Time Series AI to Improve the Productivity of Tandem Steel Cold Rolling

Strip break occurs → **Cause unknown** →
- Time spent in manual analysis → Production loss
- Unplanned downtime, equipment damage → Possible safety issues

So, how to detect and classify strip breaks in real-time to accelerate recovery and prevent productivity losses?
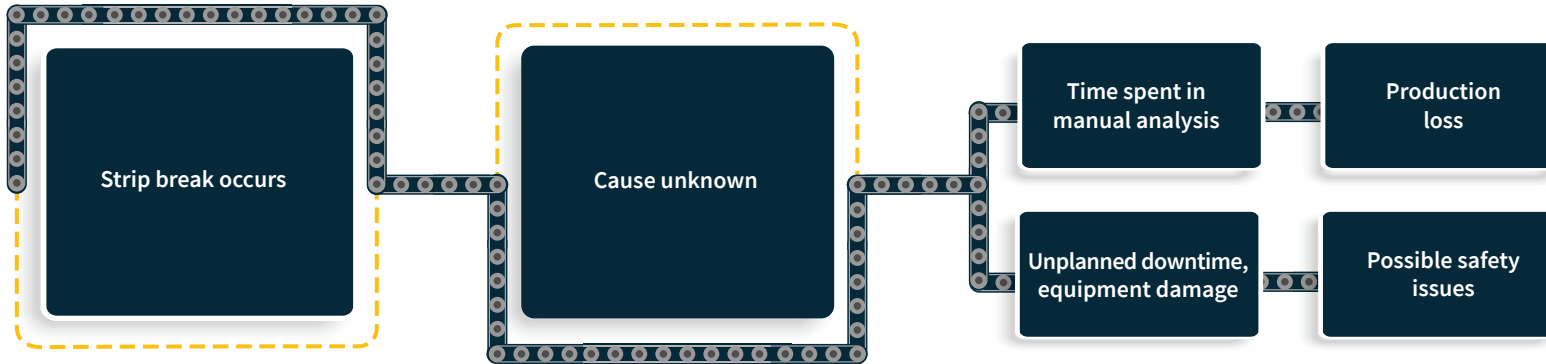
Tandem cold rolling is a complex process in which welded coils are fed continuously through mill stands to achieve a desired thickness.

The strip thickness decreases from stand to stand, and therefore the operating parameters such as RPM, torque, current, tension etc differ.

Poor weld quality and other factors such as surface defects, tensile stress exceeding tolerance, hole punch and edge defects cause the strip to break as it passes through the stands.

On average, dozens of weld and strip break events each month cause 3-4% (or **10-15 days**) of production losses each year. These line stoppages, equipment damage and safety hazards can result in **$3.5mn** in financial losses every year.

Additionally, manual diagnosis of strip break is time consuming (**~400 hrs/year**) and less accurate, significantly delaying corrective action.

ArcelorMittal Nippon Steel (AM/NS), utilized its existing PLC data by leveraging the seamless integration between **iba systems and Falkonry**. This electrical and mechanical signal data was analyzed using Falkonry Time Series AI, enabling swift inline assessments of strip breaks and automatic identification of their root causes.

How?

Past data on strip breaks was used to train and validate a classification model with high accuracy.

The ranked contribution scores generated by the model helped detect the type of break and identify contributing signals. These root cause explanations were utilized by subject matter experts to mitigate upstream causes and the alerts generated were used by line personnel to accelerate recovery.

Tell us your challenge, we're here to help:

BOOK A MEETING