

Background

Inspections, damage classification, and subsequent damage repair are necessary. But taking a reactionary approach rather than following a preventative strategy can lead to unnecessary budget spend, especially if you're not planning for asset health from the very beginning.

Taking a full cycle of life approach to managing asset health can help your organization reduce spend, use resources more efficiently, and increase turbine uptime.

Objective

The objective of this analysis is to learn the impact on damage propagation and the benefits of following a preventative maintenance strategy and taking preliminary steps during COD to avoid headaches later.

We believe that routine blade monitoring reduces risk across an asset's life for both FSA and self-perform operating models, and taking preventative steps in the earlier phases in an asset's life will reduce cost and downtime while increasing overall turbine performance.

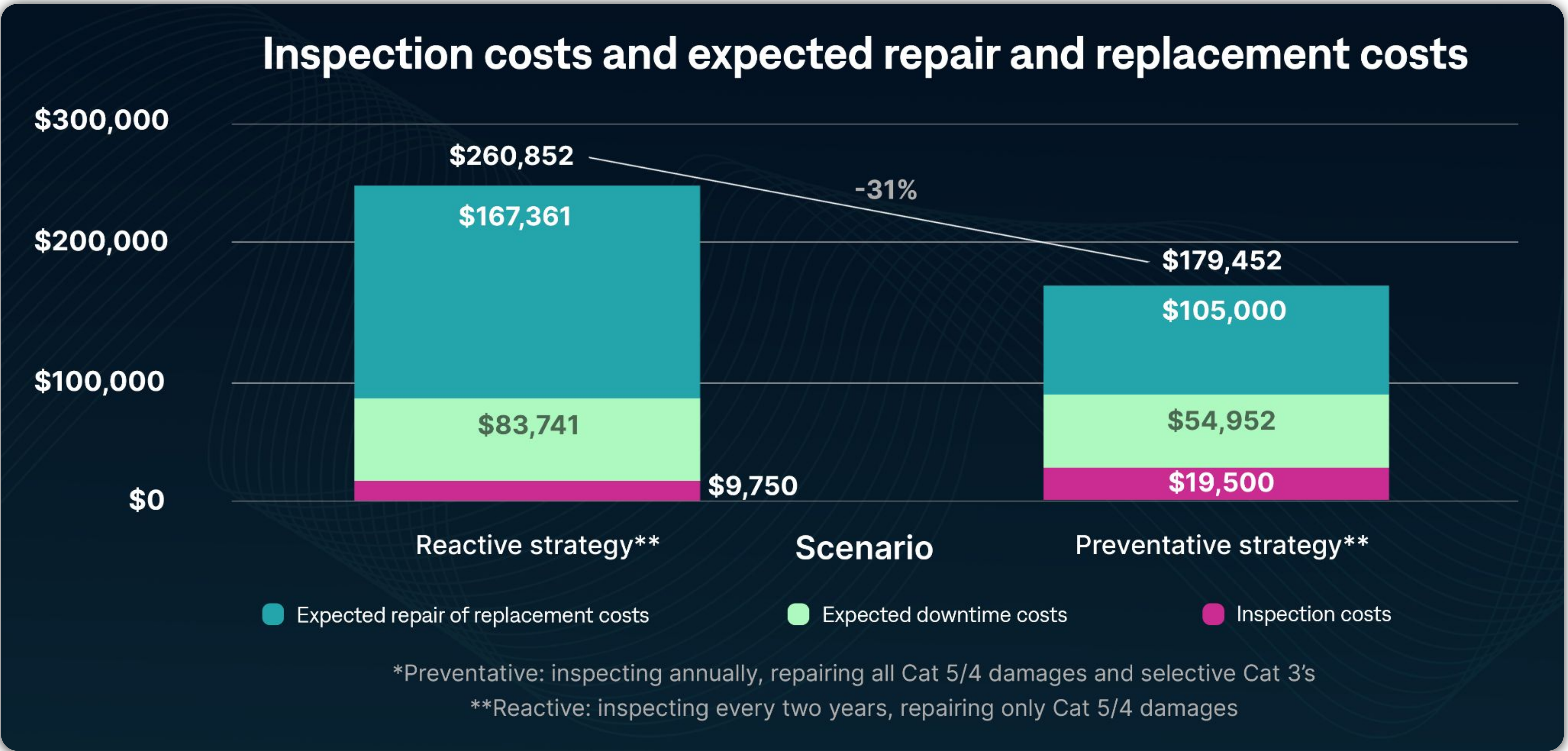
Methods

We used SkySpecs historical autonomous drone inspection data to analyze the frequency of blade damages in the early phases of asset life, including those caused by human error during installation. We were also able to use this data to compare proactive vs. reactive blade management strategies and their impact on damages and revenue for a mid-sized wind farm with 7 years of operation.

Results

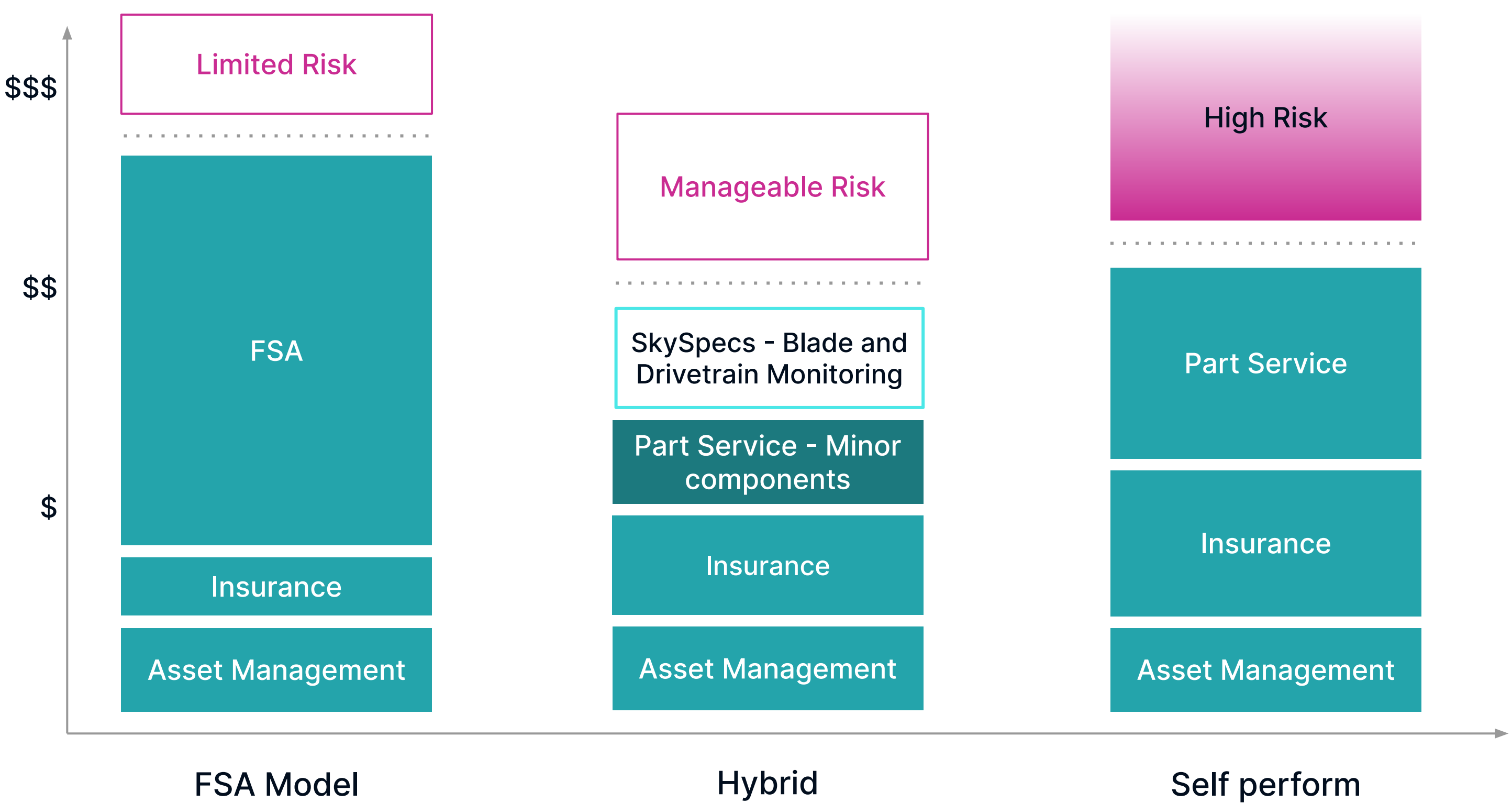
This analysis shows that companies who chose to prioritize inspection and monitoring at the start of COD have a lower failure rate than those who wait until later in asset life to begin preventative maintenance, and those taking a reactionary approach will expect to have increased risk of damage propagation and higher costs in the long run compared to a preventative maintenance approach.

Inspections of a mid-sized wind farm with 7 years of operation revealed severe systemic transverse cracks with 3% occurrence rate, or about 5 impacted blades. Based on damage severity, we expect 1 in 5 impacted blades would fail within a year if left unresolved, for a total failure rate of 0.6% (3% occurrence rate x 1 in 5 failure rate). Transverse cracks cost \$35k+ to repair as a Cat 5, versus \$10-20k as a Cat 3 or 4.



How do you protect your assets and manage risk?

As the asset moves from construction to operation, there many factors and options to protecting your assets. Having access to all your data in one centralized place allows you to make better decisions over the life of your assets.



This graph highlights three different types of operating models we see common in the industry today. Each provides a different O&M strategy balancing risk and cost.

Conclusions

The results of this analysis show that preventative blade management and a data-driven approach lowers maintenance costs and allows for a more effective asset management strategy. Those who embrace a preventative rather than reactionary strategy will be able to more accurately prioritize O&M spend and avoid catastrophic failures and production interruption.

Companies should also consider several factors before and at COD to prevent headaches later on in asset life, such as identifying damages or defects prior to COD to help reduce potential repair costs, clarifying causes of and accountability for any uncovered damages by inspecting at a key handoff stage of site development, and building a baseline for blade health prior to operation.

Contact Information

SkySpecs
Simplifying renewable energy asset management so less can do more for the planet

www.skyspecs.com
info@skyspecs.com