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**International Conference on Aeronautic
Research & Technology
London
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AirTN MISSION TO CHINA



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Map of the People's Republic of China





AirTN Mission to China

February 2008

The mission's objectives were to understand:

- the development of the aviation in China;
- the government's involvement in Chinese civil aeronautical research, technology & development;
- the mechanisms the Chinese government uses to support aeronautical research, technology & development;
- potential for international co-operation.



Meetings

- Delegation of the European Commission
- Tianjin Aviation Park
- China Civil Aviation University, Tianjin
- Ministry of Air Transport (CAAC)
- Ministry of Science & Technology (MOST)
- Ministry of Commerce (MOFCOM)
- Commission of Science, Technology & Industry for National Defence (COSTIND)
- AVIC1
- AVIC2
- Beihang University of Aeronautics & Astronautics, Beijing



Chinese Aviation

- China predicts high growth potential in air travel and cargo volumes (currently expanding at 18% per year).
- However, 80% of the Chinese airspace is for military use.
- The Chinese government is consolidating the airlines; stopped the airline liberalisation and in effect limited the growth of aircraft to 150 per year.
- There will be 4.000 aircraft in 2020 (currently 1.131) serving domestic destinations.



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Chinese aviation

- The current Air Traffic Management system is already experiencing airways congestion problems. The main metropolitan airports are also congested already.
- By 2010 China expects to have 186 airports and by 2020 the total should have reached 244 (compared with the current 147).
- China is educating a large number of pilots and airline /airport staff.



Chinese aircraft industry

- China has built many Russian types under license. License building of the Embraer 145, A-109 and Eurocopter helicopters.
- It has manufactured the indigenous Y-12 commuter plane.



- China will assemble 284 A-320, has a 5% stake in the A-350 and is offered 10% in the future Airbus development project.



Chinese Strategy for Civil Aviation Industry

- To have an indigenous aerospace that supplies aircraft for the domestic (and international) market.
- To develop and implement a modern and indigenous air traffic management system.



Priorities

- ARJ-21 first flight ,(international) certification and further development assisted by Bombardier.



- Develop a new turbo-prop aircraft (MA-700).
- General aviation is fairly limited at present, but AVIC expect regulations to be relaxed.
- Develop other versions of civil helicopters (although at present only 100 helicopters are operational in China).



ARJ21 合作伙伴 ARJ21 Partners

- 24个系统设备19家供应商
- 19 Suppliers for 24 systems





Priorities

- Set up a national joint venture company to manage the design, development, manufacture and support for a large commercial aircraft (150 seats) by 2020. Cost is \$8 billion.



- Greater participation in the global supply chain.
- Develop and implement “New Generation of indigenous Air Traffic Management System”.
- Educate thousands of students in airlines operations, pilots, air traffic control etc



China Aerospace Industry

At present there are 2 state owned aerospace industries AVIC 1 and 2, that jointly

- employ more than 430,000 people (of which some 50% in aerospace);
- consist of 101 large/medium sized companies, 31 research institutions and 3 scientific research institutes;
- manufacture Chinese and Russian designed fighters and smaller aircraft and helicopters; commercial aircraft components for Airbus, Boeing, RR and P&W; airborne equipment; weaponry and fire control systems; ground support equipment.



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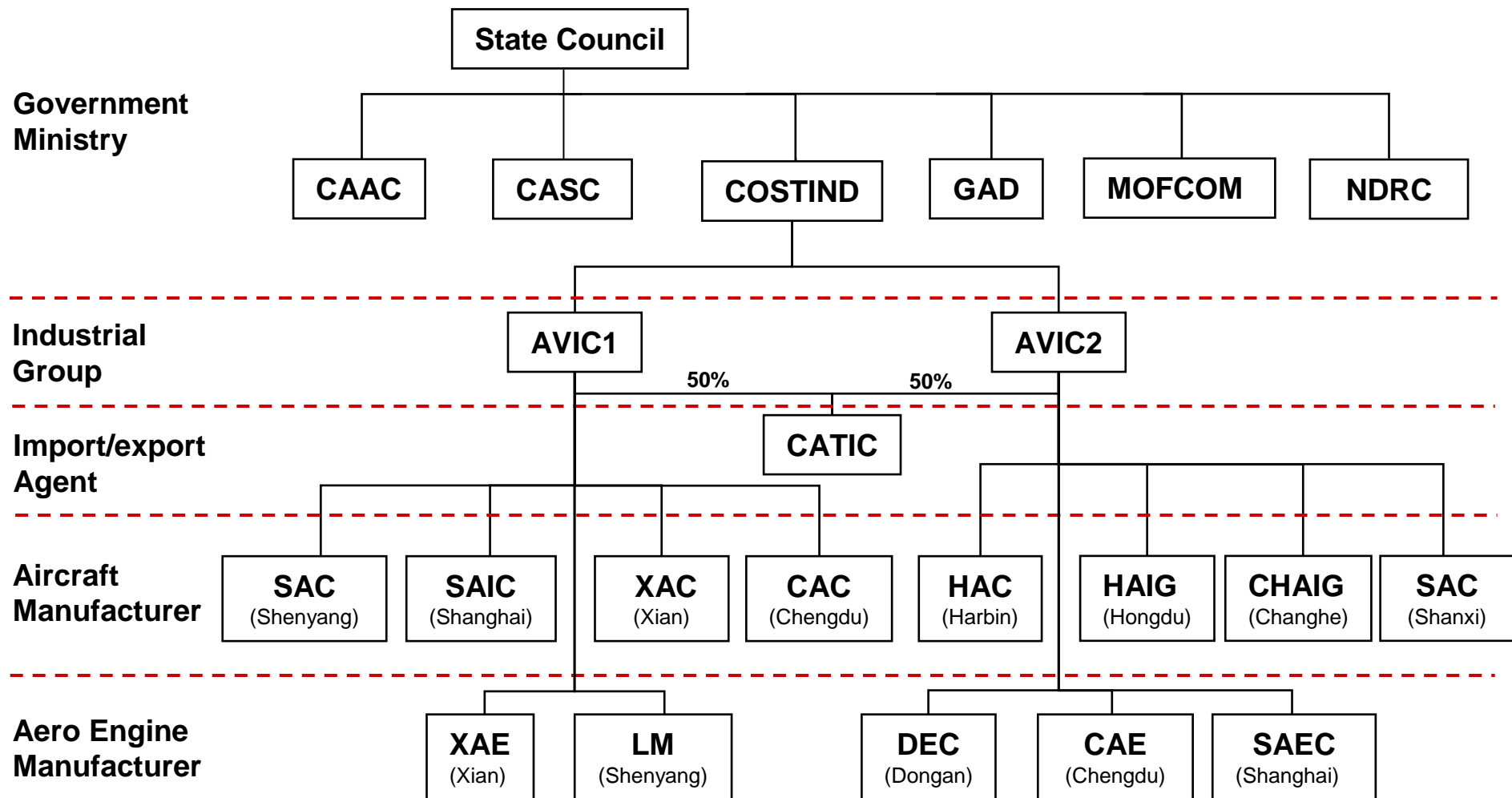


Future structure

The set up of a large company to develop the large airliner, by possibly merging AVIC 1 and 2, has been delayed due to decisions regarding the governance, leadership, and formation of the Joint Venture.



Major Aerospace Organisations and Companies in China





Major Aerospace Companies

Aircraft Manufacturers

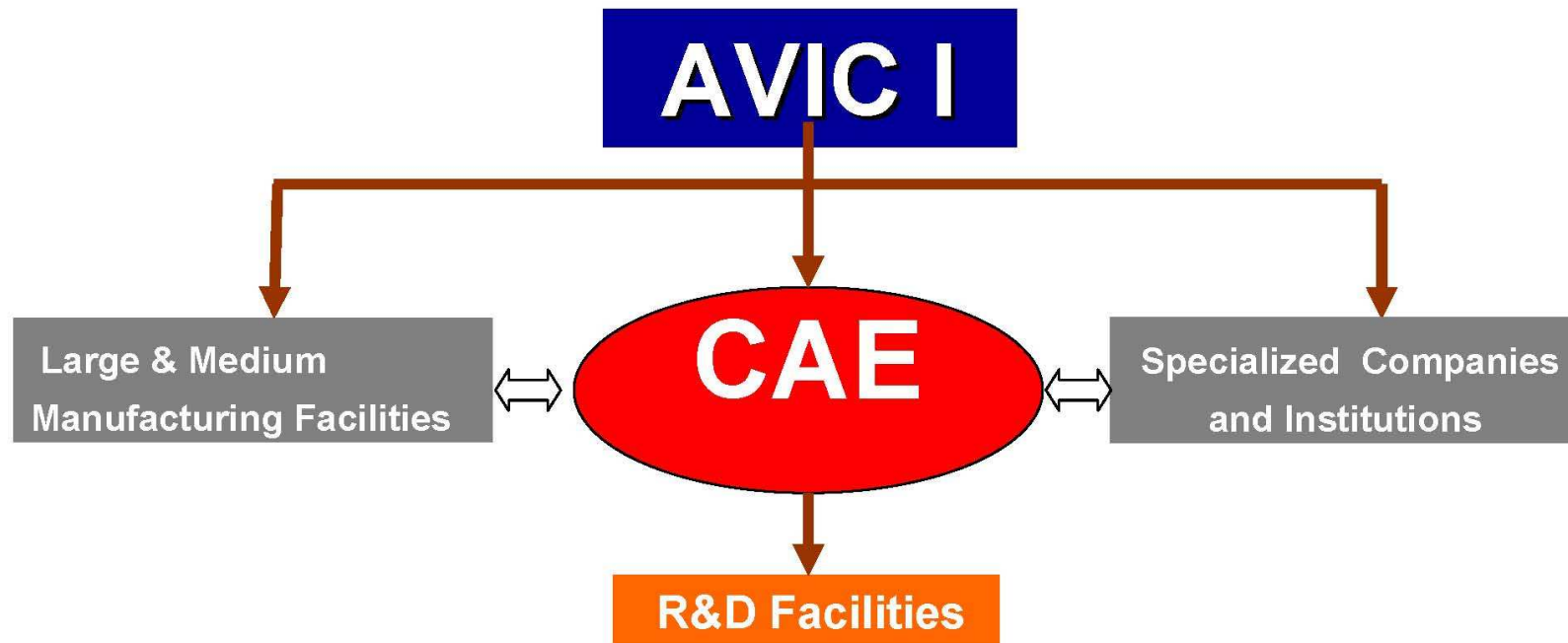
- Shenyang Aircraft Company (SAC)
- Shanghai Aircraft Industry Company (SAIC)
- Xian Aircraft Industries Group (XAC)
- Chengdu Aircraft Company (CAC)
- Harbin Aircraft Company (HAC)
- Hongdu Aviation Industry Group (HAIG)
- Hafei Aviation Industry Company (HAI)
- Changhe Aircraft Industries Group (CHAIG)

Engine Manufacturers

- Xian Aero-engine Corporation (XAE)
- Liming Engine Manufacturing Corporation (LM)
- Dongan Engine Manufacturing Company (DAE)
- CAE Chengdu Aero-engine Company (CAE)
- South Aero-Engine Company (SAEC)



CHINESE AREONAUTICAL ESTABLISHMENT(CAE)



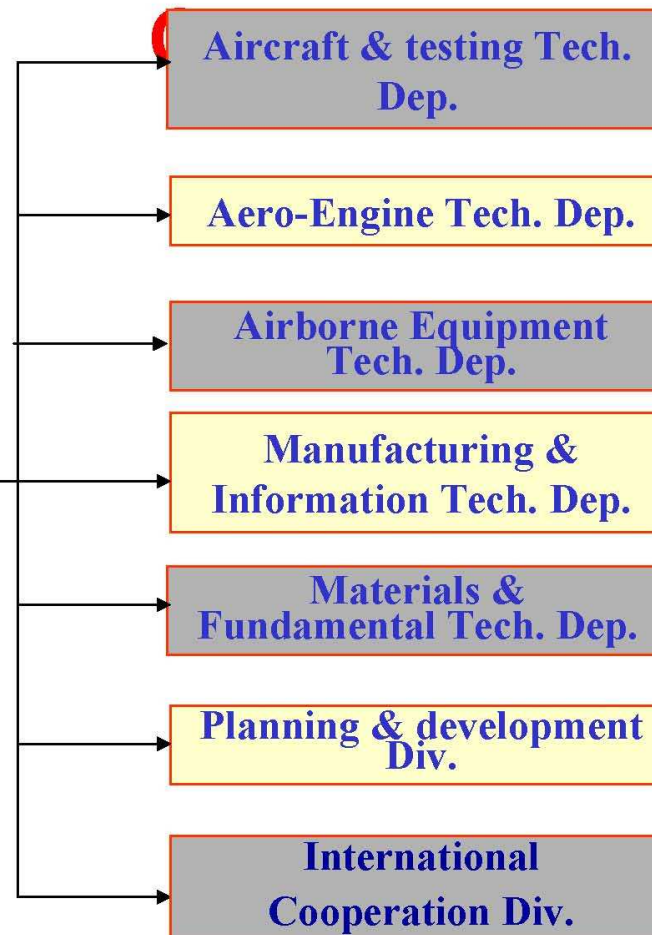


ORGINAZATION STRUCTURE of



President
Professor Yang Yuzhong

CAE
Headquarter



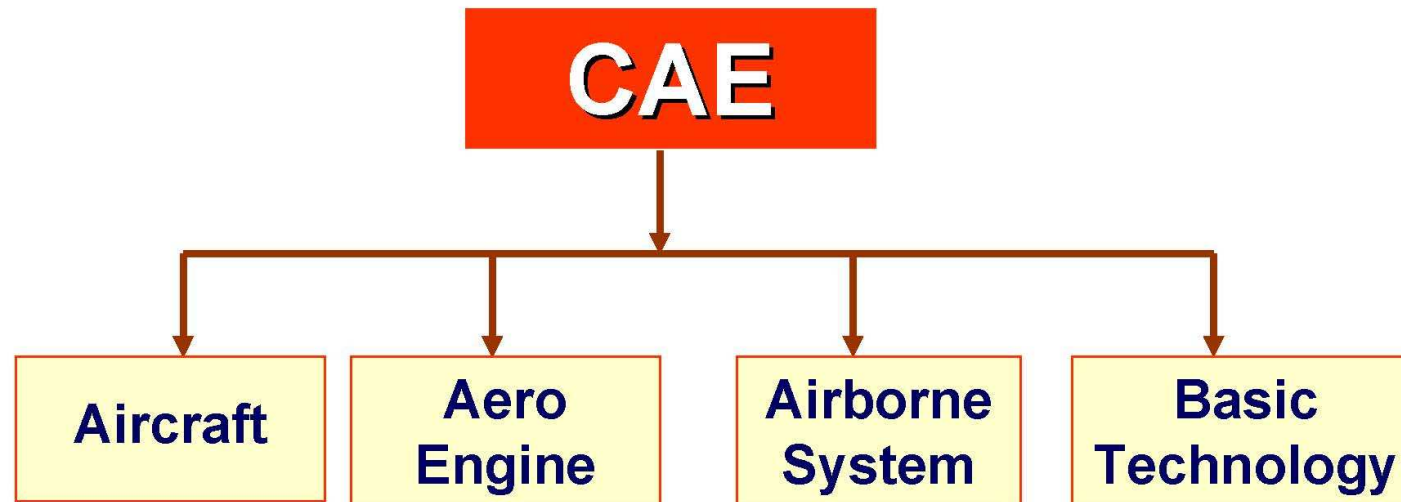
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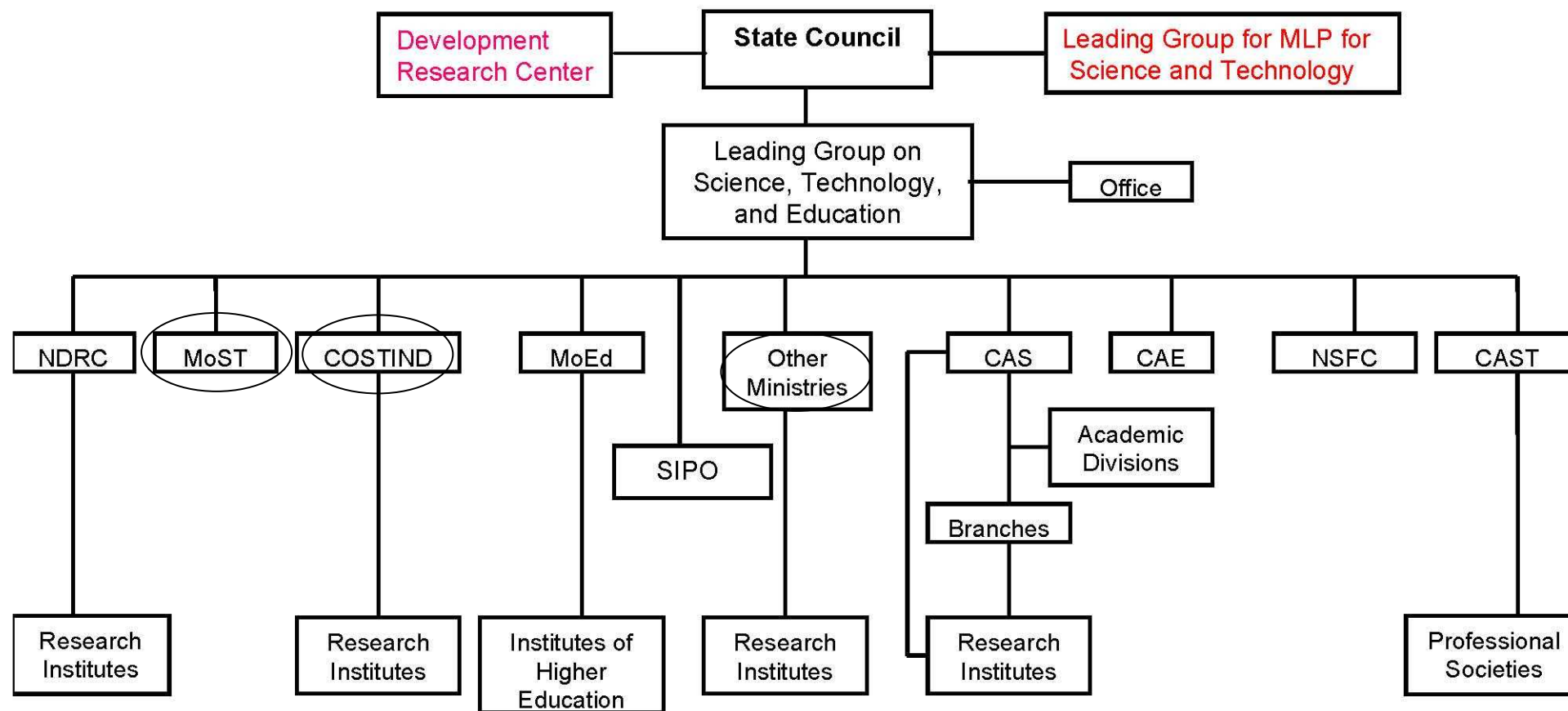


COMPLETE SPECIALITY SYSTEM



Complete Industrial System of full-spectrum of disciplinary

Organization of China's Science, Technology, and Education System (2006)



NDRC: State Development and Reform Commission; **MOST:** Ministry of Science and Technology; **MOE:** Ministry of Education; **COSTIND:** Commission of Science, Technology, and Industry for National Defense; **CAS:** Chinese Academy of Sciences; **CAE:** Chinese Academy of Engineering; **NSFC:** National Natural Science Foundation of China; **CAST:** Chinese Association for Science and Technology; **SIPO:** State Intellectual Property Office.

Note: Not included here are research institutes of enterprises and at the provincial levels.



Ministry of Science & Technology (MOST)

MOST is responsible for:

- for the actions resulting from the document 973 (fundamental and basic research);
- formulating policy on medium and long term developments plans for science and technology;
- coordinating fundamental science and technology research conducted in universities;
- participating in all the large technology development programmes.



The Commission of Science, Technology and Industry for National Defence (COSTIND)

COSTIND is the ministry responsible for planning industrial development and the development of the large commercial aircraft, including the setting up of the joint venture.

It is also responsible for:

- Implementation of the actions from document 863 (applied research and development);
- Controlling the policy framework for the AVICs; Technology policy for development of nuclear, aerospace, aviation, shipbuilding and weaponry industries;
- Foreign co-operation and acquisitions, particularly those with military application;
- Regulation of export of sensitive military technologies;
- Project management of weapon projects and defence conversion.



Civil Aviation Administration of China (CAAC)

- CAAC is the ministry responsible for civil aviation affairs, including:
 - Policy and strategy for the industry's development;
 - Civil aviation laws and regulations, including safety;
 - Civil aviation standards and certification;
 - International civil aviation affairs, including Air Service Agreements.
- CAAC has 200,000 employees.



Schematic view of Chinese Ministries

	MOST	CAAC	COSTIND	
Focus	Basic research	Air Transport	Industrial development	
TRL	1-3	4-8	4-9	
Topics	Basic research and infrastructures	ATM, safety, security, airports	Industrial developments	
Document	973		863	
Universities	Yes	Yes	(Yes)	
Research establishments	Yes	Yes	Yes	
Industries		Desire to start up	Yes	
cooperates	Chinese Academy of science		Industry CAE	
	Ministry of Education			



Conclusions

- New ATM technologies need to be introduced to manage increased capacity; China is looking for Western help to learn about and improve ATM
- Looking for help in the domain of Safety and Certification. The FAA already has an office based in China.
- China seeks cooperation in the initial development of new airports and related equipment
- Large numbers of pilots and technicians required to cope with demand.
- It is difficult to assess the level of Chinese knowledge.
- Capabilities in engineering aeronautic products is not yet at world standard.
- Co-operation is seen as possible in the domain of basic research. The co-operation in applied research is seen by Chinese counterparts as unlikely.
- There is a firm intention to go it alone in the future. The Chinese market may be closed to Western products to support local development.
- Many Western companies are trying to set up joint ventures in China to benefit from future developments. Offering knowledge in the hope that goodwill in the coming years will pay off seems not a business deal supported by Chinese thinking.
- The Dragon is waking up.