
satsafeti
TURN YOUR
EXISTING
CCTV CAMERS
INTO

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PPE

INTRUDER

SECURITY THREAT

AND FIRE DETECTING DEVICES

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MANAGE YOUR SAFETY WITH VIDEO ANALYTICS

MONDAL VENTURES LLP

SATSAFETI IS A RISK MANAGEMENT SOFTWARE DETECTING THREATS AND HAZARDS WITH LIVE FEED FROM EXISTING CCTV CAMERAS

SAT WAS CREATED WITH A CAUSE TO MAKE OUR SOCIETY AND WORKPLACE SAFER. OUR TEAM IS WORKING RELENTLESSLY TOWARDS THIS GOAL. EACH DAY WE ARE TRYING NEW CONCEPTS. AS EXPECTED WE ARE NOT SUCCEEDING IN EVERY TRIALS. MOST OF OUR EXPERIMENTS END UP BEING FAILURES. BUT ALONG THIS WAY WE ARE RE-SHAPING THE WAY WE THINK OF SAFETY IN OUR DAY TO DAY LIVES. SAT WILL CONTINUE TO EVOLVE AND DURING THIS ENDEAVOR, WE WILL PUSH THE HUMAN RACE FORWARD BREAKING THE BARRIER OF OLD CONCEPTS AND BELIEFS....

Is your FIRE Detection system truly intelligent ?

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VIDEO ANALYTICS MODULES

Fire Detection

As we have seen most accurate & fast fire detection technique is optical detection & camera is nothing but an optical device, which can capture everything having wavelength within visible light change (IR camera can detect Infrared emission also). IP cameras feed is taken as input, algorithm coverts it to n-dimensional mathematical array according to the pixel values of the frame. The mathematical array is then feed to the level-1 filter. In level-1 filter complex mathematical computation is done to detect a particular bandwidth of pixel values and masked all other irrelevant object (not fire) from the frame. Output of the level-1 filter is fed to level-2 filter. When both filter surpasses a threshold value, FIRE alarm is being triggered.

Advantage over Traditional Fire Detection System

As self intelligent learning algorithm can bring in many advatages over traditional detection system. We have designed our algorithm in such a manner that you can truly focus on emergency management during crisis time.

Last Saved Video

Our solution captures a 30 sec video clip of the moment it sees fire. This becomes really helpful in detecting small fires where flames are intermediate. More faster you can detect and douse the fire more quickly you can avert the disaster.

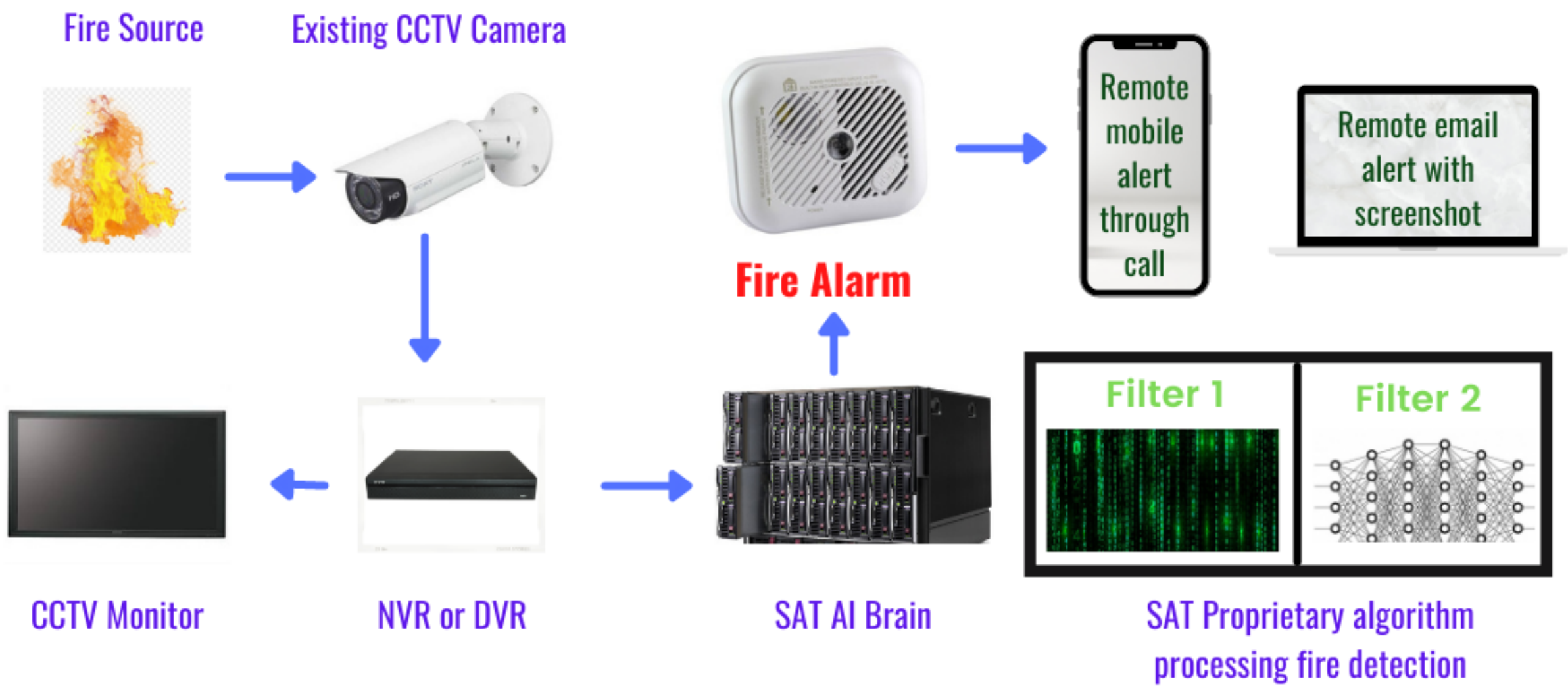
Remote Alert

Generating Remote alert is one of our biggest USP. Upto this date normal practice is the station in-charge will inform everyone about fire incident, but our intelligent system will send alert on it's own.
Imagine at 3 am you are at your home and a fire incident occurred at plant premises. SAT Safety Suit will inform you on it's own through remote calling and email with incident screenshot so that you can act ASAP

Fire Detection Mechanism

level-1 filter: complex mathematical computation is done to detect a particular bandwidth of pixel values and masked all other irrelevant object (not fire) from the frame. Output of the level-1 filter feed to level-2 filter.

Level-2 filter: R-CNN deep learning algorithm which can detect fire or smoke. If any fire or smoke initiates, then level-1 filter keeps only the fire or smoke region of the frame and masked out all the residuals & pass it to level-2 filter. Finally, the fire is detected accurately by level-2 filter & initiate alarm immediately.



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PPE Detection

SAT PPE Detection is one of the most demanded solution by our clients. Given it's customization ability virtually it can detect any combination of PPE for any specific act. It has also the capability of detecting PPE Violators from a group of workers.

- Any number of PPE can be incorporated into Detection algorithms
- Very useful in specific zones or acts where specific PPE required
- Detection of PPE Violators can be useful for contract workers
- Backend database can create specific alerts using face recognition

SAT PPE Detection of Helmet Compliance module

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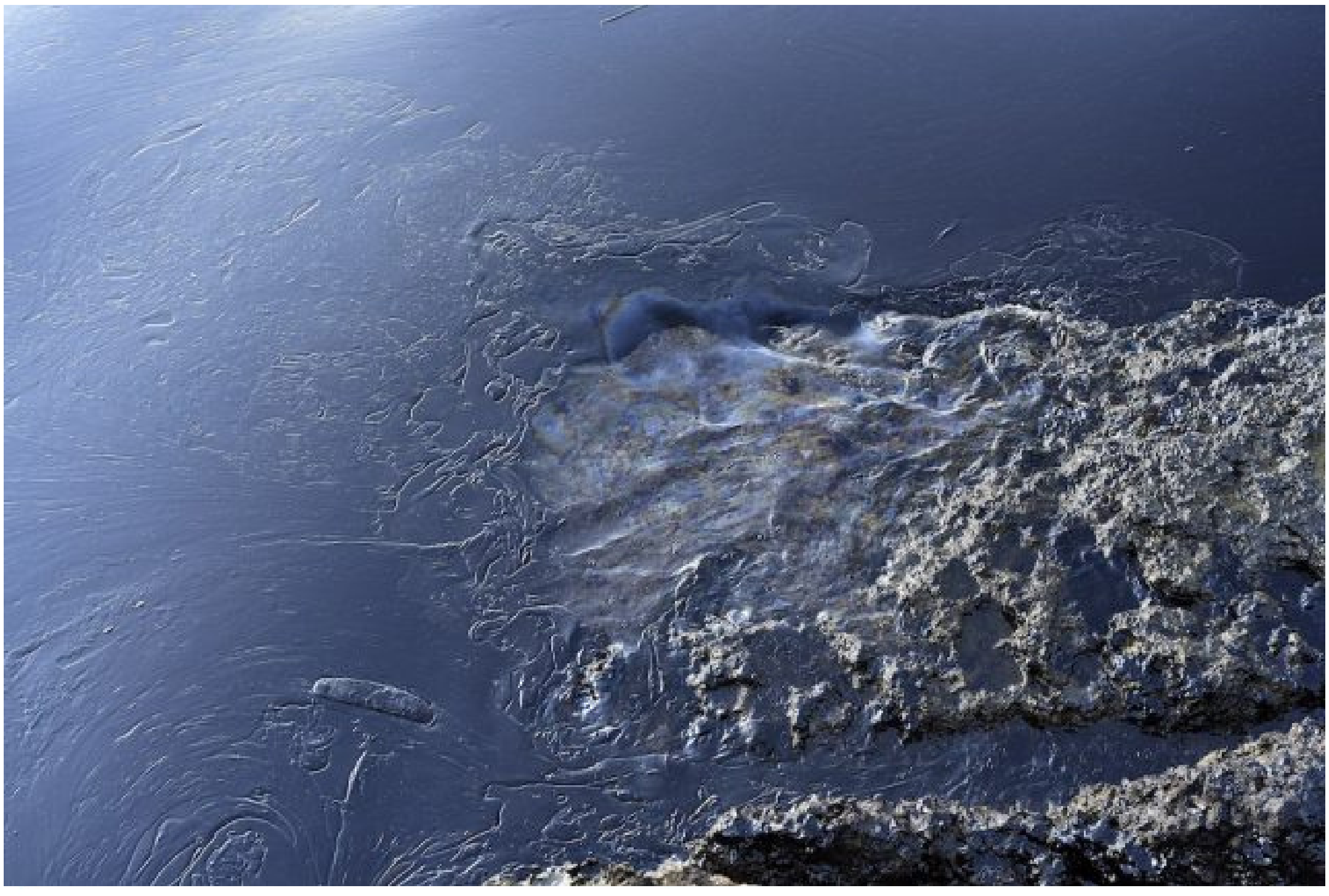
Hydrocarbon Detection in Strong Water Channel

Floating hydrocarbon presence in strong water channel is a dangerous proposition. Often it gets neglected due to day to day work inside plant battery limit. This situation becomes particularly hazardous during rainy season when strong water channel starts to overflow with rainfall. Floating heavy oil spreads everywhere and if it gets an ignition source, fire can spread rapidly.

SAT has developed and solution keeping this hazard in mind. We have trained an ML Module which can detect hydrocarbon floating over water with dynamic colour difference. This solution can alert user of impending danger of fire hazard prior to that happens.



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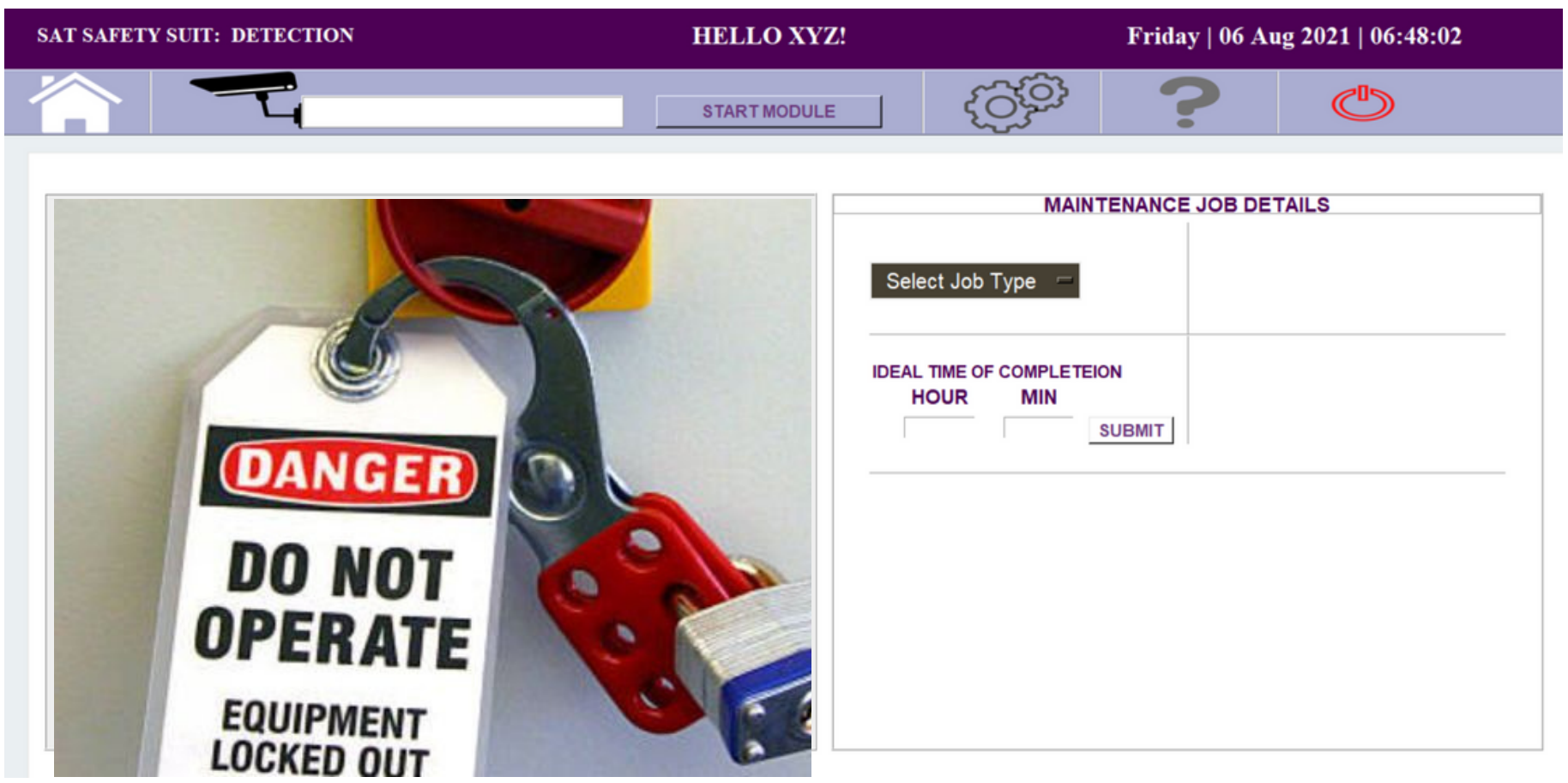
Critical Equipment Maintenance Time Monitor

Maintaining critical equipment is absolutely necessary for sustainable operation. Critical equipment often doesn't have multiple substitutes. The deadliest disaster Piper Alpha also happened during the maintenance of critical condensate pumps.

SAT has a very basic solution for that. Engaging a process manpower to overlook maintenance is not often possible due to prior field work schedule. SAT will take feed from nearby CCTV camera of critical equipment and trace the Lock Out Tag. Once the maintenance time gets over from predefined time given by user, it will start alerting the respective authority.



Critical equipment maintenance time monitor procedure

- Select Job type
- Input time into UI
- Start the algorithm
- SAT will start time monitoring
- Once maintenance time is over, it will start generating alarm.

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SAT COMPLIANCE MODULES

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PSM AUDIT TOOL

SAT PSM Module has been designed with utmost autonomy in mind. Unlike other modules it is an automatic compliance calculator module. From PSM GAP assessment to full implementation, this module will give you live completion data.

PSM can be implemented with own workforce without any external help

Live compliance calculator will give real time data of PSM implementation till task is over

Customized to end user need for OSHA or CCPS module along with required subelements

SAT PSM suit

PSI PHA Operating Procedure

Employee Participation	Questions	29 CFR 1910.119 Reference	Your Answer	Comments
1.Records Review	Has written process safety information been complied prior to conducting any process hazard analyses?	(d)	○ Yes ○ No	Your Comments..
2.Records Review	Does it include information pertaining to the hazards of highly hazardous chemicals used or produced by the process? I-vi	(d)(1)(i-vii)	○ Yes ○ No	Your Comments..
3.Records Review	Does it include toxicity information?	(d) (1) (i)	○ Yes ○ No	Your Comments..
4.Records Review	Does it include permissible exposure limits?	(d) (1) (ii)	○ Yes ○ No	Your Comments..
5. Records Review	Does it include physical data?	(d) (1) (iii)	○ Yes ○ No	Your Comments..
6. Records Review	Does it include reactivity data?	(d) (1) (iv)	○ Yes ○ No	Your Comments..
7.Records Review	Does it include corrosivity data?	(d) (1) (v)	○ Yes ○ No	Your Comments..
8.Records Review	Does it include thermal & chemical stability data?	(d) (1) (vi)	○ Yes ○ No	Your Comments..
9. Records Review	Does it include hazardous effects of inadvertent mixing of different materials that could foreseeably occur? Note: MSDSs meeting the requirements of 29 CFR 1910.1200 (g) may be used to the extent they contain the information required.?	(d) (1) (vii)	○ Yes ○ No	Your Comments..
10. Records Review	Does it include information pertaining to the technology of the process?	(d) (2) (i) (A-E)	○ Yes ○ No	Your Comments..

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IMS AUDIT TOOL

SAT IMS Module takes into account of safety compliance. This solution is designed for self implementation. You can create your own work force for safety compliance. This module will give you real time completion in each step that you take towards enhancing your safety.

- ISO 14001, ISO 45001 & OSHA 18001 Compliant module
- Separate Audit sheet for each of these standards

SAI AUDIT SUIT

Internal Quality Management System Audit Checklist (ISO 9001:2015)

Q#	QuestionsISO 9001:2015 Clause	Audit Question	Audit Evidence
	4 Context of the Organization		
	4.1 Understanding the organization and its context		
4.1q1	The organization shall determine external and internal issues that are relevant to its purpose and its strategic direction and that affect its ability to achieve the intended result(s) of its quality management system.	How has the organization determined external and internal issues relevant to its purpose and strategic direction? How do these affect the ability to achieve the intended result of the QMS?	CHOOSE AN OPTION option1
4.1q2	The organization shall monitor and review the information about these external and internal issues.	How do you monitor and review information about these internal and external issues?	CHOOSE AN OPTION option1
	NOTE 1 Understanding the external context can be facilitated by considering issues arising from legal, technological, competitive, market, cultural, social, and economic environments, whether international, national, regional or local. NOTE 2 Understanding the internal context can be facilitated by considering issues related to values, culture knowledge and performance of the organization.		
	4.2 Understanding the needs and expectations of interested parties		
4.1q2	Due to their impact or potential impact on the organization's ability to consistently provide products and services that meet customer and applicable statutory and regulatory requirements, the organization shall determine: a) the interested parties that are relevant to the quality management system; b) the requirements of these interested parties that are relevant to the quality management system.	How have you determined what interested parties are relevant to the QMS? How have you determined what requirements those parties have that are relevant to the QMS? How has impact or potential impact been determined?	CHOOSE AN OPTION option1

OHSAS 18001:2007 Internal Audit Checklist

System & Process Compliance Auditing

Clause No.	Question No.	Audit Question	Audit Findings				Audit Evidence	Oppurtunites for Improvement
			Compliant	OFI	Minor N/C	Major N/C	Provide reference to documented information to justify the finding	Provide suggestions for process improvement
4.1	1	Has the organization established, documented, implemented and maintained and continually improved an H&S management system in accordance with the requirements?	...				Your Comments..	Your Comments..
4.1	2	Has the organization determined how it will fulfil these requirements?	...				Your Comments..	Your Comments..
4.1	3	Has the organization determined defined and documented the scope of its H&S management system?	...				Your Comments..	Your Comments..
4.1	4	Has the organization established an appropriate health and safety policy?	...				Your Comments..	Your Comments..
4.1	5	Has the organization identified the health and safety hazards arising from its past, existing or planned activities, products and services, in order to determine the health and safety risks of significance?	...				Your Comments..	Your Comments..

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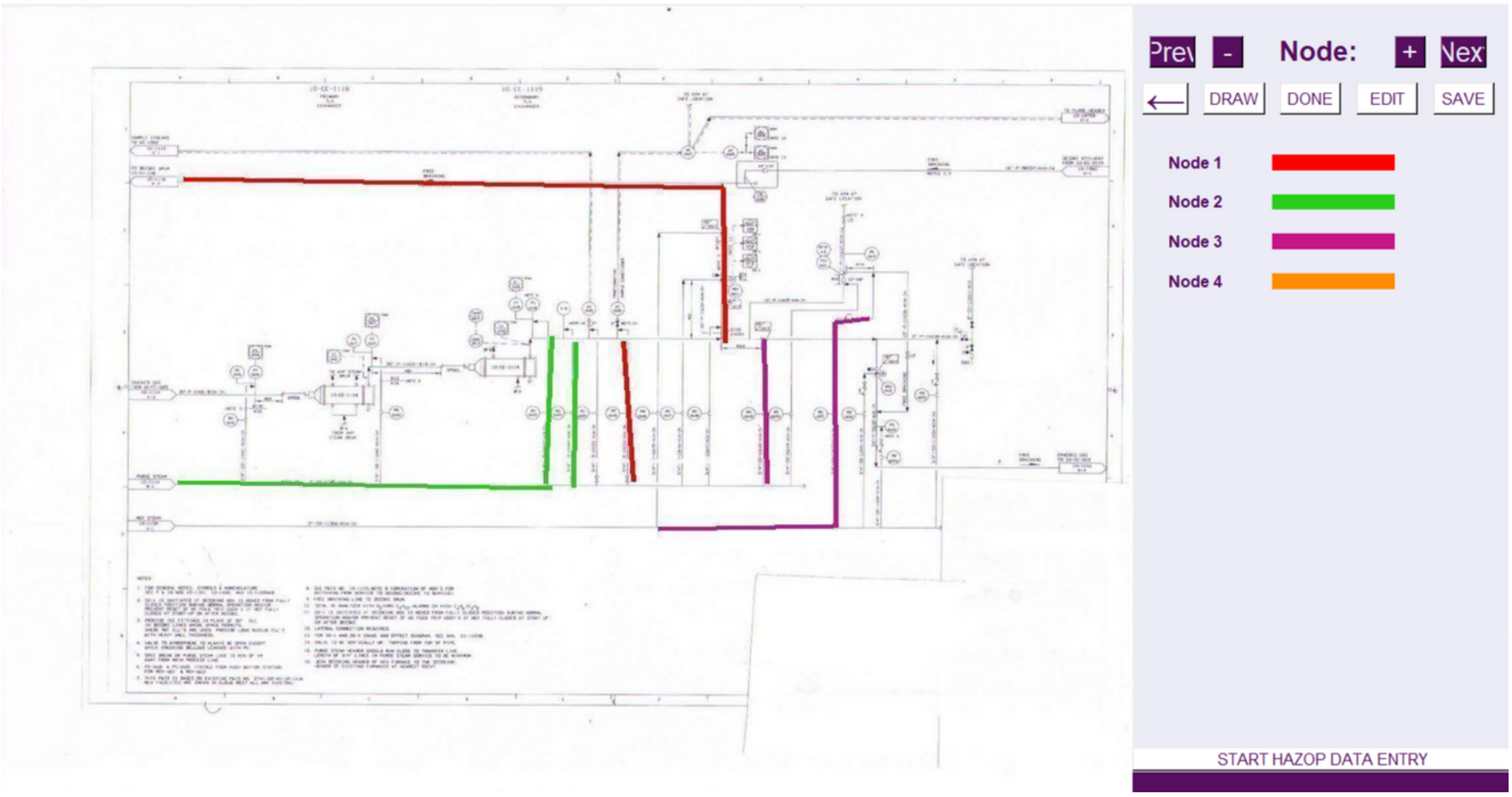
HAZARD IDENTIFICATION TOOLS

HAZOP, FMEA & LOPA

SAT HAZOP Software is designed on an unique process flow. It keeps in mind that the HAZOP team has to achieve the maximum flexibility.

It registrars HAZOP data through an unique tree view matrix where data entry and evaluation becomes very useful and handy with a very rich UI.

Biggest value proposition is this software produces HAZOP sheet into MS Excel to give user maximum flexibility for using hazard data, not like in CMS format as other software does.



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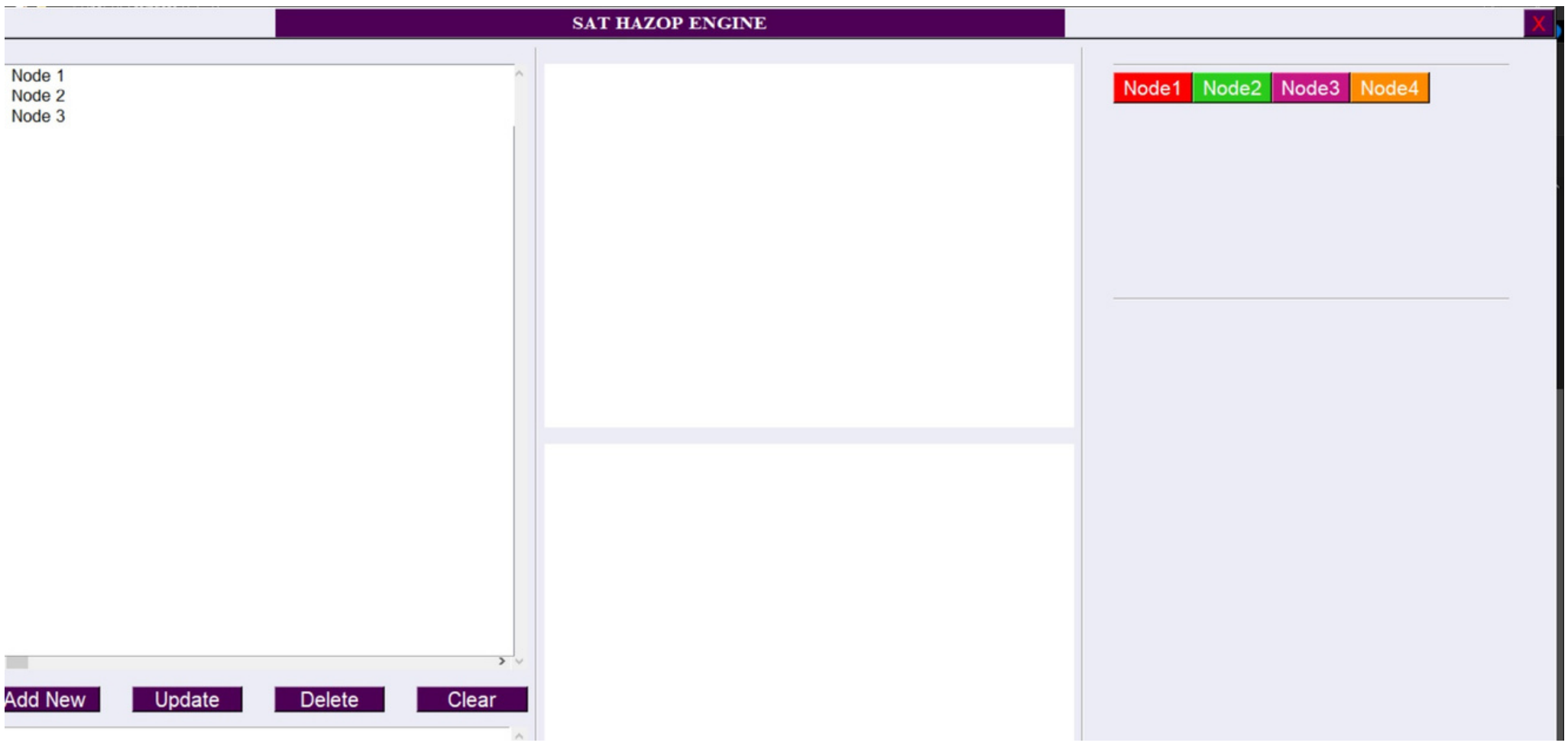
HAZOP, FMEA & LOPA

Similarly FMEA and LOPA have also been done to deliver maximum autonomy to end user. HAZOP , FMEA and LOPA together forms a very powerful tool to detect high severity hazards which may lead to catastrophic consequences.



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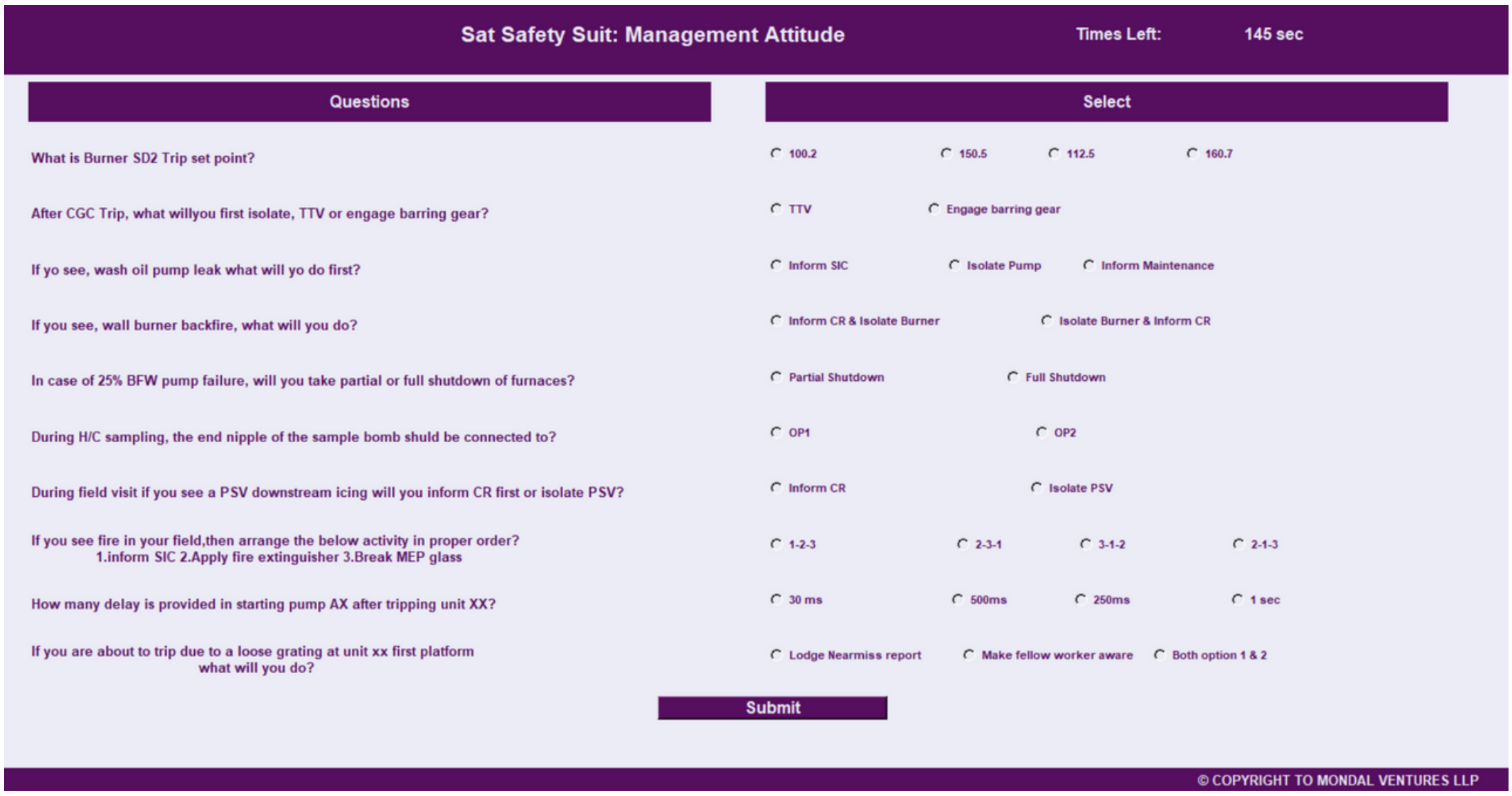
EMPLOYEE PREPAREDNESS ASSESSMENT

Operating Emergency Readiness

Handling Operational Emergency becomes very crucial during critical equipment or process upset. If the operating team is not conversant with step by step procedures, then one process upset can take millions in revenue.

To keep operating team up to date with emergency SOPs, SAT has formulated a unique method. SAT team will collaborate with client's operating team and understand the process. Then a questionnaire will be formed which will be put into a database.

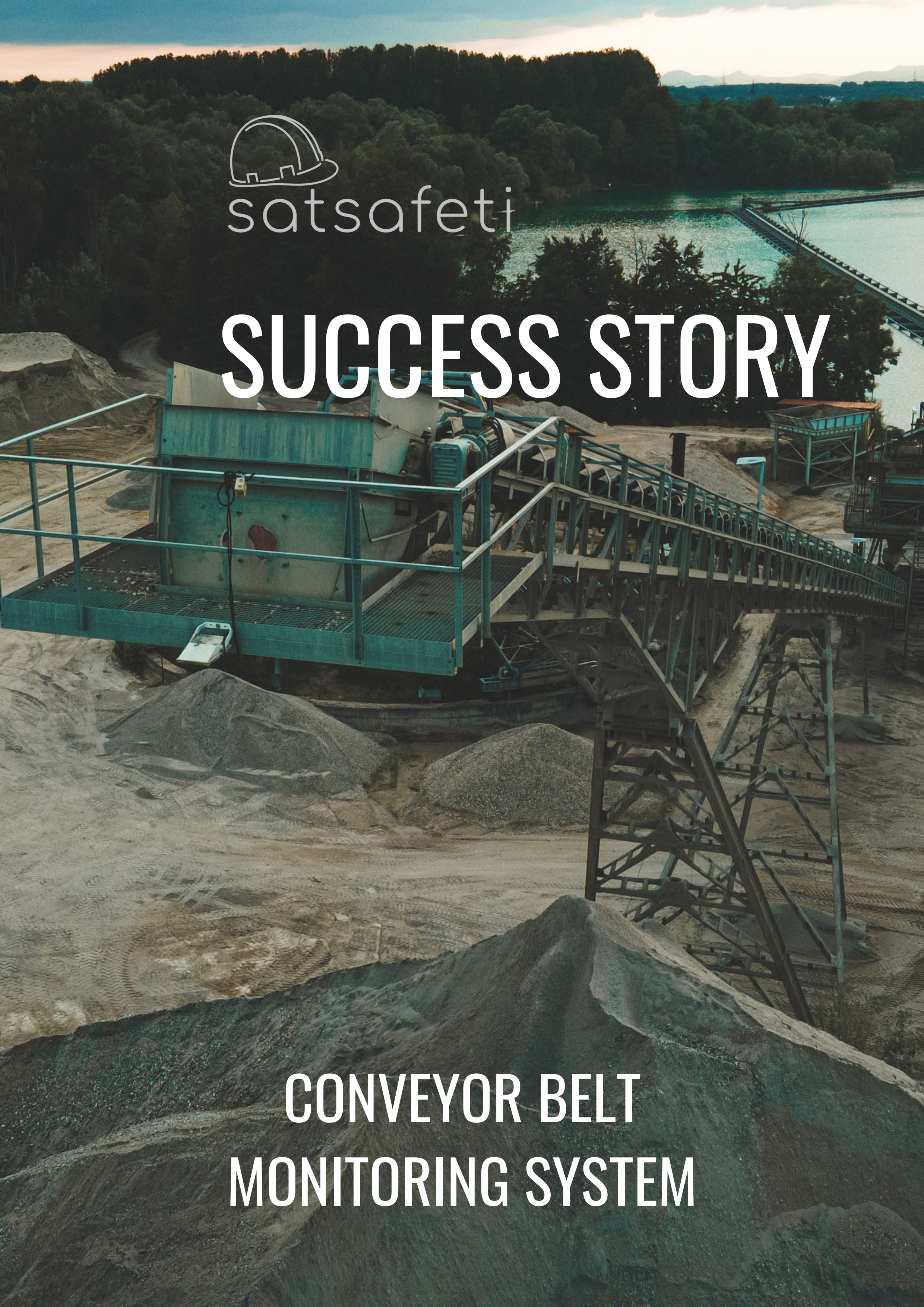
Employees will have to take a time bound assessment, where the questions will be coming up through a unique AI directed process. The time bound manner of this assessment will measure the particular employee's operating preparedness.



Stress Level Detection

Detection of stress level is a mandatory exercise in safety compliance. SAT has developed a process in consultation with leading occupational psychiatrist. This process will help each employee to monitor their mental healthiness and be more productive in a longer run. Psychological health monitoring also gives other benefits like,

- Reduced symptoms of poor mental and physical health.
- Fewer injuries, less illness and lost time.
- Reduced sick leave usage, absences and staff turnover.
- Increased productivity.
- Greater job satisfaction.
- Increased work engagement.
- Reduced costs to the employer.



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SUCCESS STORY

CONVEYOR BELT MONITORING SYSTEM

Conveyor Belt Off-Centering Detection

A conveyor belt is an integral part of the manufacturing industry. For years after years, conveyor belt operation has changed significantly, high-end automation is introduced to get optimize conveyor belt operation, but there are very few technologies developed for monitoring the conveyor belt itself. SAT Conveyor Belt Monitoring System brings state of the art belt monitoring module that can detect conveyor belt off-centering & initiate a remote alert.

One of our client in Eastern India has approached us with a unique problem. It was a DAP manufacturing plant and their final product conveyor has been a pain area as it was getting off-centered frequently. The belt conveyor is at height and approach to the belt platform is limited. Scheduled inspection of that belt was a nightmare for them. Once the belt gets off-centered valuable DAP product used to spill over the platform and that is a product waste.

Conveyor Belt platform at height. Approach is not easy to platform, which makes periodic inspection a nightmare.

Loaded conveyor belt running with product.

Conveyor Belt monitoring Parameters

- Off-centering detection and remote alert
- DAP Spillage detection on belt platform
- Belt health monitoring
- Driving end bearing temperature monitor and alarm beyond high value

Through analyzing IP camera feed our algorithm is capable of measuring the exact deviation of belt from it's original position

The basic principle of the system is it takes video feed from an IP camera installed parallel to the belt & our machine learning-based algorithm to detect the original position of the belt. After getting the belt position coordinates, a pixel versus dimension mapping algorithm analyses the coordinate & check whether the belt has deviated from its centered position. Any significant deviation will initiate a remote alert which the user can get through email with the picture & deviation length in it.

Our algorithm is monitoring the belt position. Once belt is deviated it starts generating alarm

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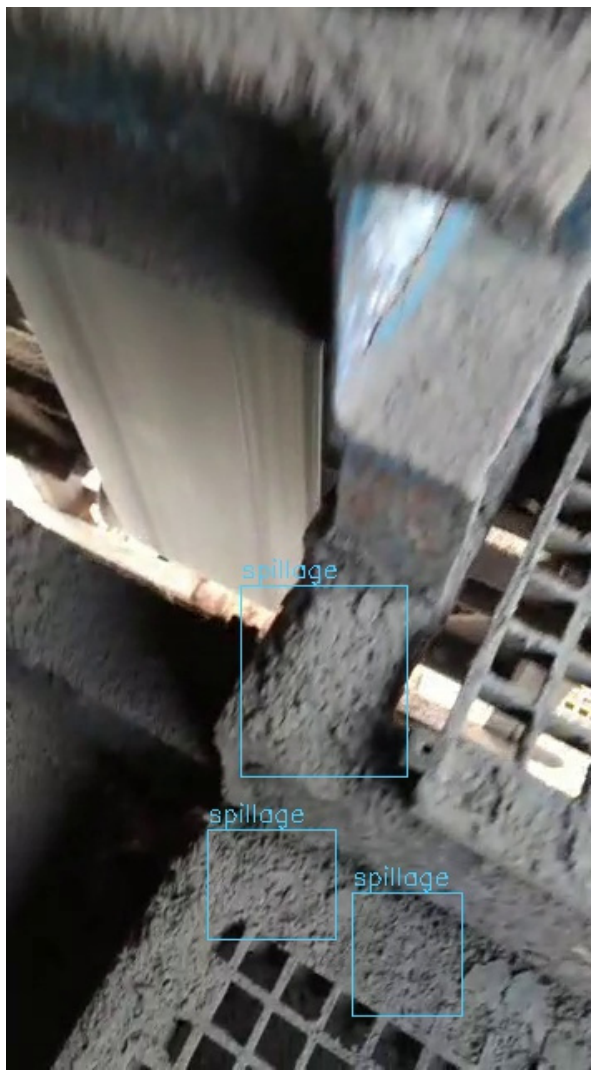
Spillage and Temperature Detection

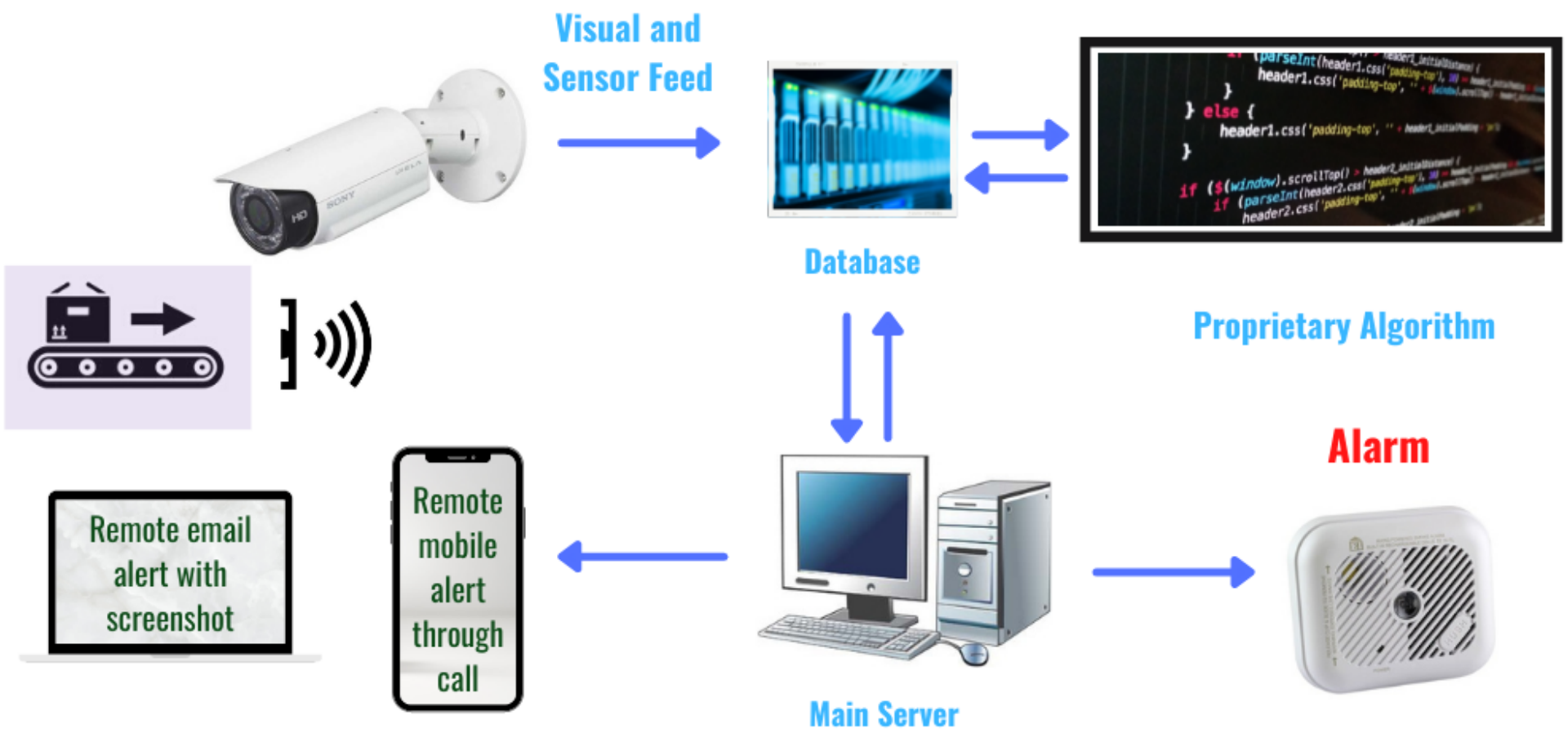
For Spillage and belt health monitoring we have prepared a module based on image detection mechanism, where we are analyzing the frames after a certain time interval and generating output through our Neural Network.

For Bearing Temperature we have installed a laser based sensor and taking feed from that. Once the feed crosses certain high value, we are generating alarm for that.



DAP spillage is being monitored through our algorithm

WORKFLOW OF CONVEYOR BELT MONITORING SYSTEM



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