

# PROPEL

ISSUE 30 | JULY 2022

**Great  
Place  
To  
Work®**

**Certified**

MAY 2022–MAY 2023

INDIA

TM

**FIVE RANE  
COMPANIES  
CERTIFIED AS  
GREAT PLACE  
TO WORK**

A RANE GROUP  
PUBLICATION





# *The World of Rane*

*Rane Holdings Limited (RHL)*

*Rane Brake Lining Limited (RBL)*

*Rane Engine Valve Limited (REVL)*

*Rane (Madras) Limited (RML)*

*- Steering & Linkages Division (SLD)*

*- Light Metal Casting India (LMCI)*

*- Rane Auto Parts (RAP)*

*- Rane Light Metal Castings Inc (LMCA)*

*Rane NSK Steering Systems Private Limited (RNSS)*

*ZF Rane Automotive India Pvt. Ltd. (ZRAI)*

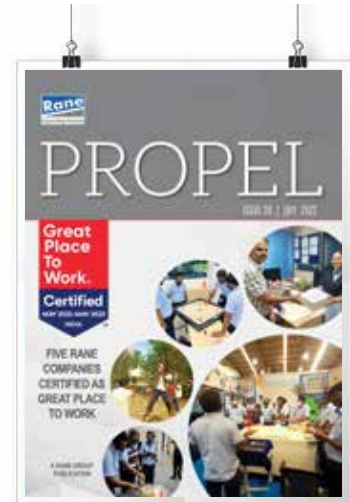
*-Occupant Safety Division (OSD)*

*- Steering Gear Division (SGD)*

*Rane Holdings America Inc. (RHA)*

*Rane Holdings Europe GmbH (RHEG)*

*Rane t4u Private Limited*



Please send in your feedback and queries to  
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magazine

## INSIDE THIS EDITION

The Rane Group has been striving for excellence through Total Quality Management and has received the Deming Award in the past validating its efforts. On the employee front too, we have been making efforts to empower promising and capable employees with programs to further their growth. As a recognition of these efforts, five of our companies received the Great Place to Work certification. Read all about it in the *Cover Story*.

Rane shares a deep and long relationship with the global auto component major, ZF. In *Outside In*, we present an interview with Dr. Holger Klein, ZF Board Member, about his perspectives on the future of mobility, the merger of TRW Automotive and ZF, and ZF's relationship with Rane.

The *Employee Spotlight* focuses on finance employees and their journey with Rane, learning and contributing as they continue to grow.

Much has been happening at Rane this quarter. In addition to receiving awards, Rane also organised the Rane Premier League and saw some impressive cricketing skills from across the companies. We have also had many board members completing their terms and many new joining us. Read all about it in *News @Rane*.

We are also very proud to share that Rane Polytechnic Batch 2021-22 found 100% campus placements from top-notch manufacturing companies. Read about it and more in *Rane for Good*.

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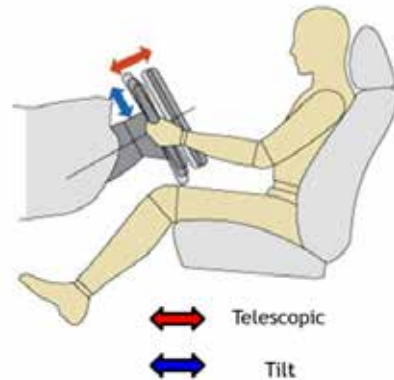


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## Award for Performance in Exports from Bosch

Rane (Madras) Limited – Light Metal Castings India has received an award from Bosch for their performance in the export of Steering Housing Castings.



## Maruti Suzuki Overall Performance Award

Rane (Madras) Limited has received Overall Performance Award from Maruti Suzuki India Limited for the stellar performance by their plants across India in the year 2021-22.



# GROWING Against Odds



## Performance of FY22

FY22 was an eventful year. The global economy recorded the fastest growth rate in over four decades at 5.9% in 2021. India too recovered from a historic contraction of 7.3% in the preceding year to grow by 9.0% in FY22, surpassing the pre-pandemic level.

The second wave of Covid-19 in Apr/May 2021 was shorter but severely affected the people of India and the employees of Rane. That and the third wave, driven by Omicron variant in Jan 2022, caused the growth momentum to slow down a bit, but, overall, the demand environment remained favourable, spurring growth.

Semiconductor shortages continued in FY22 and were particularly pronounced in the third quarter. This significantly impacted production during the festive season. Supply chain and logistics-related issues have been chaotic and commodity price increases globally and in India have been extremely challenging.

Commodity price inflation was one more factor that caused a setback. Though the Rane companies were able to manage this through back-to-back recovery from all major customers, there was a significant increase in

other variable costs—logistics, etc. Despite it all, the Rane Group posted Rs. 5,440 Cr turnover, the highest ever sales for the year. It took us three years to surpass the results in FY19.

### Performance Trends of Automotive Segments

The Indian OE business did well, seeing a strong volume growth and price increase due to the commodity movement. The passenger vehicle and commercial vehicles segment especially benefited from strong demand. The passenger vehicle segment saw new launches, a lower production due to semiconductor shortage resulted in low inventory and a higher waiting period for many models. In the commercial vehicle segment, stronger demand for freight, higher fleet utilization and growth of e-commerce contributed to its growth.

The two-wheeler segment and farm tractors business saw a volume decline. This could be due to significant price increases and penetration of electric vehicles in the two-wheeler segment while the farm tractor buying may have been affected by a general negative sentiment due to unseasonal rains.

### International Business

International expansion has been one of the priority areas for Rane. Our focussed business development and customer service efforts over the past 5 to 6 years are paying dividends today. As a result, the international business grew by 33% despite the semiconductor shortage and was mainly driven by steering and light metal castings products.

The company also continues to secure good orders from international customers.

Our occupant safety products will be shipped to new geographies in Europe with support from our joint venture partner ZF. Rane Brake Lining

*Despite odds,  
Group posted  
Rs. 5,440 Cr  
turnover, the  
highest ever sales  
for the year*

is working on enhancing exports and targeting 100 Cr sales (4x growth) in 5 years.

### FY23 Outlook

The global economy is showing signs of slowing down with tighter monetary policies due to inflation all over. The war in Ukraine is also causing turbulence in world economies. The year 2022, therefore, is very critical with a lot of uncertainties. The industry is also going through the transition in focus to EVs. We need to watch these developments closely and steer cautiously.

We hope the Indian economy remains shielded from the global slowdown. The volumes on various vehicle segments are below the peak volumes of 2018-19.

As a Group, we are planning 10-12% growth in sales in FY23.

### Rane's Focus Areas

Given the economic environment, Rane will continue to work on operational improvements and cost savings to mitigate inflationary pressures.

Enhancing exports while looking for opportunities to localise will also continue. We will also be

consolidating our aftermarket offerings.

Given the uncertainties, agility and flexibility in connecting with our customers to exceed our customer expectations will be another key area.

### Rane Companies Certified as a Great Place to Work

I am happy to share that five of our companies became Great Place to Work-Certified this year. These were:

- Rane (Madras) Limited
- Rane Engine Valve Ltd
- Rane Brake Lining Ltd.
- ZF Rane Automotive India Pvt Ltd.
- Rane Holdings Ltd.

The certification is a reiteration of the high trust and high-performance culture at Rane. It is a moment of pride that some of our companies have got GPTW certification in earlier years as well. This award is great recognition of the values we hold and the fairness and trust we cherish. We have been an employee-centric organization and our people are our greatest asset. A big thank you to all Rane employees.

### Message for Rane Employees

- Collaborate across plants, across functions to better leverage our strengths. And today, communication and software technologies such as G Meet, Zoom etc., have made this easier. So let us embrace it to collaborate even more.
- Given the available opportunities, there is a need to create a culture of high performance and desire to exceed the targets we set.

# 5 Rane Companies Certified as Great Place to Work

The Rane Group believes in continuous improvement in all aspects of its operations. Employee satisfaction and engagement are as key to our growth as business performance. Therefore, to give our employees a platform to express their views in a free and open manner, Rane has been conducting an Employee Opinion Survey for almost a decade. An external consultant would administer the survey, share the findings, and help in identifying the strengths and areas of opportunity. As the organisation grew, there was a need to find other models that accurately and efficiently captured employee views and helped to benchmark against the best in keeping the employees happy.

Great Place to Work is a globally recognized body that helps businesses create a sustainable, high-trust, high-performance culture. Since 2008-2009, Rane Group has been participating in the survey and using the findings to fine-tune the employee engagement and development programs. Subsequently, individual Rane companies have been participating in the survey. The survey is administered to the management

staff and does not cover the shop floor people as of now. The shop floor employees are being sensitised to the needs of the survey and may be encouraged to participate in a year or two so that they can contribute meaningfully and with full understanding.

While this is not the first time a Rane company has received certification from GPTW, this is the first time that five of them have received the certification.

## The Survey Process

The GPTW survey has three parts, the Culture Audit© Part I, Culture Audit© Part II and the actual survey. Culture Audit© Part I is essentially a data consolidation of information about the organization, demographics, hiring and turnover trend, C&B policies and L&D. Under Culture Audit© Part II - the company shares information on its practices in an open ended essay format w.r.t hiring, welcoming, communication – speaking & listening, collaborating, thanking, developing and celebrating. The actual survey carries 2/3rd weightage and measures people's

feedback on five dimensions, Credibility, Respect, Fairness, Pride and Camaraderie. A GPTW team audits the responses, evaluates them, and speaks to a random sample of employees to validate the responses and then certifies the company. To be certified, the company being audited must achieve a minimum of 70% score in the Trust Index survey and abide by the audit norms.

## Establishing a Policy Framework

The survey findings are used by the Rane HR team to establish a framework of policies common to all the group companies with a focus on career opportunities, learning and development and growth opportunities. This is shared with the individual companies who then plan specific interventions based on their individual need and objectives. Creating action points based on this GPTW survey is one of the key deliverables of the Company HR head. Rane also has an award for HR excellence. Nearly 50% of weightage goes to the GPTW score.

The GPTW exercise is given much







importance, not just because the companies get a certification. What is more important is to use the learnings from the survey to roll out different initiatives for improving employee satisfaction. In fact, it is part of the HR deliverable and year on year, the team works on it to improve the employee experience. The HR team shares communications in multiple languages on the survey, the process and its significance with its employees to create awareness and make their participation meaningful.

The progress is reviewed on a quarterly basis by the chairman.

## Competing and Collaborating

Participation of individual companies in the survey and the weightage given to the certification in deciding the Rane HR Excellence award has created a subtle sense of competition for each company to do better than the rest. This, naturally, translates



into creating a better workplace as each company initiates interventions best suited to their requirements. This further spurs improvement in employee experience.

This also helps to benchmark against others and implement best practices to improve employee programs in individual companies. The HRG (HR group where all company HR heads

are part of) meets regularly to share each other's best practices and learn from one another, thus setting the companies on a path of continuous improvement. This is reflected in the constant improvement in scores. For Rane, that counts as much as the certification.

# Consistently Making the **Workplace Great**



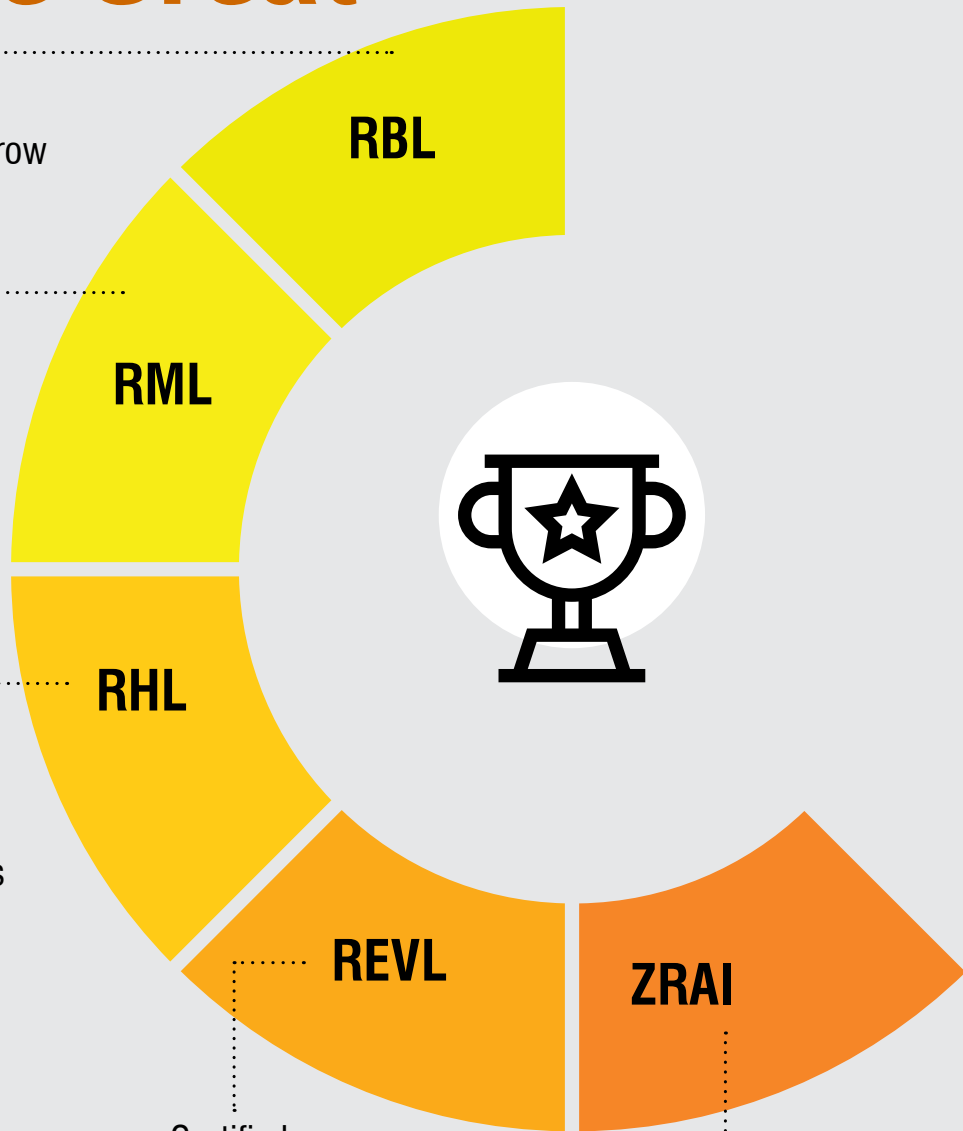
Certified  
6th year in a row

Certified  
5th year in a row

Certified  
2 continuous years

Certified  
2 Times in 3 years

Certified  
2 Times in 3 years



Some of the initiatives that made the companies eligible for certification include

### RANE (MADRAS) LIMITED

- **Manager's Scorecard:** This initiative was introduced to help our managers
  - Receive feedback
  - Reflect and plain their development journey
  - Enhance internal conversations on talent development
  - Build winning teams
- **Employee First:** This initiative is a philosophy to build and sustain "A Positive Work Culture that encourages employees to be happy, healthy and competitive"

### RANE BRAKE LINING LIMITED

- **Learners Today Leaders Tomorrow:** Cross Learning, a Learning platform to enhance the understanding and gain knowledge & skills
- **Employee Recognition & Engagement programs:** Few other initiatives under this are
  - Gratitude cards - Thank you, well done, you are the star, Congrats you did it, Kudos cards are given to the employees as a part of appreciation culture
  - Monthly fun events
  - Employee Engagement programs like Fri-Yay

### ZF Rane Automotive India Pvt. Limited

- **STAR Scheme:** Staff Appreciation and Recognition Scheme for all employees including trainees to motivate them to perform better
- **Outbound Training:** This initiative is for all executives to develop team building and leadership skills

### RANE ENGINE VALVE LIMITED

- **A to B League (Alignment to Business) :** to align employee roles for fulfilling the business objectives and build a sense of pride.
- **Employee Communication Effectiveness Survey – Alignathon:** This initiative is conducted to
  - Encourage employees demonstrate their understanding of organization's direction and align towards it.
  - The top scorers are identified and recognized with the title "Mr. / Ms. Aligndln"

### RANE HOLDINGS LIMITED

- **App-ing Wellness:** App based workplace wellness programs designed to support healthy behaviour and improve health outcomes. Employees compete in wellness goals through challenges such as fat loss, stepathon etc. Wellness sessions by SMEs on various themes augment our initiatives to encourage employees adopt a healthy workstyle.
- **Employee connect sessions:** Regular employee bonding and engagement sessions during festive occasions in the form of fun filled contests and theme based events help build a sense of collaboration within and across teams.



## Rane's Leaders on GPTW Certification



### VENKATANARAYANAN R

President, Corporate Services

This recognition is a reflection of the reach and relevance of our people practices in providing a meaningful employee experience. It will also set the stage for reimagining the talent agenda for the future.

### BALAKRISHNAN R

President, RBL

Creating an atmosphere of "Great Place to Work" is not based on a set of targeted activities but it is a way of life in all facet of employee involvement. We realised that we can create a great place to work only if systems like TQM are implemented. The more we reinforce this culture, the easier it is for the employees to integrate the vision and have job satisfaction.



### PARTHIPAN G

CEO, ZRAI

At ZRAI, it was a clear transformation with young leaders taking over the Functional responsibilities and we are strong believers of trust based Leadership. This year's GPTW certification not only proved this but also our employees' continuous faith in us. This achievement is because of continuous interventions by our Teams based on employees' feedback and creating an open and transparent work culture.





**KUDOS**  
to all the teams  
that participated!



## Rane Premier League

#RanePremierLeague | One Trophy; 9 Teams!

**R**ane Premier League (RPL), a first of its kind cricket tournament was held among the group entities of Rane. They nominated their best cricketers who were enthusiastic to bring home the trophy.

We had a total of 9 teams REVL, RML - SLD, RAP, RHL, ZRAI - SGD, ZRAI - OSD, RPTC, RBL and RNSS which were divided into two different groups. After a tough battle amongst them, 4 teams (RNSS, ZRAI - OSD, ZRAI - SGD, RAP) qualified for the semi-finals.

The Winner of the first edition of Rane Premier League is ZRAI - SGD. The team showcased their excellent, professional-grade cricket and spot-on sportsmanship. ZRAI - OSD grabbed the Runner-up title and they gave a tough competition with their power packed performance.

We also congratulate the individuals who bagged the prizes for their best performance all through this season of RPL. Man of the series - Anandraj (ZRAI - SGD), Best Batsman - Vikas (RAP), Best Bowler - Sivaraman (ZRAI - OSD).

The trophies were presented to the Winner and the Runner-up by Mr Venkatanarayanan R, President-Corporate Services. Individual trophies were presented by Mr Giriprasad T - President, Rane Aftermarket Business and Mr Muralidharan G - President, ZRAI - SGD.

# Future of Mobility Founded on E-Mobility, Software-driven Cars and Autonomous Vehicles



*The relationship between Rane and ZF Group goes a long way back. Over the years, this joint venture has moved from strength to strength.*

**Dr. Holger Klein, ZF Board Member**, during a visit to Chennai spoke to the **Propel Team** to share his perspective on the future of mobility, the merger of TRW Automotive and ZF, and ZF's relationship with Rane.

*Dr. Klein is responsible for Car Chassis Technology, Aftermarket, Asia-Pacific and India Regions, and Production. He holds a Ph.D. in Technology Management and is a trained engineer. He joined the ZF Group from McKinsey in 2014, when he was appointed Head of Integration Management upon the acquisition of TRW Automotive. He has brought to ZF more than 15 years of experience in leading the consulting company's automotive practice, and global engagement in Europe and North America.*

and zero emissions, while providing different modes of transportation. Electric vehicles are becoming a popular choice.

The future of mobility was redefined by Covid when there was less travel. People refrained from going long distances. As a result of this change in behaviour, the travel volume decreased substantially, at least for businesses. One wouldn't travel, for instance, to New York for a one-hour meeting and instead choose Microsoft Teams.

Today, people have become more conscious of the impact of travel and are making discreet choices like taking public transport. It may be a combination of modes of transport such as the cycle or a two-wheeler to the nearest subway/metro, a ride in the subway/metro, and a taxi to cover the last mile. All these choices can be efficiently managed using an app.

The future is really about shared mobility.

## What is the Future of Mobility looking like in say 12-15 years?

We believe there will be a three-fold transformation. The first is E-mobility, the second is in software-defined cars and the third one is autonomous/self-driving.

Initially, there was much skepticism about e-mobility, but it is happening right now. Software-defined cars are also here. Tesla, for instance, is a software-defined car. If you look at the new vehicles using these new platforms, it is a totally different

## Excerpts:

**Over the last few years, Future of Mobility has become a buzzphrase! According to you, what is the "Near-Term Future of Mobility" looking like?**

When we talk of the Future of Mobility, it is more about mobility than automotive. Our streets are congested and result in quite some causalities. Future of Mobility addresses these issues by focusing on zero accidents

customer experience. You can come from your home listening to some music and have the same music playing in your car as well. You can have a navigation system guiding you when driving. You can plan your driving time based on the navigation and the expected time of arrival based on traffic conditions and start a little early or just on time based on that. The car knows where you are going, and you follow the map. This is today.

Autonomous will take some more time. Robo-taxis in any Indian city will be a huge challenge. But in restricted environments like the airport, we are already operating autonomous shuttles. Office parks and Sentosa Island, Singapore, are some other places where it is being used. Transportation as a service is faster adopted in commercial vehicles. On highways, you have these vehicles running for longer distances than drivers are allowed to. As against the 8-hour shifts drivers do, the vehicles can run 12 hours because on the highways, you may have other systems like the lane-keeping assistants to navigate the vehicle. From three drivers, you can have two drivers who drive for 12 hours each in case of round-the-clock driving.

You save a driver. You have a business case. So, it forces assisted driving into the application.

### **What are some of the “newer skills” that will be needed in the automotive company of the future?**

Today, we use more software in our cars and sell it as a product. Given the fact, that we employ a lot more software engineers, system architects, material science experts, battery technology and management experts, and connectivity and data experts than ever before. In fact, in our Hyderabad Technology Center, the number of software engineers is growing tremendously. We expect it to grow to 5000 within a short period of time.

Today, the lines between skill sets specific to industry segments are blurring. Earlier, only those in the automotive industry would have been of interest to us. But today, we need employees with telecommunications, battery management, and data and analytics skills.

### **Please share with us some of the big learnings from your experience of spearheading the integration between ZF and TRW Automotive.**

In 2014, the ZF-TRW Automotive merger was one of the first consolidations on the supplier side and therefore a significant one. For ZF, it was the last exit to make a meaningful move into software and electronics. ZF was traditionally more in the mechanical/mechatronics side and this merger was to move into electronics and software. It was important that we transform to keep pace with the changing times. At that time, our ICE business was more than 50%. Today it is 22%. We are getting ready for transformation to electric, which contributes 23%.

The acquisition of the American company that was almost as large as ZF and is listed in the NY Stock exchange brought its own challenge of how to bring this together and unify the culture. That was important to really benefit from the complementary skill sets.

The two principles we followed to make this merger a success were: be open-minded and learn from each other; and don't lose the business orientation. Competitors expected this to fail but retaining the business orientation and approaching the integration step by step helped us succeed.

In 2016-17, this self-induced cultural shock accelerated us enormously, making us serious about the transformation of the company. We questioned ourselves and redefined our operations. For example, we had

three headquarters now and board members in each of these. This increased customer proximity and our sales increased like never done.

It was a very important step in our transformation, and we were courageous and lucky with our timing.

### **How do you see the partnership between Rane Group and ZF shaping up and growing stronger over the next few years?**

Rane is a much-admired company. I have been visiting India frequently since 1998. Rane is a family-run business with high entrepreneurial capabilities, very values-driven, very reliable, and traditional. I think we are partners forever, for many decades. This relationship has grown over time. At the top-management level too, there is a very trust-based relationship, which is looking through cycles. The family business resonates very well with the foundational business. We are not quarterly driven but driving our businesses together through cycles, through generations, to success. And ZF regards Rane as one of the JVs which helped it to anchor in the Indian market, better understand, jointly learn, and build something. If I look at what we have on steering and safety systems, it is tremendous how it has developed over time. We were very selective with partners in India and, of these, Rane has become a very important strategic partner for the future. I expect our relationship to become intensified.

The Rane leadership is much respected. The way Ganesh, Harish, and the other leaders manage the business - in a very reliable, strategic, tough, manner striving for excellence - is very admired.

### **When do you think we will see 100,000+ self-driving cars?**

In The Hitchhiker's Guide to the Galaxy, the answer to every problem is 42. So, I am saying, 2042.



# FINANCE PROFESSIONALS

*Finance is not just balancing ledgers but also involves improving the financial health of the company through effective financial practices. In this issue, we speak to members of the Rane finance team to understand their experience, the impact of leadership training and how working in the Rane Group has helped with improving their capabilities. Excerpts*



**Chandrasekaran P,**  
**Senior Manager - Finance,**  
**REVL**

## Memorable Experiences

I was part of the team that turned the Trichy plant around. It is now running profitably. From handling one plant's finance function, my portfolio was enlarged to handle three plants. Now Tumkur plant also is turning around and is a shot in the arm. I was involved in the challenging task of capitalizing on customer/new technology.

## Greatest Learning

As part of the REVL finance team member, I imbibed the TQM way of working and presented on behalf of the plant finance team during the RBEM Audit. The HPLD program enhanced my leadership abilities and built teams at the plant level. I also identified multiple initiatives across the plants to achieve BEP and provided proactive information support to all the functions. This gave me an overall business perspective.

## My Key Contributions

Implemented the BOY (Balance of the Year) approach for costing feasibility in line with the turnover of the plant with respect to direct overheads. Engaged with the plant CFT and identified corrective actions for variances in plant metrics. Was part of the implementation and horizontal deployment of SAP Internal controls across the three plants by standardization. Through the PIP approach, identified an alternate course of action with a contingency plan for unplanned cost escalations.

## Keeping Pace

Continuous learning through mailers from consultants on various legislations, including taxation. Further, reading professional and business magazines and industry reports on EV penetration to keep myself updated on current trends.

Rane provided opportunities to improve my team-building capabilities through HPLD Program, which also helped me in inter-departmental coordination and influencing. Rane's external training programs imparted comprehensive knowledge in the latest amendments in GST. My cost analytical skills improved through external training programs organized by Rane.

**Rane in One Word:** Awesome





**Lijo K Thomas,**  
*Assistant General Manager  
- Finance, RAP*

#### Memorable Experiences

I joined Rane Auto Parts (RAP) in 2016, which commenced operations in 2014. As a new division, RAP posed many challenges early in my tenure. The most memorable experience is reaching operating profits in Rane Auto Parts in FY 21-22. I was responsible for spearheading all the key cost-effectiveness improvement

plans. It was a roller-coaster ride that helped me grow up as a Business-Focused Finance Partner.

#### Greatest Learning

My biggest learning in Rane is the TQM way of working - customer-centred process that focuses on consistently improving business operations. My career in Rane went through two distinct stages—first, learning how to contribute individually to the company's success, and later, learning how to grow and develop a team. The best life lesson I learned from Rane is "Remain humble even in success."

#### Key Contribution

Successfully led a cross-functional team of 10 members consisting of marketing and finance professionals for Rane Aftermarket Business (RAB) Margin Improvement Project. The project significant savings to drive the group aftermarket profitability in FY 21-22. Implemented various cost-saving initiatives, which helped Rane

Auto Parts to achieve operating profits in FY 21-22. Implemented a variety of digital initiatives that have helped RAP keep up with changing industry demands,

#### Keeping Pace

The company provided me with the opportunity to interact with industry experts through various forums and meetings. The knowledge-sharing sessions with industry experts, hosted by the company, helped me stay abreast of evolving industry trends.

Participation in training programs such as HPLD has contributed to the development of communication, decision-making and leadership skills. The 360-degree feedback sessions provided me with an understanding of my strengths and areas for improvement. Active engagement in various aftermarket initiatives at the group level helped me acquire a greater knowledge of other functions.

**Rane in One Word:** Virtuous



**Prakash R,**  
*Senior Manager - Finance,  
ZRAI-SGD*

#### Memorable Experiences

One most memorable experience is how we handled the closing and audit of the accounts during the pandemic. We completed all the activities working at home with SAP support through VPN access and necessary meetings through Google Meet.

Originally, our board meeting was scheduled for 16th April, 2020, and we were ready for it.

#### Greatest Learning

I have been working in Rane for the past 10 years. My greatest learning is to adapt to the changing requirements through proper planning and execution of the task within the timeline and better coordination with all the members, which is essential to complete the task on time.

#### Key Contributions

In 2016, a major change in the accounting profession was brought in by Ind As - Newly introduced accounting standards almost in line with IFRS. During this transition period, I coordinated with both the divisions of ZRAI, statutory auditors and other stakeholders in identifying the gap and ensuring proper

accounting within the timelines.

In 2021, when I was learning IFRS, I interacted with various stakeholders and met the new requirements of reporting under IFRS along with Ind GAAP.

#### Keeping Pace

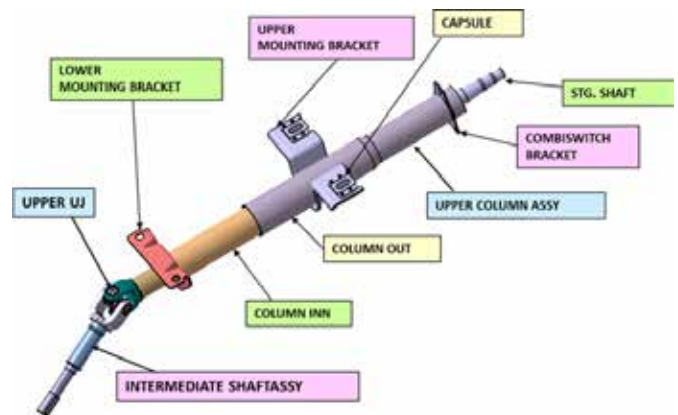
In 2018, I was part of an HPLD program which helped me to learn by interacting with the persons across the group companies.

I keep myself updated with the changes in the industry and statutory/reporting regulations by actively discussing and coordinating with various colleagues in the group. I regularly read the statutory updates by going through the chartered accountant institute magazines and daily business newspapers.

**Rane in One Word:** Professional.

# How Things Work

## Steering Column



### INTRODUCTION

The basic function of steering column and intermediate steering shaft is to establish the mechanical link between steering wheel and steering gear. The steering wheel and the steering gear are linked in such a way that any rotation initiated at the steering wheel will be converted almost without loss or backlash. Torques load from the steering gear are likewise converted to the steering wheel. The connecting elements, steering column and intermediate steering shaft, hence, affect the driveability and the perceptible contact with the road.

Steering column consist of driveline supported by bearing which is fixed inside Column tubes. Mounting brackets are used to clamp the steering column with vehicle Cross Car Beam (CCB). Universal joints are used to connect the shaft from upper side to lower side and bending angle is limited based on its limitation on smooth torque transmission. When

driver rotates or applied load to steering wheel, generated torque is transmitted through driveline to Rack and Pinion.

Additional to torque transmission, steering column included lever mechanism which locks or unlock the column with respect to fixed parts of vehicle. Thus driver can able to adjust the Steering wheel position in any Tilt and Telescopic function for his comfort. Similarly Steering Column supports Energy absorption during vehicle crash.

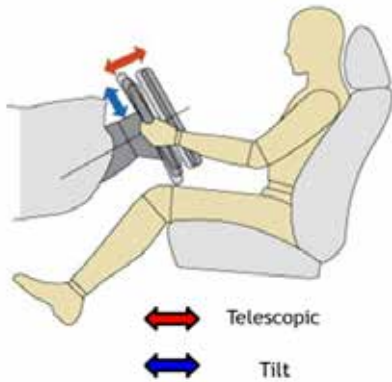
The Steering wheel device intended for connecting the steering wheel to the steering mechanism or transferring the drivers input torque from the steering wheel. The steering column device mounted at the vehicle cabin which in turn supports the driver to control the lateral movement of vehicle. The column tube is rigidly fixed with vehicle frame and the steering wheel is allowed to rotate an

account of bearings which interlinked between the steering shaft and tube. The intermediate steering shafts represents the link between steering column and steering gear to ensure smooth torque transmission with limited angles.

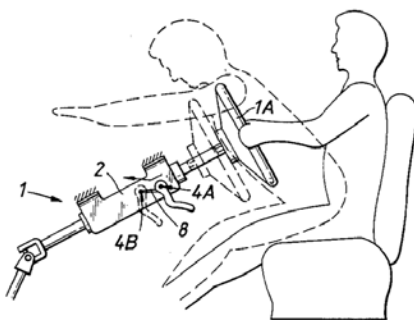
### BASIC FUNCTIONS OF STEERING COLUMN

Broadly we can define the functions as shown below,

1. Steering Stability
  - o Torque transmission as safety critical part
  - o Excellent steering response
2. Comfort
  - o Steering wheel position adjustment where a driver wants
  - o Stiffness (mainly idle vibration prevention)
  - o Absorption (input from tire etc.)



Electrically adjustable steering columns are driven by one or two motors and use independent mechanisms to generate both shifting movements. Manual steering columns can be locked by Pneumatic actuator which is commonly used in Commercial trucks. It is important that the locking mechanism has to lock and unlock smoothly while generating high clamping forces. Electrically or Pneumatic Lock adjustable steering columns lock as a rule by autolocking drive systems.



## ENERGY ABSORPTION OF STEERING COLUMN

Energy absorption steering column which minimizes the injury of the driver during a car accident by collapse or breaking particular part of system. For Collision absorption, steering column uses fuse mechanism at driveline, outer tubes and mounting structure. During Crash, primary collapse or displacement absorption will occur at Intermediate shaft zone. Immediately or Same time, Driver will hit the Steering wheel and activates primary collapse or Energy absorption at upper column. Below is the schematic diagram of Steering column with Intermediate Shaft.

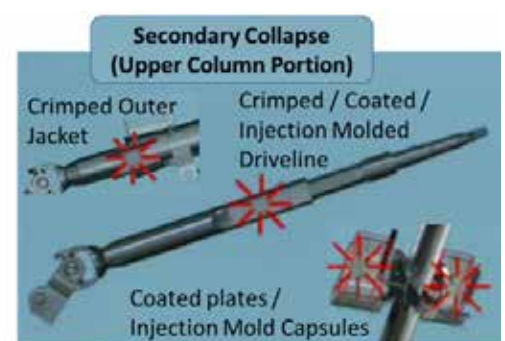
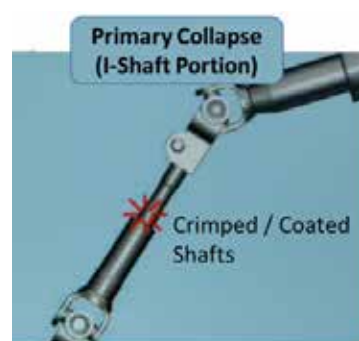


Crash qualities of safety steering columns are tested in sled or vehicle tests under real conditions. Damage to vehicles or subassemblies with crash-relevant parts is recorded and the crash performance is evaluated, based on retention values, measured on crash dummies. In a vehicle crash taking about 200 ms, the steering column is strongly loaded for a short time.

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## ADJUSTABILITY OF STEERING COLUMN POSITION

In the next stage of development, the steering column also permits positioning the steering wheel relative to the driver. One distinguishes tilt and vertical/longitudinal adjustment. Both mechanisms can be implemented either separately or combined, the latter being the more common method. For example, gate systems of manually adjustable steering columns enable a combined relative movement between the vehicle-fixed case and the jacket tube.





## Rane Polytechnic Batch 2021-22 100% Campus Placements



**R**ane Polytechnic Technical Campus, a self-financed institution of Rane Foundation, has secured 100% placements for the students for the second consecutive year. Overall 164 students would be graduating from the college this year. Of these, 32 students have opted for higher studies. The remaining 132 have been offered jobs from companies like PCBL, Hyundai WIA, Sanmar, Brakes India, Fastenex, Tube Products of India, Turbo Energy, Balu Auto Components, etc.

Rane Polytechnic has helped the graduating students of its batch secure lucrative job positions during the current placement season. The Rane Polytechnic students made the most of this opportunity with their high-quality performance and have attracted great packages. Many students have secured more than one offer.

B. Rajalakshmi, Head of Educational Initiatives, Rane Group, said, "The uncertain times of COVID are certainly behind us. With the manufacturing industry bouncing back in full swing, we had multiple offers for our students. Their performance in the interviews and selection process is heartening and stands proof to the tireless efforts of our teachers, punctuated by online and off-line college functioning throughout the year."

This year's placement season has reinforced the faith in the quality of talent by opening more of their desired roles during such challenging times.

## Vaibhav 2K22



Rane Polytechnic Technical Campus organised a State Level Technical Symposium, Vaibhav 2k22, for the year 2021-22 on the RPTC campus on May 6, 2022.

More than 70 students from 9 Institutions across the state actively participated in various events like Paper Presentation, Project Expo, CAD Modelling, Circuit debugging, Mathematics Puzzle solver and Short Video Project. Twenty different teams were formed with staff and students who worked together for the successful conduct of the event.

Ramani Balaji, Manager-Projects, ZRAI, inaugurated the function and enlightened students to develop LIST (Learning, Interest, Sincerity and Trust) in their life. G Venkata Ragavan, Plant Head, ZRAI, Siruganur delivered the Valedictory Address and distributed the prize to the winners. B. Rajalakshmi, Head-Educational Initiatives, Rane Foundation encouraged students to develop 21st-century skills.



# Rane Vidyalaya Reopening



**R**ane Vidyalaya has successfully stepped into the 5th academic year on April 6th 2022. A New School Year means New Beginnings, New Adventures and New Challenges!

We believe in giving the best to our students and are running that extra mile. We want to make up for the missed school days during the pandemic. We believe in working for the fullest in the school premises, so we are the first to reopen the school for the academic year 2022-23.

## To all our students

"We believe in you!  
We trust in you!  
You are listened to!!  
You are cared for!!  
You are important!!!  
You will succeed!!!"

# Retirements



## Anita Ramachandran

Independent Director

Retired from the Board of Rane (Madras) Limited (RML) on June 29, 2022, as per the retirement policy of the board. Anita joined the Board of Directors of RML on October 15, 2012, and served as an Independent director for two terms. She was one of the first generation of women professionals to become an entrepreneur and run a successful HR consulting firm. She is a past Chairperson of TIE Women.

## Anil Kumar Venkat Epur

Independent Director

Retired from the Board of Rane Brake Lining Limited (RBL) on June 28, 2022, as per the retirement policy of the Board. Epur joined the Board of Directors of RBL on February 6, 2008. He was a director since January 27, 2005, on the board of erstwhile Rane Brake Linings (since demerged in 2008). He has over 42 years of experience and has worked with MNCs as well as Indian companies both in the US and India.



## S Sandilya

Independent Director

Retired from the Board of Rane Brake Lining Limited (RBL) on June 28, 2022, as per the retirement policy of the board. Sandilya joined the Board of Directors of RBL on February 6, 2008. He was a director since May 26, 2006, on the board of erstwhile Rane Brake Linings (since demerged in 2008). With his 50-plus years of experience, he has contributed significantly to the board discussions and decisions on various strategic matters.



# Appointments & Retirements



**Mr Ashok Malhotra** has been appointed as an Independent Director on the Board of Rane Brake Lining Limited on June 28, 2022.

He is presently on the Board of Etrans Solutions, Flame-Tao Knoware, Reflexive Lenses and Quinnergy Leadership.

Mr Ashok Malhotra retired from the Board of Rane Engine Valve Limited (REVL) on June 28, 2022 as per the retirement policy of the Board.

Mr Ashok Malhotra joined the Board of Directors of REVL on February 06, 2008. He was a director since October 30, 2001 on the board of erstwhile Rane Engine Valves (since demerged in 2008). With his 50 plus years of rich experience, he has contributed significantly to the board discussions and decisions especially on various strategic matters.



**Mr C N Srivatsan** has been appointed as an Independent Director on the Board of Rane Brake Lining Limited on June 28, 2022. He is presently on the Board of Precot Limited.

He is a Chartered Accountant and a Certified Information Systems Auditor (CISA) with over 38 years of diverse experience in handling Indian and overseas assignments.

Mr C N Srivatsan retired from the Board of Rane Engine Valve Limited (REVL) on June 28, 2022 as per the retirement policy of the Board.

He joined the Board of Directors of REVL on July 2009. He was a director since July 20, 2006 on the board of Kar Mobiles Limited (amalgamated with REVL in 2015).

## Appointments



**Mr Ramesh Rajan Natarajan** has been appointed as an Independent Director on the Board of Rane Engine Valve Limited on June 28, 2022.

Mr Ramesh Rajan is also presently in the Board of Rane (Madras) Limited, Cholamandalam Investment and Finance Company Limited, TTK Healthcare Limited and Kineco Limited (subsidiary of Indo National Limited).

He is a Graduate in commerce and a fellow member of the Institute of Chartered Accountants of India and is the founder and senior partner of LeapRidge Advisors LLP and also the Chairman of Indo National Limited with over 38 years of experience in the fields of finance, strategy and operations.



**Ms Vasudha Sundararaman** has been appointed as an Independent Director on the Board of Rane (Madras) Limited on June 29, 2022.

Ms Vasudha Sundararaman is also presently in the Board of Cholamandalam Financial Holdings Limited.

She holds a B.Sc (Zoology) from Stella Maris College, Chennai, M.Sc (Zoology) from Madras University and a Certified Associate of Indian Institute of Bankers. She has a rich professional experience of over 35 years in the banking and financial services sector in various leadership roles.





**Rane Corporate Centre**

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