Dispatch Resource Management
签派资源管理

罗凤娥　郑力维　代　毅　编著

西南交通大学出版社
·成　都·

图书在版编目（CIP）数据

签派资源管理 = Dispatch Resource Management : 英文 / 罗凤娥，郑力维，代毅编著. —成都：西南交通大学出版社，2020.11
ISBN 978-7-5643-7817-2

Ⅰ. ①签… Ⅱ. ①罗… ②郑… ③代… Ⅲ. ①民用航空－机场－业务－高等学校－教材－英文 Ⅳ. ①F560.81

中国版本图书馆 CIP 数据核字（2020）第 211646 号

Dispatch Resource Management
签派资源管理
罗凤娥　郑力维　代毅　编著

责任编辑　赵玉婷
封面设计　何东琳设计工作室

出版发行　西南交通大学出版社
（四川省成都市二环路北一段 111 号
西南交通大学创新大厦 21 楼）
邮政编码　610031
发行部电话　028-87600564　028-87600533
网址　http://www.xnjdcbs.com
印刷　成都中永印务有限责任公司

成品尺寸　185 mm×260 mm
印张　13.5
字数　415 千
版次　2020 年 11 月第 1 版
印次　2020 年 11 月第 1 次
定价　49.00 元
书号　ISBN 978-7-5643-7817-2

PREFACE

"Dispatch Resource Management (DRM)" is a compulsory course for air transportation majors. Its task is to enable students to proficiently apply the skills of DRM to actual aviation operations after systematic mastering the theoretical knowledge of dispatch. In accordance with the requirements of the International Civil Aviation Organization (ICAO) and the Civil Aviation Administration of China (CAAC) for flight dispatcher licenses and training, combined with actual operations, this book focuses on training students' DRM skills and lays a solid foundation for students to engage in flight dispatch work in the future.

In order to facilitate students' understanding and mastery, the layout of this textbook is based on the internal relations of the teaching content, striving from easy to difficult, highlighting the key points, and closely linked with reality. Besides, the content arrangement has a strong logic, and considers the arrangement that is conducive to the update of teaching methods. Chapter 1 is the introduction, including the development history, the definition and the subject nature of DRM. Chapter 2 is communication, including communication methods and skills, and how to overcome communication barrier. Chapter 3 is decision-making, including factors that affect decision-making and methods to improve decision-making ability, etc. Chapter 4 is workload management, including situation awareness and stress management. Chapter 5 is human factors and error management, including human factors in operation control and countermeasures to prevent dispatcher errors. Chapter 6 is team building and collaboration, including teamwork and team performance management. Chapter 7 is airlines DRM training and management, including DRM training introduction and training effect evaluation. Chapter 8 is DRM skill assessment, including DRM skill assessment index system and DRM skill management, etc.

This textbook refers to domestic and international regulations, manuals and other related materials, implements the principle of combining theory with practice, and tries to reflect the latest achievements, documents and regulations in combination with ICAO latest Competency-Based Training and Assessment (CBTA) project. Therefore, this book meets the needs of civil aviation professionals.

In the process of writing this book, we combined with a large number of actual

operation cases of airlines, so we would like to express our sincere gratitude to each airline for their support. Meanwhile, we have also received help and support from the Civil Aviation Flight University of China (CAFUC), and we are deeply grateful. In addition, thanks for the support of the post graduates.

Due to the wide range of knowledge involved in this textbook and the limited information available to the editors, some of the contents of this book may differ from the actual situation in the future. Limited by time and knowledge, there are inevitable omissions and inadequacies in the book. Please oblige us with your valuable comments.

The Editors
At the Civil Aviation Flight University of China
August, 2020

CONTENTS

CHAPTER 1

Introduction

With the continuous growth of aviation freight volume and the increasingly complex operation environment, higher requirements are put forward for flight dispatchers to scientifically manage available resources and ensure operation safety. The airline operation control center (AOC) is the core of the safety management for airlines. It is a professional technical team composed of representatives of various functional departments. According to the policies, procedures and standards specified in the operation manual, it ensures that each flight can operate safely and efficiently according to the predetermined plan. With the continuous expansion of the number of aircraft and route scale of airlines, the airspace is busy and the operation environment is becoming more and more complex. It is particularly important to improve the ability of the AOC and strengthen the dispatch resource management (DRM).

As an introduction to the DRM, the main purpose of this chapter is to establish the knowledge framework, so that readers can grasp the essence of DRM under the premise of grasping this theoretical framework in the study of the following chapters. The main content of this chapter includes: the development process, meaning and subject character of DRM.

1.1 Overview of DRM

1.1.1 Development of DRM

DRM is accompanied by the development of crew resource management. In 1979, the concept of crew resource management (CRM) was first proposed by National Aeronautics and Space Administration (NASA). CRM is a method that uses all available resources (people, equipment and information) to ensure flight safety, and to improve human factors at safety points by managing and preventing crew errors. Airlines have realized the importance of crew resource management, and have gradually adopted and started to use it. With the development of CRM, the concept of resource management also extends from the initial cockpit flight crew to cabin crew, flight dispatcher, air traffic controller, etc. At first, DRM was discussed as a

part of CRM. However, with the development of civil aviation, DRM has been researched by airlines as an independent part.

1.1.1.1 International development

The development of civil aviation transportation is earlier. The research on DRM is based on the CRM proposed by National Transportation Safety Board (NTSB) in 1979. With the rapid development of the international civil aviation system, the operation becomes more and more complex, and the operation safety is affected by many factors. Only strengthening the pilot's ability training can not make up for the short board of development. Therefore, the Federal Aviation Administration (FAA) put forward the extended training on the basis of CRM, including dispatchers, controllers, etc. With the in-depth study of human factors, NTSB found that the dispatcher is an important link in the accident chain of many aviation accidents. Strengthening the use of resources by the dispatchers can effectively avoid the occurrence of untimely operation control and unreasonable collaborative decision-making. Gilbert, Gordon A. based on the Advisory Circular of CRM, put forward the proposal of applying CRM to dispatcher training for the first time, and defined the concept of DRM, training implementation process and feedback evaluation mechanism in detail.

In order to standardize DRM training of airlines, FAA issued the Advisory Circular in 1995 to guide airlines to carry out DRM training. The contents, implementation process and feedback evaluation concepts of the training were unified. However, due to the lack of preliminary research, the implementation quality is not as good as expected. On this basis, the International Civil Aviation Organization (ICAO) issued the DRM Advisory Circular in 2004, which expanded the scope of DRM training objects and encouraged airlines to strengthen the management and attention of DRM training. As a result, the FAA issued a new version of the Advisory Circular in 2005, updating the DRM training composition, feedback evaluation, and adding supervision and guidance settings.

In 2011, the DRM training issued by FAA introduced in detail the training process, training content and training methods of DRM. This advisory circular (AC) presents guidelines for developing, implementing, reinforcing, and assessing DRM training programs for aircraft dispatchers. This AC complements guidance already developed for flight crew members. These programs are an integral part of training and operations. These guidelines are primarily for those operators subject to Title 14 of the Code of Federal Regulations (14 CFR) part 121. Regulations require domestic and flag operators to provide DRM training for aircraft dispatchers.

In 2013, FAA issued Aircraft Dispatcher Practical Test Standards, and the NTSB has found that inadequate operational control and inadequate collaborative decision-making have been contributing factors in air carrier accidents. Effective management of available resources by aircraft dispatchers is one essential deterrent to such accidents. In exercising

operational control, the aircraft dispatcher coordinates with flight crew members, air traffic controllers (ATC), and other members of a vast team in order to meet the requirements of daily flight operations. AC 121-32, Dispatch Resource Management Training, encourages the aircraft dispatcher's knowledge of the functions of the other participants throughout the operation environment. Two expected benefits to the aircraft dispatcher are: better handling of information that affects the safety of flight operations; and a better interface with each pilot in command, consistent with the joint responsibility requirement outlined in 14 CFR part 121.

In 2017, the Competency-Based Training and Assessment (CBTA) project launched by ICAO also put forward requirements for DRM competency training and assessment, such as communication, problem solving and decision-making, situation awareness, workload management, leadership and teamwork. (refer to appendix I).

1.1.1.2 Domestic development

As the development of China's civil aviation is relatively late, the research on DRM has only been involved since the 20th century. The research on DRM is still in its embryonic stage in China. Considering that DRM is a comprehensive application of human resource development, it is necessary to conduct a comprehensive and in-depth study and analysis on it.

As the core personnel of airline operation command, flight dispatchers have great safety responsibility. According to the requirements of civil aviation regulations, flight dispatchers must have the necessary knowledge, ability and experience to perform operation control duties. In order to promote the development of domestic DRM, Civil Aviation Administration of China (CAAC) has issued a series of regulations and advisory circular.

CCAR-65 (Management Rules of Flight Dispatchers License Certification) stipulates that the theoretical examination of dispatcher's license shall include relevant knowledge of DRM. The practical examination standards formulated by the Flight Standards Department of CAAC in accordance with the regulations on the CCAR-65, requires applicants to demonstrate their abilities in DRM.

CCAR-121 (Large Aircraft Commercial Transport Operators Operating Certification Rules) requires airlines to provide DRM training in the initial training, transition training and recurrent retrain of dispatchers, and the applicant of dispatch license should master the theoretical knowledge and practical skills of DRM.

In 2005, CAAC issued the Flight Dispatcher Practical Examination Standards, which clearly requires the applicants to show their ability in DRM in the practical examination.

In 2009 and 2011, CAAC issued two advisory circulars (AC), namely DRM Training (AC-121-FS-2009-32) and Formulation and Implementation of DRM Training Outline (AC-121-FS-2011-44), which made clear requirements on training outline, training stage,

effect evaluation, supervision and inspection of DRM.

At the end of 2011, CAAC issued the Flight Dispatcher Qualification Management Standard (AC-121-FS-2011-43), which standardized and strengthened the flight dispatcher qualification management, and played a positive role in improving the operation control ability of air carriers.

In 2014, Flight Dispatcher Human Resource Assessment Guide (AC-121-FS-2014-121) was issued by CAAC to carry out the human resource assessment of flight dispatcher.

In 2016, CAAC issued the Flight Dispatcher Qualification Management Standard (AC-121-FS-2016-043-R1), which aims to provide standards and methods for qualification assessment and qualification management of flight dispatchers to air carriers, and to provide guidance for CAAC supervisors to implement continuous supervision and inspection, which clearly proposes that DRM training should be conducted at least once a year.

In 2017, CAAC issued the Flight Dispatcher Qualification Check Guide (AC-121-FS-2017-129), which standardizes the contents, processes and procedures of qualification inspection of air carrier flight dispatchers, which proposes that the dispatcher should meet the ability requirements of dispatching resource management in the qualification inspection.

1.1.2 Importance of DRM

In the investigation of flight accidents, it is found that improper operation control, improper cooperation and release decision lead to the accidents. Therefore, the effective management of reliable resources by flight dispatchers is one of the basic measures to prevent such accidents. In the implementation of operational control, dispatchers cooperate with flight crew members, air traffic controllers and other personnel of many teams to meet the requirements of daily flight operation safety. In order to achieve the following two purposes, one is to improve the information processing ability of safe operation; the other is to improve the communication interface with each captain, so as to conform to the concept of joint responsibility specified by CCAR-121. Flight dispatchers should carry out resource management training and strengthen their understanding of the functions of other participants in the whole operation environment.

In the past investigation of unsafe incidents, it is found that inadequate operation control and insufficient collaborative decision-making are the contributing factors of many aviation accidents. Strengthening the effective management of available resources by dispatchers is the basic measure to prevent such accidents. The dispatcher shall cooperate with flight crew members, air traffic controllers and other members of the operation team to meet the requirements of daily flight operation safety.

For airlines, to speed up the pace of development and improve the ability of operation control, the first thing is to fully tap the potential of employees. The operation control center

is the command center of front field operation. As the core of operation control, flight dispatchers should not only consider safety, but consider the interests of the company. Therefore, DRM is particularly important. As the most basic and front-line production and management unit, work-team has different professional quality, work experience and ideological status. Therefore, we must rely on management to effectively organize and coordinate each flight dispatcher in the team, make full use of their existing resources and give full play to the overall and systematic functions of the team.

Through DRM, dispatchers should have the following qualities:

1) They should have a high sense of responsibility. The dispatch work has an important responsibility for flight safety, because he/she controls the dispatch release and monitoring of the aircraft, especially in the case of dangerous weather such as low visibility, thunderstorm, strong wind, etc.

2) They should have extensive professional knowledge. With the continuous expansion of the fleet, flight dispatchers should know well specific knowledge of aviation, aircraft performance and business operation as much as possible.

3) They should have strong organization and coordination ability. Flight dispatchers play an important role in ensuring the punctuality of flights. Dispatchers need to contact and coordinate with air traffic control, airport, commerce, border inspection, fuel and other relevant units to improve the punctuality rate.

4) They should have a high level of English proficiency. It is very important to have a good command of English, because dispatchers are supposed to interpret and apply NOTAM, METAR, TAF, CFP, ACARS, SITA and AFTN telegrams compiled in English. Moreover, some kinds of manuals provided by aircraft manufacturers are also in English, such as AFM, FCOM, QRH, MEL, CDL.

5) They should have cost awareness. How can flight dispatchers improve the company's benefit and efficiency? As we all know, in the case of saturated sales, reducing the operating cost of enterprises can increase the benefit. Flight dispatchers should know well about the flight status in time. In case of aircraft malfunction or flight delay, flight dispatchers should make reasonable use of transport capacity and make decisions on cancellation, merger or replacement of shifts according to the actual situation, so as to minimize the operating costs of airlines.

1.1.3 Definition of DRM

DRM focuses on the use of available resources to solve the communication between different groups in the flight operation process and the optimization of related interpersonal relationships, including effective team building, conflict resolution, situation awareness, information transmission and release, problem solving and decision-making. DRM originates from the joint responsibility of the captain and the dispatcher for the flight plan, flight delay

and dispatch release. It has become an urgent problem for airlines to make rational and effective use of the dispatcher resource to make the aircraft in the safest state in the whole operation process, so as to improve the economic benefits of the whole airline.

DRM is to use all available resources (personnel, equipment, manuals, procedures, processes and information) to ensure flight safety, and to improve the human factors affecting safety by preventing mistakes of dispatchers, so as to maximize the economic benefits of airlines. It includes human factors and error management, problem solving and decision-making, communication, workload management, team building and cooperation.

DRM regards the members of team as an organic whole, communicates and cooperates through various advanced auxiliary systems and facilities, and realizes the effective exchange and sharing of various information. Considering the improvement of operational safety and service quality, various resources should be fully, scientifically, effectively and reasonably used to implement flight management, adjustment and monitoring.

1.1.4 Significance of DRM

NASA and the Canadian Transport Safety Commission have found that the lack of operational control and collaborative decision-making are the important reasons for air transport accidents through a large number of investigations on air accidents and accident symptoms. For example, in a domestic airline, on July 10, 2018, the crew mistakenly closed the components, which led to cabin pressure loss and continued to fly. This was mainly caused by crew members' lack of safety awareness, lack of theoretical and professional knowledge, and careless work of dispatchers. This incident is equivalent to two serious accident symptoms, both caused by human factors. One is cabin pressure loss; the other is the crew's wrong handling and decided to continue to fly to the destination. During the occurrence of the incident, the dispatchers on duty did not find the emergency descent of height and incidents the subsequent serious non-compliance with the regulations. It cannot meet the relevant requirements in the consultation notice of Implementation Guidance for Aircraft Tracking and Monitoring issued by CAAC, and the ability to monitor abnormal changes of flight path vertical profile is insufficient. Moreover, the operation control department and the corresponding dispatchers did not give appropriate response measures according to the regulations.

On the contrary, in another domestic airline, a passenger found that one part of the aircraft wing was different from other parts. After hearing this information, the crew immediately contacted the company's dispatchers, and the company's dispatchers contacted the maintenance in time and conveyed the maintenance opinions to the crew. Finally, the crew listened to the suggestion of the dispatchers and the maintenance personnel, and made a diversion to Stockholm airport nearby, thus avoided the occurrence of flight accidents. These two different results illustrate that different collaborative decisions will lead to various

consequences. Therefore, effective DRM can enhance the flight safety.