



Contribution ID: 126

Type: Oral Presentation

## Advantages of manufacturer expertise and machine self-learning for effective predictive maintenance of industrial gearboxes

*Thursday 9 October 2025 11:40 (20 minutes)*

Industrial gearboxes play a crucial role in steel industry plants by providing the required speed and torque for the operation of several machines, thus affecting the efficiency and reliability of various processes. Within this scope predictive maintenance is employed to identify potential issues before they lead to costly downtime or catastrophic failures.

In the field of industrial gearboxes predictive maintenance is significantly enhanced by leveraging the manufacturer's in-depth knowledge and integrating machine self-learning capabilities. This approach moves beyond basic monitoring by providing a more effective and accurate assessment of a gearbox's condition.

The manufacturer's expertise, embedded within the condition monitoring system, provides design and calculation data of drive components, such as gears and bearings, as well as the type of oil used, its manufacturer and its storage time. This foundational knowledge enables the system to interpret sensor data more effectively. For example, the system can differentiate between normal operational wear and potential anomalies, leading to more precise predictions about the remaining service life of the components.

Moreover, the integration of self-learning algorithms through the analysis of operating states and cluster analysis improves the predictive capabilities over time. As the system gathers more data, its ability to detect patterns, forecast oil level, and predict both short-term and long-term failures grows. This allows the system to provide automated recommendations for action. The system also identifies and notifies users of anomalies and outliers like overloads. This not only maximizes the utilization of components but also facilitates the planning of maintenance activities, reducing downtime and costs while increasing safety. Consequently, end-users become less dependent on experienced service staff as the system continuously learns and improves its predictive accuracy. Ultimately, the combination of manufacturer expertise and machine self-learning provides an integral and highly effective approach to predictive maintenance.

**Primary author:** SCARMI, Alberto (SEW-EURODRIVE)

**Presenter:** SCARMI, Alberto (SEW-EURODRIVE)

**Session Classification:** Predictive Maintenance & Equipment Optimization

**Track Classification:** Digital transformation