Smart Steel Plants

Integrated monitoring products to maximize availability and prolong the operational life of critical assets

Component-specific end-to-end monitoring products

Steel plants often share a similar layout, but all are unique in the end. Most are built up of a subset of standard types of installations found globally in similar mills.

Zensor has developed and offers to the market a set of intelligent solutions tailored for the follow-up of critical assets and components used in the steel production process. The current brochure presents an overview of the products available for these installations used in different process stages.

"Predictive maintenance isn't truly valuable when just detecting damage in an early stage, it's all about flagging conditions that will ultimately lead to damage!"

Underlying: The Virtual Engineer

Specific components require specific solutions. Even for similar installations, the behaviour and issues encountered are often unique, depending on the brand, specific process parameters, material properties, and maintenance strategies. Therefore Zensor has developed the concept of the **Virtual Engineer**.

Each **Virtual Engineer** can collect, combine and interpret various data streams related to an individual asset and the associated operating environment. The interpretation runs on multiple layers:

- Classification Layer: what is the installation doing?
- Process & Physics Layer: what is expected or normal behaviour under these conditions?
- Component Layer: Component-specific tuning and machine learning-based approaches make the follow-up specific for your installation.

Building blocks

A component-specific solution always makes use of the same building blocks:

- Engineering: selecting what is needed and why.
- Data collection, depending on the specific case:
  - Various sensors of different types are distributed over the asset, all connected to the associated acquisition system.
  - Sourcing data from on-site data lakes, such as PLCs, iBA, SCADA, Historian, Pi...
- Data management: combining all the data collected in a single, dedicated warehouse and ensuring all data received is present and reliable
- Continuous and automated continuous analysis and interpretation
- On-line visualisation of insights derived with access to the associated raw data streams for those interested
- Warnings and alarms in relevant states

Our Approach

It is important to note that Zensor's product range hasn't been developed to follow up isolated primary components such as motors, pumps, and gearboxes. On the contrary, it focuses on the entire machine or installation.

It also goes far beyond mere 'anomaly detection' or 'threshold watching' on temporal data. It relies on translating raw data from combinations of continuous measurements related to various aspects into descriptive parameters and indicators. The monitoring includes short-term, mid-term as well as long-term elements. This gives back control to those responsible for making informed financial and operational decisions, considering all relevant factors.

"Our 'Engineers in a Box' continuously watch over your installations, send out alarms when things tend to go wrong and provide periodic reports indicating the present state and what preventive repair is required: the ultimate tool for risk reduction and maintenance optimisation!"

Monitoring products for

Rolling bridges, EAF, Rolling Mills, Conveyors, AOD Converters, Cooling water pumps, Continuous casters..

Consult the individual, asset-specific leaflets for more details.
Not only the analytics needs to be strong. The initial data preparation and validation stages are essential for a reliable follow-up. No matter how advanced the analysis algorithms are - when fed with incorrect data, their output is also non-relevant.

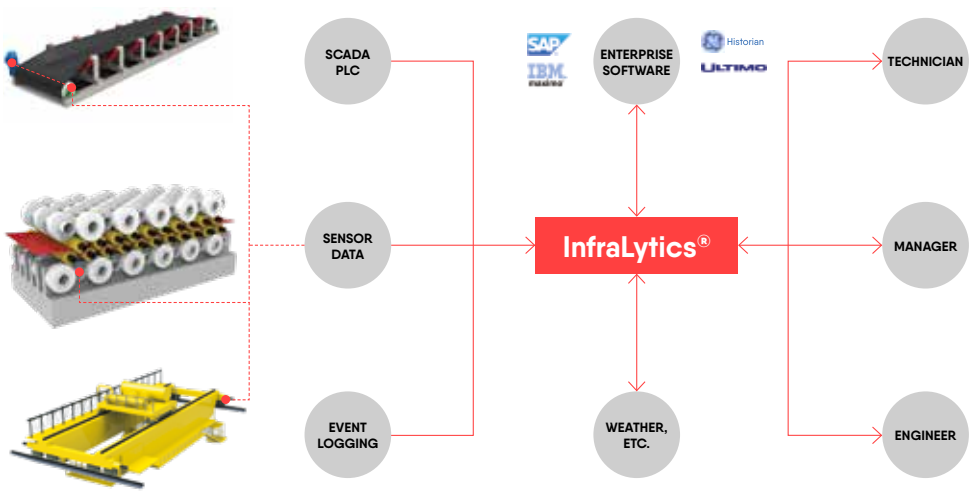
Therefore, the incoming data streams are continuously verified within the platform. When data is absent, zero, out-of-bounds, too noisy, non-coherent or simply unrealistic for the specific sensor type in the location it's installed in, the appropriate action is triggered.

The responsible entities are informed, and processes are set up to ensure the correct data streams are re-established as soon as possible.

Each solution is specific to the asset or installation type. All are pre-engineered and modular. As such, the configuration for your particular asset and situation is rapidly established and implemented. As the underlying models are developed and pre-trained for each specific asset, there's a short time-to-value. Once the models are activated, the platform starts identifying issues and predicting damage from the very beginning.

From that moment on, the follow-up becomes more intelligent by continuously optimising the configuration and self-learning modules. The prediction horizon and the ability to provide context only become more specific for your exact situation.

"The follow-up doesn't rely on standalone, pure threshold watching, but is based on a multi-aspect, continuously improving and context-aware follow-up."



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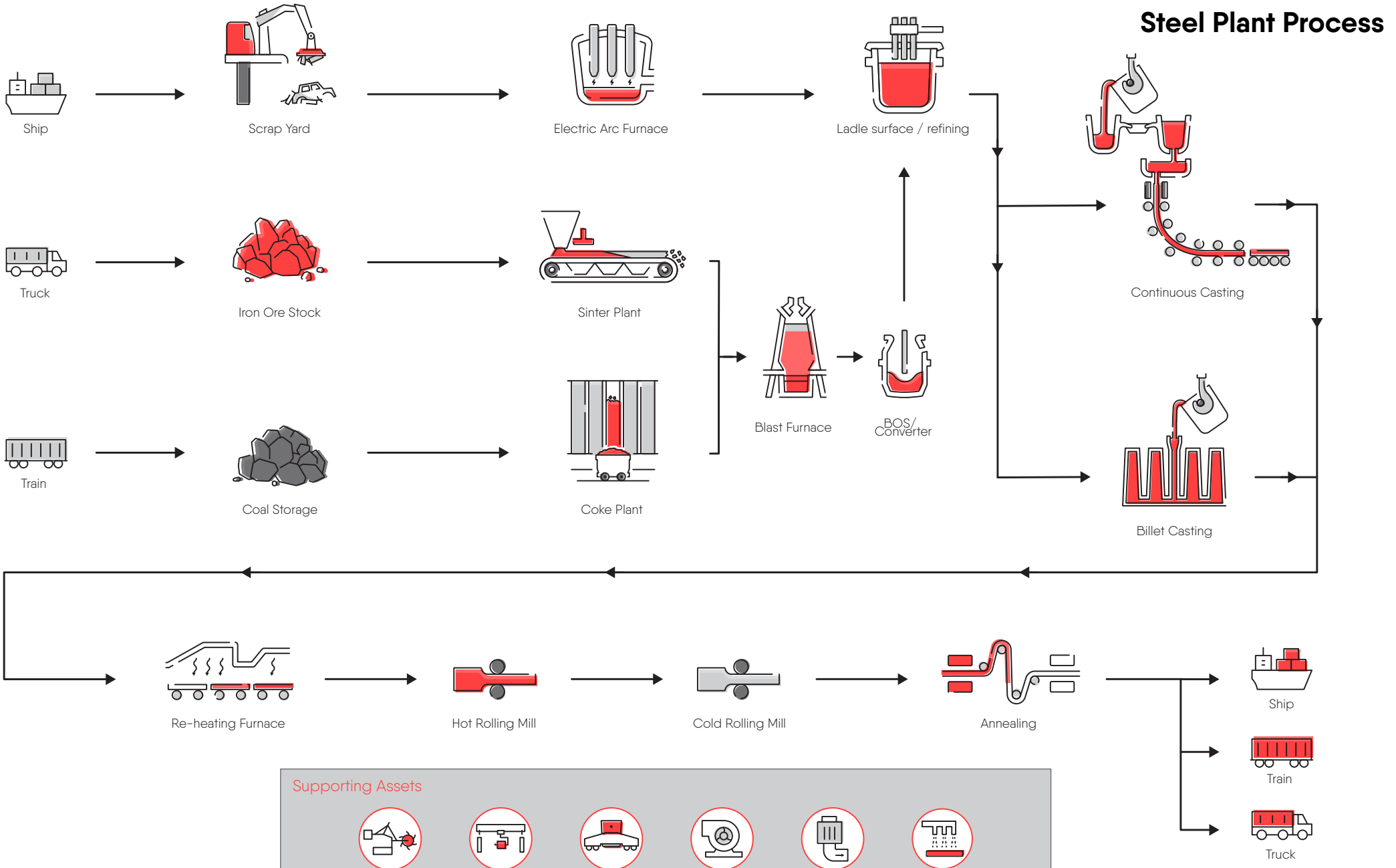
Steel Plant Process



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