



RF studies for wind farm impacts on communication networks

Protecting critical communications in Australia's growing wind energy landscape



bai communications

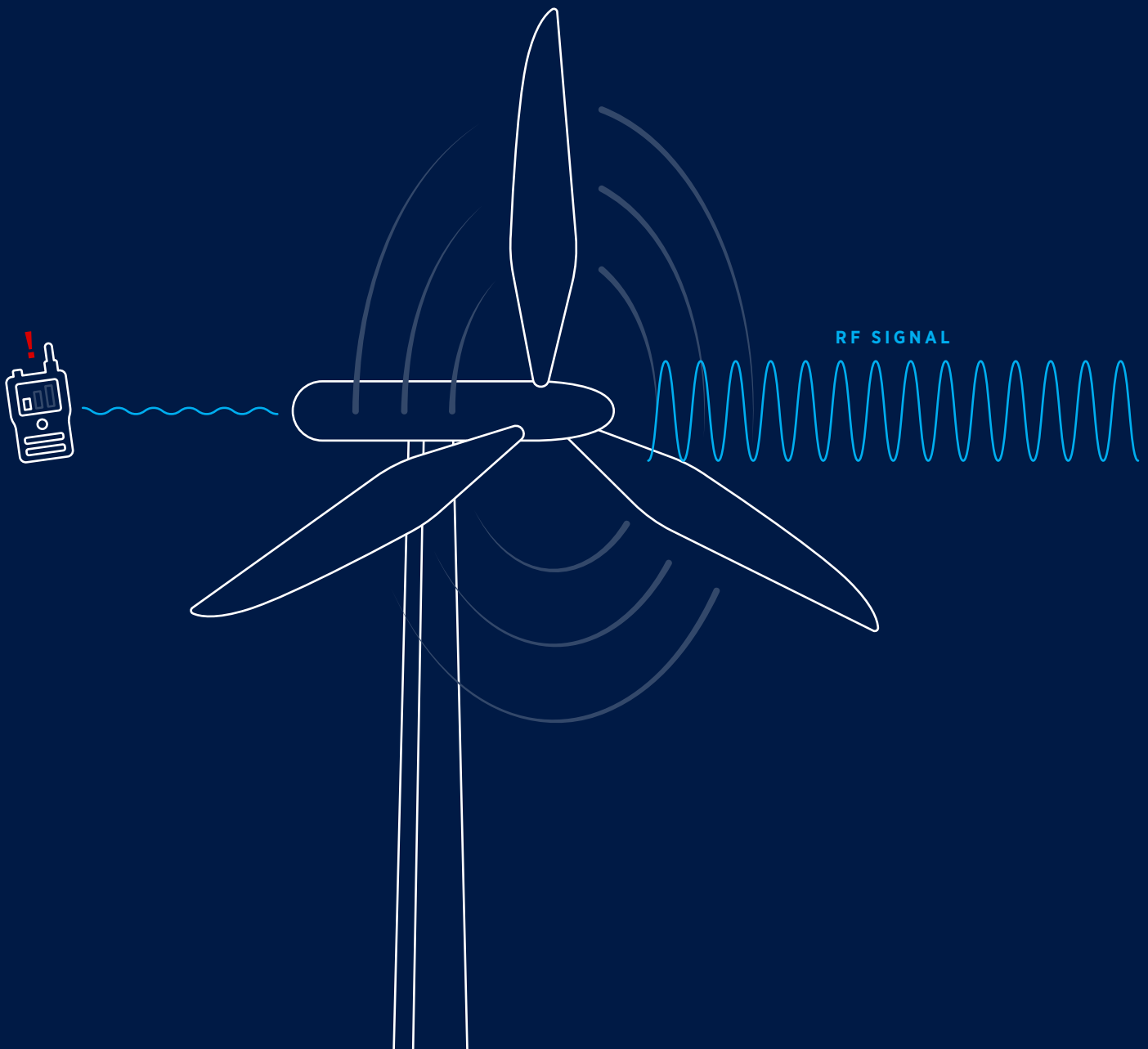
Australia's wind energy boom, and what it means for communications



Australia's transition to net zero is accelerating wind farm development at pace. The country's wind energy market generated 33.4 TWh in 2023 and is forecast to reach 141.4 TWh by 2032 — a compound annual growth rate of 15.7%.

This rapid expansion brings a significant but often overlooked challenge: the impact of wind turbines on radio communication networks. Wind turbines can interfere with communications through physical obstruction, signal diffraction, scattering, near-field effects, and electromagnetic emissions. These effects can disrupt both private networks and public carrier and government infrastructure — from microwave backhaul links and 4G/5G networks to emergency services radio and meteorological radar.

Understanding and mitigating these impacts before construction begins is essential for wind farm developers, network operators, and regulatory compliance.



Communication networks potentially affected by wind farms



Wind farms can affect a wide range of communication systems. The scope of impact extends across both privately operated networks and public carrier and government infrastructure.



Private Networks

Point-to-point and point-to-multipoint microwave links, mobile and fixed telemetry (4G/5G), two-way radio systems (TETRA, DMR, P25, analogue), fixed telemetry networks including SCADA, Wi-Fi, satellite communications, and citizen band (CB) radio.



Carrier & Government Networks

Point-to-point and point-to-multipoint microwave links, mobile and fixed wireless (4G/5G), Wi-Fi, emergency services two-way radio and paging, broadcast radio and television, meteorological radars, satellite networks, and trigonometrical stations.

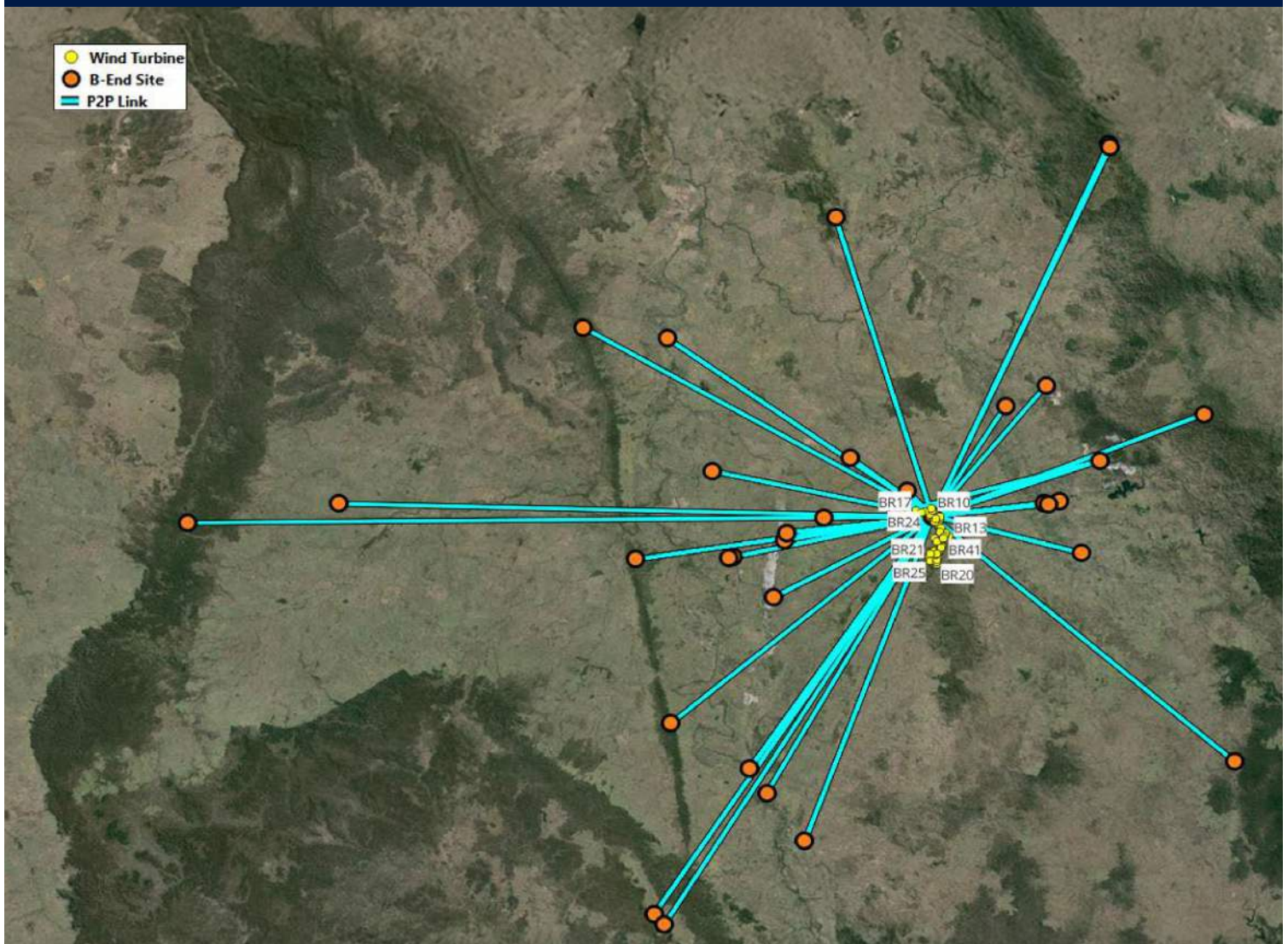
A thorough RF impact study must account for all of these network types within the wind farm's zone of influence.

How we assess wind farm impacts on communications



BAI Communications follows a structured, three-phase methodology to identify, analyse, and resolve potential communication impacts from wind farm developments.

- **Phase 1: Desktop study** We begin by gathering detailed information on proposed turbine specifications (coordinates, height, wingspan) and existing radiocommunication networks, drawing from client data, the ACMA database, and other sources. Using radio planning tools with dedicated wind turbine modelling capability, we conduct a general analysis to identify potentially impacted networks, followed by detailed studies of specific links including Fresnel zone clearance analysis and interference assessment. We then develop mitigation strategies and provide recommendations for remediation, including possible repeater or relocation sites with associated budget estimates.
- **Phase 2: Site survey and drive testing (optional)** Where required, we verify data accuracy on the ground, survey proposed mitigation sites, and conduct drive test calibration of the propagation models used in our planning tools.
- **Phase 3: Final report** Our comprehensive report delivers general analysis results, detailed assessments of impacted networks, interference mitigation analysis, clear recommendations, and an overall remediation budget.



Why BAI Communications



BAI Communications brings unmatched capability to wind farm RF impact assessments:



20+ years of RF studies and advisory work for blue-chip clients across mining, energy, and utilities



Principal and Senior RF Engineers with world-class skillsets and experience with tier 1 vendors and carriers, including RPEQ-certified professionals



Specialist tools: HTZ RF Planning Tool with wind turbine modelling capability, plus drive test kits for propagation model calibration



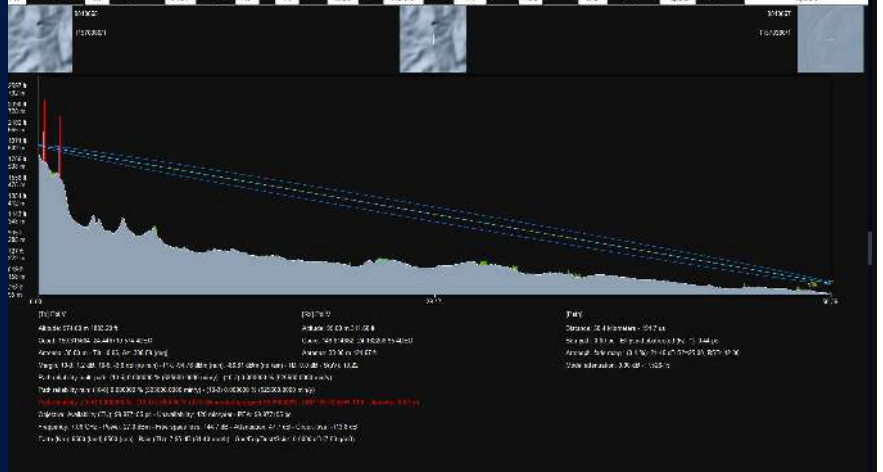
Quality assured: ISO 9001, ISO 14001, and ISO 45001 certified with Integrated Management System governance



Proven methodology: PRINCE2 project management and ITIL-based support and managed services frameworks



Recent experience: Completed RF study of the proposed Banana Range Wind Farm's impact on radio communication networks



About BAI Communications



BAI Communications is a leading Australian communications infrastructure company, delivering connectivity solutions across broadcast, telecommunications and public safety networks. With operations nationally and global expertise through our sister company Boldyn Networks, we bring independent thinking and proven capability to some of Australia's most complex connectivity challenges.

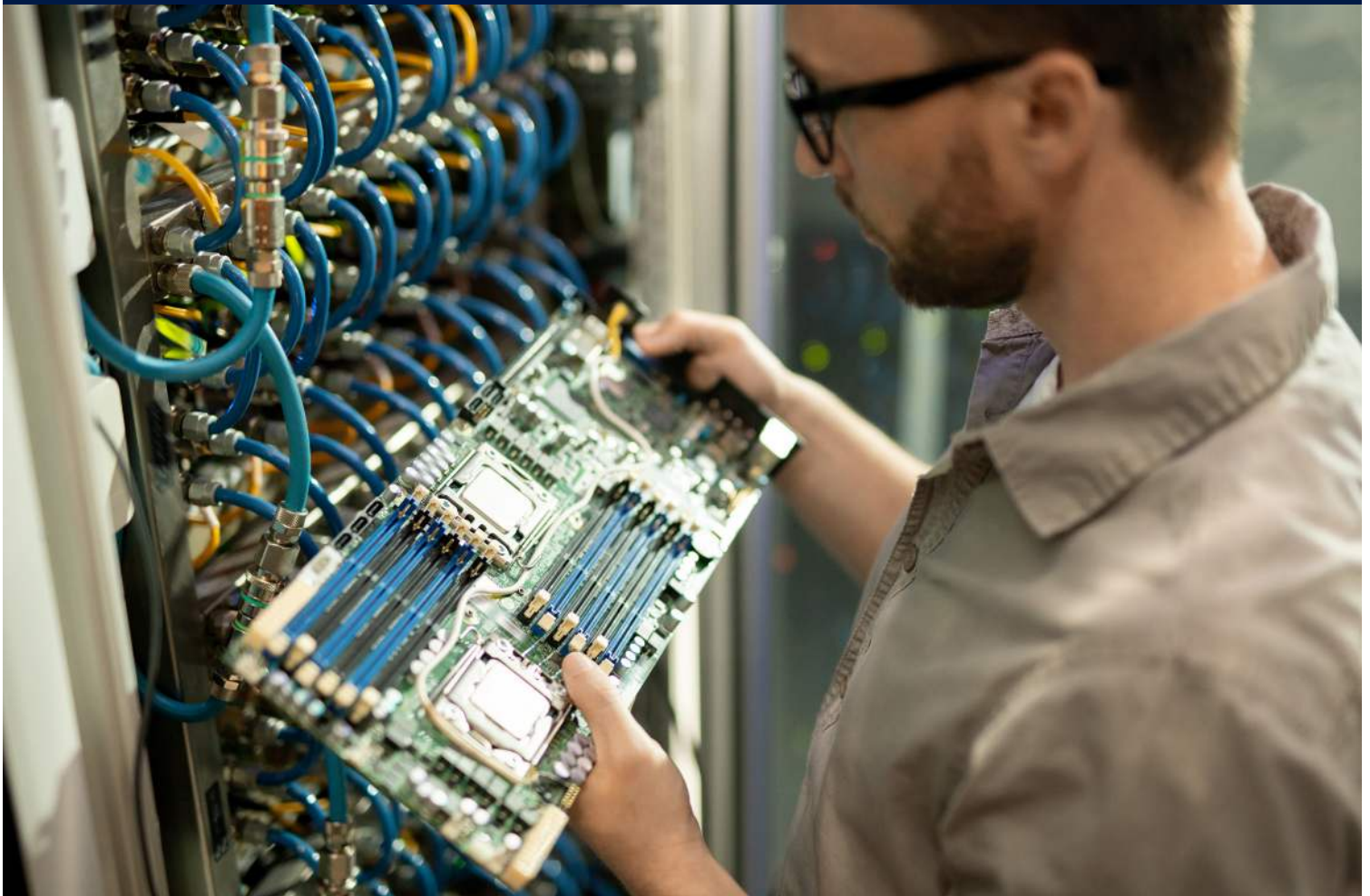
BAI Communications is an advanced engineering and connectivity company with deep expertise in information and communication technologies. With over 100 years of combined experience in communications infrastructure and ICT engineering and a team of 500+ professionals, we deliver end-to-end solutions spanning the complete project lifecycle, from strategic ICT advice and engineering design through to systems integration, commissioning, and ongoing managed services.

Operating from our head office in Sydney, with offices in Brisbane, Perth, Mackay, Dalby and Adelaide, we bring national reach and local knowledge to every engagement.

Our industry specialisations span broadcast, telecommunications, public safety, mining, energy and utilities, with deep expertise across private LTE (4G/5G), enterprise microwave, mission-critical push-to-talk, industrial Wi-Fi, digital mobile radio, IoT, and more.

We operate one of Australia's most extensive communications networks, supporting 99% of the population through 745+ transmission sites, and manage the NSW Public Safety Network on behalf of the NSW Telco Authority, one of the largest P25 trunked radio networks in the world.

Our enterprise client portfolio includes BHP, Rio Tinto, Arrow Energy, Origin Energy, Optus, ABC, and SBS.



Our RF specialist team



Our RF impact studies are led by highly experienced Principal and Senior Consultants with deep expertise across telecommunications, mining, energy, and government sectors.



Joel Dean
Senior ICT Consultant

Extensive experience in radio communication and transmission systems across government, oil, coal, and gas industries. Led systems integration for the Australian Federal Government's ICT Uplift Program, deploying 4G LTE infrastructure in Antarctica. Previously held RF performance and vendor management roles at SingTel Optus, with international experience in Kuwait and the UK.



James Worsfold
Senior ICT Consultant

Over two decades of global telecommunications experience. Currently supporting LTE and DMR planning at Arrow Energy. Previously Senior Optimisation Engineer at Virgin Media O2, with roles at Rakuten Mobile, Qualcomm, and Huawei Technologies. Specialises in network optimisation, data analysis, and machine learning-driven performance tools.



Charles Shi
Principal Consultant (RPEQ)

Solutions architect with expertise spanning mining, oil and gas, transportation, and carrier industries. Master's degree from University of Melbourne. Proficient across GSM, UMTS, LTE, P25, Tetra, and railway telecommunications. Led LTE design for the Surat Gas Project and rollouts for Yarrabee Coal and Cameby Downs.

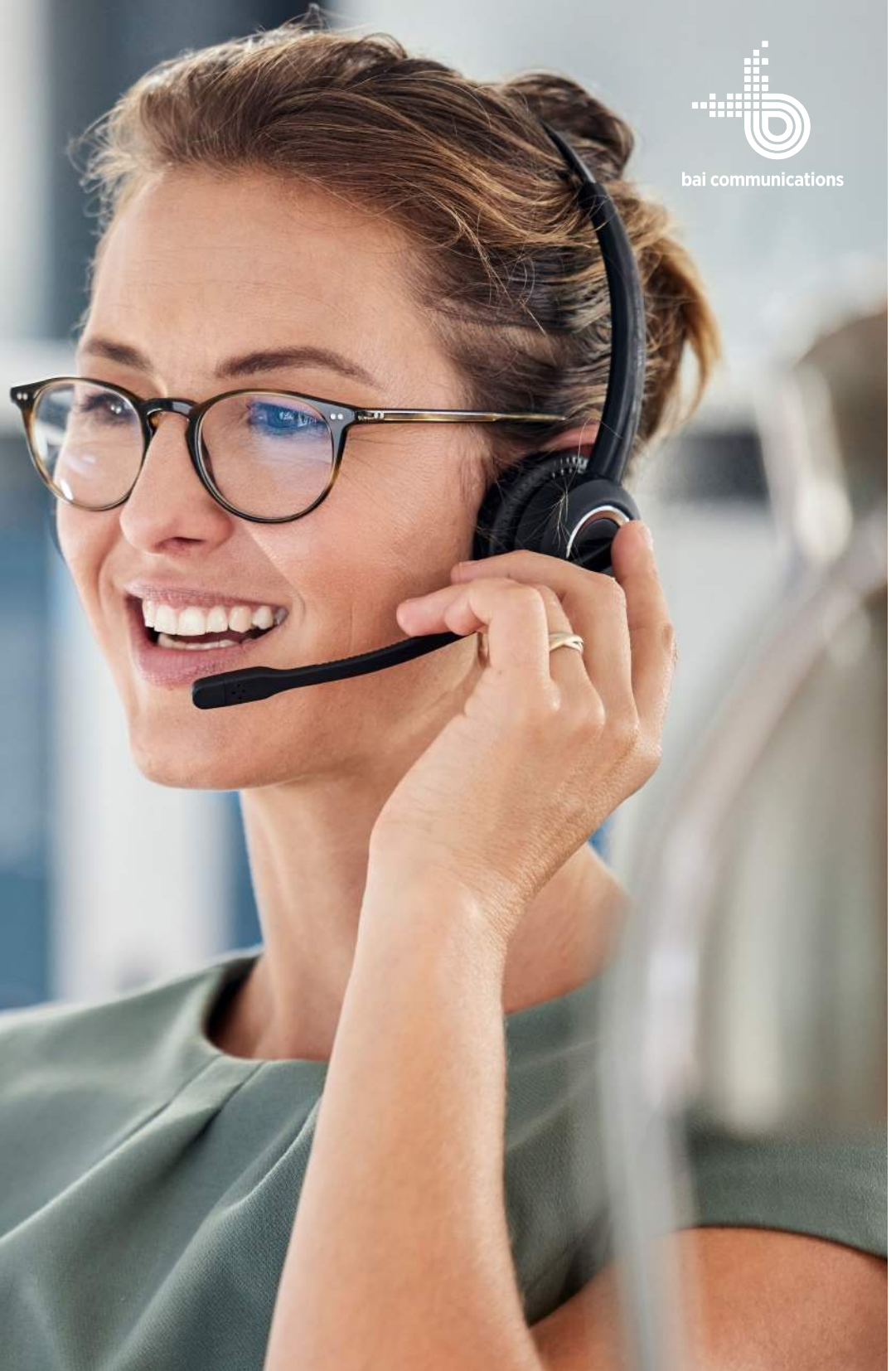


Sameera Pathirathna
Principal Consultant (RPEQ)

Over two decades of experience leading Private LTE network design, installation, and commissioning for oil/gas and mining sectors. Previously Senior Technical Support Specialist at Quortus UK. Expertise in 3GPP standards, virtualised core networks, and PS Core engineering from roles at Huawei Technologies and Du Telecom.



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Get in touch

To discuss how BAI Communications can support your wind farm development with expert RF impact studies, contact us:

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