

Risk Management & QHSE

Orientation & Training

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Kufan Contracting
14th Nov 2006

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Zero Defect Approach

Safety - Service - Risk - Quality

All Have a Common Approach

Focus	Definition	Goal	Measurement	System
Safety	Program	Zero accidents	CMS*	Preventive
Service	Program	Zero failures	CMS*	Coaching & KM
Risk	Program	Zero loss	Cost in \$	Analysis
Quality	Conformance	Zero defects	Cost in \$	Prevention

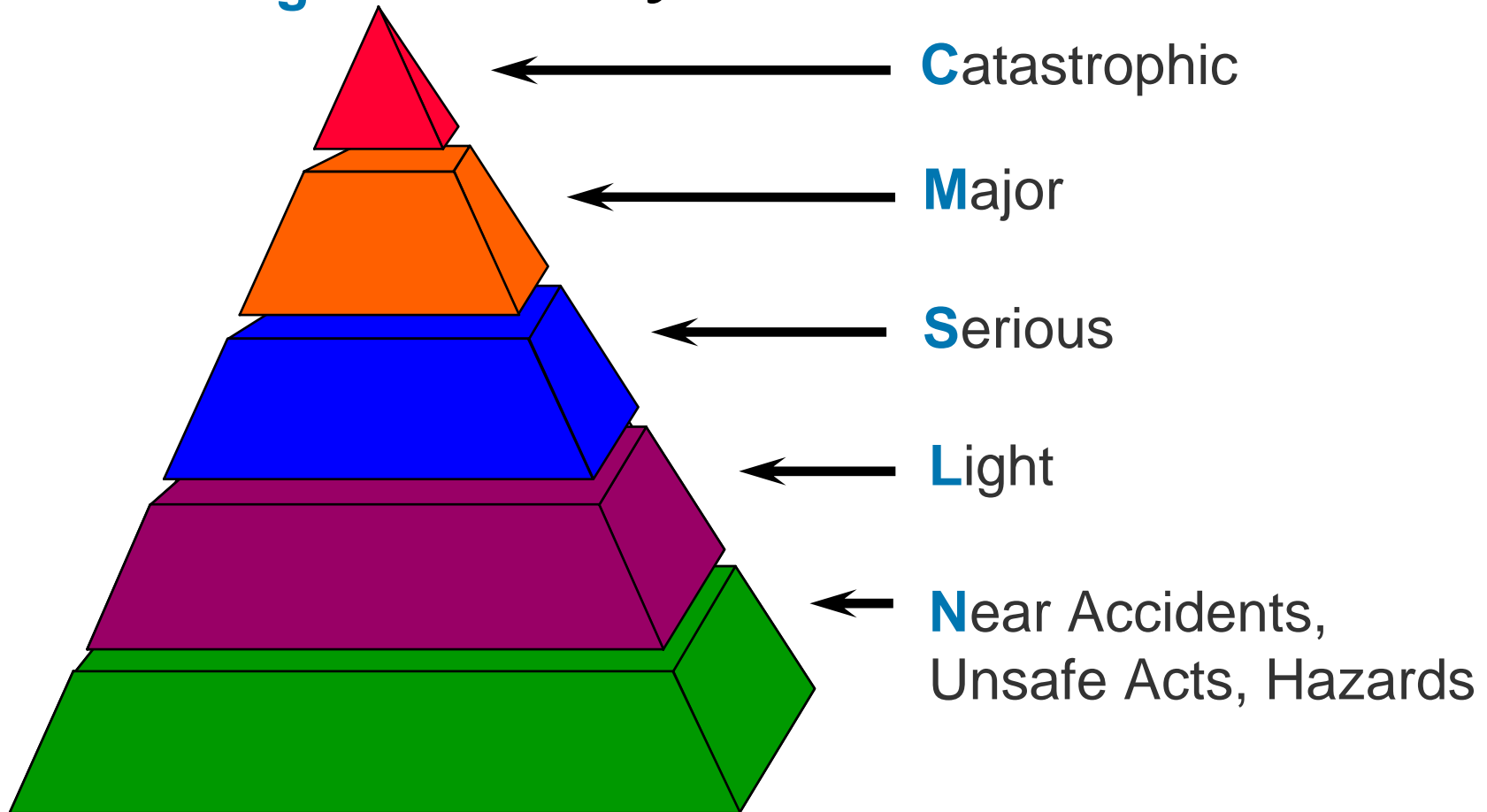
The Common Goals Aim Toward **Zero**:
Accidents, Failures, Losses, Defects

*CMS = Catastrophic, Major, Serious

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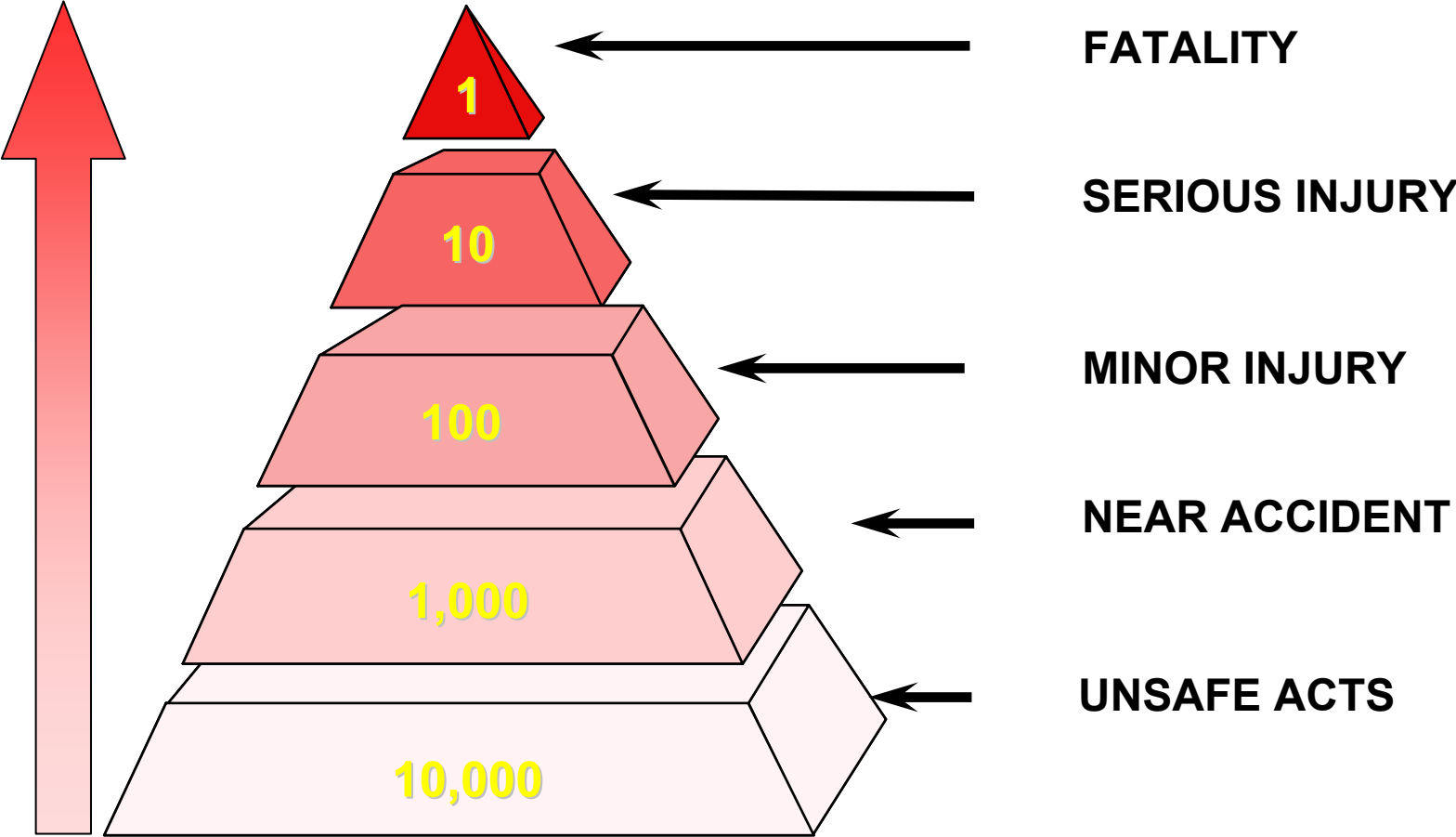
A Common Measurement System

The Iceberg

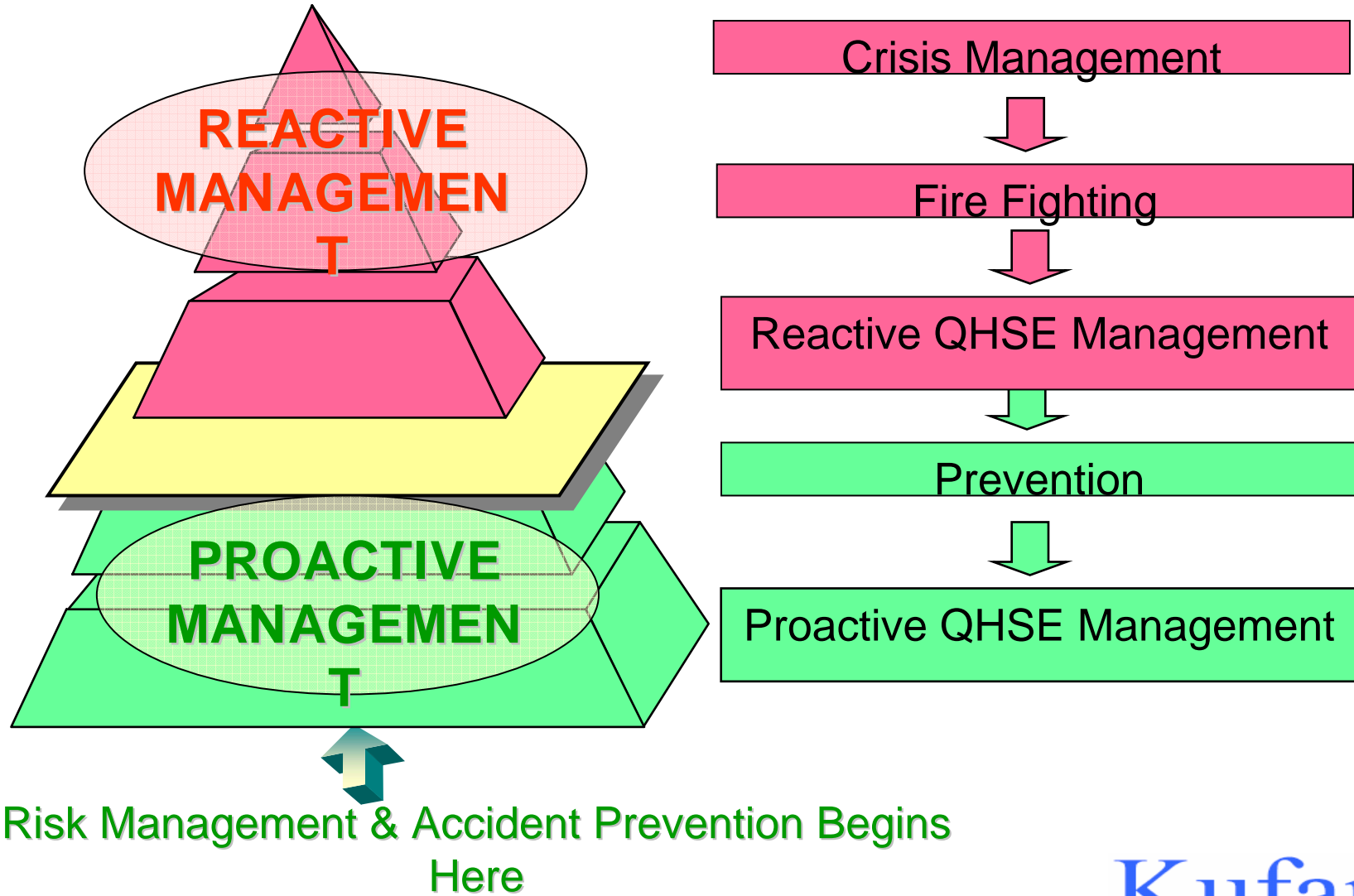


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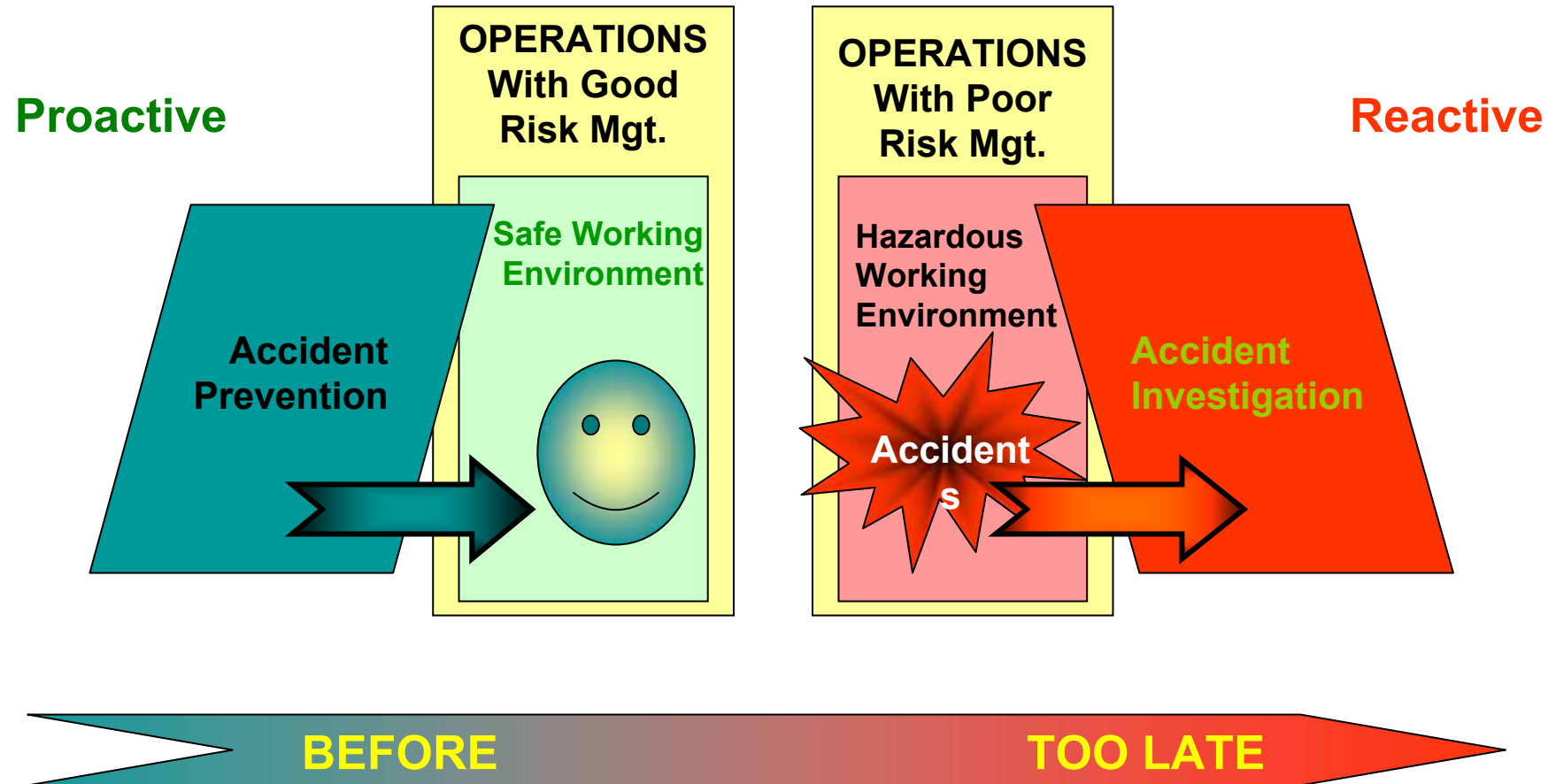
The Incident Pyramid



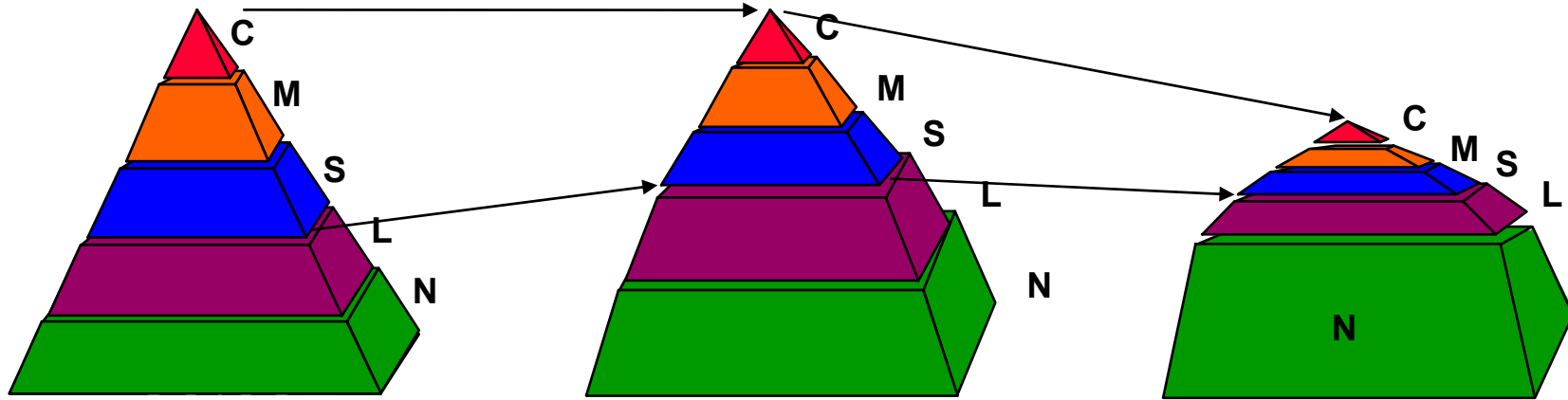
Proactive versus Reactive Management



Proactive versus Reactive



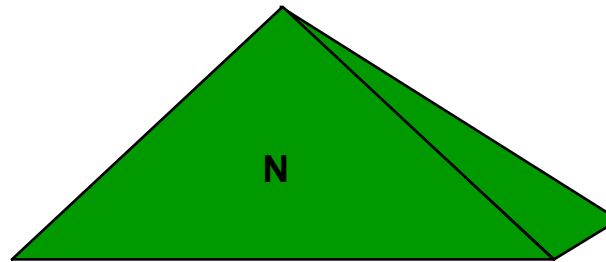
Prediction and Prevention



Without
Continuous
Improvement

Improved
Reporting

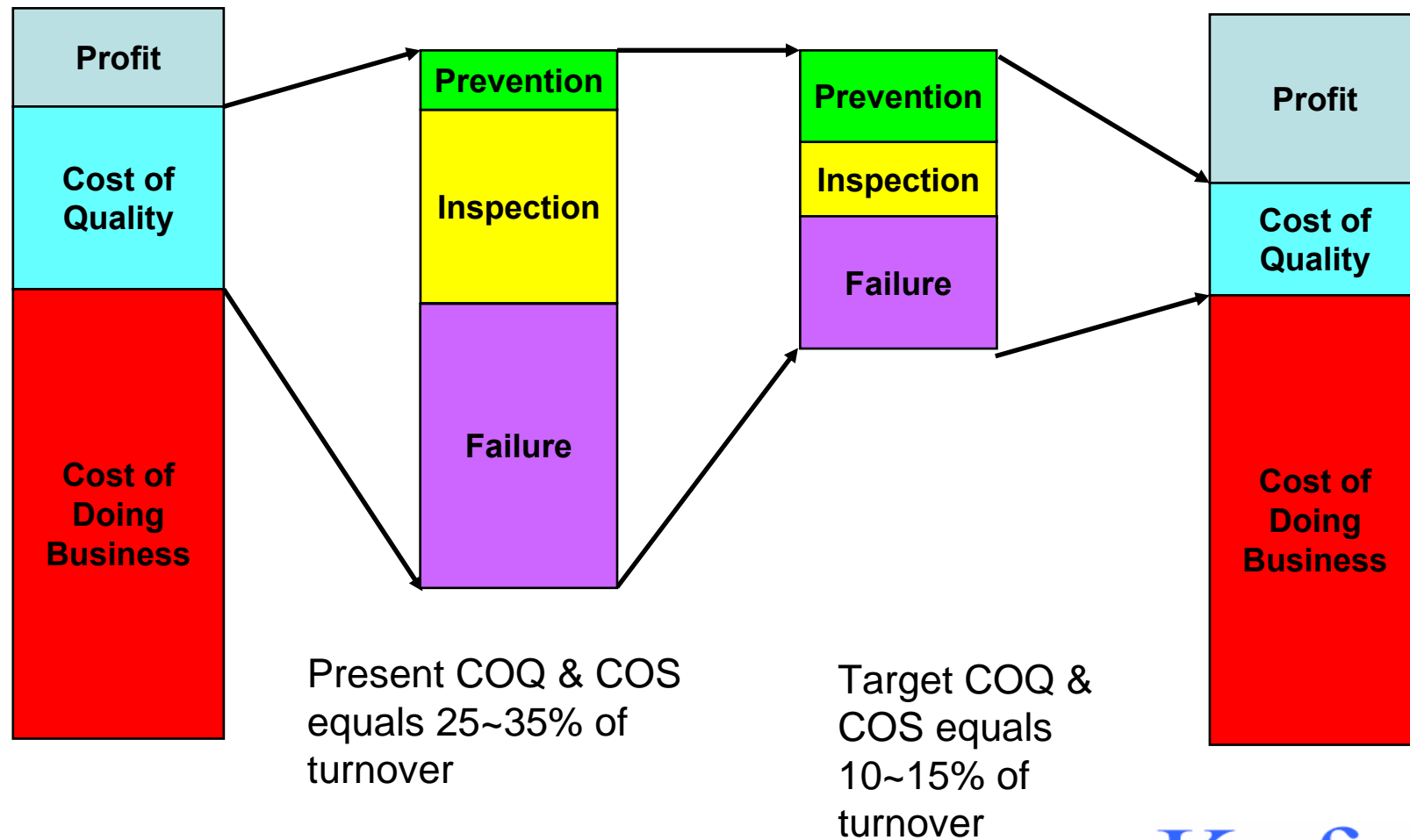
Prevention
Applied



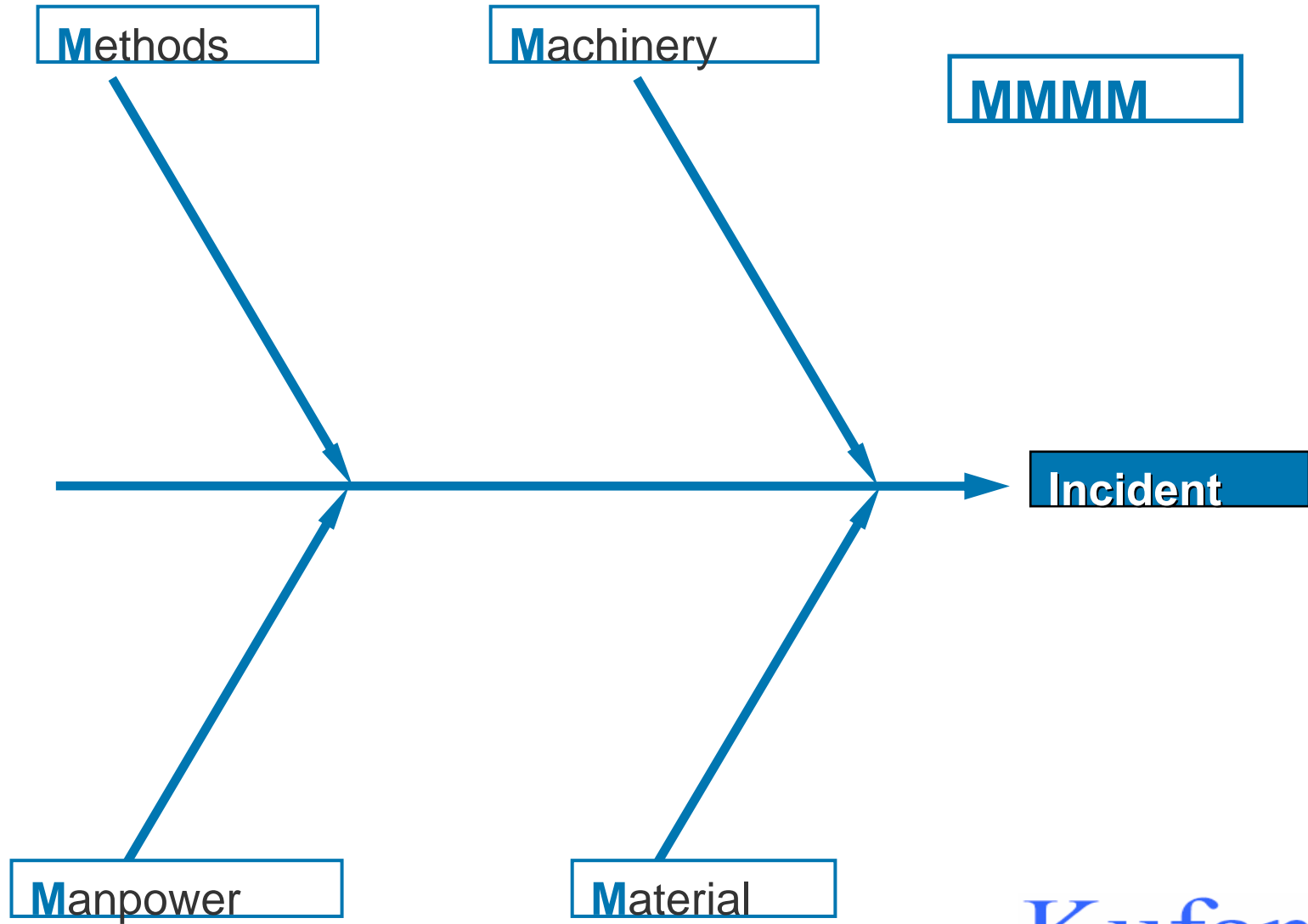
Objective

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Lost Profits



Root Cause Analysis



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First Level Root Causes

Main Contributing Factors

- **Methods**

- Inadequate

- Maintenance & inspection
 - Documentation
 - Failure/defect closure & implementation
 - SOP
 - Planning
 - Communications within organisation
 - Hiring
 - Training and indoctrination

- Incorrect

- Assembly
 - Purchasing standards
 - Equipment assignment

First Level Root Causes Cont'd

- **Materials**

- Inadequate
- Design criteria exceeded
- Quality control
- Environment

- **Machines**

- Design criteria exceeded
- Human engineering
- Tolerance sensitive
- Environment

- **Manpower**

- Skill, ability experience
- Communications-see/hear
- Motivation
- Environment
- Misuse
- Personal factors
- Disposition



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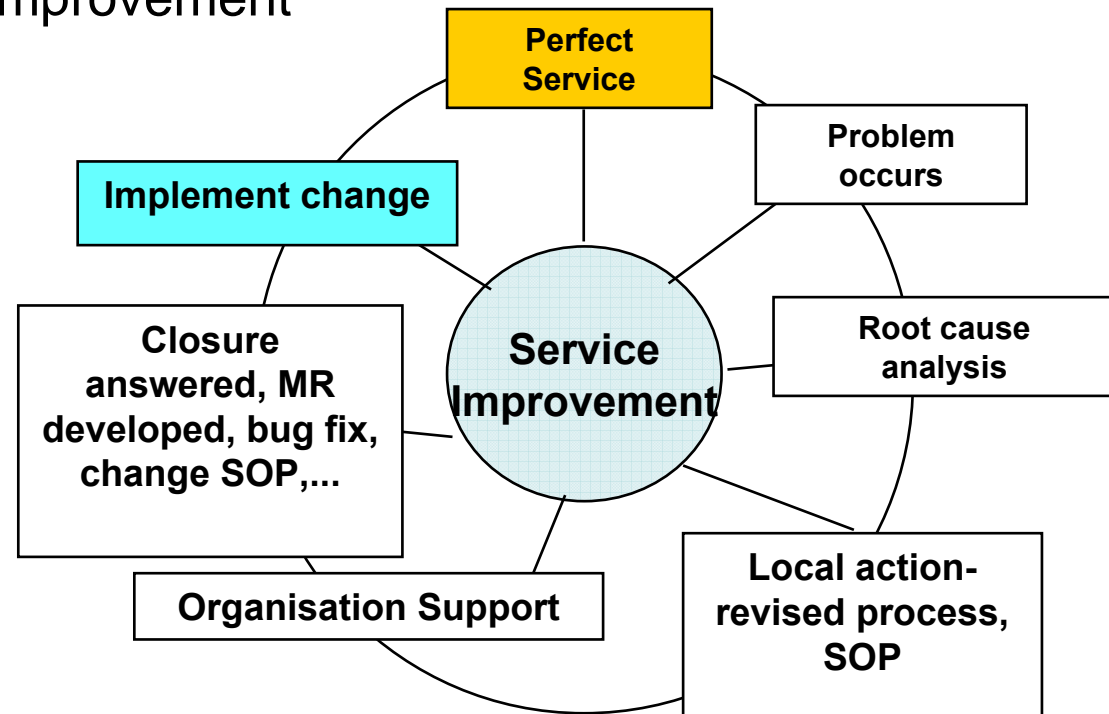


Personal Factors

- Commonly Called Human Factors
 - Error rate
 - Level of arousal
 - Work load
 - Fatigue, stress
 - Circadian cycle
 - Visual illusion
 - False hypotheses
 - Creature of habit
 - Motivation, leadership & creativity
 - Communications and “Power Distance”

Root Cause Analysis: why do it?

- Because:
 - It leads to improved service for our Clients
 - It ensures continuous improvement
 - It reduces cost
 - It increases profits



Root Cause Analysis - Process

- **How**

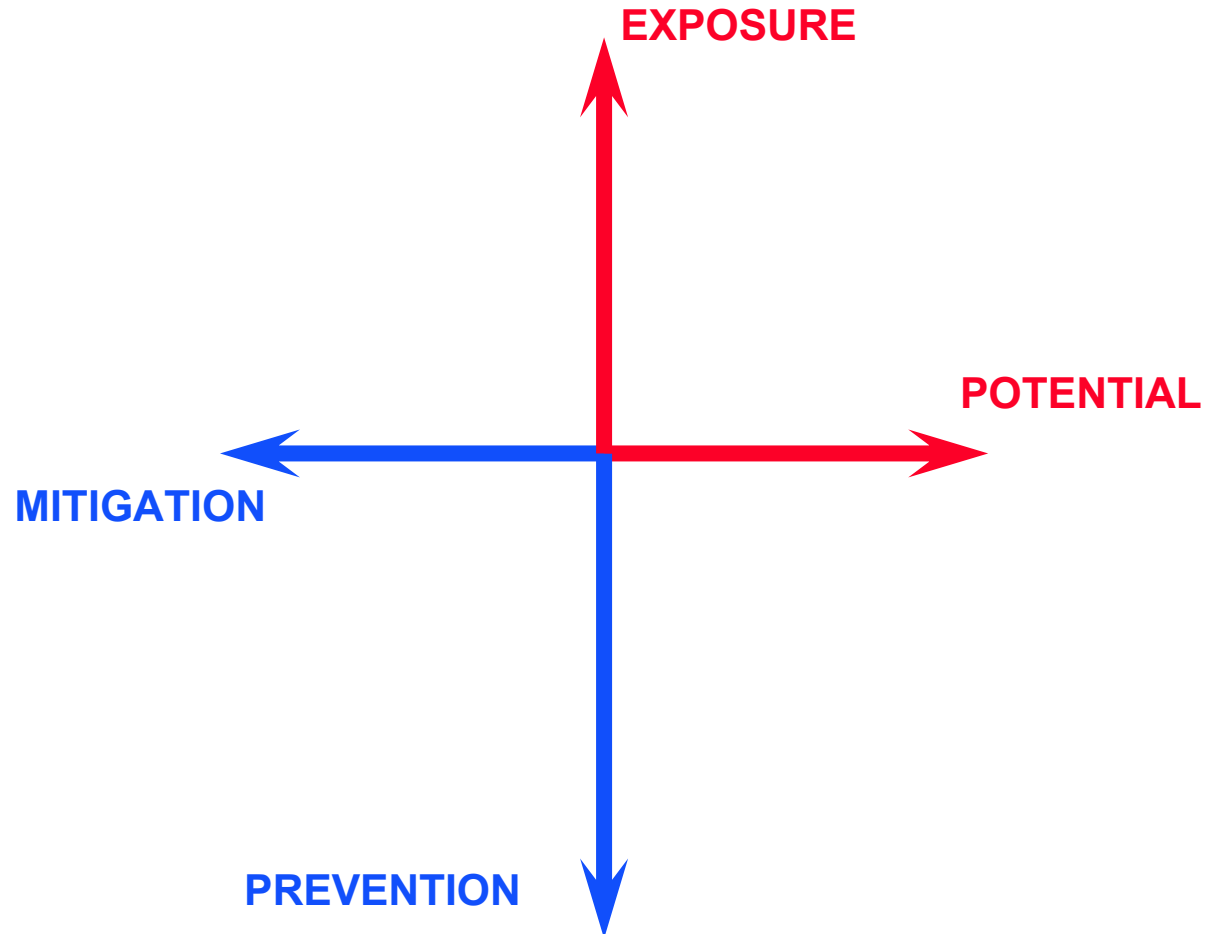
- Gather the facts
- Drive down to the root cause
 - Ask WHY
 - Ask WHY
 - Ask WHY...
- For corrective action, choose 20/80

- **Then Apply Preventive Methods**

- Follow SOP
- Self and crew training
- Brief and debrief (Morning meeting)
- Job preparation, check lists.
- Cell system (Team) of assigned equipment
- Implement change

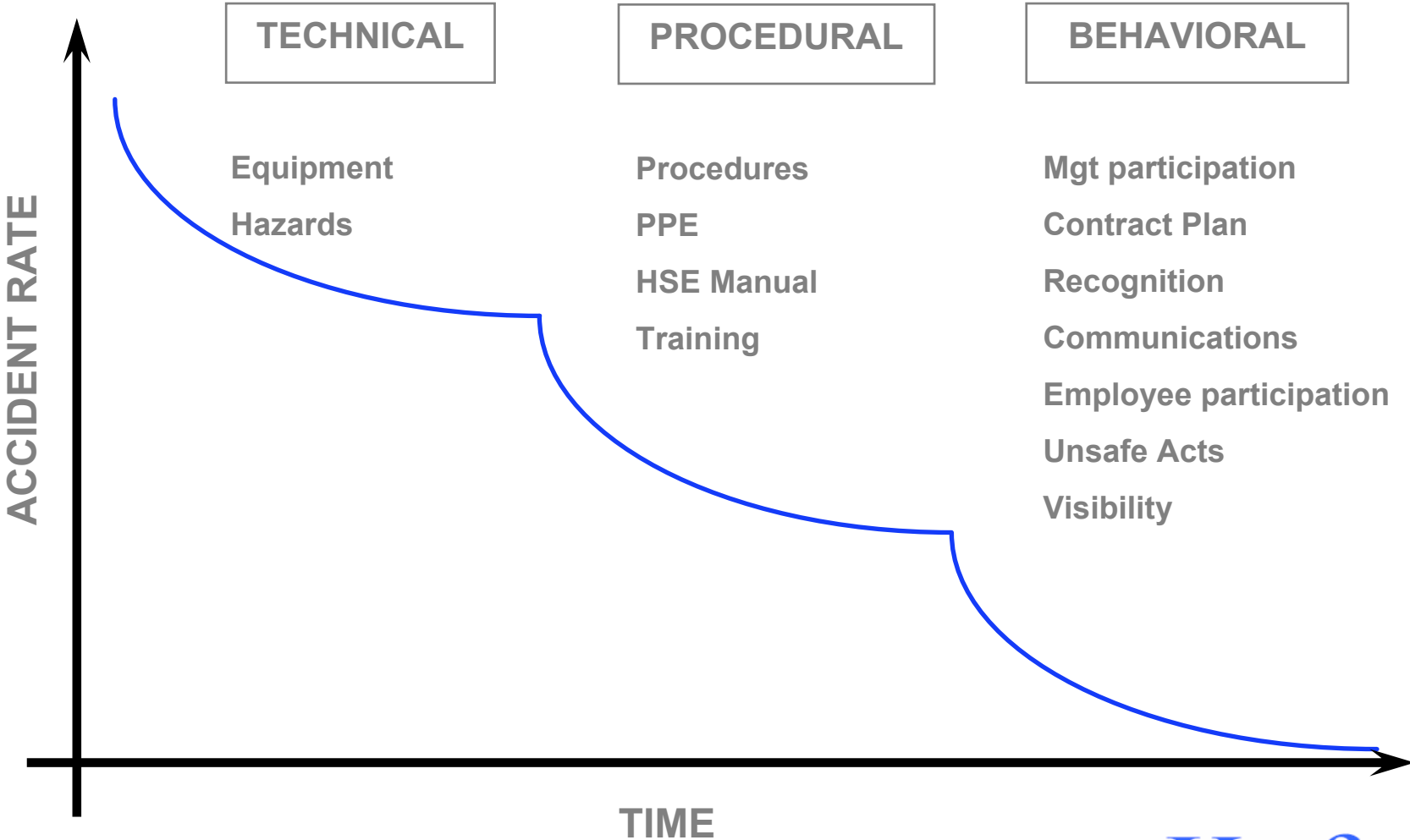
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Risk management



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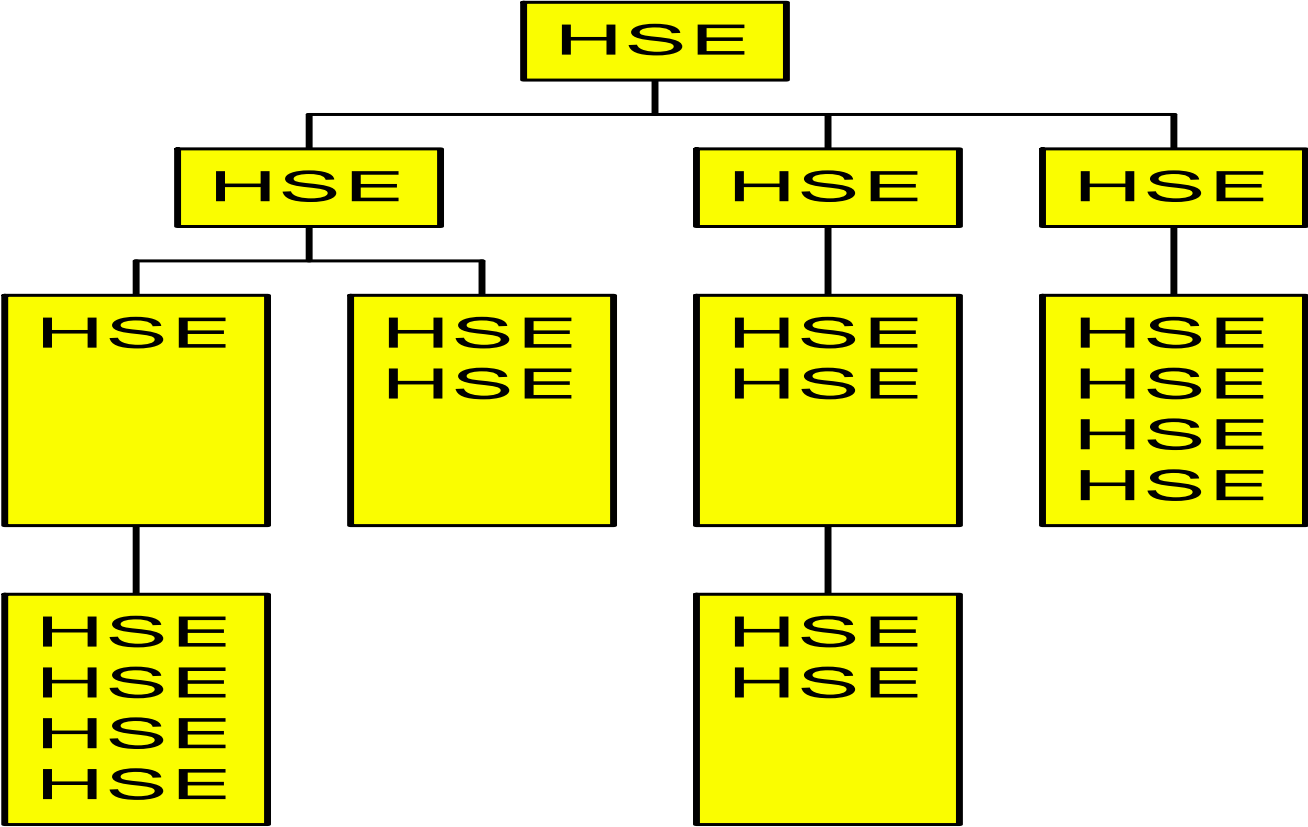
The three phases of risk minimization



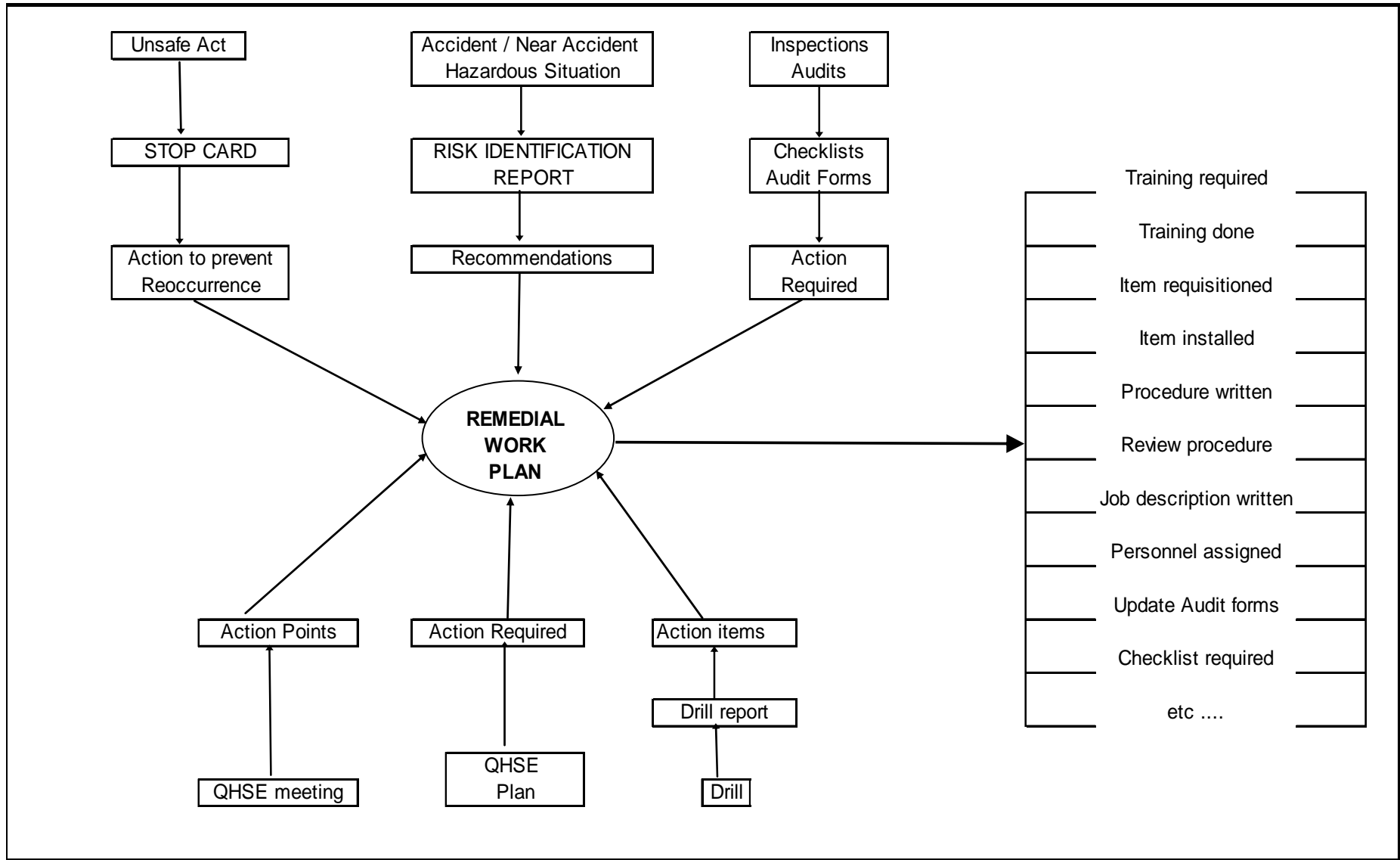
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The behavioral phase

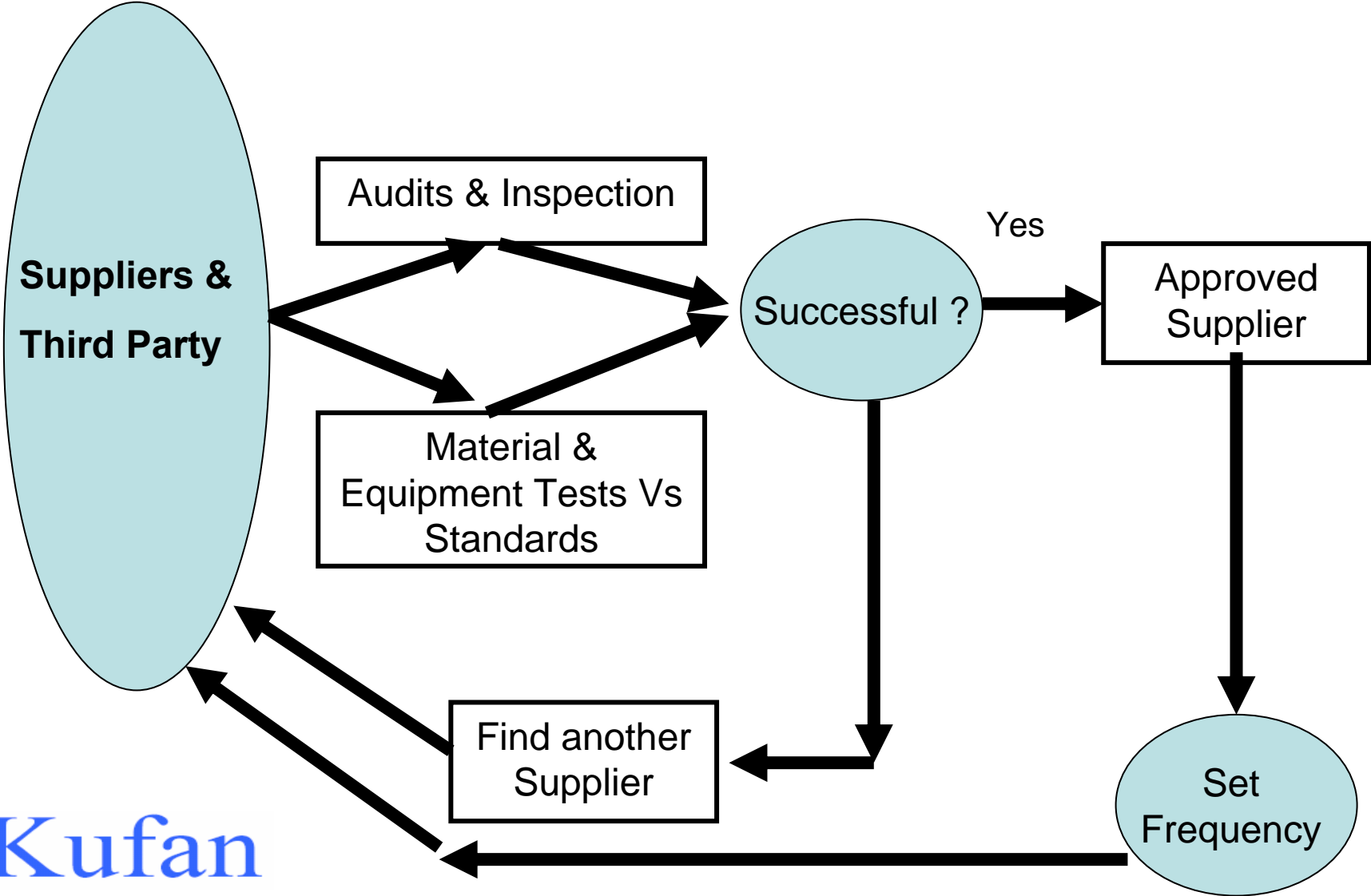
(Our Aim)



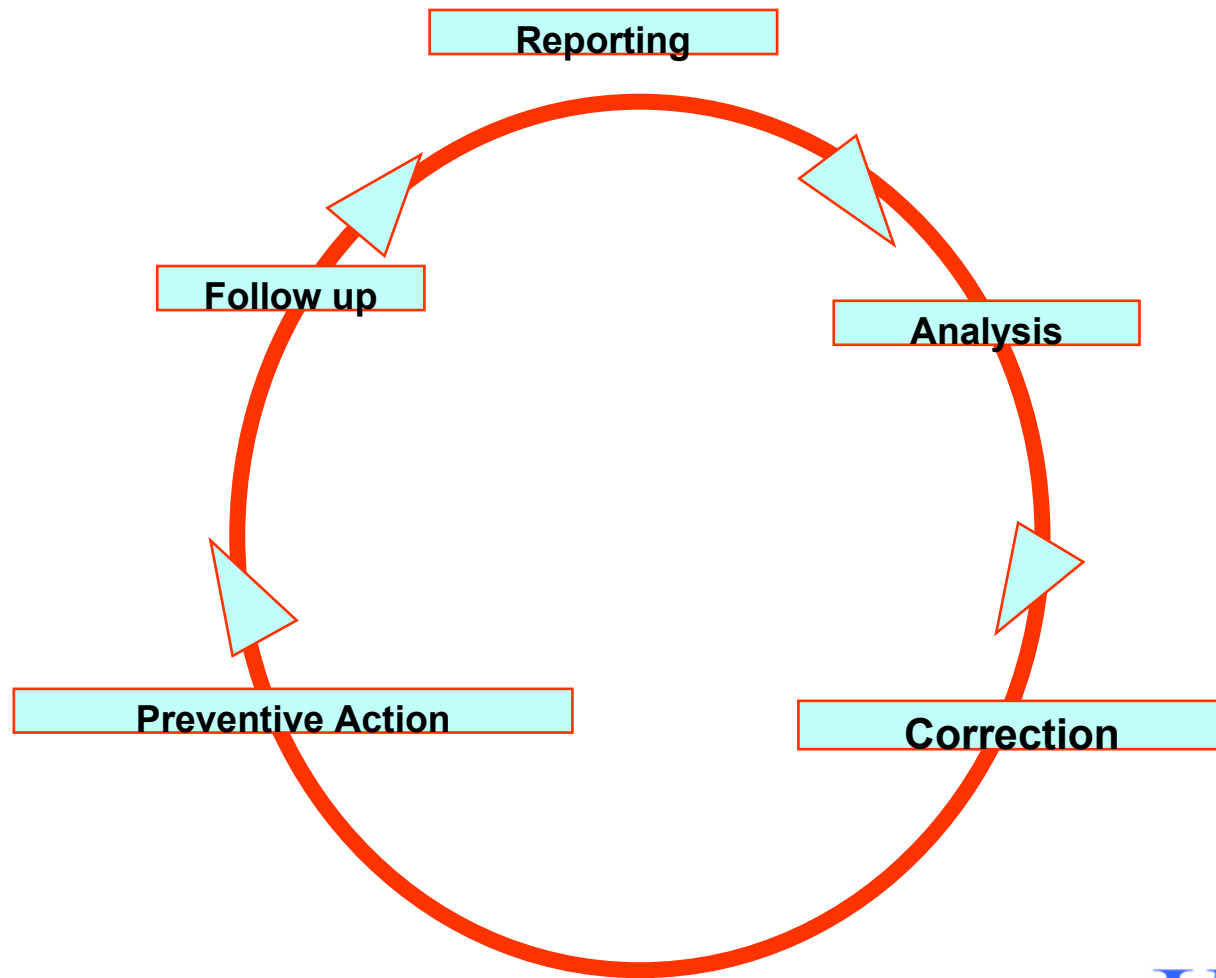
THE REMEDIAL WORK PLAN



Supplier & Third Party Quality Assurance & Certification



The continuous improvement loop

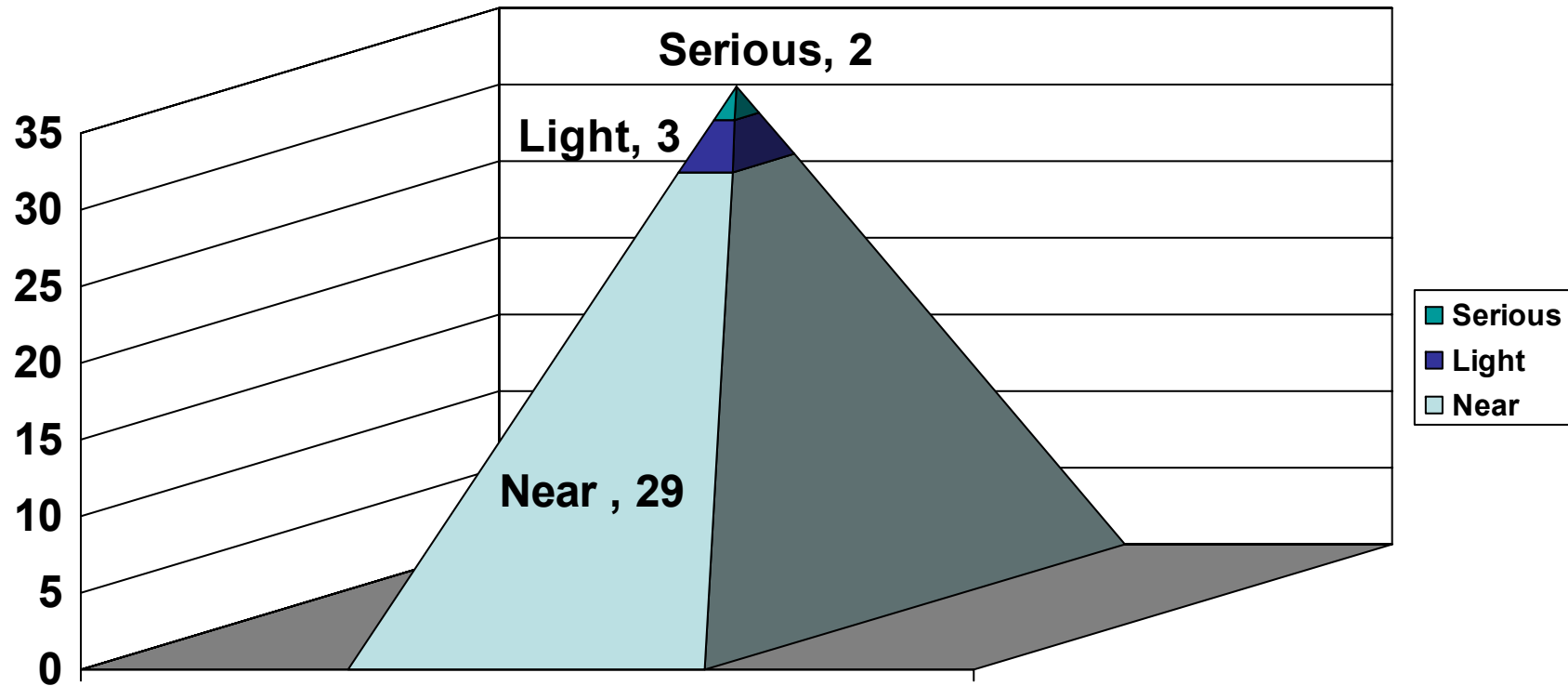


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Performance Key Indicators (PKI)

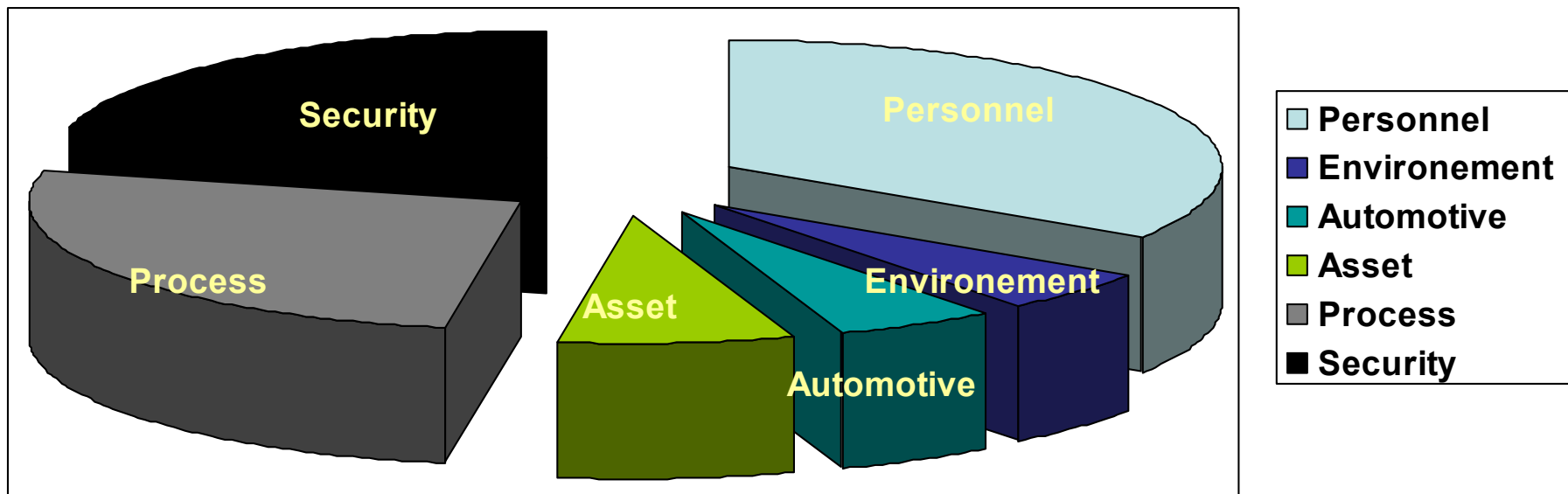
- **DPR (daily progress report)** – Which includes a brief of the daily activities and the day to day QHSE indicators.
- **Tests, Audits & Inspections** – The frequency is set on case by case fashion.
 - Tests are done for material & their compliance to contractual standards.
 - Audits are done to material In, quantities & suppliers. (Log Book Inventory)
 - Inspections are done for equipment & Machinery
- **QHSE events :**
 - QHSE Risk Identification Report.
 - STOP Card
 - Accident Report
 - QHSE Suggestion
- **Tasks monitoring sheets.**
 - Pipe measuring sheet.
 - Manhole Construction sheet.

QHSE Events

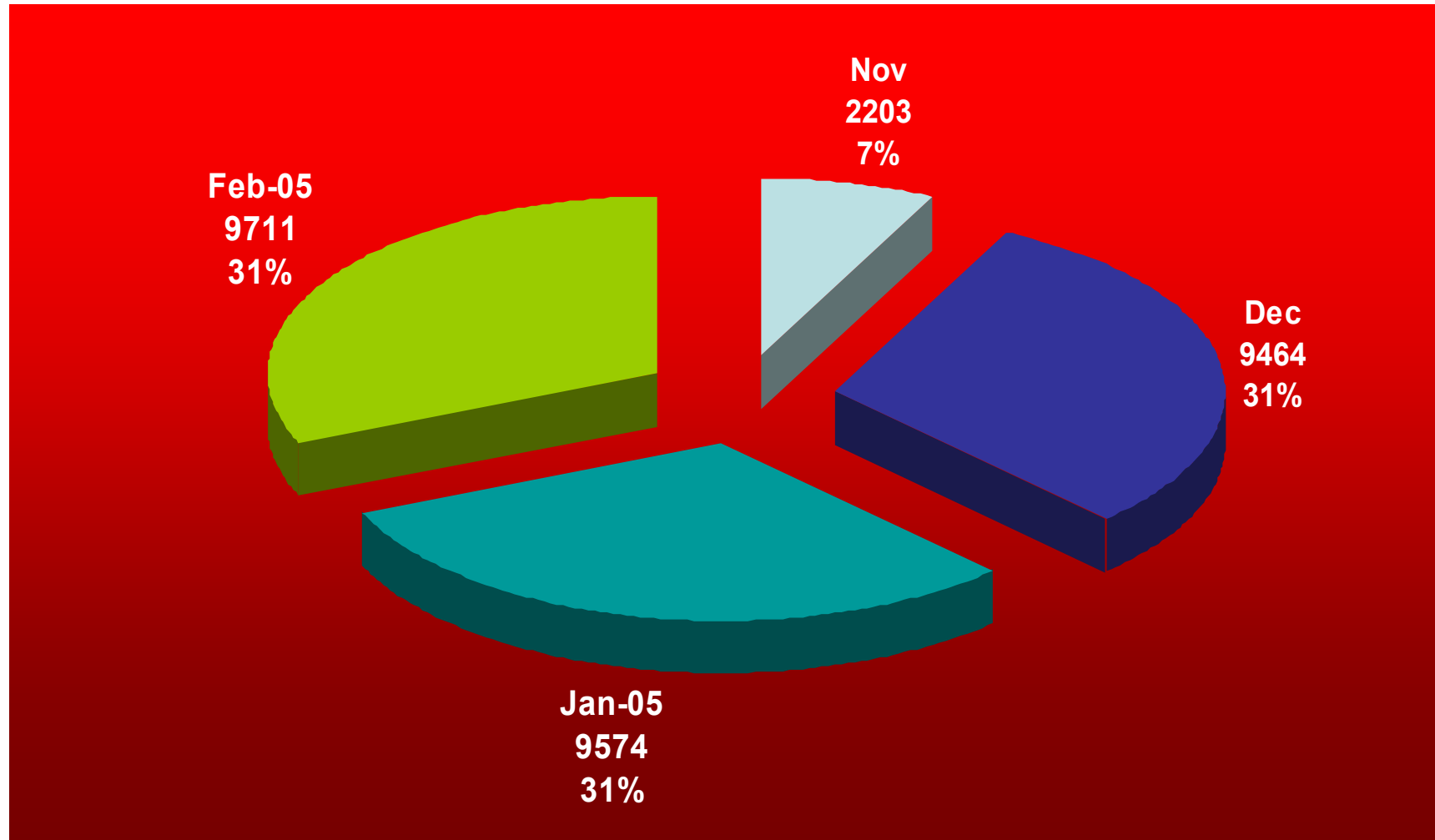


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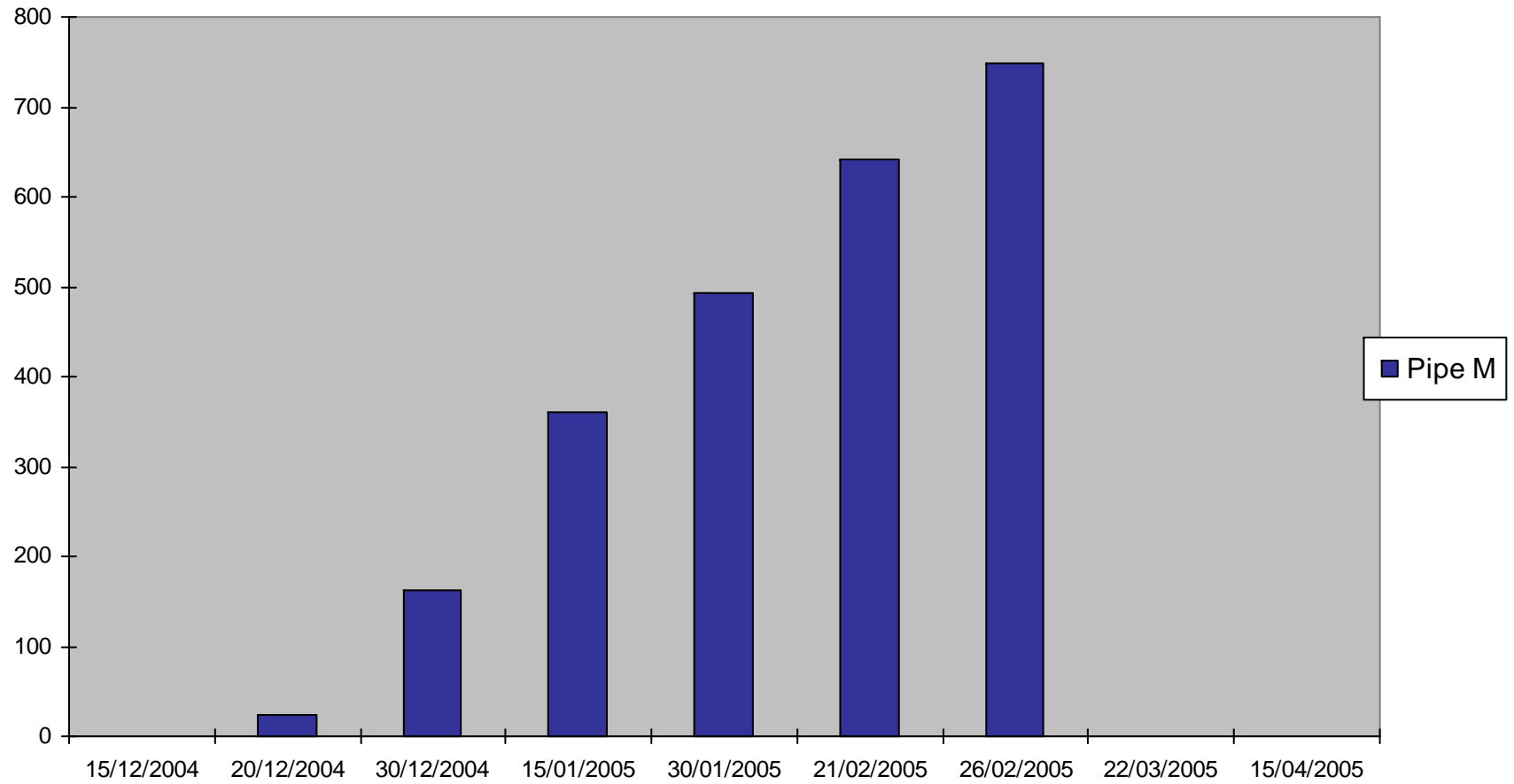
QHSE Events Occurrences



Total Man Hours (TMH)

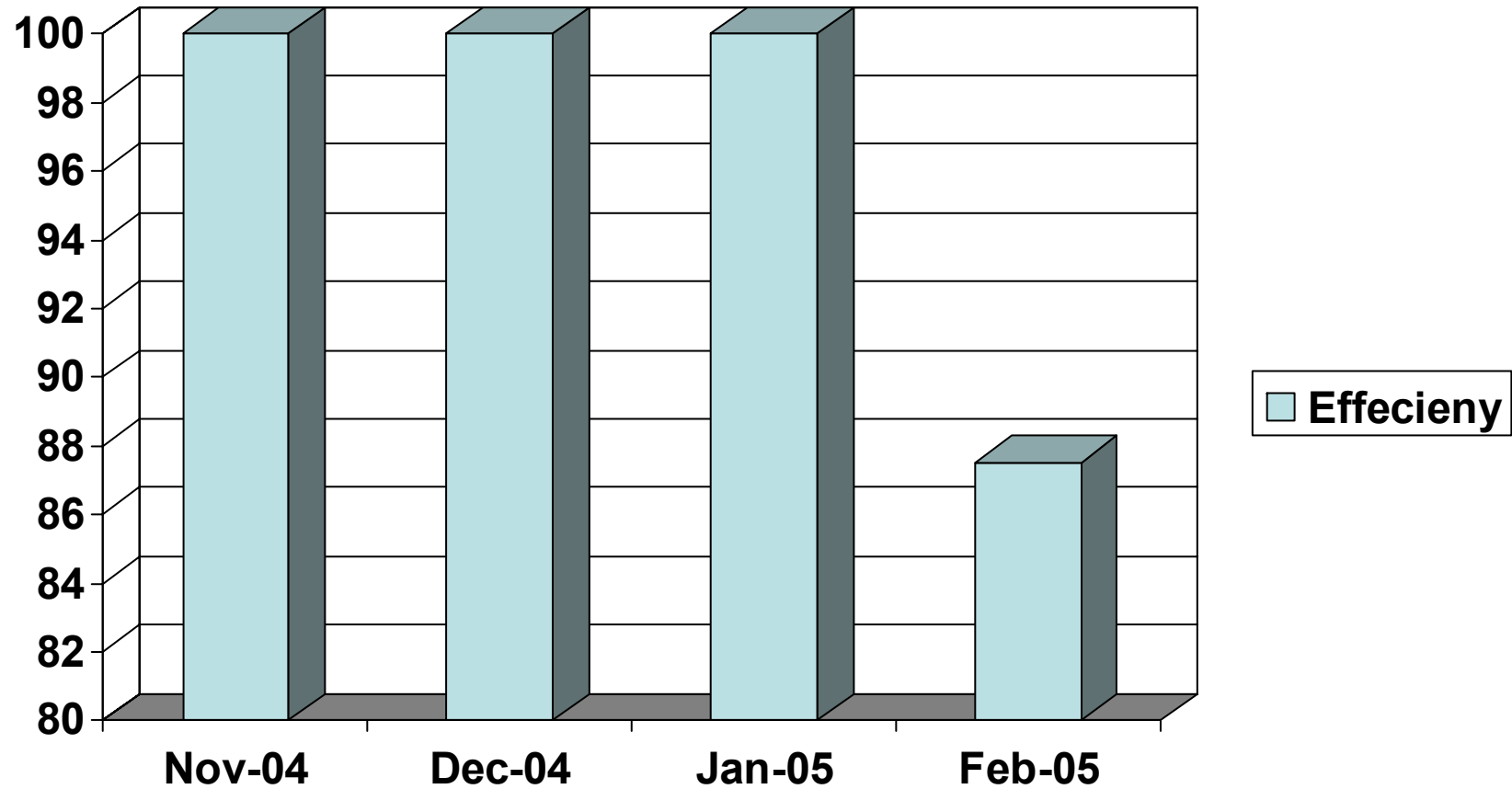


Pipes Laid



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Efficiency (OT-LT/OT)



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Contracting

Daily Progress Report (No 34)
Al Zafaraniyah Gravity Sewer Trunk line.
Project 744066-30002

Tue 21st Dec 2004.

Summary :

(Construction Phase – Installation of 900mm pipe between LM1 to LM11)
No LTI (lost Time Injury), accidents, no incidents.

Highlights :-

low Lights :-

Operations details :



- **Install of pipes, 2 pipes of (6) m length between LM2 and LM3.**
- **Survey works continue to locate the manholes and trunk line between LM5 to LM11 and peg out accurately. Existing ground level surveyed and recorded.**
- **Excavate the trench between LM3 to LM4 to the formation level.**
- **Continue of trench excavations from LM4 to LM5 to depth of 1.5 m.**
- **Furnish and backfill the pipe zone materials between LM2 and LM3.**
- **Utility relocation allowance preparations work for the high voltage tower in the route of trunk line.**
- **Separate 900mm pipes from 1400mm pipes and prepare the bundles of 1400mm pipes to transport to storage near SE 1.**
- **Procure of 6 trucks of crushed gravel.**

for next 48 Hrs:

- **Continue installation of pipes.**

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Material Test (Lab tests)

BAGHDAD ENGINEERING LABORATORY Aqaba Bn-Nafi'e Sq. Hay Al-Wahda-904/ 60/ 11 Karradah - Baghdad Tel.: 7194914 P. O. Box: 2376 Elweyaa		 مختبر بغداد الهندسي الكرادة الشرقية - ساحة عقبة بن نافع - حي الوحدة محطة ٩٠٤ - زقاق ٦٠ - دار ١١ بغداد - العراق تلفون: ٧١٩٤٩١٤ ص.ب: ٢٣٧٦ عطوية	
No.: 10104 Date: 16/1/2005		To: Messers Kofan Company	
Subject: Test Results			
<i>Dear Sirs,</i> Reference to your letter No. / Dated on / Please find enclosed the grading curves of samples of Sand forwarded to our laboratory on 15/1/2005 also find tabulated below the results of sulphate tests and material finer than sieve No. 200.			
Lab. No.	Sulphate Content (%)	Passing Sieve No. 200 (%)	Grading
Sand-8451 KHALID(1)	0.20	2.50	Within grading of zone (2).
Required by Iraqi Standard No. 45/1980	Not more than	Not more than	
For Sand	0.50 %	5.0%	Within grading of zones limit
For Gravel	0.10%	3.0%	Within grading of limit
For Sand for mortar and rendering	0.75%	5.0%	Within grading required
Remarks: • The sample of Sand above is comply with the Iraqi Standards for Sulphate contents, Clay contents and Grading therefore it is considered suitable for Concrete works.			
 Yours Sincerely Sally G. Yasso Baghdad Engineering Lab. BAGHDAD ENGINEERING LABORATORY			

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Lab Tests Log Book

Lab Tests Log Book (All Tests)

Material	Date	Quantity	Type	Lab	Supplier	Results
Gravel	06-Dec	36 m3	Sieve analysis	Andrea	mohamed salah	Fail
gravel	09-Dec	36 m3	Sieve analysis	Andrea	mohamed salah	Fail
Gravel	11-Dec	500 m3	Sieve analysis	Andrea	Abo Nabaa	Pass
Gravel	22-Dec		Sieve analysis	Andrea	Abo Nabaa	Pass
Crushed gravel	22-Dec	200 m3	Sieve analysis	Andrea	Abo Nabaa	Pass
Rebar	22-Dec		Strength	Andrea	Local Market	Pass
Gravel	25-Dec		Sieve Analysis	Andrea	Abo Nabaa	Fail
Crushed Gravel	25-Dec		Sieve Analysis	Andrea	Abo Nabaa	Pass
Gravel	30-Dec		Sieve Analysis	Andrea	Abo Nabaa	Pass
Gravel	03-Jan	200 m3	Sieve Analysis	Andrea	Abo Nabaa	Pass

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Log Book (Material-In)

Material	Date	Quantity	Supplier
Gravel	06-Dec	36 m3	mohamed salah
gravel	09-Dec	36 m3	mohamed salah
Gravel	11-Dec	500 m3	Abo Nabaa
Gravel	22-Dec		Abo Nabaa
Crushed gravel	22-Dec	200 m3	Abo Nabaa
Rebar	22-Dec	3 Ton	Local Market
Gravel	30-Dec	200 m3	Abo Nabaa
Gravel	03-Jan	200 m3	Abo Nabaa
Gravel	05-Jan	300 m3	Abo Nabaa

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Equipment Status Book

From the start of work - Till today

Dates From-To	Lost Time	Date Of Failure	Operational Date	Failure	Active Operation Time (Hrs)	Operation Time (Hrs)	Type	Nu
19-12- to- 27-2			19/12/2004		420	448	Kawasaki FL	1
19-1-to-26-1	48	19/01/2005	26/01/2005	Engine failure (Center)			Kawasaki FL	1
18-12-to-27-2			18/12/2004		280	320	Caterpillar F.L	2
28-1-ot-29-1	8	28/01/2005	29/01/2005	Fuel Pump			Caterpillar F.L	2
5-1-to-8-1	24	05/01/2005	08/01/2005	Driver Absence			Caterpillar F.L	2
s			18/12/2004		392	408	Hitachi Excav	3
28-12-ot-27-12	8	28/12/2004	29/12/2004	Fuel Pump			Hitachi Excav	3
25-1-ot-27-1	16	25/01/2005	27/01/2005	Hydraulic Hose			Hitachi Excav	3
8-1-to-22-2			08/01/2005		208	224	Komatsu 210 Exc.	4
8-1-to11-1	24	08/01/2005	11/01/2005	Oil Filter & Eng Belt			Komatsu 210 Exc.	4
15-1-to-22-2			15/01/2005		192	200	Komatsu 240 Exc.	5
11-1-ot-15-1	48	18/01/2005	15/01/2005	Heat Switch			Komatsu 240 Exc.	5
2-2-to-22-2			02/02/2005		98	176	Compactor 1 ton	6
18-1-ot-2-2	56		18/01/2005	Gear			Compactor 1 ton	6
3-12-to-22-2			30/12/2004		92	248	Compactor (Small)	7
19-12-to22-2			19/12/2004		300	440	Crane	8
19-12-to-22-2			19/12/2004		320	320	Generator 25 KV	9
20-1-to-24-1	24	20/01/2005	24/01/2005	رأس التوليد			Generator 25 KV	9
20-12-to-22-2	24	24/02/2005	20/12/2004		204	368	Generator 5KV	10
5-1-to-22-2			05/01/2005		128	218	Generator 2.5	11

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QHSE Events

QHSE : No 16

2-Risk Identification Report :- Category : People

Severity: Near

a- What happened ? (People, Asset, Process) ... In Brief

- **Not enough ladders – being highlighted in the weekly Meeting. With an open trench of 240M, there should be at least one fixed ladder on every 40M.**
- **Two Ladders were kept in only the condensed work area**

b- Why Happened (Cause & Analysis)

- **Lack of safety awareness.**

c- How to Prevent from happening again (corrective actions)

- **Point was highlighted to senior foremen, there was a bit of defensiveness, they got convinced in the end. Carpenter & welder were requested to make extra 6 ladders (a mix of wooden & steel ladders) - Done**

Status : Closed – day 15th Jan 2005

QHSE Events

QHSE : No 19

STOP Card : Category : People

Severity: Near

a- What Was Wrong ? (Practice, Behaviour or danger)

- Leaders Breaking the rules !! Hard Hat is used by labourer working inside the trench. But group leaders (Foremen Or Engineers) sometimes they go inside the trench to direct workers do not use hard hats.
- Reason was simply the unavailability of extra hard hats in the location.

b- Corrective action ? (Training & raising awareness)

- Spot meeting with Senior Formen, solution was to put two extra Hard Hats inside the trench (set aside in a clean spot)

Status : Closed on 6th Jan 2005.

QHSE Events

QHSE : No. 20

Suggestion: (ideas to improve work place & operations)

a- What to Improve ? (Resources or **Process)**

As a part of implementing our Emergency Response Plan (Safety Evacuation) – A suggestion came to communicate with a nearby hospital in Al Zafarniyah area to ensure fast admission & good medical care. Dr. Ayman. (based in Al Zafaraniyah Govt Hospital) will be our focal point for any worksite injury & to ensure good evacuation & good medical treatment.

b- The Added Value ? (Impact on Orgaization, Operation or Morale)

- Time is precious in injuries. Few minutes earlier could save his live.

Status : **Closed** on 21st Dec 2004.

Kufan Accident Report

Reporter: Mavthem Al Asdi **Time & Date (Incident) :** 9:00am 7th Feb 2005
Accident classification (severity): Serious (Refer to Severity Table)
Accident Category: Personnel & Security
Type of Risk: People
Lost Time Injury: 2 days **Name Of Injured :** Mahmood Al Meshry / Salah Hadi
Job Title: (Senior Foreman) / Excavator Driver
Location Of Accident : Near LM -7 (900mm Line)

PROBLEM IDENTIFICATION

State the Problem:

- People in one of the houses close to LM 7, had a confrontation (Hand Fight) with two senior foremen and one excavator driver from Kufan, two of Kufan Personnel had some light-medium injuries. Work was suspended for 72 hrs to resolve the incident amicably and avoid any risks escalation that may erupt. (threats were received from the other party)

Injury Details:

1- Mahmood Al Meshry (Senior Foreman) : Minor face injuries (Lips & eye-browse)
First Aid was provided (No clinical treatment was needed)

2- Salah Hadi (Excavator Driver) : Back bruises & ear injury
First Aid was provided – Clinical checks were done (Including X ray) – Medical Advice was to take 2 days home rest.

ROOT CAUSE ANALYSIS

Miscommunication. Very poor communication prior to incident. (Incident was avoidable)

ACCIDENT PREVENTION

Continuous improvement of communication with the local residents & more social interaction. To resolve potential problems prior to occurrence.

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Pipe Laying (Measurement Sheet)

As Built Measurement Summary

No	Manholes	Distance LM	Comments	Date Started	Dates Of Completion	Duration (Days)
	SE224-LM1	4	Un-Completed			
1	LM1-LM2	75	Full	19-12-04	03/02/2005	
2	LM2-LM3	68.2	Full	23-12-04	27-12-04	5
3	LM3-LM4	68.2	Full	27-12-04	29-12-04	4
4	LM4-LM5	68.2	Full	30-12-05	01/02/2005	4
5	LM5-LM6	96	Full	01/02/2005	01/11/2005	10
6	LM6-LM7	61.4	Full	01/11/2005	16-01-05	6
7	LM7-LM8	42	Full	17-01-05	18-01-05	2
8	LM8-LM9	60	Full	19-01-05	25-01-05	7
9	LM9-LM10	103.9	Full	25-01-05	21-02-05	28
10	LM10-LM11	42	Full	22-02-05	23-02-05	2
11	LM 11-LM12	60	Un-Completed	23-02-05	24-02-05	2
					Total Days	70
					Avg Meter Pipe/Day	10.7
					Target Avg Meter/Day	12

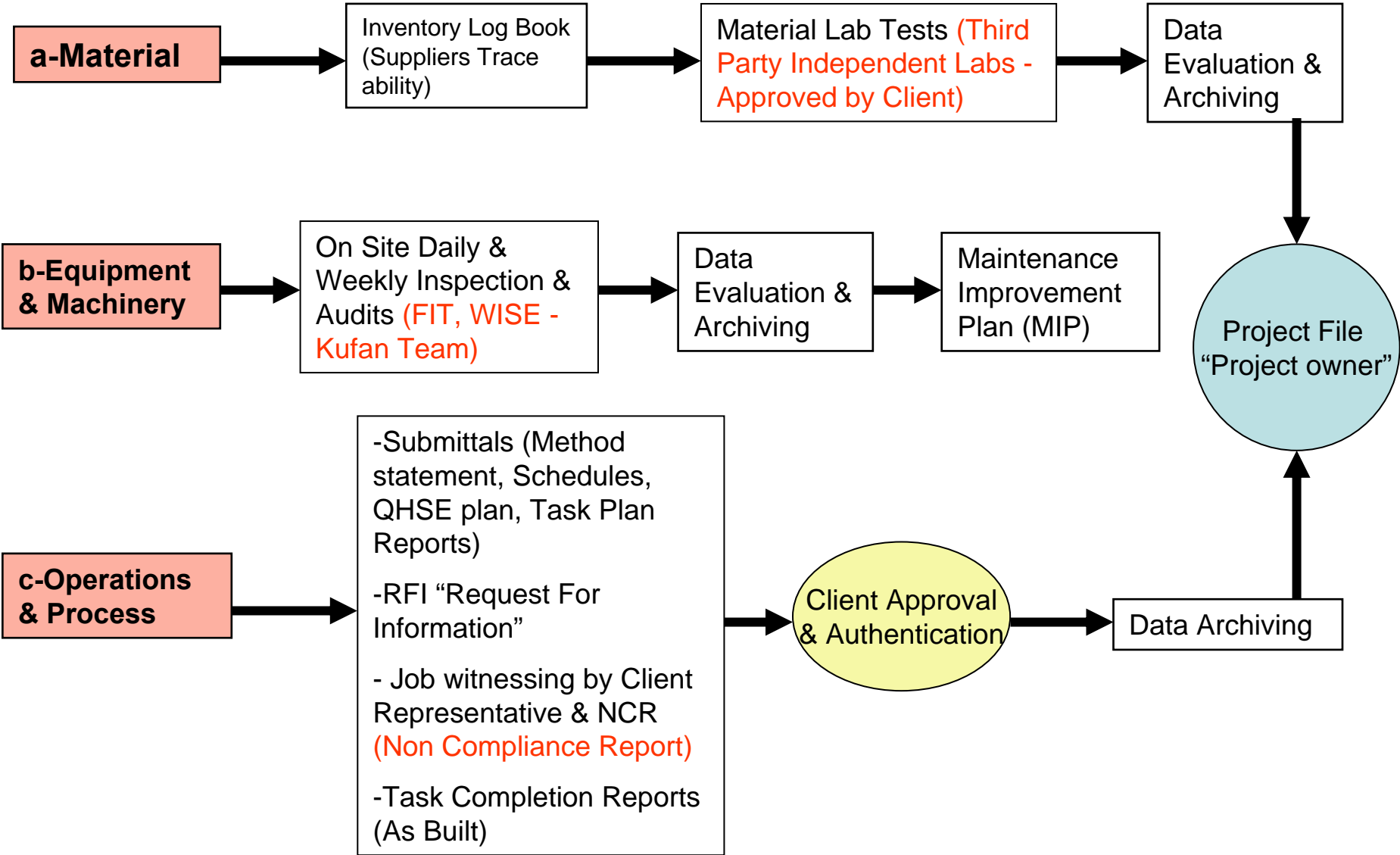
Total Meter Pipe Laid	748.9
Total Meter Pipes to be Laid for 900mm	830
Total Length left	81.1

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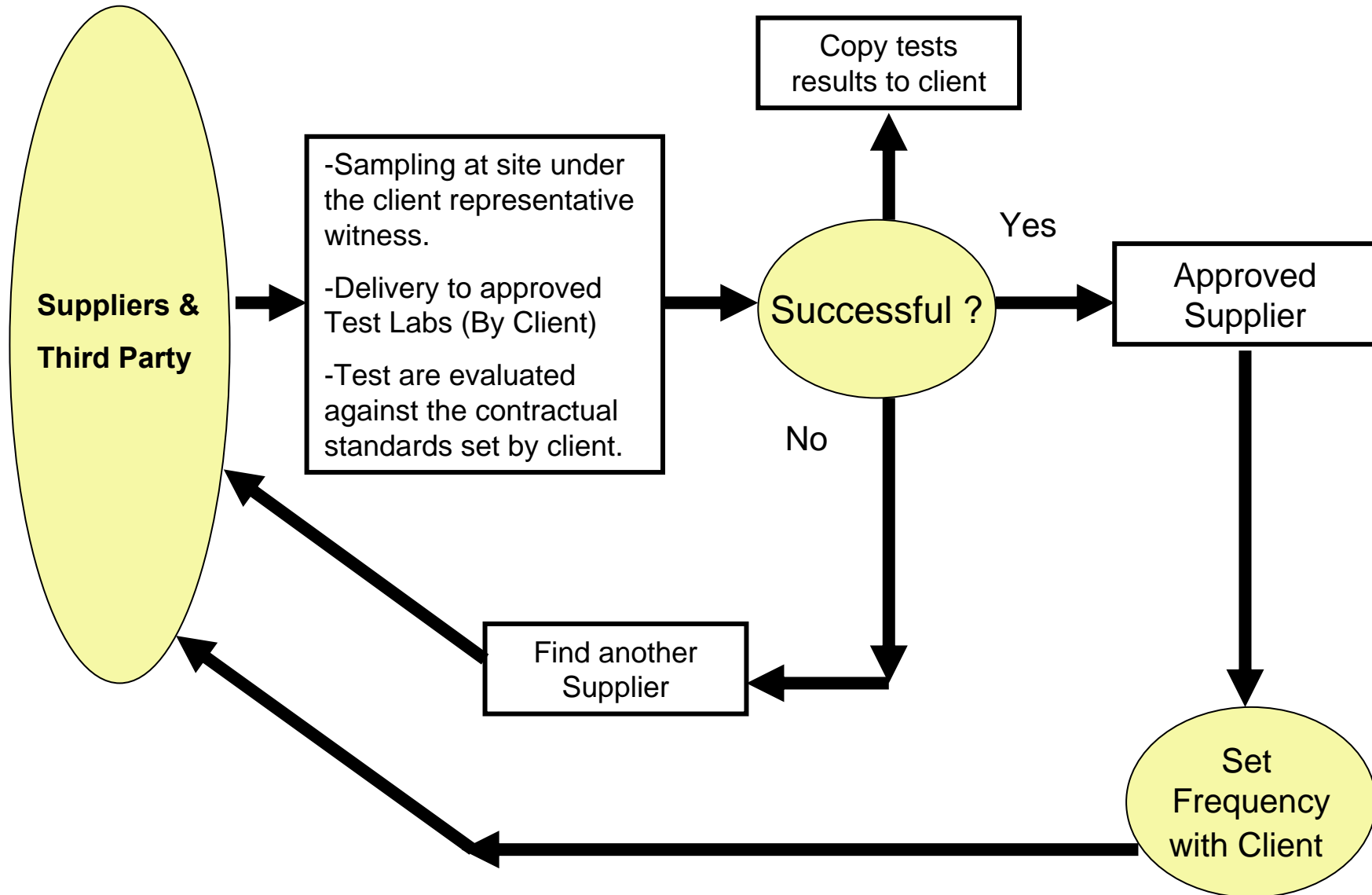
Manholes Task Sheet

Construction Stages	LM 1	LM 2	LM 3	LM 4	LM 5	LM 6	LM 7	LM 8	LM 9	LM 10	LM 11
Lean Concrete	02-Mar-05	16-Dec-04	20-Dec-04	28-Dec-04	03-Jan-05					21-Feb-05	24-Feb-05
Base Slab (C20 R.C)	03-Mar-05	16-Jan-05	17-Jan-05	13-Jan-05	12-Feb-05	15-Feb-05	02-Feb-05	21-Feb-05	17-Feb-05		01-Mar-05
1st Stage walls		02-Dec-04	15-Feb-05	17-Feb-05	24-Feb-05	21-Feb-05		27-Feb-05			
2nd Stage walls											
3rd stage walls											
XXXX											
XXXX											
XXXX											

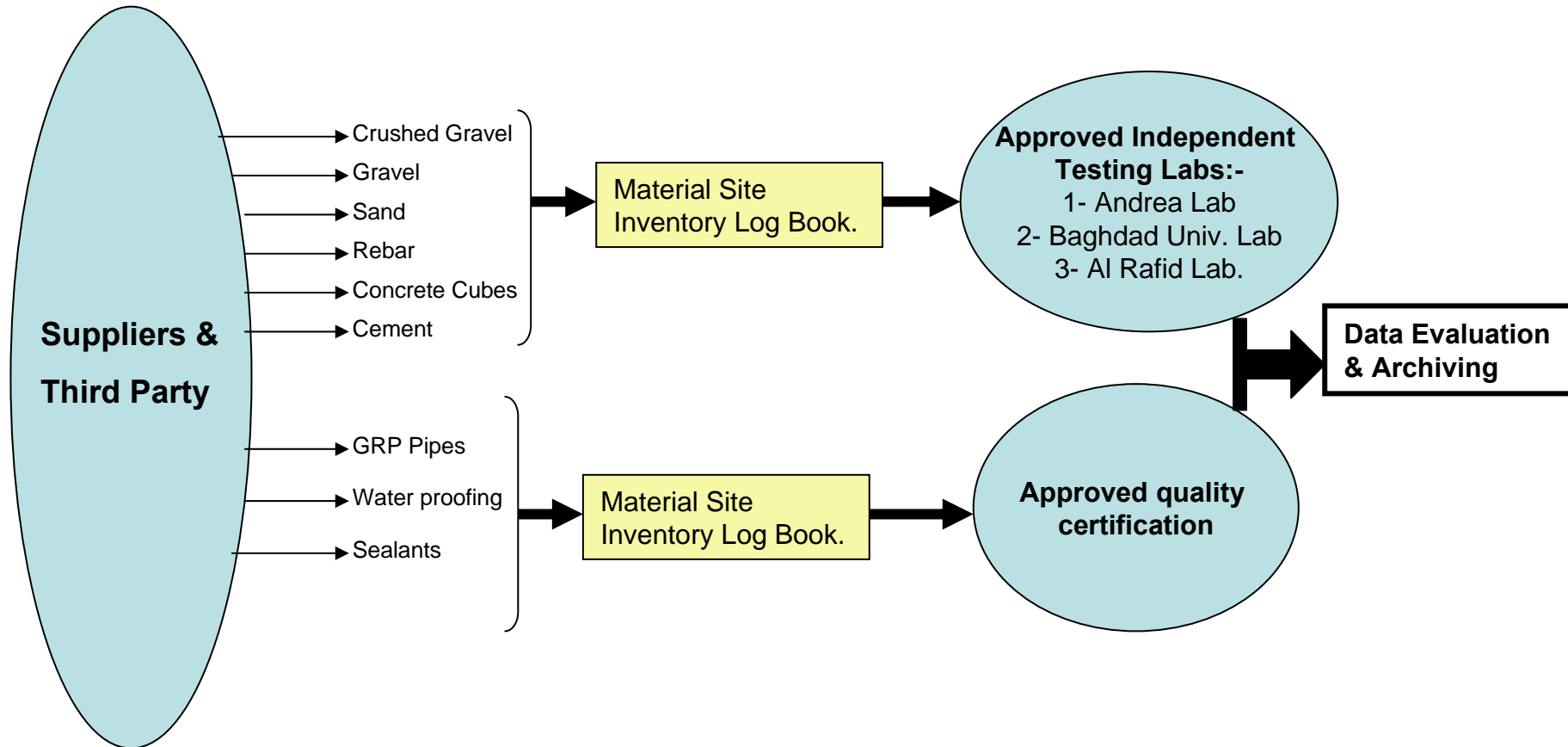
Inspection & Tests Plan (ITP)



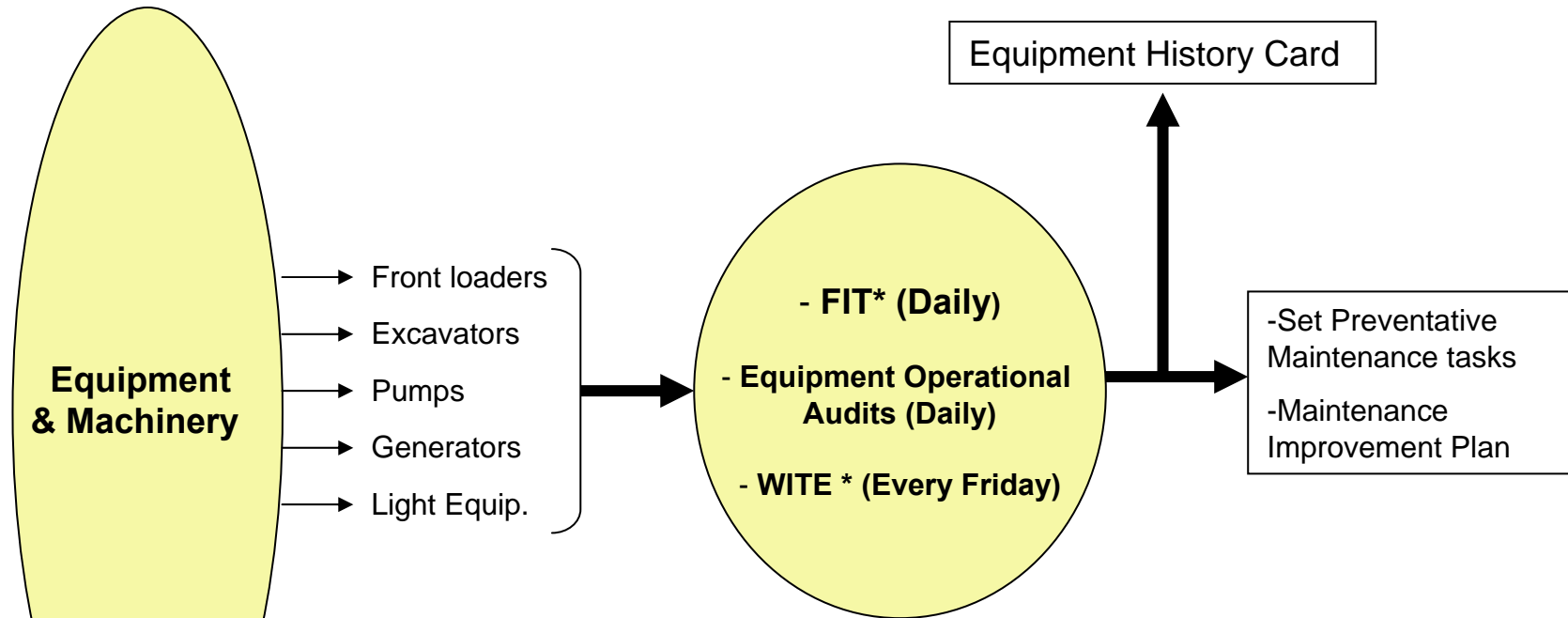
A. Material (ITP)



A. Material (ITP)



b- Equipment & Machinery (ITP)



• FIT : Fast Inspection Test

• WITE : Weekly Inspection Test Equipment

C- Operations & Process (ITP)

