

From research to reality

Panah Fasihi is living her dream, working as a Test and Commissioning Engineer on Alstom's X'Trapolis 2.0 project.

When Panah Fasihi was nine years old, she and her mother were flying home from an overseas holiday when the engine of the plane they were on suddenly failed.

The pilot had to execute an emergency landing on a remote island – but despite being terrified of what was happening, the young girl couldn't help being curious.

"I wanted to understand how we had landed safely," Fasihi said. "That experience sparked further interest in me, and I was driven to learn more about planes, modes of transport and how they can be made safer."

This drive, combined with a natural aptitude for maths and physics, led Fasihi to pursue a career in engineering.

"Engineering brings together my interests, drive and skillset, combining logic, creativity, and meaningful impact," she said.

Fasihi, now aged 31, is originally from Iran but migrated 15 years ago to attend university in Australia.

She obtained a Bachelor's degree in Aerospace Engineering at Monash University in Melbourne, but her academic research gradually led her towards rail.

"Rail stood out to me as a discipline because it brings together mechanical, material performance, electrical, operational and human factors," she said.

Fasihi went on to complete a PhD focused on rail maintenance and reliability – with an emphasis on development, implementation, and advancement of railway maintenance technologies to improve asset performance.

"Specifically, my research investigated improving the wear and rolling contact fatigue performance of railway rails through the use of friction modifiers and laser cladding," she explained.

"The project was highly multidisciplinary, combining mechanical and materials engineering with additive manufacturing technologies, data and image processing and project management.

"At its core, the research addressed one of the rail industry's ongoing challenges – namely extending asset life while maintaining safety, reliability, and cost efficiency."

She said one of the biggest challenges of her PhD was managing the uncertainty that's inherent in research while balancing technical depth with real-world applicability.



Panah Fasihi works as a Test and Commissioning Engineer for Alstom's new X'Trapolis 2.0 train fleet.

Images: Pana Fasihi

"There were moments where experiments didn't go to plan, but learning to adapt, iterate, and refine approaches became an essential part of the process," she said.

"Integrating these areas while managing complex experimental programs needed strong planning, adaptability, and persistence."

Fasihi's work was recognised by the Railway Technical Society of Australia (RTSA), which presented her with the prestigious PhD Thesis award in 2024.

"That recognition was especially rewarding because it reflected not only the technical depth of the work, but also its potential value to the rail industry," Fasihi said.



Fasihi won the Railway Technical Society of Australia (RTSA)'s prestigious PhD Thesis Award in 2024.

"From the beginning, I wanted my research to be useful beyond academia."

Fasihi now works as a Test and Commissioning Engineer for Alstom's new X'Trapolis 2.0 train fleet, with a focus on documentation, assurance, and customer interface.

She's primarily based in Melbourne but often visits various Alstom sites and depots as part of the job.

"My role is all about translating complex engineering requirements and testing activities into clear, accurate, customer-facing documents, ranging from test procedures to compliance reports," she said.

"I work closely with engineers, technicians, testers, quality teams, production, and project managers, coordinating inputs, managing iterative reviews and ensuring every deliverable meets technical and governance standards.

"A typical day might involve reviewing test procedures and/or test reports, leading customer review sessions, coordinating with stakeholders, and ensuring test evidence fully supports train acceptance."

She loves working on a project that will serve Victorians for decades to come.

"Being part of something that improves public transport, enhances reliability, and supports sustainable city living is a real source of pride," she said. "Working on a high-profile project such as XT2.0 also reinforces why attention to quality, safety, and diligence matters so much.

"Every test procedure, report and approval contributes to outcomes that people rely on every day, which makes the work both meaningful and motivating.

"It's incredibly rewarding to see the tangible impact of the work we do – literally watching the trains I help commission carry people safely every day."

She said it's a privilege to work with Alstom, a leading global company that is shaping the future of rail transport.

"Alstom brings together global expertise from highly skilled teams across engineering, testing, production, and project management, which makes collaboration a core part of every day," she said. "I work closely with a diverse range of professionals, from operators and maintainers to designers and regulators. That exchange of perspectives not only strengthens outcomes but also makes the work environment engaging and constantly educational.

"For Alstom, safety, quality, agility, and reliability are not just goals on paper, but integral to every decision and process."

She said the job has been a tremendous learning experience, developing her systems thinking, assurance mindset and more.

"By reviewing test evidence, ensuring compliance, and supporting acceptance milestones, I've learned how small technical details can influence broader operational and safety outcomes," she said. "My experiences have enhanced my technical and analytical abilities while strengthening problem-solving, communication, and leadership skills; capabilities I rely on and continue to build every day."

With the rail industry suffering from a skills shortage, Fasihi said she would love to see more structured pathways for students and early-career engineers to gain hands-on exposure to rail technologies and systems.

"While there's incredible expertise across engineering, operations, and testing, greater integration of R&D (research and development) and targeted training programs at universities could help prepare the next generation of engineers to tackle complex, real-world rail challenges," she said.

"It's something I'm personally passionate about, and I hope to contribute to through mentoring, teaching, technical course development, or industry-academia collaboration in the future."

Sharing her advice to other young people interested in a career in rail, she said it's important to stay curious and be patient.

"Don't underestimate the value of communication skills; being able to explain technical decisions clearly is just as important as making them," she said.

"Seek out mentors, ask questions, and embrace opportunities to work across disciplines."

"Rail is a complex, safety-critical industry, and understanding takes time. The more you understand the system as a whole, the more of a difference you can make." 🚆



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