Expression of Interest (EoI)

FOR

DEVELOPMENT OF AI/ML BASED SOLUTION FOR ANALYSIS OF WORKMAN SAFETY RELATED DATA

Reference No. CIL/SYS/2024-25/EOI/SAFETY ANALYTICS

Dated: 01-08-2024

1. About the Company:

Coal India Limited (CIL) the state owned coal mining corporate came into being in November 1975. CIL functions through its subsidiaries in 83 mining areas spread over eight (8) states of India. Coal India Limited has 322 mines (as on 1st April, 2023) of which 138 are underground, 171 opencast and 13 mixed mines.

CIL Produces around 83% of India's overall coal production in India where approximately 57% of primary commercial energy is coal dependent, CIL alone meets to the tune of 40% of primary commercial energy requirement. The share of coal is expected to remain high at 48-54% till 2040 and accounts for 76% of total thermal power generating capacity of the Utility sector. CIL further operates 12 coal washeries, (10 coking coal and 2 non-coking coal).

CIL is a Maharatna company – a privileged status conferred by Government of India to select state owned enterprises in order to empower them to expand their operations and emerge as global giants. CIL has seven producing subsidiaries namely Eastern Coalfields Limited (ECL), Bharat Coking Coal Limited (BCCL), Central Coalfields Limited (CCL), Western Coalfields Limited (WCL), South Eastern Coalfields Limited (SECL), Northern Coalfields Limited (NCL) and Mahanadi Coalfields Limited (MCL) and one mine planning and consultancy company that is Central Mine Planning & Design Institute (CMPDI).

For detailed profile of company and past financial results, Applicants may visit the CIL website: https://www.coalindia.in/

2. Objectives of EoI:

Coal India Limited (CIL) aims to enhance safety protocols and mitigate risks by leveraging Artificial Intelligence (AI) and Machine Learning (ML) techniques on the safety dataset available in the Centralised Safety Information System (CSIS) portal. This project will focus on analysing safety-related data in CSIS portal to predict potential hazards, improve safety compliance, and recommend proactive safety measures.

3. Scope of Work:

To develop trained AI/ML models on the safety dataset and deploy and integrate with the existing CSIS portal. This will include extraction and consolidation of safety related data from the CSIS portal and cleaning and pre-processing the data to ensure quality and consistency.

The solution should be deployed on CIL's cloud servers.

The vendor should ensure to maintain the confidentiality of all the datasets that will be used to develop the AI models.

3.1 Datasets involved:

The following datasets will be utilized in this project including additional training datasets as needed:

- Pit Safety Committee (PSC) minutes files of mines
- E-inspection and e-audit data from CSIS portal
- Accident data from CSIS portal
- Mines Act 1952, Coal Mine Regulation 2017, Mine Rules 1955 files

3.2 Application Areas:

The models developed should be able to perform the following functions:

1. **Creation of violation list with categorization from** Mines Act 1952, Coal Mine Regulation 2017, Mine Rules 1955 files
2. **Violation Extraction**: Extract and analyse violations from Pit Safety Committee (PSC) minutes, e-inspection and e-audit modules present in CSIS portal.
    - Scanned documents called Pit Safety Committee (PSC) minutes are being uploaded in the CSIS portal every month for each mine of CIL. This documents contains all the recorded violations and the action take report (ATR) for each of the past violations for a particular mine. The model should be able to do following:
        - i. Document Processing: Develop OCR (Optical Character Recognition) models to extract text from scanned PSC minutes. The format of these documents varies for different mines.
        - ii. Violation Identification: Use NLP (Natural Language Processing) techniques to identify and categorize recorded violations.
        - iii. Pattern Detection: Identify recurring violations across different PSC minutes.
        - iv. Violation Monitoring: Flag violations that require immediate action based on severity and frequency.
        - v. Compliance Tracking: Monitor actions taken for each violation and ensure follow-up.
3. **Recommend Safety Compliance**: Monitor and recommend measures which can improve compliance with safety regulations.
    - The CSIS portal contains e-inspection and e-audit modules. These modules contains data regarding the observations which may lead to potential hazard, areas of system improvement etc. and the action taken by respective mine authority. The model should be able track the observations from these modules and flag violations which require immediate action.
    - Also utilise the violations and ATR extracted from PSC minutes for compliance monitoring.
4. **Incident Analysis**: All the subsidiaries of CIL upload the accident related data like category, causes, persons involved etc. The model should be able to analyse past incidents to identify patterns and root causes and recommend proactive measures to enhance safety.

3.3 Deliverables:

1. **AI/ML Models:** Develop AI models customised for incident analysis, compliance monitoring, and violation extraction from the existing CSIS portal. This will include extraction of safety data from the CSIS portal and cleaning and pre-processing the data.
2. **Dashboards and Reports**: Develop Interactive dashboards and regular reports for safety insights.
3. **Training Materials**: Documentation, training manuals, and video tutorials etc. for all the stages of development starting from data gathering till integration with CSIS portal.
4. **Deployment Plan**: Comprehensive plan for deploying and integrating AI/ML models within CSIS portal.
5. **Integration with CSIS**: The models will be integrated with the CSIS portal.

4. General Eligibility conditions and Instructions to Prospective Bidders:

- **Procedure for submission for EoI:** The EoI shall be submitted containing the response in soft copy through email sanjay.mishra1795@coalindia.in super scribed with the words EXPRESSION OF INTEREST FOR DEVELOPMENT OF AI/ML BASED SOLUTION FOR ANALYSIS OF WORKMAN SAFETY RELATED DATA.
- **Availability of EoI:** The EoI document can be downloaded from the Coal India Corporate Website i.e. https://www.coalindia.in . Prospective EoI participants are requested to please contact the following address for any queries related to EoI document:
   Email: sanjay.mishra1795@coalindia.in

5. EOI Submission Model:

The Solution Providers should submit the offer in soft copy.
a) Expression of Interest Letter
b) Technical offer with terms and conditions
c) Solution Providers should submit a letter explicitly mentioning their expression of interest in participating in the project duly signed with an official stamp.
d) Technical offer should cover

   i. A detailed proposal outlining the approach to the scope of work.
   ii. The different AI technologies offered by the solution provider for the above mentioned application areas.
   iii. Presentation on any similar projects completed.
   iv. Solution Providers should fill and submit annexure-I.
   v. Solution Providers designated personnel should put a signature with a stamp on each page.

6. Submission of EOI response:

- **EoI Response format:** The Prospective Solution Providers should submit a response to EoI with information mentioned in 5.
- **Schedule of events:** The EoI Participants are requested to note that the dates mentioned in the schedule of events Coal India Ltd. Kolkata reserves the right to modify these dates at any time.

S. No	Event	Timeline
1	Publication of Expression of Interest (EoI)	01-08-2024 11:00 AM
2	EOI Download start date	01-08-2024 11:00 AM
3	EOI Download end date	11-08-2024 05:00 PM
4	Last Date and time for Submission of EoI response	11-08-2024 by 05:00 PM
5	Date and time of opening of EoI response	12-08-2024 at 11:00 AM

- **Clarifications:** If deemed necessary, Coal India may seek clarifications on any aspect from the participating Solution Providers. All expenses for this purpose, as also for the preparation of documents and other meetings, will be borne by the prospective Solution Providers.
- **Presentation of solution:** The detailed and in-depth presentation of the solution proposed in EoI will be done as such the prospective bidder should provide an extensive solution understanding of the project. The presentation should contain all the points mentioned in the proposed solution.
- The information submitted in the response to the EoI may be subjected to public release (As per RTI norms). Solution Providers responding to this notice assume the risk of public disclosure if confidential information is included.
- The EoI does not constitute a commitment to offer a contract or prospective contract. CIL shall not be liable for any cost incurred by any potential Solution Providers in the preparation and submission of information in response to this EOI.

Details of Bidder

1. Name of the Firm/LLP/Company:
2. Address:

i) Permanent Address	:	
ii) Address for Correspondence	:	
iii) Telephone Number	:	
iv) PAN Number	:	
v) Email Address	:	
vi) Website	:	
vii) Service tax registration No. / GST No	:	

3. **Details of Firm/LLP/Company:**

Sl. No.	Criteria	Details to be filled in the TPS
1	Number of years in existence	Year of incorporation/start of business:- No. of years - Attach documentary evidence *
2	Relevant experience in the Developing AI based analytical solutions preferably in Mining sector in the last 3 Financial years.	No of Projects :- No. of Projects in Government/ PSU organization:- Attach documentary evidence *
3	Details of similar projects completed in last 3 Financial years	Brief Description of Project:- Duration of Project:- Technologies used during project:- Attach documentary evidence *
4	Branch office at Kolkata (if any)	Address:- contact details of the partners/associates working there with documentary evidence:-
5	Bidder should not have been blacklisted by the Government of India or any regulatory authority or PSU or by any law enforcement authority for breach of any regulations or laws as on the date of publication of tender	Attach documentary evidence / undertaking *

Place

Date   Signature and Seal of Bidder