

August 2017, Jakarta

GEOHERMAL SAFETY ISSUES

Course: Operators of Geothermal Power Plant

Hosting by: PPSDM EBTKE, Jakarta

Ardila Johan Erdiansyah



Ardila Johan Erdiansyah (PT. Pertamina Geothermal Energy)



- Engineer of Operational Excellence
- New Zealand Scholarship Awardee, Master Degree in Electrical and Electronic Engineering, The University of Auckland (January, 2018)
- Studied Bachelor Degree in Electrical Engineering, Sepuluh November Institute of Technology



Rule #1

Follow the prescribed Safe Journey Management Plan

HAZARD POTENTIAL ON GEOHERMAL FIELD

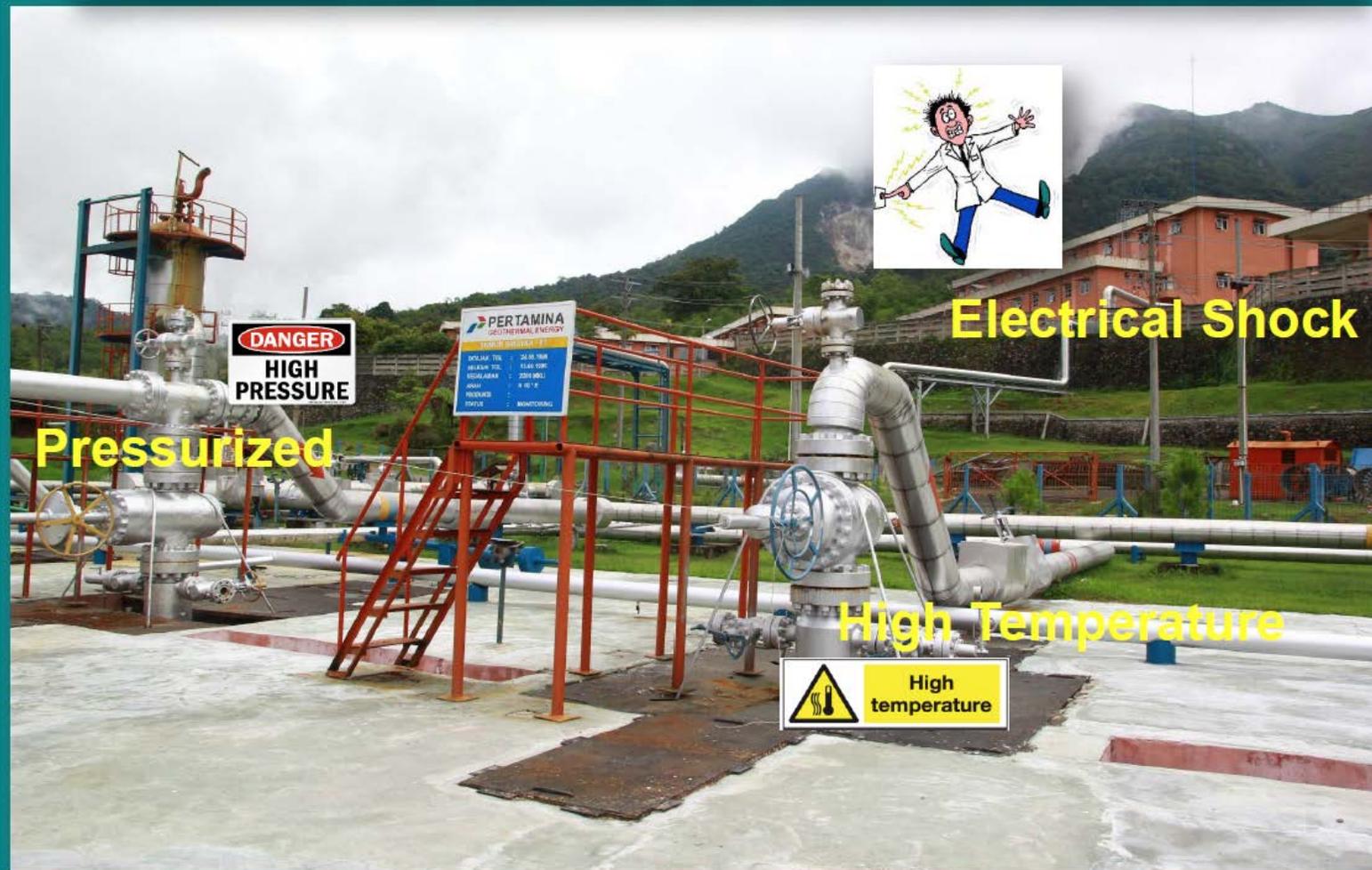
HAZARD POTENTIAL



HAZARD POTENTIAL ON GEO THERMAL FIELD



HAZARD POTENTIAL ON GEOTHERMAL FIELD



HAZARD POTENTIAL ON GEOTHERMAL FIELD



Pay attention to the signs around you



SAFETY TARGET ON WORK ACTIVITIES



*) Ref. : Iwan Jatmika, VP QHSSE PT. Pertamina Hulu Energi



Substandard Platform & Grating



*) Ref. : Iwan Jatmika, VP QHSSE PT. Pertamina Hulu Energi





Substandard Ladder



Standard Ladder



Standard Grating

*) Reference : Iwan Jatmika, VP QHSSE PT. Pertamina Hulu Energi

Unsafe Action – Work at Height



Without Body harness

Unsafe Action – Work at Height



Without Body harness

*) Reference : Iwan Jatmika, VP QHSSE PT. Pertamina Hulu Energi

Unsafe Action – Work at Height



Without Platform

Safe Action – Work at Height

Wearing Body harness



Safe Action – Work at Height

Indonesian Working at Height Regulation

→ Permen No 9 Tahun 2016

Related Regulation

1. Permenakertrans No Per 01/Men/1980 tentang K3 pada konstruksi bangunan
2. Permenaker No Per 05/Men/1985 Tentang pesawat angkat dan angkut Pasal 35 s/d 48
3. DJPPK Direktur Jendral Pembinaan Pengawasan Ketenagakerjaan No KEP. 45/DJPPK/IX/2008 Pedoman K3 Bekerja di Ketinggian dengan menggunakan akses tali (Rope Access)
4. UU No 1 Tahun 1970 tentang Keselamatan Kerja
5. EN Standard/CEN Standard/CE Standard : EN-12277 : Harnesses, EN-12492 : Helmets, EN-12275 : Connectors, EN-12276 : Frictional Anchors.
6. OSHA PART 1910, BS 1139 Metal Scaffolding, AS/NZS 1576 Scaffolding



Positive Safety Culture And Safety Performance

The Way We Do Things Around Here (How HSSE Risks Management Practices in E&P)

Thinking and Believing (All Incidents can be prevented. Safety is every body responsibility)

Acting and Doing (Safe behavior On and Off The Jobs)

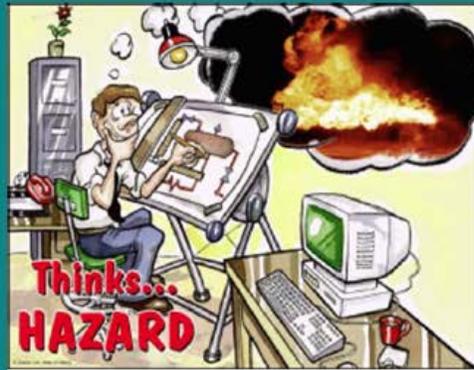
Unintentional and Deliberate Actions (Reduce un-safe acts)

Improved HSSE Performance and Work Environment



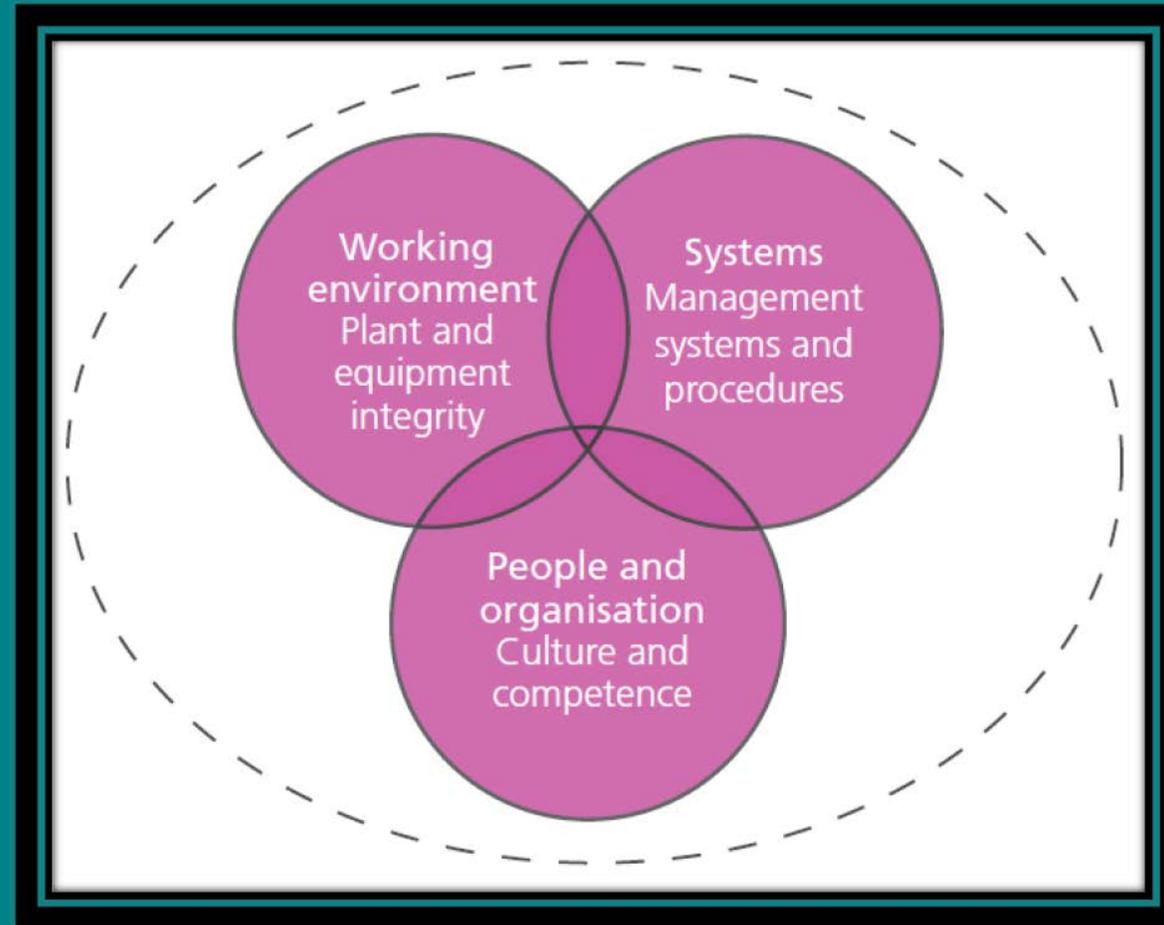
What Does Positive Safety Culture mean?

- *I know the nature of works and its scope and steps*
- *I understand the hazards & risks may exposed*
- *I can plan and program the risks control and mitigation reasonably*
- *I manage the residual risks within my budget and authority of control*
- *I have the anticipated emergency and crisis situation responses readiness*



***To ignore safety does not indicate bravery;
only foolishness***

Positive Safety Culture



STRONG HSSE CULTURE

Safe Place To Work



HSSE Leadership:

- Set Policy & Standards Expectation
- Communicate the policy & expectation and motivate to achieve
- Be **ROLE MODEL** and Intervention Feasibility for incompliance & Stop Unsafe Works
- Provide Competence Resources and Infrastructures
- Understand Manageability Measures & promote continues improvement
- Supervise & Coach to link CHALLENGE, PROCESS & RESULT.



People



Plant



Process (Business)



Performance
(Management &
Measurement)

STRONG HSSE CULTURE

PEOPLE

- *Safe Behavior Observation – 3 HSSE Golden Rules*
- *Competency - Trainings, Assurance, Certification and Authorization*
- *Leadership & Supervisory - MWT, Safe System Of Work Organization & Authorization (SC/ AA/ PA/ AGT/ IA)*
- *Individual HSE Performance Contract*

PLANT

- *Process Safety – CRR/ HAZID/ HAZOP/ LOPA/ SIL, Proses Setting, Process Control, Shutdown System & Fire Deluge System*
- *Facility Integrity Management System*
- *Inspection, Maintenance and Repair / TA Program*

STRONG HSSE CULTURE

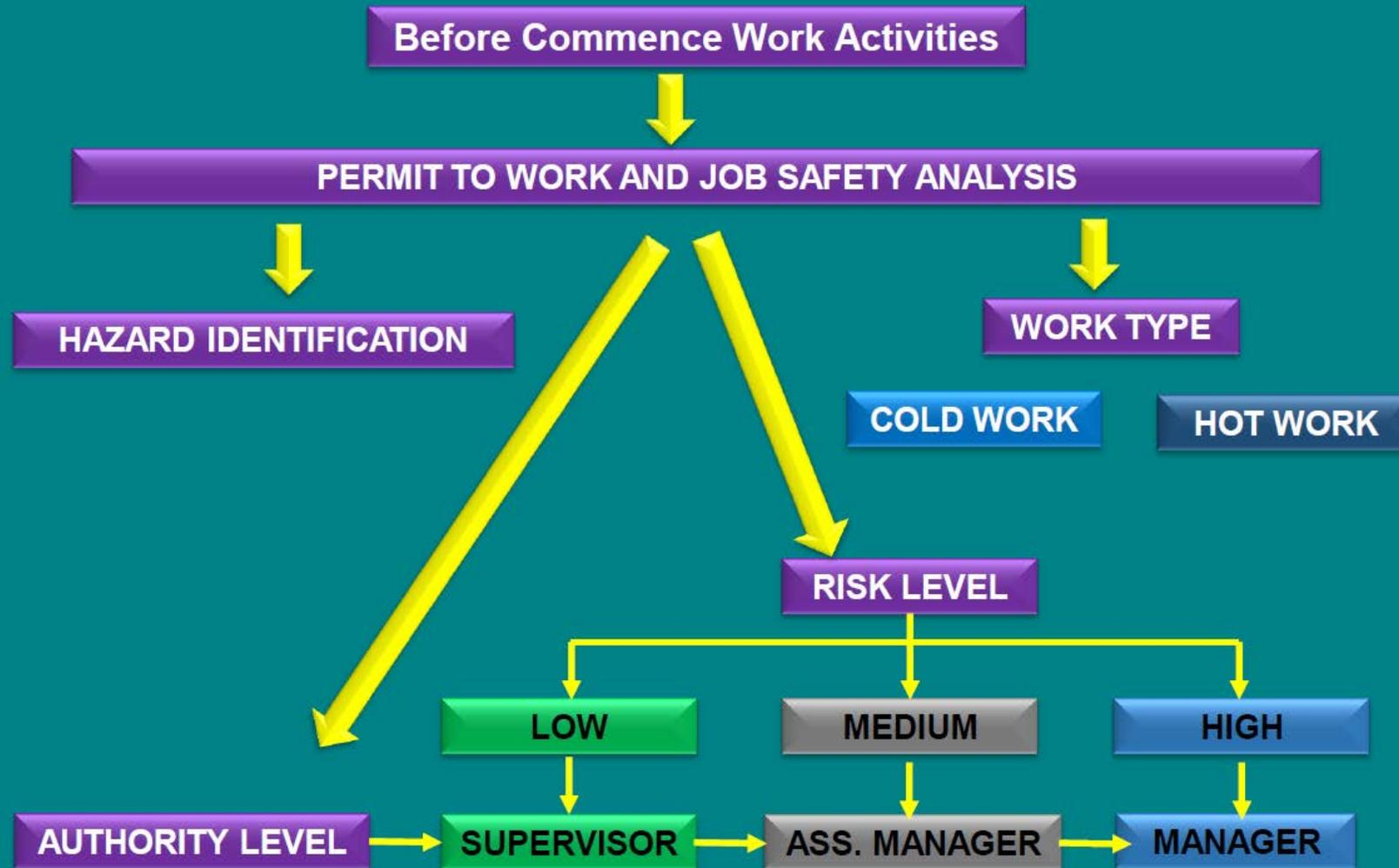
PROCESS (Business)

- *Contractor Safety (CSMS) for contracted services works*
- *Project/ Non-Routine HSE - Risk Register/ PHSER/ PSSR/ Handover Certification in PUDW Cycle*
- *Control of Work (CoW) for safe work execution/ 9 Aspect Fundamental Safety/ Basic Safety Rules*
- *Site Pre-Mobilization Readiness: HSE Passport, SBTC, Crew Induction, Go/No-Go readiness check list.*
- *Investigation, Emergency Response and Crisis Mgmt..*

PERFORMANCE (Management & Measurement)

- *Introduce Management System & Measurement (ISRS)*
- *Set Up Relevant KPI & Genuine Excellent People/ Plant/ Process leading and Lagging metrics*
- *Performance data Analysis & Synthesis to intervene*

SAFETY AT WORK



EMERGENCY PROCEDURES

Fire Emergency Checklist

1. Raise the alarm
2. Evacuate people from the area
3. Activate any emergency shutdown systems
4. Call emergency services
5. Call your manager

Precautions

- Do not endanger yourself
- Make sure you have an escape route
- Do not use water on petroleum or electrical fires
- Do not leave the site unattended if there is a risk of further outbreak
- Advise your manager of the incident

EMERGENCY PROCEDURES

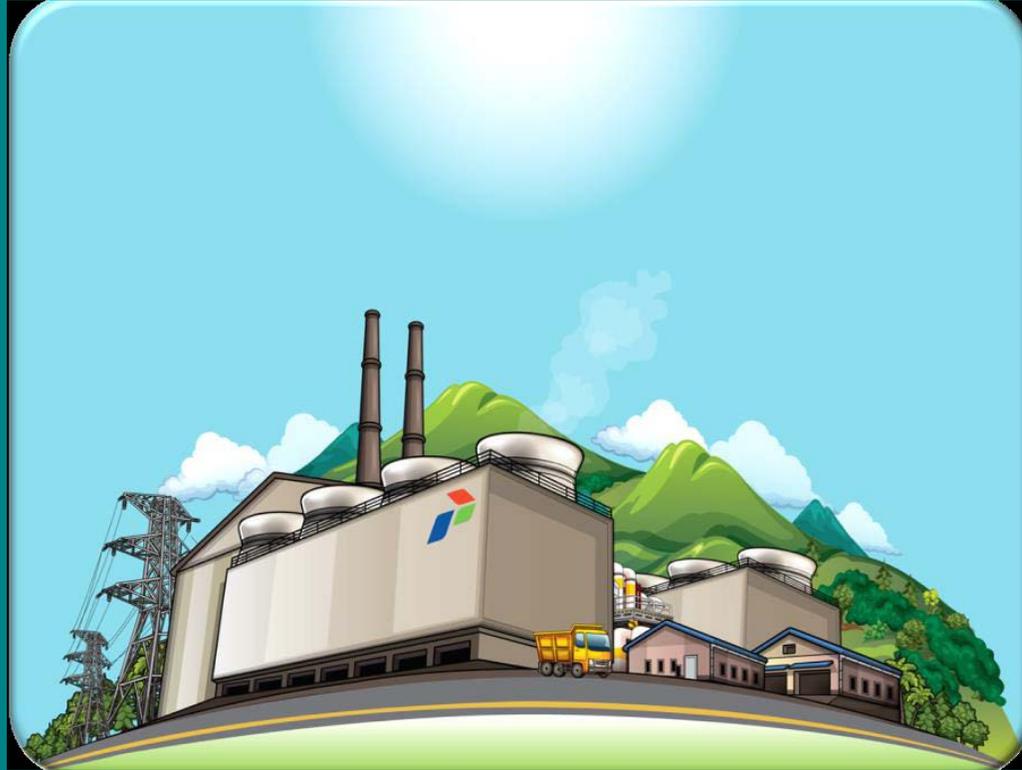
DISASTER STRIKES - EARTHQUAKE

During the earthquake

1. Keep calm
2. Stay indoors where practical
3. Keep away from windows and heavy furniture
4. Take cover – use a doorway or get under a strong table or other sturdy structure

After the earthquake, if the building is damaged

- -Turn off water, electricity, and gas at mains (Operator)
- -Follow the instruction from safety officer
- -Go to muster points
- -Treat injuries
- -Get in touch with neighbors – they may need help
- -When help is needed go to your nearest civil defense post
- -Advise manager of damaged sustained



THANK YOU



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Risk Assessment, mitigation, and control

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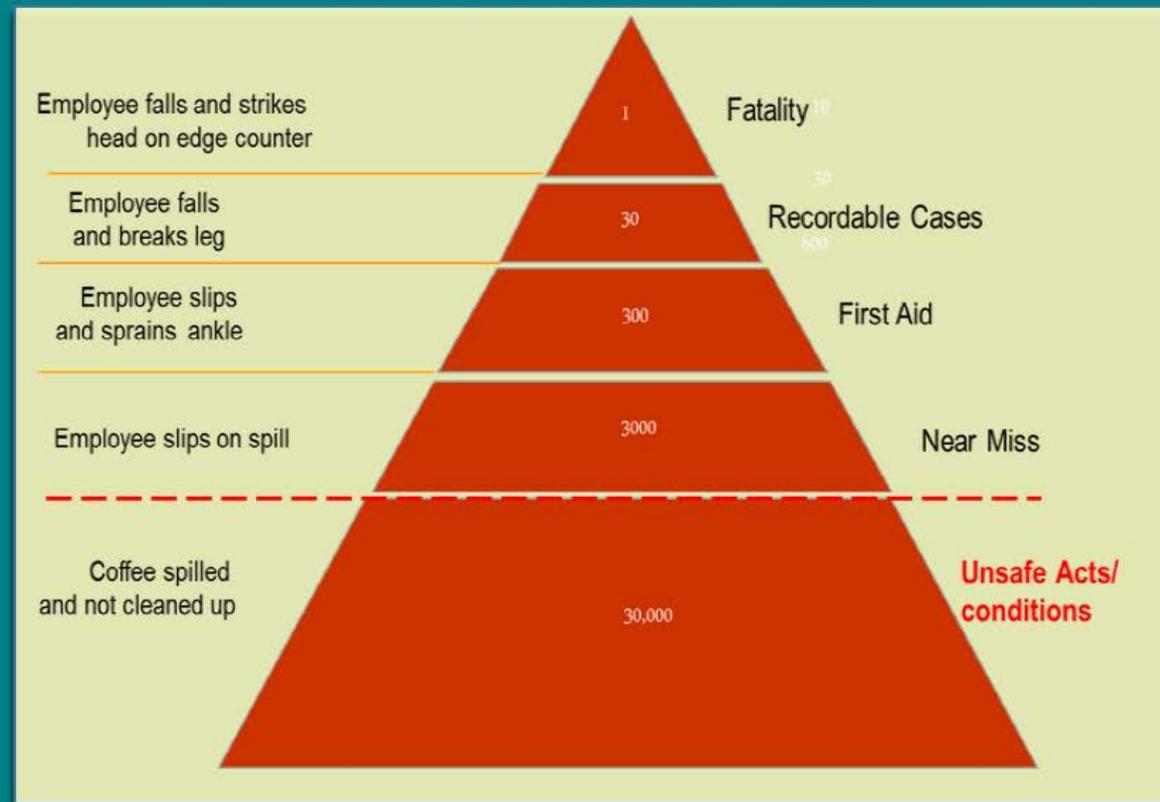
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Hazard Management

1. No intervention or in-effective investigation/ symptomatic only or recommendations are not follow up effectively
2. Less Pay attention or No intervention, No HSSE 3 Golden Rules commitment



Risk Assessment

Purposes :

- Identify the hazards created at work and evaluate the risks associated with these hazards,
- Determine what measures they should take to protect the health and safety of their employees and other workers
- Evaluate the risks in order to make the best informed selection of work equipment, chemical substances or preparations used, the fitting out of the workplace, and the organization of work
- Check whether the measures in place are adequate

Risk Assessment

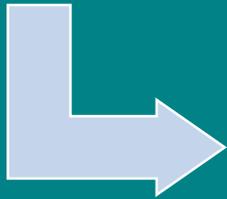


Purposes :

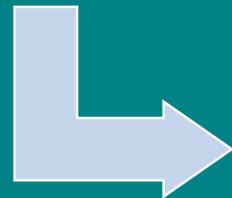
- Prioritise action if further measures are found to be necessary as a result of the assessment
- Demonstrate to themselves, the competent authorities, workers and their representatives that :
 1. All factors pertinent to the work have been considered,
 2. An informed valid judgment has been made about the risks
 3. The measures necessary to safeguard health and safety
- Ensure that the preventive measures and the working and production methods, which are considered to be necessary and implemented following a risk assessment
- Provide an improvement in the level of worker's protection.

Risk Mitigation

Risk mitigation planning is the process of developing options and actions to enhance opportunities and reduce threats to project objectives

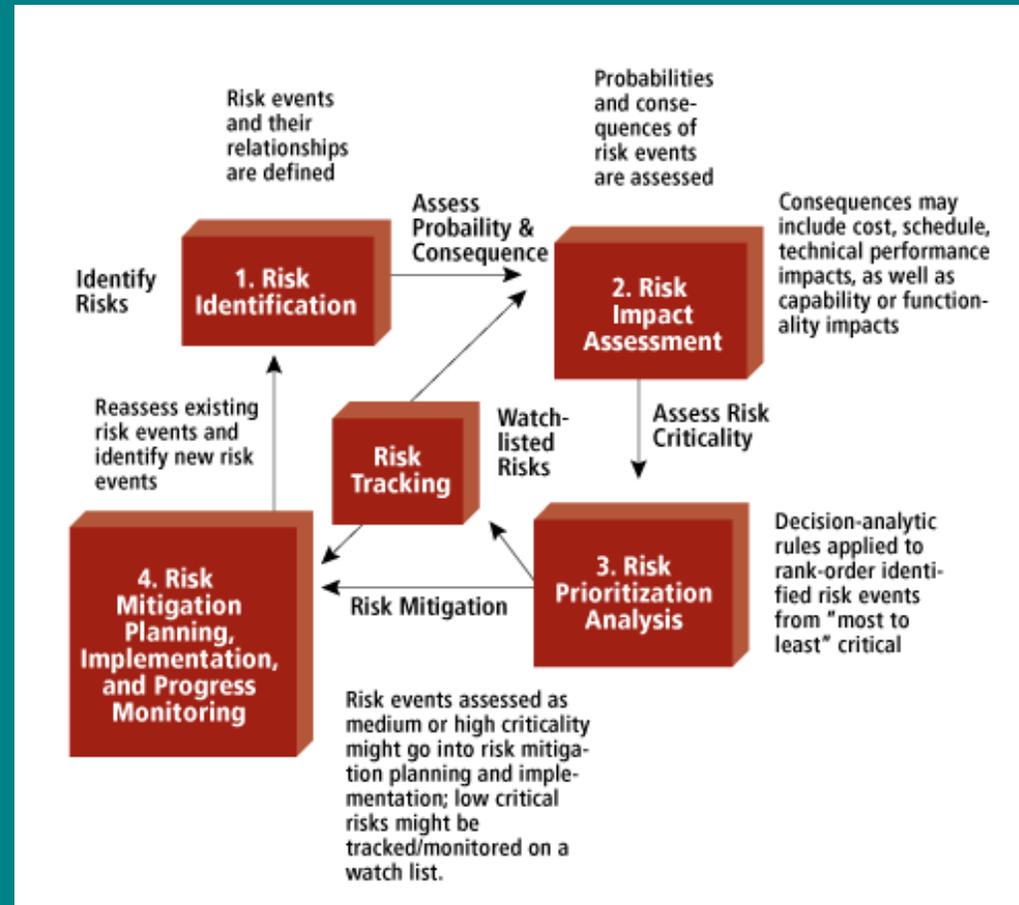


Risk mitigation implementation is the process of executing risk mitigation actions



Risk mitigation progress monitoring includes tracking identified risks, identifying new risks, and evaluating risk process effectiveness throughout the project

Risk Mitigation



Risk Register - Practical



Safety Observation & Intervention Cycle

To make SAFETY is Your Value/ Mind Set. All incident can be prevented. Safety is everybody responsibility

DECIDE



STOP

Pay attention to surrounding work environment



OBSERVE

For Unsafe Acts & Unsafe Conditions



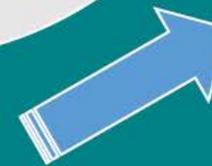
Remove the unsafe acts/ unsafe conditions in situ and report (for data base & analysis)

ACT & REPORT



DISCUSS

How the job or conditions may be done MORE SAFELY



Safety Observation & Intervention Cycle



RISK CONTROL IS ABOUT PEOPLE

Heinrich's Domino Theory says that Incident:

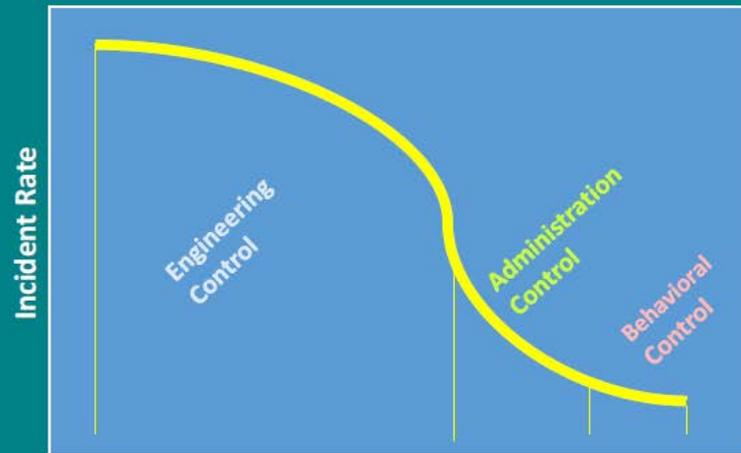


02% Are Unavoidable

10 % Caused by Unsafe Conditions

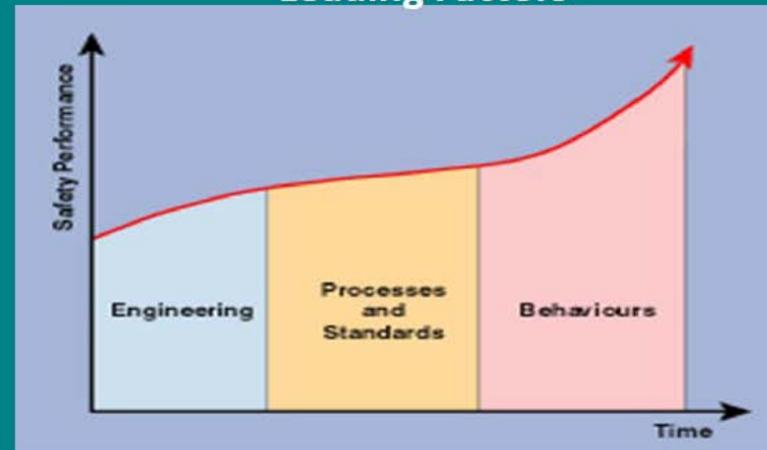
88 % Caused by Unsafe Acts !!!!! (it is about people)

Cost Of Risk Control



Cost Proportional

Sustainability Of Risk Control
Leading Factors





THANK YOU

