

ITARSI RRI *fire* - NOT AN ORDINARY DISRUPTION

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It may be recalled Itarsi is a critical four directional junction station in Bhopal Division of West Central Railway. Being situated strategically in central part of India, Itarsi serves as a vital junction for trains running from north to south and from east to west. All trains from Delhi to Chennai and from Guwahati to Mumbai via Allahabad passes through Itarsi.

Major fire in Route Relay Interlocking (RRI) at Itarsi on 17th June 2015 disrupted whole train operations through Itarsi and it was not an ordinary disruption. This tremendous load could not be taken by non-interlocked Itarsi yard. Hence, only 33 pairs of passenger trains and 13 pairs of freight trains could be continued. Rest all were diverted or cancelled. Cancellation and diversion plan issued and continued till commissioning of new RRI.

After inspection of damaged old RRI by Member Traffic, Railway Board and General Manager, West Central Railway along with other concerned PHODs on 18th June 2015, it was planned to commission new RRI and a target of 35 days was set for restoration of normal traffic at Itarsi by commissioning new RRI. It may be recalled old RRI had outlived its normal life and work of new RRI was sanctioned way back in year 2006. The work could not be taken up due to delay in obtaining mandatory CRS sanction. Within 48 hrs. of the incidence, a temporary panel was made operational to allow running of limited number of trains.

SALIENT FEATURES OF NEW RRI AT ITARSI

▪ Cost of RRI	: ₹ 19.64 cr
▪ Total Routes	: 583 nos.
▪ Total Relays	: > 9000 nos.
▪ Motor points	: 108 nos.
▪ Main signals	: 42 nos.
▪ Shunt signals	: 36 nos.
▪ Axle counters	: 89 nos.
▪ Length of cable	: > 700 km.
▪ Fire alarm control	: 01 (4 hooters)

Train movement via Itarsi was disrupted for 34 days resulting in cancellation of 2044 trains, short termination of 17 trains and diversion of 249 trains. It costs Railways a huge revenue loss of about ₹80 cr. Though train operation continued by operating all signals and points & crossings used for changing routes through electrical devices, normalcy could be restored after commissioning of new RRI at Itarsi on 21st July 2015. Though new RRI at Itarsi was commissioned but operation of all trains via Itarsi could be normalized by 26th July 2015 due to rake imbalance on account of sudden cancellation of trains for past one month.

FIELD VISIT AND PLANNING FOR QUICK RESTORATION:

After the field visit by Member Traffic along with AM/Signal, Advisor/Signal and GM/WCR, it was seen that entire old RRI at Itarsi is reduced to ashes and that it could not be retrieved or restored. Hence, the new RRI, which was to be commissioned, should be commissioned on war footing. Part of new RRI's wires also got burnt which needs to be restored. There are more than 580 routes in Itarsi RRI and entire indoor work has to be carried out along with requisite yard remodeling. CSTE (Constn.) / WCR explained the methodology of working during this forced NI or unplanned NI period and routes which could be made available for partial train movement. Limited interlocking and operation of 6 points of west side i.e. towards Bhusawal and Nagpur side would be made operational from panel within 48 hrs i.e. by 09.00 a.m. on 20.06.16 so that cranking was not to be done and these points could be set faster for smooth movement of trains. Routes on eastern side i.e. from Jabalpur and Bhopal side need to be permanently clamped and locked.

A decision was taken to commission new RRI within 35 days. Engineering works need to be completed within 25 days leaving 10 days exclusively for S&T testing and final commissioning of RRI.

All officials were informed about seriousness of the issue that all out efforts have to be made and multi-layered supervisory teams were constituted to ensure that no conflicting movement takes place.

Primarily, there are 4-direction traffic at Itarsi, i.e. Jabalpur (JBP), Bhopal (BPL), Khandwa (KNW); and Nagpur (NGP), one platform each was nominated for these four sides.

- PF-1: reception from NGP/JBP side, dispatch towards BPL

- PF-2: reception from BPL side, dispatch towards NGP
- PF-4: reception from JBP side, dispatch towards JBP
- PF-7: reception from JBP side, dispatch towards NGP/Bhusawal side

Only Bhopal/Jabalpur side i.e. East side points which are 6 in number will be operated through the Panel and points towards Bhopal and Bhusawal side will be permanently set clamped and locked for nominated platforms indicated above.

A complete working plan for 35 days about reception, dispatch and handling of trains at Itarsi was made and given to each and every staff deputed in goomties, at platforms, at Central panel and in yard so that there is no communication gap between various coordinating agencies.

A separate sheet of detailed point operation and line admission for each goomty, platform and central panel was made and used to be handed over in each shift to the next staff about working and operation of points and trains concerning that goomty and platform.

A very seasoned, mature, calm and cool person was made in charge of central panel in each shift who after cross-checking that all the points and route are set, used to operate free home and starter signals for train movement.



Manpower and Machines engaged in restoration going on war-footing

MANPOWER PLANNING:

The extensive detailed planning was chalked out and pooled manpower was deputed for doing not just the related civil engineering works but complete yard remodeling of Itarsi. To handle complexity, highly skilled, most highly trained and dedicated work force of WCR were pooled in final commissioning of RRI & yard remodelling work at Itarsi includes track Engineers, 14 supervisors and approx. 450 Trackmen.

7-8 teams of about 70-80 labour headed by JS/SS officer included one black smith team, one welder team and two supervisors. Splitting manpower in 7-8 teams helped in execution of the whole task at 7 to 8 locations simultaneously. Other departments also pooled their resources and formed several teams for carrying out these forced unplanned works at a time for early commissioning of new RRI.

Proper stay arrangement for boarding, lodging and food along with emergency medical services were ensured for all labour, staff etc. at GM and DRM's level for smooth functioning during this forced/unplanned NI due to fire. Staff was provided with all facility of drinking water, umbrella, raincoat, mosquito repellent, etc. for working. The stay arrangement of not only manpower but also of supervisors and officers was planned. This includes arrangement of food also. The Railway

Institute and Railway school building were used for temporary housing of 450 labour called from adjoining sections and Divisions. Running rooms & Officers Rest House were used for continuous staying of supervisors and officers respectively.

GOOMTIES:

Goomties were constructed with sturdy material because of rainy season and high wind velocity and staff have to stay for almost 35 days in these Goomties. Floor of goomties was properly made in order to prevent water logging as Itarsi yard is prone to water logging. Released unserviceable concrete sleepers in inverted position were used for this purpose.



Goomties with unserviceable PSC sleeper flooring

All equipment like walkie talkie, spare battery for walkie talkie, mobile phones of all supervisors, ASMs and Construction staff, magnato phones and tri-coloured LED torch to all staff deputed in

the yard and at station were arranged so that abnormal movement can be prevented timely by showing red light as the yard was totally non-interlocked and conflicting movement may take place. A little advance preparation averted the possibility of any communication breakdown during the period of NI working.

Emergency control with PC, Fax & wi-fi etc. was opened at Officers Rest House for faster communication. Medical doctors were also engaged to look after sanitation around stay arrangements and for medical aids to injured workers, if required.

CONTROL CENTRE:

Review of daily progress and planning of activities for tomorrow was done periodically at 19:00 hrs at Officers Rest House where all officers and supervisors of all departments used to assemble every day. The meeting was chaired by CTE/WCR as CAO posted especially for early commissioning of RRI and attended by either ADRM or DRM with Divisional officers. This includes requirement of traffic blocks by various departments for activities planned for tomorrow. Main objective was coordination and facilitating the requirement of traffic blocks.

Progress report was updated and sent to HQ and Rly. Board daily. Improving teamwork was so fundamental to make a difference. Each successive review meeting encouraged improved team work in following days. Review meeting not only tracked daily performance but helped in ironing out the difference between two executing Departments i.e. between Engineering and S&T Departments. Some of S&T works out of purview of Construction contract were got executed by Open line S&T of Bhopal Division. For all departments, posting of CT/WCR as CAO for this specific assignment proved irreplaceable, lending a level-head, around-the-clock support, and continually wise counsel.

BOON IN DISGUISE FOR CIVIL ENGINEERS:

One of the best part of this emergent situation was ready availability of concrete turnout sleepers, fabricated curved switches, cast manganese steel crossing, glued joints for insulation, switch expansion joints and other related track fittings. All track material could be arranged locally and there was no need for any material from other Zonal railway. It is pertinent to mention that the e-procurement of track fittings is a long drawn process and it generally takes 12 to 18 months to arrange track materials. But this shows the preparedness of West Central Railway to meet any such eventuality. Rake loaded with PSC sleepers (13 nos. of 1:8.5 turnout) at Concrete Sleeper Plant (CSP) at Shamgarh (Kota Division) was diverted to Bhopal Division and reached on 18th July 2015. Similarly, 7 sets of PSC sleepers for Derailing switches transported from CSP at Bankhedi (JBP Division) to Itarsi very next day i.e. on 19th July 2015.

And in shadow blocks, host of pending civil engineering maintenance works could be executed and this emergency proved to be a boon in disguise for civil engineering department. All major civil engineering works generally requires traffic blocks of about 3-4 hours and it is virtually impossible to get a traffic block for maintenance activities especially in such a busy yard like Itarsi. The cancellation

of trains resulted in availability of traffic blocks and major renewal of all track structures could be done during these 34 days. All maintenance civil engineers felt relieved with the major yard remodeling of Itarsi yard, which used to be normally a trouble spot for them. In fact, it is similar to renovation of London city aftermath of outbreak of Great bubonic plague of London long back in year 1666.

CIVIL ENGINEERING WORKS AT ITARSI:

A tender for yard remodeling already opened was finalized within 24 hours to take up the work through contractual labour in addition to deputing departmental manpower.

• Laying / Dismantling of Turnouts	: 34 nos.
• Laying of Plain track	: 1200 Tkm.
• Laying of Glue d Insulate d Rail joints	: 38 nos.
• Running out of ballast	: 3500 m3
• Extension of Platforms	: PF No. 2, 4 & 5.
• Welding of rail joints	: 900 joints.
• Joint Engg. and S&T work on new turn outs. Electrical & mechanical testing, Engine rolling & re-testing on both sides	: 21 nos.

These civil engineering works were completed well in time by 15th July 2015.

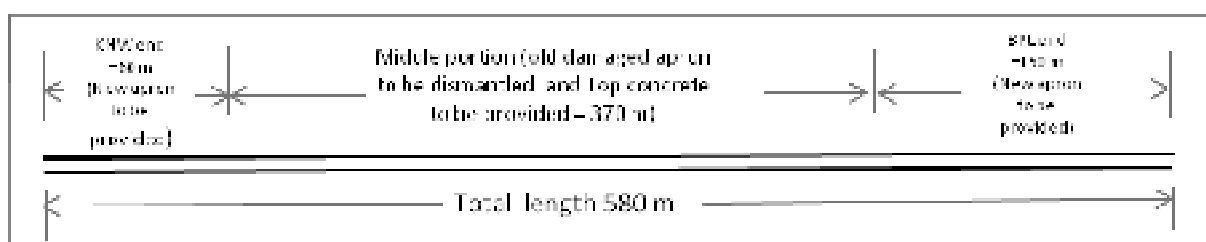
Additional modification / upgradation works were also carried out which included extension of Platform No. 2 & 3, Platform No.5 and 6 and Washable concrete apron on Platform No. 5. Track improvement was also done in waiting bay lines having 8 Turnouts and 2 km length. In all, Total Rail Renewal (TRR) of 5824 m, replacement of broken turnout sleepers, removal of muck, improvement of drainage, lowering of the shoulder cess in complete Itarsi passenger yard was carried out taking out the advantage of shadow block. Tamping of 140 Turnouts and plain Track in Itarsi yard, and 63 Turnouts in ET Goods yard have been carried out mostly by UNIMAT tamping machines.



Using Hydra for collecting released PSC sleepers

WASHABLE CONCRETE APRON:

Washable concrete apron work of Platform no. 5 of 580 m length with extension of 210 m could also be done by synchronizing execution during this period. Here, the biggest challenge was to execute the work in monsoon. Old damaged concrete apron was dismantled. Slushy area was filled up with coal ash. Being rainy season, though problem could be faced in concreting of washable concrete apron but tarpaulins were used to protect & preserve the quality of fresh/green concrete. Temporary speed restriction (TSR) of 10 kmph on Platform No. 5 line has now been relaxed to 30 kmph.





Sleepers spread out for concrete apron on Platform No. 5



PF-5: Tarpaulins used to protect and preserve the quality of the green concrete during monsoon

The improvement of waiting bay lines by way of rail renewal having 8 nos. of Turnouts and 2 km length long track could also be done with ease during the period. This track is going to be exclusively utilized now for Rajdhani trains having no stop at Itarsi. This will help in reduction of running time of the trains, fulfilling the '*people-centric initiatives*' undertaken by Indian Railways.

Released permanent way materials could be collected using five Hydra cranes. Muck removal and improvement of yard drainage was undertaken on extensive scale in Itarsi yard during the period of disruption. For this purpose, two UTV machines were deployed. 25 BRM rake were deployed for collection and disposal of released materials. The whole Itarsi yard is virtually renovated taking advantage of reduced train movements in the yard.



T-28 Machine laying 1:12 turnouts on PSC sleepers

Similarly, other improvements such as replacement of 1:8.5 cross over by 1:12 crossover at Point No. 232 could also be done using T-28 machine. This crossover joins both UP & DN main lines at Khandwa end and replacement of it by 1:12 turnouts will not only improve riding quality & comfort for passengers but also mitigate frequent maintenance requirement. As a result, speed at Turnout of Point No. 232, towards Khandwa has been raised from 10 to 30 kmph.



Dismantling of track on existing concrete apron



Alumino Thermic Welding of all track joints

JUHARPUR YARD WORKS:

Old wooden sleepers at Point No. 106 in Jujharpur yard (near Itarsi yard towards Nagpur) were replaced with PSC sleepers and it was converted to Point No. 338. Similarly, wooden sleepers of Hand Point No. 1 & 2 were replaced with PSC sleepers and these were converted to Point No. 230 & 229 B respectively. Machine tamping of Turnouts was also carried out in Jujharpur yard and Goods reception cabin area at Itarsi. New Derailing switch (D/S) Point no. 329 A was also laid on IOC siding of JHP yard. Deficient ballast was replenished, wherever necessary.



JHP: Old Point No. 106 on wooden sleepers
converted to Point No. 338 on PSC sleepers



JHP: Old Point No. HP-1 on wooden sleepers
converted to Point No. 330 on PSC sleepers

LESSONS LEARNT:

Every asset is having of limited life and it has to be replaced in a planned manner, else it may force to do replacement in an un-planned manner. Secondly, such an eventuality may be harnessed by synchronizing the execution of ancillary works taking advantage of all shadow blocks. Disruption may be turned into an opportunity to execute host of pending works. This may be blessing in disguise. Railways need to be well prepared for such disruptions by keeping emergency stock of materials which are normally long-lead items and may require longer time in its procurement. There is need for proper coordination by way of posting an exclusive CAO for a specific job. Pool of highly skilled, trained and dedicated manpower needs to be identified for deputing them to man such situations effectively.

CONCLUSION:

All the departments of West Central Railway rose upto the occasion to take up the challenge of New RRI and completed it in a short period of 34 days, mobilizing additional man power and resources of Bhopal Division and adjoining Divisions of WCR. With coordinated team work, pre-planned RRI completion target of 21st July 2015 has been met to overall satisfaction, resulting in overall improvement of Itarsi yard and platform lines, against all adversity including weather conditions.
