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Advice For Young Engineers: Learn From Failure, Not Just From Success

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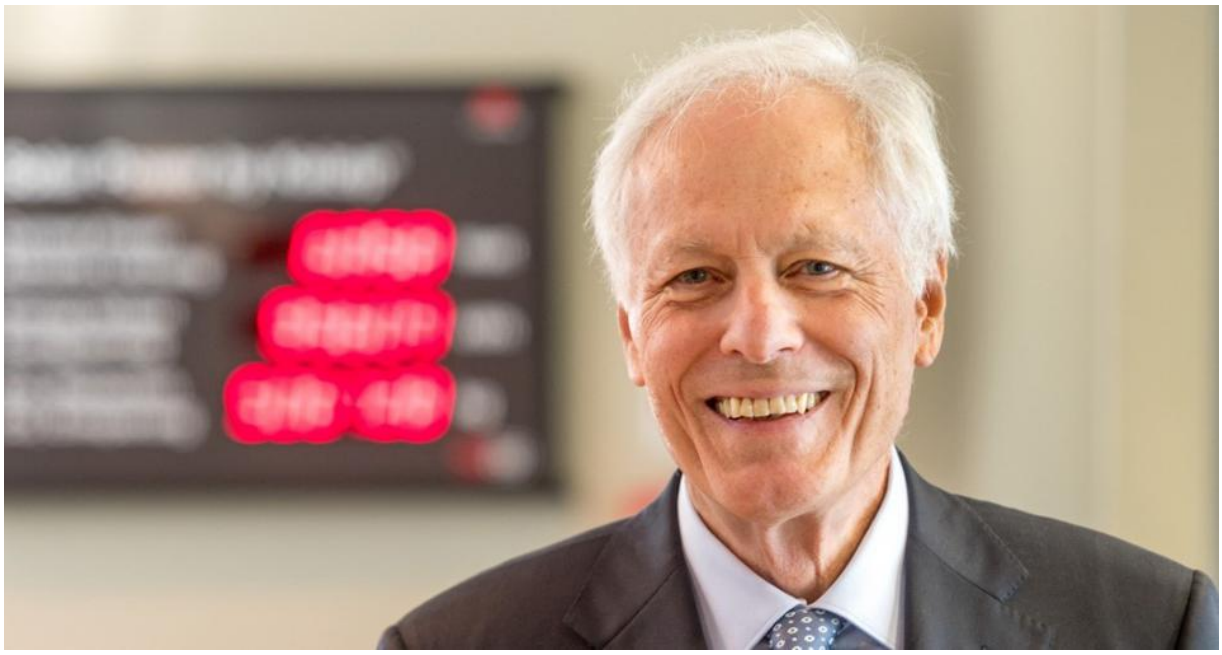
Business

By Johnny Wood



Mario Gaia is the founder and honorary chairman of Turboden, an MHI Group company. TURBODEN

When it comes to offering lessons on navigating a fulfilling career in engineering, Mario Gaia has no shortage of rich material to draw on. He's worked for more than a half century in energy, as an engineer, innovator, entrepreneur and businessman.

Gaia, the founder and honorary chairman of MHI Group company Turboden, started out on the research team of Professor Gianfranco

Angelino at Politecnico di Milano, investigating Organic Rankine Cycle (ORC) thermodynamics and design. ORC systems generate electric and thermal power from multiple sources, including renewables, traditional fuels and waste heat from industrial processes, waste incinerators, engines or gas turbines, making them an important and versatile technology in decarbonization.

Enthusiastic about the impact the technology could have, Gaia went on to found Turboden in 1980, which became part of MHI Group in 2013. As his company turns 40 this year, Gaia reflects here on success, failure and moments of inspiration – each of which he considers vital to continual growth and creativity.

In addressing engineers who are just starting out, what would you say are the most important skills and qualities for having a successful career? How about for building a successful engineering company?

Companies grow through fostering creativity and innovation, attributes which help good engineers succeed and are at the heart of Turboden's continued development. In the field of engineering, technical excellence provides the bedrock which allows creative, enterprising people to flourish.

Whether a new recruit or an old hand, engineers need to feel part of a team where all colleagues, junior and senior, are valued and share common goals. This sounds simple, but it involves everybody working to build a company culture that creates opportunities to suggest solutions, be creative and get involved.

Which do you consider the better teacher, success or failure?

It's easier to learn from success than failure. The latter is more painful, but both are valid. Success is encouraging. It stimulates analysis and knowledge, which often supports new thinking and novel ways of doing things.

“[Failure] requires you to take full responsibility for mistakes and be honest with yourself about them, and that’s not easy.”

On the other hand, failure generates fear and makes you question the validity of what you are doing. It requires you to take full responsibility for mistakes and be honest with yourself about them, and that’s not easy. When someone fails, it can be both a tough lesson and a good teacher, provided you are prepared to learn from the experience.

The Italian ORC engineering school formed in the 1970s at the Politecnico di Milano. TURBODEN

What prompted you to start a company based on a new way of generating energy?

Throughout my career I have followed my instincts and let curiosity be the mother of invention.

As a young student, I wondered what the effect would be of using a different fluid in steam engines. Many years later, after joining the research group of

Professor Gianfranco Angelino at Politecnico di Milano, we discovered the answer.

With the help of the professor and other friends from university, I designed some small ORC machines. My father found space for me in his gemstone-cutting workshop, and I spent long hours developing and building these unique systems.

Further experiments led to ORC turbines of increasing power, until in 1980, the engineer turned entrepreneur. Investing my own savings, and supported by friends, family and university colleagues, a small startup came to life and has been innovating and growing ever since.

Turboden's ORC systems generate electric and thermal power from multiple sources. TURBODEN

Starting a business consists of numerous challenges. When did you realize yours would succeed?

Like any new business, finance was a major challenge at the start. Building experimental ORC machines is an expensive business, but with the help of friends we got through the early hardships.

Looking back, the turning point for Turboden was the decision to target high temperature ORC systems, which could be adapted to utilize biomass as a heat source. Early success supplying a 300 kW ORC system to the Swiss Army in 1997 was followed by about a hundred more biomass-fed systems in the next few years, and the business took off from there.

Our unique system gave non-utility customers a reliable and easy-to-operate way of converting heat to electricity. Collaborating on a reciprocal trust basis, with engineering companies and boiler manufacturers who were in charge of other parts of our clients' plants, has certainly been instrumental to Turboden's growth.

> **"Successful collaboration is based on trust and respect, which is an essential part of helping young engineers innovate and devise creative solutions."**

How should companies encourage young engineers to be creative and innovative?

Turboden's history is essentially a story of young people who share a common spirit and give the best of themselves, each in their own unique way. Successful collaboration is based on trust and respect, which is an essential part of helping young engineers innovate and devise creative solutions.

I think a central tenet of our success has been employing, encouraging and valuing people whose creativity, skill and commitment continue to drive the company forward.

About the author

Johnny Wood has been a journalist for more than 15 years, working in different parts of the world, including Asia, Europe and the Middle East. In addition to being a feature writer, he has edited several prestigious lifestyle magazines and corporate publications.

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