



MEASUREMENT AND ANALYTICS | SUCCESS STORY

# **Türkiye's largest thermal** power plant relies on **ABB's digital positioners**

ABB has provided its reliable positioners to Eren Enerji, Türkiye's biggest thermal power plant, supplying the customer with reliable instrumentation for accurate and real-time measurements, boosting the plant's performance.

## Introduction

Eren Enerji, also known as the Zonguldak Eren Thermal Power Plant, located within the borders of Çatalağzı Town and Muslu Town of Zonguldak province, is the biggest thermal power plant operating in Türkiye.

The power plant consists of units with a total installed power of 2,790 MW: 1\*160 MWe with Fluidized Bed technology, 2\*615 MWe with Super Critical Pulverized Coal, and 2\*700 MWe. To increase data quality and consequently streamline manufacturing operations, Eren Enerji chose to replace existing instruments with ABB's reliable digital positioners.

Eren Enerji power plant



### Challenge

Eren Enerji power plant encountered issues with the behavior of valve applications, primarily related to oscillation when approaching the deadband – a zone where the positioner stops moving and holding the position steady. The factory setting for this parameter is 0,1 %.

After conducting a comprehensive analysis and considering the magnitude of the problem, the ABB team recommended replacing the existing equipment with ABB's digital positioners. To carry out the replacement ABB had to adjust the mounting kit to adapt its positioners to the existing valve.

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#### **High-Pressure Turbine Bypass Valve**

A high-pressure turbine bypass valve is used to divert some or all of the steam flowing from the main boiler away from the turbine and into the cold reheater line.

The valve reduces both the pressure and temperature. This ensures that the steam can be safely transferred between these two systems.

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#### **High-pressure Spray Water Controller**

For cooling down of the HP-bypass steam, feedwater is injected after the pressure reduction valve. The position of the HP-bypass water injection valve is controlled to adjust the steam temperature downstream of the HP-Bypass. The temperature setpoint is based on the actual steam flow rate. With the implemented follow-up integrator, the steam temperature gradient setpoint can be adjusted.

An additional feed-forward signal to the temperature controller leads to an immediate opening of the spray water valve. The PI controller takes over the control for fine adjustment.



#### Separator Level Control Valve

# **The ABB Solution**

To assist in resolving the customer's challenge and to enhance overall power plant performance, ABB supplied Eren Enerji with more than two hundred TZDIC digital positioners.

The <u>TZIDC</u> is an electronically configurable positioner with communication capabilities designed for mounting to linear or rotary actuators. ABB's solution provides high-precision control functions and ensures high operational reliability:

- Characteristic curve: deviation of  $\leq 0,5 \%$
- Ambient temperature effect: ≤ 0.5 % per 10 K
- Influence of vibration:  $\leq 1$  % to 10 g and 80 Hz

The positioners have a special function in the automatic adjustment of the parameters.

Additionally, the control parameters can be set automatically in adaptive control mode ("Adaptive mode"). With this feature, internal control parameters are dynamically adjusted. This ensures that if external operating conditions change, the control parameters are automatically modified to maintain stable actuator positioning.

Overall, we installed 70 positioners at each of the customer's three production sites, resulting in the total to 210 new TZIDC positioners at the power plant.



It seems that the best summary of this project, and proof of our success, is the customer's comment:

When it comes to valve controller applications at the Çatalağzı power plant, Eren Enerji trusts ABB positioners above all.

