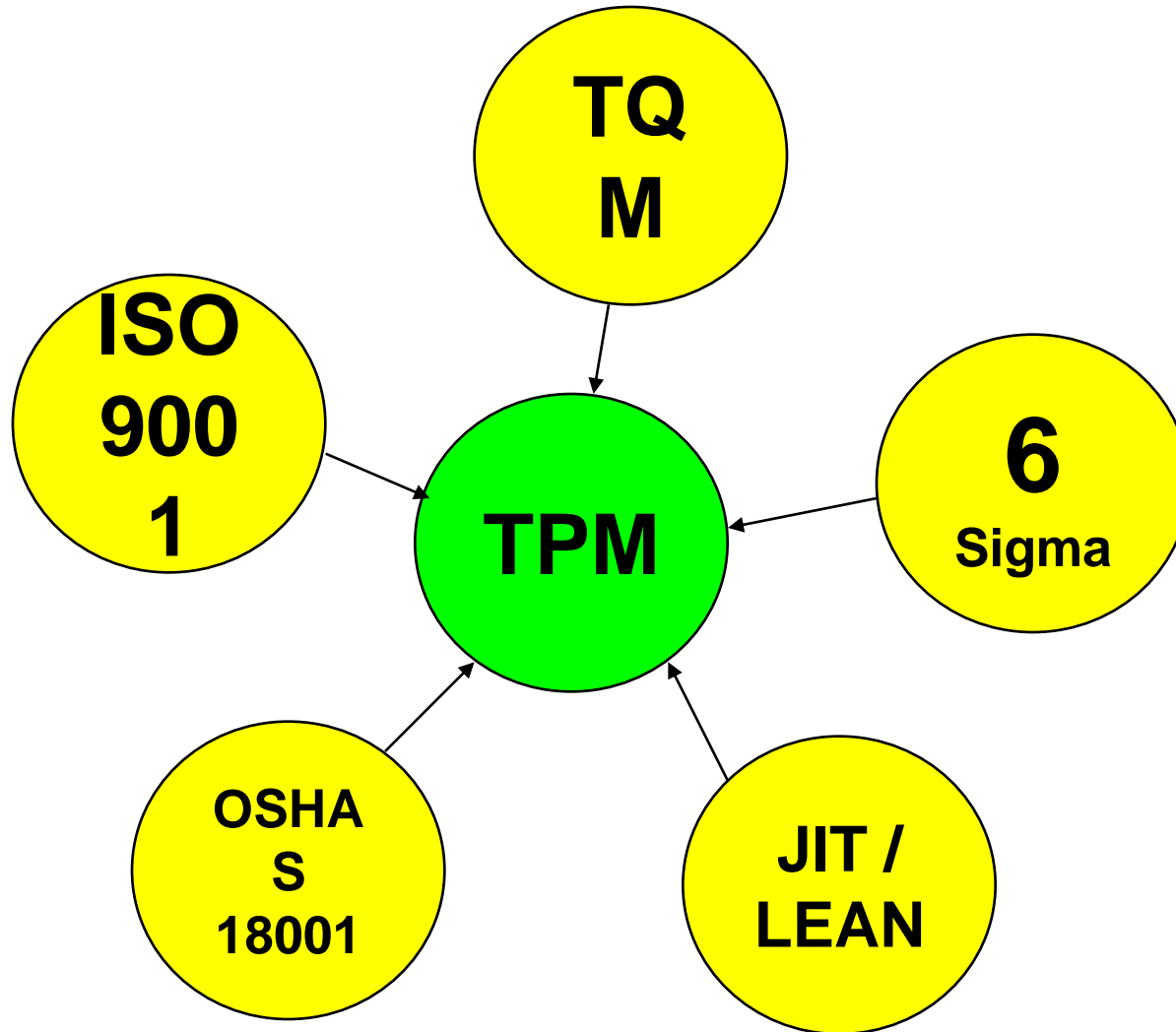


MAKING E&T AS NAVIGATOR

Today's Business Scenario

- **Organization are facing many problems.**
- **Customer's requirement is not static.**
- **Frequent changes in the organization.**
- **New technology and new development of products.**
- **Changing the Internal / External environment.**
- **Frequently changing the decisions.**
- **Negative Attitude of the employees.**

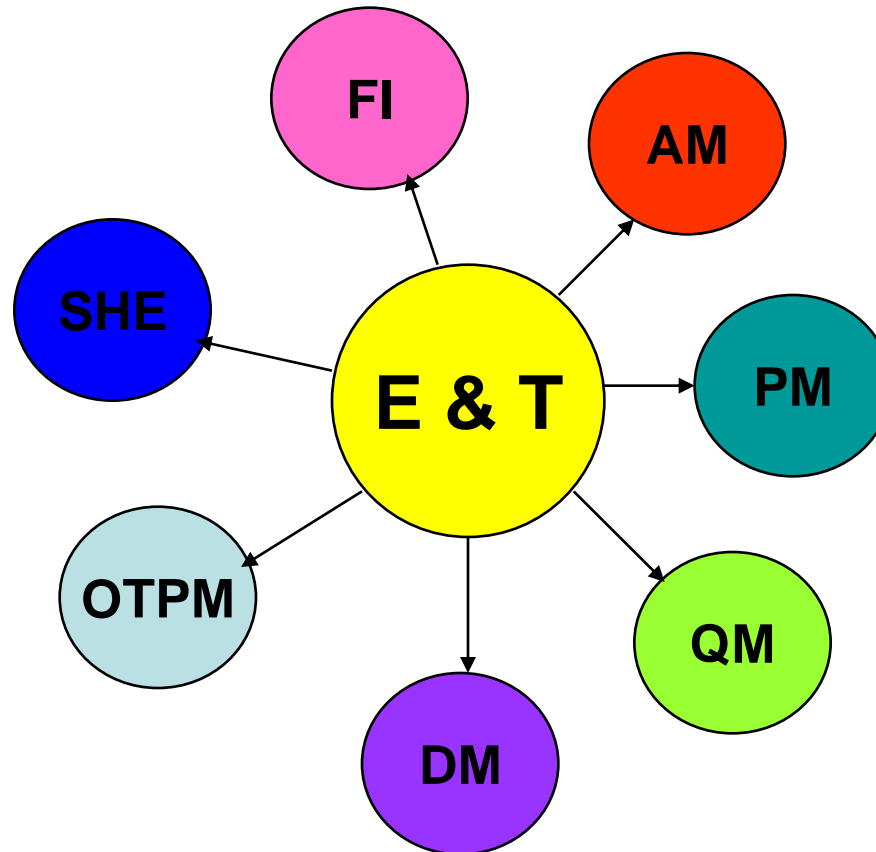


Why we need Navigation for TPM?

- We do not know how to reach our vision.
- E & T Pillar act as a navigator for other pillars by Changing the Attitude at all levels for TPM Journey.



E&T AS NAVIGATOR



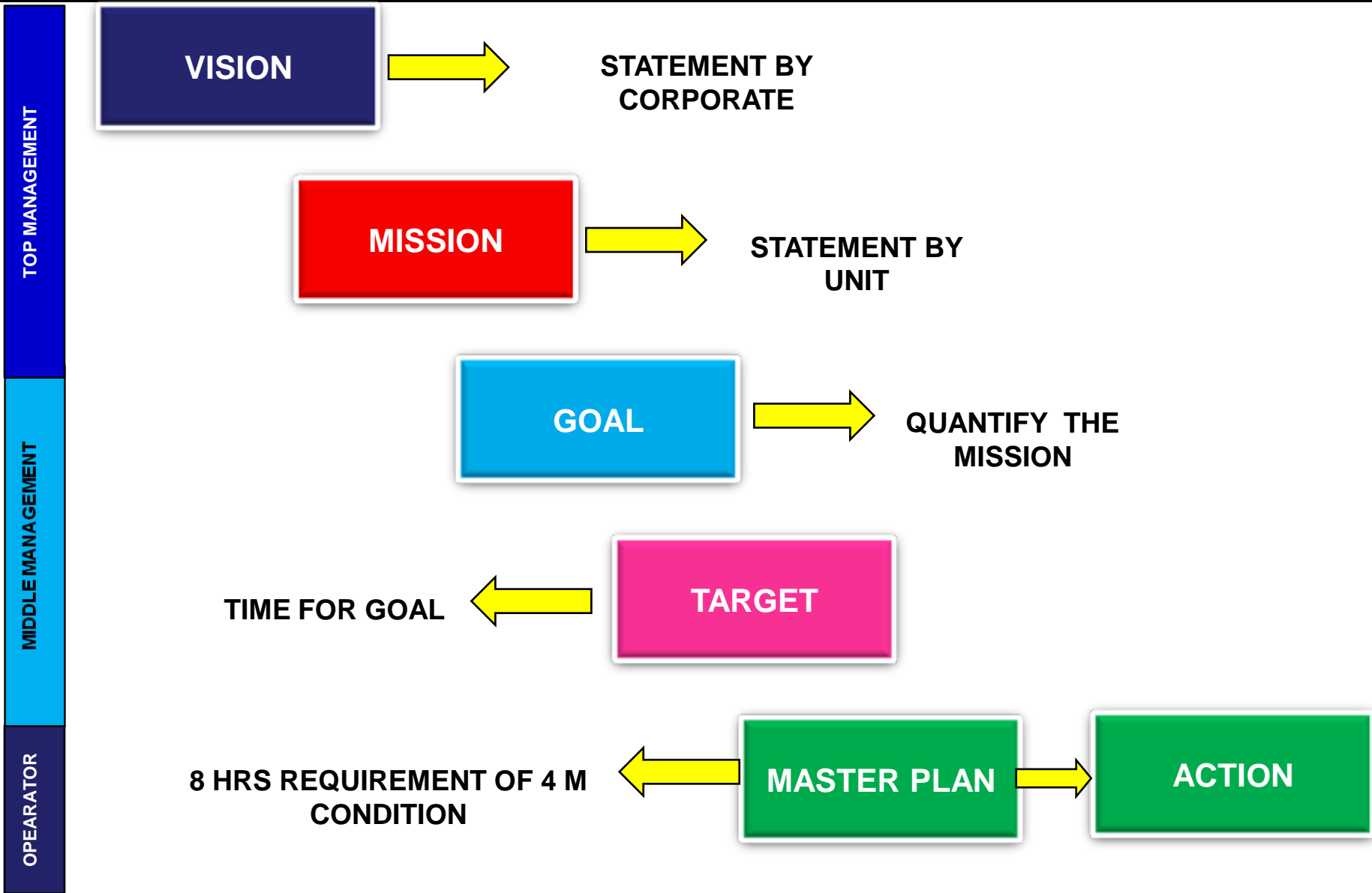
Navigation on... to achieve productivity

Knowledge

Practice

Skill

Starting point of navigation



Starting point of navigation

VISION

The present product range shall be the most preferred in India and reputed in 10 other countries

Minimum of 1/4th of sales contributed by exports

1/5th by entirely new line of business

Ensuring Long Term Health & Progress for the Group and its associates at all times

GOAL

To Develop Competent Operators and Maintenance Personnel

To eliminate Equipment and Process Failure / Malfunctions

To Develop Multi Skill in Maintenance and Process

To develop Safety and Environment Risks Awareness
To eliminate Accidents due to lack of skill

RESPONSIBILITY

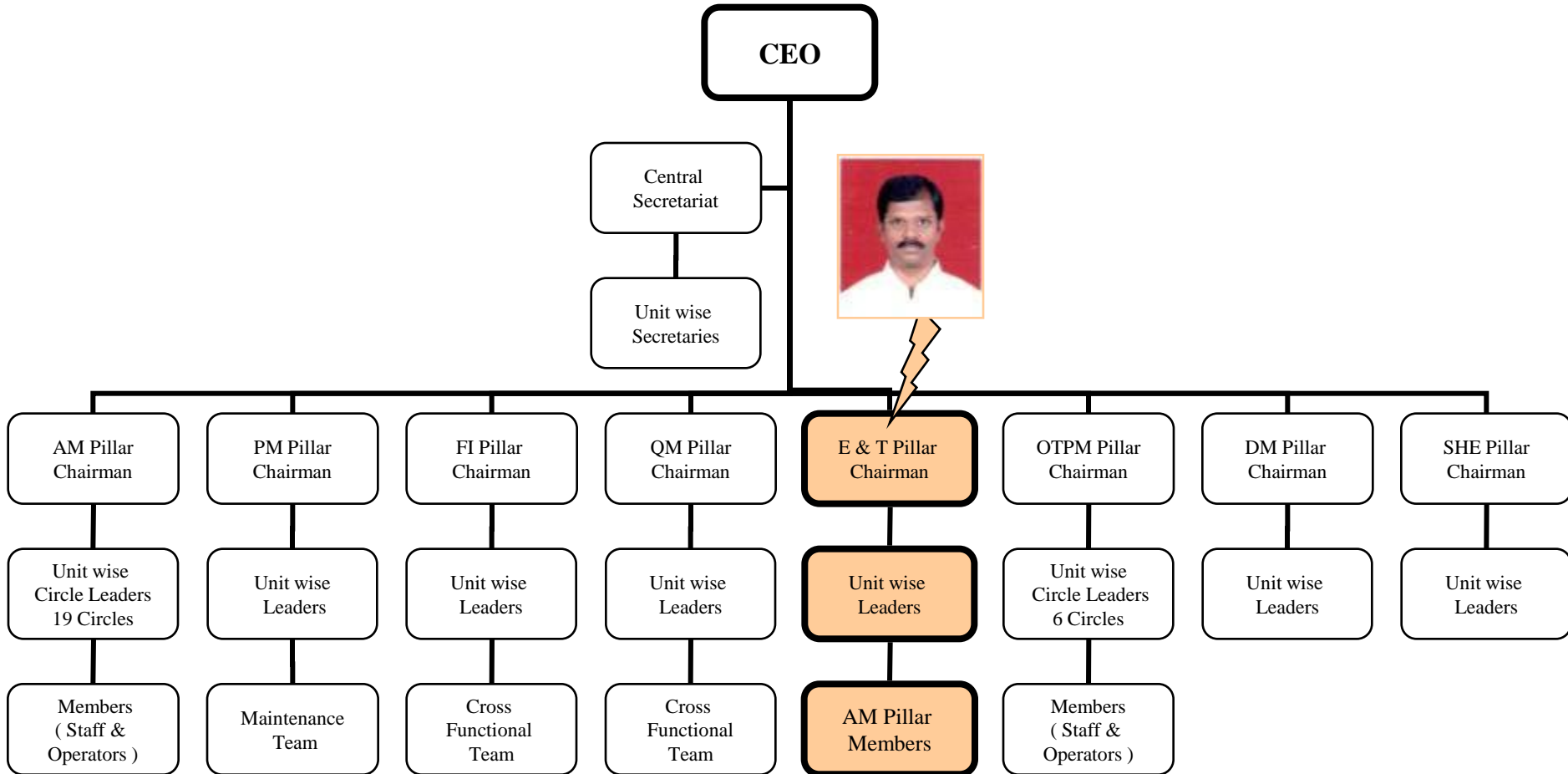
Primary / Secondary

E & T / AM

E & T/AM, PM

E & T/AM, PM & KK

E & T/AM, SHE



**Non Availability of Equipment
Competent operator. Less focus
on Skill Development**



**Higher rate of Equipment & Process
Failure Quality Defects & Accidents.
Inadequate Skill to take up
Countermeasures**



**Lack of Specialized and Multi
Skill People**



**Poor awareness of Safety and
Environment Risks**



To Develop Competent Operators and Maintenance Personnel



To eliminate Equipment and Process Failure / Malfunctions



To Develop Multi Skill in Maintenance and Process



To develop Safety and Environment Risks Awareness
To eliminate Accidents due to lack of skill



Result Area	Key Performance Indicators	UOM	Benchmark	Target					Key activity			
			2006	2007	2008	2009	2010	2011 Upto July	OPL	KAIZEN	OJT Training	Classroom Training
P	Failure Due to lack of Skill in "A" Rank Equipments	Nos	560	410	310	155	16	5	✓		✓	✓
P	Number of FUGJAI Rectified (Lack of Skill)	Nos	70000	40000	25000	5000	3000	1000		✓	✓	✓
P	Multiskill Operators	Nos	50	200	300	400	450	475			✓	✓
Q	Defects due to lack of Skill (Average Per Month)	PPM	5925	3000	2500	1360	136	50	✓		✓	
S	Accident due to lack of Skill	Nos	120	75	20	0	0	0	✓		✓	✓

Basic Concepts & Priority Measures for Navigation

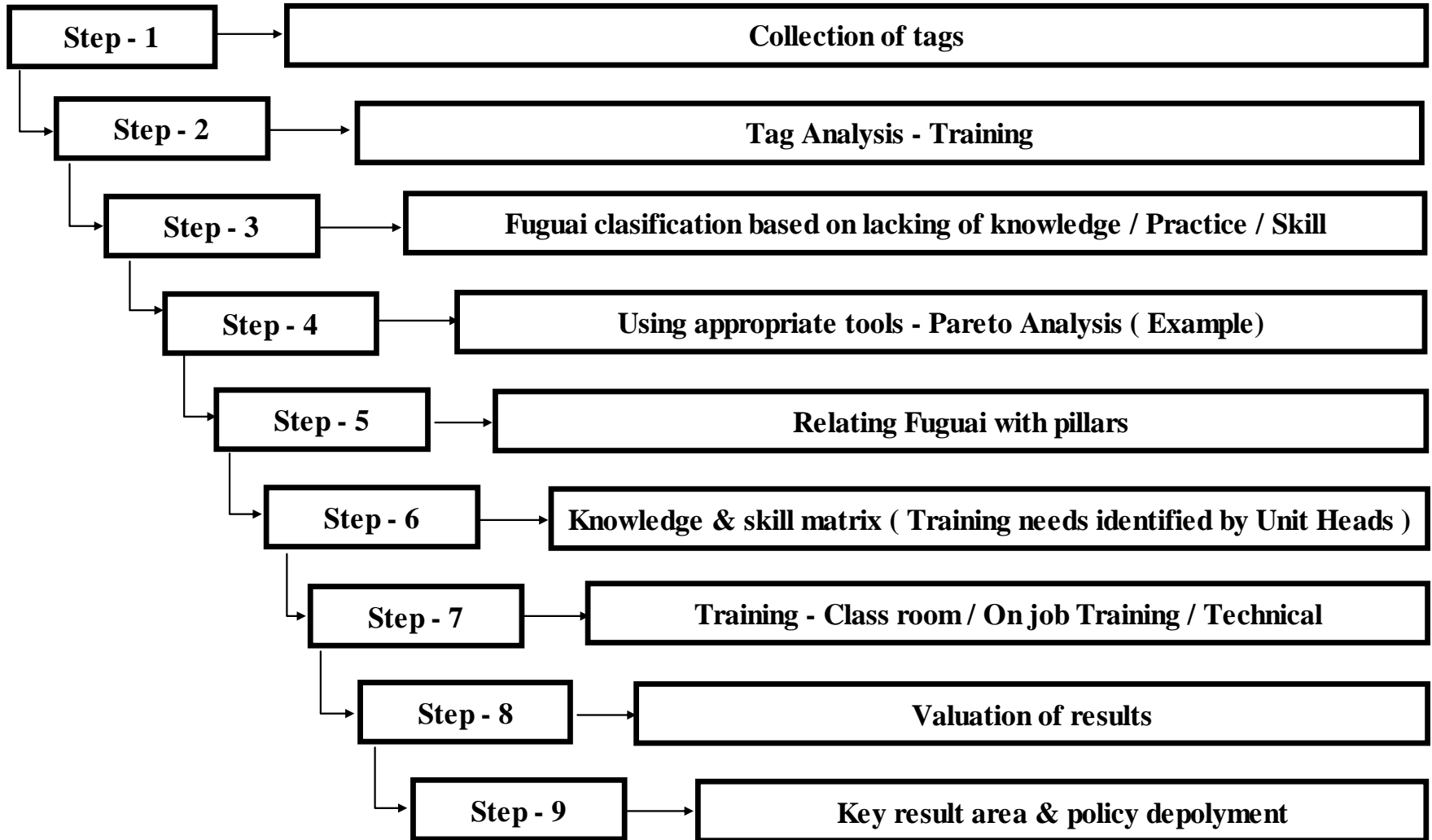
Priority based on AQUAGROUP'S requirements



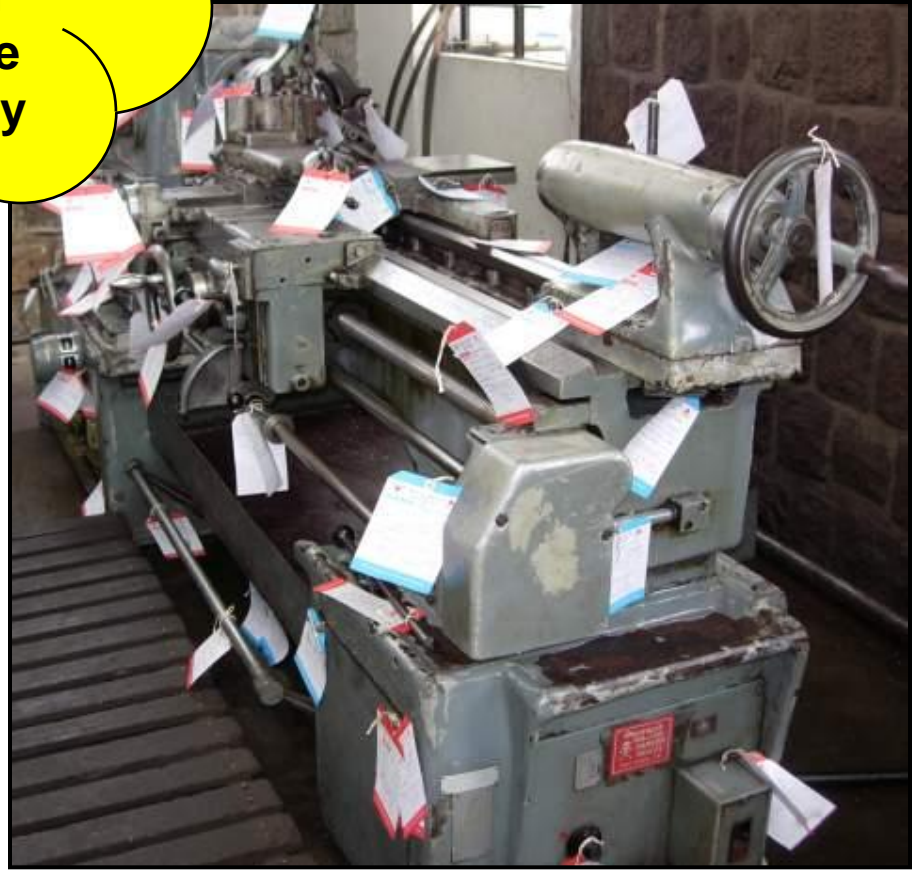
Basic Concept →			Productivity		Quality		Cost		Delivery		Safety		Morale
Autonomous Maintenance JH ↓	P	M	10%	P	10%	K	10%	P	10%	P	5%	K	5%
		S	15%		15%		75%		15%		5%		5%
		O	75%		75%		15%		75%		90%		90%
Focussed Improvement KK	S	M	30%	S	10%	S	20%	S	10%	S	5%	K	5%
		S	60%		30%		30%		30%		5%		5%
		O	10%		60%		50%		60%		90%		90%
Planned Maintenance	P	M	10%	S	10%	P	10%	P	10%	P	10%	K	10%
		S	60%		40%		60%		30%		60%		50%
		O	30%		50%		30%		60%		30%		40%
Quality Maintenance	S	M	5%	S	5%	S	5%	P	5%	P	5%	K	5%
		S	15%		5%		5%		5%		5%		5%
		O	80%		90%		90%		90%		90%		90%
Development Management	S	M	60%	S	60%	S	60%	S	60%	S	60%	K	5%
		S	30%		30%		30%		30%		30%		5%
		O	10%		10%		10%		10%		10%		90%
Office TPM	P	M	75%	K	60%	K	60%	P	60%	P	60%	K	5%
		S	15%		30%		30%		30%		30%		5%
		O	10%		10%		10%		10%		10%		90%
Safety, Health & Environment	P	M	10%	K	30%	K	40%	K	40%	S	5%	K	5%
		S	30%		30%		40%		40%		5%		5%
		O	60%		40%		20%		20%		90%		90%

NOTE :- % - Percentage of Persons to be trained

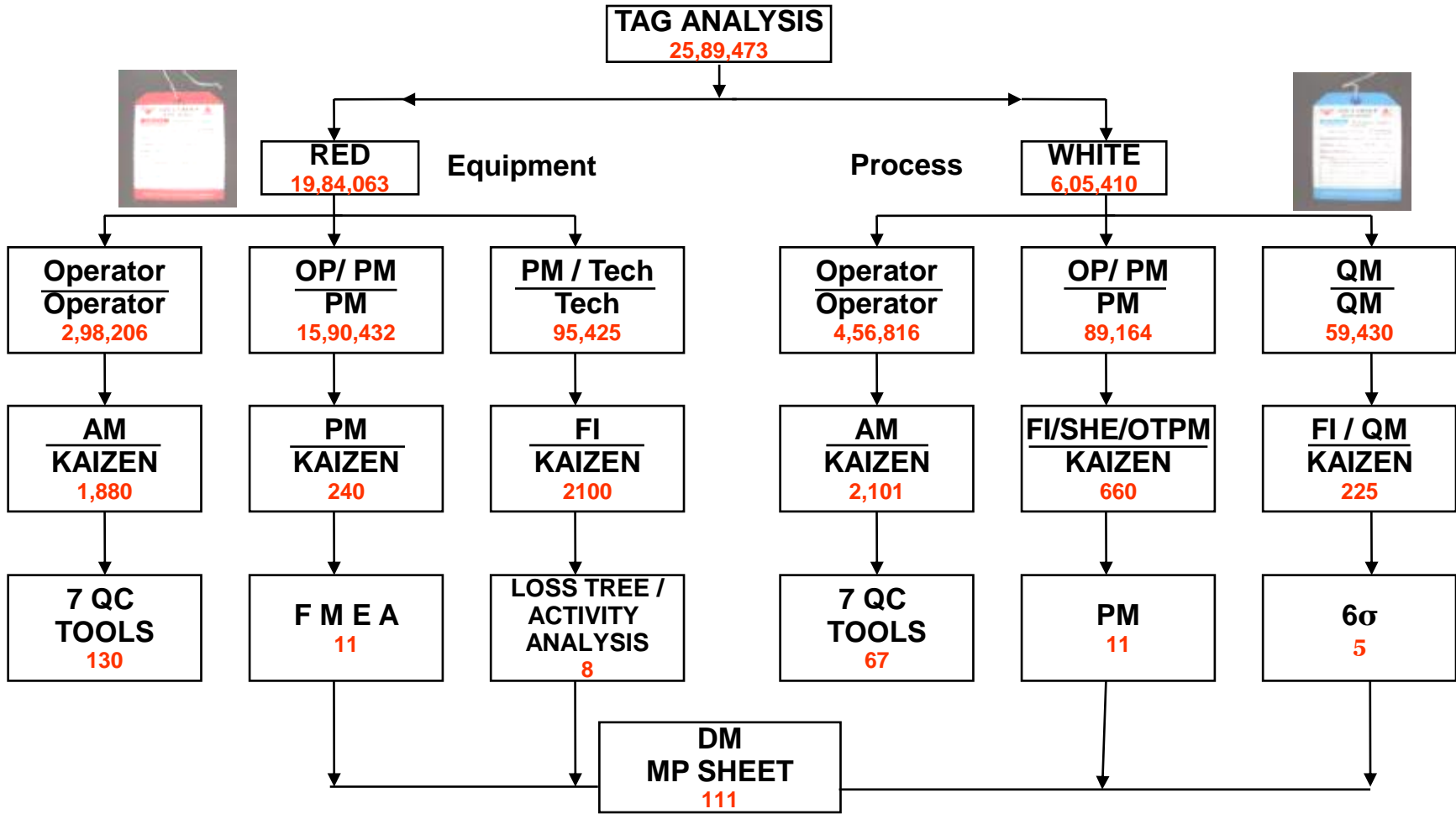
KNOWLEDGE
 PRACTICE
 SKILL
 M MANAGEMENT
 S SUPERVISOR
 O OPERATOR



**Apply the concept
of fast food track
this means E&T
should show the
path immediately
without any
further delay**



JH – Workshop conducted along with 10 outside companies with AQUAGROUP operators



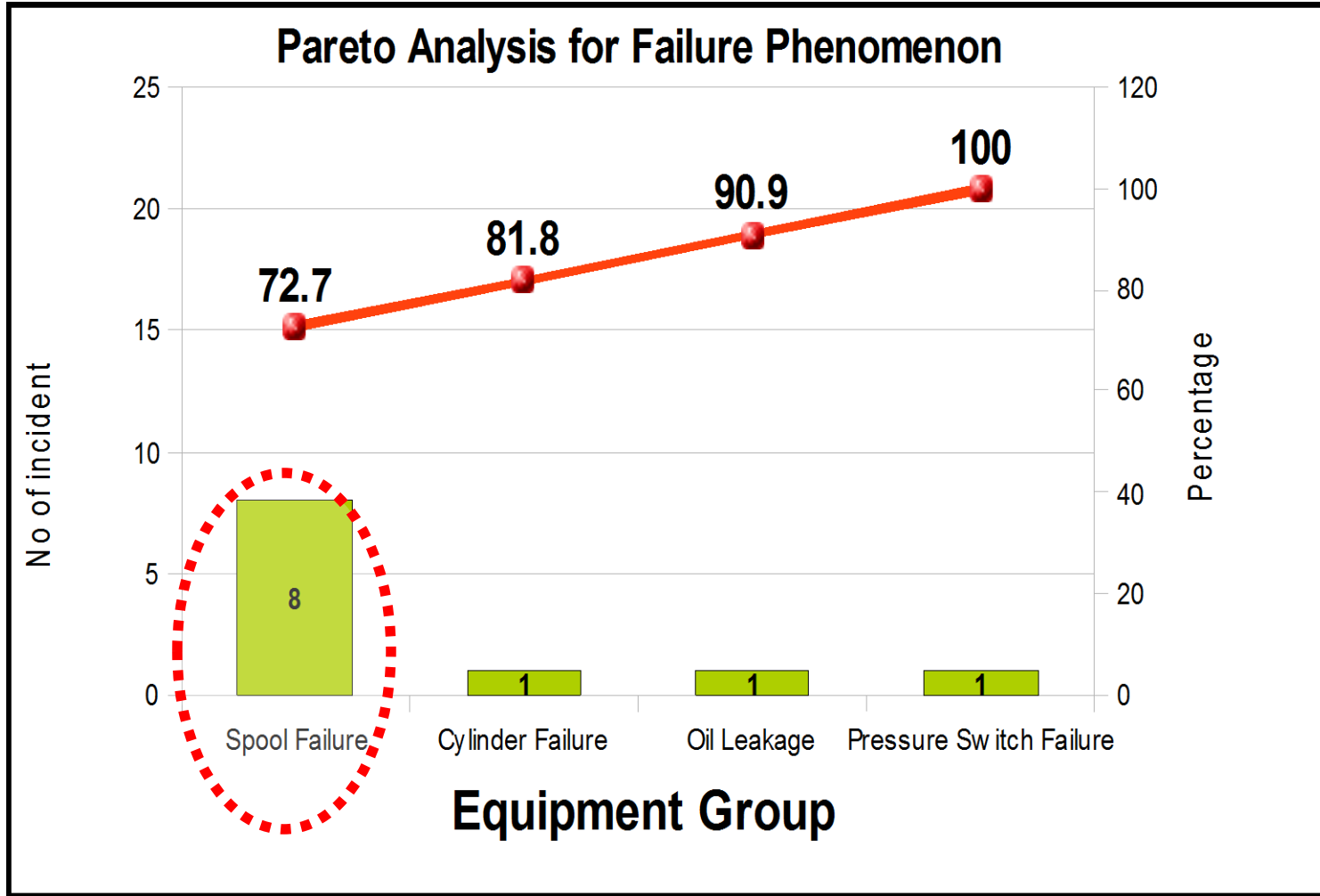
Training Given :

1. Tags Identification/rectification Training
2. Kaizen Training
3. QC Tools Training
4. MP Sheet Preparation Training

Identification of Type of Process / Material Defects - Impeller



PILLAR	Q M		
FUGAI	Material / Process Defect		
TRAINING	K ✓	P	S
TOOL	6 σ		



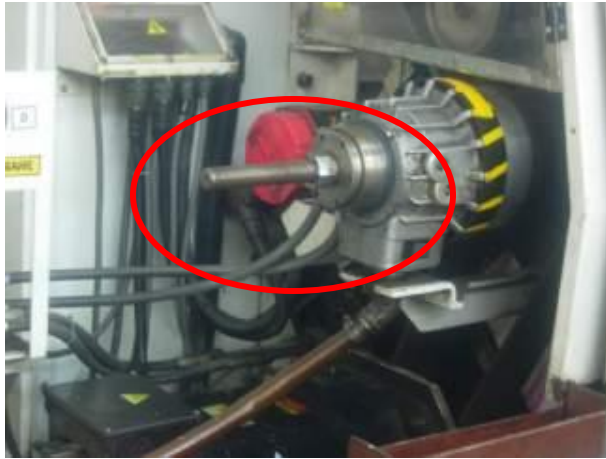
Conclusion: Spool failure is the root cause for more breakdown in Press group machines.
Corrective Action : KAIZEN to be initiated to eliminate spool failure

Step 4 Using Appropriate Tools – Example (Why Why Analysis)



AQUAPUMP INDUSTRIES				YY No.	YYM09/000269
WHY - WHY ANALYSIS SHEET				Date	29-Jul-09
Machine	27-API-SINGLE SPINDLE TURNING CENTER - LAL2	Sub Assembly	TURRET	Circle	CIRCLE4-MC(API)
Breakdown /Physical Phenomenon:		HYDRAULIC OIL LEAKAGE TURRET CYLINDER O RING DAMAGED			
What is your Final Action:		DEFECTIVE O RING REPLACED			
<input checked="" type="checkbox"/>	Spares replacement	<u>Checks Made</u> O RING - 1 NO CHANGED.			
<input type="checkbox"/>	No Spare Replacement				
Sr. No.	WHY	ANSWER			ACTION
1	O RING REPLACED	OIL LEAKAGE IN TURRET CYLINDER			
2	OIL LEAKAGE IN TURRET CYLINDER	O RING DAMAGED			
3	O RING DAMAGED	WEAR AND TEAR			
4	WEAR AND TEAR	DUE TO LOSS OF SELFLIFE OR AGING			O RING HAS TO BE CHANGED FOR ONCE IN TWO YEARS - TBM STANDARD INCLUDED IN PM SCHEDULE.
Root cause is one of the following 5 items		JH	PM	Design	E & T Skill
1	POOR BASIC CONDITION				
2	POOR OPERATING CONDITION				
3	DETERIORATION		<input checked="" type="checkbox"/>		
4	WEAK DESIGN				
5	POOR SKILL				
<input checked="" type="checkbox"/>	Indicate the selection by putting check box as shown				
Kaizen Idea and Schedule					

JH Tag transfer to PM pillar for countermeasures

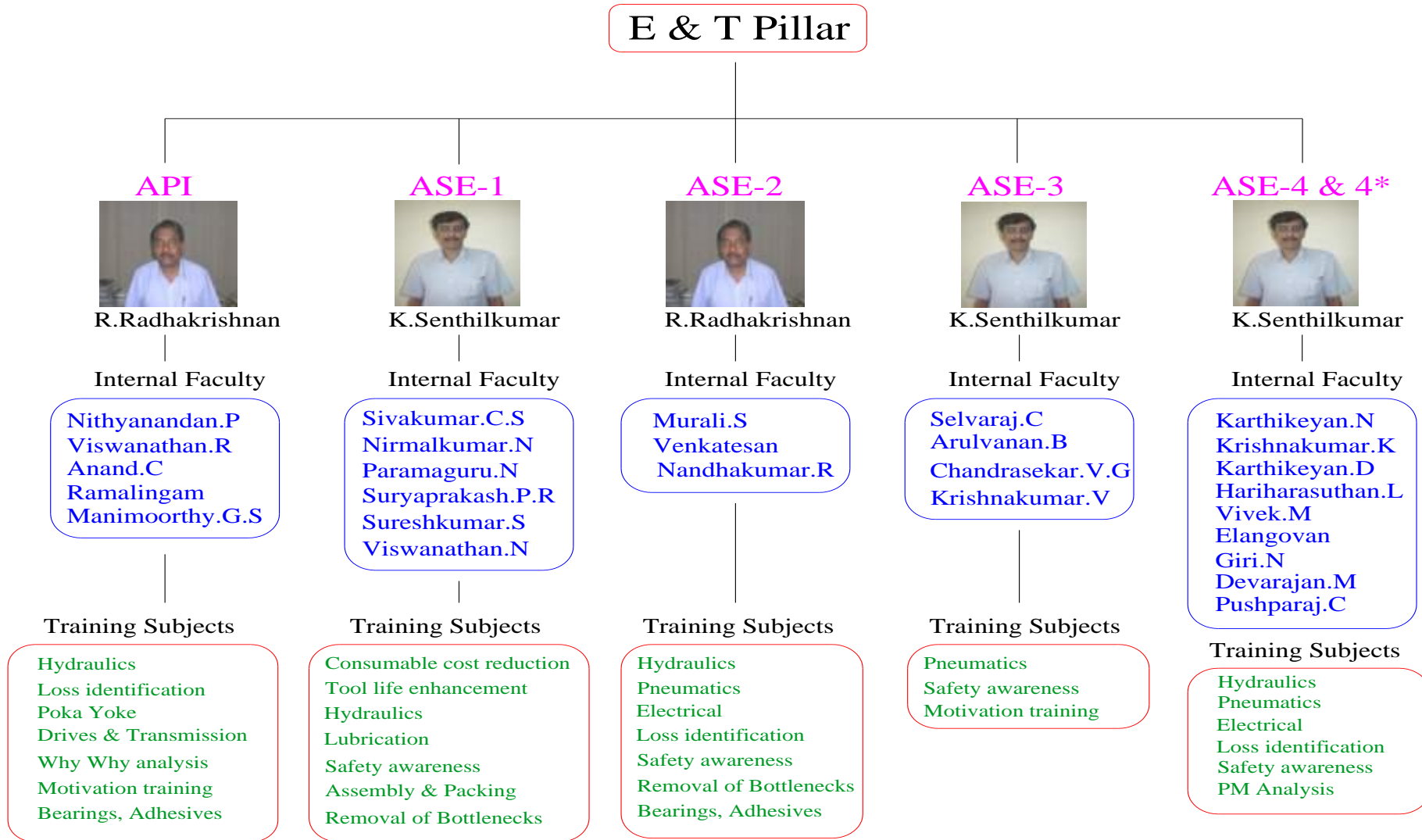


PILLAR	JH / PM / SHE ✓		
FUGAI	Unsafe Place/Source of contamination		
TRAINING	K	P	S ✓
TOOL	KAIZEN		

OPERATION	TRAINING		KNOWLEDGE			PRACTICE			SKILL			DEPTH OF TRAINING
	On The Job Training	Off The Job Training	Management	Supervisor	Operator	Management	Supervisor	Operator	Management	Supervisor	Operator	
PUMP												
Machining	✓	✓	✓	✓				✓			✓	HIGH
Assembly	✓		✓	✓				✓			✓	HIGH
Testing	✓	✓		✓	✓		✓	✓			✓	HIGH
Painting	✓			✓	✓			✓			✓	MEDIUM
Packing	✓			✓				✓			✓	LOW

MOTOR												
Machining	✓	✓	✓	✓				✓			✓	HIGH
Assembly	✓		✓	✓				✓			✓	HIGH
Testing	✓	✓		✓	✓		✓	✓			✓	HIGH
Painting	✓			✓	✓			✓			✓	MEDIUM
Packing	✓			✓				✓			✓	LOW

Training Subjects identified based on Unit Head's recommendations



TPM Awareness Training



Training on Importance of TPM at Shop floor



Functional heads of each unit with unit head are given training with respect to

- Identification of major losses through F.I Pillar**
- Identification of abnormalities and elimination program through J.H Pillar**
- Increasing equipment availability program through P.M Pillar**
- Safe working practices, Safety and Hygiene at work places through SHE Pillar**

Training in Hydraulics



Training in Hydraulics with the help of External Experts

Training in Bearings



Training given to the Engineers & Operators by External Faculty on

1. Types of Bearings & Application

3. Maintenance of Bearing

2. Bearing selection

4. Special Tools for Assembly & Dismantling

<p style="text-align: center;">AQUA GROUP - TPM ONE POINT LESSON</p>					
<p style="text-align: center;">GENERAL INSTRUCTIONS TO BE FOLLOWED BEFORE STARTING CLEANING</p>					
Classification		<input checked="" type="checkbox"/>	Basic knowledge	<input type="checkbox"/>	Improvement cases
S.NO	DESCRIPTION	VISUAL CONTROL			
1	Switch off of the machine before start machine cleaning.				
2	Don't use air for machine cleaning.				



JH Step-4 Training given to the operator in the shop floor

- ✓ Evaluation on the effectiveness of training is done on the job
- ✓ Further training needs are identified and provided
- ✓ Skills are evaluated and rated as follows

Level 0 - Do not Know

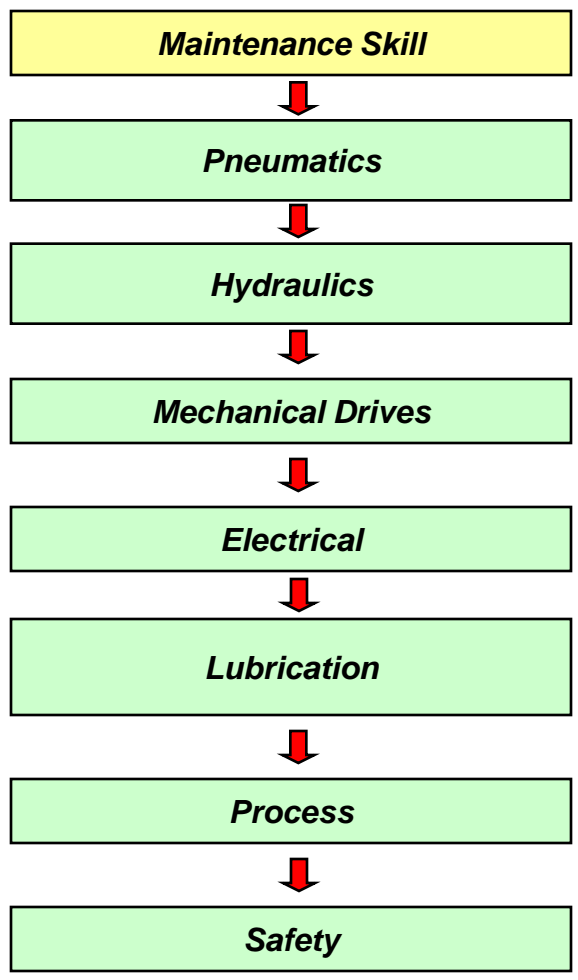
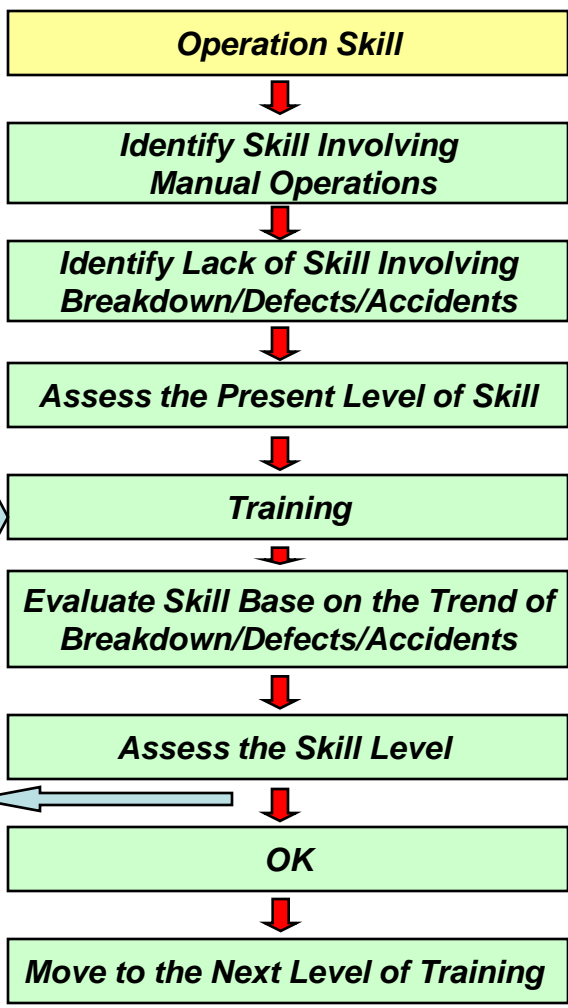
Level 1 - Know but Cannot do

Level 2 - Can do with assistance

Level 3 - Can do alone

Level 4 - Can teach others

OPERATOR



Qualified Specialists

Model Based Training at Technical Centre - Knowledge



Product Assembly

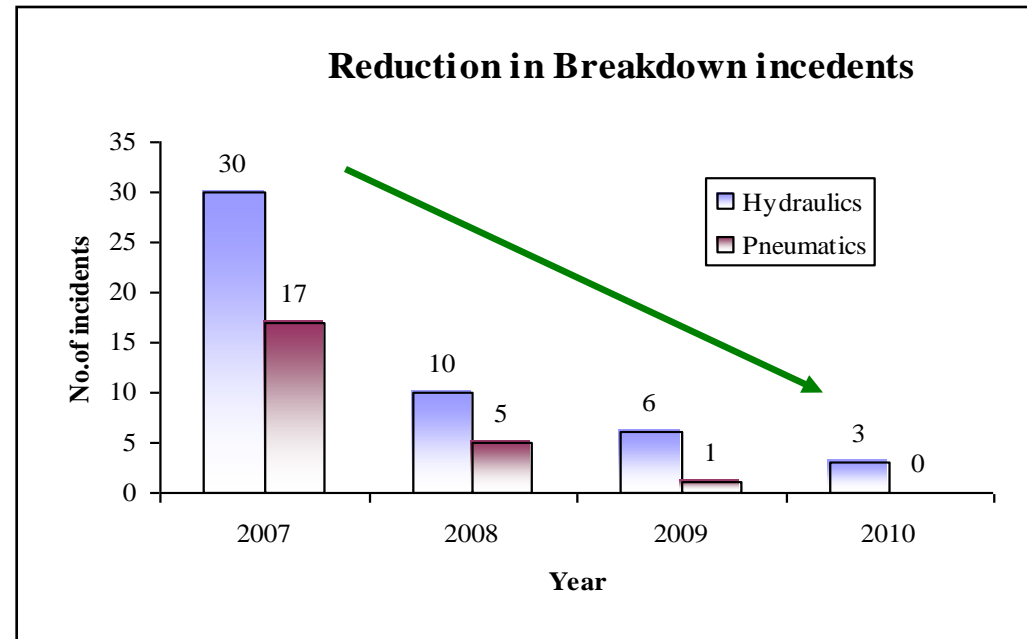
S.NO	SUBJECT	No.of. PERSONS TRAINED
1	PRODUCT ASSY.	285
2	HYDRAULICS	654
3	PNEUMATICS	654



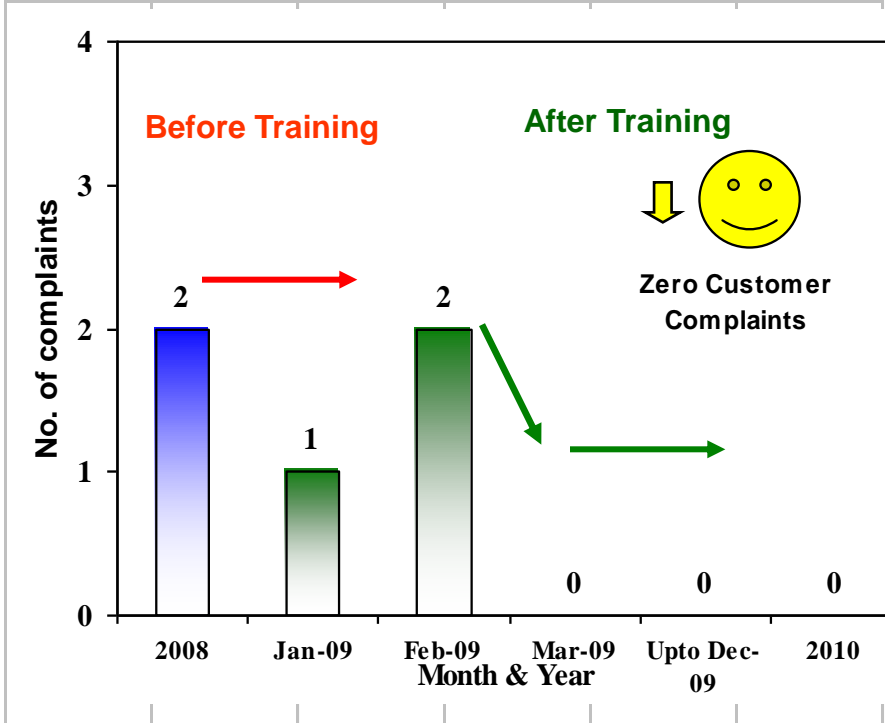
Hydraulics



Pneumatics



Packing Operators Training



Examples of Training, Education & Effects - OJT

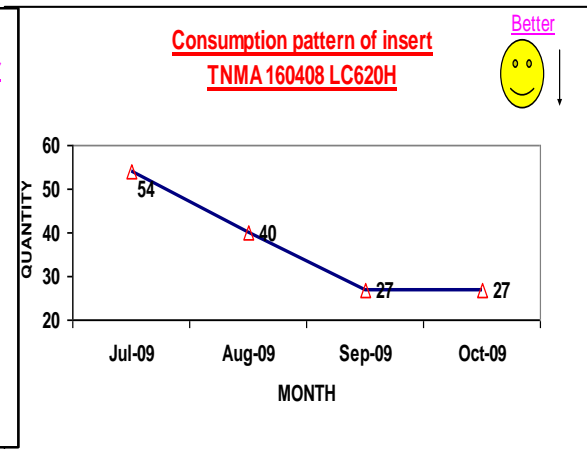
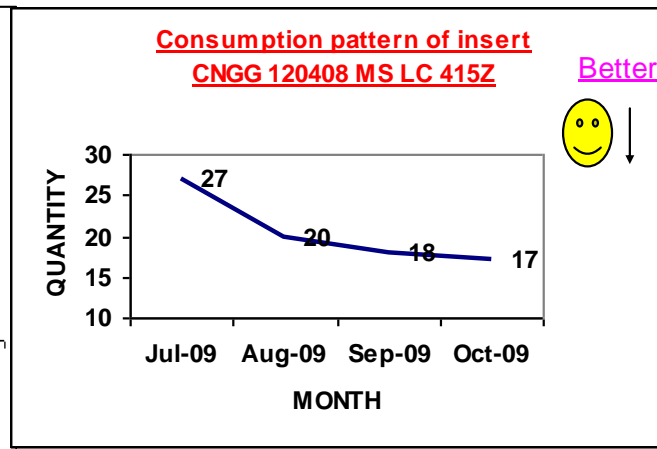
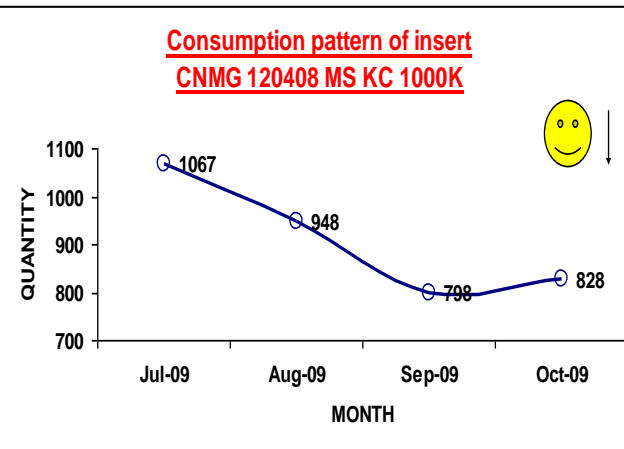
Practical training identified and imparted to Engineers & Operator

Step 4 Training given to TPM members on Tool life enhancement

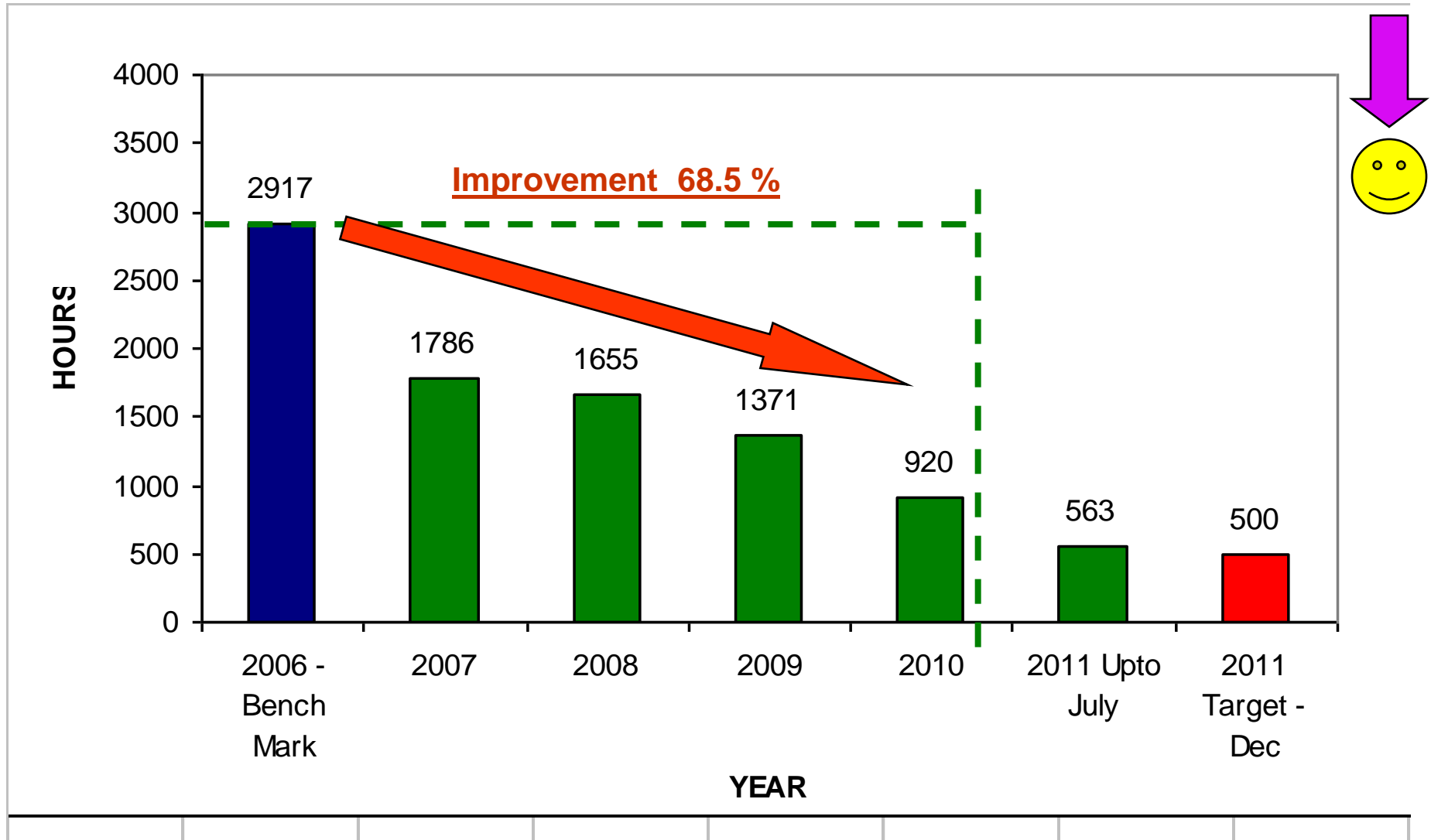
- Number of theoretical classes conducted 3
- Number of TPM members attended theoretical classes 81
- Number of On the Job Training given in the shop floor 25
- Number of members trained by OJT 288

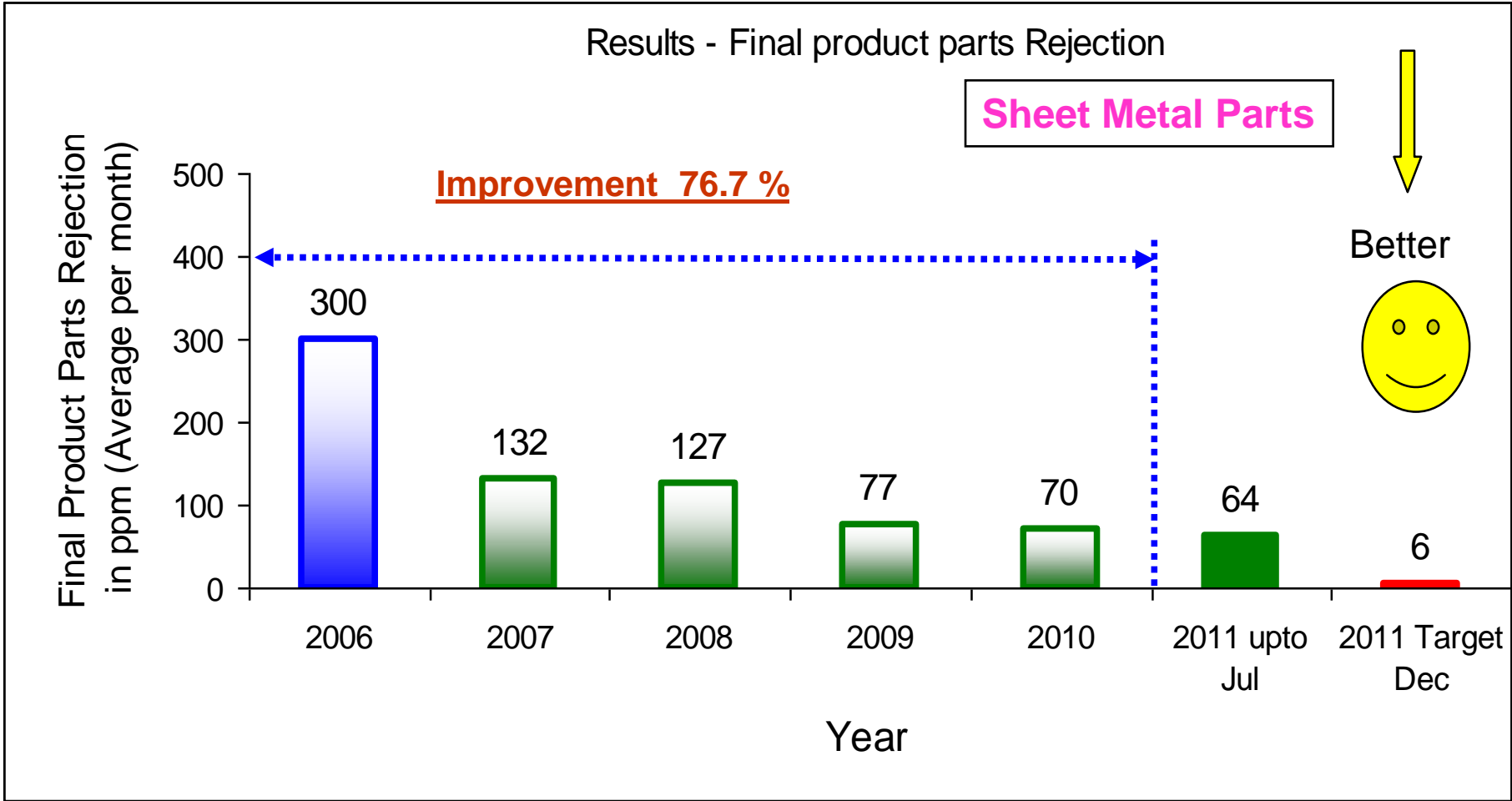


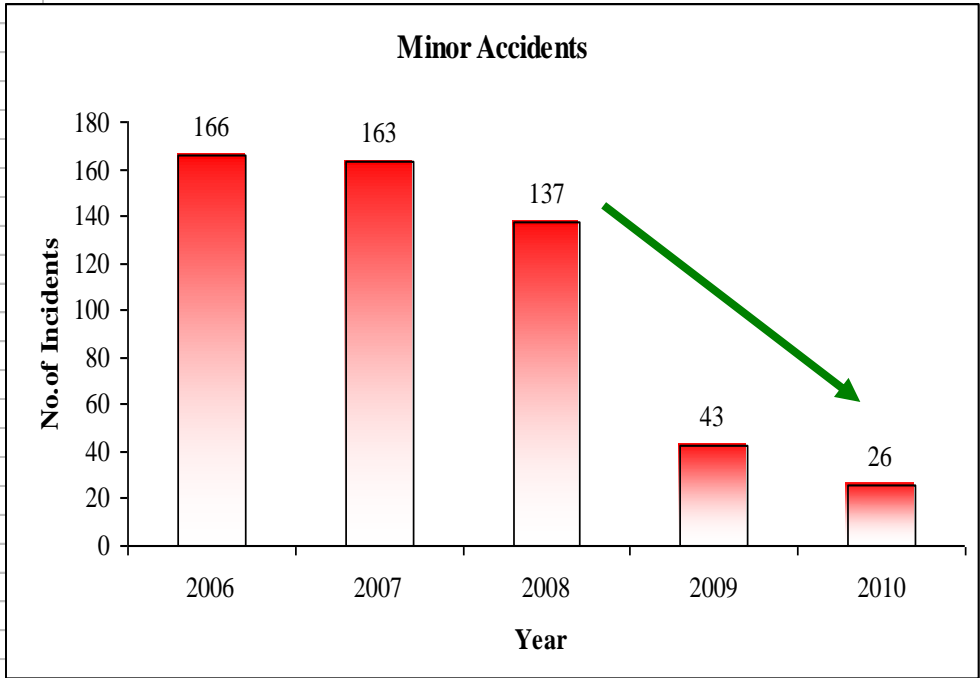
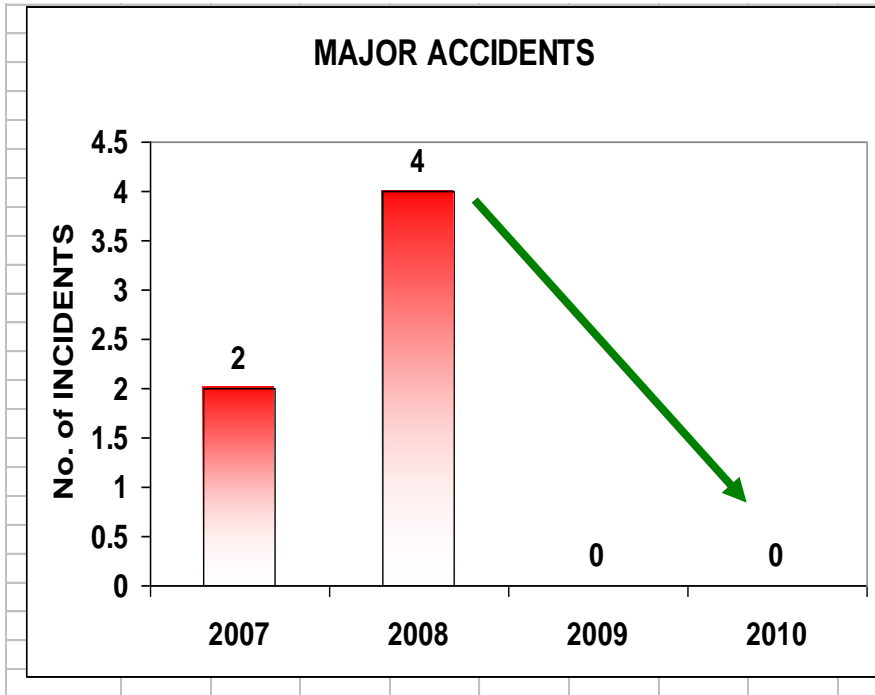
Results of the Training on Tool life enhancement

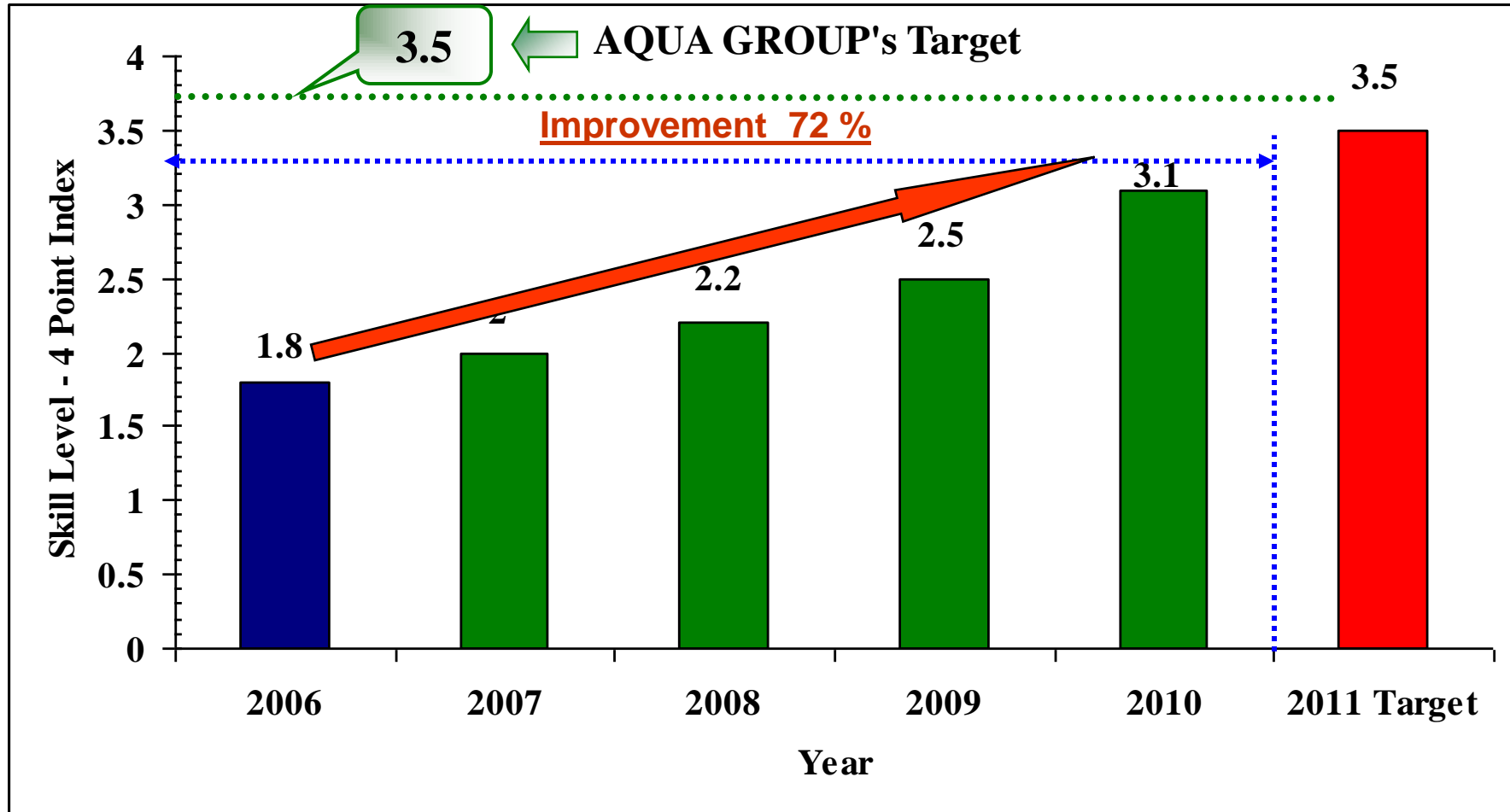


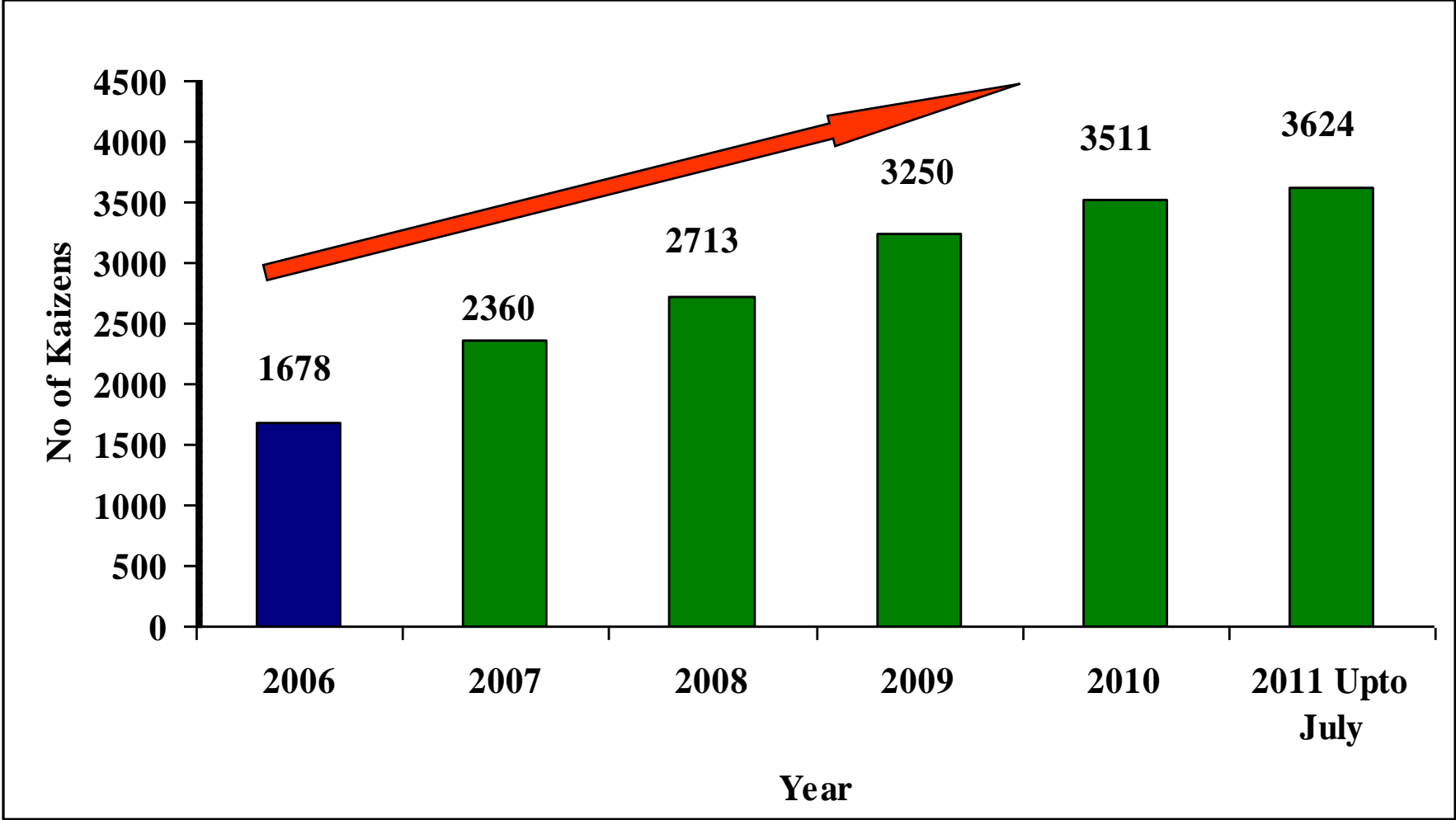
Result – Breakdown Hours Average











THANK YOU