तेल उद्योग सुरक्षा निदेशालय
Oil Industry Safety Directorate
ISO 9001:2015 certified

सुरक्षा संवाद
Suraksha Samwad

An opportunity to learn from mistakes....

Disclaimer

"Presentations are intended for educational purpose only and do not replace independent professional judgement. Statement of facts and opinions expressed in the presentations are solely those of the presenter and unless expressly stated to the contrary, are not the opinion or position of the Oil Industry Safety Directorate (OISD). OISD does not endorse or approve and assumes no responsibility for the content, accuracy, reliability and completeness' of the information provided herein."



B. P. DHANKAR
Chief Manager (Safety), BPCL-Mumbai Refinery

For Educational Purpose

He is a Fire Engineering graduate from the National Fire Service College, Nagpur. He has more than 22 years of diverse experience in managing fire services, safety in Refinery Operations, Quality Management Systems, Process Safety Management. He is certified lead auditor ISO 45001:2018 He is currently heading the Safety function of BPCL-Mumbai Refinery.

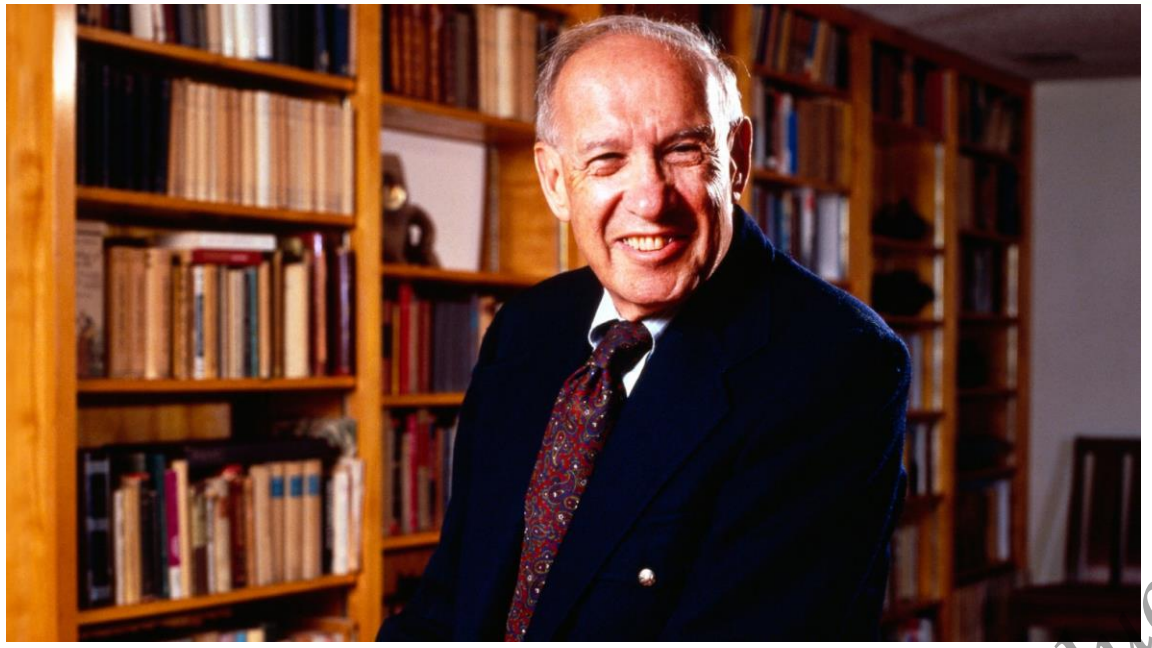
He was involved in implementation of Behaviour based safety systems in refinery. He was also instrumental in implementing the integrated management systems including ISO 45001. He is actively involved in implementation & apex committee member for Process Safety Management elements in the refinery in line with the Occupational Safety and Health Administration (OSHA, USA) and Centre for Chemical Process Safety (CCPS, USA) for improving the safety systems in the refinery to meet global standards. He has presented papers on ‘Safety management systems’ at the Various forums such as Corporate HSSE Meet , Fire & Safety Conferences, Industry meets, etc.



Safety Management System in BPCL Mumbai Refinery

Educational Purpose

Presentation by:
Bhushan P Dhankar
Chief Manager(Safety)



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"The first duty of business is to survive and the guiding principle of business economics is not the maximisation of profit – it is the avoidance of loss…"

IMPACT OF GLOBALISATION ON HEALTH & SAFETY

Research in 2017 has estimated 2.78 million annual work-related fatalities. 2.4 million fatalities are attributed to work related illness with 380 500 being caused by occupational accidents. Fatal accident rates continue to rise in the lower income, developing nations.

This means that every 15 seconds 151 workers were involved in workplace accidents and one worker died from a work-related accident or disease.

The global economic cost of occupational accidents and diseases has been estimated at 4% of the global gross domestic product (GDP).

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WHY MANAGE HEALTH & SAFETY

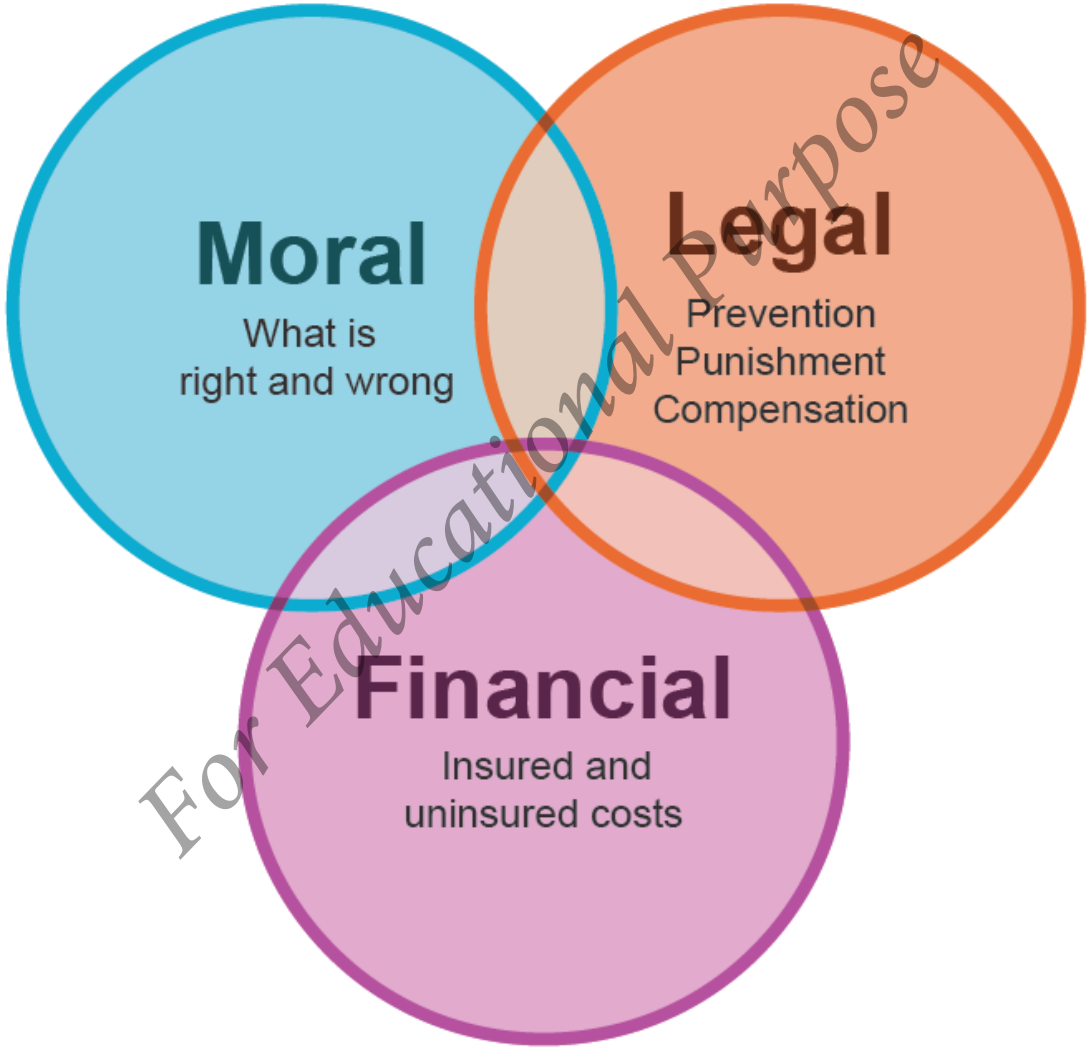

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Figure 1.1: Moral, legal and financial drivers

Why Safety Management system ?

Good Standards of Health & Safety

Better understanding of the workplace hazards

Importance organizations brand or reputation

Social Media & immediate access to health & safety information

Pressure from customers & insurers

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BPCL Group Refineries

For Educational Purpose



Mumbai Refinery

- Set up in 1955.



Kochi Refinery

- Set up in 1963.

BORL Refinery



- Set up in 2009

Subsidiary

NRL Refinery



- Set up in. 1999



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QUALITY & PROCESS IMPROVEMENTS

Journey on the path of Business Excellence .....



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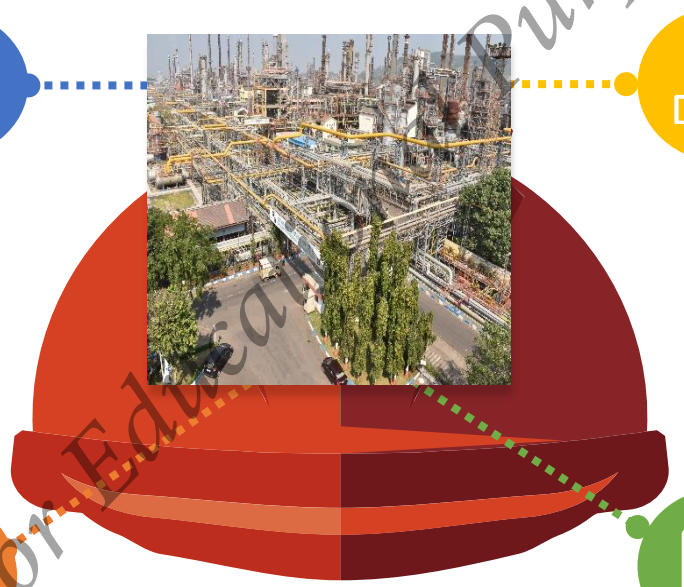
Mumbai Refinery Vision

Role model for environment, safety and health performance



Greatest place to work

Market Responsive

Consistently the most profitable and reliable refinery

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Bharat Petroleum
energising lives

PROCESS SAFETY MANAGEMENT
VISION 2021
BPCL MUMBAI REFINERY



Bharat Petroleum
energising lives

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संसाधन सुरक्षा दृष्टि Process Safety Vision

BPCL Mumbai Refinery aspires to be a Global Role Model by building sustainable Process Safety Capability, Culture and strive towards achieving Zero Process Safety Events by engaging all stakeholders.

संसाधन सुरक्षा लक्ष्य Process Safety Mission

BPCL Mumbai Refinery is committed to

Adopt **PROCESS SAFETY CENTRIC** approach to design, operation and maintenance

Develop **PROCESS SAFETY COMPETENCIES** among all employees and associates

Ensure **AVAILABILITY AND RELIABILITY** of Process Safety Barriers at all times

DIGITAL VISION





We are a SMART and digitally connected refinery adopting cutting edge technologies for sustained operations and business excellence.



We maintain highest standards of Health, Safety, Security and Environment with digitally integrated systems.



We leverage Digital for excellence in Project Management.



We nurture strong Digital Culture.

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SAFETY MANAGEMENT SYSTEM

- QEHSS POLICY
- EHS HAZARD IDENTIFICATION & RISK ASSEMENT
- ONLINE MANAGEMENT OF CHANGE SYSTEM
- ONLINE INTERLOCK BYPASS AUTHORISATION SYSTEM
- ALARM MANAGEMENT SYSTEM

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SAFETY MANAGEMENT SYSTEM

- ONLINE SCAFFOLDING MANAGEMENT & TAGGING SYSTEM
- CONTRACTOR EQUIPMENT TAGGING SYSTEM
- ONLINE INCIDENT REPORTING & INVESTIGATION SYSTEM
- BEHAVIOUR BASED SAFETY SYSTEM
- ONLINE FINANCIAL PENALTY SYSTEM FOR SAFETY VIOLATIONS

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WORK PERMIT SYSTEM

- TWO TIER SYTEM (AUTHORIZATION & PERMIT)
- ONLINE SYSTEM
- JOB SAFETY PLAN & EXECUTOR JOB SAFETY PLAN
- MONSOON EXCAVATION AUTHORIZATION FROM CGM(OPS)/GM(HSE)
- DIGITAL –TAB READY WPS ON NEW PLATFORM

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THE IMMERSIVE LEARNING EXPERIENCE





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R

REFINERY OVERVIEW

INTRODUCE KEY FACILITIES & PROCESSES TO STAFF & WORKERS

W

WORKING AT HEIGHT

IMPORTANCE OF USING THE SAFETY HARNESS

L

LOTO

EXPLAIN THE RATIONALE OF LOTO

C

CONFINED SPACE

EMPHASIZE THE RATIONALE BEHIND PERMIT PROCESS

G

GRINDING SAFETY

THE RIGHT TOOL FOR THE RIGHT JOB

LEVERAGE HANDS FREE TECHNOLOGY TO ENABLE THE FIELD WORKER





Director Steam Boiler, Mr D P Antapurkar appreciating the VR modules during Boiler India 2020 Exhibition

Zone 1 Intrinsic safe hands free head set

Helmet mounted

Operates on voice command

Connects through Wifi

Recently used in one of our refineries during plant turn around jobs where licensor/OEM abroad was able to connect & guide through this technology during covid-19 restrictions.

Used for inspection of equipment & safety inspections, remote troubleshooting

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Safety / Housekeeping Surveillance using Industrial Drones (Improved Safety/Better Housekeeping)

Collaborated efforts with Start Up Company- Detect Technologies

Application : Safety & Housekeeping surveillance during planned turnaround in high risk area .
(Working at Height – 10 to 80 meter)

Technique Adopted :- Use of Unmanned Ariel Vehicle (Drone) for constant data acquisition.

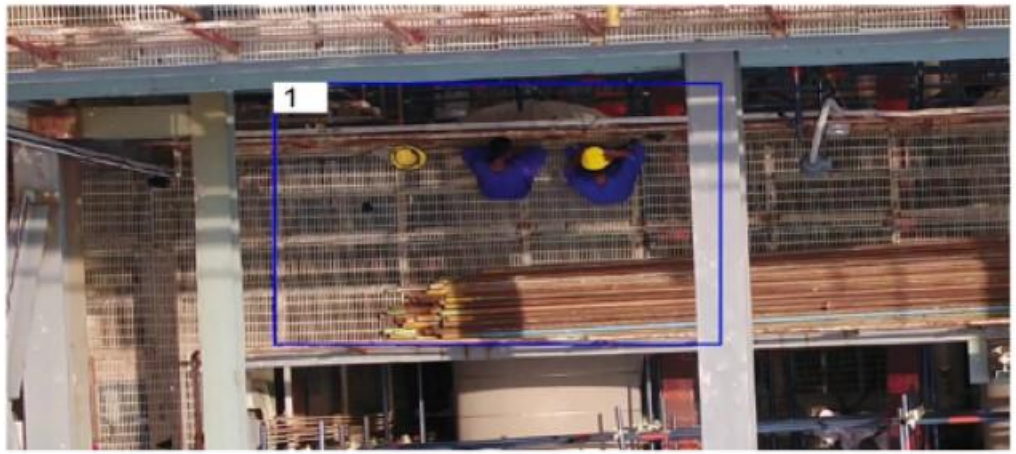
Technology :- Automated flight path for safety and housekeeping surveillance. Use of Machine Learning driven algorithms for segmenting data into four violation categories. (SV, PPE, PAoP…)

Benefits :- Real time monitoring of safety deviations for immediate corrective action.
Improved Plant Housekeeping during turnaround

Way Forward :- Automated Identification of violations and generation of alarms in real time.



5) Confined space work there was no attendant. Toolbox meeting to be conducted and incident to be addressed to ensure safe practices
. Vessel Maintenance



11) Safety helmet is not used by a worker. Toolbox meeting to be conducted and incident to be addressed to ensure safe practices
. TS1/TS2/TS3 Area

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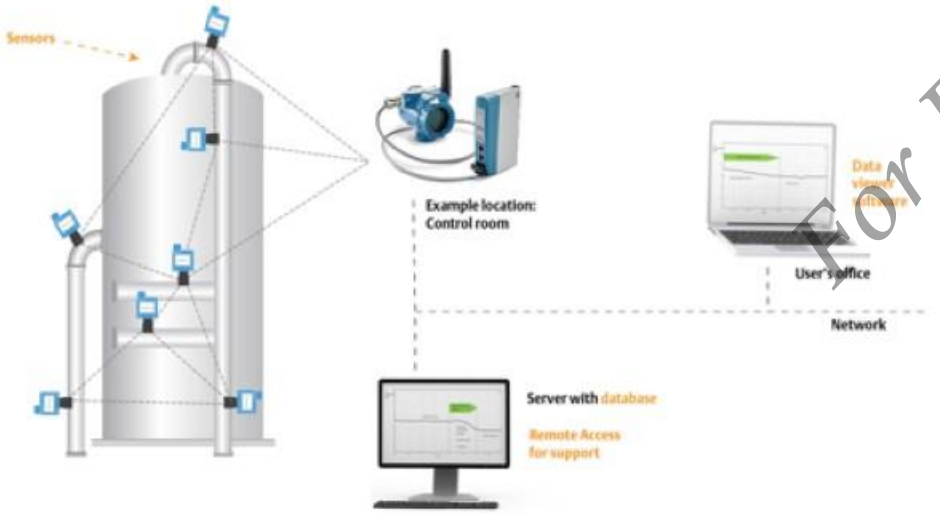
Safety & Reliability: Non Intrusive Ultrasonic Thickness Monitoring

- The wall thickness sensors capable of measuring through external protective coatings
- **Easy, intuitive and non-intrusive installation**
- 30 Sensors across most corrosive circuits in refinery





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ROBOTIC SCAVENGING OF OWS PIT

Robotic cleaning of Manholes- (Improved Health / Safety)

Collaborated Efforts with Startup Company- GenRobotics

Application :- Cleaning of 50 Nos. Manholes in Mumbai Refinery & 10 nos in public areas (Collaborartion with MCGM)

Technique Adopted :- Intrinsically safe cameras suitable for hydrocarbon environment with display screen, control panel, robotic arm and bucket , total weight – 60 Kg

Technology :- Bandicoot (World's first robotic scavenger)

Benefits :- Eliminates risk, safety & health hazards to workers involved in manual cleaning of sewers/ manholes







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Real time tracking of manpower (Safety/ Improved Productivity)

RTLS pilot project approved for new tracking system

Collaborated efforts with Start Up Company- Detect Technologies

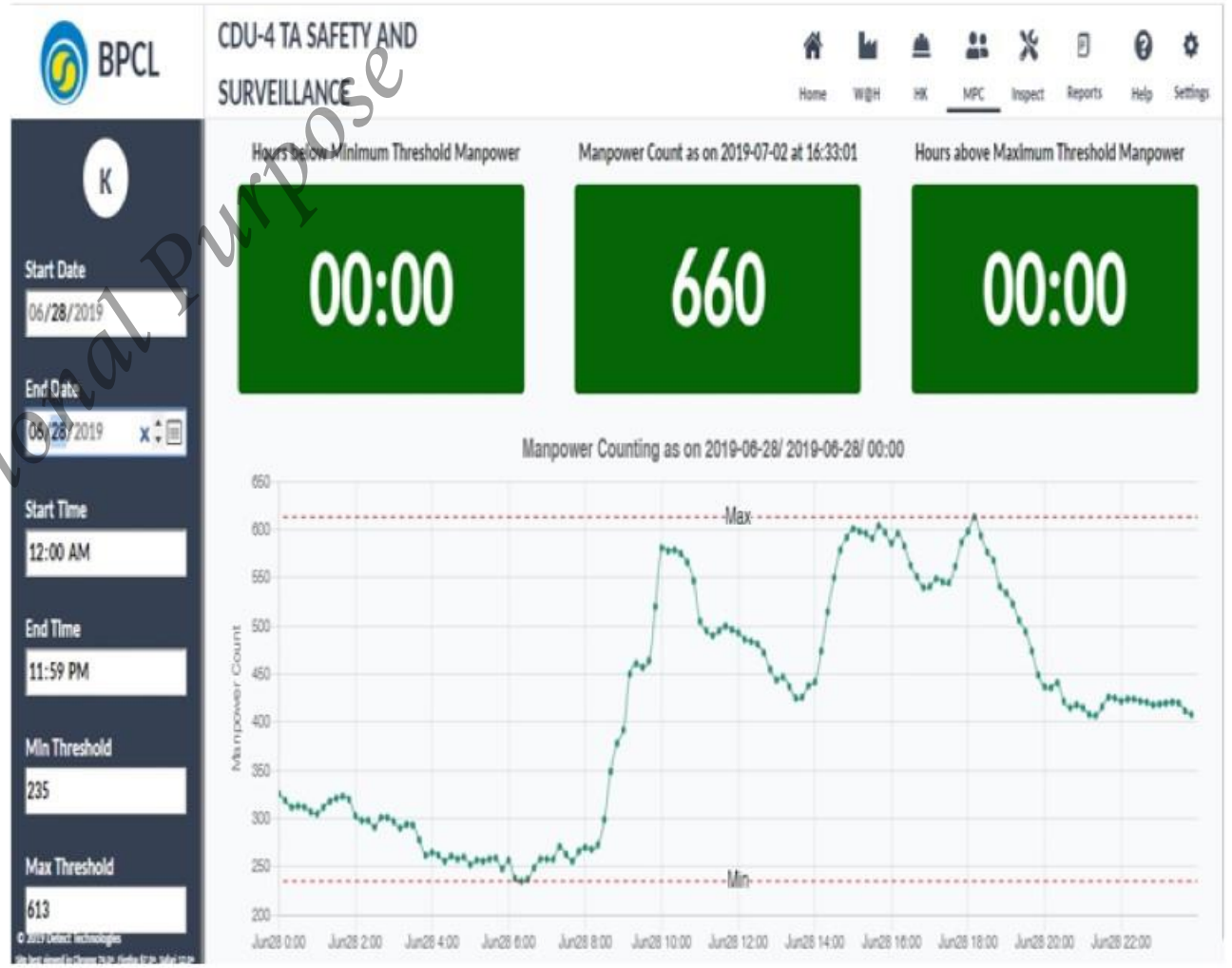
Application : Tracking of manpower in real time in the shutdown area.

Technique Adopted :- Unstructured Image Analytics using CCTV cameras to identify and count humans at each entry/exit point.

Technology :- Creation of virtual fence and use of Artificial Intelligence engine.

Benefits :- Real time monitoring of personnel inside the process unit and data analysis for assessment of productivity .

Way Forward :- Contract Based Segregation using image analytics (Artificial Intelligence), Accuracy Improvement and Face Recognition for Identification of person



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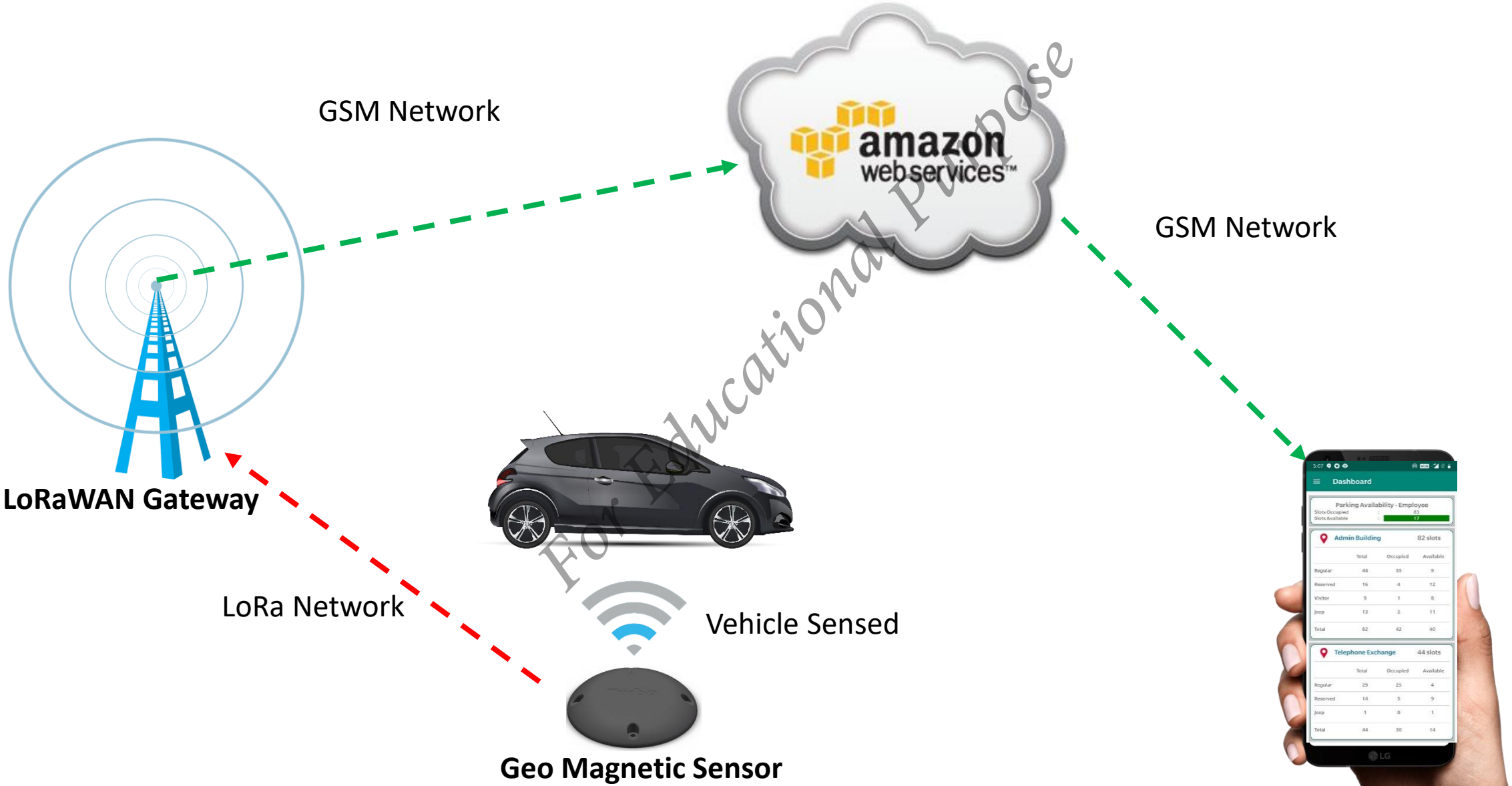
VEHICULAR TRAFFIC REDUCTION



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BLAST RESISTANT MODULE

BPCL (MR) is first in India to Procure & Install Blast Resistant Module

Blast resistant module inaugurated at CCR on 29th Nov'2019.

Features:

- BRM is designed for Blast Overpressure of 8 psi for 200 milliseconds.
- BRM is designed with the criteria for ASCE 2010 Publication for Blast Resistant Buildings in Petrochemical Facilities.
- Glass window tested in accordance with DIN 52 290 Part 5.
- Electric fittings & JBs are Flame proof (Ex "d" Hazardous area Zone-II)
- Flameproof AC unit 1(+1 standby)
- Weight- 18 Mt approx









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LIGHTENING PROTECTION OF TANKS WITH CATENARY WIRES







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EMERGENCY PREPAREDNESS

MUTUAL AID RESPONSE GROUP TROMBAY CHEMBUR REGION









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EMERGENCY PREPAREDNESS

MANTRALAYA FIRE ON 22.06.2012

For Educational Purpose

MumbaiMirror | FRIDAY, JUNE 22, 2012



BPCL Foam Tender

While the fire brigade's snorkels on the left were largely ineffective, the Bharat Petroleum firetruck with a high-intensity hose (right) made a big difference

COVID-19 OSH CHALLENGES & PREVENTIVE MEASURES

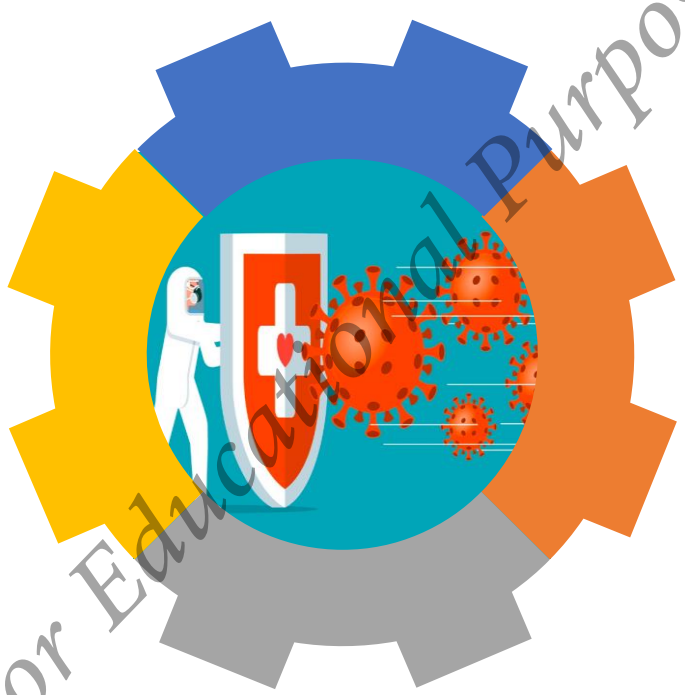
Bharat Petroleum
energising lives

Manpower Protection
12 Hrs Operation Shift Rota
Alternate Day rota for Maint.
Work from Home

Mass communication
Communication from Management & Doctors ,
F & S Announcements

In-house Sanitizer
Sanitizer developed in-house by Quality Assurance Laboratory

Ultra Violet Germicidal
Introduced UVGI (Ultra Violet Germicidal) facility at Air Handling Units of all AC system



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Support Facilities
Hospitalization help to staff and family
Quarantine centre at RCF

Thermal Screening
New Thermal screening system installed at entry gates

Hygiene Facilities
Hygiene co-ordinators
Fumigation of all the working areas & canteen, sanitization of buses

IS systems, Applications & Dashboards developed Support Facilities
Use of VPN enabled Application
Dashboard for COVID-19 Updates

UNIQUE ALTERNATIVE ARRANGEMENT TO OPERATE IN CRISIS

BUSINESS CENTER DEVELOPED IN BPCL CHEMBUR COLONY WAS UTILISED FOR STRATEGY MEETINGS DURING COVID CRISIS WHEN COUNTRY WIDE LOCK DOWN WAS IMPOSED.

CORPORATE OFFICES WERE CLOSED & SENIOR MANAGEMENT LEADERSHIP TEAM WAS OPERATING & GUIDING FROM THIS CENTER









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Covid-19 Measures – In House Sanitizer





For Educational Purpose

Covid-19 Measures – UV Lamp in Control Rooms





For Educational Purpose

UV lamp in control room AHU

Covid-19 Measures - Thermographic Screening System





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Inauguration Of Thermographic Screening System at BPCL MR Entry Gates

Major Challenges faced during COVID

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FCCU WGC Seal Repair – In house (May 2020)








Challenges:

- No OEM support
- No contract available for overhauling
- Limited resources
- No extended hours due to travel restriction
- Ensuring covid precautions

Achievements

- Completed in house with record time of 3.5 days
- Reduced seal oil loss from 25 to 4 drums per day

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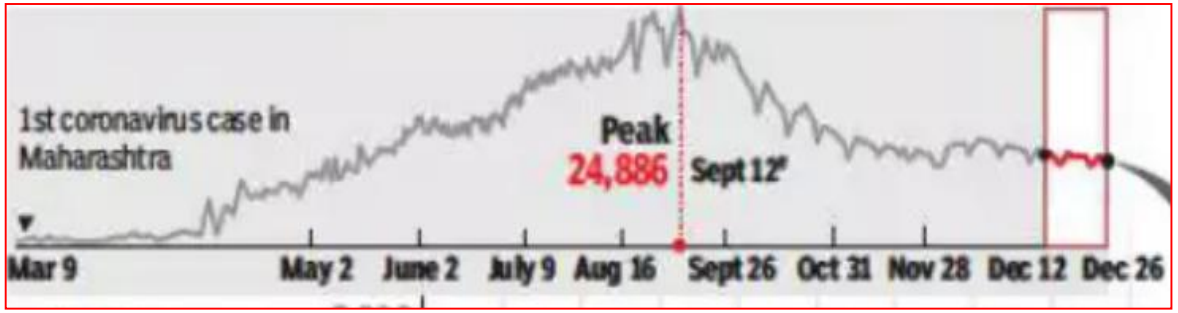
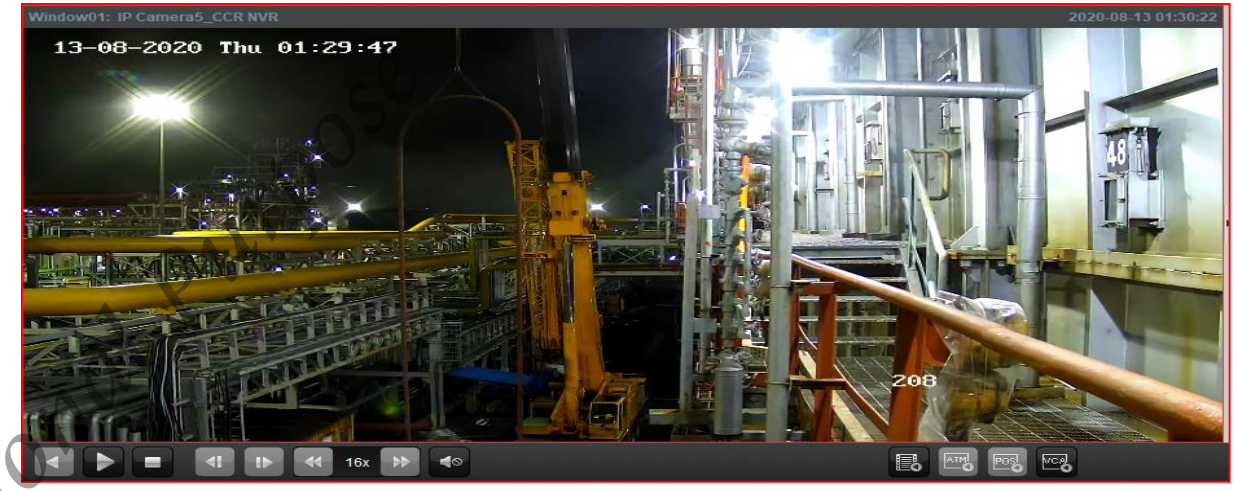
CCR and GT -2 Turnaround during peak COVID times







CCR Heater Tubes Replacement



GT Turbine Rotor

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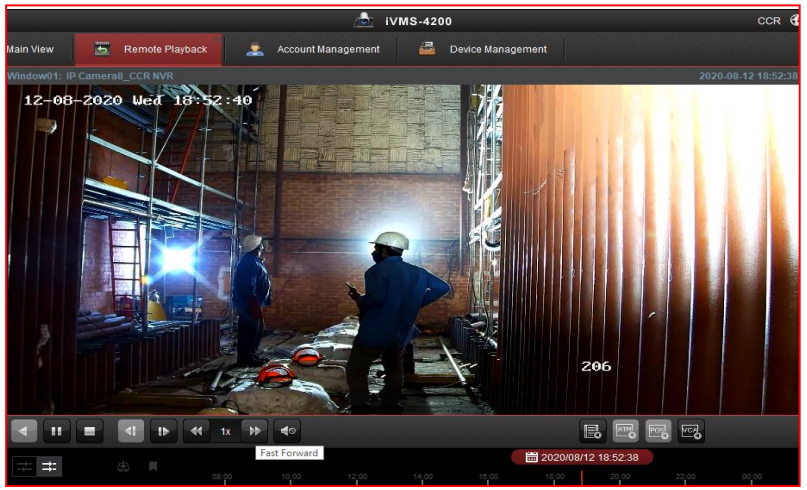
CCR and GT -2 Turnaround during peak COVID times



Digital Monitoring



Clean Drinking water facility



Place for eating food



Covid Care centre



Document disinfectant



Screening of Employees

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CCR & GT-2 Turn around

CCR & GT-2 TURN AROUND COMPLETED SAFELY & SUCCESSFULLY WITHOUT ANY INJURY & COVID CASE

RTPCR TEST OF ALL 600 CONTRACTOR EMPLOYEES WORKING IN TURN AROUND COMPLETED BEFORE ENTRY IN REFINERY

SAFETY TRAINING WAS COMPLETED WITH SOCIAL DISTANCING BEFORE MAKING THE ENTRY PASS

DEDICATED HYGIENE COORDINATOR FROM BPCL AS WELL AS CONTRACTOR WERE POSTED ROUND THE CLOCK IN TURN AROUND AREA FOR MONITORING COVID-19 PRECAUTIONS

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CCR & GT-2 Turn around

DEDICATED COVID CARE CENTER WAS SET UP AT TURN AROUND SITE.

DAILY TEMPERATURE & PULSE OXYGEN SCREENING FOR ALL EMPLOYEES.

CONTINUOUS MONITORING THROUGH CCTV CAMERAS IN TURN AROUND AREA.

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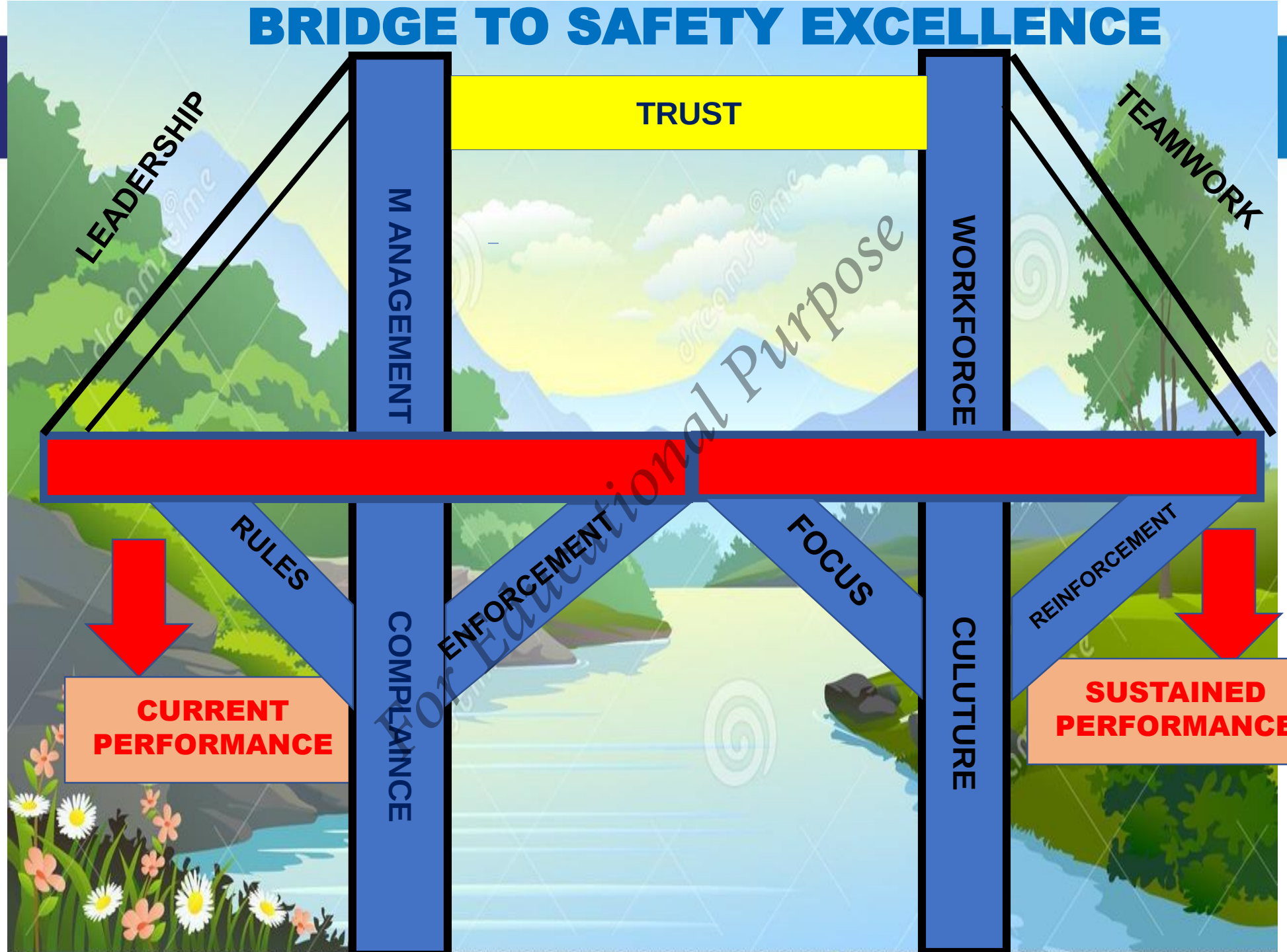
BRIDGE TO SAFETY EXCELLENCE



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Bharat Petroleum
energising lives

कोशिश करने वालोंकी कभी हार नहीं होती

- नन्ही चिटी जब दाना लेकर चलती है
- चढ़ती दीवारों पर सौ बार फीसलती है
- मन का विश्वास रगों मे साहस भरता है
- चढ़कर गिरना गिरकर चढ़ना ना अखरता है
- आखिर उसकी मेहनत बेकार नहीं होती
- कोशिश करने वालों की कभी हार नहीं होती।



For Educational Purpose

कोशिश करने वालोंकी कभी हार नहीं होती

- सिन्धु मे गोता खोर लगाता है
- जा जा कर खाली हाथ लौटकर आता है
- मिलते नहीं सहज ही मोती गहरे पानी में
- मुठ्ठि उसकी खाली हर बार नहीं होती
- कोशिश करने वालों की कभी हार नहीं होती।



For Educational Purpose

कोशिश करने वालोंकी कभी हार नहीं होती

- असफलता एक चुनौती है ईसे स्विकार करो
- क्या कमी रह गयी देखो और सुधार करो
- जबतक न सफल हो नींद चैन को त्यागो तुम
- संघर्ष का मैदान छोड़कर मत भागो तुम
- कुछ किए बीना ही जयजयकार नहीं होती
- कोशिश करने वालों की कभी हार नहीं होती।



For Educational Purpose

International Labour Organization

Anticipate, prepare and respond to crises



INVEST NOW IN RESILIENT OSH SYSTEMS

World Day for Safety and Health at Work

28 April 2021

ilo.org/safeday

For Educational Purpose

Bharat Petroleum

Thank You