

Study on the Flight Safety of Russian Aviation Troops

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Abstract: Flight safety is foundation of supporting flight training and combat of aviation troops. PLAAF is equipped with a large amount of Russian-made aircraft , so a comprehensive analysis and study of the flight safety of Russian aviation troops is of great significance to our flight safety. This paper analyzes the flight safety of Russian aviation troops and the main reasons and problems in recent years , the main measures and experiences of the flight safety of Russian military are summarized , and the work plan of Russian aviation troops in the future are introduced.

Key words: russia; aviation troops; flight safety

1 An introduction to flight safety of Russian aviation troops

Russian aviation troops , consisting of military aviation , aviation of Ministry of Internal Affairs and aviation of Ministry of Emergency Situation , lost more than 320 aircrafts in recent 15 years. Russian flight accident rate is twice higher than that in other major aviation powers from 2007 to 2009 , and the flight accident rate per 100 thousand hours is 4.8. The flight accident rate in West Europe is 2 , and in America it is 1.2. In 2008 , the deputy commander of Russian air force pointed out that the flight accident rate of Russian air force in recent three years had dropped 86%. If the average interval of each flight accident in other countries is 22000 hours , then in Russia it is 20 000 hours.

In 2010 , in Russian aviation troops there were nine flight accidents , in 2011 there were eight occurrences , and in 2012 there were ten. In addition , in 2011 , in Russian aviation troops there were 3 serious flight accident symptoms causing the damage of the aircraft , 280 serious flight accident symptoms and 1401 ordinary flight accident symptoms. In 2012 , there were 7 serious flight accident symptoms causing the damage of the aircraft , 298 serious flight accident symptoms and 1199 ordinary flight accident symptoms.

2 The main reasons of flight accidents of Russian aviation troops

2.1 Human factors

According to the investigation of flight accidents of Russian aviation troops , about 60% flight accidents are caused by human factors , with more than half caused by aircrew error. Those human factors are categorized into the following aspects.

2.1.1 Violation of regulations in organizing and commanding flight due to insufficient training of the flight leadership responsibility

Flight leaders have low level of flight organization and insufficient preparation for the aircrew command , especially. in the abnormal situation , flight leaders fail to provide aircrew the timely and effective instruction. Flight leaders violate the requirement of standard documents about flight organization and implementation and lack responsibility. They fail to make full use of objective monitoring information to analyze whether the military personnel comply with the regulations on the aircraft flying and technology utilization and whether the military personnel accomplish the flight mission with integrity and high quality. They also fail to attach importance to the investigation on the violation of flight and flight preparation regulations and take appropriate measures , which eventually causes many flight accidents.

2.1.2 Insufficient flight training and weak sense of discipline

Insufficient expertise , non-compliance with specified flight mission procedure and regulation , and wrong flying techniques of flight crew are embodied as follows: decline of professional training level of flight crew , ill-conceived flight preparation classification and meteorological condition , violation of regulations on aerial equipment utilized in the air and on the ground , inconsistency of psychological and physiological endurance capacity and sophisticated aerial equipment and the mission to be accomplished , and so on. All these phenomena have direct relationship with insufficient training time in the air and on the ground. In addition , a large amount of

flight accident occur because the flight crew don't have a strong sense of discipline during flight and ignore the safety measures , especially. when they accomplish a complex maneuver in the altitude below the minimum safe altitude.

2.1.3 Insufficient training and violation of regulations of the ground crew in flight preparation and support

This aspect is characterized by the ground crew's neglect of the quality of flight preparation and support , violation of the regulations on flight support document , inadequate capability of meteorological and airfield support , and so on.

2.2 Aerial equipment failure and other reasons

According to the statistical analysis of the flight accidents of Russian aviation troops , the flight accidents caused by aerial equipment failure and other reasons account for about 30%. With the development of the aerial equipment technology such as airborne test and monitor , the reliability of each aircraft system is improving , thus the percentage of the flight accidents caused by aerial equipment failure is decreasing , especially. the first rate accidents which rarely occur. However , the aerial equipment failure is still a dangerous factor to flight safety. In Russian aviation troops , there are 3 to 5 flight accidents caused by this reason each year , accounting for 20% to 30% of the total flight accidents. The outdated aircraft is another main factor.

3 The measures and experiences of Russian flight safety

The Russian military has realized that the current status of flight safety is not optimistic , thus it has

begun to reform the safety support system concerned. Each military service successively established flight safety sections , developed and utilized objective inspection equipment , adopted scientific methods to investigate the flight accidents and accident symptoms. All these measures gained good effects with the accident percentage decreasing from 8 per 100 thousand flight hours at the beginning of 1970s to today's 4 to 5. The main experiences are as follows:

3.1 Implementing the process monitor of flight organization and operation by adopting modern information methods

From 2010 to 2014 , the federal program on the aviation flight safety support called for working out and adopting a series of organization and technology methods to guarantee that the flight safety system could effectively work. It also reformed the flight safety management system by establishing a new flight mission automatic monitoring system and integrated information analysis system , and developed and adopted a system that can provide the leaders of aviation organizations at all level the decision support about flight safety. According to “The Federal Special Plan about Supporting the Aviation Flight Safety of the Russian Federation from 2011 to 2015” , the Russian Ministry of Defense planed to establish an integrated national aviation flight accident investigation center in Chkalov in July 2014. According to the plan , this center aims to investigate and research the malfunctioned aerial equipment on a new level , shortens the time used to determine the aviation accident causes and formulate the preventive measures to decrease the aircraft accident rate of the national aviation.

3.2 Reducing the impact of human factors on flight safety by adopting various supporting management measures

Statistics show that many flight accidents in recent years in Russian aviation troops can be avoided. 2/3 flight accidents are caused by poor performance of air and ground crew and inadequate flight organization and command. In order to minimize the accident rate and reduce the impact of human factors on flight safety , Russian aviation troops perfects the rules and regulations , and strengthens the supervision and management of the commander and air and ground crew so as to improve their sense of discipline. Besides , Russian aviation troops lay down such measures as: increasing flying hours; improving the training base and the training quality of flying personnel and the utilization of simulator; strengthening the psychological training of flying personnel and improving the capability of dealing with the emergency , etc.

3.3 Improving the reliability and safety of aerial equipment by enhancing the construction of technical means

The measures taken by Russia are as follows:

Firstly , a series of norms and criteria about the reliability , safety and survivability of the equipment are adopted during the designing phase of the aerial equipment. The top priority is reliability and safety. The number of the engines and aircrew and the redundancy of the control surface are determined by the safety required , thus the reliability and the safety level of the new developed aerial equipment will be guaranteed from the source.

Secondly, the plan of active aerial equipment modification is implemented positively, thus the accident rate will be reduced. Modern aerial electronic equipment, reliable objective inspection equipment, automatic monitoring equipment and the equipment that can check out and troubleshoot the potential safety hazard of the flight accident are installed to aerial equipment.

Thirdly, the status quo of the aviation repair base and the repair capability of the repair base and aviation repair enterprises is improved. The responsibility of aviation repair enterprises is specified in the law so as to avoid the utilization of fake spare parts, components and parts during the repair.

Fourthly, supervision is enhanced to guarantee the airworthiness of the aerial equipment. A series of supervision measures are taken, and supervision organizations at different levels enhance the supervision to meet the requirement of aerial equipment research and development, and guarantee the reasonability of the aerial equipment technology lifespan and the airworthiness of the aerial equipment.

3.4 Reducing the impact of composite reasons on flight safety by attaching importance to flight support condition

Composite reasons cover flight support and flight condition, which emphasize two aspects. The first one is meteorological support. Russia sets down relative regulations, specifying the responsibility of flight meteorological support organization. National hydrometeorologic and environmental inspection sections increase the atmospheric radiosonde observation branches to improve the credibility of

aerial weather forecast and minimize the negative impact of natural environment. The second one is field station support, such as supervising airfield runway condition and improving runway smoothness; guaranteeing various aspects of the airfield such as airfield navigation equipment, visual flight support equipment, radio technological equipment, ATC dispatching station, meteorological equipment, power supply and electrical equipment, emergency lifesaving equipment and navigation information meet the requirement of flight safety; effectively and timely dealing with the impact of birds in the airfield.

3.5 Emphasizing the summary of lessons and enhancing the utilization and support of the information

The modern information system of flight accident, accident symptoms and aerial equipment failure is established with the lessons summarized continuously. Powerful measures to support flight safety are laid down. The suggestions put forward by the flight safety organizations are implemented. The reasons that caused the previous flight accidents should be avoided. A series of measures adopted by aviation engineering services section to support flight safety are as follows: analyzing the aerial equipment failure caused by deficiency in design and manufacture, failure consequences and flight accidents in these years; working out the checklist of fire position of the aerial equipment; periodically checking and inspecting the parts and positions listed in the dangerous failure list; organizing the specific study on flight safety, debriefing the mistakes made by personnel during aerial equipment technological maintenance and repair and conducting complicated

operation training.

4 Work plan for Russian aviation troops in the future

Firstly , a deep study on flight safety data in recent years will be carried out. Flight accident precaution program will be improved. Concrete precaution measures about various dangerous factors including the new emerged dangerous factors will be set down , and the suggestions on precaution work will be put forward as supplement.

Secondly , the training , management and supervision of the leaders and flying personnel of the aviation troops will be enhanced. Expertise training will be enhanced by modern technological training means. The working methods and manners of the leaders of the aviation troops that take the direct responsibility to organize the aerial activities will be studied to evaluate their compliance with the flight mission procedure and regulations and their executive and organizational ability in flight accident precaution. The most important aspect that needs to be prevented is the wrongdoing or negligence of flying leaders and personnel in organizing , implementing , commanding or supporting the flight.

Thirdly , the analysis quality of flight mission and aerial equipment performance will be improved by the full use of objective monitoring information and effective measures. A special attention should be put to those aircrew who leave the base to accomplish the mission.

Fourthly ,precaution and identification of the potential hazard of flight accidents and accident symptoms will be attached great importance to. From 2011 to 2012 , flight accidents and serious accident symptoms in Russian aviation troops increased , but less accident symptoms were diagnosed. The analysis of the situation shows that the effectiveness of checking out and preventing the accidents and dangerous factors is low , therefore the management and supervision mechanism need to be improved and incentive policies should be implemented so as to stimulate the initiative of the military personnel. The function of the modern information communication system should be put into full utilization to improve the effectiveness and visualizability of the report by the military personnel on the flight safety problems.

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Brief Biographies

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