Institute of Leadership Development (ILD)

6/2, Jamdoli, Jaipur-302031

ILD invites Expression of Interest for Design, Development, Deployment and Maintenance of Immersive VR-Based Mining Training Simulators

Scope of Work (SoW) for Hiring AR/VR Technology Provider

1. Introduction

This document outlines the proposed initiative for the design, development, and deployment of immersive Virtual Reality (VR) based training simulators for mining equipment operations.

Mining operations involve complex machinery, hazardous environments, and strict adherence to operational procedures and safety protocols. Conventional training methods often provide limited opportunities for operators to practice operational procedures and respond to critical scenarios in a controlled environment. In this context, immersive technologies such as Virtual Reality and simulation-based learning are increasingly being adopted to enhance workforce competency and operational safety.

The proposed VR-based simulator ecosystem will provide operators with an interactive and realistic platform to practice equipment operations, safety procedures, inspection routines, and emergency responses without real-world risk. The system will replicate actual mining environments and machine behaviour, enabling trainees to develop operational skills and decision-making capabilities through hands-on experiential learning.

The initiative aims to establish a scalable, technology-driven training platform that standardizes learning processes, enhances safety awareness, and supports performance-based skill development across mining operations.

2. Background

Mining operations require operators to handle heavy equipment and perform complex tasks under demanding environmental conditions. Effective training and continuous skill development are essential to ensuring safe and efficient operations.

Traditional training methods generally rely on classroom instruction and limited field exposure, which may not adequately prepare operators for critical operational scenarios. Additionally, conducting training on live equipment may involve operational risks, equipment downtime, and logistical challenges.

Immersive VR-based training provides a safe and controlled environment where operators can repeatedly practice procedures, understand equipment behaviour, and develop situational awareness before operating actual machinery.

The proposed training solution will leverage immersive simulation technology to create realistic operational environments that enable operators to gain hands-on experience while ensuring adherence to Standard Operating Procedures (SOPs) and safety guidelines.

3. Objectives

The objective of this initiative is to develop immersive VR-based training modules that:

- Simulate real-world mining equipment operations and procedures
- Enable experiential learning through interactive virtual environments
- Improve operator competency and decision-making capability
- Reduce operational risks during training
- Provide performance analytics for skill assessment
- Standardize training programs across multiple mining locations

4. Scope of Work

The selected solution provider shall design, develop, and deploy immersive simulator-based training modules for mining equipment operations, including but not limited to the following::

4.1 Simulator-Based Training Modules

The VR training solution will simulate real operational scenarios for mining equipment such as:

- Dumper Operations Simulator
- Ripper Operations Simulator
- Loader Operations Simulator
- Excavator Operations Simulator

Each simulator will replicate realistic operational environments, including equipment controls, terrain conditions, safety checks, and operational workflows.

4.2 Training Features

The VR modules will include:

- Realistic 3D environments replicating mining sites
- Equipment controls and operational procedures
- Pre-operation inspection modules
- Safety compliance training
- Interactive learning sequences
- Guided learning mode
- Assessment mode
- Performance scoring and feedback

4.3 Analytics and Learning Management

The solution will be integrated with a Learning Management System (LMS) to provide:

- Trainee performance tracking
- Skill assessment reports
- Batch-level analytics
- Instructor dashboards

- Progress tracking and certification

5. Technical Specifications

5.1 Hardware

The VR solution will be compatible with industry-grade VR hardware including:

- VR Headsets with high-resolution displays and spatial audio
- Motion controllers for equipment interaction
- High-performance VR-ready laptops/workstations
- Tracking systems for precise interaction

5.2 Software

The VR training software will include:

- Guided training modules
- Freestyle / assessment mode
- Real-time interaction with equipment controls
- Multi-user capability (if required)
- Performance analytics dashboards
- LMS integration for training management

6. Execution Methodology

The project will follow a structured development methodology:

Phase 1: Data Gathering

- Site visits and equipment data collection
- Collection of SOPs, videos, CAD drawings, and process documentation
- Interaction with subject matter experts and operators

Phase 2: Storyboarding and Instructional Design

- Development of module design documents

- Creation of training flow and learning objectives
- Approval from stakeholders

Phase 3: Development and Design

- 3D modelling of equipment and environment
- Interaction development
- UI/UX design
- Voice instructions and guidance integration

Phase 4: Testing

- Internal testing
- User acceptance testing
- Performance validation

Phase 5: Deployment and Commissioning

- Hardware installation
- Software deployment
- Training of trainers
- System handover

7. Project Deliverables

The project will include the following deliverables:

Deliverable	Format
VR Training Modules	Executable Application
3D Models & Assets	3D/Graphic Files
Technical Script & Storyboards	PDF / PPT

Performance Dashboard	Web Portal
User Manual	PDF
Project Completion Report	PDF

- OR any other specification as demanded by the sponsor.

8. Eligibility Criteria

Interested bidders must meet the following eligibility criteria in order to participate in this Expression of Interest (EOI) process:

1. The bidder/OEM must have a minimum of Five (5) years of experience in the design, development, and deployment of immersive technologies such as Virtual Reality (VR), Augmented Reality (AR), Mixed Reality (MR), or simulation-based training solutions. Relevant documentary evidence such as incorporation certificate and client purchase orders/work orders must be submitted.
2. The bidder must have successfully executed at least five projects involving immersive simulation or VR-based training solutions for industrial, mining, manufacturing, oil & gas, or similar operational sectors. Documentary evidence in the form of purchase orders, completion certificates, or client references must be provided.
3. The bidder must demonstrate the capability to develop interactive and immersive VR-based training modules compatible with VR headsets and supporting hardware. The bidder may be required to demonstrate a relevant VR application or simulation during the technical evaluation stage, if requested.
4. The bidder should have the capability to provide end-to-end implementation, including software development, hardware integration, installation, training, and post-deployment support.

5. The bidder must submit a budgetary estimate covering software development, hardware procurement, installation, training, and maintenance support as part of the EOI response.

6. The bidder must provide relevant company credentials, experience details, and supporting documents demonstrating technical capability and past project experience. This is a pre-qualification tenders and financial bids will be submitted when we get the work order from sponsor.

7. Only those bidders who submit their Expression of Interest in response to this EOI and are subsequently shortlisted/empanelled through this process shall be eligible to participate in the subsequent tender/bidding process, if issued for this project. When project will be awarded by the sponsor, bidding will be limited to those empanelled in this process.

8. Submission of Proposal: InterestedFirms/Companies/Agencies/Organizations/fulfilling eligibility conditions as mentioned above can submit their detailed proposal to Assistant Registrar, Institute of Leadership Development (ILD), 6/2 Jamdoli- Jaipur, Near Keshav Vidhyapeeth, Rajasthan 302031, Email Id info@ildindia.org, 9680033333, 9664418133. Last date of submission of proposal is 25 April, 2026.

9. Budgetary Estimate

Detailed budgetary estimates covering the following components will be provided as part of the commercial submission:

- VR Software Development
- Hardware Procurement
- Installation & Integration
- Training & Commissioning
- Warranty and Maintenance Support
- Scalability cost for additional locations

10. Conclusion

The proposed VR-based simulator ecosystem is expected to significantly enhance operator training, safety awareness, and operational readiness within mining

environments. By leveraging immersive technology, the initiative will enable structured, standardized, and scalable training programs aligned with operational requirements and safety protocols.