



De Pretto Industrie



**De Pretto**  
i n d u s t r i e

## De Pretto Industrie Conversions, Modifications and Upgrades capabilities

### Example of customized solution in a brownfield environment: Perlen (CH) ST replacement

Steam turbines are reliable and robust machines and can be operated for decades.

A proper maintenance program could extend their life up to 40 years and even more but often they have to be revamped or replaced before the end of their life for one the following reasons:

#### •Need for Efficiency Increase

A modern ST can express a higher performances. The power output can be easily increased by optimized the design.

#### •New operating requirements

The plant's power is to be modified because of new needs: district heating, steam for the processes, increasing or decreasing of steam production. This translates in a different mix of thermal and electrical outputs.

#### •Reliability and availability

Even if a proper maintenance program is implemented, the ST is subject to wear and tear. Costs for maintenance and repairs might be not acceptable or the maintenance intervals might be too tight for the production demand and plant availability targets.

Replacing an existing steam turbine with a new upgraded one is a very complex operation.

Removing the old unit, rebuilding or adapting the foundations if needed, designing new connections and positioning of auxiliaries' systems are just some of the critical activities that we face. A brownfield project – compared to a greenfield one – introduces additional hurdles and restrictions and requires specific competences and know-how.

### De Pretto Industrie, thanks to its extensive engineering competences, can provide cost effective solutions to minimize the impact of such activities.

DPI does not only offer a super customized solution but actively supports customers reducing the number of modifications to the plant layout. Implementing a tailored design requires the existing layout to be accurately replicated in a digital model. The following activities are performed to ensure a perfect and smooth installation of the new unit:

- Measurements and 3D scanning at site on machinery and interconnection flanges;
- Foundations review and modification according to the new static and dynamic loads;
- Plan for dismantling the existing turboset;
- Customized design of the new unit to fit within the existing footprint. DPI can offer a wide range of arrangements: from a single-lift frame to independent installation of the turbine, gearbox and generator;
- In case of partial replacement, DPI reviews the rotodynamic of the entire train and applies the needed alignment modifications to ensure a stable operation;

Not only the turboset is tailor designed but also all the auxiliary systems can be customized in order to fit the powerhouse room and the existing interconnections: oil units, heat exchangers, control and protection panels. Even the PLC system is configurable, with a choice of different brands: Siemens PCS7, Siemens TIA Portal, ABB, Emerson Ovation, Valmet and Woodward.



<b>Customer</b>	Caliqua AG (EPC) Renergia Zentralschweiz AG
<b>Year of installation</b>	2021
<b>Place of Installation</b>	Lucern (CH)
<b>Turbine</b>	De Pretto condensing steam turbine DK800-EAX-535 41bar(a) – 410°C – 136ton/h 5700rpm / 32.130kW
<b>Gearbox</b>	Flender-Graffenstaden TX90/3C
<b>Alternator</b>	Existing alternator LDW S5E1120M66-4ZP+WK
<b>Description of the plant</b>	<p>Eight waste associations from the cantons of Central Switzerland and Perlen Papier AG founded Renergia Central Switzerland AG in February 2012 and now jointly operate the waste incineration plant. The associations hold shares in Renergia Zentralschweiz AG according to the amount of waste produced. The plant has been subjected to an optimization and increasing of the thermal energy distributed through the district heating. As a consequence, the existing steam turbine (not supplied by De Pretto) had to be replaced since the steam flow increased from 115 to 140 ton per hour. The customer needed to perform the replacement in an extremely limited time frame. De Pretto offered a tailored solution comprising a new steam turbine and gear box with adapted feet and pipes connections in order to minimize the time needed for the replacement and therefore the shutdown duration. Thanks to this solution and approach, the full replacement has been performed in only 18 days.</p>
<b>Scope of supply</b>	<p>Replacement of an existing steam turbine and gearbox, without modification of the foundation. The customer replaced the alternator few years before so it has been just inspected and kept. Engineering, Manufacturing and erection of the turboset including auxiliary circuits, control and protection system.</p> <p>Steam parameters before the replacement: Live steam: 115ton/h, 41bar(a), 410°C Steam extraction at medium pressure: 82ton/h Power production: 29MW</p> <p>Steam parameters after the replacement: Live steam: 140ton/h, 41bar(a), 410°C Steam extraction at medium pressure: 131ton/h Power production: 32MW</p>



## Removal of the previous steam turbine



## Installation of the new De Pretto Industrie ST

