



Case Study

Piping System Cleaning and Drying for Green Hydrogen Plant Commissioning

Introduction

Intero was contracted to perform piping cleaning and drying at a new green hydrogen plant in the Netherlands, set to become one of the largest green hydrogen facilities in Europe and supply a nearby refinery with green hydrogen upon completion.

Designed to produce up to 60 tonnes of green hydrogen per day via 200 MW electrolyzers, the facility required rigorous piping cleanliness and dryness across multiple systems. Intero was contracted to clean and dry nitrogen, instrument air, plant air, demineralized water, and hydrogen piping ranging from 1" to 24" in diameter.

Asset Details

- Application: Green hydrogen production facility
- Services: Piping cleaning and drying after construction hydrotesting
- Systems: Nitrogen, instrument air, plant air, demineralized water, and hydrogen
- Scale: 200 MW electrolyzer facility; 1" to 24" piping
- Execution: Precommissioning in a multi-contractor, simultaneous operations environment
- Equipment: Oil-free 1,500 cfm compressor with -70°C dew point dryer

Scope of Work

Intero's scope extended beyond field execution to include a continuous on-site presence, working hand-in-hand with the customer from a project management and engineering perspective. The team tracked and adjusted to the customer's progress in real time, proactively engineering work packs for cleaning and drying operations across each piping system and coordinating execution schedules with other contractors accordingly.

Following hydrotesting by the main contractor, each system was dried and cleaned using dry air. Intero deployed an Atlas Copco 1,500 cfm oil-free compressor equipped with a -70°C dew point dryer unit, achieving dew points of -40°C on most systems to meet preservation requirements.



The Challenge

Precommissioning a new facility based on new technology was challenging, with no previous experience to build on. As a flagship project, it attracted significant attention from internal and external stakeholders.

Planning was highly complex due to the many interdependencies among contractors, requiring flexibility and close coordination from all parties. Technical execution was equally demanding, given the diversity of systems, materials, and acceptance criteria.

Organizationally, the project was demanding because many people were working in the same areas simultaneously. This required a continuous focus on safety and teamwork with the other contractors.

The Solution

Intero maintained a continuous site presence throughout the project, led by a dedicated and highly experienced project engineer and supported by an experienced execution team. Working closely with the customer from a project management and engineering perspective, Intero remained directly involved as the project progressed.

The team continuously adjusted to the customer's progress, proactively engineered the required cleaning and drying work packs, and coordinated execution schedules with the other contractors.

A high first-time-right rate for the work packs and related field execution reduced rework and relieved the customer of significant coordination pressure in a complex project environment.

While the technical cleaning and drying solution was based on established market practices, Intero's execution model was the key differentiator. Continuous site involvement, proactive engineering, experienced personnel, and close collaboration with the customer were recognized as key contributors to the project's success.

The selected compressor and dryer package provided extremely dry air to dry the piping efficiently. Before airflow was introduced, critical control valves and non-return valves were removed to prevent damage.

Each pack included a detailed work instruction, a comprehensive list of valves and equipment scheduled for removal, and highlighted PEF drawings clearly defining the system and its boundaries to ensure that adjoining systems remained unaffected.

In addition, every system required a formal safety sign-off prior to commencement of work, along with a cleanliness certificate issued for the client's records.

The Result

No safety incidents occurred. All piping systems within Intero's scope were cleaned and dried to the customer's specifications and satisfaction. In some cases, the client used camera inspections to verify the results.

It was also reported that final drying specifications were achieved quickly during commissioning because the systems had been effectively cleaned and dried during construction.

Safety Highlight

Intero received the monthly safety award twice. The first recognition was given after an Intero operator spotted and responded to a small fire on site. The second followed an Intero supervisor's identification of an incorrectly installed valve LOTO, which still allowed the valve to be operated instead of being locked closed.

