

Scope of Work

1. Introduction

This Expression of Interest (EoI) is being floated by Coal India Limited for the purpose of identifying organizations who are willing to participate in implementation of fleet monitoring system and air Quality monitoring on real time basis with robust, implementable, interoperable, innovative, cost effective and scalable technology options.

The objective of this Expression of Interest (EoI) is to identify efficient solutions with a clear understanding of the scope, approach, methodology, functional and technical architecture & other technical conditions as per the requirement of Coal India Ltd with minimum time frame to complete the implementation with increased productivity, reduced maintenance costs and improved safety and Go-Live and can further operate & maintain the same for a period from the date of Go-Live.

2. Project Background

Over the years Coal India Limited has invested heavily in procurement of new machinery and equipment to augment production level of the company. However, it has been observed that machines are not being utilized optimally due to issues with availability of land and reduction in skilled manpower both for operation and maintenance. It is therefore felt that the productivity /Utilization of the equipment may be at optimal level for which required devices are to be installed in the HEMM.

3. Objectives of EoI

To improve vehicle utilization, cost control, pollution control, enhancing safety for employees and Automating compliance through a unified solution.

4. Proposed Scope of Work

To develop a comprehensive IoT solution for CIL for air quality monitoring and HEMM monitoring. This platform is designed to enhance data storage, visualization, and analytics capabilities, with the potential to incorporate AI-driven predictive analytics as the volume of data

CIL/SYS/MISC/8241
DATE: 09/02/2024

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grows. The bidders should assist coal India for designing of software and analytics of captured data.

It is envisaged that required sensors, installation of sensors, maintenance of sensors, network provision, transport of data on real time basis to CIL server will be responsibility of the vendor.

CIL will be liable to pay for the data received in its server on revenue model basis.

Sr.No	Objectives	Date	Time
1	Submission of Proposed solution through email	16th Feb 2024	05:00 PM
2	Physical Meeting: Presentation and meeting with interested vendors at CIL HQ	19 th Feb 2024	11:00 AM onwards

Technical Services

FLEET MANAGEMENT SYSTEM

1. The objective is to extract maximum value from the data sourced from the dumpers, empowering CIL with robust tools for informed decision-making.
2. Entire scope of the project will include supply IOT Solutions along with relevant infrastructure. Bidder shall ensure both the vehicle monitoring and worker safety are delivered through one solution.
3. Capture different parameters from HEMM equipment and send them to the CIL server in real time. Also, be able to configure automated alerts to relevant stakeholders based on real time sensor data.
 - Ignition
 - Engine working
 - Vehicle working mode
 - Reverse
 - Neutral
 - Drive
 - Total engine work time
 - Total mileage of the vehicle/Vehicle mileage
 - Total fuel consumption
 - Fuel level in %
 - RPM
 - Engine temperature
 - Vehicle speed

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- Engine torque
 - Outside temperature
 - Cargo weight
4. Above is a non-exhaustive list and vendor will have to submit feasibility report of parameters that can monitored on CIL HEMM.
5. **Man-Machine Allocation**
- Solution should be able to retrieve list of active or available machine from existing on-premise Solutions/ database before start of every shift
 - Solution should have an interface populated with the list of available machines for the upcoming shift. authorized user (e.g. Shift in Charge/ Section in Charge) to have access to this list and may update the availability status on this list.
 - Solution should have provision for authorized user (e.g. supervisor) to update parameters against operators (Skill set, performance score etc.) and machines in a master setup for rule- based allocation
 - Solution should have provision for rule-based allocation of machines based on a set of compatibility rules Man-Machine Allocation to be triggered by the authorized user (e.g. Shift in charge/ Section- i-charge) when required
 - Solution to send the allocation data to authorized user (e.g. section-in-charge and shift-in- charge) for correction/ changes and to confirm final allocation on mobile/ web application
 - Solution to provide an option for Section/ Shift-in-charge to reallocate vehicles in the middle of shift if required (e.g. Machine Breakdown, Worker not available, approved re-allocation request for workers etc.)
 - Trigger based allocation of workers to the static work zones (e.g. Workshops)
 - Solution to have provision for authorized user (e.g. Section/ Shift In-charge) to manually assign workers to static work zones such as workshops
 - Solution to send sms/notifications to workers for the details of allocated assignment (HEMM/ Work location) post finalization of allocation

AIR QUALITY MONITORING

1	Environment related data capture	1. Capture data from existing reports of CAAQMS, CMPDI etc. The data includes Air quality readings, water quality readings, Power consumption readings etc.
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Eligibility criteria

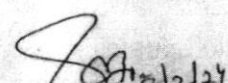


The prospective bidder should be in the business of Electronic communication networking and involved in electronic communication network implementation, telecom infrastructure development or provisioning, large-scale voice or data connectivity implementation/integration, internet service provisioning in multiple cities or multiple states, core or backbone layer telecom equipment manufacturing and other business of similar nature for at least the past 5 years.

Contact Person

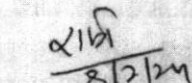
Sundaram Mishra Email: sundarammishra.cil@coalindia.in

Mob: 7003685188


8/2/24

S M Mohapatra

CM(EXCV)


8/2/24

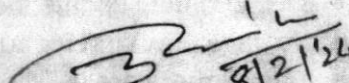
R N Tripathi

CM(ENV)


8/2/24

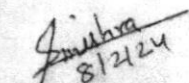
D Sarkar

CM(MIN/S&R)


8/2/24


Ashok Kumar

CM(CMC)


8/2/24

Sundaram Mishra

DM(System)


8/2/24

GM(System), CIL

Scope of Work

In addition to scope of work CIL/MISC/8241 published on 08.02.2024, the technical services and transport of data w.r.t safety is also included in the scope

Technical Services

Safety

1. This FMS would have component to detect unsafe act of the fleet operators (e.g. Over speeding, dangerous overtaking, unauthorised riding, fatigues of driver/ operator) and also identify unsafe mine conditions such as haul road conditions (width, gradient, turning radius, undulation etc.), status of various safety features in dumper / tipper) e.g. service brake, parking brake, retard brake, power steering, proximity warning device, rear view camera, blind spot mirror, AFDSS etc.

Underground (UG) mines:

1. Monitoring of ventilation system in Underground Mine

- Quantitative issues – amount air volume reached at different location, air velocity, air pressure, setting alarm / warning
- Qualitative issues – percentages of Methane, CO₂, CO, temperature, humidity

2. Monitoring of the Underground Mine Environment

- Required for detection of spontaneous heating / mine fire early.
- Eliminate explosion risks.
- The creation of a suitable gas monitoring system is a crucial component of underground mining, which has long been an area of focus on the detection of hazardous gases.
- The first method to detect the gases involves using human because it seemed to be the only solution. Gas detection methods such as catalytic Pallistors, flame safety lamps, and sensors with cable communication systems have been followed at regular intervals.
- Whether electronic sensors in wireless communication systems can be used for detecting various parameters.

3. PPE Detection:

- PPE is a basic necessity for ensuring workers' safety in jobsites.
- Safety Helmets, safety glasses, mask/respiratory protection, hearing protection, reflective jackets, lifesaving ropes, harnesses etc.t PPEs used for mining.
- Option -1: RFID based / other sensor based Tag can be fixed in the said PPE so that same can be tracked.
- Option -2: AI powered cameras are capable of detecting whether or not workers are wearing (proper) PPE.
Thus, PPE detection with AI can further boost safety in the mining jobsites.

4. Miner tracking System:

- The MINER requires that electronic tracking systems be in place at mines to facilitate rescue operations in case of an emergency.
- Electronic tracking systems provide a mechanism for surface personnel to know which workers are in the mine and in which area they are working.
- Manual tracking has a number of limitations, but the RFID tracking and locating tracks within a working section. The mine can be quite large and therefore different RF detection solutions can offer miner's exact zonal location.
- Many mines use RFID tracking to monitor which miners are underground and their general location.
- Using RFID tracking, at the beginning of each shift, the mine supervisor / officials gets the list of names of people working in and where they are going or working within the mine. Once in the mine, if a miner needs to go to a different area to work, RFID notifies the system using RF detection to update the miner location to the ground staff.
- Such System can slashing downtime, useless efforts of finding things and personnel, make more traceable procedures and resources and all while increasing mine productivity.

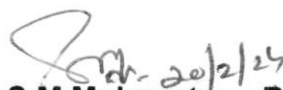

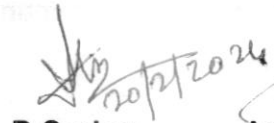
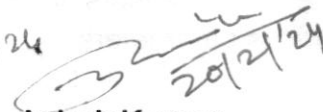
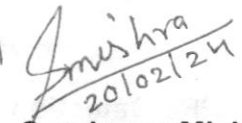
Extended Timeline is mentioned below.

Sr.No	Objectives	Date	Time
1	Submission of Proposed solution through email	27th Feb 2024	05:00 PM
2	Physical Meeting: Presentation and meeting with interested vendors at CIL HQ	28 th Feb 2024	11:00 AM onwards

Contact Person

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 CM(EXCV) CM(ENV) CM(MIN/S&R) CM(CMC) DM(System)

GM(System), CIL

Sundaram

Pl. publish without CM(ENV)'s sign as he has resigned.