Industrial Case Study on Flexible Arm And Driving Arm of Plug-in-Box in BBT

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ABSTRACT

This paper is about the industrial case study on the Flexible Arm and Driving Arm in the Plug-in-box (PIB). Plug-in-box is one of the component present in Busbar Trunking System (BBT). In BBT, Plug-In-Box are required to supply the current to the bus duct. Plug in box acts as the source of the current in busbar trunking system. PIB is provided with non-fused circuit breakers (MCCB) of various current ratings. Flexible Arm is used to interlock the PIB box with busduck lock and Driving arm is use to Switch On and Off the MCCB knob. After testing this PIB, many errors were generated, to overcome this problems it was necessary to come with the solutions and this solutions will result in the launching and installing of this product.

Keyword: - *PIB , BBT, Flexible Arm, Door Lock, Busbar*

1. INTRODUCTION OF BBT

Bustrunking has lower impedance in comparison to cable and conventional busducts for the same application, Lower impedance means less energy lost during distribution and this translates into cost savings and makes this as energy saver. Flexible Distribution because of Plug-in type arrangement at regular intervals or as per customer design provides efficient power distribution.

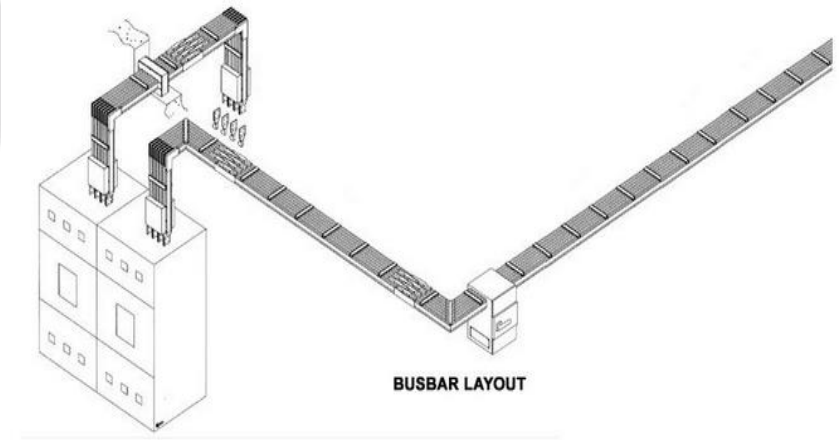

Fig. 1: Busbar layout

1.1 Plug-In-Box (PIB)

Plug-In-Box are required to supply the current to the bus duct. It is use to Tap up and Tap out the current supply to the trunking system. Plug in box acts as the source of the current. This plug in box is use to control all of the components of the busduct. Plug in box acts as a safety encloser to the MCCB.

Fig 2 : Plug-In-Box

2. Case Study 1:- Flexible Arm

The Flexible arm is an rotating mechanism. This Flexible arm plays the major role in security purpose of the busbars. Objective of the Flexible arm is to to hit the plunger spring which is then connected to the inter lock. Function of the Flexible arm is to interlock the PIB box with busduck. To fulfil this many such components are designed in PIB. PIB includes door lock, door defeater, Driving arm.

2.1 Problem

The previous design of the flexible arm was costing lot of money and can be moved only in one direction after its placement to the plunger.

Fig 3 : Flexible Arm (Before)

2.2 Solution

For the solution we decided to create such a design which will be of low cost and which has an easy instalation. The new flexible arm was designed so fluently that it does not require any external assembly or reveting, and will also cost less money and material to the manufacturing of the flexible arm. This design gave us the best result and can be control even if there is short circuit in MCCB or even if MCCB burned.

Fig 4 : Flexible Arm (After)

3. Case Study 2:- Driving Arm

Driving arm is use to hold the MCCB knob. Its objective is to switch on and off of the MCCB switch. It is linked to the other components of PIB box such as Handle, Flexible arm and Door defector.

3.1 Problem

The driving arm is made up of mild steel. Therefore it gains much more weight on the MCCB knob. Which leads to effect of the stress on the other component. This high steel driving arm causes the damage to the MCCB knob.

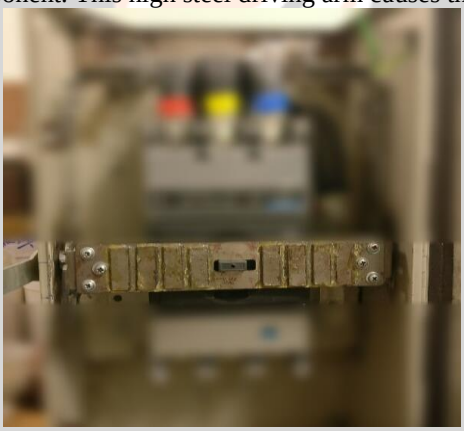

Fig 5 : Mild Steel Driving Arm

3.2 Solution

After breaking of the stress caused on the MCCB knob we decided to create the perfect solution for this PIB assembly. I decided to change the material of the Driving Arm. I change the mild steel to Aluminum (Al). I use the Aluminum with some mixture of the steel which has an hardenability. Due to which the weight of Driving arm is controlled. Breaking of the MCCB knob is avoided.

4. CONCLUSIONS

The implementation of this Designs was successful. This design acted as a perfect solution for the PIB. After applying this designs the total errors produced in the PIB installing were reduced successfully and supply to current to the busduct was also improved. This design reduced the stress acting on the busduct. This modification increased the life of the busduct and the PIB frame.

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