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**CHANGING AVIATION INDUSTRY IMPACT
ON STAKEHOLDERS ...
An Engine Manufacturers View
Presentation to the Transportation Research Forum**

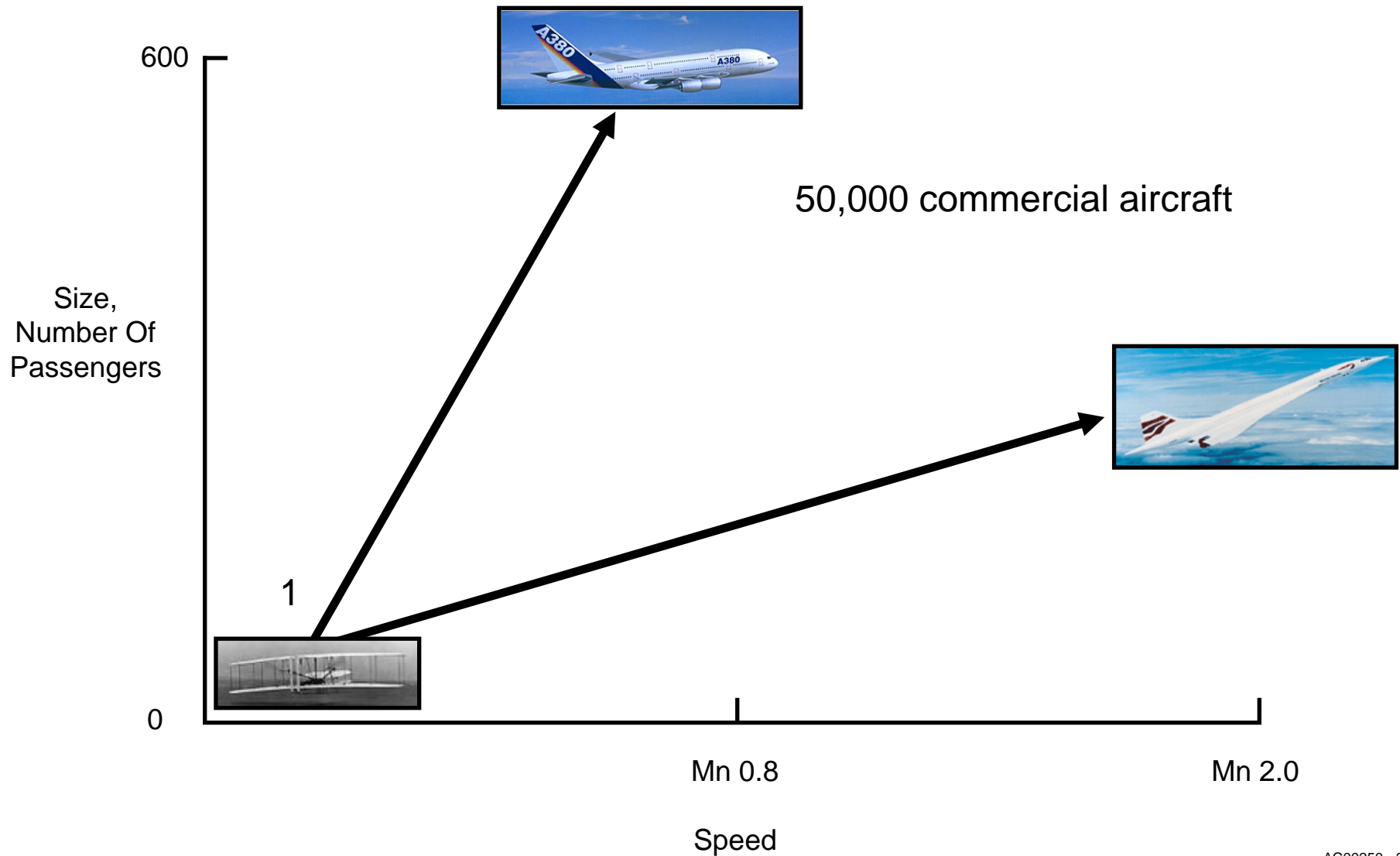


Richard Altman
Manager, Business Development
Advanced Engine Programs
United Technologies/Pratt & Whitney

March 22, 2004

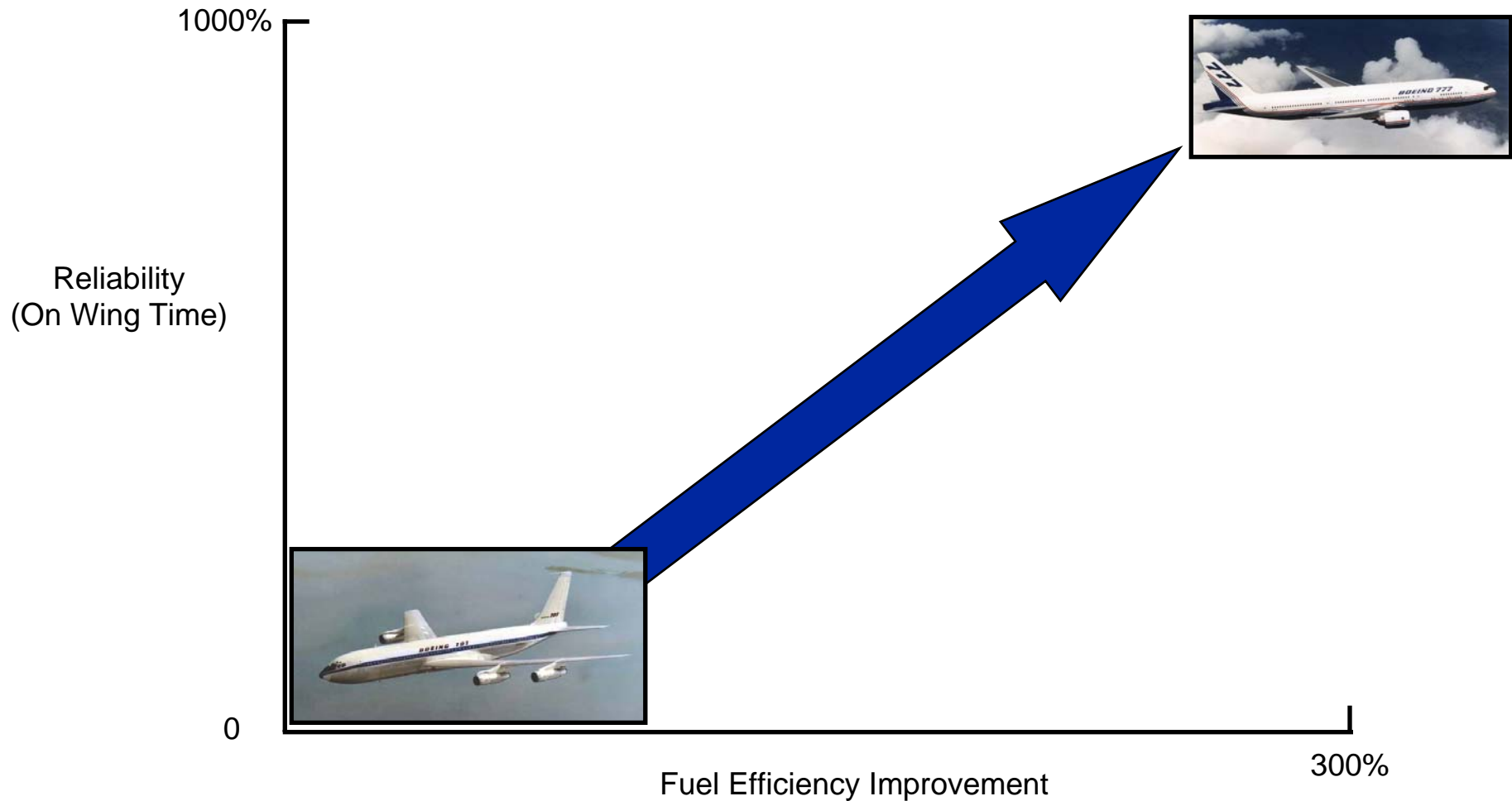
THE FIRST 100 YEARS ... (1903-2003)

Bigger, Faster



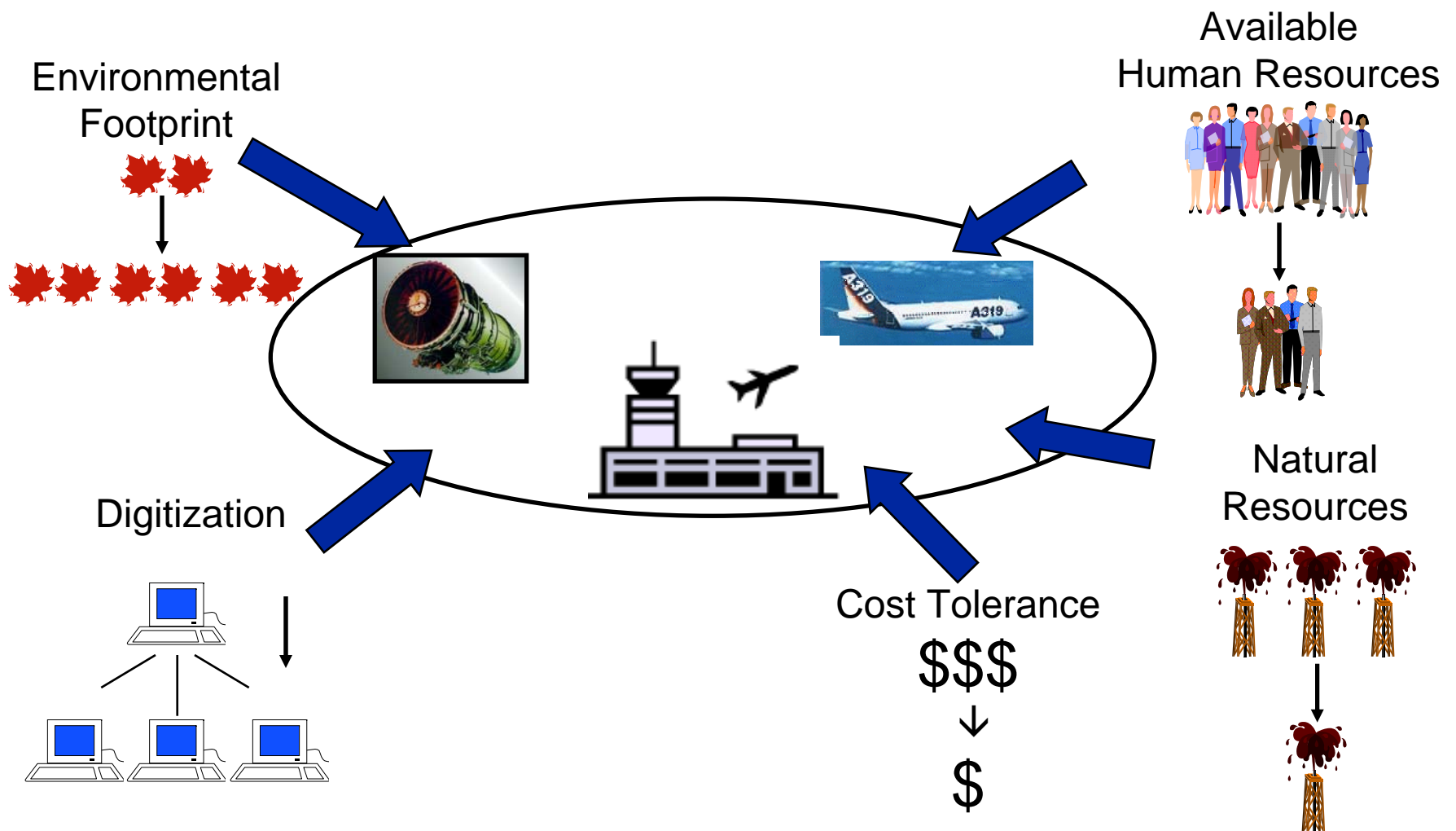
THE COMMERCIAL JET AGE (1960-2003)

A Leap In Efficiency, Reliability Of Jet Engines



CIVIL AVIATION FUTURE VISION

Dominant External Factors Set Challenges For . . .



. Dependable Power Reinvented

DEPENDABLE POWER REINVENTED

Cross Enterprise Initiatives Address Challenges

Challenge \ Initiative	Environmental Footprint	Cost Containment	Digitilization	Natural Resources Conservation	Human Resources
Green Engine Process	X	x	x	X	x
Aircraft Diagnostics	x	x	X	x	X
Integrated Power Module Technology	x	X	x	X	x
Strengthened Government / Industry Partnership	X	x	X	x	X
Total Maintenance Focus	x	X	x	x	X

GREEN ENVIRONMENTAL CONCERNS

The Global Challenge Demand New Focus



Electricity use per capita	86% increase	1970-2000
CO ₂ concentrations	13% increase	1970-2000
Waste to landfills	46% increase	1970-2000
Ozone hole	53% deeper	1979-2000
Number of Laws (U.S.)	>725% increase	1965-2000

GREEN ENGINE PROGRAM

P&W Company Vision/Focus For Initiatives

Lowest possible
gaseous emission

Smallest possible
noise footprint

Green
Manufacturing

Design Set
Human Factors

Material
Efficient

Energy
Efficient

Green Materials,
Low Hazmat Index



PT6A



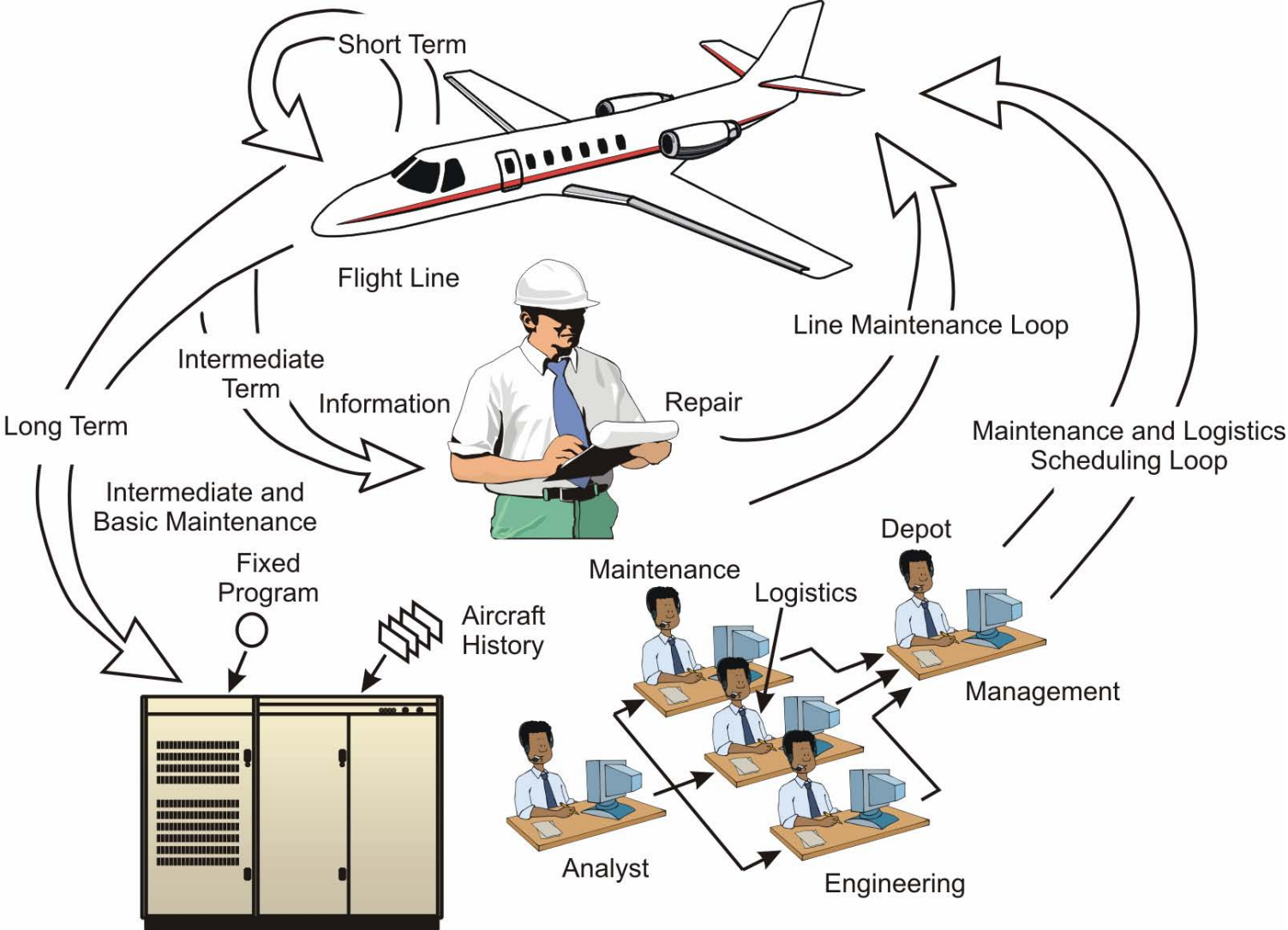
Green Suppliers
and Partners

Green Overhaul and
Repair Processes

Designed
Serviceability, Reusability, Recyclability

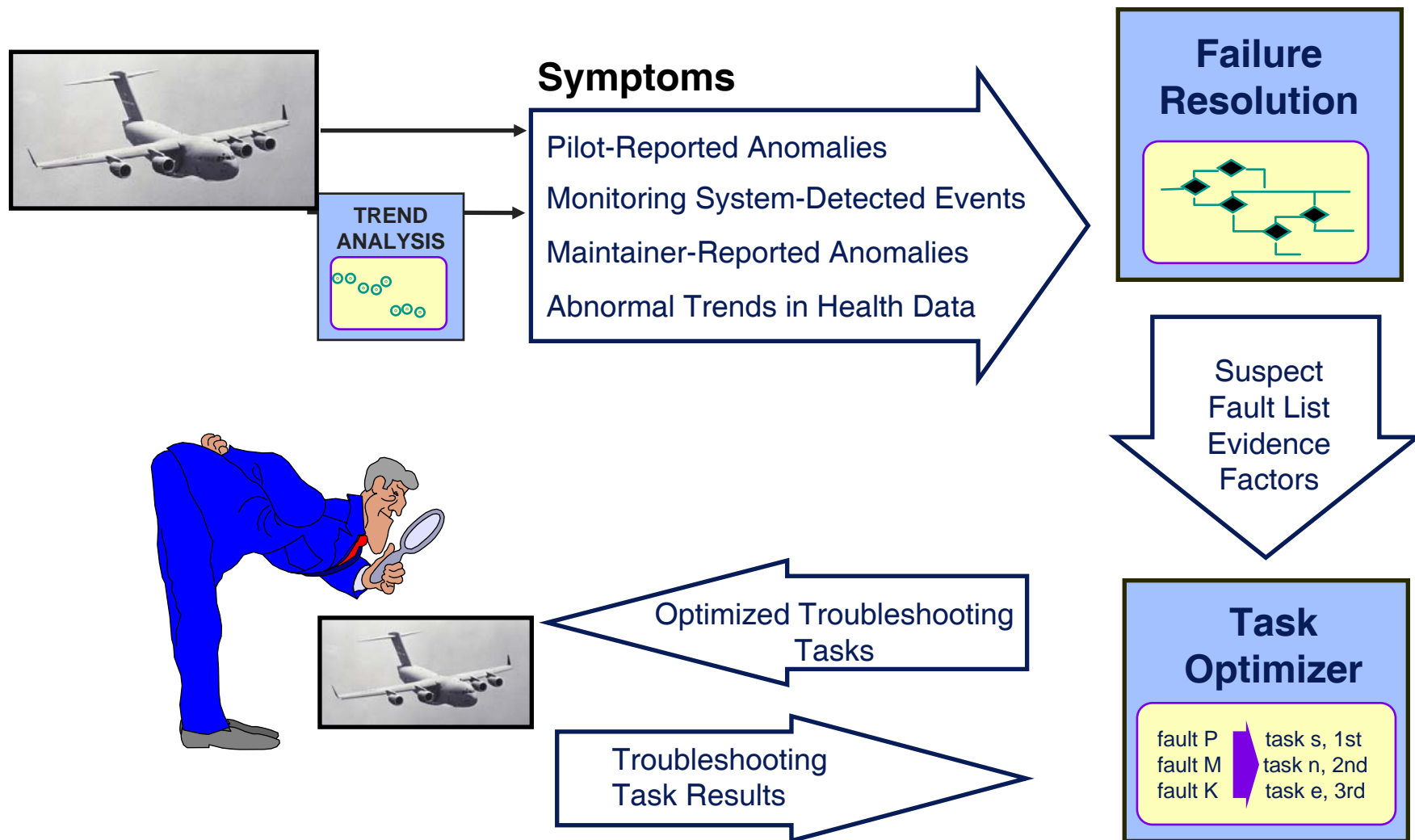
LEGACY ENGINE MONITORING MODEL

Expert Manpower Intensive – Limited In Scope



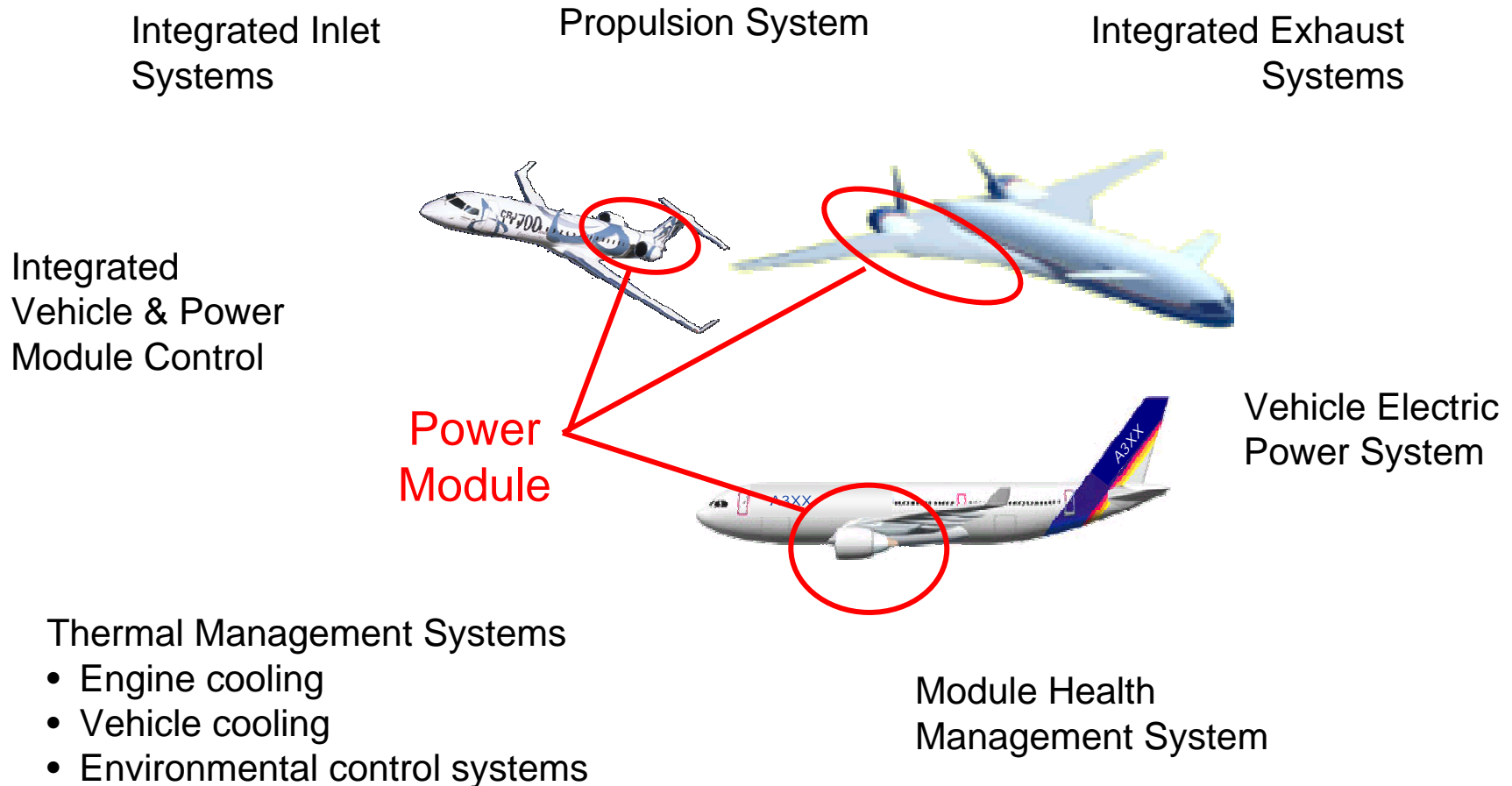
REINVENTED AIRCRAFT SYSTEMS DIAGNOSTICS

Data Intensive – Unlimited In Scope



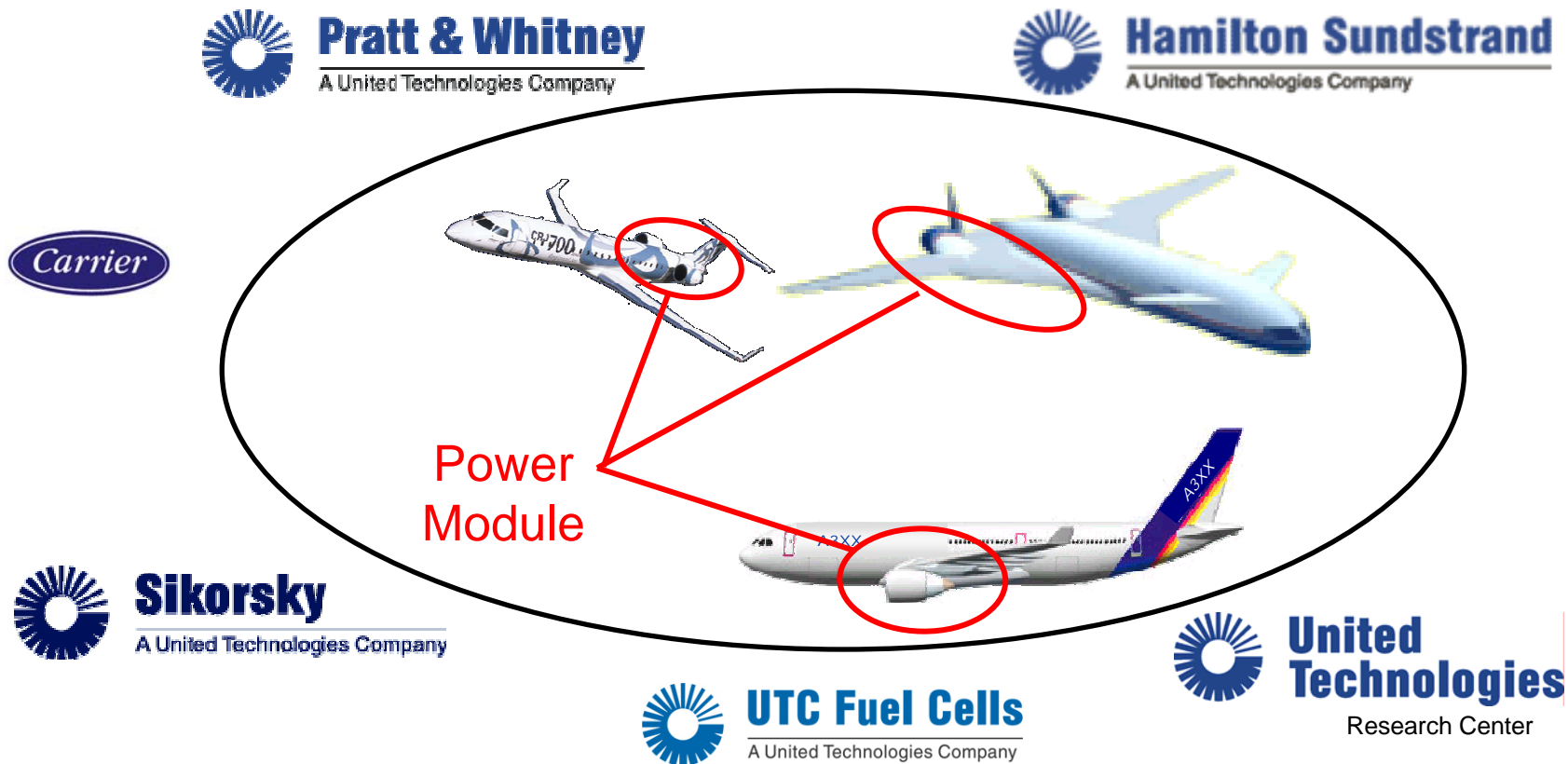
INTEGRATED POWER MODULE CONCEPT

Vehicle-Level Management Of Energy Systems



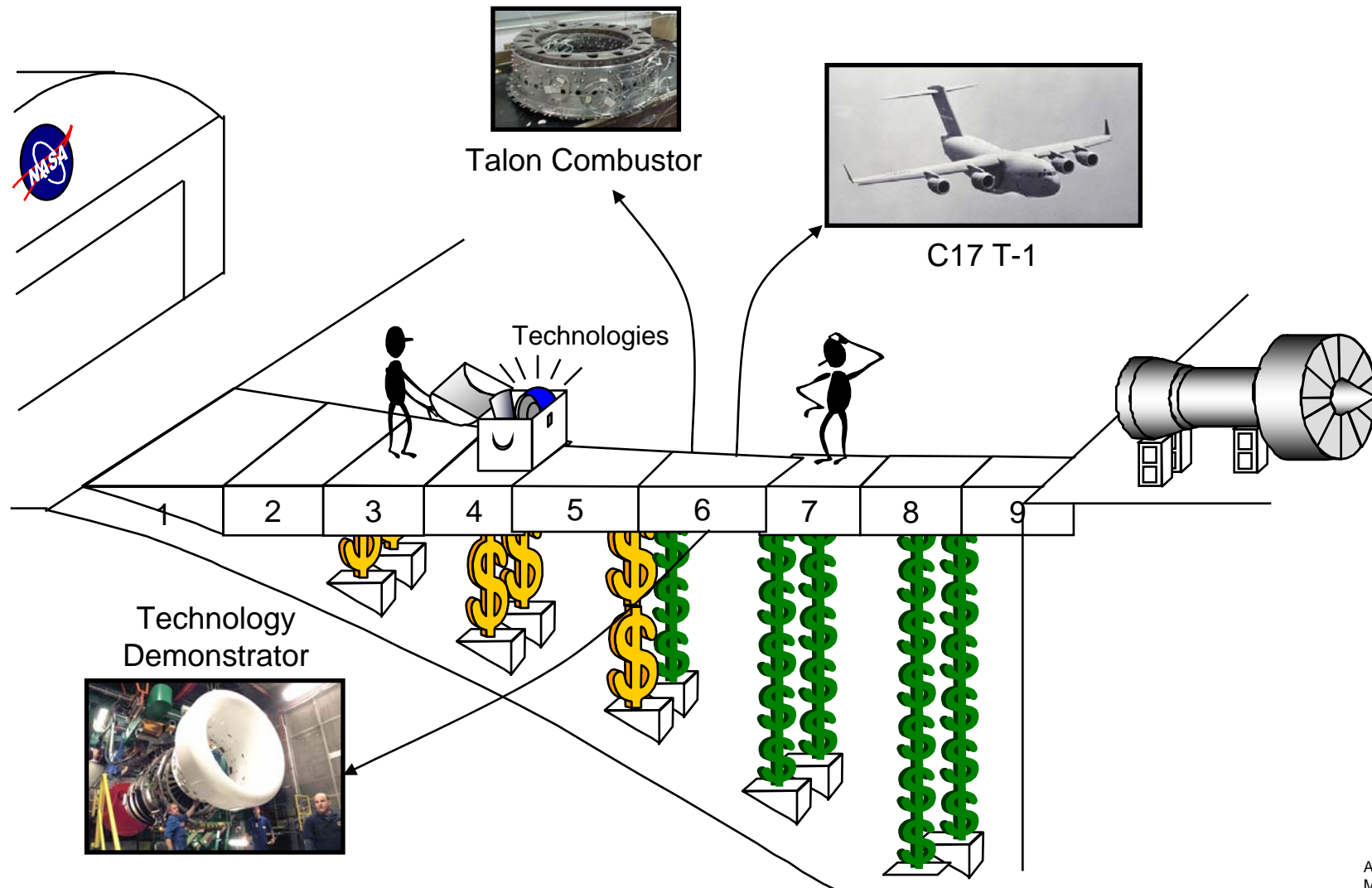
INTEGRATED POWER MODULE CONCEPT

Combining Resources From All UTC Divisions



GOVERNMENT/INDUSTRY PARTNERSHIP

Building A Bridge To The Future



P&W AFTERMARKET OPERATIONS

Reinvented Engine Maintenance Means ...



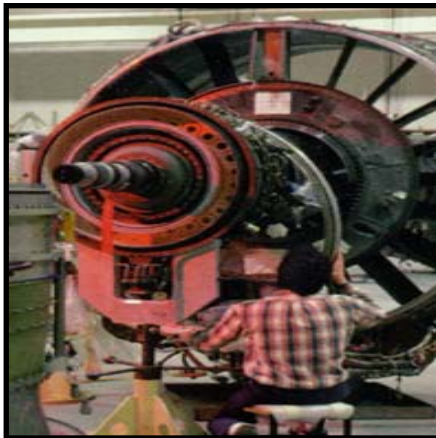
Serviceable Parts

Timeliness ...

Global reach ...



Part Repair

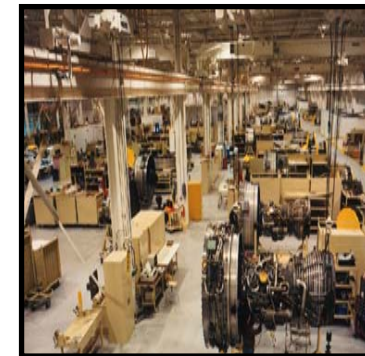


Engine Overhaul

Full range of ...

... products

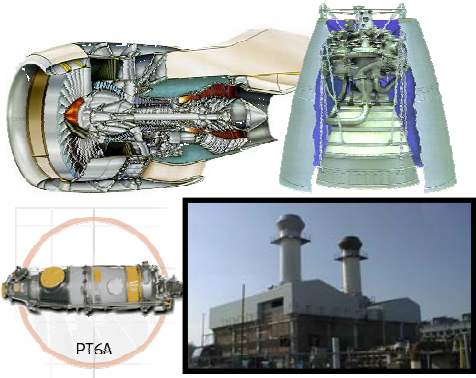
... services



Maintenance Programs

DEPENDABLE POWER REINVENTED

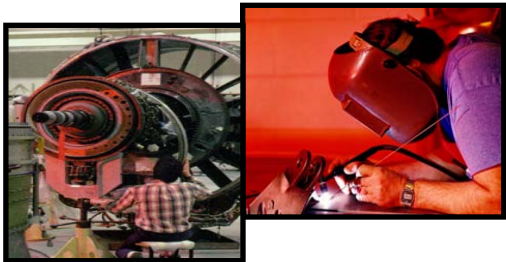
Pratt & Whitney's Commitment



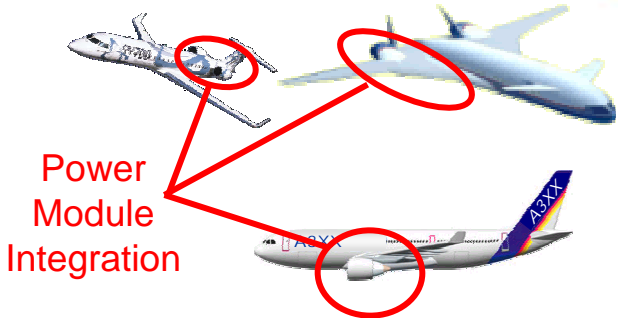
Green Engine Program



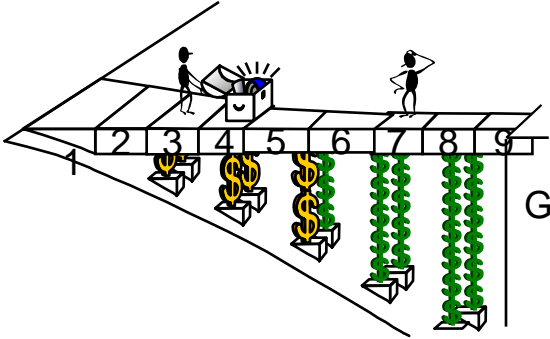
Advanced Diagnostics



P&W Engine Services



Power Module Integration



Government/Industry Partnership