

## Company / Factory Profile:

1. **Company Name** : Amara Raja Energy & Mobility Limited.  
Automotive strategic Business unit (ASBU).



2. **Company** :

3. **Company Photos showing features of the plant:**



1 4 Wheeler Battery manufacturing facility

2 2 Wheeler Battery manufacturing facility





**Grid Casting**



**Strip Casting**



**Pasting**



**Oxide Preparation**



**Assembly**



**Formation**



**Finishing**



**Dispatch**

#### **4. Company Profile:**

Amara Raja group founded by chairman Dr. Ramachandra N Galla in the year 1984. The Amara Raja Group is one of the fastest growing conglomerates in India with a revenue of USD 1.2 Billion through highly engaged customers across the globe. Through our engaged employees, empowered teams and collaborative leadership, we are in a constant endeavor of making things better for the Environment, Society, Customers, Suppliers, Employees and Shareholders.

The company began in Karakambadi Village, Chittoor district, Andhra Pradesh state has today anchored by a workforce of 16,118+ people working for 7 companies (in Chittoor District) encompassing 16 businesses. Over the years, Amara Raja has diversified from its core offering Batteries into Power systems, Mangal Industries Ltd, Galla foods, Electronics, Infrastructure, Health care and hospitality.

Amara Raja Energy & Mobility Limited (ARE&ML) is the first company in India to manufacture Maintenance Free Valve Regulated Lead Acid (MF-VRLA) Batteries. Our product range is from 40 Ah to 6000 Ah (Ampere hour) to meet the power requirements of variety of various industrial customers. Under automotive strategic business unit 25AH to 200AH in four-wheeler batteries segment and 2.5AH to 18AH in two-wheeler batteries segment are manufactured.

The company also provides technical and After-Sales service to meet diverse customer needs through its network of Regional / Branch offices spread across the country. Today Amara Raja Energy & Mobility Ltd. is one among the world class battery manufacturers.

Amara Raja Energy & Mobility Limited (ARE&ML) has two Strategic Business Units (SBUs).

Industrial Strategic Business Unit (ISBU) caters to the needs of Industrial batteries which will supply batteries to railways, telecommunication and defense sectors.

Automotive Strategic Business Unit (ASBU) deals with the requirement of batteries in the automotive segment.

Automotive Strategic business unit (ASBU) is our flagship company which generates 36% of group revenue and also which is having 20% of group employees.

ASBU is well known for its automotive battery brand "AMARON" which is India's second largest selling automotive battery brand.

The portfolio of ASBU includes.

- 4 Wheeler batteries
- 3 Wheeler batteries
- 2 Wheeler batteries.

The production Unit comprises

- Oxide Manufacturing
- Grid Casting
- Strip Casting
- Paste mixing, Pasting on grid and Plate curing
- Assembly
- Formation
- Finishing
- Dispatch

## 5. Mile stone on the journey of manufacturing excellence

### Reasons for adopting TPM as company policy

In ASBU relentless journey towards excellence, our continuous focus is to improve both our products and processes. We aim to achieve this through fostering a culture that engages our employees in continuous improvement activities. TPM provides us with an ideal platform to engage and empower our employees in our journey towards excellence.

By Implementing TPM, ASBU wants to improve business results and foster safe, pleasant and productive workplaces by optimizing the relationships between the people who work there and the Equipments /systems they rely on by taking a closer look at the plants, machinery, systems and resources, assess their level of efficiency, and identifies opportunities for improvement.

For us, it is about a powerful structural approach to create a work culture that promotes excellence powered by Innovation. Through TPM, ASBU wishes to achieve results, particularly in boosting productivity, trimming costs, reducing equipment breakdowns & stoppages, lessening quality defects, shrinking inventory, and promoting employee involvement. While it seeks to empower the employees, it also wants the systems to become more reliable and flexible. Also, to visibly transform the workplace, and raise the level of knowledge and skill of the workforce.

- Staffing structure

S.No	Plant	M Grade	S Grade	Workmen	Total
1	ABD1	45	73	1065	1183
2	SBD1	37	72	1300	1409

### TPM journey after receiving JIPM TPM Excellence Award

- Amara Raja Energy & Mobility Limited decided to Implement TPM Consistency award requirements in Automotive strategic business unit in Jan'2020.
- Restructuring of TPM promotion organization done in Jan'2020.
- Refresh training on TPM awareness and TPM tools given in Jan'2020.
- Setting of basic TPM principles & Targets for Consistency Award
- Restructuring of TPM circles and nominated circle facilitators.
- Preparation of master plan for implementing TPM for meeting the Consistency requirements
- Deepening and widening of Kobetsu Kaizen pillar activities to meet the JIPM TPM Consistency award requirements
- Deepening and widening of Jishu Hozen pillar activities to meet the JIPM TPM Consistency award requirements
- Deepening and widening of Planned maintenance pillar activities to meet the JIPM TPM Consistency award requirements
- Deepening and widening of Quality maintenance pillar activities to meet the JIPM TPM Consistency award requirements
- Deepening and widening of Development Management pillar activities to meet the JIPM TPM Consistency award requirements
- Deepening and widening of Education & Training pillar activities to meet the JIPM TPM Consistency award requirements
- Deepening and widening of Office TPM pillar activities to meet the JIPM TPM Consistency award requirements
- Deepening and widening of Safety, Health & Environment pillar activities to meet the JIPM TPM Consistency award requirements
- Establishment of Tool Management Pillar done in Oct'2020.
- 4-day workshop conducted for TPM Facilitators by consultants.
- Quarterly TPM Steering Committee meetings conducted.
- Implemented management Audits for Pillar Steps.
- Conducting fortnightly circle meetings and carrying out review of Circle PQCDMS targets.
- Conducted workshop on TPM tools usage like Why-Why analysis, Elimination, combine, rearrange and Simplification (ECSR), Why-Why Because Logic Analysis (WWBLA), Physical Phenomenon-Mechanism (P-M) Analysis, Process point analysis (PPA), Makigami analysis etc.
- Promoted monthly Kaizen Competitions.
- OPL, Poster, Slogan & Schematic diagram Competitions conducted.
- Promoted monthly Rewards and Recognition Program.
- Monthly 5S Audits and Best 5S section Competition.
- Inclusion of TPM related objectives in Performance Evaluation.
- Introduced 5S Gallery and well established TPM Gallery.
- Upgraded JH step4 Technical Training Centre.
- Introduced Safety Corner.



## **6. Benefits Achieved**

### **Tangible Business Results Achieved**

Following Are some of the benefits achieved through TPM

- OEE improved from 84.4% to 89.4% in 4W Plant and 85.5% to 88.60% in 2W Plant.
- Manpower productivity improved from 775 to 903 batteries / Employee in 4W Plant and from 978 to 1324 batteries / Employee in 2W Plant.
- Yield improved from 98.6 to 99.4% in 4W Plant and 94.5 to 95.8% in 2W Plant
- Manufacturing cost reduced from 1966 to 1708 INR / Battery in 4W Plant and 430 to 375 INR / Battery in 2W Plant.
- Customer complaints reduced from 8 to 0 in 4W Plant zero is sustained in 2W Plant.
- In process scrap reduced from 0.70% to 0.51% in 4W Plant and 0.92 to 0.60% in 2W Plant.
- Scrap (Reject) and rework reduced from 0.84% to 0.64% in 4W Plant and 1.92 to 0.87% in 2W Plant.
- Incoming material complaints reduced from 13 to 0 per annum in 4W Plant and sustained zero in 2W Plant.
- Savings against material procurement cost is 20 INR/ Battery in 4W Plant and 86 INR/ Battery in 2W Plant.
- Workplace became Safer and number of accidents eliminated from 3(First Aid cases) in 4W Plant and from 2 (First Aid case) in 2W Plant.
- Delivery performance improved from 99.5% to 100% in 4W Plant and improved from 95% to 99% in 2W Plant
- Total number of breakdowns per machine per annum reduced from 13 to 7 in 4W Plant and 17 to 8 in 2W Plant.
- 2714 Kaizens implemented, 8175 OPLs implemented

### **Intangible Improvements**

- Significant cultural change in the organization and improved morale of the employees.
- Improved health of the equipments by improving operator skills. White to Red tag ratio Improved.
- Considerable reduction in the cleaning time in plants, visualized clean plants, highly satisfied customers during their visits.
- Usage of root cause analysis tools and kaizen culture among employees.
- Participation of Employees in Circle meetings, Kaizens and creation of OPLs increased tremendously.
- Ergonomics Improved.
- Motivational levels improved
- Presentation and communication skills improved
- ASBU Won 5S Model Plant award received from ABK-AOTS in 2016

- Amara Raja Energy & Mobility Ltd. has bagged the Gold at the CII-SR EHS Excellence Awards 2021, in recognition of the company's adherence to the most stringent environment, health & safety (EHS) practices

## **7. Key of our manufacturing Excellence**

The management is convinced of the productivity improvements and overall organizational effectiveness that TPM can bring and has selected TPM as a business excellence model to achieve our Vision of "We will continually redefine business to Deliver High Social Impact, by Anticipating Future Trends, Building Preferred Brands and Leveraging Talent & Technology". Policy deployment. The Pillar and circle targets are being part of performance evaluation system.

## **Key Items for Manufacturing Excellence in Future**

- Sustaining the Circle Activities and continually improve.
- Completion of Autonomous Maintenance Step-5 and 50% completion of step 6 and initiation of step 7.
- Spread TPM activities in supply chain and sales & marketing areas.
- Spread the TPM activities in other ARE&ML units and other group companies.
- Further improve projects in Focused improvement.
- Further improve cycle times in plants.
- Focus on energy consumption reduction.
- Horizontal replication of Kaizens in other ARE&ML units and multiply the savings.
- Improve number of Kaizen to 2 Nos/ Employee.
- Focus on cost Trend.
- New supply chain initiatives.
- More safety focus.
- New technology and innovation acceleration.
- Instilling culture of continuous improvement.
- Improved version of SAP - S4 HANA for TPM data capturing and analysis.
- Implementing inventory management.
- Focus on breakdown elimination.
- More focus on Global competition.

## 2023 TPM Award -Achievement Sheet

Company	Amara Raja Energy & Mobility Limited
Plant name	Automotive Strategic Business Unit (ASBU)
TPM Slogan/Objectives	Marching Towards Consistency
Year when TPM activity started	2014-15
Year of benchmarking	2019-20

Category	Index (Calculation Formula)	Unit	Kick off/TPM Started (or last time awarded) 2019-20	Actual Status 2022	Actual Status YTD 2023
S	Number of work-related accidents requiring days off work - 4W	Cases/ year	2	0	0
	Number of work-related accidents requiring days off work - 2W	Cases/ year	6	0	0
S	Number of work-related accidents not requiring days off work - 4W	Cases/ year	1	3	0
	Number of work-related accidents not requiring days off work - 2W	Cases/ year	0	1	0
P	Productivity for main products - 4W	Parts/Operator hours	775	880	903
	Productivity for main products - 2W	Parts/Operator hours	978	1317	1324
P	OEE (or Overall Plant Efficiency) - 4W	%	84.4	89.3	89.4
	OEE (or Overall Plant Efficiency) - 2W	%	85.5	88.2	88.6
P	Availability - 4W	%	88.8	92	92
	Availability - 2W	%	87.9	90.1	90.25
P	Performance Rate - 4W	%	95.3	98.27	98.27
	Performance Rate - 2W	%	98.26	98.61	98.78
P	Quality Products Rate - 4W	%	99.7	99	99
	Quality Products Rate - 2W	%	99.21	99.36	99.4
P	Number of breakdowns - 4W	Breakdowns/ Machine	13	2	2
	Number of breakdowns - 2W	Breakdowns/ Machine	17	3	3
P	MTBF - 4W	Days	28	29	30
	MTBF - 2W	Days	21	23	24
P	MTTR - 4W	Hour	0.53	0.52	0.50
	MTTR - 2W	Hour	0.5	0.48	0.46
Q	Number of customer complaints - 4W	Number/year	8	0	0
	Number of customer complaints - 2W	Number/year	0	0	0
Q	In-line defect rate( scrap ) - 4W	%	0.7	0.48	0.48
	In-line defect rate( scrap ) - 2W	%	0.92	0.64	0.6
Q	In-line defect rate, (rework ) - 4W	%	0.84	0.6	0.64
	In-line defect rate, (rework ) - 2W	%	1.92	1.04	0.87
C	Cost index (Manufacturing cost )- 4W	INR / Battery	1966	1770	1708
	Cost index (Manufacturing cost )- 2W	INR / Battery	430	385	375
D	Production Lead time - 4W	Days	12	9.5	9.5
	Production Lead time - 2W	Days	16	13	13
D	Delivery performance - 4W	%	99.5	99.5	100
	Delivery performance - 2W	%	95	98	99
S	Safety index - 4W	Accidents per 1,000,000 operator hours	0.64	0	0
	Safety index - 2W	Accidents per 1,000,000 operator hours	1.75	0	0
M	Number of Employee Suggestions - 4W	Number/year	11500	11673	11895
	Number of Employee Suggestions - 2W	Number/year	20192	21018	21496