



Verifying Critical Cooling Water Flows at a Major Steel Mill:

How Panametrics' Clamp-On Flowmeters validated emergency shutdown (ESD) pump performance to support production efficiency and high yield

Summary

A large steel mill in the Middle East relied on high-pressure cooling water to protect critical furnaces and process equipment. Emergency Shutdown (ESD) valves were installed to isolate different production areas during emergencies or maintenance.

Although the plant's control system confirmed the valve position (opened or closed), the maintenance team had no reliable method to verify whether sufficient water was flowing downstream of the ESD valves. Not doing so can lead to potential issues including:

- Partially closed or malfunctioning ESD valves
- Internal valve damage or blockage
- Pipeline fouling and scaling
- Insufficient cooling water during production
- Unplanned equipment overheating and production losses

Benefits:

- Ease of installation with no mechanical modification
- Ability to run a quick and effective survey on water cooling lines
- No process shutdown required for verifications
- Improved cooling system reliability and operational safety
- Continuous verification of the emergency shutdown (ESD) pump performance
- Strong local support



Application

Medium:	Sea Water
Pipe size and thickness:	10" & 12" & 16" Sch. STD (DN 250 / DN 300 / DN 400 WT 9.5 mm)
Pipe material:	Carbon steel
Temperature:	5 – 30 °C (41 – 86°F)
Requested accuracy:	~2-3% of reading

Challenges

Installing an inline flowmeter was not considered an option for the following reasons:

- The cooling water network was already operational and could not be stopped since shutting down production would be extremely expensive.
- Pipe cutting and hot work required extensive permits and safety procedures.
- Straight runs downstream the ESD valve was limited (see picture 2).

Solution

Panametrics worked closely with the plant management team to evaluate a suitable solution.

A demonstration was conducted using the Transport PT900 liquid ultrasonic clamp-on flowmeter with CRS 402 1 MHz transducers on the cooling lines downstream of the ESD valves.

The customer could get visibility into the actual flow conditions after each of the ESD valves in a matter of minutes, enabling the customer to:

- Verify that every ESD valve delivered the required cooling water.
- Detect partially blocked or malfunctioning valves before they cause production issues.
- Confirm sufficient cooling water flow after maintenance activities.
- Improve process reliability and equipment protection while keeping a high yield.
- Reduce maintenance costs through condition-based monitoring.
- Eliminate costly production shutdowns for installing conventional flowmeters.

The customer was delighted with the outcomes from the demonstration – the findings helped to improve the plant efficiency and performance. As a result, the customer ordered a Transport PT900 ultrasonic flowmeter and at the time of publication is expected to order permanent AT600 flowmeters for live monitoring on the most critical lines. Indeed, the customer, impressed by the impact of Panametrics technology, is now looking at how ultrasonic flow solutions can support other applications.



Pic. 1: C-RR 1Mhz on DN300 CS cooling water pipe



Pic. 2: PT900 & C-RR 1MHz transducers installed on short straight line



Pic. 4: PT900 & C-RR transducers (1MHz) on DN300 (12 inch) CS pipe



Pic. 3: PT900 installed to verify the existing Magnetic flowmeter