and the plant at the project's implementation stage, says Vesiluoma, who has been working with automation solutions since 1989.

External project management makes the customer's and the designer's work easier and enables flexible customization of solutions. The designers of the plant benefitted from Vesiluoma's expertise as well.

– We had to close the first equipment deals based on preliminary

information while the design phase was still in progress. Tapio has been indispensable to the management of Endress+Hauser's equipment base, and he has made our designers' job easier, says Project Engineer **Petri Leksis** from Sweco, who is responsible for the project's instrumentation and automation.

Endress+Hauser's expertise was also useful during the procurement negotiations.

– We went through all the equipment required for the project with Endress+Hauser's **Elisa Manninen**, **Kari Isometsä**, Seppo Reijonen and Petri Leksis. They gave us valuable information on e.g., piping and mechanical engineering. They also helped us notice several compatibility and design issues, Leksis praises.

### W@M information service helps manage the equipment base

Usually, developers do not contact their equipment supplier until the last leg of the design phase, but Vesiluoma reminds that not everything has to be finalized at the ordering stage. Often, the best solutions are found and confirmed later.

Terrafame's process plans have also changed over time, and several solutions selected at the sales stage have been replaced. Reijonen and Leksis praise Vesiluoma for his excellent adjustment to the changing plans.

– We have been able to order the best equipment for our needs thanks to Tapio's expertise and knowledge of the equipment base. He has helped us avoid many unnecessary orders and expenses, which we would have incurred if we had worked only by the original information, says Leksis.

– For the customer, this is a very safe and flexible way to work. Due to changes in plans as the project proceeds, the end result is not always what was originally planned – and that is fine, Vesiluoma says.

The W@M information service is used in the management of the project's equipment base. W@M is Endress+Hauser's database that collects information on all the supplied equipment and is updated automatically as changes take place in the life cycle of the equipment base. The battery chemicals plant also uses W@M to transfer information between Endress+Hauser and Sweco.

– W@M benefits our inventory management in particular. We have tried to use lists to monitor deliveries, but keeping the lists up to date turned out to be challenging. Now, we know that we have received a piece of equipment if it shows up on W@M, explains Reijonen.

– The information service is also very useful to us designers. W@M compiles all the information on and documentation for delivered products, says Leksis.

W@M will also be introduced at Terrafame's metal recovery plant as a tool to manage the life cycle of the plant's equipment base.

### Successes and opportunities to learn

According to Vesiluoma, the client, the supplier and the designer all strived to maintain practical and seamless cooperation. They have achieved this goal: the trio has been working closely together and used various tools from Excel spreadsheets to remote meetings.

– Despite the challenging nature of the project and problems caused by the coronavirus pandemic, the project has progressed according to schedule and any delays in deliveries have been caught up with, says Leksis.

Terrafame's project is neither the first nor the last of its kind for Endress+Hauser. Vesiluoma has previously worked as a project manager in Metsä Group's bioproduct mill project in Äänekoski and he believes that many larger projects would benefit from operations model similar to the one used in Äänekoski



and Sotkamo. Equipment procurement decisions can be made at an early stage on the basis of insufficient information, as long as all parties have committed to the project management and information exchange arrangements early on.

– We are moving toward a more comprehensive partnership, where we support the customer from design to commissioning – and beyond, Manninen says. The new battery chemicals plant began its operations

in early 2021. However, there is still much to be done.

– At the moment, we are selecting the final spare devices for the project and reviewing all the past changes in the project. We will compare the original order to what was actually supplied, says Vesiluoma.

Over the past year, Endress+Hauser has provided both on-site and remote commissioning support to the plant personnel. Instructing the personnel

remotely has been easy with handy tablet computers.

– The key objective of our cooperation was to provide and install the right equipment in the right places, which we have achieved successfully. I believe there will be a need for external delivery supervision and coordination and Endress+Hauser's expertise in the future as well, says Reijonen.

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