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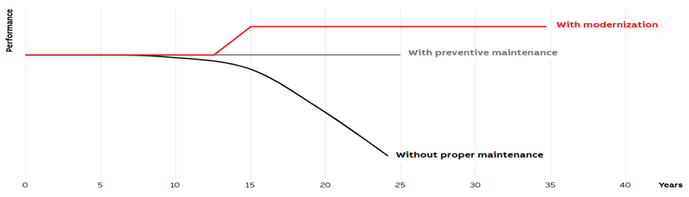
Are you ready to be a self-maintainer? Things you need to know as you plan to take over the powertrain lifecycle.

BACKGROUND

Are you ready to become a self-maintainer? Are you sure? Is there a checklist of readiness you should be following?

Here are some things you should be asking yourself as you look to take over the regular maintenance and basic repair activities on your equipment inside the turbine.



OBJECTIVE

Through this presentation, we will talk through the benefits of proper lifecycle activities on your equipment.

Through maintenance, health checks, and access to upgrades on the equipment, you can plan your operations budgets in advance, steer clear of risks on component obsolescence, and be ready for the modernization activities due on your equipment when the time is right.

How do you gain access to the information your team needs for the switch over to self-maintenance? Ask the questions of your equipment OEM partners to drive that ownership.

METHODS

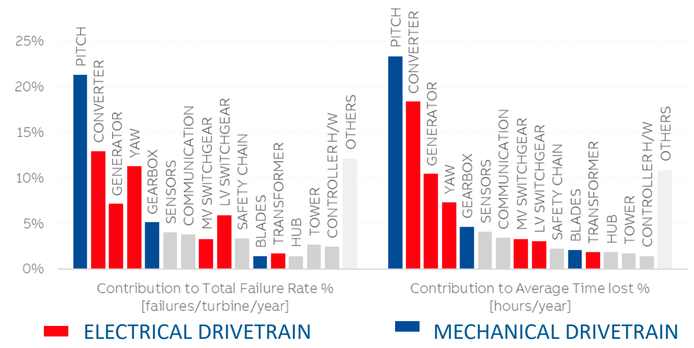
Where to start?

- Have the equipment **OEM train your team on the maintenance process for your drivetrain equipment**
- **First responder training** for troubleshooting of the equipment is needed to recognize when things aren't functioning right
- Set a plan for regular updates from your OEM partners for **hardware, software and firmware updates**
- **Data analytics** is a great way to gain insight into performance, use it to make decisions on lifecycle extending activities
- Know when it is time to **upgrade your equipment.** When your install was more than 15 years ago, its most likely that your components have a limited amount of time before obsolescence

DRIVING VALUE THROUGH COST SAVINGS, INCREASED PRODUCTIVITY AND LIFETIME ENHANCEMENTS

Wind turbine drivetrain failures account for more than 70% of the average OPEX and downtime cost per year. By partnering with your drivetrain equipment OEM to provide a broad range of lifecycle services and digital solutions to maximize the reliability and performance of wind turbine electrical and mechanical drivetrain assets throughout their lifecycle, can be disruptive to the lack of reliability faced in the past.

Regular maintenance, as recommended by the OEM, can reduce OPEX costs up to 10%. This also can increase in production over projected and by 5%. Increasing the life of an electrical drivetrain component by 10 years or more will permit a turbine to run more economically than projected and double the expected life from 20 years to 40 years.



MAINTENANCE SERVICES	Corrective	Spare parts	Maximize your turbine availability and help you achieve reliable energy output.
		Workshop repair	
		Technical support	
	Preventive	Training	
		Preventive maintenance kits	
MODERNIZATION SERVICES	Workshop Refurbishment	Inverter module	The most advanced hardware and software packages have been built to double the converter and generator life-time and boost Annual Energy Production.
		Cabinet	
	Upgrade	Inverter module	
		Control HW & SW	
	Replacement	Indoor solution	
		Outdoor solution	
DIGITAL SERVICES	Asset performance management	Converter Pulse	Increase the annual energy production of your turbine via deploying data and simulations to predict and prevent turbine downtime
		Remote troubleshooting	
	Simple commissioning & consulting	Commissioning App	
		Simulation services	

Self-Maintainer growth of expertise through equipment OEM knowledge share

Extending the lifespan through partnership with your OEM, what's old is new again

Data driven decisions can lead to customized maintenance schedules, reducing trips to the site and total site ownership for the self-maintainer

Benefits of self-maintaining

- **Enhanced Safety.** By performing regular maintenance, potential hazards can be identified early, reducing the risk of fire, shocks, and other potential hazards
- **Improved Equipment Efficiency.** Well-maintained equipment experiences more efficient operations, increasing the productivity of the turbine
- **Extended Equipment Lifespan.** Regular maintenance can prevent premature failures due to unseen wear and tear. This, coupled with the **modernization** of the electrical equipment, can increase the lifespan 2X
- **Reduced Downtime.** Proactively addressing issues through self-maintenance minimizes the unexpected downtime experienced from breakdowns on the drivetrain
- **Cost-Savings.** By identifying the issues before it takes the turbine down, repairs can be planned and repeat trips to the turbine can be avoided. Emergency parts orders and repeated troubleshooting trips can quickly add up to thousands of dollars, not to mention the cost of production loss.
- **Job creation.** Lifecycle services create new jobs locally as they need fast response that is only possible by local production and repair.

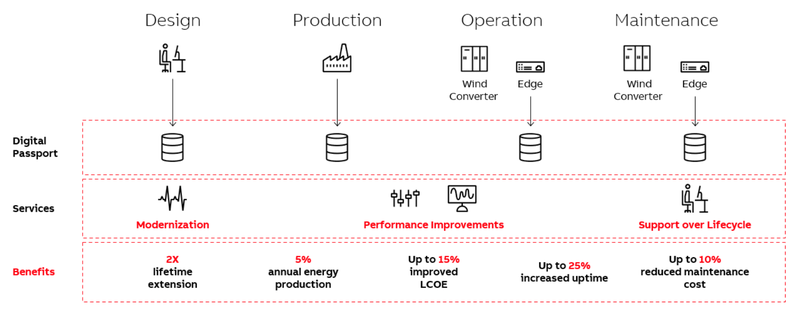
CONCLUSIONS

Becoming a self-maintainer is not an easy transition. However, there are many benefits to taking this path for your farm.

Before you make the switch, engage the different OEM partners to start the path to training on your equipment.

You will find they are ready to support you to find the options available to solve those problems you have been facing on your site. With the right planning, you can transition to being a self-maintainer and extend the life of the farm, all while avoiding costly downtime through total ownership of your drivetrain.

Ingredients to maximize the performances over the complete life cycle



ACKNOWLEDGEMENTS

ABB has worked to educate their customers on the benefits of total site ownership and modernization of more than 50GW of power equipment in many industries.

REFERENCES

Based on Key Performance Indicators (KPIs) and metrics as Mean Time to Failure (MTTF). May differ from customer to customer.

Sources: Global Data. Wood Mackenzie, ABB

CONTACT INFORMATION