

Rolls-Royce Perspective on Propulsion Control and Diagnostics Research

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Outline

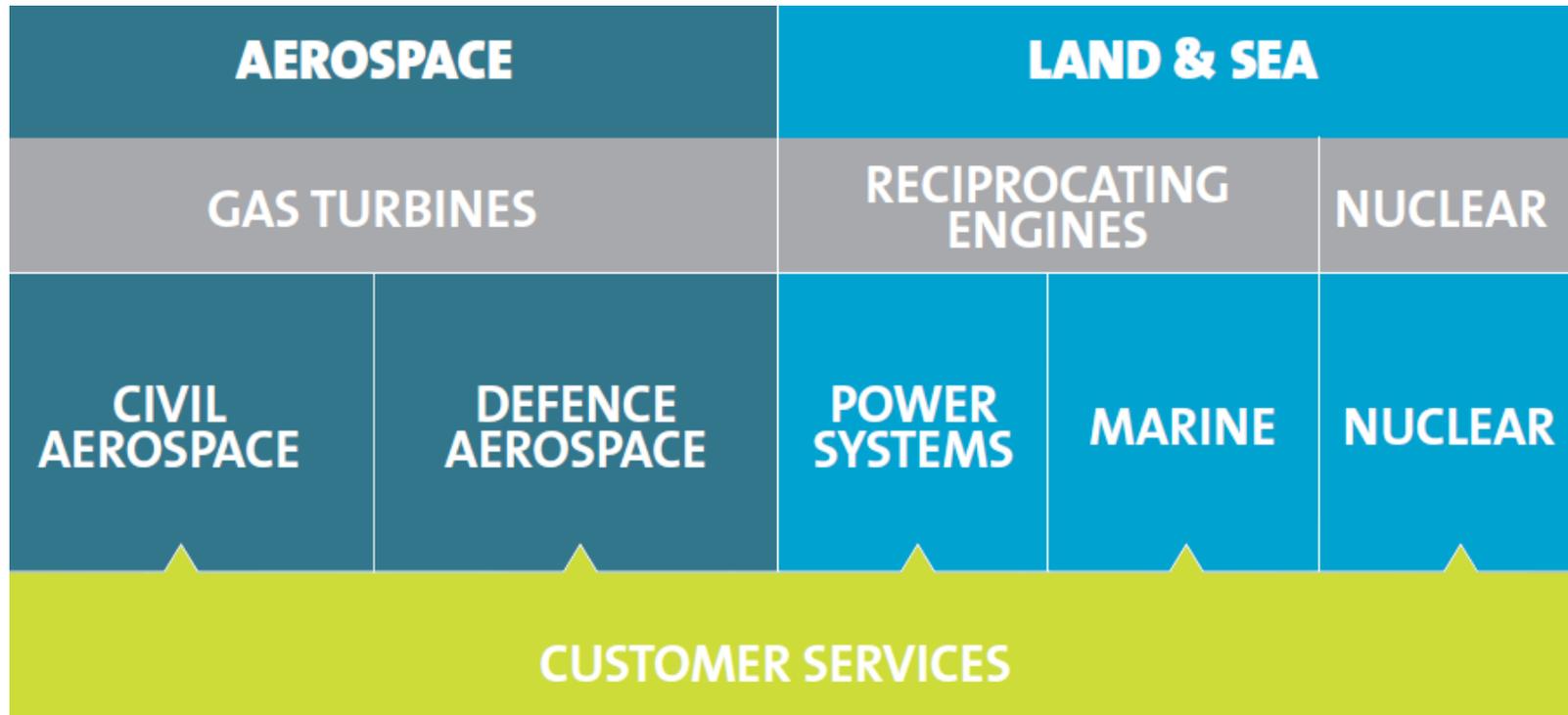
- Introduction
- Vision and Challenges
- Research and Technology Development



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Introduction

- **Future platforms will be expected to perform more demanding and complex functions while delivering improvements to key metrics**
- **In support of this, propulsion systems of the future are going to require more capabilities**
- **These capabilities will be enabled by future control and monitoring systems**



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Vision and Challenges



- **Future PCD systems will:**
 - **Be intelligent, optimized and integrated with propulsion system health management (significant utilization of on-board, real-time, models)**
 - **Coordinate propulsion system subsystems in multiple modes to achieve multiple objectives**
 - **Be optimized and integrated with the platform control and health management systems**
 - **Be adaptive to platform modes, missions, and hardware conditions**



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Vision and Challenges



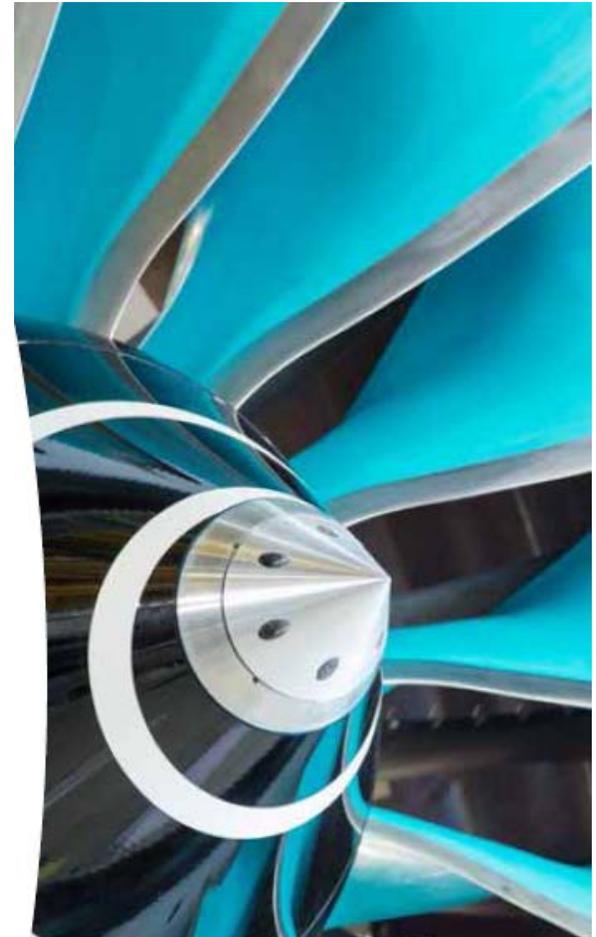
- **Future PCD systems will:**
 - **Utilize distributed, open architectures with smart modules for processing, data concentration, sensing, and actuation**
 - **Utilize reliable, high temperature, wireless electronics**
 - **Be compatible with future, more electric engines and aircraft**
 - **Be composed of components and subsystems that are used by multiple propulsion systems and platform applications**



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Research and Technology Development

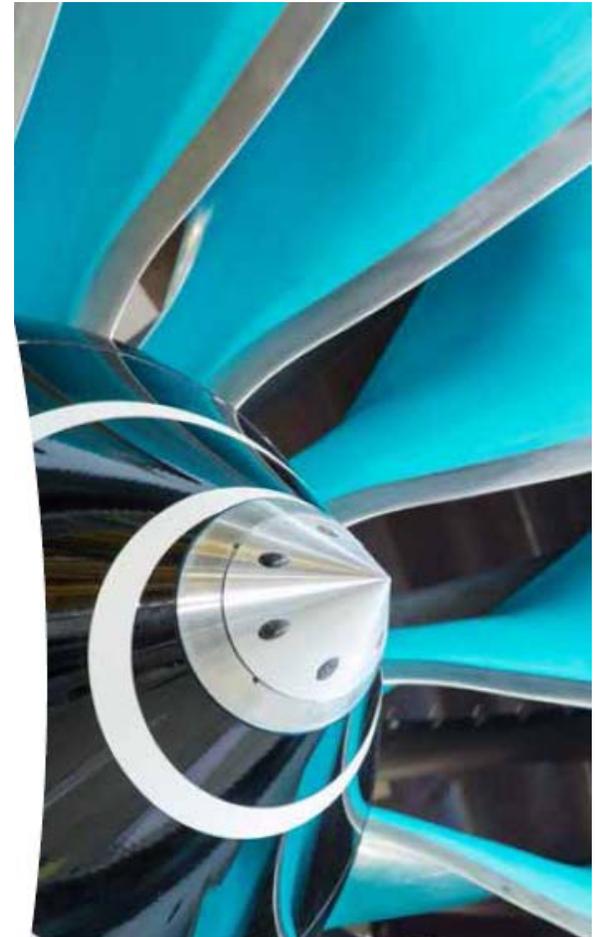
- Approach development from an integrated systems perspective (employ systems engineering principles)
- Work more closely with platform OEMs to achieve highly integrated power systems
- Explore nontraditional physical and functional integration opportunities



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Research and Technology Development

- **Look for more opportunities to optimize control and health management**
- **Work with qualification and certification authorities to understand the implications of future technology and architecture concepts**
- **Develop certification and qualification strategies for future concepts**



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Summary

Future PCD systems will be:

- Intelligent
- Optimized
- Integrated
- Adaptive
- Distributed



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