



U.S. – China Trade Impacts on the Defense Industrial Base

**Testimony by Pierre Chao before the
U.S.-China Economic and Security Review Commission**

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How has the relationship between the aerospace industry and DoD changed? How has this affected R&D and readiness? What should the USG do to deal with shortcomings?

- Last 15 years marked by:
 - Post-Cold War drop and 911-related upramp in defense spending
 - Fewer new program starts (in military and commercial aerospace)
 - Which drove consolidation of prime contractors (see support slide #1)
 - Increasing budget dollars drives health of companies, numbers of programs drives the health of the industry (see support slide #2)
 - Has and is driving the major subsystem suppliers (avionics, engines, structures, hydraulics, etc.) to look for overseas for new program launches to deploy new technology (for example growing regional aircraft market driven by Canada and Brazil, and strong interest in Asia)



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- Last 15 years marked by (cont'd):
 - Government science & technology and company independent R&D in decline (see support slide #3 and #4)
 - Government investment
 - Near term pressures of the war versus long term investments
 - Lack of strong institutional champion for long term investments
 - R&D mostly focused on risk mitigation of existing programs
 - Industry IR&D
 - Uncertain demand makes it hard to undertake investment
 - Old bargain of accept low margins for R&D and make it up in long production runs is broken



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- What should USG do?
 - Strengthen institutional champion for long term investment – raise DDR&E to Principle Deputy status in AT&L
 - Review margin policy related to R&D
 - As much as possible, create more points of competition
 - Spiral development with open architecture allows for more points of competition
 - Experimentation programs
 - Avoid going to joint programs too early



Does offshore manufacturing in the aerospace industry detrimentally affect the ability of the US to engage rapidly and effectively if it becomes involved in armed conflict?

- Military aerospace
 - Offshoring limited in military aerospace, primarily driven by
 - Offsets (impact mitigated by using indirect offsets)
 - Use of leading foreign technology (head up displays for example)
 - Jointly developed programs (such as JSF) being done with closest allies like the U.K.
- Commercial aerospace more globalized than the military aerospace market
 - The more commodity-like or simpler the work, the more global (aerostructures for example)
- The further down the tiers of suppliers, the more inherently global
- To date, globalization has increased the list of potential suppliers
- There are other areas of the defense-industrial with bigger problems

What is the process for monitoring the impacts on the U.S. defense industrial base and, in turn, on U.S. security when U.S. firms outsource work abroad for defense contractors?

- Government reporting
 - Offsets reports
 - DoD reports on uses of foreign components
- Industry
 - Tracking of suppliers/parts to comply with “traceability of parts”/liability issues
- Less visibility once you go below 2nd/3rd tier
 - Trade off cost of tracking the information versus utility of the information



How has US-China trade changed the aerospace portion of the defense industrial base? What trends do you see for the next five years? How can potential problems be prevented?

- No trade with China on military aerospace
 - China has been obtaining its military aerospace technology from Russia
- Commercial aerospace
 - China is one of the largest and fastest growing markets for commercial aircraft (large commercial and regional aircraft)
 - China leveraging this to attract aerospace manufacturing
 - Mostly aerostructures and engine technology to date
- China will continue to be a large, attractive market
 - Lax intellectual property protections limits what companies are willing to place in China (irony is that as IP laws strengthen, the rationale for self-restraint lessens)

Specifically, how is China attempting to improve its aerospace capabilities through commercial trade with the U.S. and others?

- In aerospace, particularly military, China is obtaining world class aeronautical expertise from trade with Russia
 - Commercial aerospace technology available from multiple sources – Canada, Brazil, Europe, US
- Product technology being provided by the Russian
 - Interaction with other suppliers improving quality of manufacturing, processes, etc.
- Electronics/avionics expertise lacking from Russia, area of interest and focus on the part of China

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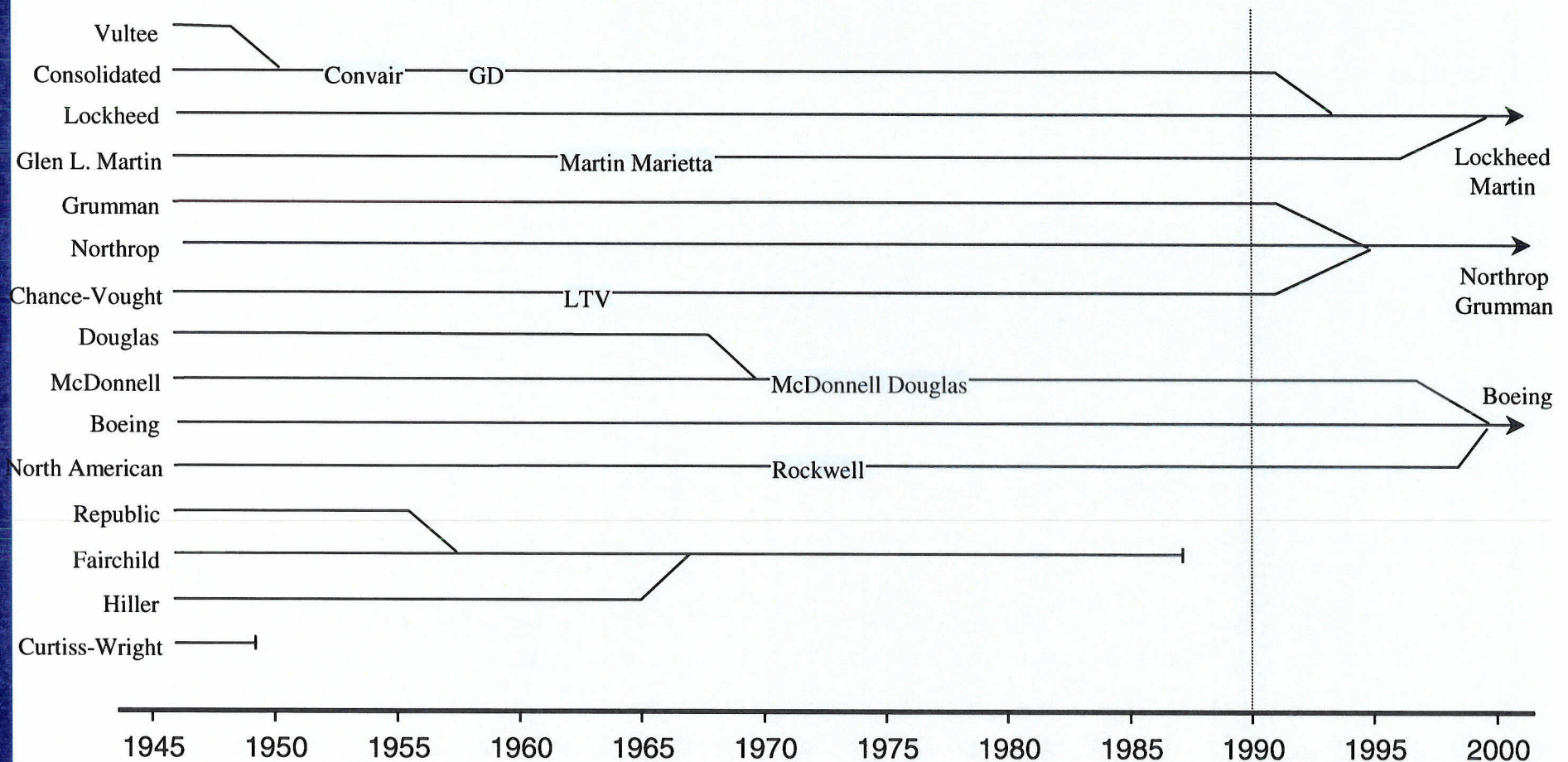


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Supporting Material



Supporting Slide #1: Consolidation in the Military Aircraft Industry...





Supporting Slide #2

Fewer New Large Platform Programs, Supports Fewer Competitors

Combat Aircraft

	New Program Starts	No. Suppliers End of Period
1980-1989	6	7
1990-1999	3	3
2000-2003	0	2

And Vice Versa...

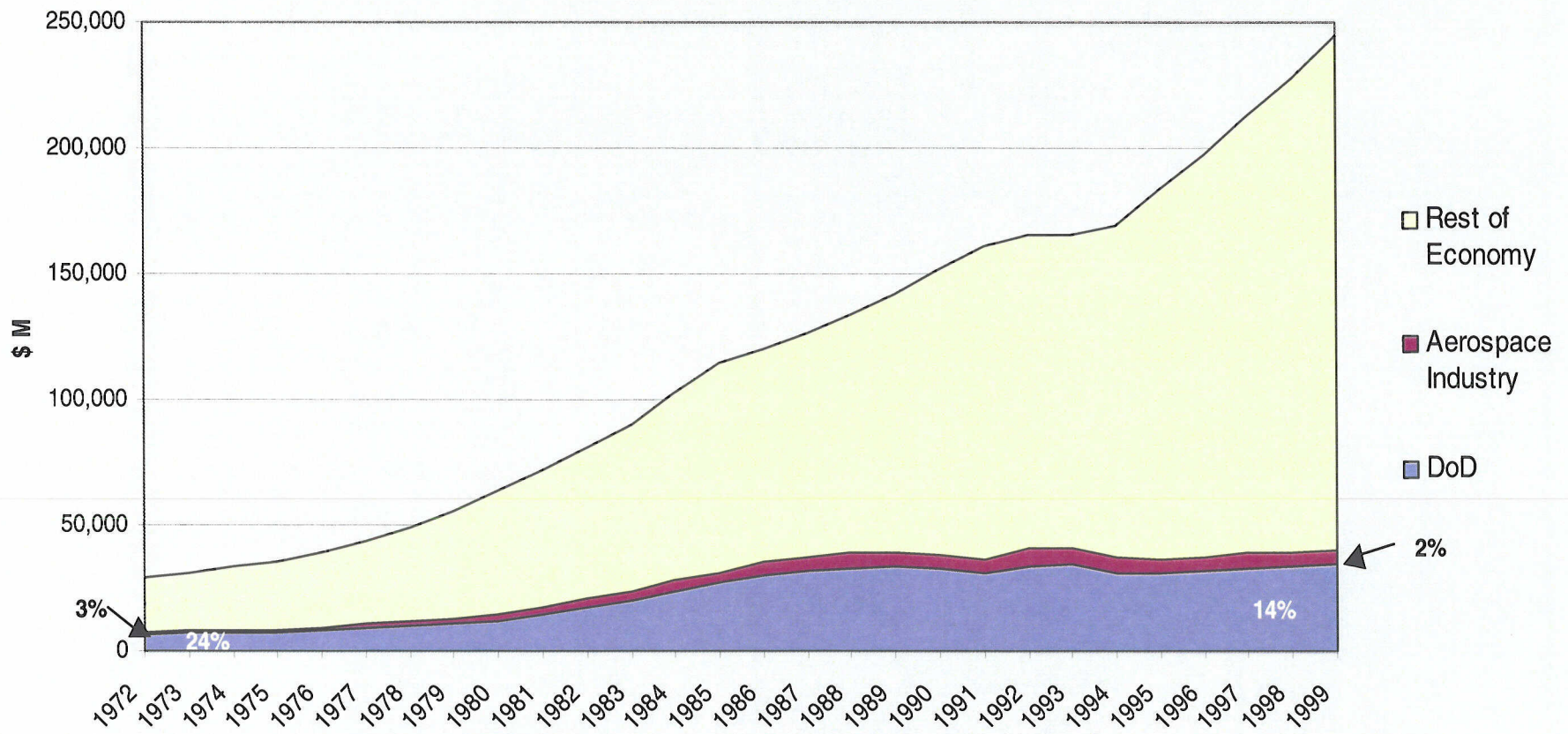
Uninhabited Aerial Vehicles

	New Program Starts	No. Suppliers End of Period
1980-1989	8	8
1990-1999	14	21
2000-2003	9	29



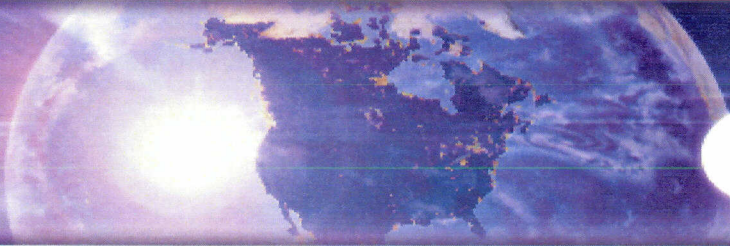
Supporting Slide #3: DOD Proportion of US R&D Spend is Shrinking

R&D in the United States



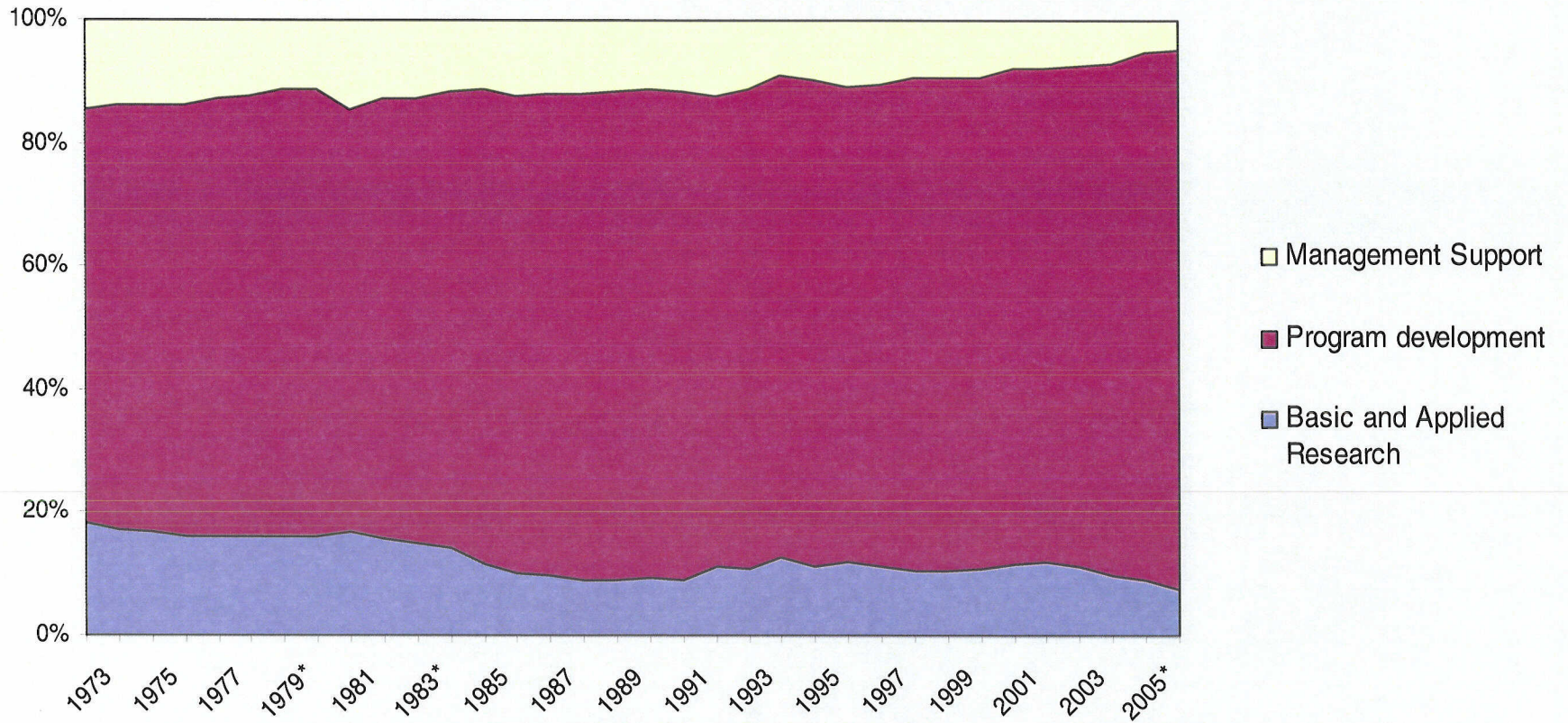
Sources: National Science Foundation, AIAA, CSIS Analysis

Notes: 1) Owing to lack of general data, the Aerospace Industry has here been used as a proxy for the defense industry



Supporting Slide #4: With Basic/Applied Science Also Shrinking . . .

DoD R&D Funding



Sources: National Science Foundation,
CSIS Analysis

Notes: 1) Figures for 2004 and 2005 are estimates only

Supporting Slide #4: Company Internal Research & Development in Decline Due to Fewer Opportunities, Low Returns and Disincentives

Industry Internal R&D to Sales (weighted by revenue)

