2024/25

MAINSTREAM®

Skilling Up:
FUTURE-READY
Maintenance & Reliability Teams

Exploring the immediate and relevant challenges and opportunities in training, skills, and capability development for the future of the Maintenance & Reliability workforce.

Research Partner | ASSETSCHOOLS

MAINSTREAM

RESEARCH

For 29 years, the Asset Schools and MAINSTREAM research team has engaged with Maintenance, Reliability and Asset Management leaders and their teams, to understand their challenges, pain points and the opportunities which exist, as they work towards achieving asset management excellence and improving overall business performance.

These findings enable leaders, teams, and individuals to understand best practices, compare their organisations' performance and working environment to those inside and outside their industry, and make informed and effective decisions.

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Training and Capability Development Challenges and Opportunities

The next decade brings with it the greatest workforce challenge we've ever faced. Machines and automation are replacing human tasks, while macro-factors like decarbonisation will significantly impact future jobs and skills. These forces are reshaping the very foundation of the workforce, pushing organisations to rethink the skills they need—now, over the next 12 months, in the short to medium term (3-5 years), and for the long haul (5-10 years).

Critical skills in areas like advanced diagnostics, preventive maintenance, and troubleshooting are vital for staying competitive in this evolving landscape. But it's not just about developing new skills; organisations must also find ways to retain the invaluable knowledge of an ageing workforce. As seasoned professionals retire, the risk of losing decades of institutional knowledge looms large. How do we ensure this expertise passes on to the next generation. From structured onboarding processes to leveraging digital tools like knowledge-sharing platforms and video tutorials, businesses are searching for innovative solutions.

Meanwhile, the ongoing shortage of skilled tradespeople and widening capability gaps present further challenges. Training programs not only impart technical knowledge but also equip teams with the skills needed to close these gaps. Whether it's retraining staff or attracting new talent, impactful training is essential for overcoming these obstacles and ensuring long-term workforce sustainability.

There is no doubt that training maintenance professionals is a game-changer for improving plant reliability and overall business performance. Whether you are an enlightened organisation or striving to become one, the benefits of good training are clear:

- Enhanced technical skills that reduce downtime.
- Attracting and retaining talent.
- Improved preventative maintenance to avoid unplanned outages.
- Faster troubleshooting that cuts Mean Time to Repair (MTTR).
- Standardised, best-practice processes across operations.
- Better compliance and safety through well-trained teams.
- Fostering a culture of continuous improvement and collaboration.

> "Effective training not only cuts costs but boosts reliability, productivity, and morale. The challenge lies in ensuring that training investments translate into long-term improvements.

Head of Asset Management, Power Utility

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Methodology

The results are an outcome of three research methodologies:

- Fifteen one-on-one interviews.
- Two x 2-hour roundtable discussions. 24 people participated in these interactive discussions.
- Online survey completed by 177 people.

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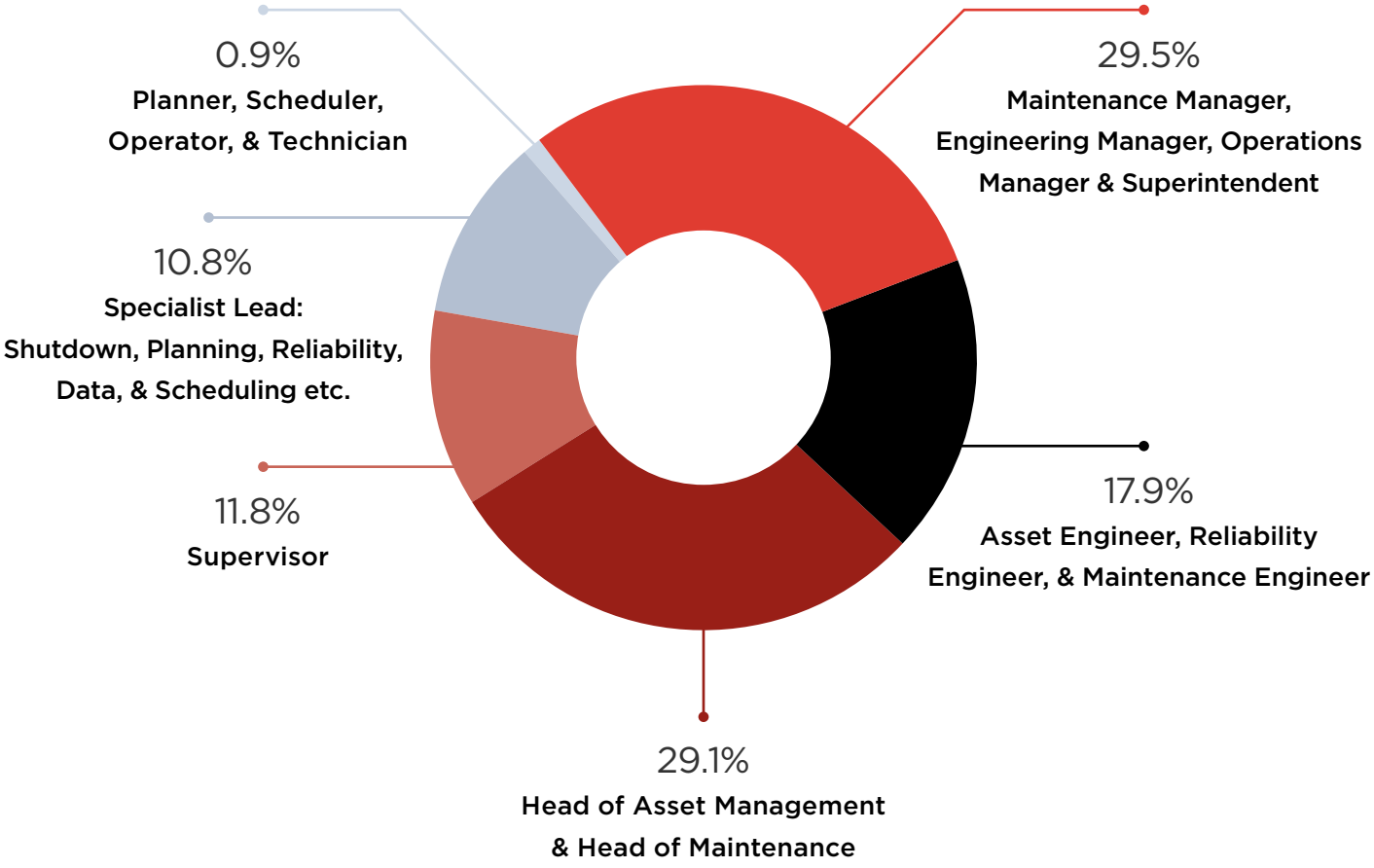
Participant Profile



04

Organisations Represented

AGL Energy
ANSTO
Aurecon
Aurizon
BAE Systems
BE Campbell
Bega
BHP
BlueScope
Boral
Brisbane City Council
CBH
Citic Pacific Mining
City of Gold Coast
Conoco Phillips
Cooperative Bulk Handling
CS Energy
CSBP
Dalrymple Bay Coal Terminal
Delta Electricity Department
Downer
Ego Pharmaceuticals
Electra Net
Endeavour Energy
EnergyAustralia
Enerven
Fonterra
Fortescue
Gladstone Ports Corporation
Glencore
Goldfields
GWM Water
Horizon Power
Hunter Valley Water
Hydro Tasmania
Incitec Pivot
Lion
Macmahon
Mars
Melbourne Water
Metro North Hospital and Health Service
Metro Trains Melbourne
Mid West Ports Authority
Mineral Resources
New Zealand Steel
Newmont
Petrofac
Power & Water
Powercor / Citipower
PTA of Western Australia
Qantas
Queensland Alumina Limited
Queensland Rail
Queensland Sugar Limited
Rio Tinto
Shell
SIMEC Mining
Southern Ports
Sydney Water
Talison Lithium
Taswater
Territory Generation
Transdev
UGL Limited
Unity Water
Vicroads
Visy
VLINE
Water Corporation WA
Western Power
Wilmar

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Report Highlights

- 216 Maintenance and Reliability professionals from 71 companies participated
- Less than 30% of organisations surveyed report that they have a workforce transition plan with KPIs, timelines, and role-based capability gap measures
- 27% of organisations indicate that they are ‘good’ or ‘very good’ at retaining institutional knowledge form their ageing workforce
- The traditional apprenticeship model where younger workers spend years learning from seasoned professionals, is becoming less feasible
- 35% of the Australian workforce in industrial sectors are over the age of 55, with significant numbers planning to retire within the next decade
- 50% of organisations say that training opportunities are discussed regularly with their team or department
- The average amount of hours spent per month on training for maintenance and reliability teams is <10hrs per month
- Team-based training offers noteworthy benefits for Maintenance and Reliability teams
- CPD (Continuing Professional Development) points are ‘nice to have’, but not vital, and are seldom used as part of formal performance appraisal or review
- Planners & Schedulers, Reliability Engineers, Maintenance Engineers, Maintenance Supervisors, and Tradespeople and Operators are the biggest priorities for role training
- Planning, Reliability, Asset Management Fundamentals, Condition Monitoring, and Root Cause Analysis are the biggest priorities for domain training
- Soft skills like leadership, empathy, and EQ are not being sufficiently developed
- Crowd-sourced, must-implement solutions are long-term training, tech-enabled learning, tailored programs, soft-skill development, knowledge transfer, post-training support, and psychological safety.

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Building the Maintenance Workforce of the Future

Although two years on, the COVID-19 pandemic has presented great challenges that linger and remain with us, but at the same time it has also helped to put people more at the centre of the business agenda. Technology is a major driver of change, and application of automation, robotics and AI is likely to impact many jobs, and the skills people need. Skills which as of today might not be in their workforce.

Organisations are struggling to plan for the maintenance workforce of the future. How do we mentor highly skilled and adaptable professionals who are ready to embrace emerging technologies?

Participants told us they are struggling to recruit for a myriad of roles. This is compounded by a knowledge exodus from experienced professionals who are calling time on their careers.

The strong sentiment is that we are unprepared and ill-equipped for the future.

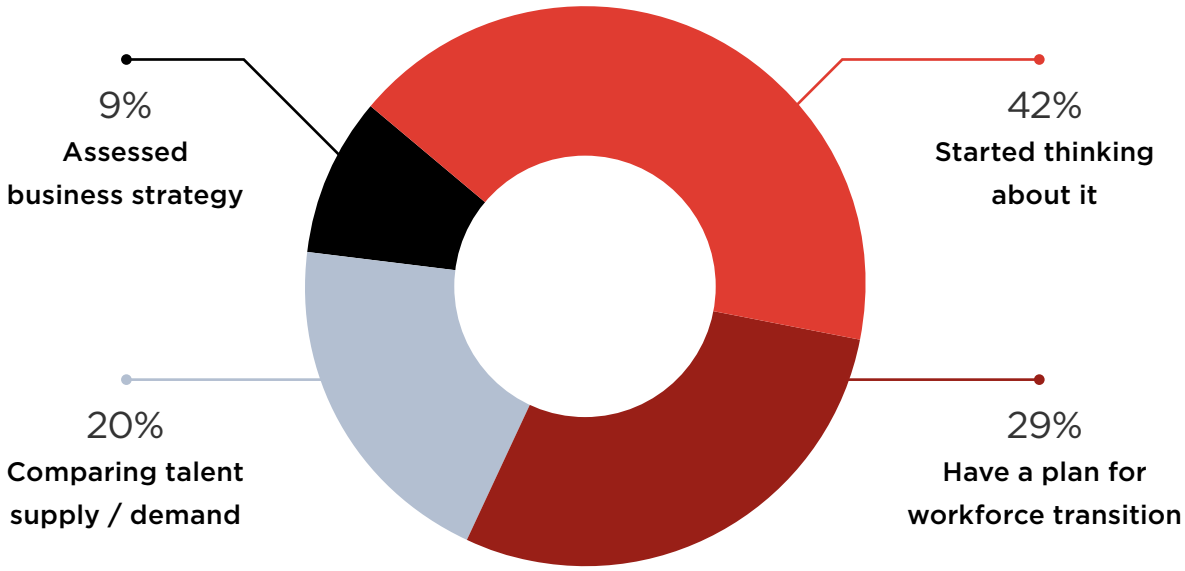
Attraction and retention of skills

Organisations must create a resilient and agile workforce by aligning training, development and education programs with the organisation's strategic goals and workforce needs. The maintenance workforce of the future will need to be highly skilled, adaptable, and committed to continuous learning. They will need to have a strong understanding of emerging and existing technologies, data analytics, as well as being good communicators with strong problem-solving skills. This is a short-term and long-term aim.

Many organisations talked about knowing what they must do. But the question is where they find the time and resources to tackle this incredibly complex issue while managing business as usual and taking critical assets offline. There is a genuine concern that the impact of the current skills shortages will cause major disruption in the coming years.

> "We have identified where we need to go to, what needs to be done, and even what skills may be required. But HOW to do this is the bottleneck because without taking our assets offline we do not have the time or resources.
>
> MAINTENANCE AND RELIABILITY MANAGER, WATER UTILITY

How prepared is your organisation for the knowledge, skills and experience required for the Maintenance workforce of the future?



Started thinking about it. We collated data on our workforce to help us understand skills and capabilities to give us a detailed view of our jobs.

Have a plan for workforce transition. We plan to address capability gaps on a role-by-role basis. We have measures, KPI's & timelines in place.

Comparing talent supply/ demand. We've assessed how attrition, retirement & tech might impact talent, and understand the demand for future skills.

Assessed business strategy. We understand the enterprise strategy, how it might impact workforce, and which future roles are required.

Expectations and Engagement of the Next-Gen

The next generation of engineers and tradespeople entering the Maintenance and Reliability workforce bring new expectations and demands for learning, mentoring, and career progression. Unlike previous generations, younger professionals today are accustomed to rapid access to information and real-time communication, thanks to the prevalence of digital tools and platforms such as online training, video tutorials, membership platforms, and even virtual mentorship programs.

Once industrial organisations have managed to attract younger workers, the next step is to engage them so they can be successful. Many leaders report that early-career workers seem to lack technical or people skills that traditionally have been viewed as fundamental. While this might be valid, it often ignores the inherent skills that these younger workers do have but that many asset-intensive environments aren't yet equipped to use well.

For example, having grown up with instant access to digital answers, the Next-gen workforce is more likely than older workers to look first to self-help videos to solve problems. That habit can yield fast, accurate answers – if the solutions make sense for the plant or mine or site where they work. But the average Next-gen worker is likely somewhat less experienced with asking coworkers for advice in person.

Maintenance and Reliability leaders will need to merge the digital and the analog in ways that give workers the skill development they need, while ensuring that they are building interpersonal relationships with experienced workers and supervisors who can help integrate them in the community. Otherwise, younger workers can become disengaged, resulting in higher rates of absenteeism and lower productivity.

In McKinsey's (US) 2024 Talent Trends Research Report, they found that three in five Next-gen workers in manufacturing are disengaged, which is comparable to the total number of disengaged workers of all ages outside of manufacturing. McKinsey estimates that this level of disengagement costs US manufacturers about $20 billion to $40 billion per year.

They also expect mentoring to be continuous and collaborative, seeking frequent feedback and personalised development plans to ensure they are on track with their career goals. Traditional models of long-term, slow-paced growth are giving way to more agile career paths where these professionals expect to see measurable progression in their skills and responsibilities within shorter timeframes.

In Australia, the statistics are clear – underlining the urgency for companies to adapt:

- a recent study by Engineers Australia (EA) revealed that nearly **40% of engineers in the country are under the age of 35**;
- the same EA study found that more than **60% of engineering graduates prioritise career development and growth opportunities** when choosing an employer

According to the Australian Industry Group, younger engineers and tradespeople are significantly more likely to leave their current roles if they feel their career progression is stalled, making effective mentoring and training critical for talent retention. Asset-intensive organisations that can meet these Nex-Gen expectations are best positioned to attract, retain, and empower the leaders of tomorrow.

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Retaining Institutional Knowledge From Ageing Workforce

Organisations are caught between two urgent challenges: finding skilled technical workers and ensuring they capture and retain the institutional knowledge of retiring employees. These factors are central to both short-term operations and long-term business sustainability.

The Skills Shortage Crisis

Australia's skilled labour shortage is a growing concern. According to reports, industries are struggling with productivity losses, operational inefficiencies, and, in some cases, the threat of closures. The shortage has not only led to increased downtime and higher operational costs but has also driven up labour expenses as organisations compete for a limited talent pool. This is especially challenging for smaller firms that can't match the compensation packages offered by larger players.

A 2023 report from the National Skills Commission shows that approximately 50% of Australian employers are struggling to find skilled workers, particularly in trades like engineering, maintenance, and mechanical repair. This growing gap in talent threatens not just current productivity but also the ability of organisations to innovate and evolve and for Australia to remain competitive.

An Ageing Workforce & the Loss of Expertise

With many experienced professionals on the verge of retirement, organisations face a critical challenge: how to retain and transfer their knowledge to newer employees. This loss of institutional knowledge – expertise acquired over decades on how to maintain and repair complex equipment, manage assets, and avoid costly downtime – can be catastrophic for operational continuity.

One key issue is the reliance on veteran employees who have deep, often undocumented, insights. When these workers retire, organisations may find themselves scrambling to fill the knowledge gaps left behind. In industries like mining, oil and gas, and utilities, where equipment downtime can mean millions in losses, this is a severe risk.

Many organisations are taking creative steps to mitigate this risk. Some are re-engaging retired employees as consultants or mentors. This allows them to transfer knowledge

> "We are facing a double whammy: We can't hire enough skilled people fast enough, and we're doing a poor job retaining the knowledge of our ageing workforce.
>
> **Maintenance Planning Superintendent, Mining**

to younger workers while also filling temporary skills gaps. Other firms are investing in knowledge-sharing platforms – using digital tools, video tutorials, and web-based resources to capture the insights of retiring workers and pass them on to the next generation of engineers and technicians.

The Diminishing Apprenticeship Model

Traditional apprenticeship models, where younger workers spend years learning from seasoned professionals, are becoming less feasible. As more experienced staff retire, there are fewer mentors available to guide new talent. This gap in mentorship exacerbates the skills shortage and makes it harder to ensure a smooth transition between generations of workers.

To address this, some organisations are implementing structured knowledge-transfer programs, pairing junior engineers with senior experts in formal mentorship roles. This not only helps capture knowledge but also develops leadership skills and provides career guidance to newer employees.

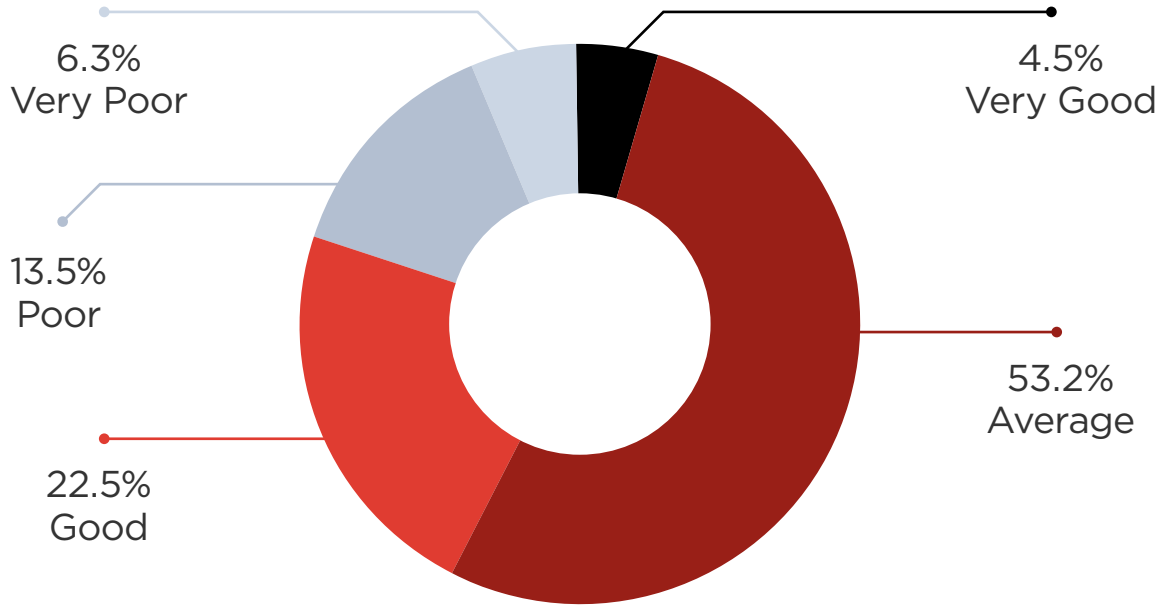
How long is long enough for the mentor-mentee model. With fewer mentors available and the need to rotate onto new mentees, do you adopt batch mentee program or a fast track (or neither)?

Workforce Planning: Addressing Short-Term and Long-Term Goals

Strategic workforce planning is essential for aligning talent development with an organisation's operational needs. This includes not only hiring and retaining skilled workers but also ensuring they are continuously trained in the latest technologies and methodologies.

However, the pressure to manage both day-to-day operations and long-term workforce

How good is your organisation at retaining institutional knowledge?



needs can be overwhelming. Many organisations know what they need to do but struggle to find the time and resources to address these complex issues while maintaining business as usual. The fear is that continued skills shortages could lead to widespread operational disruptions in the coming years.

Creative Solutions for Securing Future Talent
To stay competitive, organisations must think creatively about talent development. One key strategy is offering training programs that upskill and repurpose existing employees, particularly in emerging technologies. This not only helps fill immediate skill gaps but also positions organisations to lead in areas like automation, digital transformation, and predictive maintenance.

In addition to training, mentorship and coaching programs are critical. By linking junior employees with experienced mentors, organisations can facilitate the transfer of knowledge while also fostering the personal and professional growth of younger workers. Similarly, offering internships, co-op placements, and other hands-on learning opportunities to students provides valuable real-world experience and helps create a pipeline of future talent.

The Role of Diversity and Inclusion
Diversity and inclusion initiatives are key to creating a resilient workforce. A diverse team brings different perspectives, which can lead to more innovative problem-solving. An inclusive culture, where employees feel valued and empowered to contribute, can improve retention and job satisfaction. This is especially important in industries that have traditionally struggled to attract diverse talent, including women and underrepresented groups.

Securing Talent for Long-Term Success
As the maintenance and reliability sector grapples with a shrinking pool of skilled labour and the looming loss of institutional knowledge, organisations must act swiftly. The future depends on their ability to not only hire skilled employees but also retain and transfer the knowledge of their ageing workforce.

Agile and creative strategies – such as robust training programs, mentorship opportunities, and digital knowledge-sharing tools – are crucial to meeting this challenge. Additionally, fostering an inclusive workplace culture will help organisations attract a broader range of talent and create an environment where workers stay and grow.

By addressing these issues now, businesses can ensure they have the workforce they need to thrive in the years to come.

> “Our number one problem is retaining the institutional knowledge that our older engineers have in their heads.
>
> PLANT MANAGER, MANUFACTURING

Statistics Highlighting the Challenge

- In 2022, it was reported that **35% of the Australian workforce** in industrial sectors with maintenance and reliability functions, were over the age of 55, with significant numbers planning to retire within the next decade.
- A survey by Deloitte found that **80% of organisations** in asset-intensive industries see a lack of skills as one of their top three business risks, with more than half citing knowledge transfer as a major challenge.
- By 2030, experts predict that Australia will face a **shortfall of 300,000 tradespeople**, including critical roles in maintenance and engineering.

Which of these strategies does your organisation use to address the problem?

08

Common Challenges in the Training Landscape

So why aren't we seeing the full potential of training realised? In theory, training should be the cornerstone of a high-performing Maintenance and Reliability workforce, but the reality is often far more complicated. Despite organisations investing in training, many are left wondering why the expected gains in performance, efficiency, and safety have not fully materialised. The answer lies in the gaps between intent and execution.

Lack of Post-Training Support

Training is not a one-time event, and yet, too often, it's treated that way. Organisations may offer technical courses, but without post-training support – like ongoing mentorship and reinforcement of lessons – those skills fail to take root in daily operations. Top-performing organisations don't stop at the classroom; they nurture a culture of continuous learning and goal setting to ensure long-term impact.

Psychological Safety for Learning

Another key issue is the lack of psychological safety in training environments. People learn in different ways, but too many training programs fail to account for these differences. Without diverse learning methods that accommodate everyone – from group work to solo reflection – many employees feel left behind.

Consistency Across Sites

Consistency is another roadblock. Despite having similar assets across multiple sites, many organisations don't standardise training programs, leaving employees ill-equipped to transfer their skills effectively when moving between locations. This inconsistency hinders both individual growth and operational efficiency.

Tailored Growth Plans

And while generic training programs abound, the real potential lies in tailored growth plans. A one-size-fits-all approach fails to address the unique needs and capabilities of each team member. Instead, sequential, goal-oriented training plans tied to real outcomes can unlock higher performance across the board.

World-Class Training Quality

World-class results demand world-class training. Too often, training becomes a box-ticking exercise, with programs that lack the depth or real-world application necessary for lasting change. High-quality, industry-tested training delivered by experienced experts can be the difference between mediocre performance and operational excellence.

> "Simply put, the training is good, but ongoing adherence and attention to what's been learnt is not good enough.

Training and Capability Lead, Mining

> “Not everyone is a teacher. It is critical – if you want training to stick – that experienced educators are selected to deliver training.

Maintenance Manager, Oil & Gas

Retirees as Trainers – A Double-Edged Sword

However, the solution is not as simple as just bringing back retired employees to mentor new staff. While retirees bring valuable experience, relying solely on their outdated methods can limit innovation. Striking a balance between institutional knowledge and fresh perspectives is crucial.

Role Clarity Issues

Role clarity, or the lack of it, also hinders the effectiveness of training. Employees, particularly those in roles like planning, are pulled in too many directions due to undefined expectations. Clear role definitions and aligned training can resolve this disconnect and allow individuals to excel.

Fear of Churn

Organisations also fear that if they invest in training, employees will take their new skills and leave. But the real risk is what happens if you don't train them, and they stay. Studies show that employees are far more likely to remain with organisations that invest in their development, boosting both retention and morale.

Resource Constraints

Compounding these issues are the all-too-common resource constraints – limited budgets, lack of trainers, barriers to training due to shift work and FiFo schedules, and time pressures. While these factors make training difficult, the costs of not providing adequate training – downtime, inefficiency, safety risks, staff churn – are even higher.

Geographic Barriers

Geographic isolation presents another challenge, particularly in a country as vast as Australia. While online training can bridge some of the gaps, it's not always a sufficient substitute for in-person, hands-on learning.

Regulatory Compliance and New Tech

Finally, regulatory compliance and new technologies are two more hurdles that must be overcome. Navigating the complexities of regulatory requirements while integrating emerging technologies into daily workflows demands training programs that are both flexible and future – focused.

> "Just think for yourself how engaged you are when sitting in a Planning & Scheduling class when the lesson is about the work you do, versus someone else's role. Hence understanding your role means learning is enhanced.

Head of Maintenance Planning Capability, Power Utility

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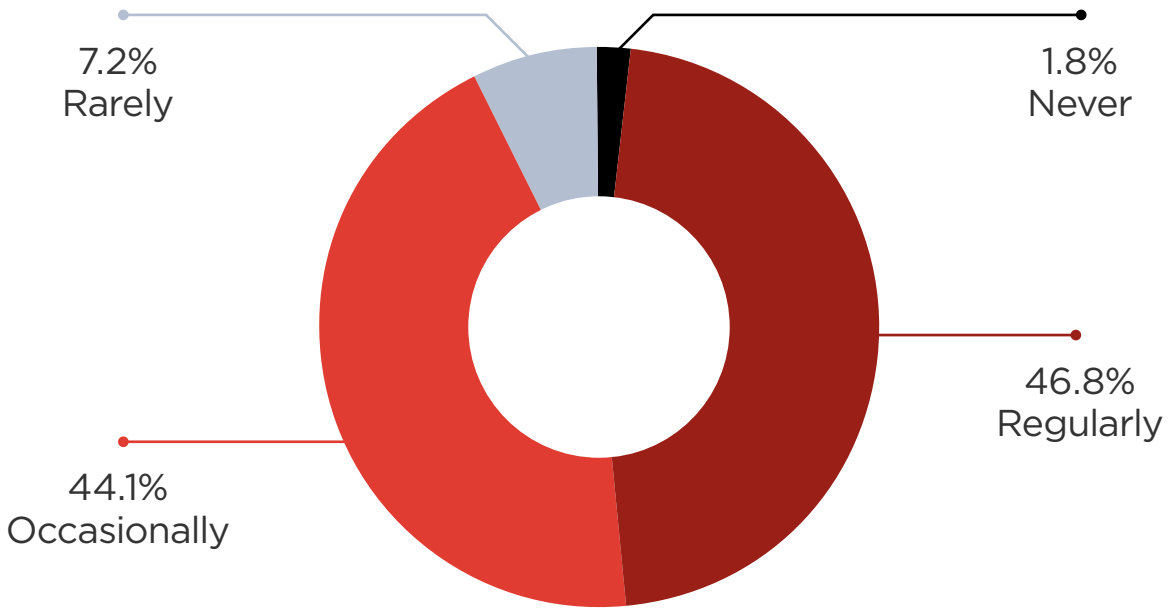
Organisational Culture and Support

The frequency with which training opportunities are discussed within teams or departments is a strong indicator of how deeply training is embedded in an organisation's culture and strategy. When training is a regular topic of conversation, it signals that the organisation values continuous improvement and sees skill development as essential to its success.

For Maintenance and Reliability teams, where technical proficiency, safety, and efficiency are critical, consistent dialogue around training ensures that employees remain up to date on the latest practices and technologies. It also helps identify skill gaps early, allowing for proactive measures rather than reactive responses to emerging issues.

At a strategic level, regular discussions about training reflect an organisation's commitment to its workforce and long-term goals. If training is prioritised and discussed frequently, it shows that the organisation is investing in its people to ensure they are equipped to meet evolving demands – whether it's adapting to new technologies, improving preventative maintenance, or overcoming staff shortages. This consistent focus aligns individual development with broader organisational objectives, leading to enhanced performance, higher retention rates, and a more agile workforce capable of driving the organisation's overall strategy forward.

How often are training opportunities discussed in your team or department?



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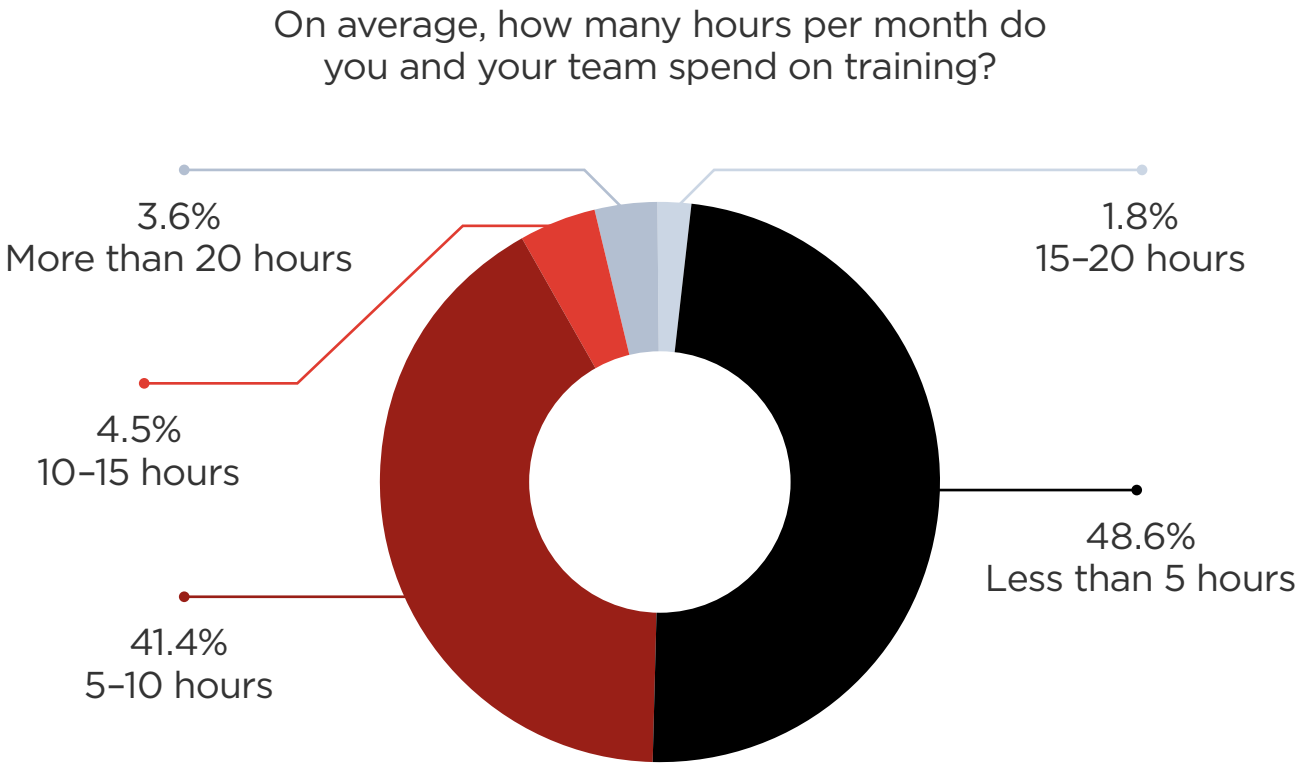
Training Investment Metrics

The number of hours spent on training each month is a crucial metric that reflects the organisation's actual investment in the development of its Maintenance and Reliability teams. This figure goes beyond mere intent, providing a tangible measure of the organisation's commitment to building the skills and capabilities of its workforce. For technical teams where precision, safety, and operational efficiency are paramount, dedicating regular time to training ensures that employees are continuously improving, staying current with industry standards, and better equipped to handle emerging challenges, such as new technologies or evolving maintenance practices.

By tracking monthly training hours, organisations can assess whether their support for training aligns with their overall strategic goals. If the time spent on skill development is insufficient, it may indicate that the organisation is under-prioritising training, which could lead to gaps in performance, increased downtime, or even safety risks. Consistent and adequate training hours not only improve technical proficiency but also foster a culture of continuous learning, leading to a more resilient, capable, and motivated workforce



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Team-Based Training

Training as a team rather than as individuals offers significant benefits for Maintenance and Reliability teams. It fosters a shared understanding of processes, tools, and strategies, ensuring everyone speaks the same language and aligns on best practices. This unified approach promotes consistent execution, reducing variability in performance and minimising errors. Team-based learning also enhances collaboration, enabling members to collectively problem-solve and apply learnings in real-time situations, which boosts overall team efficiency and decision-making. Training as a group encourages accountability and continuous improvement, as team members support each other in applying new skills, driving long-term success.

> “ Alignment and developing a common language and nomenclature is another reason for training teams together.
>
> **Maintenance and Reliability Manager, Mining**

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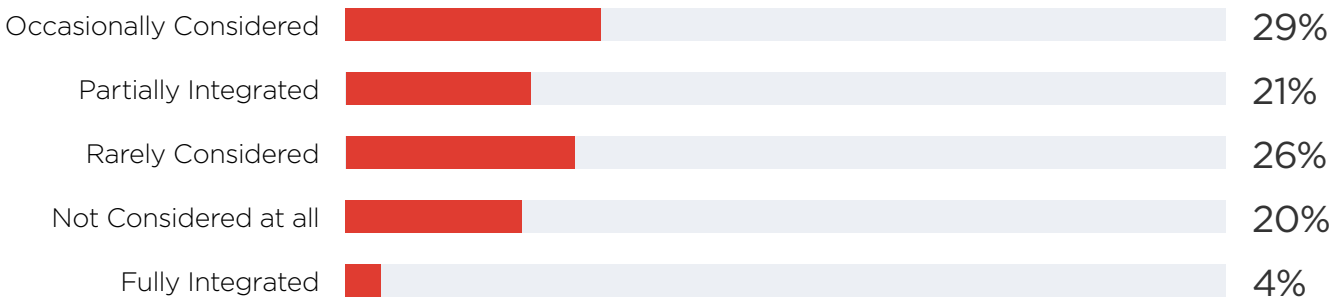
CPD Points

CPD (Continuing Professional Development) points can play an important role in an organisation's approach to training their Maintenance and Reliability teams, but their value depends on how they are integrated into the broader training strategy.

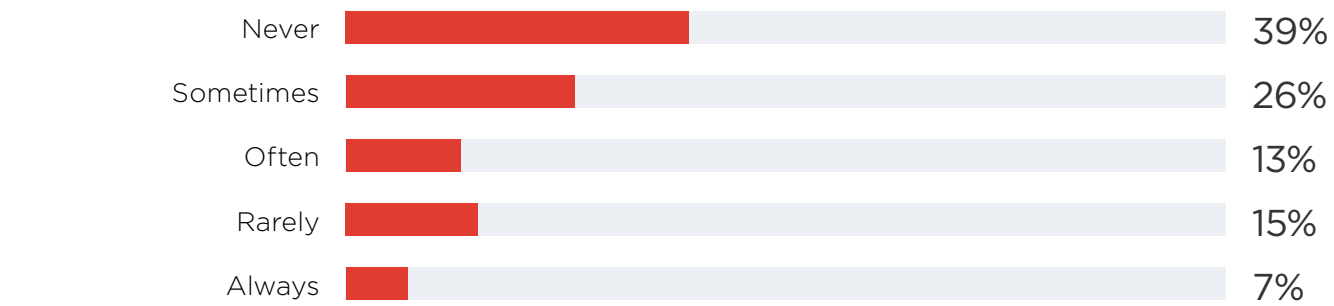
Does the organisation value CPD?



On one hand, CPD points provide a structured framework for ensuring ongoing education, encouraging employees to engage with formal learning opportunities and maintain up-to-date skills. For regulated industries that require compliance with regulations or certifications, CPD points can ensure that staff remain qualified and knowledgeable in critical areas. They also offer recognition and motivation for individuals to continuously develop their expertise.

However, CPD points alone may not be sufficient if treated as a box-ticking exercise rather than a meaningful part of the organisation's learning culture. If the pursuit of CPD points becomes more about fulfilling quotas than developing real-world skills, the impact on team performance and capability can be minimal. CPD points are most valuable when they complement a more comprehensive training approach – one that emphasises practical, on-the-job learning, mentorship, and alignment with the organisation's long-term goals. In this way, CPD points can be a useful tool, but they should not be the sole measure of an organisation's commitment to developing its workforce.

Are CPD points considered during performance reviews and appraisals in your organisation?



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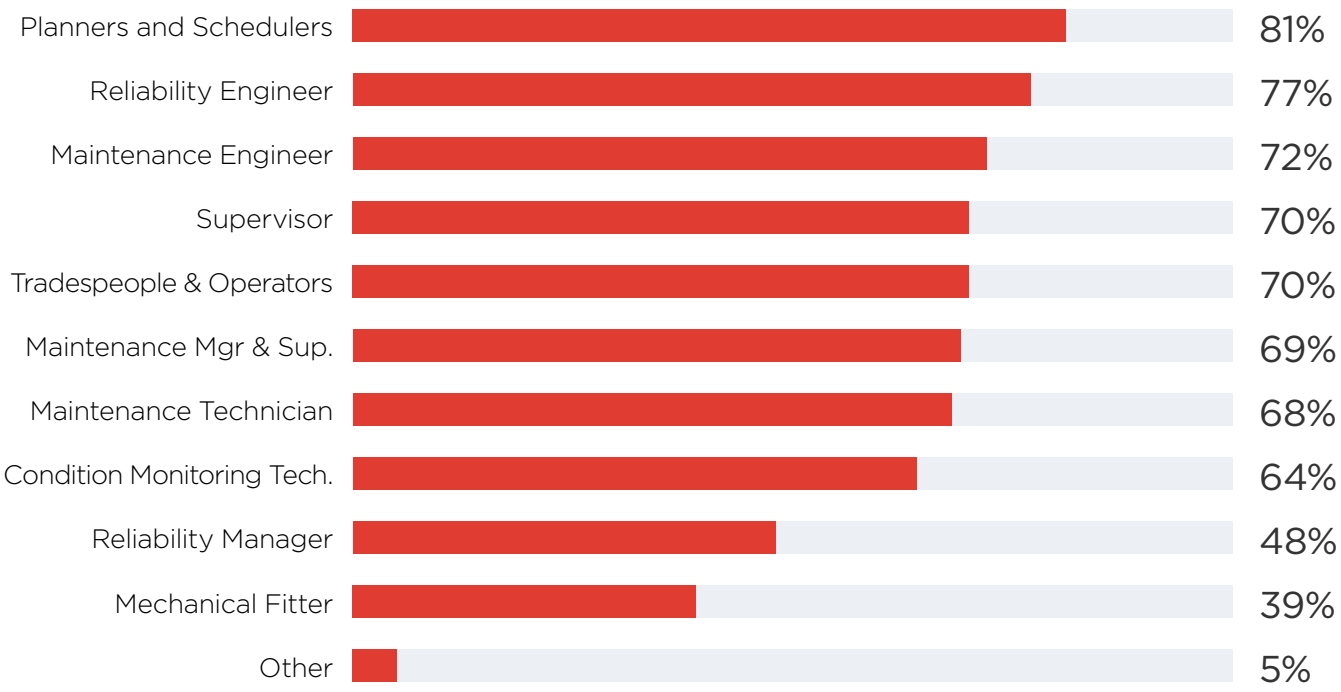
Training Priorities

For Maintenance and Reliability teams, including all operators and tradespeople, establishing training priorities is essential to ensuring that the workforce aligns with the organisation's most critical needs. In industries where equipment uptime, safety, and operational efficiency are non-negotiable, targeted training helps ensure that the skills being developed directly contribute to key business objectives.

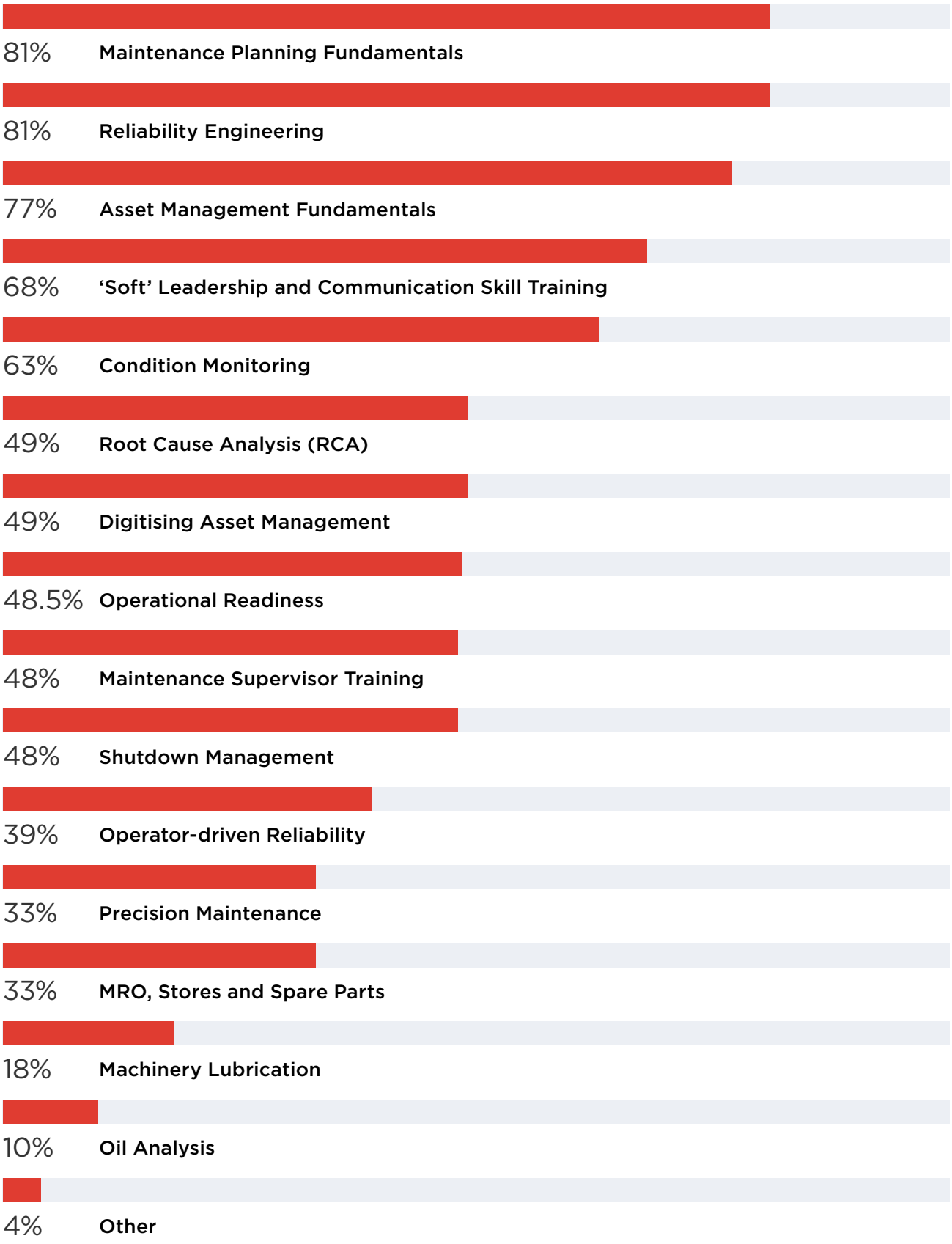
Without clear training priorities, organisations risk investing time and resources in programs that may not address their most pressing challenges – whether it's advanced diagnostics, preventative maintenance, or new technology integration. By focusing on the areas that matter most, organisations can ensure that their teams tackle specific issues, such as reducing downtime, cost, or risk, extending asset life, or enhancing compliance with safety standards.

Additionally, training priorities ensure that limited resources – both in terms of time and budget – are allocated efficiently. The Maintenance and Reliability workforce often juggle demanding schedules and pulling them away from operational duties for training can have short-term impacts. By defining clear priorities, organisations can make sure that the training provided has a direct and immediate impact on operational goals, minimising disruption while maximising long-term benefits. It also fosters a culture of continuous improvement, where teams understand that their development is not arbitrary but aligned with the overall strategic direction of the business.

From these common 10 roles, please select the top 5 that are the biggest priorities for your organisation to invest training in.



From these 15 topics or domains, please select the top 5 priorities for your organisation, department or team.



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Identifying the Training Gaps

Equally important is the identification of capability gaps within these teams. Maintenance and Reliability teams are responsible for complex machinery and critical infrastructure, where even minor skill deficits can lead to costly errors, unplanned outages, loss of production or safety incidents. Identifying capability gaps ensures that the organisation understands where its teams may be lacking the necessary expertise and can address these issues proactively through targeted training programs. For instance, as organisations increasingly adopt advanced technologies like predictive maintenance tools or IoT systems, there may be gaps in digital literacy for teams to fully leverage these innovations.

Identifying these gaps also enables businesses to manage risks more effectively. In the context of an ageing workforce, for example, there is often a wealth of institutional knowledge lost as experienced operators and tradespeople retire. By pinpointing specific areas where this expertise is critical – whether in specialised machinery maintenance or troubleshooting – it's possible to create training and mentorship programs that transfer this knowledge to the next generation of workers. Addressing capability gaps not only boosts immediate performance but also strengthens the organisation's long-term resilience, ensuring that teams are prepared to meet both current and future challenges.

In addition to the roles and functions discussed in the previous section, we asked participants in the two roundtable discussions to call out current and urgent capability gaps. These are summarised below.

- Supervisors with EQ
- Electrical Technicians and Trades
- Industrial Mathematicians
- Risk Managers
- Inclusive Leadership
- High Voltage Qualified Trades
- Logistics (for component change-out roles)

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Bridging The Gaps

So where do we go from here?

To maximise the impact of training, we need to take a more strategic, tailored approach.

Despite the recognised benefits of training, many organisations fail to unlock its full potential for their Maintenance and Reliability teams. So why isn't training having the transformative impact it promises? The issue often lies not in the training itself but in how it's approached, integrated, and supported within the workforce. Through deeper analysis, we've uncovered several critical barriers that are preventing organisations from fully capitalising on their training investments.

One major gap is that **soft skills often go unaddressed**. While technical training is robust, the development of conflict resolution, stakeholder management, and emotional intelligence tends to be neglected. Yet, these skills are crucial for effective leadership, especially for supervisors who must manage teams and navigate complex work environments. Without strong interpersonal skills, even the most technically proficient leaders can struggle to drive performance, manage change, and maintain high morale among their teams.

Mentorship is another area where the full value of training can be lost. While classroom sessions and technical instruction are important, true learning happens on the job. Without ongoing mentorship, employees may quickly forget what they learned in training or fail to apply it in real-world situations. Pairing high-performing individuals with other team members not only reinforces training but also fosters a culture of knowledge-sharing and continuous improvement, ensuring that the skills acquired are put into practice.

Moreover, organisations often fail to plan adequately for training by not prioritising **backfilling** during training periods. If training is as an afterthought or squeezed into an already hectic schedule, it can overwhelm teams and disrupt operations. However, by incorporating training into annual planning and ensuring there is adequate support for day-to-day functions during training sessions, organisations can balance skill development with operational efficiency, without burdening their workforce.

We have already dedicated a whole section to **retaining in-house knowledge**, especially as organisations increasingly rely on third-party specialists to address technical problems. For instance, apprentices may not perform certain tasks until their later years, creating a gap between in-house expertise and the reliance on external help. To future-proof the workforce, organisations must prioritise knowledge retention, whether through comprehensive apprenticeship programs or by ensuring that seasoned employees pass on their expertise before retiring.

Finally, the **future of work** demands a more adaptive and forward-thinking approach to training. With automation, decarbonisation, and workforce evolution reshaping the landscape, organisations must cultivate a skill pipeline that is resilient, innovative, and aligned with these emerging trends. The future workforce will need not only technical proficiency but also the ability to adapt to rapid technological advancements and evolving industry requirements.

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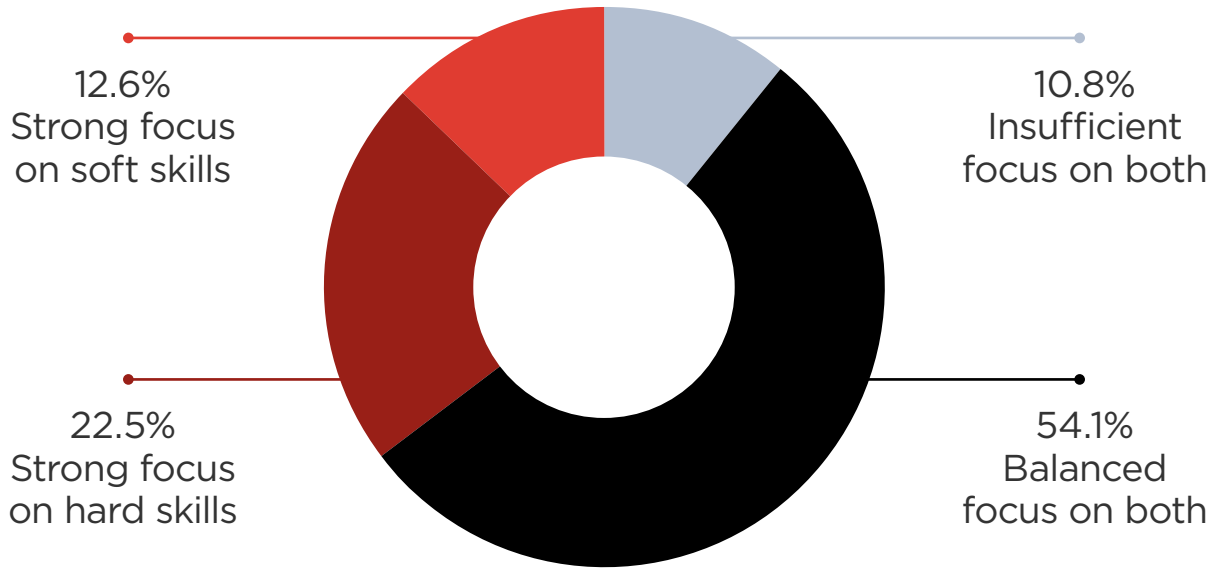
The Importance of ‘Soft Skill’ Development

Maintenance and Reliability leaders and supervisors must balance technical expertise with strong people skills to succeed in today’s industrial landscape. Hard technical skills such as the fundamentals of work management, developing PMs, Condition monitoring and reliability techniques, understanding IoT systems, sensors, ERP platforms, and predictive maintenance tools are a given. In fact, our research indicates that 83% of organisations are implementing or planning to implement digital technologies in maintenance operations, highlighting the critical importance of technical proficiency in modern maintenance roles. As the integration of advanced technologies grows, so does the need for these professionals to be fluent in complex systems and data-driven decision-making.

However, while technical skills are foundational, the rise of digital transformation has also increased the demand for soft skills such as leadership, empathy, and emotional intelligence. According to a Deloitte study, 92% of executives reported that “soft skills” like communication, collaboration, and empathy are just as important as technical skills for the success of an organisation in this era of rapid technological change. With the increased use of automated systems, Maintenance and Reliability leaders manage not only machines but also people. They need to foster a culture where team members feel supported, especially in environments that require regular safety briefings, mental

How would you rate the balance between soft skills (e.g. communication, teamwork) and hard skills (e.g. technical expertise) in your training programs?



health considerations, and adaptability in the face of constant technological change.

The Rise of EQ

Leadership, active listening, and emotional intelligence are vital for creating a workplace where employees feel heard and valued. Effective supervisors who ask questions, engage in safety discussions, and demonstrate a genuine concern for the well-being of their teams will navigate challenges such as worker fatigue, resistance to change, and mental health issues, which can arise in high-stress environments. As industries continue to embrace more technology, the leaders who master the delicate balance between technical competence and people-focused leadership will stand out in ensuring both operational success and a positive workplace culture.

The FIFO Challenge

The FIFO (Fly-In Fly-Out) workforce faces unique challenges, particularly in remote areas of Australia in mining or oil & gas. Extended periods away from home, isolation, and demanding work environments take a toll on workers' mental health and well-being.

By demonstrating empathy, Maintenance Supervisors and leaders can create a more supportive workplace culture where workers feel valued, understood, and more motivated to stay, even in difficult conditions. This can include acknowledging personal struggles, offering flexible rosters, or providing mental health resources.

As Australia faces a growing skills shortage, particularly in these remote industries, retaining skilled FIFO workers is essential to sustaining operations. Empathy training or awareness equips leaders with the tools to address workers' emotional and psychological needs, reducing turnover and improving job satisfaction. When workers feel heard and supported by their supervisors and management, they are more likely to remain loyal to the organisation. This reduces recruitment costs and ensures that organisations can maintain a stable, skilled workforce.

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Conclusion

In and amongst the many conversations, group discussions, fiery debates, and >180 survey responses about training and capability challenges, there is an immense opportunity for organisations willing to invest strategically in training and development.

To address the evolving demands of automation, digital transformation, decarbonisation and an ageing workforce, organisations must prioritise a multi-faceted approach to training that not only builds technical skills but also fosters leadership, emotional intelligence, and knowledge transfer.

> “ The future belongs to those who train for it.
>
> **Head of Maintenance and Reliability, Rail**

We crowd-sourced the participants for the most common and available actions that organisations should take – and summarise them as follows:

1. **Adopt a Long-Term Training Strategy**
   Training is not a one-off investment. Organisations need to create structured, continuous development programs that evolve with industry needs. This includes embedding ongoing learning into the organisation culture, setting clear training priorities aligned with business goals, and ensuring all employees – from trades & operators to supervisors & managers – are equipped for the future.

2. **Leverage Technology for Knowledge Retention**
   As experienced workers retire, digital platforms must be used to capture and share their invaluable knowledge. Implement video tutorials, mentorship programs, and cloud-based learning systems to ensure this expertise is passed on.

3. **Bridge the Skills Gap with Tailored Programs**
   Conduct thorough capability assessments to identify skill gaps, especially in digital literacy and advanced technologies like IoT and data analytics. Tailor training programs that are specific to these gaps, ensuring your teams are equipped to handle the demands of modern equipment and machinery and evolving processes.

4. **Foster Soft Skills and Leadership Development**
   In the future workplace, technical ability alone won't be enough. Emotional intelligence, leadership, and collaboration matter. Encourage training in soft skills that help supervisors lead with empathy, manage high-stress environments, and retain talent in challenging settings like FIFO operations.

5. **Create Structured Knowledge Transfer Programs**
   Implement mentorship initiatives that formalise the transfer of institutional knowledge. This includes pairing junior engineers with seasoned veterans and providing incentives for retirees to stay on as consultants or mentors.

6. **Emphasise Post-Training Support**
   To ensure that training investments deliver long-term results, organisations must offer continued support through coaching, follow-ups, and integration into daily workflows. Embedding training into operational processes will ensure skills are applied consistently.

7. **Create a culture of psychological safety**
   Create a culture of psychological safety to encourage the sharing of learnings and ideas by those who have undergone training with those who have not. This should be mandatory and part of the learning and development process.

By doing all or some of this, organisations will not only close existing skill gaps but also future-proof their workforce against the challenges of tomorrow. Taking training and skill development seriously will lead to improved plant safety and reliability, higher productivity, and a more engaged workforce ready to excel in an increasingly complex industrial landscape.

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