



A review on the Civil Aviation Development of New China amidst the rapid evolution of COMAC C919

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Presentation at HKIE Veneree Club
Chan Yat Mei Sophia Room
9/F HKIE Headquarters, Hong Kong
10:00 am to 12.00 noon
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Seminar Outline

- Early development of civil aviation industry in China
- The era of C919
- Challenges and Opportunities
- Future outlook

The first Civil Aircraft

Convair CV240 (USA), 1949年两航起義
Capacity: 40



The first licensed aircraft Lisunov-02 (USSR) 1949, Capacity 21, Chairman Mao's first flight 1956



DC3 (USA-MD) 1936 the original prototype of LI-2 : 21 sleepers



Ilyushin IL18 (USSR) 1959

Capacity: 65-120



Viscount 843 (UK) 1963

The first purchased Western aircraft
Capacity: 24 to 40



Ilyushin IL62 (USSR) 1971

Capacity 105, largest jet aircraft then



Trident (UK) 1970 Capacity 100



Boeing 707 (USA) 1973 First imported USA plane. Capacity 130



B747SP (USA) 1980 The first wide body. Capacity 230



Planning failure in fleet expansion

The rapid increase in domestic demand for passenger and cargo services triggered a large scale of small and mid range civilian aircrafts from many suppliers in Europe and North America

This caused major problems in:



Maintenance
support



Logistics support and
inventory planning



Pilots training

Fleet Combination before 1987 Reform

空中巴士A300B4-605R	波音707-3J6B/-3J6C	波音767-2J6ER	Mi-8直升機
空中巴士A310-222	波音737-2T4	霍克薛利三叉戟型	肖特360
安東諾夫An-12	波音737-3W0/-3J6	伊爾-18	圖波列夫Tu-154B/Tu-154M
安東諾夫An-24	波音747SP-J6/-27	伊爾-62	運-5
安東諾夫An-30	波音747-2J6BM	洛克希德L-100	運7-100
BAe 146	波音757-21B	麥道MD-82	直-5

CAAC Reform 1987

CAAC as a Government Department reporting to State Council, operated the only airline in China.

It also operated all the airports.

It is also the regulatory body for safety and certifications.

It ran its own Universities and Hospitals

This ended in Year 1987



The New look of CAAC

Starting 1987, the airline service operation was taken up by 6 airlines according to regions

1. Air China
2. China Eastern Airline
3. China Southern Airline
4. China Southwest Airline
5. China Northern Airline
6. China Northwest Airline
7. The airports will go to local Municipal Government
8. CAAC becomes a Governing body focus on safety, airworthiness certification and qualifications .

Expansion of airlines to non core business

After the 1987 Reform, the original 6 regional based airlines have evolved continuously after many cycles of M and A activities. As enhanced by local Government support, by year 2024, there are

45 passenger airlines and
12 cargo airlines

Some airlines become multi business conglomerates in which business are diversified into finance, properties, entertainments, investments....., such as Hainan Airline

China locally assembly plane Y10, powered by PWA JT3D Engines



China local designed and export: Y12 · 1982

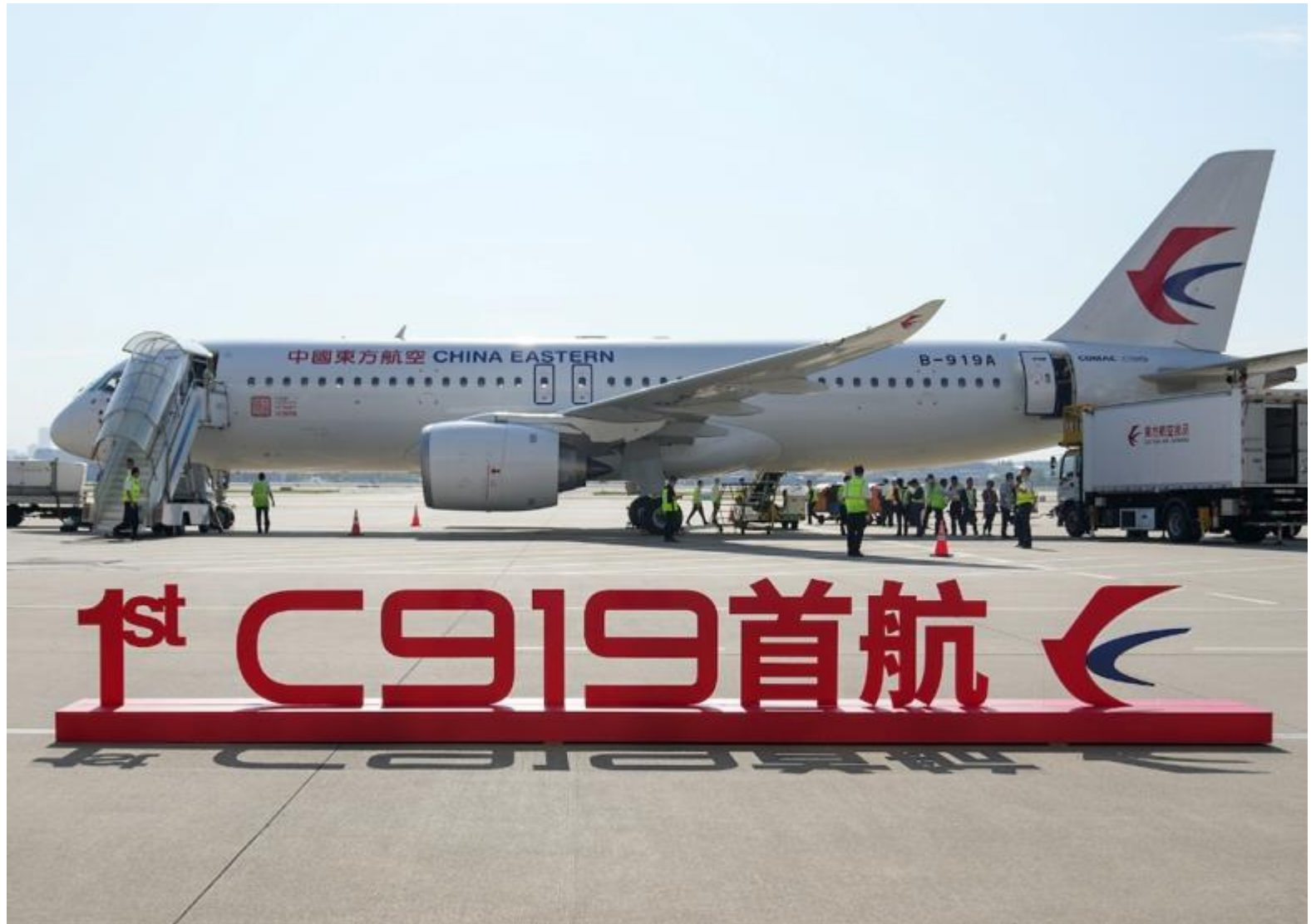
12 seats, powered by PWC PT-6 engines



Cessna Citation II 1982, the learner



The Era of COMAC C919



COMAC C919 Basic Data

Passengers: Maximum 174

Distance: 5555 km

Engine: 2 X CFM LEAP-1C

Target competition:

Boeing 737-Max, Airbus A320-neo

The Era of COMAC C919-Time line 1

2001 Proposal to State Council for building domestically large scale civilian aircraft

2003 Project under study

2006 Project put into agenda, 21 years after Y10 project abolished

2007 Project approved

2008 COMAC (Commercial Aircraft Corporation of China Limited) was set up to implement project

The Era of COMAC C919- Timeline 2

2015 First Trial Run at Shanghai Pudong

2019 The fourth C919 was put to trial run

2022 Full Airworthiness certificate granted by CAA after passing 276 stringent tests

2023 Virgin commercial flight from Hongqiao Shanghai on May 28

2023 First cross border flight to Hong Kong on Dec 13 and cruised flight on Dec 16

2024 First international flight to Singapore from Shanghai on Feb 17 attending Airshow flying non stop 4200 km

The Era of COMAC C919- Timeline 3

2024 First international flight to Singapore from Shanghai on Feb 17 attending Airshow, flying non stop 4200 km

2024 First commercial cross border flight to Hong Kong on Jun 1

China design and assembly ARJ21 2023



China design and assembly C919 2023



C919 the General Cabin



ARJ21 The cockpit

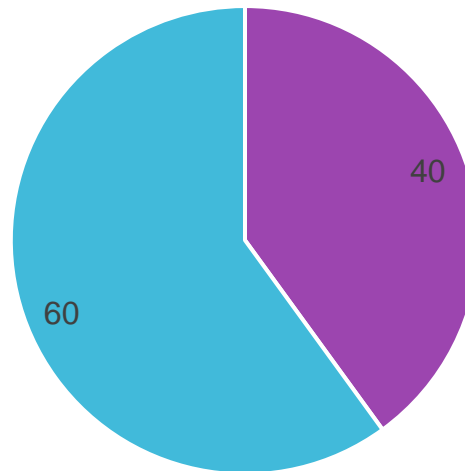


Why the world needs a Third Supplier on large Commercial aircraft supplier

Currently it is a Duopoly Situation

Manufacturer	Worldwide Market share
Boeing	40%
Airbus	60%

Worldwide Market share



■ Boeing ■ Airbus

How it was evolved

Manufacturer	Country	Major fleet type	Status
Convair	USA	240, 880, 990	Merged with General Dynamic 1954, production shutdown 1996
Lockheed	USA	L1011 Tristar, L100	Merged with Martin Marietta to form Lockheed Martin in 1995 now on Military aircrafts
McDonnell Douglas	USA	DC8, DC9, DC10, MD80 ,	Merged with Boeing in 1997
Boeing	USA	B707, 727, 737, 747,767, 777, 787	Market share now around 40% worldwide
Airbus	Europe	A300, 320, 330, 340, 380, 380	Market share now around 60% worldwide

Problem with Duopoly

1. Lack of Competition, reluctant to improve
1. Even Market share split creating formidable entrance barrier to potential challengers, noticeable Embraer of Brazil and Bombardier of Canada
1. Suppliers have a too strong bargaining position, jeopardizing the power of governing bodies
1. Duopoly in civil aviation market also lead to oligopoly in key components supply, typically the engines
1. Very long delivery lead time if only two players. Right now delivery for new order of A320neo is until 2030, B737Max is until 2031

The bottleneck for local manufacturing



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中國「國產」C919客機 主要零組件仰賴西方企業





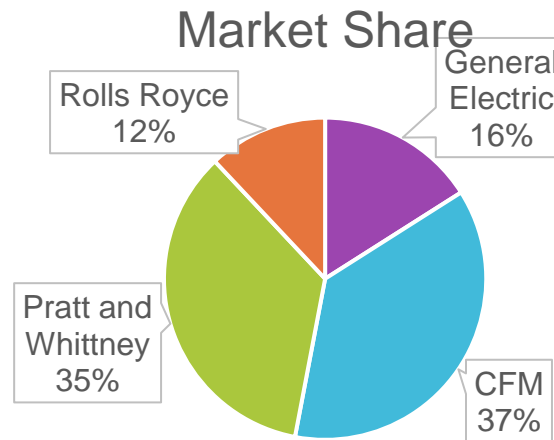
The major bottlenecks

1. Aircraft engine: Environmental, Fuel Efficiency, Maintenance and Overhaul facilities, Continuous operation monitoring facilities, world wide logistic support
1. Navigation and communications : Safety, Air Traffic Control system matching

Our mutual effort to help catching up

Major large airline engines Suppliers

Engine Manufacturer	Country	Major product type	Market Share
General Electric	USA	CF6, CF34 GE90, GE9X	16%
CFM, a joint venture between GE USA and Safran of France	USA/France	CFM 56, LEAP	37%
Pratt and Whittney	USA	JT3D, JT8D, JT9D, PW4000	35%
Rolls Royce	UK	RB211, Trent	12%



Other Major Challenges

1. Airworthiness Certificates

Now only CAAC certificates granted. Still awaiting FAA of USA and EASA of Europe (expected 2015-16)

2. Long delivery lead time of key components typically engines which lead to long delivery time of aircrafts

3. Political Sanction

4. Domestically, competition from high speed train, especially on short haul routes

Current C919 Supply Situation

Total orders received globally around 1000 units

Total delivered

China Eastern Airlines: 5

Air China : 2

China Southern Airlines: 2

Total International orders

Total Linhas Brazil: 4 ea Cargo at USD 90M per unit

GE Capital Air Services USA

PuRan Air - Germany

City Airway - Thailand

Gallop Air - Brunei

New Development on Long Haul Wide Body

CR929 a JV between China and Russia
Project abolished after Ukraine War

Now planning on C929-600 by COMAC

Passengers: 280

Distance: 12000 km

Engine: 2 x Royce Rolls Trent-900 or GEnx-1B,
both with China participation

Target competition: B767, B787, A330,

National Plan of China



The State Policy

坚持面向世界科技前沿、面向经济主战场、面向国家重大需求、面向人民生命健康，加快实现高水平科技自立自强。以国家战略需求为导向，集聚力量进行原创性引领性科技攻关，坚决打赢关键核心技术攻坚战。

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党的二十大报告

Thank you

Any questions?

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