दक्षिण मध्य रेलवे
SOUTH CENTRAL RAILWAY

STRENGTHENING SAFETY

MAJOR
MAINTENANCE WORKS
COMPLETED DURING LOCKDOWN

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GENERAL MANAGER'S FOREWORD

FOREWORD

South Central Railway, with a network length of 6282 route kilometers has always accorded top most priority to rail infrastructure maintenance, which is vital to safety of train operations. Undertaking maintenance works is always an onerous task since it involves disturbance to normal rail traffic movement. The pandemic Covid-19 lockdown brought in its wake, an unimaginable scenario of the rail wheels coming to a virtual halt all over the country. Although the situation looked grim, SCR geared itself to turn this *"adversity into an opportunity"*, with a firm belief that every adverse situation presents within it, the seeds of an opportunity in waiting.

Without a moment of hesitation, the highly motivated work force of SCR put in total efforts to utilize this never before period of stoppage to passenger carrying train services for completing most of the important pending infrastructure maintenance works. In normal circumstances, these works would have resulted in sizeable inconvenience to rail users on account of traffic blocks involving cancellation or regulation of train services.

SCR's men and machinery were deployed to carry out comprehensive track maintenance which involved strengthening the tracks, points, crossings, sleepers and ballast etc. The thrust to optimize reliability of the system included several major infra maintenance works such as full scale upgrade of Scissors crossings at major yards; huge number of bridge works; erection of foot over bridges; ultrasonic flaw detection of track fault lines; maintenance of signal & telecom equipment, electrical equipment, locomotives, coaches etc.

It is in the earnest of things that the "Covid Warriors" of SCR have successfully completed these maintenance works at the risk of their own health by fully adhering to the pandemic norms. The outcome, is a more dependable and strong rail network for the normal times ahead. We can more confidently say to the rail users – Rest assured, you are in safe hands.

Gajanan Mallya
General Manager

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SCISSORS CROSSINGS WORKS AT VIJAYAWADA YARD SOUTH SIDE

Conversion of wooden Scissors layout with standard PSC layout with CMS crossings at south side of Vijayawada Yard, Vijayawada

Cost Involved

Rs. 1.3 Crores

Date of Completion

May - 2020

Need of the Work

Points on south side of Vijayawada yard was built on wooden sleepers long back in Vijayawada yard. The wooden sleepers were decayed and were not holding gauge and cross levels. They were present at a very critical location in the yard where an approximate number of 120 passenger and goods trains are dealt on each scissor layout. These layouts cannot be replaced with the conventional T-28 cranes. They are located in a critical inaccessible location for road cranes such that their replacement is not possible with road cranes. They are surrounded by running lines in the centre of the yard.

Brief Description of the Work

Conversion of wooden Scissors layout with standard PSC layout with CMS crossings south side of Vijayawada yard.

Difficulties Arised

Unable to get traffic blocks due to busy trunk route. During normal working of trains as it requires 7 hours of UP & DN blocks.

Resources Deployed

2 Nos of road cranes, 120 man days for each point, Block period taken – 1.5 days for each point

Benefits

The safety in the yard has improved as it had become very difficult for running passenger and goods trains on the decayed wooden sleepers.

SCISSORS CROSSINGS WORKS AT VIJAYAWADA YARD NORTH SIDE

Existing Scissors Layout X-Over with Wooden Layout on North side of Vijayawada yard is renewed with New PSC/60 Kg Rails

Cost Involved

Rs. 2 Crores

Date of Completion

April -2020

Description of the Work

Existing Scissors Layout X-Over with Wooden Layout on North side of Vijayawada yard is renewed with New PSC/60 Kg Rails

Need for Conversion

The wooden sleeper crossings laid long back were decayed and were not holding gauge and cross levels

Difficulties Arised

The Magnitude of the work was huge and thereby required number of blocks for replacing entire scissors x-over duly shifting & slewing of 4 points. Due to the busy section and heavy passenger traffic, blocks could not be planned and the work could not be carried out.

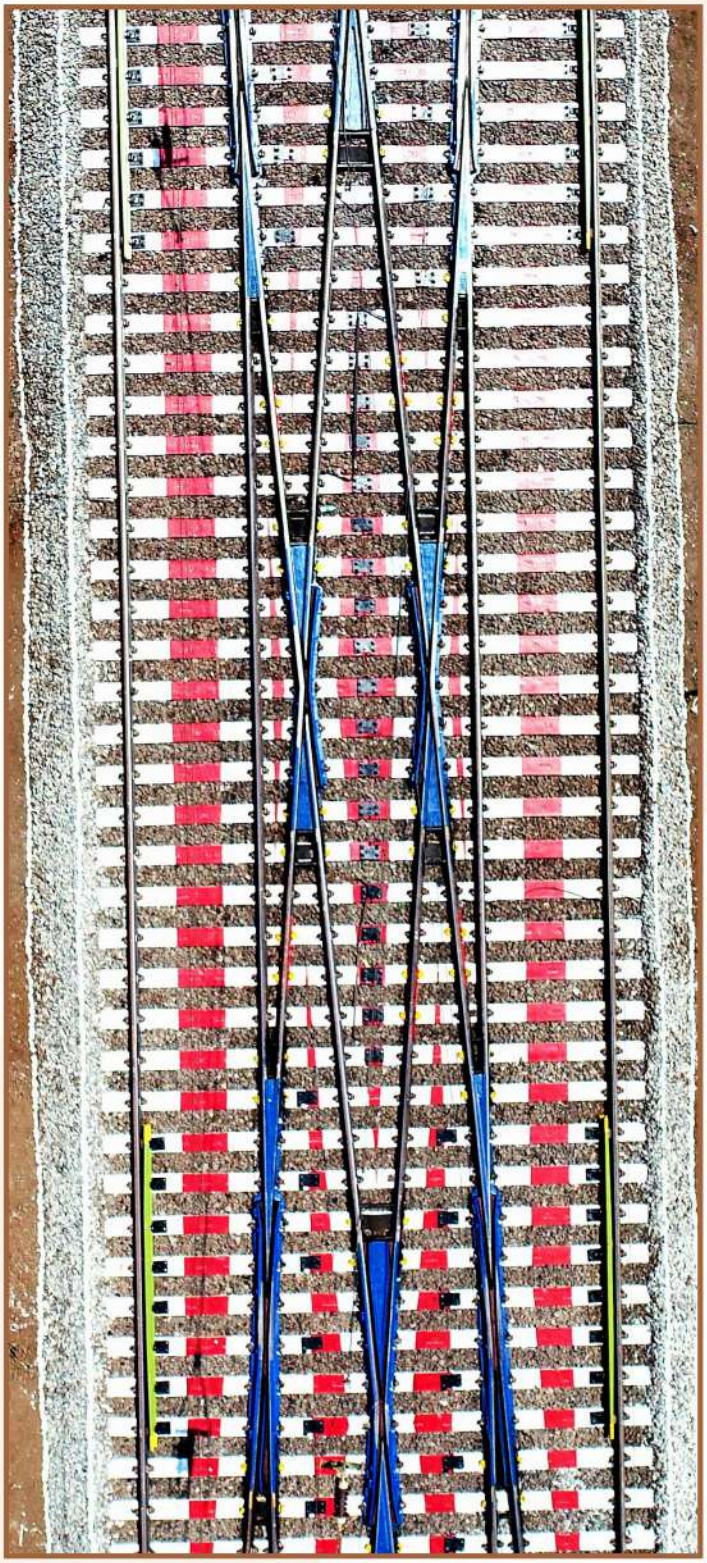
Resources Deployed

Jumbo Block was taken for 3 days.

Machinery like Hydras and Hitachis were deployed. Minimum manpower was deployed for maintaining social distance.

Benefits

Track structure on this scissors layout has become sturdy and it possesses a life of 50 yrs with reduced maintenance during the ensuing years. It will enhance safety of train services and travelling public.



SCISSORS CROSSINGS WORKS AT KAZIPET YARD

Upgrading Scissors Cross Over on Wooden layout to Standard PSC sleeper layout at Kazipet Yard

Date of Completion

April - 2020

Need of the Work

Scissors crossover is very rarely available in Railways and is essential at Major yards like Kazipet for facilitating surface crossings for movements in multi directions. The condition of this wooden layout was badly perished and was requiring frequent attention and maintenance.

Difficulties Arised

It was carried out in 3 days time. Had it been in normal days, it would have had serious repercussions on train services including cancellation and rescheduling of express trains.

Description of the Work

In Kazipet yard there was one scissors x-over laid on wooden sleepers in 1970, it was replaced with specially designed PSC sleeper layout with CMS crossings to replace wooden sleepers & built-up-crossings to provide required stability and sturdiness to the track.

Activities Done

- Replacement of points and crossings with PSC Sleeper lay out as per RDSO drawing and adjustment of OHE wires by Tower car to suit standard track geometry and checking point motors by S&T, connecting bond wires etc.,

Resources Deployed

The activities were carried out in 3 days block by using machinery like Hydras and Hitachis to minimize the use of manpower.

Benefits

Track structure on this scissors layout has become sturdy and possesses life of 50 years with reduced maintenance for the ensuing years and it enhances safety to the train services and for public travelling in trains.

BRIDGE WORKS

Rebuilding of Bridge No: 74 & Rebuilding of existing stone top culvert Bridge No: 197 in Secunderabad–Dhone Section of Hyderabad Division

Cost Involved

Rs. 6 Crores

Date of Completion

May - 2020

Description of the Work

The work of Rebuilding and increasing the opening of Br No: 64 in Umdanagar yard in Secunderabad - Dhone section. In addition, existing stone top culvert bridge no.197 has been built with RCC boxes between Gollapalli-Jadcherla Stations in Secunderabad-Dhone section and completed in the shadow of mega block at Br No: 74.

Difficulties Arised

The scope of the work is huge and required 64 hours of continuous block for rebuilding of the Bridge duly dismantling the existing Arch Bridge and placing of the box segments. If this was executed during normal train operations, it would have required complete diversion of all Mail/Express/Goods traffic to other routes thus entailing loss of revenue, additional expenditure on operations and various other logistics.

Resources Deployed

Cranes – 3 Nos (300 T), Trailers – 6 Nos, Procliners – 5 Nos., Trippers – 5 Nos. The work was executed within the permitted blocks by meticulous planning, duly following social distancing & COVID-19 protocols.

Benefits

This work has resulted in clearing the Bottle neck at Umdanagar yard towards Dhone end. This work facilitates the further work of Yard expansion towards Dhone end for carrying out doubling work.

BRIDGE WORKS

Constructing Road under Bridges & Closure of LC gates No: 232, 206 & 230 in Secunderabad - Mudkhed section and LC No. 26 in Secunderabad - Dhone section

Cost Involved

Rs. 10 Crores

Date of Completion

LC No: 232 - April 2020

LC No: 206 & 26 - May 2020

LC No: 230 - June 2020.

Description of the Work

Elimination of Manned LC gates duly constructing RUBs by cut and connection method were taken up and completed duly taking traffic blocks.

Difficulties Arised

Being single line sections, taking a Traffic block was a difficult task. During the lockdown period, 2 LC gates were eliminated duly taking 6 Hrs block at a stretch for each LC gate and other 2 LC gates were eliminated by taking 3 Hrs block for two days for each LC gate.

Resources Deployed

Cranes – 3 Nos. (180 T), Trailers – 2 Nos, Proclaimers – 4 Nos, Trippers – 6 Nos. The work was executed within the permitted blocks by meticulous planning.

Benefits

These works have resulted in elimination of 4 manned LC gates in the Division which is a priority item for Railways.

BRIDGE WORKS

Additional Bridge by the side of existing RUB No. 478 on Nizamabad-Narsi Road in Secunderabad-Mudked Section of Hyderabad Division

Cost Involved

Rs.14.47 Crores

Date of Completion

May - 2020

Description of the Work

Construction of additional RUB bridge at Km 460/8-9 as 1x12.00x5.543 m RCC Box Pushing method by the side of existing RUB No 478 on Nizamabad-Narsi road near Nizamabad yard between Dichpalli-Nizamabad stations as part of Deposit work.

Difficulties Arised

Heavy slippage of bank.

Resources Deployed

Heavy Machinery with less manpower, traffic blocks for 07 days on staggered manner.

Benefits

Enhances Safety

BRIDGE WORKS

Construction of Road Over Bridge No.58 between Nacharam and Gajwel stations in Manoharabad - Kothapalli new rail line in Hyderabad Division

Cost Involved

Rs.5.75 Crores

Date of Completion

May - 2020

Description of the Work

Road Over Bridge of 48m Bow string steel girder for 2 lane in super structure 1x48m clear span Bow string steel girder with deck slab and substructure RCC trestle on open foundation for Railway portion for 4 lane outer ring road has been constructed

Difficulties Arised

Due to heavy rains, non-function of welding for assembling and erecting of Bow string steel girder

Resources Deployed

Heavy Machinery with less manpower deployement

Benefits

For Safety of both road and rail traffic, constructed with a long term view as it is a new rail line under construction and the area falls under State High Way.

BRIDGE WORKS

Rebuilding of Stone Top culvert near Kadapa i.e., Bridge No 508 in Kadapa Station Yard

Cost Involved

Rs.1.83 Crores

Date of Completion

May - 2020

Description of the Work

Br. 508, size 2.5 meters x 1.2 meters, having barrel length of 40 meters running across 6 tracks and 2 platforms in Kadapa yard of Renigunta-Gooty section is part of Chennai-Mumbai route having heavy traffic density. This particular bridge is a through and through bridge and was not in one alignment due to piecemeal construction of yard over the years. Moreover, the whole bridge was a stone top culvert bridge having inadequate waterway and also in a bad condition. Hence, it was decided to rebuild the dilapidated, inadequate waterway bridge to improve the drainage of the yard.

Difficulties Arised

The work was sanctioned in the year 2017-18 and segmental boxes were casted but the work of dismantling of existing bridge and replacement with boxes could not be taken up because of Kadapa yard being a busy yard and taking block across 6 tracks was a difficult task.. Hence during lockdown, the work was taken up and completed.

Resources Deployed

Work was taken up on different spells on different dates by deploying heavy machinery with less man power

Benefits

The replacement of dilapidated bridge improved the safety of the track and also drainage of the yard. This leads to more reliable track and lesser failures in the future.

BRIDGE WORKS

Rebuilding of Bridge No: 1078 UP & DN at km 569/7-8 with RCC Boxes between Raichur & Yeramaras Stations by open cut method

Cost Involved

Rs.50 Lakhs

Date of Completion

May - 2020

Description of the Work

STC Slabs Replaced with RCC Boxes

Difficulties Arised

The plant & Machinery required for construction were unable to reach the work locations due to water logging during monsoon season. Later, local farmers also stopped the work due to cultivation period. Now, the monsoon has set back and the crop harvest is on, due to which the farmers have agreed to allow the machinery to pass through their fields.

Resources Deployed

3 Cranes of 150 capacity, 5 excavators & material with less man power

Benefits

Reduction in time-loss for trains, increased safety for running of trains &improvement of punctuality.

BRIDGE WORKS

Replacement of Girder Bridge with PSC slabs for Bridge No.794 UP & Bridge No.795 DN in Guntakal Division

Cost Involved

Rs. 3.95 Crores

Date of Completion

May - 2020

Description of the Work

Track on Br.No.794 (8x9.15m) UP line and 795 (4x9.15m) DN line had existed on steel girders. Replaced steel girders over these bridges with post tensioned PSC slabs, duly strengthening the piers and abutments by carrying out jacketing works.

Difficulties Arised

Maintenance of track over these bridges and approaches were tedious due to fixed structure. Hence, the work was started during JULY-2019 but due to heavy rain fall during the work, jacketing piers, abutments and casting of PSC slabs had got delayed.

Resources Deployed

Block was taken for 2 (two) days and deployed Heavy machinery and less man power

Benefits

Renewal of steel girders with PSC slabs has improved the track structure in the aspect of safety and running quality. Since these were fixed structures and fittings over them are different from the remaining part of the track, there were lot of maintenance problems requiring frequent attention. LWR track cannot be continued over those bridges and required isolation from LWR by providing SEJs on the approaches which increases the additional load of maintaining SEJs. After completion of renewal, LWR track has been continued over these bridges with 300mm ballast cushion and thereby the efficiency and speed capacity has been much enhanced. Running time of passenger/express trains can also be enhanced as an operational improvement.

BRIDGE WORKS

Replacement of RCC slab for Bridge No. 215 with PSC (Post Tensioned) slabs in Guntakal-Nandyal Section

Cost Involved

Rs. 1.18 Crores

Date of Completion

June - 2020

Need for the Work

During conversion of track from MG to BG between Guntakal-Nandyal all the bridges were strengthened duly replacing the steel girders with RCC slabs during the year 1995-96. Further during the post monsoon inspection, it was noticed that, these bridges' slabs were badly damaged, bottom reinforcement bars being exposed due to spalling of bottom cover concrete. Safety of running traffic and condition of slabs were deteriorating with time. Hence, the replacement of the RCC slabs was essential to enhance safety.

Description of the Work

Replacement of Steel girders with RCC Slabs

Difficulties Arised

Non availability of men and material due to lock down

Resources Deployed

Cranes – 3 Nos. (150 T), Proclainers :2Nos.

Benefits

Due to corroded reinforcement in RCC Slabs the bridge was categorized as ORN-2 and speed restriction of 50KMPH is continuing for the last one year. By replacing the above corroded RCC slabs with PSC slabs safety has been enhanced and punctuality of the running traffic

BRIDGE WORKS

Rebuilding of Bridge No. 1051 UP & DN by replacing old stone top culvert by Pre-cast RCC segmental boxes between Raichur – Marichetal stations

Cost Involved

Rs. 0.5 Crores

Date of Completion

July - 2020

Need of the Work

Bridge no 1051 DN line is stone top culvert bridge with opening of 0.35 m which is extended more than track center and UP Line Bridge is RCC Slab Bridge with opening of 1 m. 1051 DN bridge was given rating number 2 (ORN-2) and 1051 UP bridge was having spalling of concrete and exposed rebars and after too many attentions in the last few years it was not arrested.

Need of the Work

Both the bridges are replaced with pre-cast RCC segmental boxes of size 1.5 X 1.2 m by cut and cover method. The barrel length of bridge is 14 m.

Difficulties Arised

Track centre distance between UP and DN line is 5 m. Both bridges were required to be replaced at the same time in a single block due to less distance between tracks and STC Bridge extending up to face of the UP line. Due to heavy traffic, 5 hours block on both UP and DN lines was difficult at the same time. Also, due to unavailability of approach road and black cotton soil it was difficult for mobilisation of machineries.

Resources Deployed

Labour: 60 numbers, Crane: 2 nos – 120 ton capacity each, Earth excavator: 3 nos, Block granted 5 hours on UP and DN line; Cleared in 4:30 hrs

Benefits

ORN-2 bridge is replaced with RCC box. STC bridge which was in damaged condition on DN line side and RCC slab exposed with rebars is replaced with RCC boxes. RCC boxes are designed for 25 ton axle load and waterway length is also more than previous bridges. Overall, this work will strengthen the bridge to carry high axle load and high speed trains.

BRIDGE WORKS

Rebuilding of Bridge No. 1052 UP & DN by replacing old stone top culvert by Pre-cast RCC segmental boxes between Raichur – Marichetal stations

Cost Involved

Rs. 0.5 Crores

Date of Completion

July - 2020

Need of the Work

Bridge no 1052 DN is stone top culvert bridge with opening of 0.45 m which is extended more than track center and UP Line Bridge is RCC Slab Bridge with opening of 1 m. 1052 DN bridge was given rating number 2 (ORN-2) and 1052 UP bridge was having spalling of concrete and exposed rebars and after too many attentions in the last few years it was not arrested.

Description of the Work

Both the bridges are replaced with pre-cast RCC segmental boxes of size 1.5 X 1.2 m by cut and cover method. The barrel length of bridge is 14m.

Difficulties Arised

Track centre distance between UP and DN line is 5 m. Both bridges were required to be replaced at the same time in a single block due to less distance between tracks and STC Bridge extending up to face of the UP line. Due to heavy traffic, 5 hours block on both UP and DN lines was difficult at the same time. Also, due to unavailability of approach road and black cotton soil it was difficult for mobilisation of machineries.

Resources Deployed

Labour: 60 numbers, Crane: 2 nos – 120 ton capacity each, Earth excavator: 3 nos, Block granted 5 hours on UP and DN line; Cleared in 4:30 hrs

Benefits

ORN-2 bridge is replaced with RCC box. STC bridge was in damaged condition on DN line side and RCC slab was exposed with rebars. RCC boxes are designed for 25 ton axle load and waterway length is also more than previous bridges. Overall, this work will strengthen bridge to carry high axle load and high speed trains.

BRIDGE WORKS

Replacement of Stone-top culvert with RCC boxes on Bridge No:544 completed between Gangayapalle - Krishnapuram

Date of Completion

May - 2020

Description of the Work

Replacement of Stone top culvert bridge no. 544 with RCC boxes is completed between Gangayapalle – Krishnapuram stations of Renigunta – Gooty Section.

Replacement of Steel Girders with PSC slabs on BridgeNo 66 between Anantapur-Taticherla

Date of Completion

May -2020

Description of the Work

Replacement of Steel Girders with PSC slabs on bridge No. 66 (with measurements 2×7.14) between Anantapur – Taticherla stations of Gooty – Dhramvaram section is completed

BRIDGE WORKS

Creating of New Water Way Bridges at Bridge.No.97A between Nadikude -Macherla Section of Guntur Division

Cost Involved

Rs. 3.91 Crores

Date of Completion

May - 2020

Need for the Work

The Bridge consist of 4 vents each clear size 5.00x4.20m. Due to heavy floods in Monsoon-2016, there was huge wash out, breaches and bank slips at Km.105/3-4 near Gurajala railway station in Nadikude - Macherla Section. There is a regular problem of track sinkage and bank slips at this location. To overcome this problem, sanction has been accorded to construct new Bridge with RCC Boxes.

Description of Work

Construction of New water way bridge with RCC blocks by creating 20M clear water way for free flow of flood water

Difficulties Arised

The Magnitude of the work was huge and thereby required 10 hours of block for creating the Bridge by insertion of RCC Boxes 28 Nos. Both sides of the bridge have water stagnation and slushy land problem. Hence, work was supposed to be executed during Summer season only. The above work involves cancelling of passenger trains. For granting mega block, traffic blocks could not be granted and the work could not be carried out since one and half year.

Resources Deployed

1. Heavy cranes capacity of 200-350MT - 03 Nos
2. Hitachi (excavators) - 04 Nos
3. JCB (excavators) - 02 Nos
4. Tractor with trailors - 06 Nos
5. Road Lorries (dumper) - 04 Nos
6. Contractor labour - 30 Nos

The work was executed by taking 10 hours single line block

Benefits

Created 20 m linear water way for free flow of flood water which is highly beneficial in averting any breaches during the floods, thereby avoiding suspension of traffic during the floods for uninterrupted flow of traffic.

BRIDGE WORKS

Rebuilding of Bridge No. 518 UP, 692 Dn and 697 Up on Kazipet -Kondapalli section in Secunderabad Division

Cost Involved

Rs. 3.50 Crores

Date of Completion

May - 2020

Need for the Work

The distressed bridge No.697 UP which was rebuilt was having permanent speed restriction of 75 Kmph since last one year due to crack in stone masonry. The structural integrity of the bridge No.518 was very bad and the same was eliminated with this work. At bridge No.692 DN, water way was less and there were chances of breaches / wash out of approaches. All these three stone top bridges were eliminated as per the railway board guide lines.

Description of the Work

Rebuilding of Bridge No. 518 Up line, 692 Down line and 697 Up line by replacing old stone culvert bridges.

Difficulties Arised

The Magnitude of the work was huge and thereby required 08:00 Hr. of blocks in 3 spells required for rebuilding the Bridges in each line for insertion of RCC Box segments of 36 Nos.(12 Nos per each bridge.) But due to the busy section and heavy passenger traffic, the blocks could not be granted and the work could not be carried out for the last 03 years even though boxes were casted and kept ready.

Resources Deployed

Cranes	– 200 T (3 Nos)
Breakers	– 1 No
Trippers	– 03 No.s
Proclainers	– 4 No.s
Compressors	– 05 Nos.

Benefits

The weak links in the track were eliminated and enhanced the safety of the track as well as travelling public.

BRIDGE WORKS

Construction of new water way bridge at Bridge No.525A Up & Down between Singarayakonda -Tangutur stations of Vijayawada Division

Cost Involved

Bridge No.525A - Rs.2 Crore for Dn line & Rs.2 Crores for Up line

Date of Completion

Bridge No.525A – 29.04.2020 Up line & 01.05.2020 Dn line

Description of the Work

Construction of new water way bridge at Bridge No.525A on Up & Down lines.

Difficulties Arised

Bridge NO.525A - The magnitude of the work was huge and thereby required 8 hours block for creating the bridge in each line for insertion of RCC boxes of 32 Nos. But due to Group-A busy section and heavy passenger traffic, blocks could not be granted and the work could not be carried out since one year.

Resources Deployed

Sl. No.	Item	Bridge No.525A	
		Up	Dn
1	Cranes 200T	3	3
2	Proclainers	5	5
3	JCB	2	2
4	Tractors	3	3
5	Tippers	5	5

Benefits

Bridge No.525A (Up & Dn) – 36 m linear water way for free flow of water which will be highly beneficial in averting any breaches during the floods, thereby avoiding suspense of traffic during the floods for uninterrupted flow of traffic.

BRIDGE WORKS

Replacement of old dilapidated Bridge No.588 Dn between Ongole-Karavadi in Gudur-Vijayawada section of Vijayawada Division

Cost Involved

Bridge No.588 Dn – Rs.40 lakhs

Date of Completion

Bridge No.588 Dn – 07.05.2020

Description of the Work

Replacement of old dilapidated Bridge No.588 Down line

Difficulties Arised

Bridge NO.525A - The magnitude of the work was huge and thereby required 8 hours block for creating the bridge in each line for insertion of RCC boxes of 32 Nos. But due to Group-A busy section and heavy passenger traffic, blocks could not be granted and the work could not be carried out since one year.

Resources Deployed

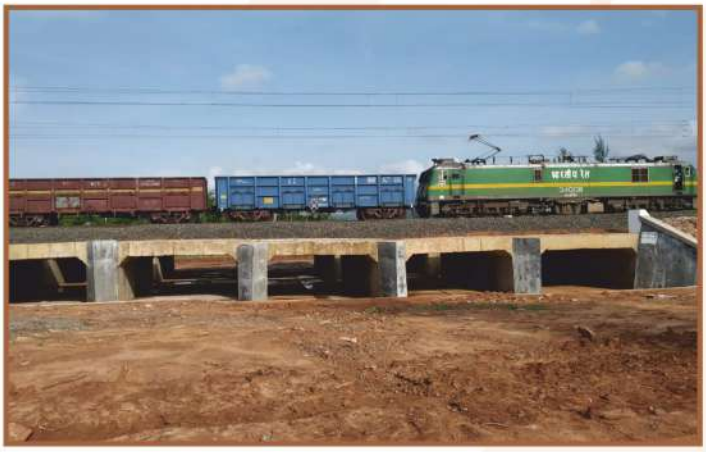
Sl. No.	Item	Bridge No.588 Dn.
1	Cranes 200T	3
2	Proclainers	5
3	JCB	2
4	Tractors	3
5	Tippers	5

Benefits

Bridge No.588 Dn – Creating 8 m linear water way as well as eliminating age old ORN-2 bridge (Stone top culvert).

BRIDGE WORKS

Construction of New Bridge at No.677C on Up and Down line between Narasingapalli - Bayyavaram in Vijayawada - Visakhapatnam section of Vijayawada Division



Cost Involved

Rs. 3.12 Crores

Date of Completion

May - 2020

Need for the Work

During the Phailin Cyclone in 2013 and Hud Hud Cyclone in 2014, unprecedented rains caused multiple breaches at the said stretches, resulting in closing of traffic for 3 days in year 2013 & 2014. To avert untoward conditions in future, there was absolute need for construction of new bridge with requisite water way. Accordingly New Bridge was planned with water way of 22.50 m in each line by providing five vents of RCC Boxes

Description of the Work

Construction of New Water Way Bridges at Bridge No.677C Up and Down line.

Difficulties Arised

The Magnitude of the work was huge and thereby required 7 hours of blocks in 3 spells required for creating the Bridge in each line for insertion of RCC Boxes 30 Nos. But due to the busy section and heavy passenger traffic blocks could not be granted and the work could not be undertaken since one year.

Resources Deployed

Cranes-3 Nos.: 1 No. 300 T & 2 Nos 200 T
Trailers-3 Nos., Proclainers-5 Nos., Trippers-5 Nos

Benefits

Created 22.50 m linear water way for free flow of flood water, which will be highly beneficial in averting any breaches during the floods, thereby avoiding suspension of traffic during the floods for uninterrupted flow of traffic.

BRIDGE WORKS

Construction of RUB by open cut method in lieu of LC No.314 'A' between Vijayawada North Cabin and Ramavarappadu stations

Cost Involved

Rs. 9.20 Crores

Date of Completion

May - 2020

Description of the Work

Insertion of RCC box segments of size 2 x 6.20 m x 6.15 m for construction of RUB in lieu of LC No. 314 A under electrified section of Vijayawada – Bhimavaram Section

Difficulties Arised

Major line block was required for carrying out the works in the busiest single line section between Vijayawada and Gudivada stations and difficult to get the mega line block

Resources Deployed

- 36 Hours of mega line block
- Proclainers - 4 Nos
- Dumpers – 6 Nos
- Cranes 200 MT Capacity – 2 Nos
- Cranes 150 MT Capacity – 1 No (stand bye)
- Hydra 15 MT Capacity – 1 No
- Labour – 60 No

Benefits

Elimination of level crossing in busy Urban limits of Vijayawada City has helped the saving of time and convenient travel for both trains and motorists.

BRIDGE WORKS

Construction of ROB in lieu of LC No.485 between Bayyavaram and Anakapalli stations

Cost Involved

Rs. 11.92 Crores

Date of Completion

May - 2020

Description of the Work

Launching of Composite steel girders under electrified section of Vijayawada – Visakhapatnam stations

Difficulties Arised

Major line block was required for carrying out the works in the busiest Double line section between Vijayawada and Visakhapatnam stations near Anakapalli yard and was difficult to get the line block

Resources Deployed

Cranes 300 MT Capacity – 1 Nos

Cranes 200 MT Capacity – 1 No (stand bye)

Hydra 15 MT Capacity – 1 No

Labour – 30 No

Benefits

Elimination of level crossing in busy Urban limits of Anakapalli Town helped in saving of time and convenient travel along with safety

BRIDGE WORKS

Track Renewal Work on Road Cum Rail Bridge across River Godavari Between Rajahmundry – Kovvuru

Cost Involved

Rs. 9.70 Lakhs

Date of Completion

May - 2020

Description of the Work

After construction of Rail cum Road bridge in 1997, it is first time to carry out the Complete Track Renewal along with TBR duly removing the track and ballast at a time on the deck slabs in 6 spans. The condition of Deck slab bridge was thoroughly examined and tested with "Rebound hammer". Deck slab concrete strength is found good. Minor cracks on side ballast retaining walls are identified and attended with cementenious material. After laying new track, ballast was unloaded and tamping carried out with DUOMATIC machine. At the same time TRR(P) with 20RP for a 3.0 km length along with 28 SEJ's is systematically planned and carried out on Godavari bridge. In consultation with state Government officials, the road traffic was also closed over the bridge for 10 days.

Difficulties Arised

Rajahmundry - Kovvur section is bottle neck of Vijayawada division and availing 1 to 2 hrs block was very difficult due to heavy traffic and lengthy block section. But this work involved a very long duration block of 36 hours.

Resources Deployed

36 hours traffic block was availed, men and machinery

Benefits

SAFETY has been increased by attending the following works :

- Rails crossed 50% GMT were renewed.
- All the damaged PSC sleepers were renewed.
- Clean Cushion and effective Drainage were provided on PSC deck slabs.
- Repairs to damaged ballast wall were carried out by using cementations material.
- Checked the strength of the slabs by using Rebound Hammer.

TRACK MAINTENANCE WORKS

Track maintenance is a crucial part of train operations which has a direct impact on both the safety of tracks as well as in maintaining the maximum permissible speed of the train on the tracks. Considering the importance of this as well as the reduced flow of train movement during the period from 26th March to 31st August 2020, the Zone had properly identified sections and meticulously deployed all its track maintenance machinery over the zone for strengthening the tracks, points, crossings, sleepers and ballast for enhancing the safety, speed and reliability.

As a result, the zone has been able to achieve the highest progress in terms of Track Machine Working across the Indian Railways and positioned top Zone amongst all the Zones. This has been achieved by deploying more machinery and less man power duly ensuring all the precautions like social distancing, wearing of masks, sanitising of machinery etc.

Plain packing Machine

It is being done by using 3x, CSM,WST machines to measure the existing track parameters and to lift the track to enable for correction of alignment, longitudinal & cross levels and also for Tamping/packing of ballast under the sleepers in order to strengthen the track.

Track Laying Equipment

It is done by PQRS (Plasser Quick Relaying System) machine for track and sleeper renewal works and which moves on auxiliary track of 3400 mm gauge.

T28

T-28 are self loading/unloading type and can load/off load it self from the road truck or railway wagon.

It is used for replacing and laying of complete assembly of turnouts and also being used for dismantling of turnouts and assembling after laying full ballast cushion and rolling.

Turnout packing Machine

The work will be executed by using UNIMAT machines for correction of alignment, Tamping & packing of points and crossings, which are available at the locations where change of track from one line to other line and converging of two lines etc.

Ballast Cleaning Machine

BCM machines are used to carry out Screening of folded ballast, disposal of muck away from track and to restore clean ballast cushion thereby improving the elasticity (resilience) of ballast bed and also to improve drainage of track.

OTHER MAINTENANCE WORKS

Construction of Foot over Bride (FOB) at Gollapalli Railway Station

Cost Involved

Work has been carried out as a part of Doubling works between Secunderabad - Mahabubnagar

Date of Completion

April - 2020

Description of the Work

Construction of Foot Over Bridge at Gollapalli Railway Station

Difficulties Arised

Getting blocks was difficult because it is a single line section with regular traffic flow

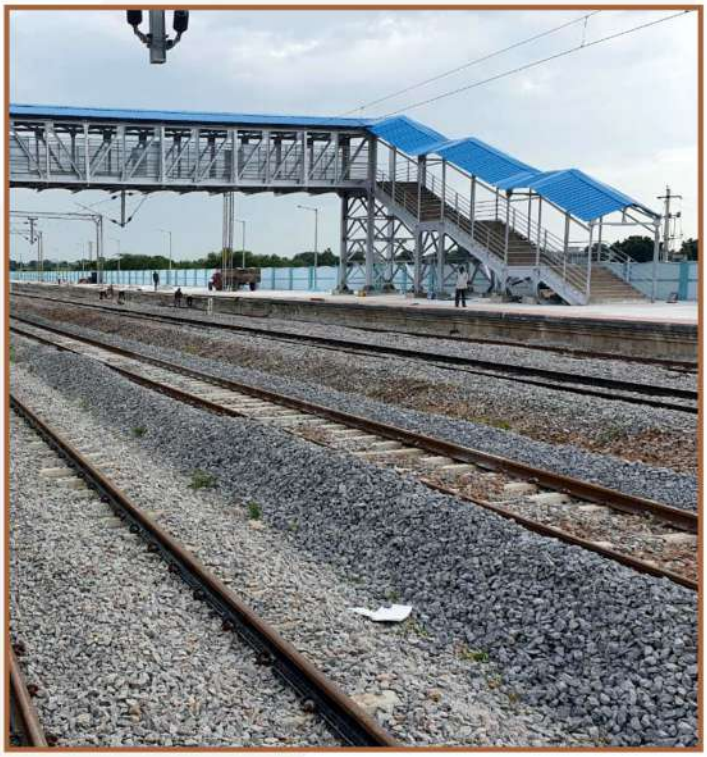
Resources Deployed

Two cranes of 200 T capacity

- 3 hrs traffic block on entire yards.
- 25 people engaged for each block.

Benefits

Avoids trespassing of the tracks and helps for crossing of passengers from one end to other end.



OTHER MAINTENANCE WORKS

Construction of Foot over Bride (FOB) at Balanagar Railway Station

Cost Involved

Work has been carried out as a part of Doubling works between Secunderabad - Mahabubnagar

Date of Completion

April - 2020

Description of the Work

Construction of Foot Over Bridge at Balanagar Railway Station

Difficulties Arised

Getting blocks was difficult because it is a single line section with regular traffic flow

Resources Deployed

Two cranes of 200 T capacity

- 3 hrs traffic block on entire yards.
- 25 people engaged for each block.

Benefits

Avoids trespassing of the tracks and helps for crossing of passengers from one end to other end.

OTHER MAINTENANCE WORKS

USFD Testing of rails and welding

Date of Completion

May - 2020

Why USFD testing of Rails?

USFD Testing of rails and welds are done on a regular basis in order to detect any fault in rails or welds accordingly appropriate action will be initiated. Depending on the traffic, frequency of testing can be done from a month to a year.

Description of the Work

A total of 1459 kms of rails and 11624 welds were tested.

Difficulties Arised

Difficulties of the Work : The work was not overdue but because it's a continuous work the same was carried out even during lockdown despite all restrictions and difficulty in the movement of men and material. The work was done as per schedule and there was no overdue during the lockdown.

Resources Deployed

Movement of men and USFD testing kit.

Benefits

Reliability of track increases as faults in the track can be detected which will not lead to a major failure.

STRENGTHENING OF SIGNAL & TELECOM EQUIPMENT

Commissioning of Largest Electronic Interlocking Signaling System along with Major Yard Remodeling at Gooty

Description of the Work

Remodelling of Gooty Yard and commissioning of Route Relay Interlocking (RRI) System

Date of Completion

July - 2020

Need of the Work

With regular increase of train services the Gooty yard has became highly saturated. To enhance Safety and to ensure punctual running of trains there was a necessity for installing Interlocking System along with yard remodeling.

Difficulties Arised

Gooty Station is a major junction on SCR and handles trains from four important directions - Mumbai, Chennai, Bengaluru and Secunderabad. To take up this work at one stretch will have lot of impact on train service and leads to dislocation/cancellation of train services. Due to reduced train movement on account of lock down was facilitated to complete the interlocking and yard remodeling works.

Benefits

The completion of this advanced and modern Electronic Inter-locking signalling system and yard remodelling eases the congestion on this important junction distinguished feature of this installation is that there will not be any un-signalled/manual movement of Trains leading to safer train operations.

STRENGTHENING OF SIGNAL & TELECOM EQUIPMENT

Activities of S&T Workshop to Strengthen Safety

Introduction of New products

- Self-designed 500Kgs Portable Crane has been manufactured for the use of Overhauling of Point Machine as part of cost cutting measure.
- Marking Jigs for Digital axle counters were designed & developed
- Indigenously developed Passenger announcement system has been installed at Therban Station in Nanded Division.
- E-Bicycle has been manufactured for the use of S&T Maintainer. This bicycle can run with the help of motor or by manual pedalling. It can be operated with 24AH/40AH batteries and can travel for a distance of 18kms. Approximate weight of E-bicycle with motor operation is 48kg and Manual operation is 22kgs.
- The present Interlocked Mechanical Gates after removing Winch and wire rope transmissioncan be added with the Pedestal, Operating panel & Boom lock supplied by S&T, workshop Mettuguda and the same can be operated electrically similar to Electric Lifting Barrier and the boom strength can be retained.

Development of New Items in Electrical & Electronics

- Long range LED torch.
- Tri color LED lamp.
- Warning cum Work light.
- Mini cordless LED based Inspection lamp.
- Automatic Private number generation App was developed with two Industrial tablets.
- DC – DC converters have been developed with 24 – 32 Volts/5 Amps, 24 – 32 Volts/10 Amps& 12 – 28 Volts/5 amps.
- LC Gate Announcement (Multi Language)
- Signal Unit Mounting Hoist

MAINTENANCE OF SIGNAL & TELECOM EQUIPMENT

During Nationwide Lockdown & Post lockdown, Signal & Telecommunication (S&T) department rose to the situation and contributed their best to ensure safe and hassle free working of the System

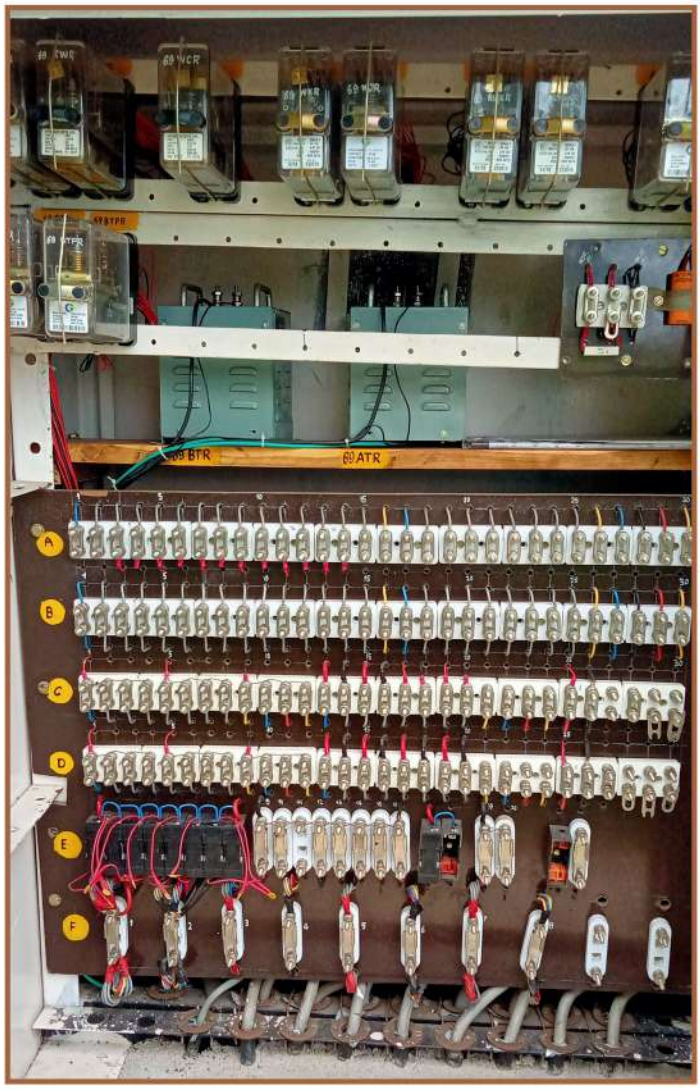
Some of the works completed during the lockdown period include...

- S & T staff along with Railtel Corporation had facilitated video conferencing duly ensuring availability of required internet band width at camp offices of senior officials and important locations.
- Innovative use of applications like web-ex from CISCO and ZOOM were made to facilitate video conferencing.
- Similarly many audio conferencing facilities were also rendered by divisional teams to take the stock of situation from remote places and convey important management decisions to all.
- To disseminate COVID-19 related information to common public over SCR jurisdiction, 18 telephone lines were provided over the six divisions of the zone.
- Non-Interlocking working & Relay Room alterations completed at Sri Laxmi Narasimha Swamy Infrastructure siding at Nagireddipalli station.
- Provision of overlap points release with 60 seconds time delay commissioned at Tenali 'A' & 'B' cabins.
- 06 nos. of Electrically Operated Lifting Barriers have been commissioned during lock down
- Interlocking circuit has been shifted and commissioned to New Gate HUT duly providing Mini IPSat Level Crossing 54 (E), Level Crossing 17 (E) of Secunderabad Division and Level Crossing 5(JB) of Hyderabad division.
- System Integrity Test done at 23 stations
- 9 no. of Track circuits have been converted from parallel to Series at Sanatnagar station of Secunderabad Division.
- Cable Meggering carried out at 96 stations/Level Crossings

MAINTENANCE OF SIGNAL & TELECOM EQUIPMENT

Works carried out to improve reliability

- 08 no. of LC Gates have been equipped with Emergency Sliding Booms to increase reliability
- 2 Old specification/Aged Integrated Power supply Systems (IPS) replaced with new specification IPS and 1 new Mini IPS provided at LC gate.
- 09 New IP Cameras provided at Anantapur Railway station in Guntakal division.
- 9.8 KM of defective cable replaced.
- 03 nos. of manned LC Gates viz., LC No.84 of Secunderabad Divison, LC No.4 of Guntakal Division and LC No.328 of Vijayawada Division have been interlocked to enhance Safety
- Signal & Telecomm cable shifting work was done at LC-49, 51, LC 55 on Secunderabad Division, LC 95 on Guntakal division and LC 314A in Vijayawada division in view of RUB work.
- Electronic Interlocking have been commissioned at 8 Stations during lock down to strengthen safety
- 04 nos. of Block Sections have been commissioned with 05 nos. of Block Proving Axle Counters (BPAC) with redundancy of High Availability Single Section Digital Axle Counter (HASSDAC) between New Piduguralla – Nakirekallu, Nakirekallu – Rompicherla and Rompicherla – Savalyapuram stations on Guntur division and between Gooty Jn. – Jakkalacheruvu stations (UP & DN) on Guntakal division along with segregation of power supplies to ensure Safety.
- 08 nos. of obsolete Universal Analog Axle Counters in 04 IBS block sections and 02 nos. of obsolete Universal Analog Axle Counters of loop lines have been replaced with redundant Digital Axle Counters (HASSDAC / Dual MSDAC) with segregation of power supplies to increase reliability.
- 02 nos. of aged Intermediate Block Signalling (IBS) gears have been replaced between Mahabubabad – Gundrathimadugu stations on Secunderabad division and Narsipatnam Road – Regupalem stations on Vijayawada division along with Solid State circuits minimizing copper cable usage to increase reliability.



MAINTENANCE OF SIGNAL & TELECOM EQUIPMENT

Works executed to strengthen safety and reliability

- Feature of separation of Calling-On signals initiation circuits with that of Home Signals and Auto-release of Calling-On Signal on clearance of the train is provided at Lingampalli station.
- 05 nos. of stations have been provided with air-conditioning in relay rooms along with commissioning of Electronic Interlocking
- 03 nos. of stations have been equipped with Integrated Power Supply (IPS). With this all required 582 block stations have been provided with IPS over SCR (excluding 04 no. of block stations which are temporarily closed).

Operating Panels of UFSBIs

- 11 nos. of stations have been provided with failure detection of Track Feed Battery Chargers through datalogger along with provision of Audi-Visual alertness alarms at stations to increase reliability.
- 1020 nos. of Integrated LEDs have been provided for Signal Main Aspects like Red, Yellow and Green duly replacing existing combination of separate Current Regulator Units and LED units to increase reliability
- 140 nos. of Thick Web Switch Points with clamp type locking Point Machines of 220 mm. stroke have been provided duly replacing existing 143 mm. stroke Universal Point Machines to facilitate increasing of trains speed and to enhance safety and reliability.
- 06 nos. of points with wooden layouts with diamond cross-over points have been replaced with PSC layouts duly replacing the Point machines along with shifting of layouts by Engg. Dept. at Kazipet junction RRI and Vijayawada junction RRI

Telecommunications

- 222 Km. of 6-Quad cable has been newly commissioned.
- 122 Km. of OFC cable has been newly commissioned.

MAINTENANCE WORKS OF ELECTRICAL SAFETY EQUIPMENT & LOCOMOTIVES

Traction Rolling Stock - Loco Maintenance

Description of the Work

Due to reduced train movement, guidelines were issued for management of locomotives stabled during the period of lock down. All the sheds/deports were followed scrupulously. The major works include...

- Switching off Battery MCBs, checking of Battery voltage and charging of Batteries for 2 -3 hours on every alternate days by energizing the Locos.
- Checking of Lubricants and Transformer Oil levels and for leakages if any. Monitoring of over due locos and diverting them to home sheds for carrying out schedule maintenance.
- Ensuring availability of Safety items in Locomotives
- Ensuring 100% working of sandem and availability of sand in all the Locomotives.
- 13468 Nos. of earth pits checked for healthiness and proper connectivity
- 2191 Nos. of MCCBs/MCBs checked in Distribution Panels/Boards for proper rating.
- 2200 Nos. of cables meggered to check damaged insulations. Unused/spare cables and removed.
- 3500 Nos. of electrical joints checked for loose connections and tightened.

Modification of Locomotives at Electric Loco Shed, Lallaguda and Electric Loco Shed, Kazipet

Description of the Work

- Modified Motor Supports provided at Traction Motor 3/4 position in WAP7/WAG9/9H 3-Phase Locos for 24 bogies to avoid falling of traction motors while on run.
- Conversion of TBU/PBU type brake rigging to conventional brake rigging to avoid falling of break equipment for 6 WAG9/9H Locos.

SAFETY RELATED MAINTENANCE WORKS - ELECTRICAL WING

During the lockdown period & Post lockdown from April to July 2020, Regular maintenance activity of Electrical Safety equipment and Electric Locomotives have been carried out throughout the Zone.

Traction Distribution - Modification of Circuit Breaker

Description of the Work

Rotation of Feeder Circuit Breaker orientation by 90 degrees with respect to bus bar to improve the safe working clearance between opened door of circuit breaker and live bus-bar for 79 numbers at various Traction Sub-stations has been completed.

Benefits

Earlier the Circuit Breaker door which was right under the live bus bar is now away from the line of the bus-bar after change in the orientation. This has enhanced the safe working clearance from 25KV line supply.

Provision of Copper Packing Saddle for Catenary Wire

Description of the Work

Copper packing saddle for catenary wire inside suspension clamp has been provided at 5159 locations to ensure firm contact so as to avoid sparking and snapping of conductor during bird/monkey electrocution across insulators.

Benefits

Packing saddles provided for the catenary wire inside suspension clamp will prevent loose contact between the stranded catenary wire and the catenary suspension clamp body. This will reduce the catenary wire strand cutting during flash over of insulators.

Traction Distribution - Overhead Earthing

Description of the Work

Overhead earthing at the structures of OHE, platforms, foot-over bridges, etc., on platforms has been carried out at 11 stations in Secunderabad division doing away with conventional surface bonds which normally get soiled, corroded/cut, difficult to maintain and sometimes endanger passenger safety due to their physical obstruction on path ways.

Elimination of critical implantation locations

Critical implantation locations on main line OHE caused due to track slewing have been eliminated in Vijayawada division by providing new masts with higher implantation. This has enhanced Safety of Train operations and working.

ELECTRICAL MAINTENANCE WORKS - TRACTION DISTRIBUTION

Replacement of 600A isolators in Renigunta sub division

Cost Involved

Rs. 40.6 Lakhs

Date of Completion

April - 2020

Description of the Work

Replacement of 600A isolators with 1250A in Renigunta sub division. The Isolator replacement work (600A with 1250A isolator) which was pending for last 3 years was taken up and total 16 nos. of 600A Isolators are replaced with 1250A Isolators during lockdown

Difficulties Arised

Non availability of Power block & Traffic Blocks

Resources Deployed

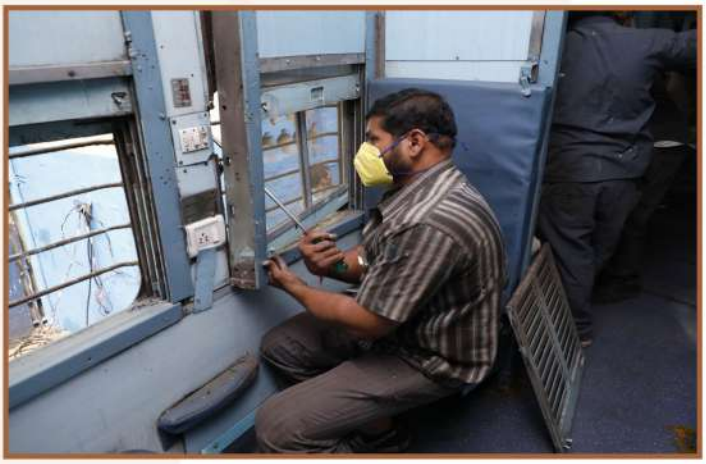
8 nos. of Contractual staff were engaged and availed Power Block for period of 32 hrs

Benefits

Safety and Higher Reliability.

COACH MAINTENANCE ACTIVITY

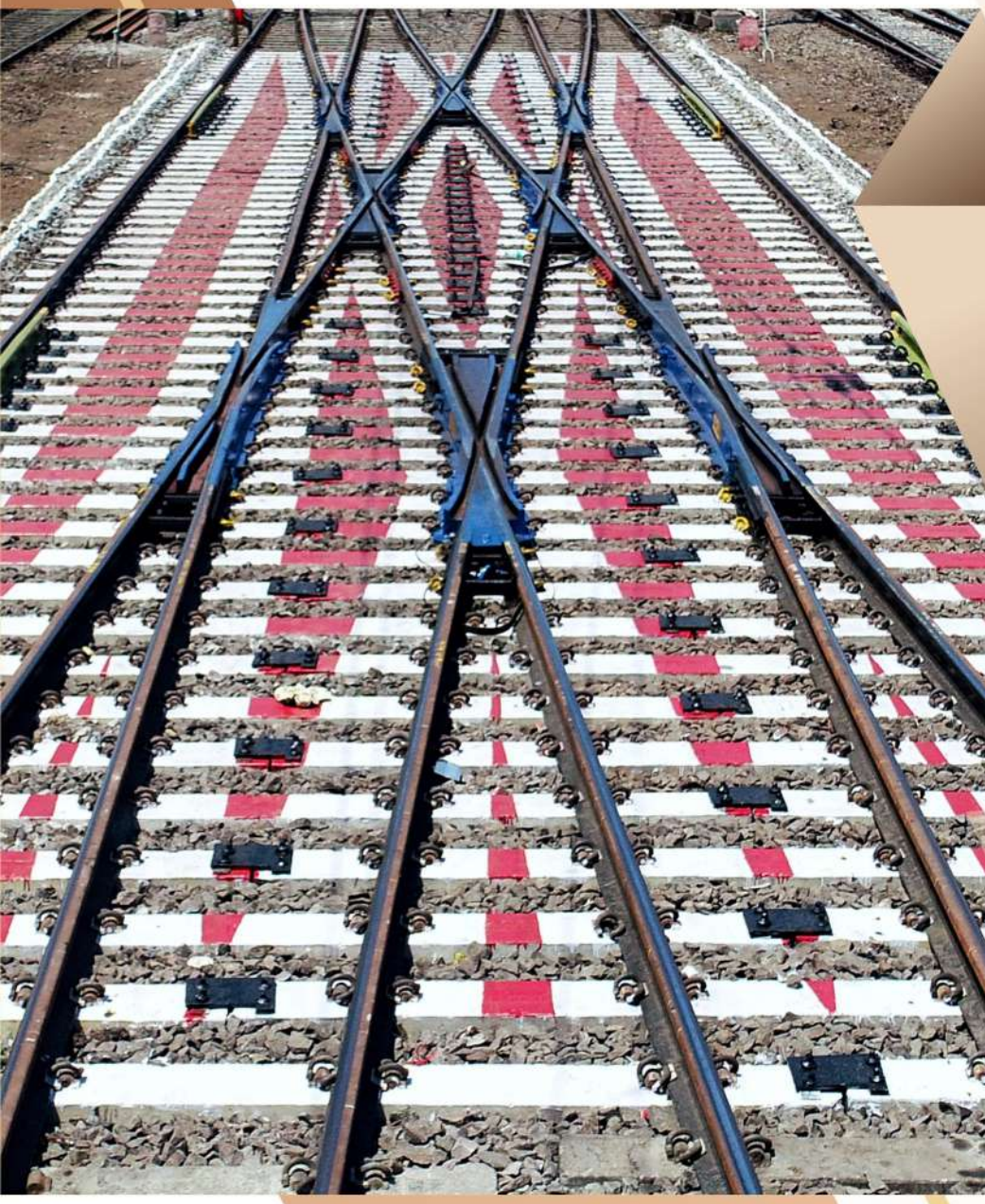
Maintenance of Rolling Stock (Coaches & Wagons) have been regularly carried out during lockdown period and several innovative measures have been adopted to improve safety of rolling stock due to reduced train movement during this period. As per the directives of Railway Board, South Central Railway has pioneered to form committees to review the maintenance periodicities of Rolling stock and submitted the reports on same to Railway board for further action in this regard.



Description of the Work

- Coaching Workshops and open line Coaching depots converted 486 coaches to be used as Isolation coaches within short time of 10 days.
- All the three workshops on SCR have achieved their targets for 2019-20, even though there was loss of 10 working days during the period ending due to closure of all activities during lockdown.
- In spite of COVID-19 spread and the restrictions imposed from time to time, all the workshops have given the POH Outturn against odds though nearly 50 working days were lost due to complete lockdown and functioning with less staff.
  - Lallaguda Workshop out turn is 363 coaches
  - Tirupati Carriage Repair shop Workshop out turn is 253 coaches while liquidated corrosion repairs by giving outturn of 34 coaches for corrosion repairs.
  - IOH of 12 IOH VVN bogies were carried and supplied 32 assembled wheel sets for VVN milk tank to Renigunta depot.
  - Rayanapadu Workshop outturn is1273 wagons
  - Workshops were developed new gadgets/equipement with the available resources and man power which will help in improving the efficiency and strengthen the system there on by reducing utilization of Manpower/resources.
  - Gadget for DEMU Ventilation Pump testing and Mobile gadget to test the working of Radiator/Heat Exhangers were developed by Lallaguda Workshop.
  - Rayanapadu Workshop developed coupler body monitoring & dismantling gadget and also modification to cut off angle cock test bend.

COACH MAINTENANCE ACTIVITY

Several Measures adopted by Mechanical Workshops, Coaching Depots, Wagon depots, TL&AC, EMU &MEMU sheds to improve safety of coaches is as under

- C&W depots are functioning in three shifts in spite of all lockdown restrictions to ensure seamless operations of Freight trains as well as for running of Parcel/Shramik/Special trains.
- The Coaching Depots are regularly maintaining the 486 coaches converted as COVID CARE CENTRES which are stabled at different locations in three states of AP, Telangana & Maharashtra.
- Maintained the 509 stabled rakes (7541 Coaches), 95 OMS (Engineering Track recording Units) consisting of 163 coaches
- To clear the migrant rush during lockdown period Open line C&W depots have maintained and dispatched 401Shramik special rakes (9488coaches) on requisition from the local State Government.
- IOH of 331 coaches was carried in depots.
- Outturn of ROH of 3239 wagons completed.
- Sick line Repairs & attention carried out for 7696 Wagons to make them available for traffic use.
- Freight Examination of 3226trains (CC-878, Premium-1415 & END to END-933 rakes) were carried and issued BPCs.
- To ensure the safety of the wagons on run, 9337 goods trains were attended for enroute rolling in examination and revalidation of 138 BPCs was done to meet the additional requirement of freight stock for transportation of the essentials across the country without any disturbance.
- In view of the health and hygiene of the running staff accompanying the freight trains, 30652 brake vans were attended with disinfection at enroute stations.
- To improve the rake availability, the validity of the CC rakes of BCN/BCNHL is made universal for all Indian Railways duly removing the existing specified circuits. Premium rakes are given extended validity of 12+8 days instead of 12+3 days.