TATA STEEL

VIRTUAL COMMISSIONING FOR PROCESS INDUSTRIES

IMPLEMENTED INNOVATIONS

Tata Steel and Tata Technologies have developed the first virtual commissioning platform for process industries, which will substantially reduce time and cost overruns while commissioning automation programmes.

THE CONTEXT

The successful development and deployment of an automation programme plays a key role in project life cycle for a process plant. Tata Steel's experience in rolling out Phase 1 of Tata Steel Kalinganagar plant revealed that over 30% of the commissioning activity and ramp-up time was spent in fine-tuning the automation application on site. Currently, automation programmes are only tested during the actual commissioning of the plant. Issues such as debugging the programme or correcting automation sequences are also addressed then.

Since the stakes are highest during the commissioning phase, failures at this juncture can lead to missed deadlines, waste of resources and cost overruns.

THE INNOVATION

Conventionally, after developing an automation programme, engineers wait till the commissioning phase to test and run the application programme logic. To overcome this limitation, the company has created a 3D digital platform that allows engineers to virtually commission a plant or process before physically commissioning it in the field. The 3D platform has the same physics and Input-Output behaviours as the actual plant. Thus, engineers can use it during the application simulation phase to eliminate failures and to train operators.

Additionally, the virtual platform can help perform 'what-if' analysis on the plant and provide real-time process visualisations in a 3D environment. It can also act as a user-friendly interface for changing plant parameters and simulating fault conditions, which is practically impossible during the physical commissioning. By identifying failures early, it can compress commissioning timelines and thus reduce project costs.

KEY CHALLENGE

TO CREATE THE FIRST EVER VIRTUAL COMMISSIONING PLATFORM FOR PROCESS INDUSTRIES

Since this was a first, the company needed varied skill sets such as domain know-how, automation engineering and proficiency in software coding. It formed a cross-functional team and conducted customised training programmes to develop the required skill sets. It also scaled up software that was meant for a discrete packaging line or robotics to the level of a process plant.

THE IMPACT

The virtual commissioning platform has the potential to reduce time and cost overruns while commissioning an automation programme. Most industries use PLC or DCS platforms for developing the application logic but testing and simulations are only possible at the physical site, resulting in cost overruns. For example, each day lost in commissioning a 1 million tonne per annum (MTPA) steel plant can impact revenues by

₹25 CR A DAY

Hence, the virtual platform is expected to provide substantial savings when Tata Steel rolls out the second 5-MTPA phase of Tata Steel Kalinganagar.

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