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The Charlie Taxiway Design And South Apron At Adi Soemarmo Boyolali Internasional Airport

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ABSTRACT
On the job training activities at Adi Soemarmo Boyolali International Airport there are three things that are of concern, namely the problem with the color of the apron lights on the south side using red lights, where according to the regulations the color of the apron lights on the south side must be blue. And the electrical system for the Taxiway Edge lights are old components that were installed in 1980, and also the electrical lines for the Taxiway Edge lights still use 1 circuit. The problem with the South Apron lights is that they do not comply with the standards of the Ministry of Transportation regulations number:. KP 39 of 2015 Concerning Technical and Operational Standards for Civil Aviation Safety Regulations - Part 139 (Manual of CASR Standards - Part 139) Volume I Airports (Aerodromes), Then the problem with the Taxiway Edge lights is that the continuity of spare parts does not meet and it is difficult to find components. The tool components are due to the old production year, and also still use 1 circuit on the Taxiway Edge lamp electrical line. Based on this background, the author intends to present a report with the title "Design of Taxiway Charlie and Southern Apron at Adi Soemarmo Boyolali International Airport."

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INTRODUCTION

In preparing Transportation Human Resources, especially in the field of Air Transportation, On the Job Training is carried out which is an obligation for Medan Aviation Polytechnic OJT cadet participants, as stated in the Regulation of the Head of the Transportation Human Resources Development Agency Number PK.09/BPSDM-2016 concerning Program Curriculum Education and Training Establishment in the Aviation Sector, KP 22 of 2015 concerning Operational Technical Guidelines for Civil Aviation Safety Regulations Part 139-11 concerning Competency Standards. Airport Electrical Engineering Study Program Training Calendar. Then the Medan Aviation Polytechnic issued a decree regarding On The Job Training number: ST-POLTEKBANG.MDN 437 of 2023.

Medan Aviation Polytechnic cadets are expected to be able to carry out On the Job Training as much as possible to put into practice the knowledge they have gained while studying at the Medan Aviation Polytechnic as an application in the real world of work. So while carrying out this On the Job Training, basically cadets are expected to be able to apply the knowledge that has been absorbed during their education and then put it into practice in

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actual situations in the field, and be able to understand and refer to local procedures at the On the Job Training location in providing engineering services. Airport Electricity.

Literature Review

Taxiway And Apron

A taxiway or connecting runway is a path at an airport that connects the apron to the runway or vice versa. Taxiways are prepared to facilitate the smooth and safe movement of aircraft on land and if the end of the runway is not equipped with a taxiway, the airport manager can create an area at the end of the runway that can be used by aircraft to make turning movements, which is called a turning area. Taxiways should be provided to enable safe and fast and efficient movement of aircraft on the surface. Meanwhile, the apron is a part of the airport that is used as a parking area for airplanes. Apart from parking, the aircraft yard is used for refueling, unloading passengers, and loading aircraft passengers. The aircraft yard is on the air side which is directly connected to the terminal building, and is also connected to the taxiway which leads to the runway.

Taxiway and apron edge lights must be provided at the edges of the runway turn pad, holding bay and apron. Taxiway edge lights must be provided on runways that form part of standard movement routes and are used for movement at night. Taxiway edge light is a light to indicate the right and left borders of the taxiway. The maximum distance between lights is 60 meters, while the distance from the light point to the Taxiway edge marking is a maximum of 3 meters. At turns, the light points must be arranged so that the distance can be reduced, according to the size of the turn. Taxiway edge lights should be fixed blue lights. Lighting should be visible at 75° above the horizontal and at all angles in azimuth necessary to provide guidance to a pilot taxiing in either direction. At intersections, exits or curves, lights should be covered as much as possible so that they are not visible at all angles in the azimuth where they could later be mistaken for other lights. The intensity of Taxiway edge lights must be at least 2 cd from 0° to 6° vertical, and 0.2 cd at any vertical angle between 6° and 75°.

Constant Current Regulator (CCR)

Constant Current Regulator (CCR) According to KP 2 of 2013, CCR is a constant current power supply used to supply Airfield Lighting (AFL) equipment. functions as a fixed current regulator specifically designed to meet the power supply needs of a series of airport lighting system lights such as: runway light, taxiway light, PAPI light, approach light. With various levels of light intensity, the basic model of this CCR provides 5 steps, the current level options include: step 1 with a current of 2.8 Ampere, step 2 with a current of 3.4 Ampere, step 3 with a current of 3.4 Ampere, step 4 with a current of 5.2 Ampere , step 5 with a current of 6.6 Ampere. CCR is used because of the long circuit and load distribution.

Cable Connector Isolation

FL2XCY is a type of cable used as the main ALS equipment for series circuits connecting CCRs and isolation transformers, and includes cables that are impact and weather resistant. This FL2XCY cable has a diameter of 6mm and the voltage it carries is 6KV and is usually connected to a CCR which only has 1 core and uses PVC as insulation, which aims to hold the core on the cable securely. This type of cable is a planting cable.

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Isolation transformer or isolation transformer is a transformer whose function is to limit the direct electrical connection between primary and secondary currents without changing the voltage and current ratings. The winding ratio of the isolation transformer is one to one. Isolation transformers have often been considered as a solution to protect sensitive electronic loads from various interference problems in electric power systems.

Primary Connector Kit is a power connector or power supply. The AGL connector is the most sensitive of the main circuits and therefore, a high quality connector is the easiest way to increase the reliability of the airfield lighting circuit. Primery Connector Installation kit that is water resistant and durable for any environment. Nominal rating 5000 V.

METHOD

On the Job Training (OJT) activities will be carried out from 25 September 2023 to 16 February 2024 at Adi Soemarmo International Airport, in accordance with standards with Ministry of Transportation regulations Number: KP 39 of 2015 Concerning technical standards and operations of Civil Aviation safety regulations Section 139 Regarding the location, distance and characteristics of apron edge lights referring to taxiway edge lights, they must be fixed lights pointing in all directions and emitting a blue color. The problems encountered are:

1. Taxiway Edge Charlie lights use components from old production years, this results in inadequate continuity of spare parts and it is difficult to find the components of the equipment.
2. The Southern edge apron lights use red lights which should be blue in accordance with Ministry of Transportation regulations Number: KP 39 of 2015.
3. There is only 1 circuit for the Taxiway edge light and Apron edge light.
4. Cadets discussed planning to add a new circuit to the taxiway & apron edge light. And understand how to calculate CCR capacity.

RESULT

Problem solving

Where the Taxiway Edge Charlie Light system requires a new lamp replacement plan with a new production year so that it does not become an obstacle for technicians to find spare equipment so that the South Edge Apron Lamp requires a standard adjustment from red lights to blue in accordance with Ministry of Transportation regulations. Number: KP 39 of 2015. In the electrical lines for the Taxiway edge light and Apron edge light, 2 circuits are required. then here is the solution to the problem:

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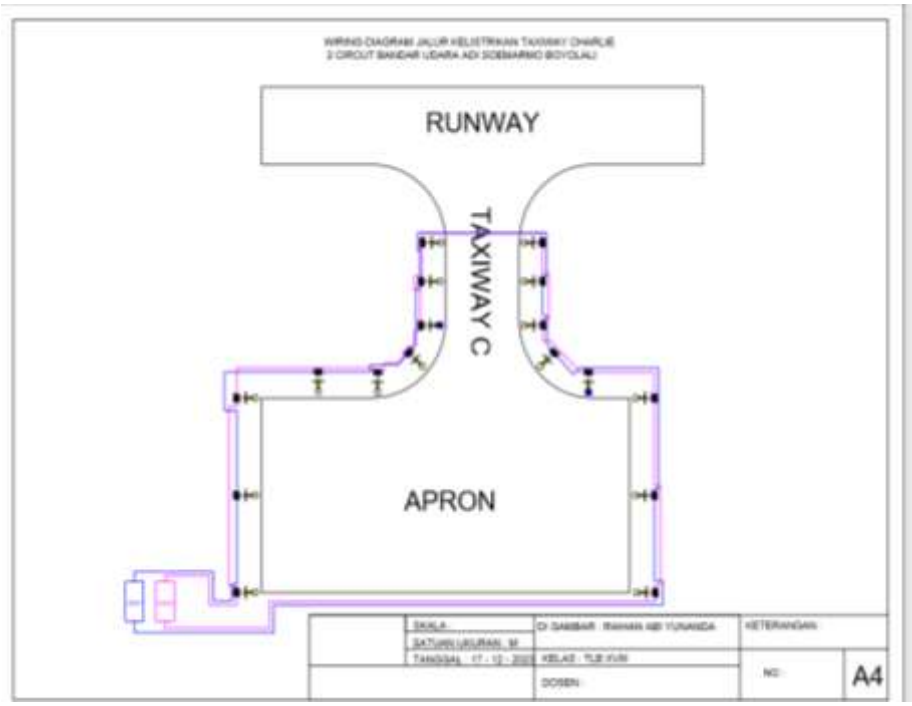

Figure 1. Wiring diagram of the Taxiway Charlie 2 Circuit electrical path

Table 1. Material

NO	Item	Specifications
1.	cable FL2XCY	6 kV
2.	*Primary Connector Kit Type* KDR 600	
3.	Rubber	*Splicing Tape* 19,0 mm X 9,1 mm X 0,761 mm
4.	Isolation	3,4" X 25 m
5.	Resin	*Size* C @420 g
6.	cable NYYHY	2 X 2,5 mm^2

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Work on Taxiway Charlie Lights and South Apron

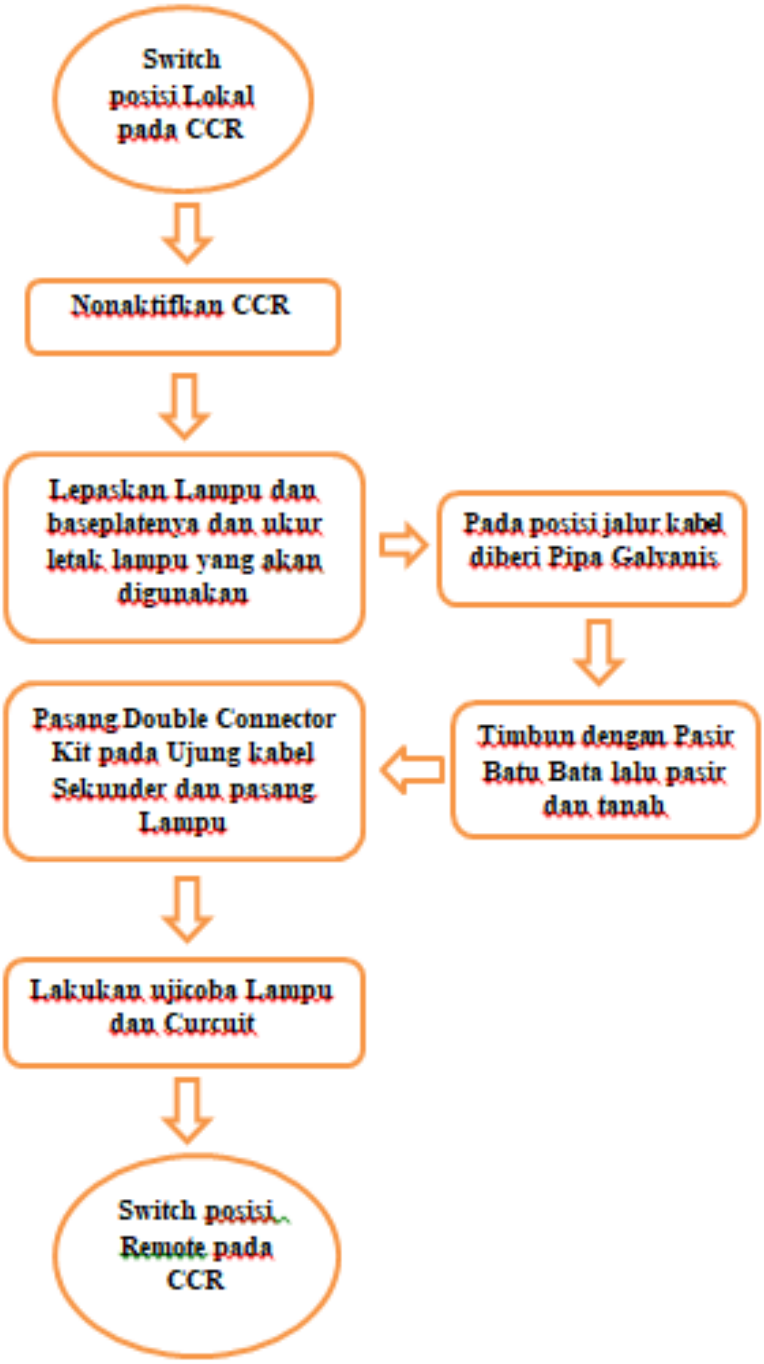

Figure 2. Work Implementation Flowchart

1. The lights used for Taxiway Charlie and the South Apron are ADB Branded with Type ETES-L (LED) with a light power of 10 watts. For installation, follow the existing installation using 2 circuits.
2. In CCR, move the switch to the local position, then disable CCR. Remove all lamps

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and their base plates.

Measure the light placement point according to the specified distance. Earth excavation work is carried out using equipment that has been prepared to a predetermined size. The soil is excavated to a depth of 80 cm according to regulations in and SKEP 114 2002, namely:

a. Installation of ground cables
b. When installing ground cables, attention must be paid to the construction and characteristics of the cables concerned.
c. Installation of cables in the ground must be carried out in such a way that the cables are adequately protected against mechanical and chemical damage that may arise where the ground cables are installed. The location of the ground cable must be marked with cable marking stakes that are strong, clear and not easily lost.

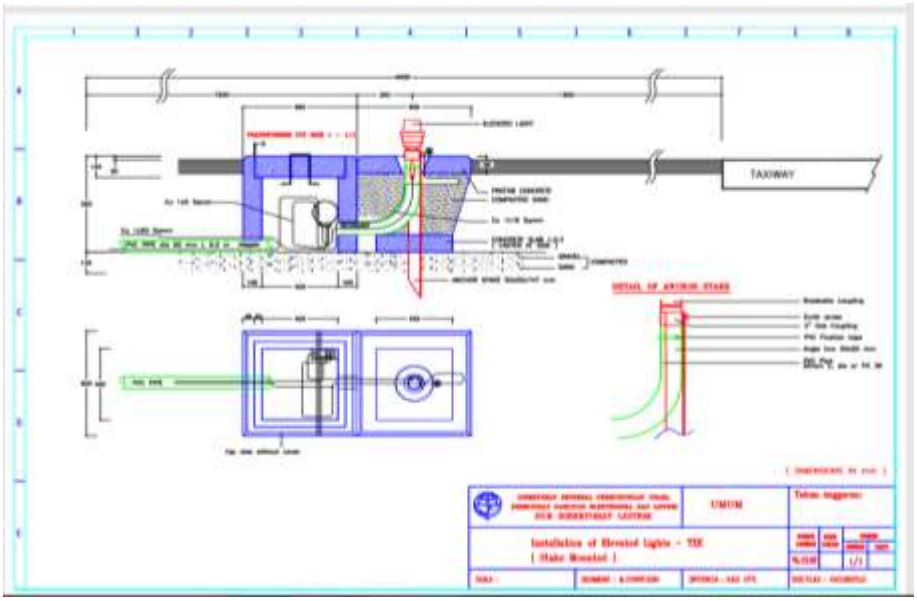

Figure 3. Terms of excavation and placement of Taxiway Lights and Elepated Aprons

d. In the foundation for the cable route, a hole is dug to create the cable route which will have a galvanized pipe in it to protect the cable.
e. Installation of secondary cables and galvanized pipes. After the cable is laid, it is filled with sand and red bricks are placed on top of the sand.
f. Installation of a double connector kit at each end of the secondary cable.

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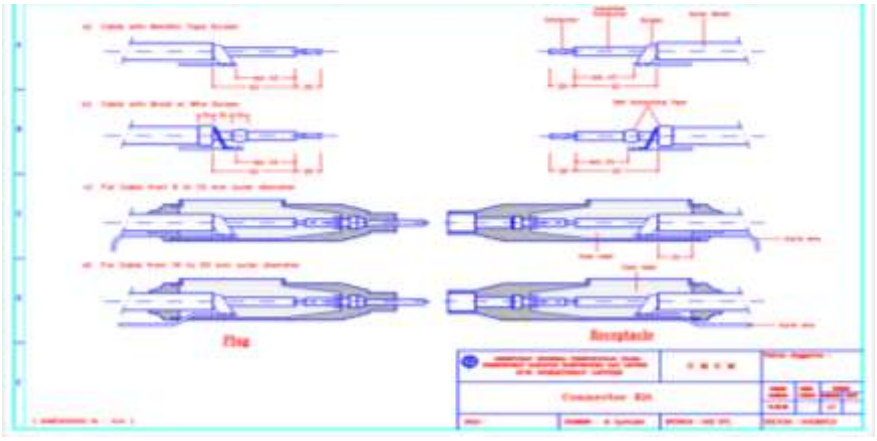

Figure 4. Connector Kit

a. Install one side of the secondary cable on the transformer according to the picture description
b. Install taxiway Edge and Apron Edge lights on the other side.
c. Testing of the Taxiway Edge and Apron Edge lights is carried out, to find out that the lights are on normally and in accordance with Ministry of Transportation regulations Number: KP 39 OF 2015.

Calculating CCR Capacity

After designing the taxiway edge light and apron edge light circuit routes, then calculate the cable routes and determine the CCR capacity.

Figure 5. Long distance of Taxiway Charlie to Adi Soemarmo Boyolali International Airport

It can be seen from the picture above that the cable length is 846 m. To determine the CCR capacity, it is necessary to calculate the loads first. The following is the CCR capacity calculation which will be used for planning the addition of the taxiway and apron edge light configuration to 2 circuits.

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CONCLUSION

From the problem it can be concluded that: Taxiway Edge Charlie lamps use components from old production years, this results in inadequate continuity of spare parts and it is difficult to find the components of the equipment. The South Edge Apron lights use red lights which should be blue in accordance with Ministry of Transportation regulations Number: KP 39 of 2015. There is only 1 circuit for the Taxiway edge light and Apron edge light

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