Predictive Maintenance of Ship Propulsion Train System based on ML algorithms

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Objectives: Early detection of faults in the Controllable Pitch Propeller system to ensure safe and reliable operation.

Controllable Pitch Propellers

- Convert mechanical energy into thrust to move the vessel through the water
- Give the highest propulsive efficiency over a broad range of speeds and load conditions.
- For a fully loaded vessel with cargo the propulsion required at a given ship speed is much higher than when the vessel is empty.
- By adjusting the blade pitch, optimum efficiency can be obtained and fuel can be saved.
- Improves maneuverability of a vessel by fast change of propulsion direction without slowing down the propeller

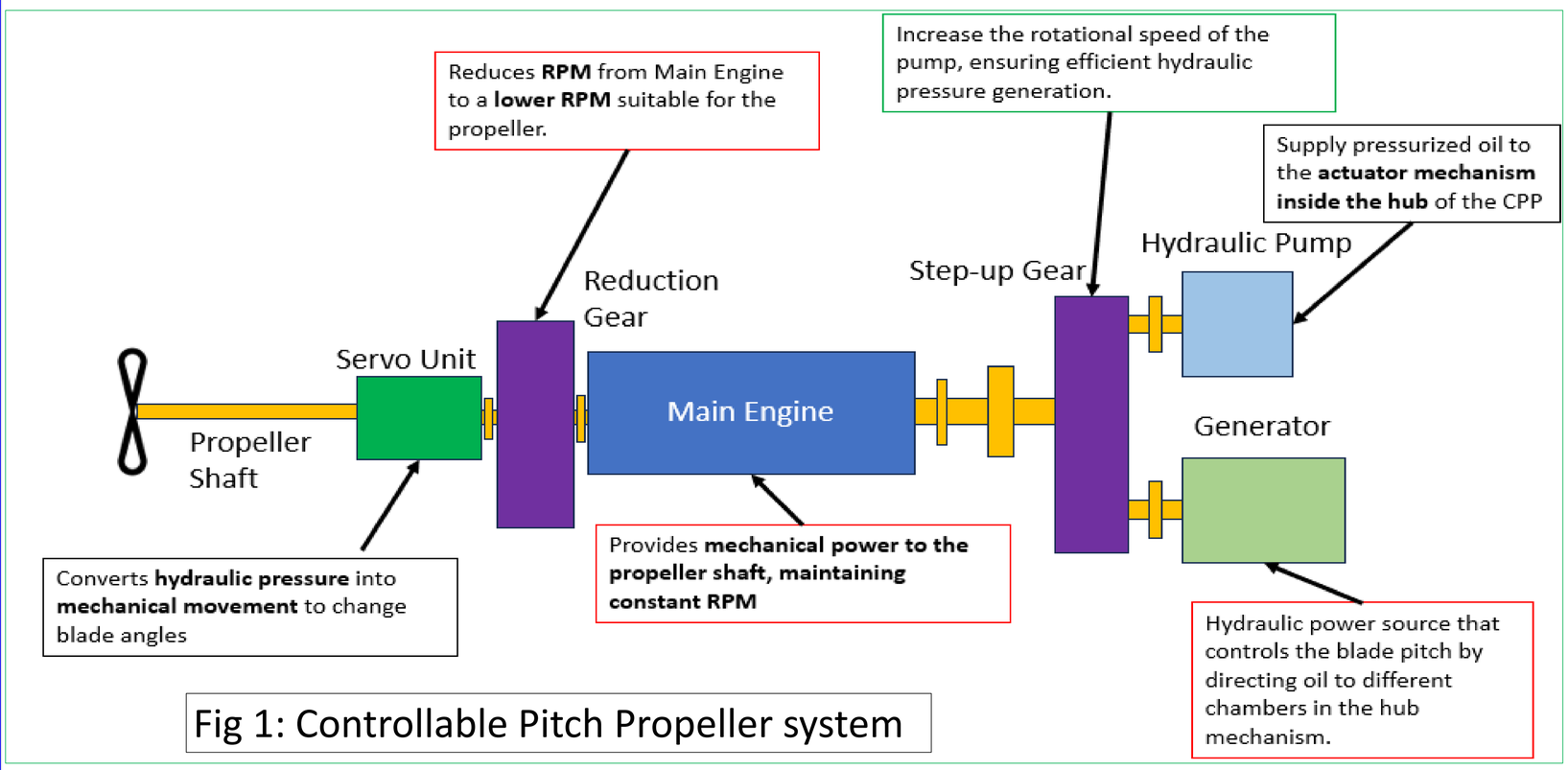

Fig 1: Controllable Pitch Propeller system

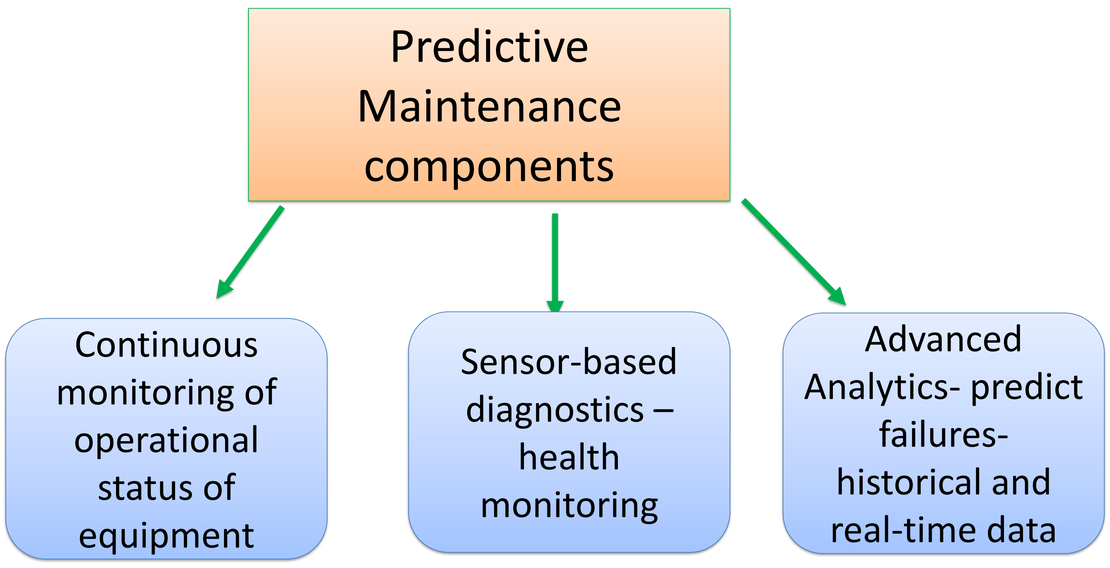

Fig 2: Key components of Predictive maintenance

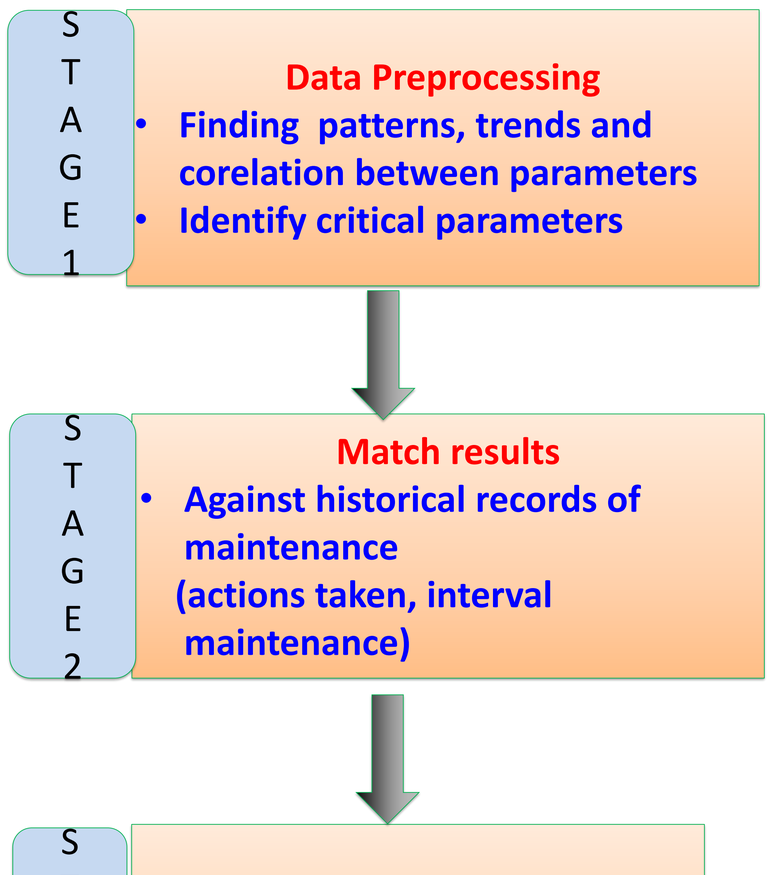

Fig 3: Predictive maintenance Work flow

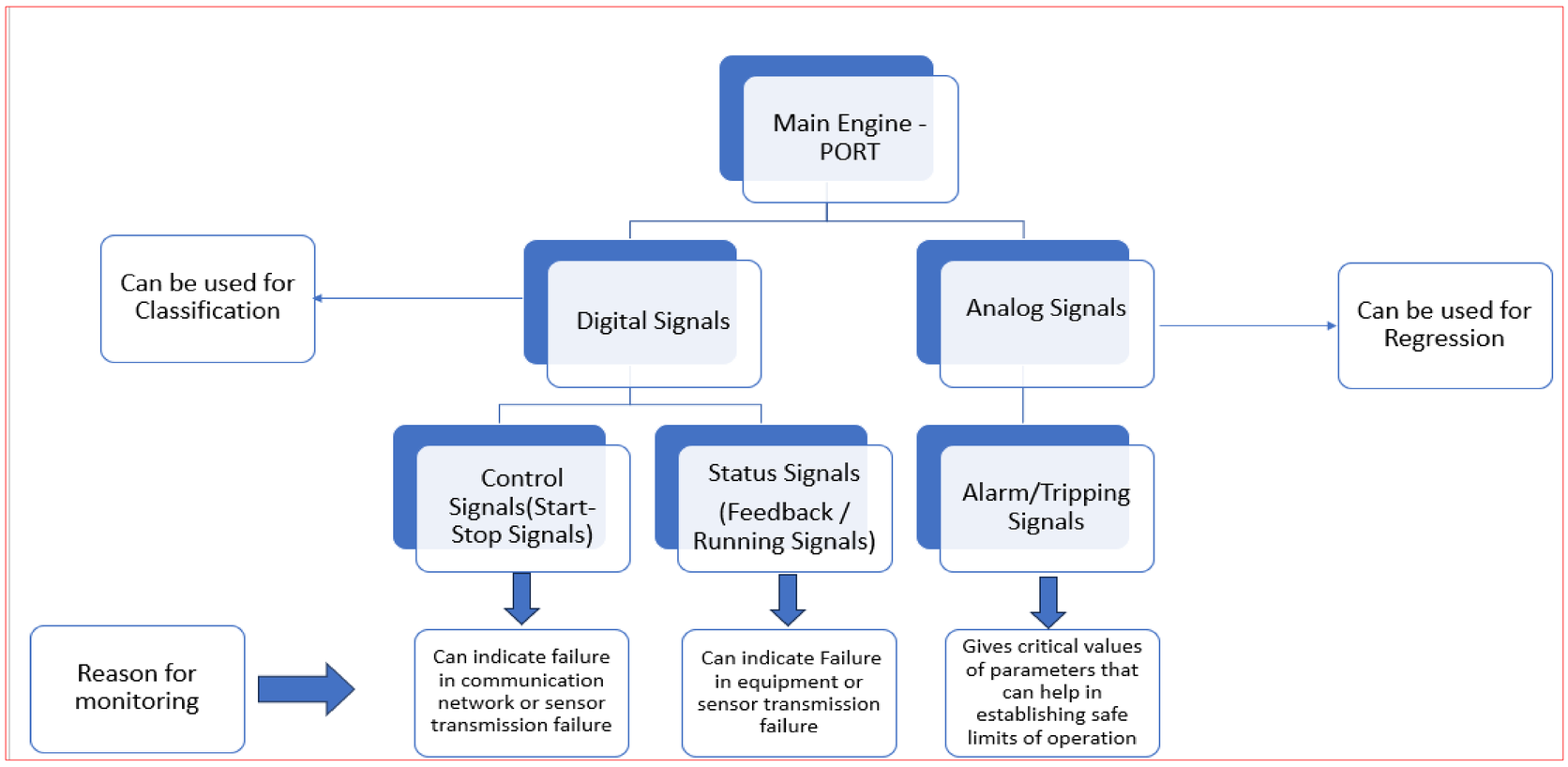

Fig 4: Signals from Main Engine (PORT)

References: Dalzochio, Jovani, et al. "Machine learning and reasoning for predictive maintenance in Industry 4.0: Current status and challenges." Computers in Industry 123 (2020)

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