

Company / Factory Profile:

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

2. **Company** :  **AMARA RAJA**
Gotta be a better way

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





Grid Casting



Oxide Preparation



Pasting



Assembly



Formation



Finishing

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 and later expanded in Nunegundla palli Village and other locations in 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 Ltd (ARE&ML) has two Strategic Business Units (SBUs).

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

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

Industrial Strategic business unit (ISBU) is our flagship company which generates 33% of group revenue and also which is having 18% of group employees.

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

ISBU is well known for its inverter battery brand "QUANTA" and "POWER ZONE" and we are pioneer in India to manufacture batteries with AGM technology.

The portfolio of ASBU includes.

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

The portfolio of ISBU includes.

- UPS batteries
- Telecom batteries
- Solar batteries.
- Motive batteries
- Railways batteries
- Defense applications

Amara Raja Energy & Mobility Limited (ARE&ML) is the first company to manufacture Valve Regulated Lead-Acid (VRLA) batteries in India. They are engineered to provide the performance reliability and consistency over the life of the product and they offer a long battery life with minimal maintenance. The VRLA products fit virtually anywhere and provide superior performance in the most demanding applications.

Amara Raja Industrial Batteries are built to the highest competence in its class. They are fail-safe and fool-proof battery technology manufactured at our premium manufacturing facility. The epitome of quality. an ISO:9001 certified ARE&ML manufacturing plant render batteries with Higher cyclic life, Superior discharge performance, Lower self-discharge rates, Explosion resistant, Factory charged and Eco-friendly batteries with a floating life of 10 plus years making ARE&ML, among the most preferred battery manufacturing company in over 32 countries across the globe.

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 ISBU 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, ISBU 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, ISBU 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	LVRLA	32	61	1071	1164
2	MVRLA	28	64	797	889

Items Introduced Since Commencing the TPM Journey

- Amara Raja decided to Implement TPM in Industrial strategic business unit in Jan' 2018
- Steering committee formed in Jan'2018.
- 5S & Basic TPM training for all staff.
- Workshop for pillar committee members.
- Formed TPM circles and nominated circle facilitators.
- Selected 8 Manager Model Equipments (MME)and formed the teams across ISBU.

- Formed the factory TPM targets and TPM Policy.
- Managers carried out the TPM activities in Manager Model Machines.
- ISBU kicked off TPM on 15th of Oct'2018.
- Implemented 5S in all areas.
- Activated Autonomous Maintenance (AM) and SHE pillar activities in Oct'2018.
- Activated Planned Maintenance (PM) in Jan'2019.
- Activated Focused Improvement (FI) and Quality Maintenance (QM) pillars in Feb'19.
- Identified and activated Focused Improvement (FI) Projects.
- Activated Education & Training (E&T) and Office TPM(OTPM) pillar activities in Oct'2019.
- Activated Development Management (DM) Pillar in Jan'2020.
- 4-day workshop conducted for TPM Facilitators by consultants.
- implemented Autonomous Maintenance (AM) Pillar activities step by Step.
- Introduced Daily AM time in plants.
- Quarterly TPM Steering Committee meetings conducted.
- Implemented management Audits for Pillar Steps.
- Conducting weekly 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.
- Introduced 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 71.1 to 82.1% in LVRLA Plant and 68.6 to 83.8 % in MVRLA Plant.
- Manpower productivity improved from 60400 to 104195 Ampere Hours / Employee in LVRLA and 114000 to 161610 Ampere Hours / Employee in MVRLA plant
- Yield improved from 93.5 to 96.1 in LVRLA Plant and 95.25 to 97.25 in MVRLA plant
- Manufacturing cost reduced from 8.81 to 7.95 INR/Ampere Hour in LVRLA Plant and 8.14 to 7.0 INR/Ampere Hour in MVRLA Plant.
- Customer complaints eliminated from 2 in LVRLA Plant and from 30 in MVRLA Plant.

- In process scrap reduced from 0.8 to 0.22% in LVRLA Plant and 2.15 to 1.06% in MVRLA Plant.
- Scrap (Reject) and rework reduced from 1.53% to 0.46% in LVRLA Plant and 4.27% to 1.21% in MVRLA Plant.
- Incoming material complaints eliminated from 17 per annum in LVRLA Plant and from 38 per annum in MVRLA Plant.
- Savings against material procurement cost is 0.24 INR/ Ampere Hour in LVRLA Plant and 0.24 INR/ Ampere Hour in MVRLA Plant.
- Workplace became Safer and number of accidents eliminated from 7 in LVRLA Plant and from 5 in MVRLA Plant.
- Delivery performance increased from 77% to 99.5% in LVRLA Plant and 90.6% to 100% in MVRLA Plant.
- Total number of breakdowns per machine reduced from 75 to 3 in LVRLA Plant and 112 to 3 in MVRLA Plant.
- 561 Kaizens and 11902 OPLs implemented in LVRLA Plant & 738 Kaizens and 6206 OPLs implemented in MVRLA Plant

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
- 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
- MVRLA Plant got 5S model Plant Award in 2018 from ABK-AOTS DOSOKAI.
- LVRLA Plant got 5S Sustenance Level – 2 from in 2019 ABK-AOTS DOSOKAI

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 i.e. Through the Amara Raja Way and through enduring progressive partnerships we will be a Global Leader in Batteries and Battery Technologies and a dominant player in the Indian Ocean Rim. 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, 6, 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 focus on safety.
- 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 reduction.
- More focus on Global competition.

2023 TPM Award -Achievement Sheet

Company	Amara Raja Energy & Mobility Limited
Plant name	Industrial Strategic Business Unit (ISBU)
TPM Slogan/Objectives	Marching Towards Excellence
Year when TPM activity started	2018-19
Year of benchmarking	2018-19

Category	Index (Calculation Formula)	Unit	Kick off/TPM Started (or last time awarded) 2018-19	Actual Status 2022	Actual Status 2023
S	Number of work-related accidents requiring days off work - LVRLA	Cases/ year	7	1	0
	Number of work-related accidents requiring days off work - MVRLA	Cases/ year	5	0	0
S	Number of work-related accidents not requiring days off work - LVRLA	Cases/ year	2	0	0
	Number of work-related accidents not requiring days off work - MVRLA	Cases/ year	3	1	0
P	Productivity for main products - LVRLA	Ampere Hours / Employee	60400	94312	104195
	Productivity for main products - MVRLA	Ampere Hours / Employee	114000	159000	161610
P	OEE (or Overall Plant Efficiency) - LVRLA	%	71.1	81.7	82.1
	OEE (or Overall Plant Efficiency) - MVRLA	%	68.58	82.3	83.8
P	Availability - LVRLA	%	77.76	86.4	86.6
	Availability - MVRLA	%	70.19	84.05	85.46
P	Performance Rate - LVRLA	%	92.3	95.2	95.4
	Performance Rate - MVRLA	%	98.63	98.92	98.98
P	Quality Products Rate - LVRLA	%	99.1	99.3	99.4
	Quality Products Rate - MVRLA	%	98.96	98.99	99.01
P	Number of breakdowns - LVRLA	Breakdowns/ Machine	75	20	3
	Number of breakdowns - MVRLA	Breakdowns/ Machine	112	17	3
P	MTBF - LVRLA	Days	4.8	13	15
	MTBF - MVRLA	Days	3.22	12	16
P	MTTR - LVRLA	Hour	0.64	0.62	0.6
	MTTR - MVRLA	Hour	0.95	0.85	0.8
Q	Number of customer complaints - LVRLA	Number/year	2	1	0
	Number of customer complaints - MVRLA	Number/year	30	2	0
Q	In-line defect rate, scrap - LVRLA	%	0.8	0.24	0.22
	In-line defect rate, scrap - MVRLA	%	2.15	1.13	1.06
Q	In-line defect rate, scrap and rework - LVRLA	%	1.53	0.47	0.46
	In-line defect rate, scrap and rework - MVRLA	%	4.27	1.25	1.21
C	Cost index (Manufacturing Cost) - LVRLA	INR / AH	8.81	8.19	7.95
	Cost index (Manufacturing Cost) - MVRLA	INR / AH	8.14	7.05	7
D	Production Lead time - LVRLA	Days	11.4	9.7	9.3
	Production Lead time - MVRLA	Days	15	9.9	9.4
D	Delivery performance - LVRLA	%	77	98.5	99.5
	Delivery performance - MVRLA	%	90.6	96	100
S	Safety index - LVRLA	Accidents per 1,000,000 operator hours	1.45	0.41	0
	Safety index - MVRLA	Accidents per 1,000,000 operator hours	1.32	0	0
M	Number of Employee Suggestions - LVRLA	Number/year	12482	12894	13089
	Number of Employee Suggestions - MVRLA	Number/year	7549	7790	7989