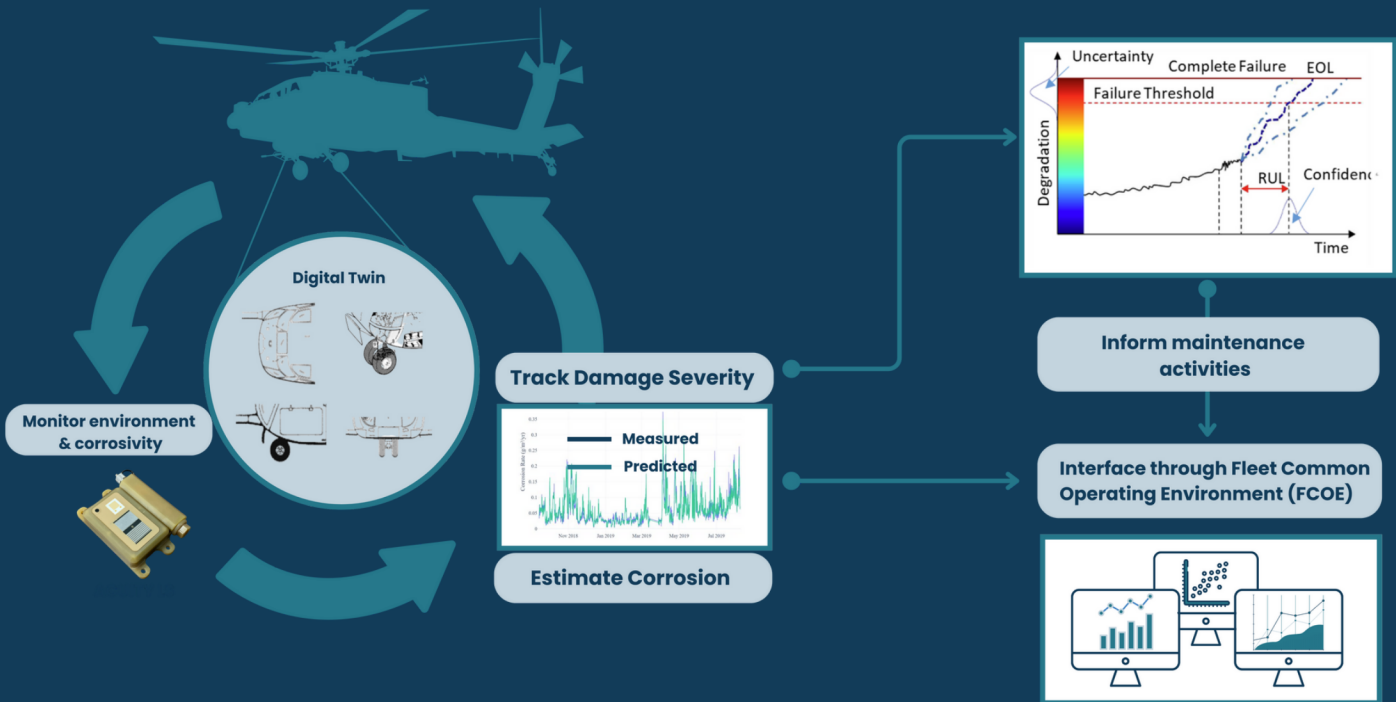


Predict Corrosion Hotspots with the Digital Twin Process

Corrosion is not only one of the biggest threats to aircraft availability, but one of the leading maintenance costs. New sensing technologies are emerging that provide maintainers with local environmental measurements, which can be directly related to local corrosion susceptibility of a given component. Machine learning can be trained on these results and used to develop a “virtual sensor” through a digital twin process. The placement of the “virtual sensor” can be optimized to components that are difficult to access or visually inspect, while physical sensors, like Acuity LS, can be mounted in easily accessible components. The physical sensors can feed additional data and information to the virtual sensors, leading to a transfer function learning process.

Creating this digital twin process to predict corrosion “hotspots” or component susceptibility will provide maintainers with:

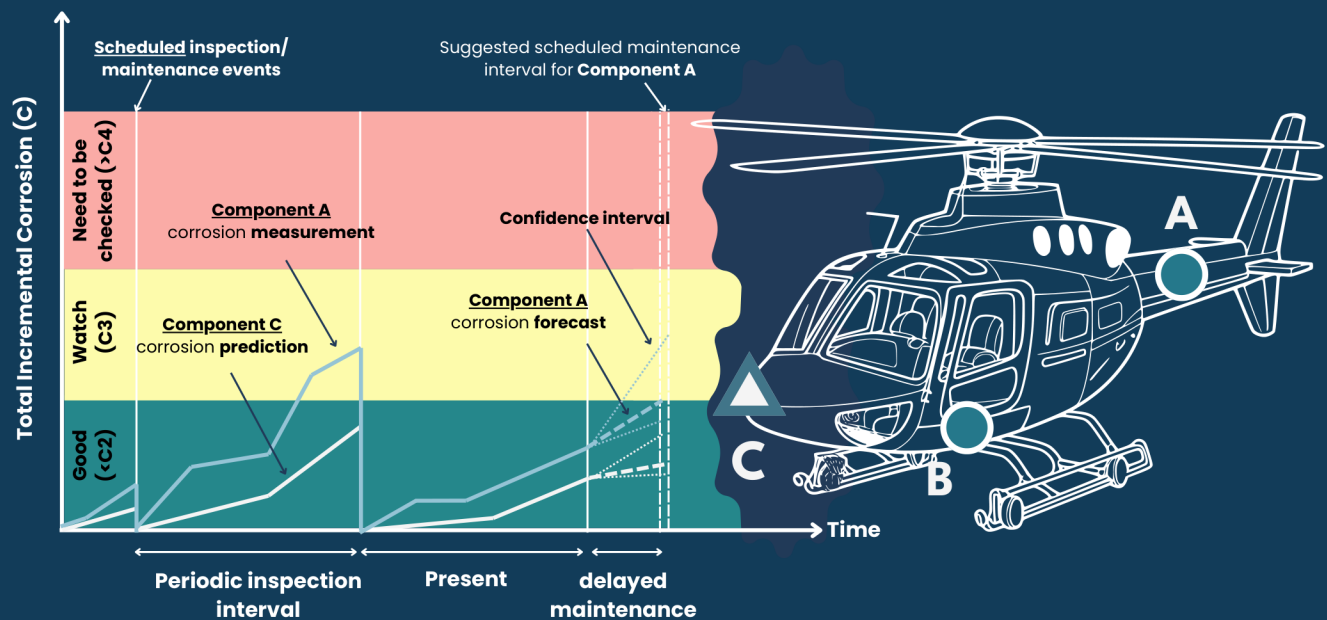
- more timely, actionable information, and
- metrics that will improve long-term predictive maintenance strategies.



Save Time and Money During Aircraft Maintenance

Time-based inspection and maintenance intervals are a conventional method of corrosion monitoring on aircraft, however, as corrosion processes do not necessarily occur in scheduled intervals these maintenance practices can lead to over- or under-estimation of costly inspections.

A shift toward evidence and data-driven predictive maintenance using a combination of on-asset sensors and component-level models could improve efficiency and reduce total ownership costs. In particular, a “virtual sensor”, i.e., a trained model to predict the corrosion at a given location node on the aircraft, can be leveraged to optimize the placement of physical real-time monitoring sensors. This digital twin process can be applied to determine the corrosion susceptibility of a single aircraft, or to conduct a fleet-wide analysis.



Use forecasted corrosion to delay scheduled maintenance events to increase airtime and cost savings.

Long-term maintenance planning based on corrosion-usage rather than on time.

Acuity LS



Acuity systems provide long-duration, autonomous monitoring of corrosivity and environment severity in service and test environments. The systems continuously collect and store measurements of single-alloy corrosion (free corrosion), dissimilar materials corrosion (galvanic corrosion), surface contaminants, air temperature, and relative humidity.

- ✓ On assets in service environments
- ✓ Qualified for flight safety
- ✓ Battery powered
- ✓ Option for integration into health management systems