Arcola Energy and Consortium of Rail Industry Leaders to Deliver the First Scottish Hydrogen-Powered Train

Tuesday 29 December, 2020

The project is a Scottish supply chain collaboration to deliver a production-ready and safety certified hydrogen powered train by November, 2021.

29 December, 2020 – Scottish Enterprise, Transport Scotland and the Hydrogen Accelerator, based at the University of St Andrews, have appointed Arcola Energy and a consortium of industry-leaders in hydrogen fuel cell integration, rail engineering and functional safety to deliver Scotland's first hydrogen powered train. A key objective of the project is to create opportunities for the Scottish rail supply chain through skills development and industrialisation of the technology.

The consortium will be led by hydrogen fuel cell integration specialist Arcola Energy and draw on the expertise of world-leading rail engineering and safety experts to deliver full system design and integration based on Arcola's A-Drive technology platform. The project is supported by rail engineering and safety experts Arup and Abbott Risk Consulting to form an integrated delivery team, with AEGIS providing regulatory third-party verification.

"Hydrogen traction power offers a safe, reliable and zero-carbon alternative for Scotland's rail network. The hydrogen train project is an excellent opportunity for industry leaders in hydrogen, rail engineering and safety to collaborate with Scottish technology providers to develop a deployment ready solution," said Dr Ben Todd, CEO of Arcola Energy. "We are delighted to be working with Scottish Enterprise, Transport Scotland and the Hydrogen Accelerator, to support Scotland's strategy to make passenger railways emission free by 2035."

Arcola Energy will develop the technology platform for the train's new powertrain from its planned new Scottish base. Arcola's existing A-Drive platform will be extended to meet rail safety and compliance requirements, thereby enabling the consortium to significantly reduce development time and cost to deliver a complete hydrogen powered solution in just 10 months.

The consortium includes:

- Arcola Energy, project lead responsible for hydrogen fuel cell system engineering, design and integration, and project demonstration
- Global engineering consultancy Arup, will provide specialist rail engineering expertise for technical concepts, high-level design and safety strategy. Arup's Edinburgh office will also work with the Hydrogen Accelerator to chart the route to mainline deployment of hydrogen powered trains across Scotland
- Abbott Risk Consulting, based in Edinburgh and Glasgow, will deliver specialist product development compliance and health and safety management
- AEGIS Certification Services will provide third party safety certification and compliance verification

Project partner Arup will use the learnings from the project to develop a roadmap to roll out hydrogen trains to support the decarbonisation of Scotland's network.

"With Scotland's focus on achieving net zero emissions by 2035 and rail playing a leading role in this, hydrogen offers a safe, reliable and zero carbon alternative to other forms of rail propulsion," said Clare Lavelle, Scotland Energy Business Lead, Arup. "This project is not only a crucial step in helping us understand the practical challenges of using hydrogen traction power on our railways, but an example of the type of investment Scotland needs to take advantage of the opportunity to build a secure, flexible, cost effective and zero carbon energy network."

Edinburgh-based risk and safety management consultancy, Abbott Risk Consulting (ARC), will bring functional safety, product development compliance and health and safety management expertise to the consortium.

John Abbott, Managing Director of ARC, added: "This is a really important project for us and for

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Scotland. We are already engaged in hydrogen fuel-cell trials for aviation. To be part of this consortium and to be able to apply our functional safety experience to such an important sustainability initiative for Scotland's railways is a real privilege."

AEGIS Certification Services brings in-depth knowledge of UK rail industry certification and approvals processes. AEGIS will provide third party safety assessment and compliance verification to deliver Scotland's first hydrogen powered train and associated infrastructure.

"AEGIS Certification Services is delighted to have been selected to team up with Arcola Energy and partners for this prestigious project that will help to enable the Scottish Government's objective of phasing out diesel only trains by 2035," said Mark McCool, Managing Director. With our growing portfolio of railway decarbonisation projects, AEGIS looks forward to working with industry leaders in hydrogen technology to assure the safe integration of hydrogen fuel cells into passenger rolling stock, enabling the rail industry to further develop this technology towards a carbon neutral rail network."

Based at the Bo'ness and Kinneil Railway, the consortium will convert a Class 314 car passenger train, made available by ScotRail, into a deployment-ready and certified platform for hydrogen powered train development.

Following demonstrations, the train will serve as a development platform for Scottish technology providers and academics as Scottish Enterprise and the Hydrogen Accelerator explore opportunities for Scotland's hydrogen-enabled low carbon strategy.

The Bo'ness and Kinneil Railway will provide engineering facilities and support for testing and public demonstrations.

Scotland's Transport Secretary Michael Matheson added: "This project has the potential to be a game changer for the future of Scotland's rail rolling stock. Our Rail decarbonisation Action Plan sets out to make our passenger railways emissions free by 2035, but to maximise our climate change ambitions, there is also a requirement to look at what we do with retired stock. If we can bring those back into use in a carbon neutral way, there are huge climate gains to be made."

The Consortium will demonstrate the hydrogen powered train during COP26, hosted by Glasgow City, from November 1-12, 2021.

About Arcola

Arcola Energy is a leader in hydrogen and fuel cell integration, specialising in zero-emission solutions for heavy-duty vehicles and transport applications. As a systems engineering specialist and Tier 1 integrator, Arcola addresses the deployment gap between rapidly evolving low-carbon technologies and efficient real-world applications by developing market-ready solutions, reducing development cost and time to market.

Arcola Energy is a privately owned company headquartered in London, with a manufacturing site in Liverpool and a new engineering and manufacturing facility planned in Dundee.

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