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1. Sigma Group

1.1 Company Profile

Brief History

Sigma Electric is a global leader in manufacturing ferrous and non-ferrous castings, precision machined components and sub-assemblies. Sigma has established long-term partnerships with its global customers, working closely to help them meet the challenges of a highly competitive business environment.

Sigma Electric is a 100 % Export Oriented Organization. Set up 30 years ago. Headquarter at Garner, NC, US and operating in India. There are over 5000 team members worldwide. Sigma has a majority shareholding from Argand Partners, USA.

Product Range

Sigma supplies to global leaders in market segments such as electrical, lighting, industrial, power tools, process instrumentation, appliances, telecom, aerospace, defense, marine, power, agricultural, food and Medical, Military, LED lightings.

Locations

Twelve world class manufacturing facilities at Pune, Jaipur, Mexico, USA for aluminum, zinc, bronze, copper, wide range alloys, iron & steel products.

Plants

Manufacturing capacity is 50,000 MT/annum with world-class manufacturing equipment tool room and design /engineering capabilities. Plants operate on Lean manufacturing system, certified for ISO 9001, ISO 14001, ISO 45001, AS9100, ITAR certifications.

Global Supply Chain

Warehouse, sales, customer service and tech teams are at Garner, NC, USA.

1.2 Outline of the Group

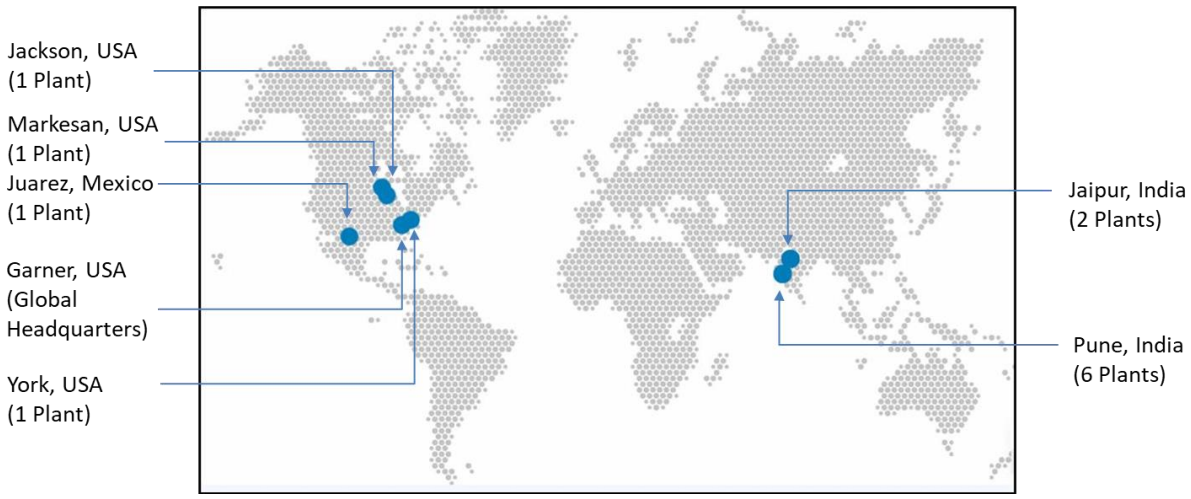
Sigma Electric is a global leader in the manufacture of machined cast metal parts and assemblies for the electrical, utility, home appliances, telecom, industrial and instrumentation markets. Sigma Unit-II and 2 other units of Sigma have won JIPM TPM Excellence Award in 2023.

Plant Certification - ISO 9001, 14001 & 45001 Standards

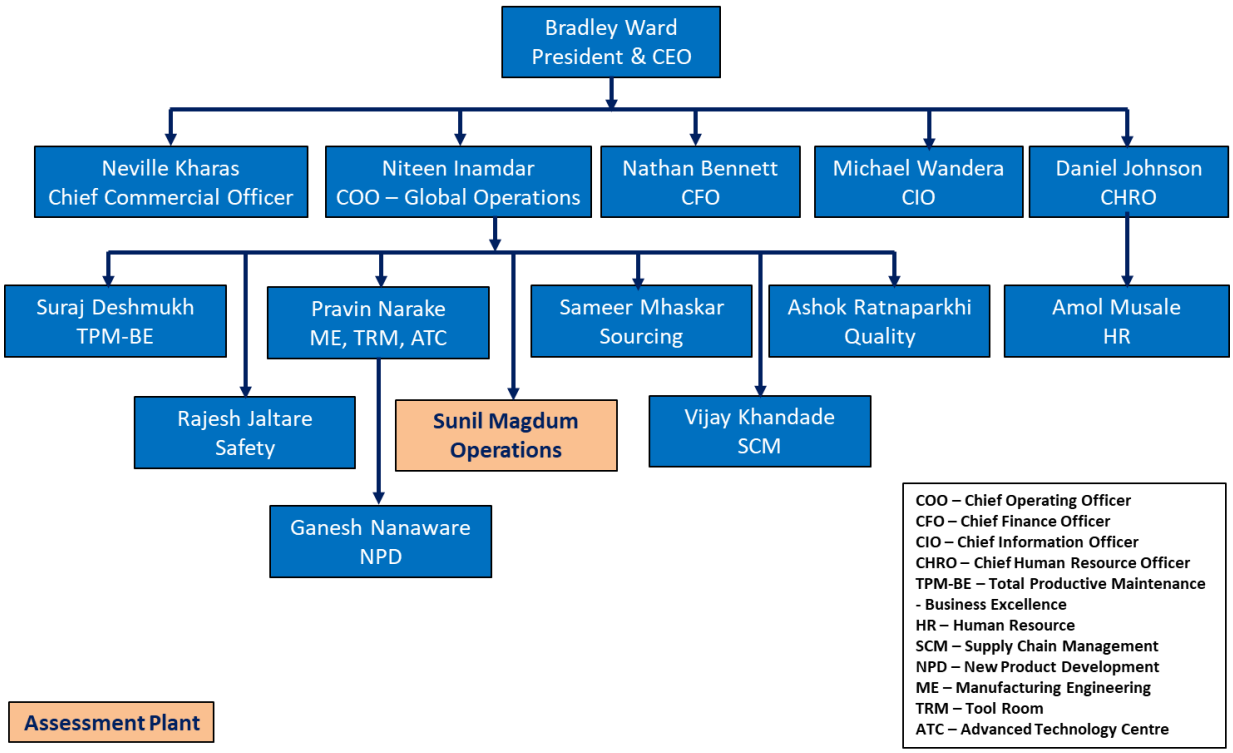
Production Capacity = 50,000 MT / Annum

1.3 Global Footprint

Sigma group is having total 12 manufacturing facilities throughout the world. Out of which 6 manufacturing plants are in Pune, 2 plants in Jaipur and 4 plants are in US and Mexico.



1.4 Organization Chart - Group

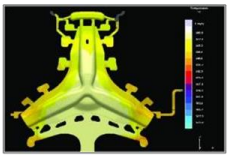


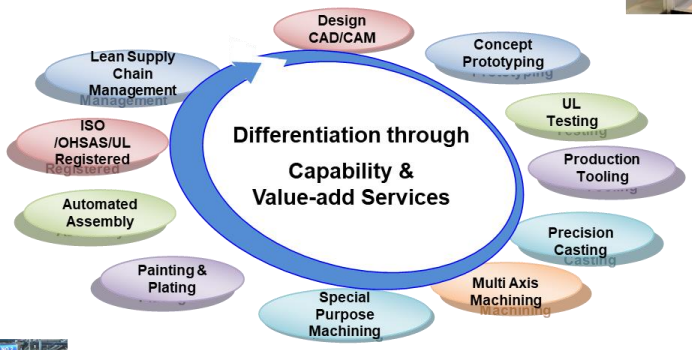
1.5 Vision and Mission

Company's Vision, Mission and Values are mentioned below.

1.6 Manufacturing and Engineering Capabilities

We call ourselves “one stop shop” as we have our own Tool room, Design centre and Machine manufacturing division. Sales and marketing functions are handled from our head office which is at USA





All Operations are In-House “One Stop Shop”

Uniqueness of Sigma

- Advance Technology Centre - Machine Manufacturing Division
- Tool Room
- Own Design Centre

1.7 Global Partners

These are our key customers.

Added 5000+ New products with 20+ New Customers over last 5 years

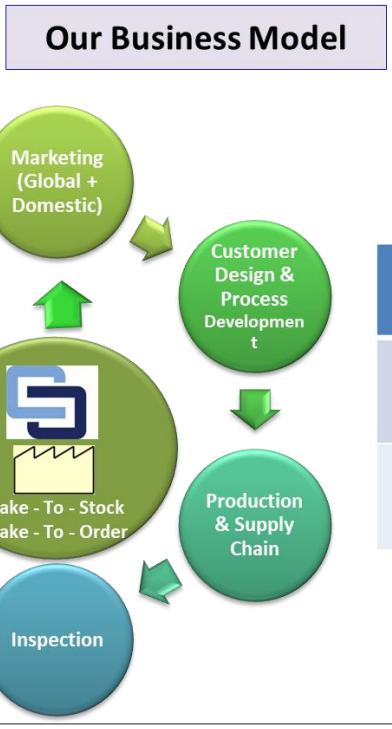
2. About Sigma Unit – II

2.1 Outline of the Unit

- Plant: Aluminum High Pressure Die-Casting Plant
- Product Range: Electrical, Lighting and Household Appliances
- Plant Area: 180,000 Sq. Ft.
- Installed Capacity: 10,680 MT / Annum
- Alloys: Aluminum Alloys
- Total Employees: 668 Nos.
- Equipment: 34 Cold Chamber HPDC Machines (Automatic) ranging from 150 Tons to 650 Tons, Three Central Melting Furnace, In-house Spectro, Precision Machining – CNC and VMC, SPMs, Powder Coating plant.

2.2 Business Model

Business model shown below

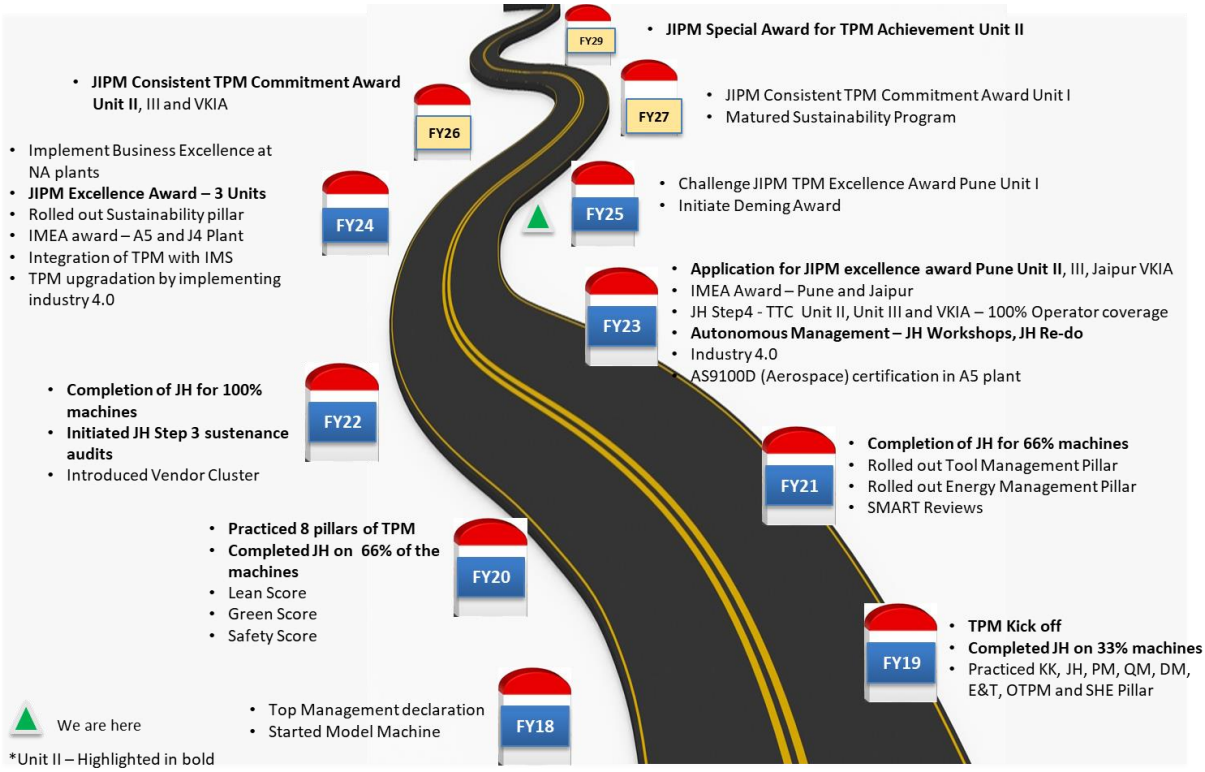


Business Model	Business Share in %	Driver
MTS	75%	Stock Driven
MTO	25%	Customer Driven

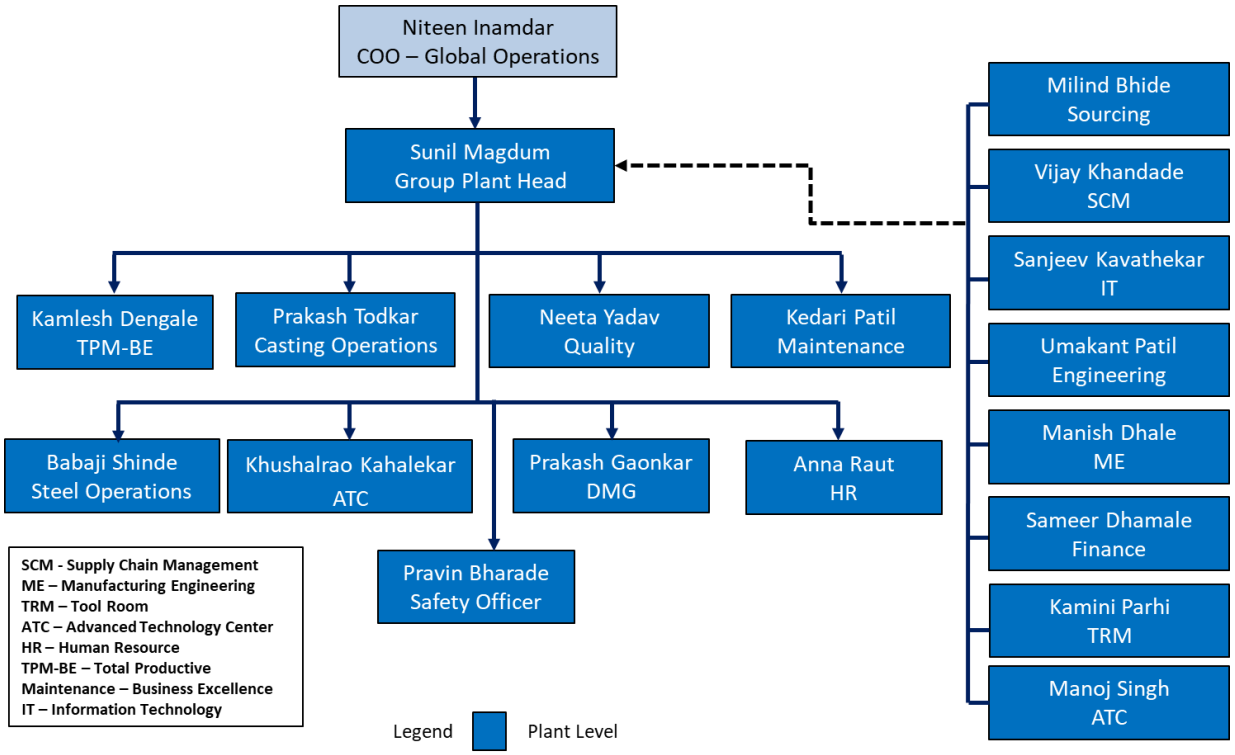
MTS (Make To Stock)– Pune → US Warehouse (Garner) → Stock and dispatch to customer

MTO (Make To Order) – Pune → Customer

2.3 Milestones



2.4 Organization Chart - Unit - II



2.5 Product Portfolio

Product Range - Electrical, Lighting and House Hold Appliances.

Weather Proof Group

Conduit Fittings

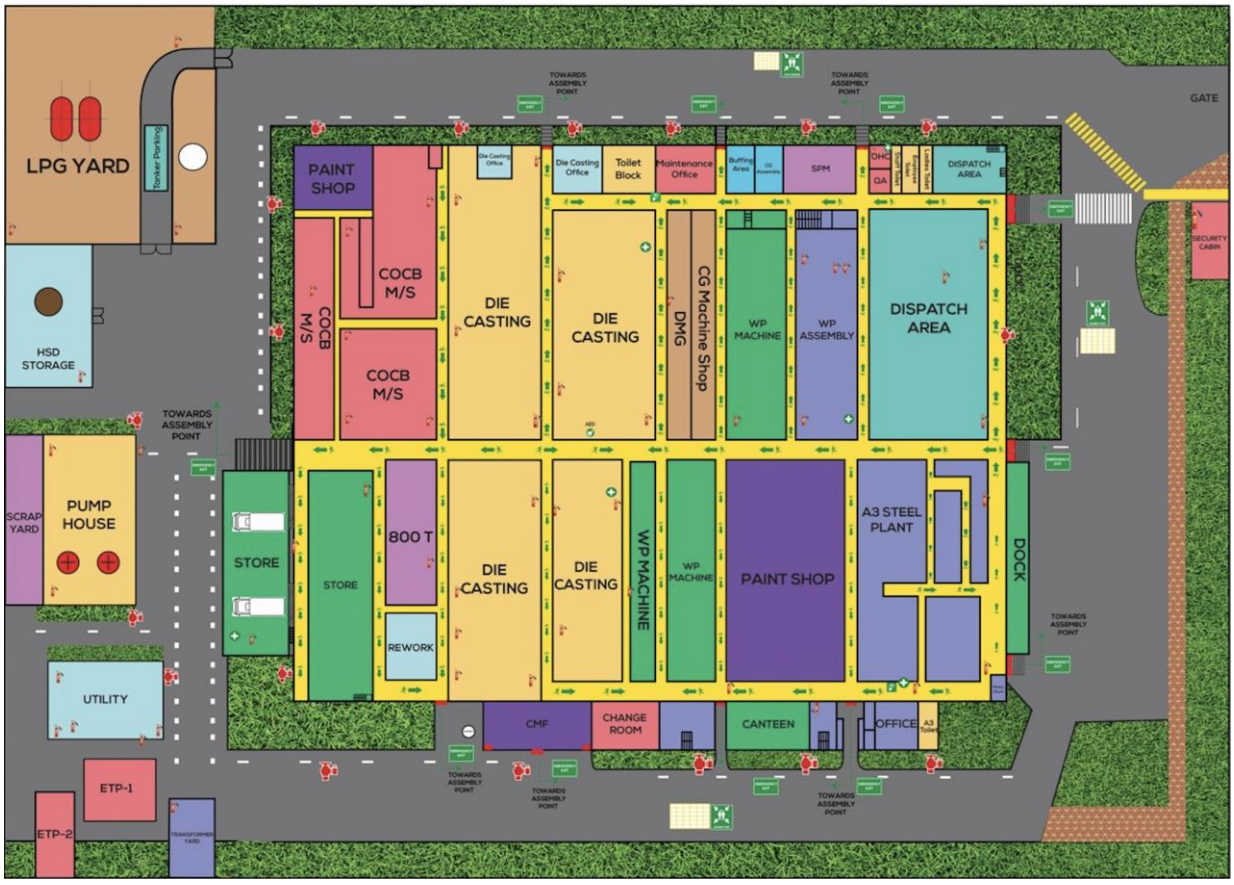
Lamp Holders & LH Covers

Steel Fittings

2.6 Key Customers

These are our key customers.

2.7 Unit Layout



2.8 Staffing Structure

Category wise manpower distribution as follows.

Category	Unit	Employee Count
Staff	Nos.	42
Associates	Nos.	68
Assistant Engineer - Line	Nos.	73
Technician	Nos	17
Diploma Engineer Trainee	Nos	183
Contract Operator	Nos	285
Total No. of Employees	**Nos**	**668**

2.9 Major Equipment

Following is equipment classification

#	Area	Equipment Quantity	Equipment Classification			
			S	A	B	C
1	Die Casting	117	3	27	87	0
2	Machine Shop	147	4	22	121	0
3	Paint Shop	20	18	1	1	0
4	Assembly	54	13	7	29	5
5	DMG	10	0	2	8	0
6	Utility	33	0	4	25	4
	Total Equipment	**382**	**38**	**63**	**272**	**9**

2.10 Manufacturing Process Flow

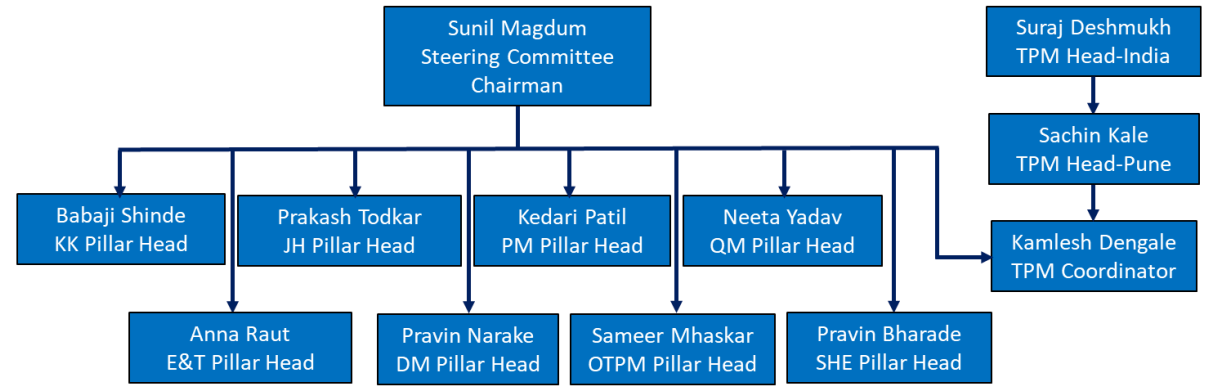
Following is plant process flow

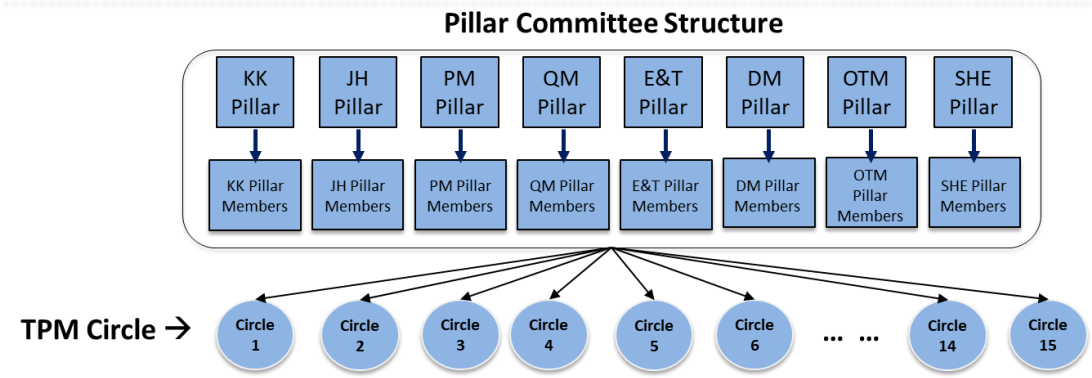
- **Process Flow:**

- **Machines:**

- **Product Flow:**

2.11 TPM Organization Structure





3. Milestone on the Journey of Manufacturing Excellence

3.1 JIPM TPM Excellence Award Journey of Unit-II Pune

TPM Health Assessment by CII – Group Photo (Mar-23)

JIPM First Stage Assessment - Group Photo (Jun-23)

Pune Unit-II Receiving JIPM TPM Excellence Award (Mar-24)

JIPM Second Stage Assessment - Group Photo (Dec-23)

3.2 Need of TPM

To improve business and overcome challenges below, management decided to implement TPM as a Business Tool.

Key Challenges:

- High Customer complaints
- High In-house rejection
- Segregation cost at Garner, US warehouse
- High COPQ
- Safety - number of injuries
- Less OEE
- Delivery compliance
- Scope for improvement in the culture – Low employee engagement

3.3 Embracing TPM for Manufacturing Excellence

Our company Vision is to 'Transform SIGMA as the Centre of Excellence through unleashing the passion and ingenuity in our people, building capabilities, using innovative technology and business processes, and consistently delivering value exceeding stakeholder expectations; thereby be the most preferred destination for investment'.

In line with our vision, we have felt the strong need of TPM as it will help us to achieve zero BAD. Developing employee capability, this will result in increased productivity, improved customer satisfaction and make profitable organization''.

The below details represent the reason we embraced TPM to achieve operational excellence.

3.4 TPM Policy

To implement TPM management established TPM Policy.

Vision Mission Statement	TPM Policy
Vision: To be our customer's partner of choice and a company that is great to do business with; a company that is trusted more than any other to continually improve and innovate products and services that solve their most pressing power connection needs. We will also be a great place to work, offering employees and environment of fulfillment and satisfaction. **Mission:** Sigma engineered solution's mission is to provide on time, on spec parts and superior service that help solve power connection needs. Our focused, customer centric approach will continually deliver purposeful solutions that meet and exceed customer expectations.	SIGMA ENGINEERED SOLUTIONS **TPM Policy** We, at Sigma Electric Manufacturing Corporation Private Limited, aim to be the most preferred global supplier of machined casting components to our customers globally. We will achieve this by designing, manufacturing and supplying innovative products of highest quality standards by implementing Operational Excellence **"Total Productive Maintenance" (TPM)** in our supply chain and adopting 0/100 philosophy. We are committed for the highest level of Operational Excellence and thereby customer delight by targeting at, • **Zero Accident** • **Zero Breakdown** • **Zero Customer Complaint** • **Zero Defects** This will be achieved by- ➢ Creating a culture through strong commitment at all levels ➢ Enhance capabilities of employee at all levels across organization ➢ Total employee involvement ➢ Achieving Product. People and Process excellence ➢ Integrating other improvement initiatives like ISO, Lean, 6 Sigma and others initiative into the TPM Sigma adopts TPM as a main prime driver to achieve Operational Excellence. Rev: 03 Date: 1st July 2023 Niteen Inamdar EVP & COO (Global Operations - SIGMA Castings)

3.5 Integration of all Tools and Methodologies in TPM

Linkage of KMI KPI and KAI established for all parameters. Sample mentioned below

KMI	KPI	KAI	Pillar
EBITA improvement	• Reduce Material Costs	• Alternate material. Alternate source , negotiations • VA –VE projects – Zero based working • Kaizen on losses / wastes • Labor productivity/ Automation/ Ind. 4.0 Projects	KK, DM
	• Reduce Conversion Cost	• CIP Projects • R&M reduction Projects • Energy cost reduction projects	KK, PM, OTPM

3.6 Evolution of Operator

We have achieved a major leap in the mindset of our machine operators and maintenance staff. This table represents the status of their mindset before and after introduction of TPM.

#	Before introduction of TPM	After introduction of TPM
A	**Machine Operators**	
1	Machine operators are mainly responsible for production	Machine operators are assigned responsibility of minor maintenance of machines
2	"I produce and You Maintain" attitude of operators	"I do, I check and I Maintain" attitude of operators—My Machine Concept
3	No formal checklist for machine maintenance basic parameters	Use of Checklist covering C-L-I-T-A
4	Only escalating when machine is dysfunctional	knowledge of machine functioning
5	Reporting of Breakdowns	- Identification and understanding of abnormalities. Participation in repair work during Maintenance Mindset change for zero breakdown
B	**Maintenance Staff**	
1	Focus on immediate repair for fixing the problems	Focus on preventive actions
2	Frequency and coverage of advanced maintenance techniques was less	More use and coverage of advance maintenance techniques – Vibration and Current Monitoring (CBM)
3	Tendency to get replacement of old machines	Focus on increasing life of old machines
4	Limited use of root cause analysis approach	Insistence on using Why- Why analysis Initiated use of Phenomena Mechanism analysis for chronic problems

4. Results and Benefits Achieved

4.1 Key Performance Indices – Results

Category	Index	Unit	BM-1 (TPM Started) FY18	BM-2 (Last time awarded) FY23	Actual Status YTD Nov-24	Target FY25
S	Number of work-related accidents requiring days off work	Cases/ year	1	0	0	0
S	Number of work-related accidents not requiring days off work	Cases/ year	169	2	2	0
P	Productivity for main products (Manpower Productivity)	Kgs / Man / Month	616	793	859	870
P	OEE (or Overall Plant Efficiency)	%	77%	88%	91%	91%
P	Availability	%	90%	95%	96%	96%
P	Performance Rate	%	88%	94%	96%	96%
P	Quality Products Rate	%	98%	98%	99%	99%
P	Number of breakdowns	Breakdowns / Month	393	130	109	102
P	MTBF	Hour	294	345	431	530
P	MTTR	Hour	1	53	49	43
Q	Number of customer complaints	Number / Year	80	3	0	0

Q	In-line defect rate (scrap)	%	3.96	2.96	2.69	2.48
Q	In-line defect rate (rework)	%	5.46	3.15	2.76	2.21
C	Cost index (Conversion Cost)	$ / Kg	0.75	0.77	0.76	0.77
D	Production Lead time	Days	0.72	0.59	0.38	0.40
D	Delivery Performance	%	85	96	97	97
S	Frequency rate	Number of occupational accidents with leave for 1 000 000 worked hours	0.49	0	0	0
M	Number of Employee Suggestions Implemented	Number / Year	1399	7015	5734	8064

4.2 Intangible Benefits

Understanding TPM in right spirit & practicing it day-to-day over six years has brought significant changes in work culture, system orientation, analytical approach & flexibility.

Work Culture:

- Sense of ownership of equipment / process i.e. "I Operate, I maintain, I Control".
- People started believing the possibility of Zero Customer Complaints, Zero In process Defects, Zero breakdowns and Accident.
- People have started thinking Deeply and Widely in their areas / section to improve from existing condition to next level.
- People now work as per the Flexibility of requirement and does not resist to any changes.
- Sustenance of Improvements done by the operators.

System Orientation:

- TPM is part of IMS.
- Management objective are well linked to plant objective, department Objective and then to Cell Objectives so focusing cell working in more meaning full and system way.
- Neat and Clean working environment can be seen.
- Well-defined system for maintenance spare management, Quality monitoring and Production monitoring.

Analytical Approach:

- Continuous Improvement / Focus on prevention of losses by searching the abnormalities, root cause analysis and Kaizen Implementation.

Flexibility:

- Flexibility in manufacturing due to multi-skilled operator.
- Production Output as per Customer Pull.

4.3 Recognitions in External Competitions

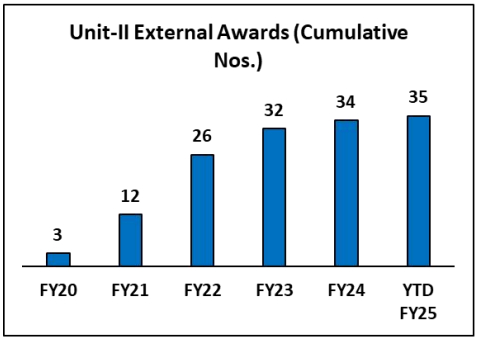
Unit-II has won 35 nos. external awards in the last 5 years. Sample images as mentioned below.

Total Awards Unit II – 35 Nos, Sigma India 166 Nos (Last 5 years)

Manufacturing Company of the Year FY23

CEO of The Year FY 23 Award
Manufacturing Today Award

Supplier Quality Contest FY20



India Manufacturing Excellence Award FY23

CII 5S Excellence Competition FY20

5. Way Ahead

#	Expectation of	Expectation	Future Plan
01	Customer	• YOY Cost reduction • New Products productionised with minimum development time • Achieve & sustain new quality, delivery criteria on continuous basis	• Focused approach for VA –VE • Strengthen Manufacturing Engineering Capability to assimilate new technology • Extend TPM methodology to suppliers in phased manner
02	Management/ Shareholders	• Improve profit margin • Add new products & customer • Positive cash flow	• Fixed & variable cost control by adopting TPM deeply & widely • Diversify in new product category • Inventory reduction
03	Employee	• Learning & career growth • Safe & Healthy working environment	• Continuous upgradation of employee knowledge & skill across all the level through IDP (Individual Development Plan)