

Advanced rail tracking and safety system (adrats): concept of operations

[Business](#), [Management](#)



Advanced Rail Tracking and Safety System (AdRaTSS Introduction There is an increasing shift to the usage of rail transportation in most settings including US due to its effectiveness and efficiency. The preference of the mode of transportation is attributable to its vital nature to the economy and security of the nations. Indeed, rail transportation remains an essential pillar of economic development in the US. It helps in the transportation of products and human beings to various destinations that include trade centers. Similarly, it helps in the enhancement of security in the nation as security officers respond to various security alerts using train that has become a reliable mode of transport (Ibrahim 3).

However, numerous setbacks that compromise the safety of rail transportation have been reported especially in the recent past. The safety issues include numerous accidents along the rail track. The accidents occur due to inferior monitoring of safety, undetected track damage, hazardous chemicals, and threat of terrorism threats. These challenges demand the development of effective response and monitoring system to enhance safety along the rail track. Therefore, this project aims at providing details pertaining to the development of an advanced rail tracking and safety system (AdRaTSS)

The rail tracking and safety system

As noted, the US rail transport sector has been facing immense challenges despite its imperativeness economically, socially and security wise. The challenges that include occurrence of numerous accidents are attributable to the undetected track damage, inferior track alert systems, hazardous chemicals that pollutes the environment and untimely response by the

locomotive engineers when damages occur. The solution to the highlighted problems is the development of an effective Track Alert System at the main stages with a centralized control unit. The development process of the Track Alert System forms the main area of concentration in this project. The system is to be developed with pertinent software's and hardware's with the capability of facilitating prompt detection of danger along the rail line and at the stations (Ibrahim 4). Once the information is detected, it is relayed to the main control center and to the responsible engineers electronically to ensure prompt response.

In executing the projects to its logical conclusion, effective software and hardware setups are to be used. The setups and applications include

1. Advanced electronic sensors – the sensors are to facilitate data capturing, interpretation and distribution.
2. Quality radars and radar based technology whose work is to monitor the location of train that assists in the clearance of the route.
3. Billboard applications – the applications are to help in supplying precise and credible information about any damage within the train track, speed of the train and distance from the main stages.
4. Advanced digital communicators – these are to track the speed and location of trains as they loco-mote every second.

The design is shown below

The Track Alert and Safety System

Electronic signals

Electronic sensor

Data transfer

Data relay through digital communicator

NB: The arrows show the direction of information flow.

The Track Alert and Safety System's development is purposely to improve safety on the train tracks.

For effectiveness as shown, the system is designed to be mounted at the main train stage, subsidiary stages and linked to the trains to inform drivers and along the rail line electronically. The system is to receive data through electronic signals of diverse issues that are essential in facilitating prompt response (Ibrahim 23). The information will flow from the signals to the electronic sensor where information is to be synthesized, interpreted, and relayed to billboard application through which communication to respective stakeholders is to take place via advanced digital communicators. Specific information that the system is designed to detect and relay for action include speed of the train, the proximity of the next stage, any damage on the rail line, unwarranted intruders such as human beings on the rail line, and congestion. Others include information about a possible oncoming train (Ibrahim 39).

Notably, systematic provision of information through a prompt Track Alert System with superior operating units and service centers as shown is essential in enhancing safety on the train track in US. The system will ensure the prevalence of high level of safety and effective usage of the rail system. It will also enable the railroad to increase its operating capacity, efficiency, and reliability through a viable online performance.

Works Cited

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Ibrahim, A. Assil. Dynamic delay management at railways: A Semi-Markovian Decision

approach. Amsterdam: Thela Thesis. 2010. Print