



# AI-Based Safety System

## Overview

World leader in marine diamond exploration and mining technology, faced the challenge of ensuring the safety of their crew members and equipment on diamond mining ships. To address this challenge, the company embarked on a project to develop an AI-based safety system that could monitor the working environment and raise alarms if certain rules were violated. The project was executed in two phases: CVRMS Phase-I and CVRMS Phase-II.

## CUSTOMER

**A leading marine diamond mining company**

**Country:** Namibia

**Industry:** Semi-government company

**Customer Size:** 500 - 1000

**Publish Date:** 24/02/2023

## Problem Statement

Working on diamond mining ships involves significant risks to the crew members and equipment. To ensure safety, the crew members are required to follow certain rules and regulations. However, monitoring compliance with these rules in real-time can be challenging, especially in remote locations. Additionally, the traditional methods of monitoring and ensuring safety are manual, time-consuming, and prone to errors. Hence, there was a need for an AI-based safety system that could monitor the working environment and raise alarms if certain rules were violated.

## Technical Solution

In the first phase of the project, the goal was to develop an MVP that could raise alarms if certain rules were being violated in the working environments on the ship. The system used computer vision models to monitor the environment. The output from computer vision models was then fed into a post-processing module, comprising of different risk bots that could apply certain rules on top of those outputs and check for any risk situation. If any bot predicted a risk situation, an alarm was raised with a video evidence so that the corrective action could be taken.

In phase-II, the scope of the project has been increased to include more areas and additional risk bots that would identify more complex risk situations. The data labeling is outsourced to AWS SageMaker, and the training is also carried out on SageMaker. The system architecture has also been made more scalable. The ML models have been improved using state-of-the-art deep learning algorithms. Development of additional risk bots for side vessels is also under progress.

## Results

CVRMS have been successful in ensuring the safety of crew members and equipment on the mining ship. The AI-based safety system has been able to monitor the working environment and raise alarms if certain rules were violated. The system has also been successful in identifying and mitigating safety risks with a high accuracy in real-time. This has led to a significant reduction in safety incidents and increased confidence among crew members.

Overall, the AI-based safety system has provided an automated and data-driven approach to ensuring safety on the drilling ship. The success of this project has led to the adoption of similar systems in other marine industries.

Technologies	Domain
Python, Flask, FFmpeg, AWS S3, OpenCV, Faster R-CNN, YOLOv5, numpy, math, shapely, AWS SageMaker, Object Tracking	Computer Vision, Industrial Safety Planning,