Data Logger Based - MIS

(Management Information System)

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Introduction

The Data Logger based MIS, first of its kind on Indian Railways, has been commissioned in February 2015 and it is operational on "24X7" basis. The Data Logger based MIS (Management Information System) is generating several automatic summary reports for preventive, corrective & predictive maintenance for use of the concerned departments, thereby, enhancing safety and these reports are being monitored by GM. Before the commissioning of Data Logger based MIS, there have been several cases of overspeeding of trains in loop lines to the extent of 80 to 90 Kmph. After commissioning of Data logger based MIS and continuous monitoring, the overspeeding cases have reduced drastically, thereby, improving safety. Moreover, reports of late start of trains, late operation of home signal, late closure of level crossing gates, premature release of panel buttons by Dy SS, point loose packing, relay rooms opening etc are also being generated by Data Logger based MIS with date and time stampings and these are discussed during Safety Meeting held at headquarter on every week for taking action by the concerned departments and monitored, thereby, assisting in punctual train operations and enhancing safety.

Synopsis

Data Loggers are being used extensively on Indian Railways for preventive, corrective & predictive maintenance, thereby, enhancing safety.

The existing system of datalogger entails preparation of various reports, like daily / weekly / monthly etc. exceptional reports, with manual intervention only. This is a time consuming exercise and also may cause some errors. To overcome this problem and also to generate large number of other user friendly reports, an MIS (Management Information System) has been developed by WCR. This MIS is able to create automatic summary reports of various types which can be used by the management at divisional and zonal levels very effectively and gainfully, thereby bringing about improvements in working and in enhancing safety.

This innovative work in the field of Data Loggers, which is first of its kind on Indian Railways, is likely to prove an important milestone in the evaluation of data loggers.

Background:

Innovation is going to be the key for success in any field in the coming years. One may correlate 'Innovation' to 'Modern Signalling Equipment' what 'Efficiency' was to 'Industrial age' period. Innovation will not flow if any modern signalling equipment is perceived as suitable only for narrow isolated functions. Innovative thought processes should be regarded as potentially valuable and eligible for logical and economic application in any equipment for enhancing its effectiveness. It can be stated that 'Efficiency' comprises mainly speed, quality and economy but 'Effectiveness' comprises 'Efficiency' and ability to deliver the desired results. Superior innovative ideas continually await birth and implementation for desired results.

In order to log events at a station on real-time basis, to facilitate analysis of critical failures, to analyse any unusual/ signal passing at danger (SPAD)/ accident by off-line simulation, to generate various exception reports as per RDSO list, safety related SMSs and reports, point reversal reports, emergency crossovers testing reports etc on a daily basis for analysis by all concerned departments, role of Data Logger, which is a modern signalling equipment, has grown immensely.

Data Logger is also being used innovatively in WCR for preventive, corrective & predictive maintenance, thereby, enhancing safety. These innovative cost-effective usages of data logger have caused a paradigm shift in considerable reduction of signalling failures besides enhancing safety.

One major innovative work in the field of Data

Loggers commissioned on WCR in the month of February 2015, which is first of its kind on Indian Railways, is described below along with some of the important reports being generated:

Description and Mode of Working:

The data loggers provided on the signalling installations have been providing very useful information for quick fault rectification of interlocking systems, besides offering a highly accurate and authentic post-mortem service for analyzing the unusual events at the railway stations.

As the data logger started penetrating more and more into the routine functioning of signal interlocking in particular and train operations in general, a need was felt to have a more user friendly management information system on hand, based on the inputs provided by the data logger.

This data logger MIS is a result of the realization of a need of user friendly MIS making use of the accurate and authentic information provided by the data loggers. Various departments are using the appropriate reports as applicable for analyzing the failures attributable to them as well as for bringing further improvement in their overall working.

Various data logger reports related to different departments can be generated, i.e., point loose packing, late starting of trains, premature release of buttons, late operation of home signal, late closure of LC gate, analog power supply failure, relay room door opening, point not set against occupied line, premature operation of block instrument, overspeeding of trains etc so that corrective action may be taken timely by the concerned departments.

Some reports generated are as follows:

Point Loose Packing

Division	Section	Station	Description	No of Count	Date and Time
Bhopal	Bhopal-Bina	Vidisha	112 RWKPR POINT LOOSE PACKING	1	08/02/2015 02:03:20.218
Bhopal	Bhopal-Bina	Gulabganj	114 NWKPR POINT LOOSE PACKING	2	08/02/2015 14:12:41.390, 08/02/2015 14:29:00.312
Bhopal	Bhopal-Bina	Bareth-SSI 2	108 NWKPR POINT LOOSE PACKING	1	08/02/2015 14:46:30.000

Late Start of Train

Division	Section	Station	Description	No of Count	Date and Time
Bhopal	Habibganj-Khandwa	Dulariya	LATE START OF TRAIN AT S5 SIGNAL	1	08/02/2015 14:43:14.625
Bhopal	Habibganj-Khandwa	Habibganj	LATE START OF TRAIN AT S4 SIGNAL	1	08/02/2015 11:44:39.125
Bhopal	Habibganj-Khandwa	Obaidullaganj	LATE START OF TRAIN AT S35 SIGNAL	1	08/02/2015 13:24:56.000

Premature release of Buttons

Division	Section	Station	Description	No of Count	Date and Time
Bhopal	Bina-Guna	Pipriagaon	S35-204 UNPR PREMATURE OPERATION	3	08/02/2015 18:33:10.375, 08/02/2015 21:00:09.421, 08/02/2015 22:23:55.906
Bhopal	Bina-Guna	Pipriagaon	S36-204 UNPR PREMATURE OPERATION	1	08/02/2015 17:40:53.906
Bhopal	Bina-Guna	Pagara	S5-247 UNPR PREMATURE OPERATION	2	08/02/2015 05:01:25.140, 08/02/2015 07:44:10.062

Late Operation of Home Signal

Division	Section	Station	Description	No of Count	Date and Time
Kota	Gangapur City-Mathura	Piloda	S5 LATE OPERATION OF SIGNALS	2	08/02/2015 15:02:09.609, 08/02/2015 18:25:31.093
Kota	Gangapur City-Mathura	Dumariya	S5 LATE OPERATION OF SIGNALS	1	08/02/2015 13:47:10.015

Late Closure of Level Crossing Gate

Division	Section	Station	Description	No of Count	Date and Time
Kota	Kota-Ruthiyai	Antah	LC22 LATE CLOSED	1	08/02/2015 18:07:28.187
Kota	Kota-Ruthiyai	Atru	LC54 LATE CLOSED	3	08/02/2015 13:30:26.296, 08/02/2015 22:21:44.140, 08/02/2015 14:17:01.140
Kota	Kota-Ruthiyai	Dharnaoda	LC85 LATE CLOSED	1	08/02/2015 08:46:39.812

Premature operation of Block Instrument

Division	Section	Station	Description	No of Count	Date and Time
Bhopal	Bhopal-Bina	Mandibamora	S22 PREMATURE OPERATION OF BLOCK INSTRUMENT	1	08/02/2015 17:19:51.000
Bhopal	Bhopal-Bina	Sorai	S11 PREMATURE OPERATION OF BLOCK INSTRUMENT	1	8/02/2015 11:24:30.312

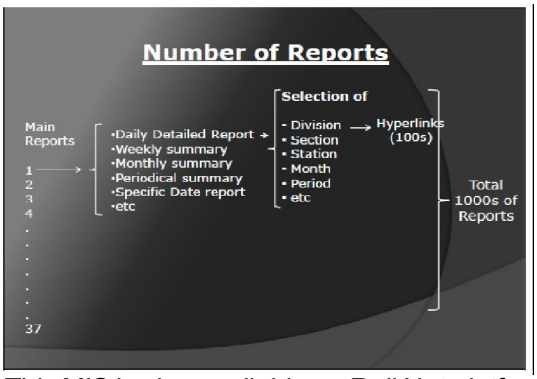
Over Speed of Train

Division	Section	Station	Date	Time	Actual Speed	Permitted Speed	Line Name
Jabalpur	Jabalpur-Itarsi	Gurra	04/03/2015	08:46:27	30.22 KMPH	30kmph.	DN Train In DI/I
Jabalpur	Jabalpur-Itarsi	Gurra	05/03/2015	18:31:52	37.84 KMPH	30kmph.	DN Train In DI/I
Jabalpur	Jabalpur-Itarsi	Gurra	06/03/2015	18:33:31	31.51 KMPH	30kmph.	DN Train In DI/I

Shri Ramesh Chandra, General Manager, WCR inaugurating the MIS in Feb, 2015

Benefits achieved

New MIS generates a total of 37 main reports, each of which includes nearly 5-6 sub reports (i.e., Daily detailed report, weekly summary, monthly summary, periodical summary and specific date report etc) so that corrective and preventive actions may be taken timely by the concerned departments, thereby, enhancing safety and preventing undesired loss of punctuality of Mail/ Express trains. The selection of reports is available division-wise, section-wise, station-wise, month-wise and period-wise etc. The schematic of Reports generated by MIS is shown below:



This MIS is also available on Rail Net platform for universal access at divisional/ Zonal level.

Conclusion:

The above-mentioned innovation has emerged as cost-effective tools in preventive and predictive maintenance besides ensuring safety by channelising the flow of creative thoughts. While 'Invention' requires greater degree of 'Free-wheeling', 'Innovation' requires 'Disciplined professionalisation'. The need is to be innovative on the right things in the right areas at the right time, to mix the proven and the novel so as to attain an optimum, harmonious ensemble. Innovation in design/ application of any modern signalling equipment must be combined with wisdom stemming from experience and with new creative, logical and economic ideas to reap maximum benefits.

This innovative work of MIS (Management Information System) is likely to prove an important milestone in the evaluation of data loggers on Indian Railways.