Engines: Challenges Ahead

Henry S. Seiner
October 8, 2018
PCC Forward-Looking Statements

Information included within this press release describing the projected growth and future results and events constitutes forward-looking statements, within the meaning of the Private Securities Litigation Reform Act of 1995. Actual results in future periods may differ materially from the forward-looking statements because of a number of risks and uncertainties, including but not limited to the risk that the Merger with Berkshire is delayed or will not be completed and the resulting effect thereof on our future business, financial results and the price of our common stock; the effect the expenses related to the Merger may have on our operating results; the effect of business uncertainties and contractual restrictions while the Merger is pending; fluctuations in the aerospace, power generation, and general industrial cycles; the relative success of our entry into new markets; competitive pricing; the financial viability of our significant customers; the concentration of a substantial portion of our business with a relatively small number of key customers; the impact on the Company of customer or supplier labor disputes; demand, timing, and market acceptance of new commercial and military programs, and our ability to accelerate production levels to meet order increases on new or existing programs in a timely fashion; the availability and cost of energy, raw materials, supplies, and insurance; the cost of pension and postretirement medical benefits; equipment failures; product liability claims; changes in inventory valuations; cybersecurity threats; relations with our employees; our ability to manage our operating costs and to integrate acquired businesses in an effective manner, including the ability to realize expected synergies; the timing of new acquisitions; misappropriation of our intellectual property rights; governmental regulations and environmental matters; risks associated with international operations and world economies; the relative stability of certain foreign currencies; fluctuations in oil & gas prices and production; the impact of adverse weather conditions or natural disasters; the availability and cost of financing; and the implementation of new technologies and process improvements. Any forward-looking statements should be considered in light of these factors. We undertake no obligation to update any forward-looking information to reflect anticipated or unanticipated events or circumstances after the date of this document.
Agenda

- **Forecasting**
  - Methodology
  - Build Rates
  - Checkpoints

- **Technology**
  - Fuel Economy
  - Additive Manufacturing
  - Electric Airplanes

- **Current Events**
  - Rate Readiness
  - Geopolitical Concerns
Forecasting
Forecasting: Methodology

## Pratt & Whitney - Forecast of PW Engines to be Delivered

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### Source: Airline Monitor
- P&W’s share: 0.4% engine market in 2015
- Targeting back to a quarter of the market by end of decade

*Source: Airline Monitor*
Forecasting: OEMs and titanium

New Engine OEM Titanium Demand

Source: Airline Monitor, Internal TIMET estimates
Next Generation engines the difference on new models:
- A320 NEO
- 737 MAX
- A330 NEO
- 777X

Next Gen engines have 2–3x the titanium as legacy engines

*Source: Airline Monitor, Internal TIMET estimates*
Forecasting: Checkpoint

- Checks aforementioned methodology
- Method for testing claims of relative market position
- Verifies share

**JETQC BILLET VOLUMES**

Source: JETQC, Internal TIMET data
Technology
Jet fuel prices are up more than 30% from a year ago

Airlines suspending service
International Flights “not sustainable”

Source: tititudorancea.com, IATA
Fuel Economy Improvements Over Time

Source: Airline Monitor
Fuel Economy Comparisons

**Fuel Economy**

1970 = 1223 gal/block hr  
2017 = 854  
30.2% improvement

**Single Aisle Fuel Economy**

1970 = 1144 gal/block hr  
2017 = 820  
28.3% improvement

**Twin Aisle Fuel Economy**

1970 = 3582 gal/block hr  
2017 = 1951  
45.5% improvement

*Source: Airline Monitor*
Future of Flight

**Higher Bypass**
- Larger Diameter

**Additive Manufacturing**
- Disruptive to traditional process
- Attractive for cost savings
- Regulatory hurdles
- Long time horizon

**Electric Airplanes**
- Longer time horizon
- Power and size capabilities yet to be proven
- Range and certification challenges

![Bypass Ratio Graph](chart.png)
Current Events
Supply Chain Ramp
Geopolitical Uncertainty
Engines: Challenges Ahead

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