



IT Initiatives in Mahanadi Coalfields Limited

(A Subsidiary Company of Coal India Limited)



Brief Details –Mahanadi Coalfields Limited



Mahanadi Coalfields (A subsidiary of Coal India Limited)

ESTABLISHED	03.04.1992
HEAD QUARTER	SAMBALPUR, ORISSA
COAL PRODUCTION	23.14 M.TE IN 1992- 93 137.901 M.TE IN 2015-16
POSITION	LARGEST COAL PRODUCING COMPANY IN CIL
STATUS	MINI RATNA COMPANY
COALFIELDS	2(Talcher Coalfield and IB Coalfield)
AREAS	11
NO OF MINES	21 (15 OC & 6 UG)
MANPOWER	22367(as on 25.10.2016) (Executives-1849, Non-Executives- 20397,Contractual-16076)

9001 & 14001 ISO certified company
18001 certified company for Occupational Health



Grey Areas Vulnerable to Unethical Practices



**Theft / Pilferage
of Coal.**

**Manipulation in
Coal Production
Figure / Under /
Over Reporting
/ Erroneous
Payment to
Transport
Contractors.**

**Entry and Exit
of Unauthorized
Coal Tippers /
Escape of
Loaded Coal
Tippers Out of
Mine
Boundaries.**

**Creation of
Artificial
Demand / False
Indenting in
Material
Procurement
(Backbone of
Coal
Production).**



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Over-loading/Under-loading of Railway Rakes at Siding End Resulting into the Financial Burden on Company / Buyers.

Slippage of Coal Grade at Railway Siding / Coal Stock .

Incidences of Bribery and Harassment in Passing of Contractual Bills (Unrest to Contractors/Vendors).

Irregularities in Wage Payment to the Contractual Employees.



Challenges Faced



Lack of Infrastructure

- Data Monitoring on Real Time Basis .
- Monitoring and Surveillance of Key Field Operations
- Data Sharing on Key Business Operations
- Data Transmission on Real Time Basis



Value Additions



- ✓ Strengthening of Coalnet over 2700 Sq. Km Of MCL Connecting 15 OC Mines and 6 UG Mines .
- ✓ Installation of 1800 GPS Devices for Tracking of Coal Tippers , 44 CCTV at Railway Sidings and 91 IP Cameras at Wbs with 6 Years AMC (Rs13.00 Cr).
- ✓ 376 IP Cameras (355 IP Box Cameras and 21 IP PTZ) at Regional and Central Stores, Mine Entry/Exit Points, Magazines of MCL with 6 Years AMC (Rs 4.08 Cr).



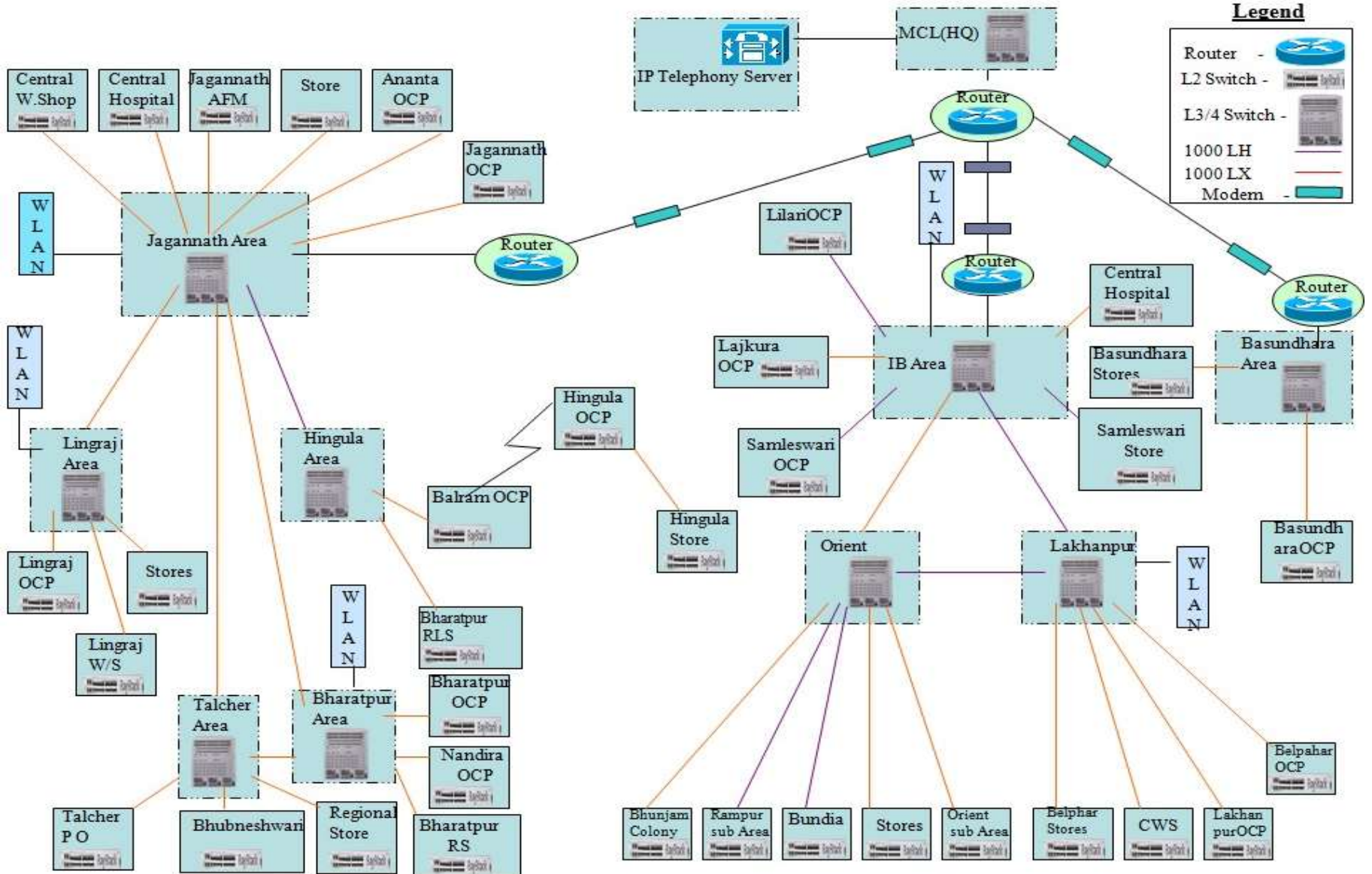
Value Additions



- ✓ Procurement of 3483 No. of GPS Based VTS for Installation on all Hemms Including all OB Carrying Dumpers and Coal Tippers with 6 Years AMC (Rs 6.00 Cr)
- ✓ Procurement of 40 In-motion Road Weighbridge with RFID Readers / RFID Tags (Rs. 3.20 Cr)
- ✓ Dedicated Portal mclvts.in Developed for Online Monitoring of Coal Transportation
- ✓ 'Samadhan' A Dedicated Portal Developed for Grievance Redressal

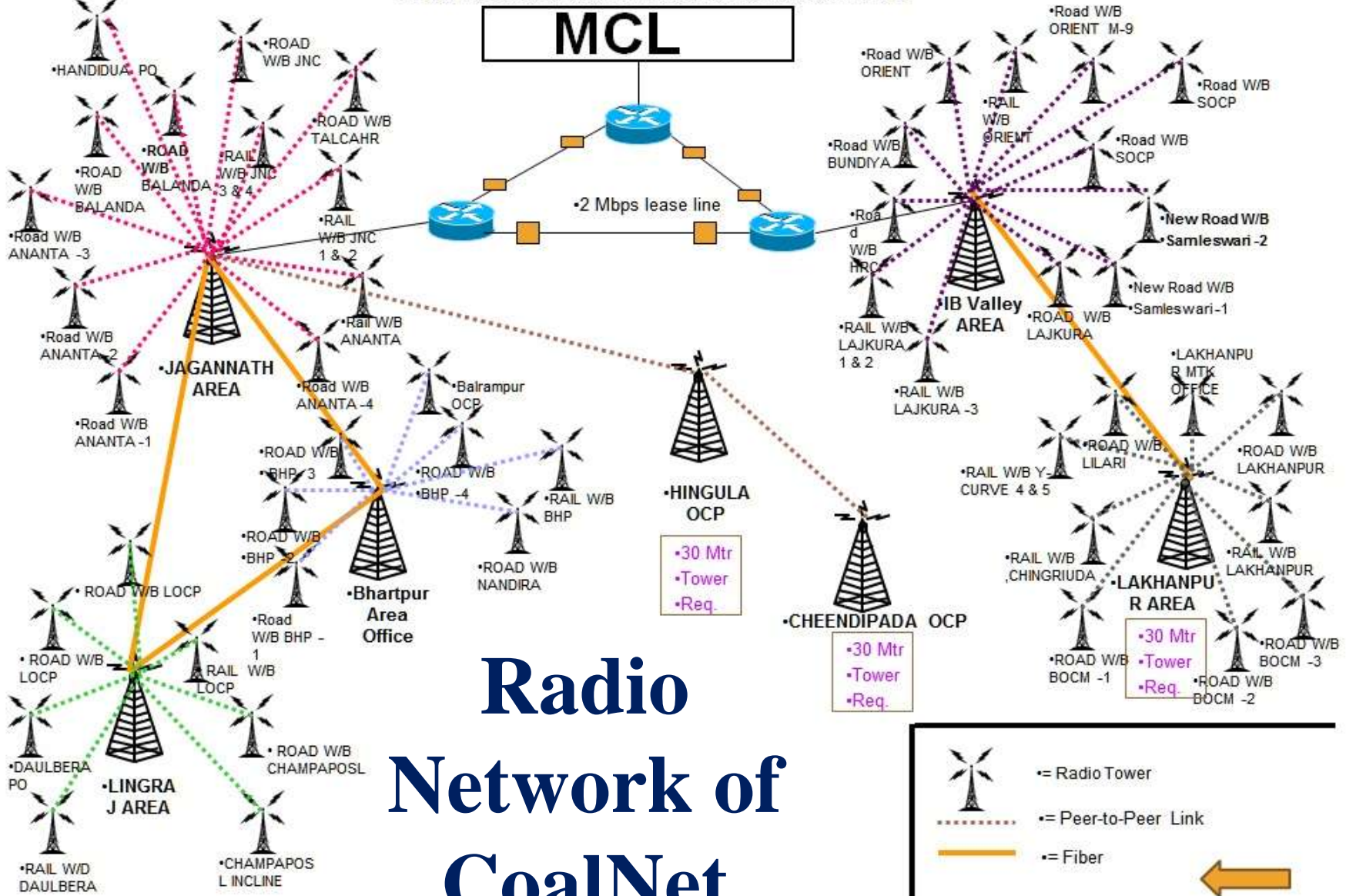


Integrated Wide Area N/W of MCL



Radio Connectivity to WBs

DETAILED DESIGN FOR RADIO CONNECTIVITY



Radio Network of CoalNet





Modules of CoalNet ERP implemented in MCL



Payroll System

Sales & Marketing

Finance (including Payment of Bills to Contractor / Suppliers)

Personnel Information System

Materials Management System

Production Information System

Equipment Monitoring System

File Tracking System



Static Road Weigh Bridge





Installation of In-motion Road WB with RFID/IP Camera







In-motion Road WB Online weighment



COMPAQ

Engineering India
Coal India
Enabling Nature · Enabling Life

Mahanadi Coalfields Limited

MCL, LINGARAJ OCP (LNS)

Date: [] Mode: Road Local Message: **<Axle Weighing>** Total Wt.: 25.720

Time: 15:59:28 B

Sl. No: 93471 Loop: Veh Status: Forward LQCP

WO No: 2015-16/101 RF: Truck No: OD35A0019 LALNT

Spd / Axle: [] 1 AD: RF-Tag ID: E2 00 10 01 83 10 02 22 18 70 53

DO Details

DoNo	Consumer	DoDate	Mat	Grade	DoQty	LiftQty	BallQty	Valde
101	MCL	11/06/2013	COAL	A	9000000.00	10759501.870	-1759507.220	31/12/

Gross Wt. 25.720 Tare Wt. 12.740 Net Wt. 13.140 Avg. 16.321

Total Trucks : 38 Known Trucks : 37 Unknown Trucks : 1 Over Speed: 0

Exit

3:59 PM 31/05/2015



Live Weighment Detail in Central Server



Weigh Bridge in Motion Data Report -- Webpage Dialog

https://172.19.0.10/CoalNetPROD/pim/jsp/VTS_In_MotionDataMainWeigh.jsp?wb_name=82&date_time=17-1-2017&ocp_name=BELPAHAR_OCP&do_no=ARK

Certificate error



Production Information Monitoring System Weighment Thru. In Motion W.B

17-Jan-2017
CoalNetPROD

Weigh Bridge in Motion Data Report for OCP:- BELPAHAR_OCP With Do No:-ARK On 17-1-2017

Back

Truck Number	RF Id No.	Tare Weight Date and Time	Gross Weight Date and Time	Tare Weight	Gross Weight	Net Weight
OD23A4046	E200107129090079202040EE	17-01-2017 12:14:42	17-01-2017 12:14:42	10.3	30.8	20.5
OD23A 8809	E20020195204009224901529	17-01-2017 12:14:32	17-01-2017 12:14:32	10.65	29.1	18.45
OR 23 D 4826	E20010712909017520703D93	17-01-2017 12:13:24	17-01-2017 12:13:24	10.2	34.25	24.05
OR23D2758	E200107129090270204043EC	17-01-2017 12:12:57	17-01-2017 12:12:57	10.5	34	23.5
OD 23 A 8807	E20030166609026212109A05	17-01-2017 12:12:14	17-01-2017 12:12:14	10.5	24.85	14.35
OD238903	E200201952040204249016E9	17-01-2017 12:08:14	17-01-2017 12:08:14	10.75	31.85	21.1
OD23A2865	E2001027680C0102214036C6	17-01-2017 12:00:41	17-01-2017 12:00:41	10.7	27.9	17.2
OD238913	E20010712909004820104071	17-01-2017 11:57:08	17-01-2017 11:57:08	10.95	32.6	21.65
OR 23 D 1204	E20010712909021220104301	17-01-2017 11:56:51	17-01-2017 11:56:51	10.8	25.4	14.6
OD 23 8911X	E20020195204017124901665	17-01-2017 11:55:44	17-01-2017 11:55:44	10.85	25.05	14.2
OR23D1205	E20010712909018020404284	17-01-2017 11:52:41	17-01-2017 11:52:41	10.5	26.3	15.8
OD23A2870	E2001027680C01542020421A	17-01-2017 11:47:17	17-01-2017 11:47:17	10.65	26.2	15.55
OR23D2757	E200107129090167200045DC	17-01-2017 11:47:02	17-01-2017 11:47:02	10.5	26.2	15.7
OD23A2872	E2001027680C0103213036C1	17-01-2017 11:45:20	17-01-2017 11:45:20	10.5	27.4	16.9
OD 23 A 8807	E20030166609026212109A05	17-01-2017 11:42:49	17-01-2017 11:42:49	10.5	29.85	19.35
OD23A8806	E20030311702025116406E38	17-01-2017 11:39:51	17-01-2017 11:39:51	10.5	32.6	22.1
OR23D2756	E2001071290900552010408D	17-01-2017 11:39:11	17-01-2017 11:39:11	10.5	31.6	21.1
OR 23 D 4826	E20010712909017520703D93	17-01-2017 11:37:21	17-01-2017 11:37:21	10.2	24.85	14.65
OR23D2758	E200107129090270204043EC	17-01-2017 11:29:07	17-01-2017 11:29:07	10.5	30.55	20.05
OR23D4827	E2001027680C0156253012ED	17-01-2017 11:27:31	17-01-2017 11:27:31	10.5	32.9	22.4
OD23A2865	E2001027680C0102214036C6	17-01-2017 11:25:14	17-01-2017 11:25:14	10.7	29.05	18.35



GPRS Based Vehicle Tracking System



fleet vigil **LIVE**
VEHICLE TRACKING

USER LANDMARK | USER GEOFENCE | VEHICLE DETAILS | SEARCH LOCATION | MEASURE DISTANCE | CLEAR MAP | AUTO REFRESH | Loading ...

GROUP MODE | Map | Satellite

Map data ©2014 Google Imagery ©2014 CNES / Astrium, Onor/Spot Image, DigitalGlobe, Landsat | Terms of Use | Report a map error

SPEED > 60 Km/h **SPEED > 40 AND <= 60 Km/h** **SPEED > 0 AND <= 40 Km/h** **SPEED = 0 Km/h** **DISCONNECTED VEHICLE**



History Tracking of Vehicle





Vehicle wise Geo-Fence violations



Vehicle Details x GEOFENCE VIOLATION x ANIL

mclvts.in/GeofenceViolationReport.aspx?Rpt_Type=VEHICLE

Apps Bookmarks MCLVTS Welcome to MCL current Affairs Latest Rajasthan Govt Pride Login Magic Autofill How to Connect Andriod html - Make an image cmpdil Other bookmarks

HOME **VEHICLE WISE GEOFENCE VIOLATION DETAILS**

SELECT AREA OFFICE JAGANATH SELECT OCP All SELECT FROM DATE 17 Jan 2017 00 00 SELECT TO DATE 18 Jan 2017 00 00

LOAD EXPORT SUMMARY EXPORT DETAILS

VEHICLE WISE GEOFENCE VIOLATION COUNTS

VEHICLE WISE GEOFENCE VIOLATION SUMMARY REPORT

DETAILS	RTO NO	GEOFENCE VIOLATION COUNT
1	OD 19 B 9141	1

Page 1 of 1 View 1 - 1 of 1

DETAILS OF VIOLATION OF A PARTICULAR VEHICLE

VEHICLE RTO NO : **OD 19 B 9141**

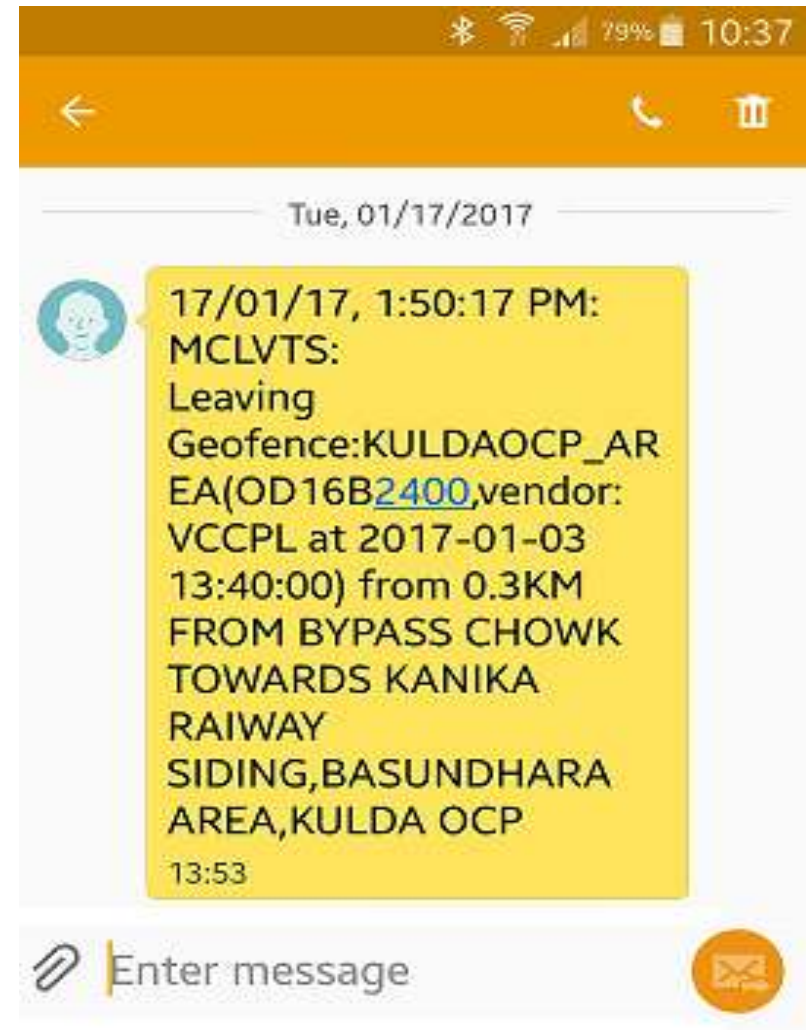
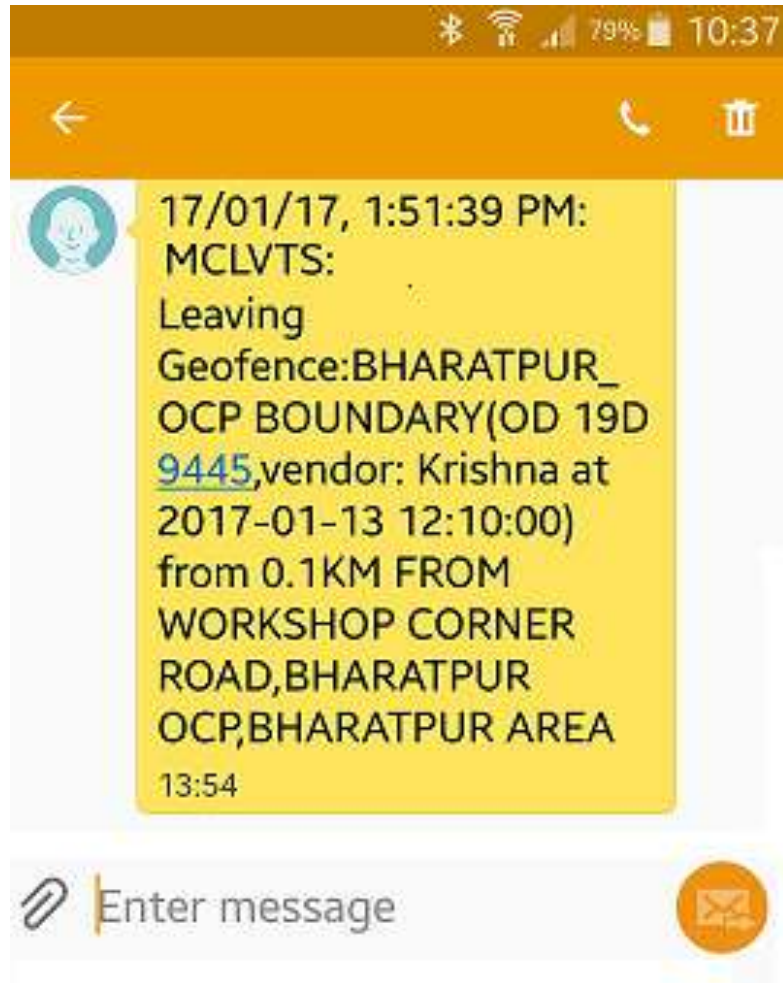
GEOFENCE VIOLATION DETAILS REPORT

Alert Type	Alert DateTime	Location
1 Reach into Geofence:BBSRI OCP BOUNDARY	17 Jan 2017 20:31:00:000	0.2KM FROM STPL GARAGE,BBSRI OCP,JAGANATH AREA
2 Leaving Geofence:BBSRI OCP BOUNDARY	17 Jan 2017 11:24:00:000	0.2KM FROM JAGANATHA RS2 END POINT,JAGANATHA

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Geo-fence Violation Alert





CCTV .. Railway Sidings





Live CCTV footage on Mobile App





Live Transportation Data on Mobile Application



Mahanadi Coalfields Limited

[Get Report](#)

Region	NoTrucks/ NoTrips	NetWt(Te)
Talchar	980/4066	71038.7
IBValley	718/2795	42485.15
Basundhara	194/564	9711.83
Total Count	1892/7425	123235.68

Mahanadi Coalfields Limited

VendorDetails	NoTrucks/ NoTrips	NetWt(Te)
BCT-BBS	16/62	989.54
BMS-BBS	6/6	91.62
BNCT-BBS	3/3	56.28
BTMF	4/29	467.42
BTMF-BBS	15/76	1216.62
JJTMCL-BBS	2/2	37.98
MCL	1/6	88.3
MGCT-BBS	15/91	1514.12
MMSHLT-BBS	20/118	1903.42
MTMCL-BBS	17/79	1254.2
NMSCL-BBS	1/7	106.16
NMSHCL-BBS	13/69	1102.12
PCTF-BBS	14/65	1072.74
PSHLT-BBS	20/107	1734.06
PTB	1/6	96.02
PTB-BBS	15/88	1402.38
PTMCL	1/5	81.28
PTMCL-BBS	15/92	1526.96
Total Count	185/920	14881.3

Mahanadi Coalfields Limited

Ocp	NoTrucks/ NoTrips	NetWt(Te)
JAGANATH_O CP	226/1056	17197.85
BHUBANESW ARI_OCP	198/734	14027.26
Total Count	424/1790	31225.11

Mahanadi Coalfields Limited

VehicleDetails	NoTrucks/ NoTrips	NetWt(Te)
OD05B8469	5	76.28
OD19D5949	5	80.34
OD19E2145	6	91.56
OD19E8432	3	49.36
OD19F0267	5	80.84
OD354514	4	63.22
OD359318	5	80.92
OR04G2291	1	16.2
OR04L5646	5	84.74
OR14P1575	1	17.36
OR14P3632	4	67.54
OR15L4248	3	50.3
OR19E6890	2	32.96
OR19G4077	3	45.48
OR19G4176	5	73.28
OR19N8337	5	79.16
Total Count	62	989.54

Mahanadi Coalfields Limited

WeighBridge	NoTrucks/ NoTrips	NetWt(Te)
INMOTION-04	185/919	14863.54
INMOTION-01	43/141	2405.55
Total Count	228/1060	17269.09

Mahanadi Coalfields Limited



[Live Summary](#) [WeighBridge](#)

Arya OmniTalk Wireless Solutions Pvt Ltd.

Version 1.0



e-Surveillance and Monitoring Unit





Positive Outcome of IT Interventions



**Material
Codification of
1,02,437 Materials
Leading to
Identification of
Total Inventory of
Rs 115 Cr**

**Proper Utilization
of Store Inventory
worth Rs 30 Cr in
a Period of Two
Years.**

**Prevention of
Unavoidable
Indenting of
Materials (Cost
Cutting Measure).**

**Monitoring of
Daily Coal
Production/ Coal
Dispatch / OB
Removal w.r.t.
Coal Mining
Projects.**

**Maintenance of Bank
A/C, CMPF Details
with Photo
Identification w.r.t.
40,000 Executives,
Non-executives and
Contractual
Employees.**

**Availability of
Information about the
Dependents of the
Employees Thereby
Restricting any
Wrongful Payment
Against a False Claim of
LLTC/Medical Bills.**



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- ✓ ■ Out of Rs 7,662.00 Cr of Contractual Bill Payment Made Since Nov'2012, Rs 2162.97 Cr Has Been Made During FY 2015-16 Within 15-20 Days as Against a Delay of 3 Months Earlier.
- ✓ ■ The Complaints Relating to the Contractual Bill Payment Has Been Reduced to Almost Nil.
- ✓ Out of **26597** No of Files Routed Through File Tracking Systems since its Inception w.e.f. 15th August 2015, Approx. 50% of the Files Have Been Disposed off.
- ✓ Coal Sale Value Worth Rs. 159.36 Cr Was Refunded to the Coal Consumers During 2015-16 Within One Month From the Expiry Of DO as Against a Delay of 4-5 Months Earlier
- ✓ Coal Stock Measurement by ETS (Electronic Total Station) with Software Eliminating the Chances of Manipulation of Survey Measurements.



Positive outcome of In-motion WB with RFID reader/tags and IP cameras



Weighment of More than 800 Tippers in One Shift With In-motion Weighbridges with RFID/IP Cameras as Against 200 Tippers Through Electronic Static Weighbridges.

100%

Increase in Coal Weighment from 10-15% to 90-95%, Reducing the Chances of Manipulation in Coal Production Figures on Daily Basis



Reduction in the Scope of Fudging of Coal Production Figures on Day to Day Basis Due to Introduction of Real Time Transmission of Coal Weighment Data to The Central Server



Enhanced Operational Efficiency Minimizing the Scope of Over Reporting/ Under Reporting of Coal Production



Positive Outcome of IP/CCTV Cameras



- ✓ Increased Surveillance of All the Coal Tippers Through IP Cameras at Electronic and In-motion Weighbridges
- ✓ Prevention of Entry of Unauthorized Coal Tippers and Persons Due to Surveillance Through CCTV Cameras at Railway Sidings
- ✓ Close Monitoring of Coal Quality, Quantity and Loading Time at Railway Sidings.
- ✓ Reduction in the Wagon Loading Time from 5-6 Hours to 3-4 Hours Thereby Avoiding Demurrage Charges to the Company.



...Contd



- ✓ Effective Monitoring of Security System at Entry/Exit Points and Explosive Magazines Thereby Preventing the Entry of Unauthorized Vehicles and Persons.
- ✓ Increase in the Availability of Coal at Railway Sidings from few Lakhs Tonnes to 8.5 Mte .
- ✓ About 75%-80% Reduction in the Incidences of Petty Coal Theft in Bags from Railway Sidings.
- ✓ Reduction in Detention of Road Sale Trucks During Night Hours from an Average of 56 Per Day Per Project to an Average of 3-4 Trucks Per Day Per Project Thereby Reducing the Chances of Coal Theft



Positive Outcome of GPS Based VTS and Geo-fencing



Online Monitoring of Movement of Each Coal Tippers and Cross Checking of Actual Distance with the Payment Made to the Contractors.



System Based Alerts on Geo-fence Violation for Taking Immediate Action (47 No. of Vehicles in MCL Were Banned/Blacklisted Due to Serious Violations)

Serial	Vehicle No.	Violation Type	Violation Date	Violation Time
1
2
3
4
5

Reduction in Geo-fence Violation

January'15 # 10394 (Unexplained)

November'16 #1103 December'16 #1051



Positive Outcome of Auto EMD Refund

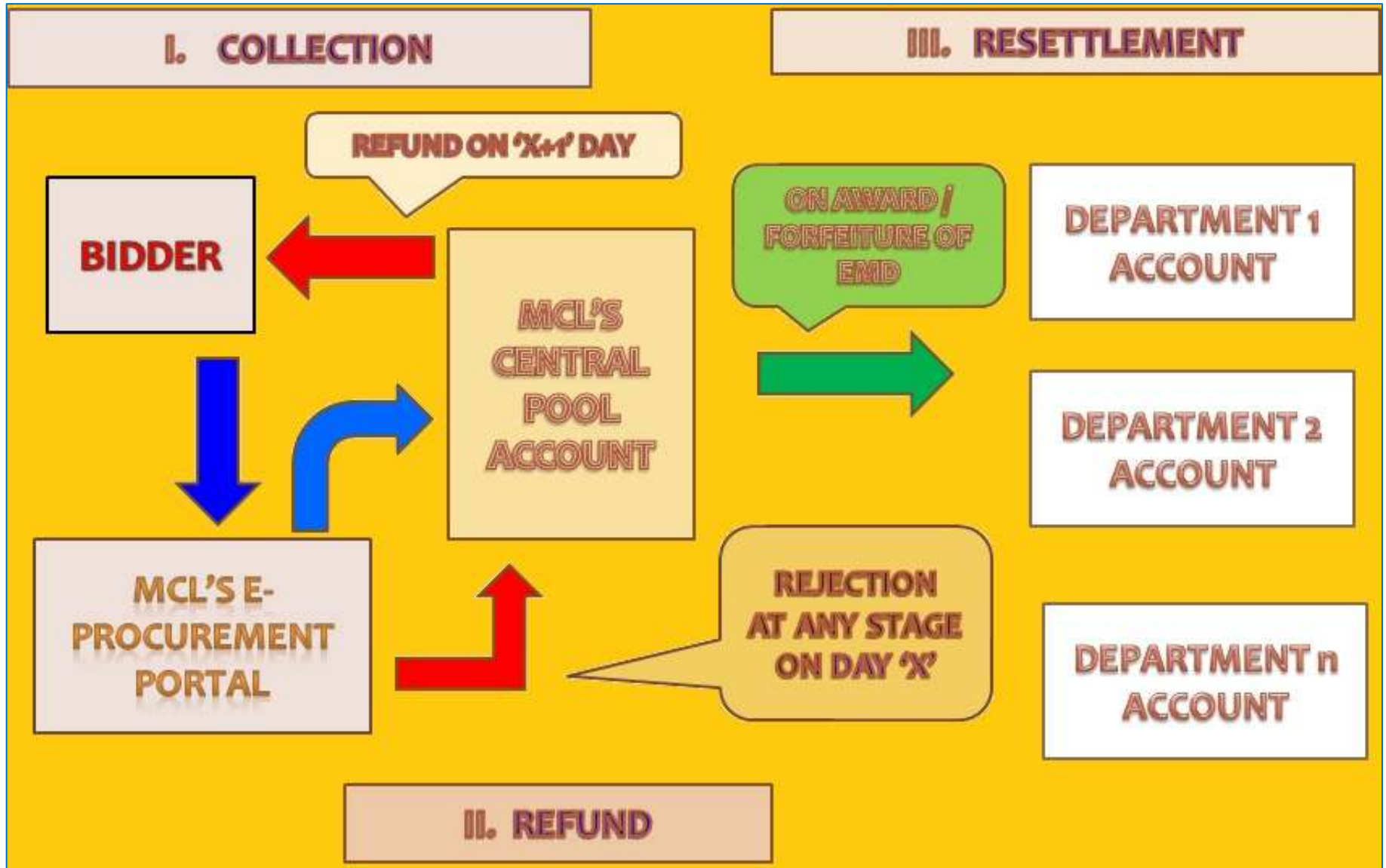
Rs 13.62 Cr Refunded to 4292 Unsuccessful Bidders for FY 2015-16 and Rs. 9.77 Cr Refunded to 3190 Unsuccessful Bidders from April'2016 to Till Date in Just One Day Time as Against Delay of up to 3-6 Months Prior to Implementation of Auto Refund System

Complaint Regarding Delay in Refund of EMDs to Unsuccessful Bidders Has Been Reduced to NIL

Bidders Participation Has Gone Up by Almost 40-50% as Also Vender Base is Improving



Forward Linkage to the e-Procurement Portal (Auto Refund of EMD)





Thank you