

Peregrine *Power LLC*

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Peregrine Quick Facts

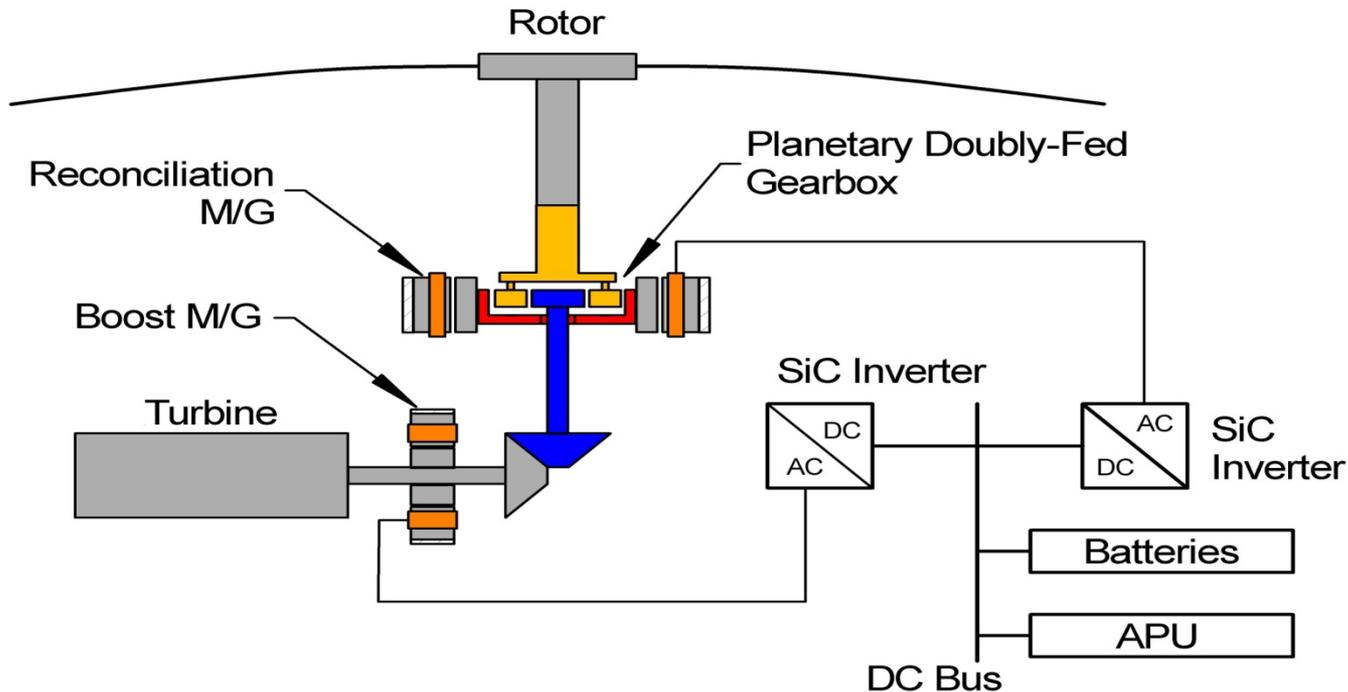
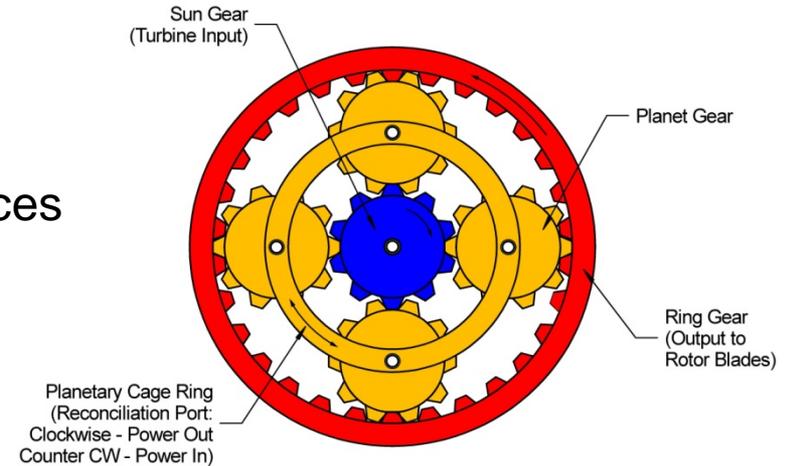
- Oregon power electronics company
- Engineering for military & commercial entities
- High level of innovation (disruptive technologies)
- Significant number of projects with DOD
- NASA funded project on variable speed rotors
- Must team with others to move forward

Benefits of Variable Speed Rotors in Rotorcraft

- Widely known benefits
 - Higher fuel efficiency
 - Higher lift
 - Higher altitude
 - De-tune resonances
 - Attenuate noise
- Special benefits of our approach
 - Smooth, infinitely varying speed changes
 - Few new gears, reliable power electronics
 - VS hardware is down-rated greatly, saving weight
 - Fault tolerant, clamp restores system to fixed speed
 - Regulate torque perturbations in power train
 - Hybrid system benefits, supplemental power

Ingredient Technologies

- Multiple-fed planetary gearboxes
- Light weight power electronics using SiC devices
- Light weight PM motors/generators



Conclusions to Date

- This technical approach absolutely works
- Ingredient technologies are available, although new to rotorcraft
- Teaming is required to move ahead
 - Airframe & rotor designer (probable prime)
 - Planetary gearbox supplier
 - Peregrine will support with power electronics, motors/generators & some of controls