

1. Company, Plant/Factory Profile:

1.1. RSB Group

RSB Transmissions (I) Limited belongs to Pune based RSB Group. RSB group was established in the year 1975 to cater to the needs of Tata Motors Limited, a leading Automobile manufacturer in India. RSB Group employs a work force of 6484; with an annual turnover of Rs 35,000 million (JPY 62,508 million) in 2022-23. RSB group caters to the needs of major automotive, off highway and Agri equipment's manufacturers in India. The founders Mr. R K Behera and Mr. S K Behera remain committed to **QUALITY, SERVICE AND RESPECT FOR HUMANITY**.

Philosophy: Integrity & Ethical practices, Customer orientation, Innovation, Agility, committed to Society & Environment.

VISION: "To be the most admired organization with a significant global presence."

Group Structure:

RSB Group business is categorized into 3 portion: 1. Auto 2. Construction & Mining infrastructure (CMI) 3. Overseas.

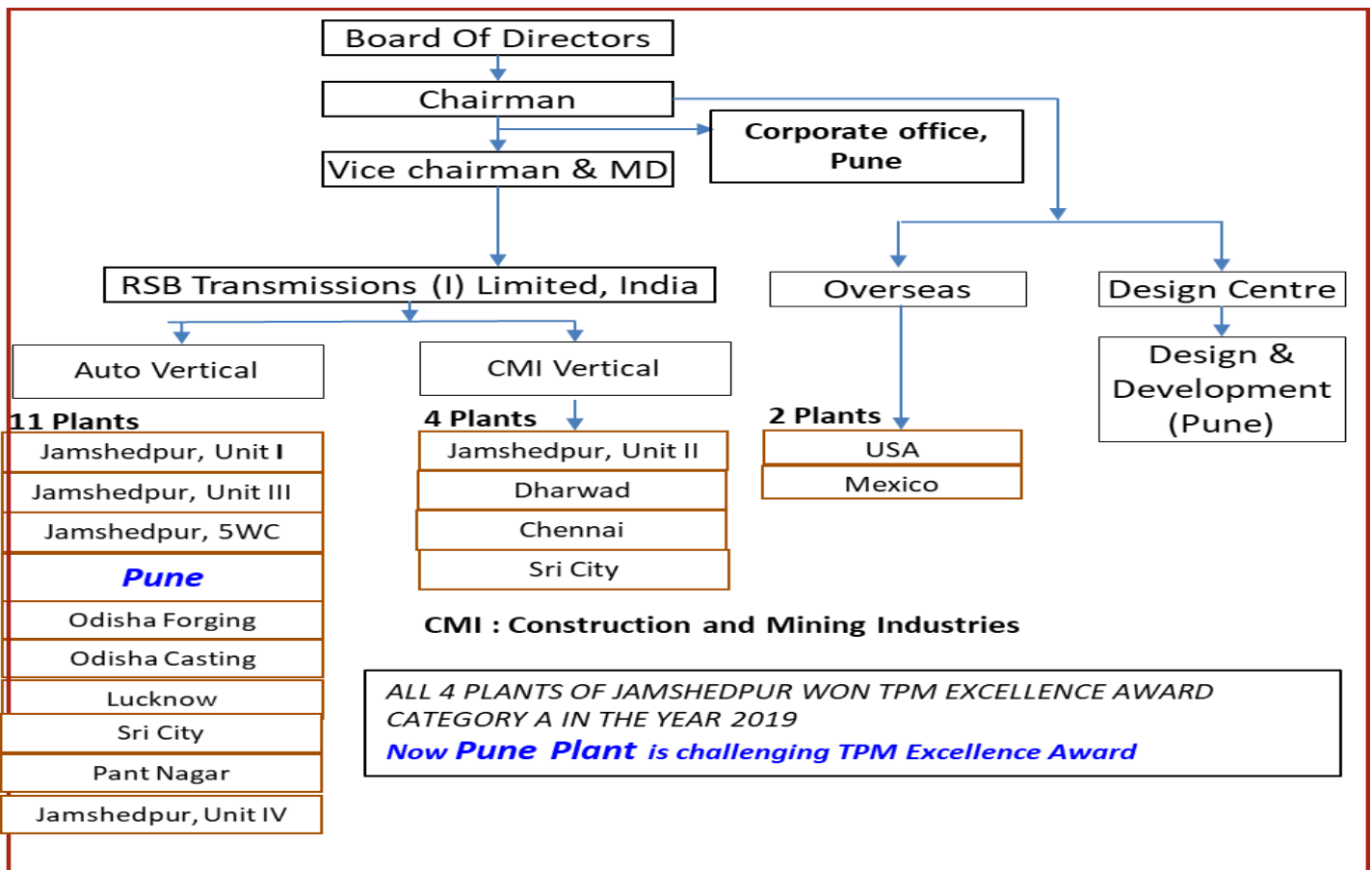


Fig.1.1

From now onwards, all descriptions is applicable for Pune Plant.

1.2 Pune Plant:

1.2.1 Organization and Staffing Structure of Pune Plant.

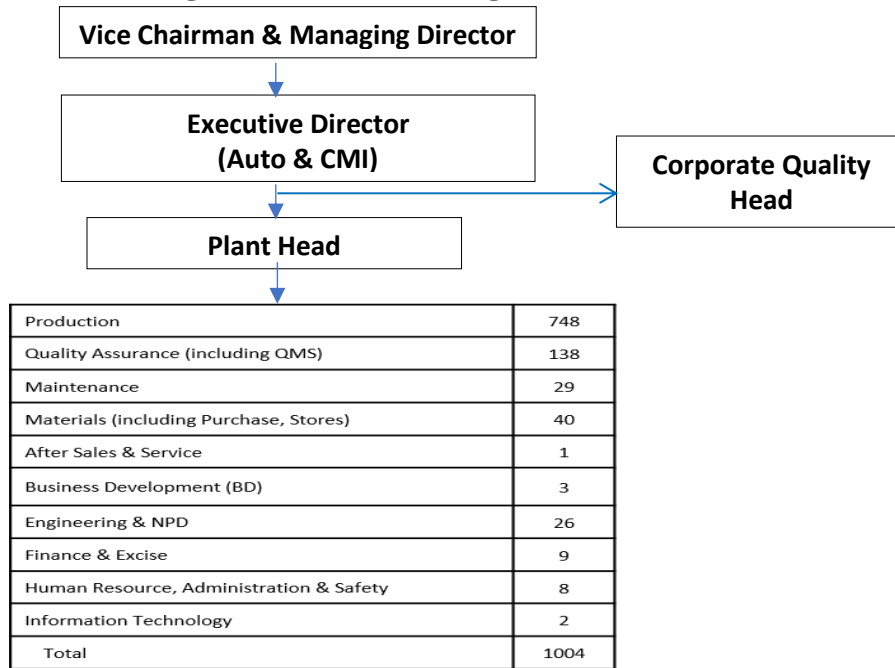


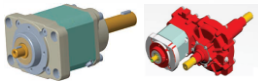


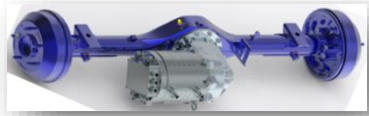



Fig.1.2

1.2.2 Product Range and Purpose

Table 1.1

Products		Category	Purpose
Gears, Shafts, Hubs, Sleeves		Automotive and non-automotive	Power transmission from gearbox to axle
Gear Box Automotive		Automotive	1.To transfer the power generated by the engine to the differential. 2.To transmit motion from steering wheel to axle
Gear Box Textile		Textile	To transmit and transfer power to the machine from the original motor
Machining		Automotive	1. Engine part for fuel combustion, 2,3 Structural part of commercial vehicles
eV Reducers		Automotive	To increase the torque produced by motor, while decreasing the speed
E Axle		Automotive	Drive unit that integrates into an axle structure the main components necessary to propel a vehicle using an electric motor as the main power source
Universal Joint Cross , Bearing Cup		Automotive	propeller shaft rotates when both transmission shafts are at an angle

1.2.3 Process Technology:

RSB Pune Plant is continuously focusing on improving the process technology to satisfy Customer & competitive by improving Product Quality & reducing cost. Refer table 1.2 for product wise process technology.

Table 1.2.1

Gears, Shafts, Hubs, Sleeves	Gear Box Automotive	Gear Box Textile	Machining
1.High Speed Hobbing 2.Dry Hobbing 3.Continuous chamfering 4.High Speed shaping 5.Hypocycloidal Milling 6.Continuous Rotary Herth Furnace, for heat treatment, with SCADA control system 7.Gear Teeth Grinding, for Gear Quality as per DIN (3962) Class 5* 8.Gear Teeth Honing for achieving surface for better NVH 9.Gear Teeth Swaging	1.Semi Automation of assembly, with electronic sensor system 2.Gearbox with double synchro-cone for better gear shift quality 3. Automatic sealant application, shim selection	1.Semi Automation of assembly, with electronic sensor system 2. Precision ground gears	1. High Speed cutting tools, 2. ADI Casting machining 3. Simultaneous controlled 5 axis CNC machining

Table 1.2.2

eV Reducers	E Axle	Universal Joint Cross , Bearing Cup	
1. Low noise 2.. Gear Quality as per DIN (3962) Class 5*	1.Low noise 2. Gear Quality as per DIN (3962) Class 5*	1. Semi automated centerless grinding 2. Rolled spline for better life of shaft 3. Cold forged bearing cup	Note: *DIN CLASS: Lower the class, better the result for Noise, Vibration, Harshness,


2. Milestone on the Journey of Manufacturing Excellence

To achieve the business objectives, it is very much essential to supply the products to customer on time. In order to do this, the infrastructure improvement should be capable enough & be available for production. Before adopting TPM practices, across plant there were issues like wastages, high cost, breakdown, low productivity and no systematic approach for managing the infrastructure. Hence RSB Pune Plant, adopted TPM approach as company policy for infrastructure management, from 2018.

2.1 Aim of TPM :

Eliminating losses (1) Zero Accident (2) Zero Break down (3) Zero Rejection and (4) Dry, Chips free, Oil free Shop floor.

2.2 TPM Deployment Process:

1. Selection of Sensei 2. Manager Model Machines 2018 3.TPM Kickoff September'2018 4.TPM activity started all “8” pillars throughout plants October'2018	
	Kozo Mizota San TPM Sensei

2.3 Major Items Introduced:

After adopting TPM, the below items have been introduced, refer table 1.3

Table 1.3

Systematic Approach	JH Pillar	PM Pillar	KK Pillar
1. Involvement of People 2. Focused-Preventive action	1. Model machine, 2. Training all people, 3. JH Kaizen, 4. Unit wise- JH activity, 5. JH Audits	1. Categorization of Machines – A, B & C ranking 2. Analysis of Breakdown 3. Improvement in Preventive Maintenance by Genba patrolling (Refer fig.1.5) 4. Support to JH Pillar	1. Loss Identification, 2. Loss Minimization, 3. Loss Elimination by KK projects, 4. Cost Optimization

2.4 Equipment Management Process:

RSB classified Machines in ABC ranking based on criteria and further deploy with Spares Management, Breakdown Maintenance and Preventive Maintenance and established measures like MTBF, MTTR & OEE.

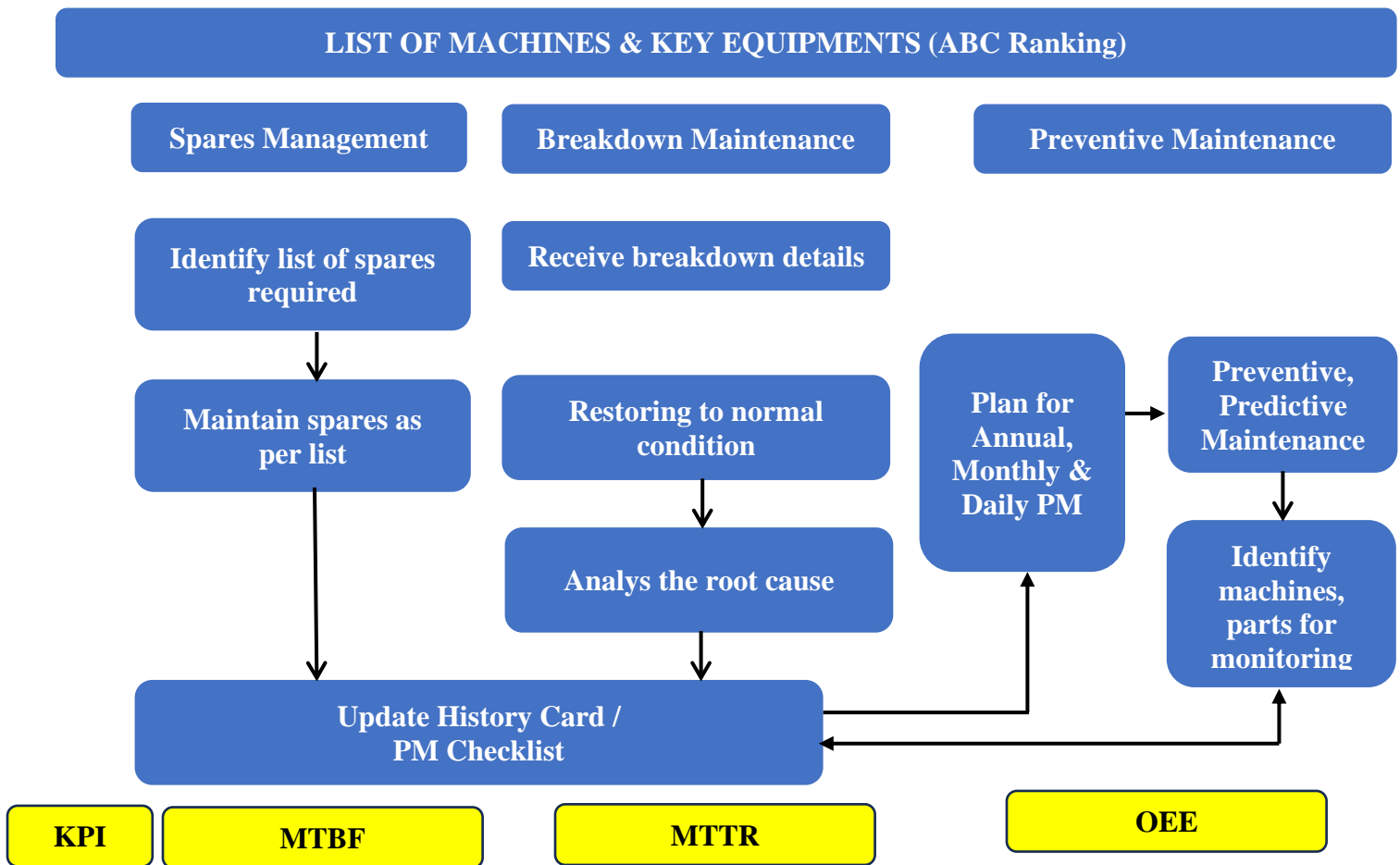


Fig 1.3

*Refer Table 1.4 for ABC ranking chart

Ranking Chart

Table 1.4

Element evaluation	A Rank failure	B Rank Failure	C Rank Failure
“S” Safety and environmental pollution	Cause serious safety and environmental problems in surrounding area	Cause some safety and environmental problems in surrounding area	Cause no serious safety or environmental problems in surrounding area
“Q” Quality and yield	Failure would cause defective product to be produced or seriously affect yield.	Failure would cause quality variation or affect yield moderately	Failure would affect neither quality nor yield.
‘W’ Working (operating) status	24 - hour operation	-	-
“D” Delay factor (opportunity cost)	Failure would shut down entire plant.	Failure would shut down relevant system only.	Stand by unit available/more economical unit to wait for failure and then repair.
“P” Period (failure interval)	Frequent stops (every month)	Occasional stops (once in 3 months)	Hardly any stops.(once in 6 months)
“M” Maintainability	Repair time: ≥ 24 hr Repair cost: over 2 lacs	Repair time: ≤ 24 hrs Repair cost: over 1.5 lacs	Repair time: < 6 hrs Repair cost: over 50,000

2.5 Genba Patrolling:

Genba patrolling process initiated to identify & eliminate abnormality in equipment to take actions proactively to reduce breakdowns and safety issues as proactive measures by PM team.

Typical example of Genba Patrolling:

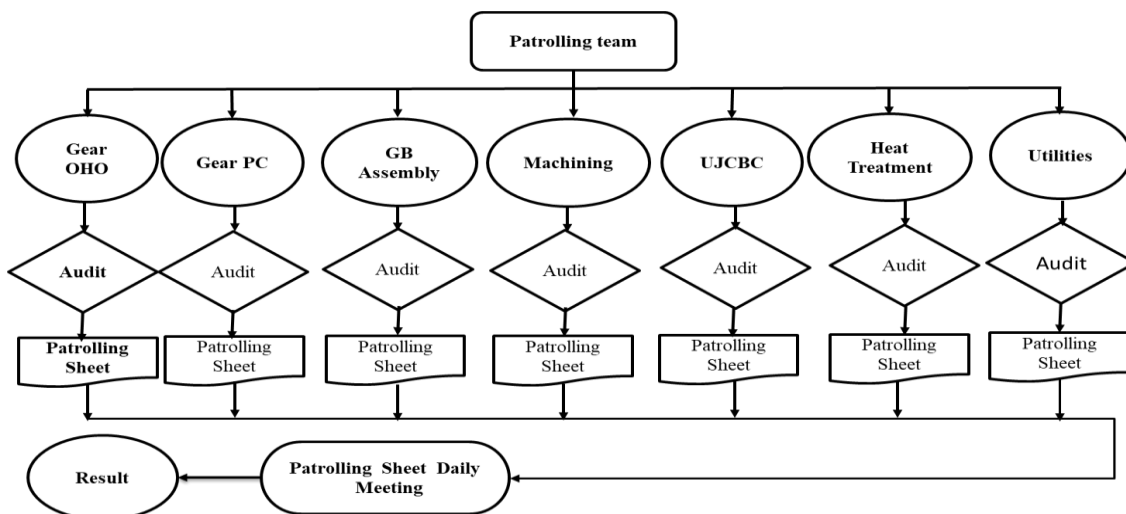


Fig 1.4

3. BENEFITS ACHIEVED AFTER TPM:

3.1 Tangible Business Results:

Table 1.5

Period	Area	Pune Unit 1
Before TPM:	Sales (Average per month)	Rs 185.2 million
	Profit Index	8 %
Period: Apr'18 – Sep'18	OEE	72 %
	Incident	26 no's
	Breakdown Occurrence (Average per month)	179 no's
	Customer Complaints	30 nos
	After TPM:	Sales (Average per month)
Period: Apr'23 – Sep'23	Profit Index	15 %
	OEE	83 %
	Incident	14 no's
	Breakdown Occurrence (Average per month)	47 no's
	Customer Complaints	7 nos

3.2 Employee Involvement & Motivation:

RSB following structured approach for employee involvement & motivation.

All employees are encouraged to participate in improvements and provide suggestions for improving organizational efficiency.

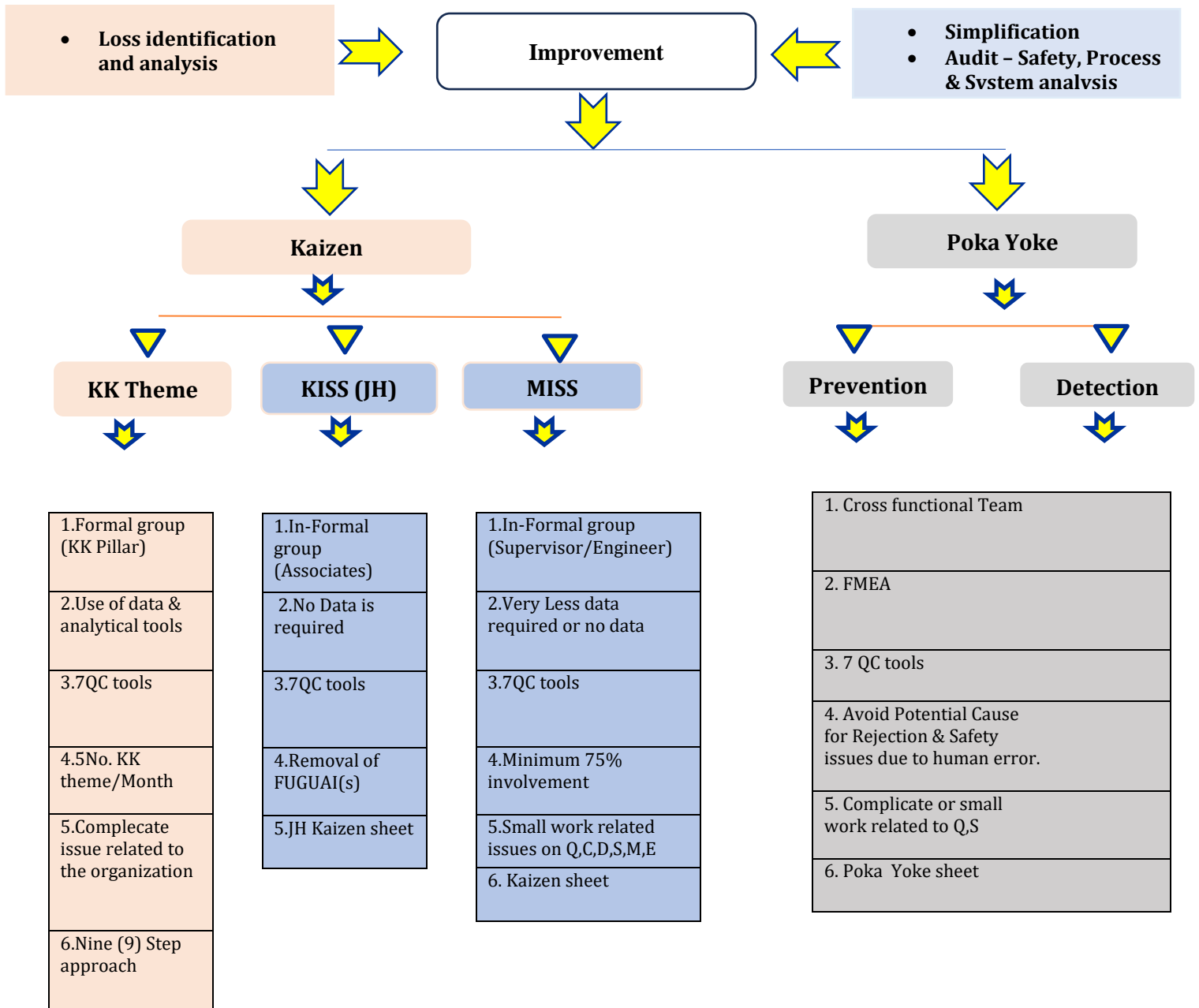
As an employee motivation, below process are followed-

Table 1.6

Awards / Recognition	Problem Solving approach	SHE activity
1) Employee of the Month /Year 1) Suggestion awards 2) Genba walk by management to understand the improvements made	1) Structured suggestion system implemented. 2) JH- Kaizen 3) CFT approach for elimination & minimization of chronic issues through *KK theme.	1) Encouragement for reporting near misses, 2) Safety Kaizen and poka yoke, 3) Safety committee including operators to eliminate unsafe conditions and acts

3.2 Continual Improvement System:

RSB has prepared a schematic diagram for "Continual Improvement" (Kobetsu Kaizen , Suggestion & Pokayoke). Refer below Fig.1.5



KISS - KEEP IT SIMPLE & SHINING (JH)
 MISS - MAKE IT SIMPLE & SHORTER

4. Key of our Manufacturing Excellence:

After introduction of TPM activities in 2018, RSB Pune Unit I adapted systematic approach which is resulting in improvement of Productivity, Losses are minimized or eliminated, Safety & Morale of employees are improved. This is further improving our Manufacturing processes & Customer Satisfaction.

Table 1.7

Category	Key Items	Unit	Actual Status (Sep'23)	Target (Mar'25)
Safety	Number of work related accidents requiring days off work	Cases/annually	0	0
	Number of work related accidents not requiring days off work	Cases/annually	2.5	0
	Safety index	Accident per 100,000 operator hours	0	0
	No of accidents requiring absence (accumulation of past 2 y)	Number/Year	0	0
Productivity	Productivity for main products	Sales/man/month	2.94	4
	OEE (Over all Plant Efficiency)	%	72	85
	Number of tags raised	Number (Cumulative)	8,994	12,000
	Number of breakdowns	Breakdown/annually	57	31
Quality	Number of Customer complaints	Number annually	7	0
	In-line defect rate (Scrap)	PPM	2969	2150
	In-line defect rate (Scrap & Rework)	PPM	3175	2300
Cost	Cost index (Lacs)	Cost/Unit (% of sales)	85	82
Delivery	Lead time in days	Days	1	1
	Delivery Performance	%	100	100
Morale	Number of Employee Suggestion	Numbers/annually	1720	2004

5. Achievement Record:

Table 1.8

Category	Index (Calculation Formula)	Unit	Kick off / TPM Started Apr' 18	Actual Status 2023	Target 2025	
S	Number of work-related accidents requiring days off work	Cases/ year	0	0	0	
S	Number of work-related accidents not requiring days off work	Cases/year	6	2.5	0	
P	Productivity for main products	Parts/Operator hours	4.2	4.8	5.7	
P	OEE (or Overall Plant Efficiency)	%	72	83	85	
	Availability	%	81.58	91.11	93	
	Performance Rate	%	88.64	91.81	92	
	Quality Products Rate	%	99.58	99.69	99.77	
P	Number of breakdowns	Breakdowns/year	2148	684	372	
P	MTBF	Hour	902	2894	5278	
P	MTTR	Hour	11.59	11.25	1.89	
Q	Number of customer complaints	Number/year	30	7	0	
Q	In-line defect rate	Scrap	%	0.38	0.29	0.21
		Scrap and rework	%	0.42	0.31	0.23
C	Cost index	Cost /Unit Cost/Kilogram	92	85	82	
D	Production Lead time	Days	15	10	7	
D	Delivery performance	%	93	100	100	
S	Safety index (ex. Lost Time Incident Rate)	(Accidents per 1,000,000 operator hours)	0	0	0	
M	Number of Employee Suggestions	Number/year	648	1720	2004	
Others	<Specify achievements not expressible in numerical terms> 1. Do you have a program where all employees can participate 2. Do you have a program allowing employees to be recognized their achievements? 3. Are top management involved in the audit/verification of completion of TPM pillar steps? 4. Are all pillar activity boards displayed and reviewed by top management?					