

Case Study - How Auxiliary Contactors mounting may result into Mal-operation & hence tripping of Equipment

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Many of you have seen position of Auxiliary contactor inside your panel as shown in Below Pic-1 & 2.

But is it the right way of putting it together?

Panel manufacturer may say, nothing is wrong, but as a maintenance engineer, what we have notice is that it may be the wrong way in the longer period. Why?

We are going to explain it. (Trying it in simple way)

Pic-1



Pic-2



Obviously, it is not necessary that all the contactors are ON at same time and it will never be. But yes 2-3 adjacent contactors can be ON simultaneously. This case happened in May 2015.

Above auxiliary contactors were placed in one HT Panel which was used to start a Mill (Motor) in a process industry. After 3 years of commissioning of plant one HT panel got tripped. And what engineer found, that coil of Auxiliary contactor was burnt and hence it was not picking up and that feedback signal was not going to control room, ultimately resulting into tripping of that Motor and hence that section of the Plant.

Maintenance team replaced it with spare Aux contactor, that's what normally we do as a maintenance engineer so that the breakdown time decreases. They try to find out what could have happened, but didn't get it in first time except the Aux contactor failed was heated.

Same problem occurs 2 times more within 6-7 months in other Panel of HT motor and again plant got tripped, reason found to be same as above coil failed and Aux contactor found heated, but this time they have to find the root causes too. After checking all the things from loose connections to earthing they didn't find anything wrong in wiring or any other abnormalities.

Then they decided to check temperature all of such motor, transformer and feeder panels with temperature Gun. Yes, there we found some differences.

Temperature on Auxiliary contactor was higher side compared to other parts of control cabinet in HT panel. And on further analysis they found that temperature of 4-5 contactors which were **ON** were on higher side. Maintenance team were getting closer to find the root cause.

HOD sir of that plant advised to create some space between all the auxiliary contactors in one HT Motor panel and compare the temperature with those with no space in between. This was **HOD sir** past experiences regarding Power & Auxiliary Contactors.

And in 3-4 days team found the root cause. The temperature difference on Aux contactors between 2 panels was around 5-6 degrees. Actually, the minor heat which was generated when contactor was **ON**, was not able to dissipate properly due to no space between Aux contactors, and due to this heat generated by the contactors were accumulated there only and in the long run contactor coil was burning or contactor failing.

(***Note** – there could be many other reasons for temperature difference in panels)

They checked the same with Other HT panel too and yes temperature on contactors in Panel with some spaces between Aux contactors was on lower side compared to those with no space between Aux Contactor. The same was implemented across plant, as per the space available.

Pic -3



Pic -4



Also, every plant has its own space problems in HT panels, but what we as a maintenance engineer found out that keeping a small space between Aux contactor is good in the long run. You too can try in your plant.