From Manual Testing to Automated Assurance

AMBITION

An **energy infrastructure leader** faced growing constraints validating complex SCADA software responsible for live monitoring and command-based operations across wind farms. Manual testing cycles could not keep pace with aggressive release schedules or rising system complexity.

Before any software could be deployed to physical turbines, it had to be validated across a **13+ VM environment** simulating real-world network conditions. The ambition was clear: **replace slow, labor-intensive testing with an automated validation framework that delivered speed without compromising operational safety.**

To achieve this, the organization aimed to:

- **Automate validation cycles:** Transition from manual testing to a scalable, automated QA framework.
- **Simulate production environments:** Create and manage a digital twin mirroring live turbine deployments.
- **Protect system integrity:** Automatically validate data accuracy and compliance with critical communication standards.

ACTION

The organization partnered with the **Enterprise Automation team at Wipro Engineering – Connected Services** to re-engineer quality assurance as a core engineering capability.

Operating as an extension of internal system engineering teams, Wipro delivered a focused automation transformation:

- **Test Infrastructure Engineering:** Provisioned and managed a **13+ VM test environment** replicating live turbine networks.
- **Automation Framework Development:** Built a comprehensive BDD-based automation framework in Ruby, translating business and safety requirements into executable tests.
- **Defect Management Integration:** Implemented structured test documentation and tracking to accelerate defect identification and resolution.
- **Interface Validation:** Automated testing of external communication standards, including MODBUS, to ensure data accuracy and system reliability.

AMBITIONS REALIZED

The shift to automated quality assurance transformed testing from a release bottleneck into a predictable, scalable engineering capability.

The Business impact:

- **Up to 40% reduction in manual testing effort**, freeing engineering capacity for higher-value innovation.
- **Faster issue resolution**, enabled by consistent automation and structured defect tracking.
- **Improved deployment confidence**, with continuous validation ensuring every SCADA release was production-ready for live turbine control.