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Transportation Major in Shandong Province (Civil Aviation Aircraft Engineering Direction) Talent Demand and Countermeasure Research

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Abstract: Civil aviation transportation industry is a sunrise industry in China. This paper studies the basic situation of civil aviation development in Shandong Province, investigates the personnel training of civil aviation maintenance related specialties in Shandong Province, and puts forward some countermeasures to promote the personnel training of civil aviation for the reference of decision-making departments.

Keywords: Transportation major, Shandong Province, Talent Demand and Countermeasure.

1. Introduction

Transportation (civil aviation engineering direction) personnel (also known as aircraft maintenance) refers to the special professional and technical personnel who are mainly engaged in the maintenance, testing and repair of civil aviation aircraft or aircraft accessories, airborne equipment and so on after graduation. As a special specialty and its corresponding booming civil aviation transport industry, it is necessary to make a summary of the current situation of its education and training, and to analyze the future social needs, and put forward corresponding countermeasures.

2. Basic Situation of Civil Aviation Development in Shandong Province

In 1997, the Shandong Provincial Government promulgated the "Opinions of the Shandong Provincial People Government on Accelerating the Development of Civil Aviation Industry" and the "Twelfth Five-Year Plan" for the development of Shandong aviation industry. After several years of development, the civil aviation industry in our province has made great progress, the number of airlines has reached 13, as shown in Table 1.

Table 1 Basic Situation of Airlines in Shandong Province

Serial number	Corporate name	Function type	Type and quantity	Company Main Operating Place
1	Shandong Airlines	121Ministry	71 frames B737 (64) CRJ200 (5) CRJ700 (2)	Airport
2	China Eastern Airlines Shandong Branch	121Ministry	11 frames(A320/319)	Airport
3	Shandong General Airlines	91Ministry	9 frames(8 Y-5B) (1 KA-32)	Dongying Airport
4	Shandong Yellow River Estuary General Airlines	91Ministry	2 frames(Y-5B)	Dongying Airport
5	Qingdao Jiudian Flight College	141Ministry	29frame(23frameC-172) (3 DA42) (2 PA-44) (1 C190 King in the Air)	Xie Big and tall
6	Nanshan Business Aircraft Company	135Ministry	7 framesG450 (3) G550 (1) BBJ (1) C605 (1) Ring Fast BD700 (1)	Airport
7	Nanshan International Flight Company	141Ministry	20 framesPA44 (2 frames) C-172 (17) DA40 (1)	Airport
8	Shandong Gaoxiang General Airlines	91Ministry	3 frames (R44 rack)	JINING Airport
9	Shandong Qixiang General Airlines	91Ministry	3 framesR22 (1) R44 (1)	Pingyin Nong Terminal
10	Shandong Phoenix General Airlines	91Ministry	3frame(1Hai Yan Hai650C)(1frameR44)	Xie
11	Shandong Hairuo General Airlines	91Ministry	2 frames.C172)	Big and tall
12	Shandong pterosaur general Airlines	91Ministry	2 frames.C172)	Weihai Airport
13	Beihai Rescue First Flight Team	135Ministry	3 frames(2 S-76 and 1 EC225)	Penglai Airport

In December, the Shandong provincial government issued "Opinions on Further Accelerating the Development of Civil Aviation Industry" and further put forward the overall goal of the development of civil aviation industry in Shandong Province. By 2030, the layout of civil airports in Shandong Province will be more perfect, the ability of guaranteeing services will be significantly enhanced, and the coordinated development of aviation manufacturing industry, aviation service industry and airport industry will basically form a safe, convenient, efficient and green modernization. Civil aviation

system, civil aviation contributes more prominently to economic and social development[1].

As an important engine of Shandong future economic development, aviation industry will drive Shandong regional development, accelerate industrial upgrading and transformation, and enhance Shandong comprehensive competitiveness. At the same time, it also puts forward higher requirements for the training of aviation talents in Shandong Province.

3. Training Situation of Locomotive Maintenance Talents in Shandong Province

At present, the civil aviation industry in our country and even in our province is in a period of sustained and high-speed development. With the further increase of the number of airlines and airports in the future, the training of professional and technical personnel for "Aviation maintenance" is not only a good opportunity, but also a severe challenge.

4. Analysis of Employment Units of Professional and Technical Talents in Transportation (Civil Aviation Aircraft Engineering Direction)

Aircraft maintenance units and airlines are the target employment units for graduates majoring in transportation (civil aviation engineering).

Shandong Taigu Aircraft Engineering Co., Ltd. is the largest and only aircraft maintenance unit in Shandong Province. It mainly carries out overhaul and maintenance business for small and medium-sized aircraft. Its specific business scope covers: overhaul and modification of airframe, system upgrade, route maintenance, component renovation, equipment processing, engineering consultation, maintenance training, ladder design and manufacturing, and aviation materials sales. Every year, Taigu in Shandong Province recruits a large number of aircraft maintenance related professionals, including aircraft maintenance, aircraft design, aircraft manufacturing engineering and aircraft power engineering. Requirements for English and practical ability are high, especially English ability. In recent years, requirements have been gradually improved. CET level 4 is required to be above 425 in 2014, and CET level 4 is required to be above 450 in 2015.

Shandong Aviation Group Co. Ltd. known as "Wing of Qilu", was established on March 12, 1994 with the approval of the State Civil Aviation Administration, Shandong Provincial Committee and the provincial government. Its headquarters is in Jinan. Taking the transportation industry as the leader, the business pattern of supporting the development of upstream and downstream business, which integrates air transportation, aircraft maintenance, aviation training, hotel tourism and advertising

business. Shandong Airlines also recruits a large number of professional personnel for aircraft maintenance and route maintenance every year. Because of the large number of aircraft, most of the required personnel are for route maintenance.

In addition to the above two units, there are other airlines listed in Table 1 in Shandong, which need to maintain their own aircraft. These units will also be the employment units for graduates majoring in civil aviation aircraft engineering.

5. Analysis on Training Units of Transportation (Civil Aviation Aircraft Engineering Direction) Professional and Technical Talents in Shandong Province

After consulting a lot of information, at present, there are four universities of civil aviation engineering related majors in shandong province: binzhou college, linyi university, shandong transportation college and nanshan college.

(1) Flight College of Binzhou University

Binzhou University established the Flight Academy in 2006 and became the first local general undergraduate college to train pilots in China. There are six major directions: flight driving, flight safety, civil aviation engineering, air traffic management and assignment, airport operation and management, and aircraft power engineering. The first batch of 28 students were enrolled in the direction of civil aviation engineering in 2007. The enrollment in the past three years was 60, 35 and 35 respectively. At present, 4 years graduate of this major have taken up their jobs.

(2) College of Mechanical Engineering, Linyi University

On the basis of Linyi University Institute of Technology, the College of Mechanical Engineering has established a new secondary college in 2011 due to the leap-forward development of mechanical engineering and related specialties. The college now has three undergraduate majors: mechanical design and manufacturing and automation, mechanical and electronic engineering and aircraft manufacturing engineering. Among them, 40 students are enrolled in aircraft manufacturing engineering every year, and no students have graduated from this major.

(3) College of Aeronautical Engineering, Shandong Jiaotong University

Shandong Jiaotong College established in 2013 an aviation engineering institute with two majors: aircraft manufacturing engineering (aircraft structural maintenance) and electronic information engineering (aviation electronic equipment maintenance direction). The Institute trains advanced engineering technicians for civil aviation aircraft and engine maintenance, aviation equipment maintenance and other directions. Each major enrolls one class. Each of the two majors enrolls 80 students in 2013 and each in 2014.There are 90 students and 60 students enrolled, and no graduates of this major have graduated yet.

(4) College of Aeronautics, Nanshan College, Yantai

Yantai Nanshan College established the Aeronautical College in 2011, and was approved for undergraduate majors in flight technology and transportation in 2014.In 2014, there were 18 students enrolled in aircraft power engineering (aircraft, engine maintenance and management direction), 18 students enrolled in measurement and control technology and instruments (aircraft airborne equipment maintenance and management direction), and no graduates.

According to the statistics of the enrollment of the above-mentioned majors, it can be concluded that only the Flight College of Binzhou University graduates about 30 students a year in Shandong Province, reaching about 270 by 2018, which is far from meeting the needs of civil aviation engineering professionals in Shandong Province.

6. Countermeasure and Suggestion on Training Engine Maintenance Talents

6.1 Reforming the Course Hours and Credit Structure of Civil Aviation Aircraft Engineering Specialty and Increasing the Proportion of Professional Course Learning

According to the investigation and exchange of Taigu and Shandong aviation, it is suggested to adjust the training plan and revise the teaching plan for undergraduates majoring in transportation, pay attention to practical education and grasp the basic theoretical knowledge of students.

Specific suggestions are as follows: Firstly, on the basis of not reducing the quality of learning and the requirement of school hours, we should change the learning methods of public basic courses such as political theory, English, computer and so on. By reducing the concentrated class time, increasing the links of self-study, self-discussion and investigation, enriching the forms of learning, ensuring and improving students; political theory quality; secondly, increasing the proportion of class hours and credits of professional course theoretical knowledge and professional English learning. While attaching importance to professional experiment, practice and practice education, we should deepen the study of professional courses and strive to make students understand the direction and trend of the development of locomotive maintenance technology and master new technologies, new methods and new equipment.

6.2 Integration of multiple specialties to train technical application-oriented talents of locomotive Engineering Specialty

Civil aviation technology development is a comprehensive subject which integrates machinery, power, electronics, materials and other disciplines. In view of the rapid development of Shandong navigation enterprises and the less enrollment of civil

aviation majors, one person is multi-purpose. The existing undergraduate education of civil aviation engineering major in Shandong universities should be based on the implementation of the major-minor system, seek the qualification of the second professional degree, and cultivate interdisciplinary technical response. Employing talents can better meet the needs of the development of civil aviation industry.[3]

Specific suggestions are as follows: aiming at training civil aviation maintenance talents of technical application type, we should formulate and implement the training plan for major and minor courses of civil aviation aviation aviation engineering specialty, and then formulate and implement the education plan for the second professional degree. It is possible to choose the interdisciplinary integration training scheme within the specialties of mechanical design and theory, mechanical manufacturing and automation, electronic engineering, etc.

6.3 Strengthen the Training of Skilled Talents

Strengthen the training of skilled personnel, and set up a training base and fund for skilled personnel of civil aviation aircraft engineering specialty. Focus on supporting Binzhou College and Shandong Jiaotong College (these two schools have the largest enrollment of civil aviation majors, among which Binzhou College has rich experience in running schools) to train all kinds of skilled talents for the development of Shandong civil aviation industry.

Therefore, it is suggested that the Shandong Provincial Government and the Ministry of Education promulgate relevant guiding policies to support the development of civil aviation specialty and cultivate and support the development of civil aviation industry. At the same time, Binzhou College as a pilot, with the help of its personnel training teachers and ability and experience, actively build the first aviation college in Shandong Province to meet the needs of aviation development and civil aviation skilled personnel training in our province.

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