

Non-stop weak current construction management plan for airport projects

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Abstract: With the rapid development of social economy, civil aviation airport reconstruction projects have become a problem faced by many old airports. The scale and construction level of airports in different cities are slightly different, but the non-stop construction organization plan is generally the same, which also brings great requirements to the construction organization plan. In order to ensure the normal operation of airport flights, the normal operation of urban transportation hubs, facilitate the management and maintenance of weak current systems, and reduce the impact on the normal operation of the terminal, this is a multi-level study to ensure flight safety, air defense safety, fire safety, construction safety, and traffic safety, and to prevent all levels of flight accidents caused by poor construction management. Non-stop weak current construction management plan.

Keywords: Civil Aviation Airport; Non-stop Flights; Construction Organization; Air Defense Safety

1. Introduction

With the vigorous development of the airport industry, a number of old airports built in the early years are gradually facing the need for renovation, expansion and functional improvement. Since airport projects have certain requirements for safety and quality and personnel organization and coordination, such projects follow the principles of scientific design, safety management, legality and compliance, and smooth operation. Most reconstruction projects inevitably need to be carried out without interrupting flight operations, and there will be corresponding management measures, so the weak current construction management plan is an indispensable link.

1.1 Characteristics of non-stop construction

Non-stop construction refers to the implementation of engineering construction in the airfield when the transport airport is not closed or some areas or periods are closed, and aircraft are received and released according to the flight plan. The airfield refers to the site used for aircraft takeoff, landing, taxiing and parking, generally including runways, taxiways, aprons, lift strips, runway end safety areas, and areas where instrument landing systems and approach lighting systems are located, usually surrounded by isolation facilities and buildings. Compared with general construction, it has different characteristics. The construction unit must first conduct on-site surveys to confirm the location of equipment points, and then make in-depth modifications to the confirmed results and draw in-depth drawings. The specific content after the in-depth design needs to be confirmed with the airport user unit before construction can begin.

2. Non-stop weak current construction organization plan

During the non-stop process, an efficient non-stop weak current construction organization management system needs to be established. For the construction work in the flight area, the construction unit should work with the construction unit, the user unit, and other relevant units to discuss and formulate a weak current construction organization plan. According to the non-stop construction management specifications, the solutions for safety influencing factors and risk controllable range should be customized in advance. The weak current system of civil aviation airports is generally in the terminal building, closed-circuit television equipment, building control and flight display areas. Due to the uniqueness of the weak current system, it is also necessary to ensure that the weak current system must be used safely and operate stably without affecting the normal operation of the airport.

2.1 Weak current construction management mechanism without flight interruption

Organizational establishment To ensure the orderly and safe operation of flights without interruption, the organizational system is the

key foundation. In order to smoothly carry out construction work, it is necessary to establish an efficient organizational structure and a sound accountability system to constrain and guarantee the advancement of the project. For this type of project, the organizational structure mainly includes a leadership organization, which allocates personnel according to positions and clarifies responsibilities. The construction command is responsible for preparing the next day's construction work plan, and participates in the construction coordination meeting of the Air Traffic Control Department, pre-construction safety education and work arrangements according to the approved construction plan; responsible for handling construction emergencies; responsible for all safety during construction to prevent any level of flight accidents; unified coordination and management of construction work, implementation of full-time supervision, and strict requirements for construction units to implement the requirements of this regulation. The construction unit and the supervision unit shall deploy at least one construction safety officer in each construction area to be responsible for the safety of the construction site and the maintenance of the operation order.

2.2 Air defense safety countermeasures for weak current construction without stopping flights

The airport construction headquarters requires that all construction personnel and vehicles must enter and exit the terminal from designated locations, and can only pass after receiving security inspections and registrations from qualified security personnel to ensure that unlicensed construction personnel, vehicles and animals are prevented from entering the terminal. Construction personnel must comply with relevant air defense safety regulations and cooperate with security inspections. Any construction personnel and vehicles that do not meet the regulations are not allowed to enter the construction area. For restricted items, if each construction unit needs to bring general tools and other items into the controlled area of the terminal, it must submit an application to the relevant department in advance, and can only bring them in after approval. Before entering the controlled area, the security personnel at the crossing will conduct a safety inspection, physical verification and fill in the record. Every day, each construction unit needs to centrally store and check the restricted items of the unit, and assign a special person to supervise them to prevent loss or improper use.

Construction safety officers check the number of workers entering and leaving the site every day in accordance with regulations to ensure that they work in the designated area. They are also responsible for supervising and inspecting the correct use of labor protection supplies, tools and equipment by construction personnel, and promptly correcting violations. Check the number of equipment, tools, vehicles and machinery entering and leaving the site every day to ensure that they are returned to the designated area as required. These equipment, tools, vehicles and machinery must be inspected and signed by the construction manager and the safety officer of the expansion command before they can be withdrawn.

The airport expansion command is responsible for supervising the management of restricted items of each construction unit and regularly checking the management records of restricted items. At the same time, it is responsible for providing air defense safety education to the employees of the construction units.

2.3 Countermeasures for wireless communication of weak current construction without stopping flights

Before starting construction, the expansion command center should prepare a communication book, which includes the walkie-talkie configuration, mobile phones and other information of the airport on-site operation command center, terminal management department, power energy branch, information network company, expansion command center, various construction units and supervision units. Ensure that each relevant unit and individual has a communication book with them. At the same time, each unit and personnel should ensure that all communication equipment is in good condition to ensure smooth communication. The on-site person in charge of the expansion command center needs to be equipped with an 800M digital walkie-talkie and a permanent "on-site command center" channel. He is responsible for communicating with the construction supervision personnel of the terminal management department, monitoring the construction supervision of the airfield management department and the communication information of the on-site command center, and is responsible for arranging work on the construction site. The on-site supervisor of the supervision unit needs to be equipped with an 800M digital walkie-talkie and a construction walkie-talkie, responsible for monitoring the communication information of the on-site command center, the construction supervisor of the terminal management department, and the on-site person in charge of the expansion command center, receiving instructions from the on-

site person in charge of the expansion command center, communicating with the person in charge of the construction unit, and organizing and coordinating construction operations. The person in charge of the construction unit needs to be equipped with an 800M digital intercom and a construction intercom, and is responsible for monitoring the communication information of the on-site command center, the construction supervisor of the terminal management department, the ground service company and the on-site person in charge of the expansion command center, receiving instructions from the on-site person in charge of the expansion command center and the on-site supervisor of the supervision unit, and organizing construction work. The expansion command center is responsible for communicating with the airport on-site^[1] command center and the aviation control department, notifying the construction unit of the airport-related real-time information in a timely manner, and feeding back necessary information from the construction site to the relevant departments of the airport.

2.4 Guarantee measures for high-altitude operations during weak current construction without stopping flights

All personnel working at heights must strictly^[2] abide by the operating specifications: they must wear safety belts and helmets, take effective protection when approaching the edge, and implement necessary safety measures. When working at heights, it is necessary to ensure that the management personnel of the relevant units are present to provide guidance.

2.5 Regular Safety Meeting System for Weak Current Construction without Stopping Flights

The airport expansion command shall be responsible for the construction without stopping flights, and a pre-construction joint^[3] meeting will be organized before the construction begins. It is responsible for contacting and coordinating the functional departments of the airport and supervising the work of the construction units throughout the process. The airport expansion command will participate in the construction coordination meeting organized daily by the terminal management department, and report the construction progress of the day and the construction plan for tomorrow to each unit. At the same time, confirm and verify the conditions for starting construction. Before starting construction, make the duty phone and mobile phone address book of the person in charge of^[4] each unit to ensure that problems arising during construction are handled in a timely manner. Coordinate and resolve conflicts in various support departments and production links to ensure smooth production and construction safety.

At the same time, it is necessary to ensure that appropriate construction protection equipment and work clothing are available, especially during the night construction stage, special reflective clothing must be equipped. According to the scale of the project and specific operation requirements, appropriate lighting facilities, power supplies and other equipment must be fully configured, and necessary traffic, safety and warning signs must be set up. All these signs should have^[5] reflective functions to strengthen and deepen the safety management measures at the project site.

In order to ensure the normal operation of the airport during the airport expansion, a sound safety meeting system needs to be established to improve the coordination of organizational work and ensure that all relevant departments can quickly solve problems at the meeting. Specifically, the following process can be adopted: in the first half of the month, each department reports the problems encountered; then, in the next week, consultations and discussions are held;^[6] after another week, the final solution is determined; and finally, the final decision is made at the meeting. This process can effectively play the role of the coordination meeting, ensure the smooth progress of the project and ensure the normal operation of the airport.

3. Multi-department collaborative management of weak current construction

Strengthening communication and contact with airport dispatch, public security and other relevant departments is an important^[7] measure to ensure the smooth and uninterrupted construction of civil aviation airport runways. Based on the actual needs of the project, it is essential to set up a joint command center, which will become the core coordination organization in the entire construction process, responsible for overall organization and management. Through the joint command center, precise instructions can be issued to effectively control the construction site, thereby ensuring the smooth progress of the construction process.

In order to ensure the timeliness and accuracy of information transmission, the construction site must be equipped with advanced^[8]

communication equipment, such as walkie-talkies, mobile phones, etc. This ensures that on-site personnel can quickly contact relevant departments and communicate in a timely and effective manner when encountering emergencies or requiring emergency instructions. In addition, a complete communication network should be established at the construction site to ensure unimpeded information flow.

Maintaining close contact with the meteorological department is also a vital part of the construction process. Due to^[9] the openness of the construction environment and the uncertainty of weather, the construction team needs to formulate and implement relevant emergency measures in real time according to specific weather conditions. During the construction period, relevant personnel should contact the meteorological department regularly to obtain the latest meteorological information, and adjust the construction plan according to weather changes to avoid safety hazards and construction delays caused by bad weather.

Before the project starts, the construction^[10] unit and the supervision unit must participate in the on-site coordination meeting. In this way, various details in the construction can be discussed and planned in detail to ensure that all parties have a clear understanding of the requirements and arrangements during the construction process. During the construction process, relevant personnel should also contact the meteorological department regularly to ensure the latest weather information, and notify the relevant departments to carry out necessary inspections before entering and leaving the construction site. This strict procedure can effectively reduce the uncertainty in the construction process and ensure the safety and efficiency of the construction.

Following the problems and solutions provided by the joint command and supervision personnel is the key to ensuring the orderly progress of various construction tasks. During the construction process, any problems and emergencies should be reported to the command in a timely manner and handled in accordance with the instructions of the command.^[11]The supervision and suggestions of the supervisors should also be fully valued and implemented to ensure the quality and safety of the construction.

4. Non-stop weak current construction management and maintenance system

Ensure that pre-construction test work is carried out in accordance with the specifications, record the site clearance, construction preparation time and equipment efficiency in detail, and clarify resource allocation^[12]. At the same time, full-time personnel must be deployed on site to inspect the construction site to ensure that the construction site meets flight requirements. If multiple work surfaces are started at the same time, cross-operation should be adjusted according to the sequence, and the construction work volume should be accurately calculated to ensure flight safety. In addition, based on the engineering construction drawings and actual conditions,^[13]the precise construction measurement is re-measured and the relevant control points are encrypted.

5. Conclusion

The uninterrupted construction of civil aviation airport runways is a very common type of engineering in current airport expansion projects. Since the operation of the airport is highly continuous and time-sensitive,^[14]it is necessary to ensure that the normal operation of the airport is not affected during the runway construction. This requires the engineering team to conduct comprehensive and detailed research and preparation before construction, and formulate a scientific construction organization plan based on the actual situation of the airport and specific construction needs.

First, the construction organization must be highly flexible and accurate.^[15]The construction plan should include detailed time arrangements and phased goals, and clarify the tasks and requirements of each construction node. In order to reduce the impact on airport operations, construction is usually carried out at night or during periods with fewer flights, which can minimize interference with flight takeoffs and landings. In addition, it is necessary to work closely with the airport dispatch department to adjust the construction progress and construction area in real time to adapt to the changing flight dynamics and emergencies.

Second, safety management is the most critical link in the entire construction process. In order to ensure construction safety and airport operation safety, comprehensive and sophisticated safety management measures must be implemented. Obvious safety warning signs and isolation facilities need to be set up in the construction area to prevent unauthorized personnel and equipment from entering the construction site. The use of construction equipment and tools must also be strictly in accordance with safety operating procedures, and regular inspections

and maintenance should be carried out to ensure that they are in good working condition.

In addition, the construction team should also formulate detailed emergency plans and make preparations in advance for various possible emergencies, such as bad weather and equipment failures. Training construction personnel to improve their safety awareness and emergency response capabilities is also an important measure to ensure construction safety.

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