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Vijayawada – Gannavaram Rail Line

Challenges

The Vijayawada – Gannavaram rail line is situated in Andhra Pradesh, a state in the southern coastal region of India. The line carries strategic importance for the entire region as it is frequently used to transport both passengers and goods between the two cities. Due to increased utilisation of the line, there has been a requirement from the operator to update the currently used absolute block signalling system to an automatic block section system with a Multi Section Digital Axle Counter (MSDAC) system.

Solution

To fulfill the requirements of the operator, the renowned Frauscher Advanced Counter FAdC® was used, thanks to the wide array of benefits that it offers. Most notably, the project required a solution with a large degree of flexibility which the FAdC® was able to fulfill, thanks to its highly configurable system architecture that can be adapted to suit the needs of every project, irrespective of size or complexity. In this particular project, there was a clear aim to reduce the amount of copper cables. As a result, there is an autohut near every signal to reduce copper cable to the maximum possible extent, and only the FAdC® makes it possible to deliver the track section information to the hut and the stations. The FAdC® was used in conjunction with the globally proven Frauscher Wheel Sensor RSR180 which provides safe and reliable wheel detection. Due to its robust design, the RSR180 is also a highly resilient system, capable of withstanding detrimental weather conditions such as ice, snow, flooding as well as challenging track conditions caused by factors such as dust or debris.



Frauscher Wheel Sensor RSR180

Project Details

In total, the project consists of 88 counting heads and 44 track sections, having been commissioned in two parts, firstly between Vijayawada North cabin and Mustabad and subsequently between Mustabad and Gannavaram. The type of architecture used in this project is a dual redundant distributed architecture with ethernet based communication for automatic block section application.

Special features of Automatic Block Section with FAdC® System

- Thanks to the FAdC®, the automatic block section has been designed in a way that enables trains which travel in the same direction to follow each other in a safe manner, thus enhancing the line capacity of the railway system.
- Furthermore, the FAdC® provides a dual detection system alongside COM, PSC and network redundancy which further enhances the availability of the system in the automatic block sections, leading to greater operational efficiency and lower operating costs.

- The Supervisor Track Section STS function has also been implemented on this line for the purposes of auto resetting in case of false errors, again leading to greater system availability and reduced downtime.
- The STS is an automated fault correction process where every two track sections are overlaid by a supervisor section. Consequently, it is possible for a faulty track section to be reset automatically if the corresponding supervisor section is clear.

Results, objectives and improvements

The conversion of Absolute Block Section into Automatic Block Section has resulted in the following benefits:

- Higher line capacity which has enabled operation of more trains on same line.
- A reduction in the waiting time of trains for track vacancy clearance.
- Lower maintenance requirements with less overall faults, leading to higher system availability.
- Reduced dependence of the system on operators and maintenance staff.
- The absence of trackside electronics reduces the need for measurements and adjustments by maintenance teams.
- Power consumption for every detection point is very low for the FAdC® which leads to cost saving for operators throughout the lifecycle of the system.

Key Facts

Operator	Indian Railways – South Central Railway	Country	India
Partner	Progressive Engineering Enterprises	Segment	Main Line
Project Start	2017	Application	Automatic Block Signalling
Scope of project	88 counting heads 44 track sections for Automatic Block Section	Axle Counter	FAdC®
Scope of supply	MSDAC components with pre-wired cubicles and FDS	Wheel Sensor	RSR180