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| Comprehensive Review and Smart Conversion of the 220kV Intertripping Scheme  Expression of Interest    Protected  11 March 2025 |

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Comprehensive Studies and Smart Conversion of the 220kV Intertripping Scheme

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# Abbreviations and Acronyms

The table below presents abbreviations and acronyms used throughout this document, with defined terms indicated by capital letters.

|  |  |
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| Acronym/Abbreviation | Definition |
| EC | East Country |
| EGF | Eastern Goldfields |
| EOI | Expression of Interest |
| HIL | Hardware-in-the-Loop |
| IBR | Inverter Based Renewable |
| I/T | Intertrip |
| RAS | Remedial Action Scheme |
| SOW | Scope of Works |
| SWIS | Southwest Interconnected System |
| WAMPAC | Wide Area Monitoring Protection and Control |
| WAMS | Wider Area Monitoring System |
| WP | Western Power |

# Background

The East Region has become a critical hub for new renewable generation as the power system transitions away from thermal power plants. Expanding power transfer (export) capacity is essential for maintaining grid stability and efficiently integrating additional generation sources.

While large-scale infrastructure upgrades, such as new transmission lines or conductor replacements, have been considered to increase capacity, several challenges hinder their timely implementation. Regulatory approval delays, environmental constraints, land acquisition issues, and extensive construction requirements create significant barriers. Additionally, studies indicate that major upgrades often yield a low cost-benefit ratio, making them impractical compared to alternative solutions.

To address these challenges, initiative IAR07323 - East Enhancement was launched to develop a prudent, cost-effective, and rapidly deployable solution that leverages existing infrastructure while dynamically adapting to system conditions. The key objectives of this initiative include:

* Increasing power transfer capability by mitigating thermal constraints, enabling greater renewable energy export.
* Accommodating approximately 440MW of additional renewable generation, raising the ECEXP01 boundary export capacity from ~200MW to ~594MW.
* Maximizing utilisation of the stronger 220kV network, ensuring compliance with contingency reserve requirements while minimizing pre-contingent curtailment.
* Enhancing system reliability and operational flexibility, particularly during periods of high wind and solar generation.

A new Remedial Action Scheme (RAS), known as EC132 de-meshing with MU BTT3 intertrip, has been proposed. This scheme will operate alongside the existing 220kV line intertrip under specific conditions, offering a fast and cost-effective means of expanding network capability without the delays and expenses associated with major transmission upgrades. By aligning implementation with the commissioning of new renewable generation, this approach ensures that infrastructure supports increased dispatch while advancing decarbonisation goals.

However, given the complexity and maintenance challenges of the existing 220kV line intertripping scheme, this expression of interest (EOI) seeks innovative solutions to simplify and integrate the current and proposed intertripping schemes into a more comprehensive 220kV network strategy (*Smart RAS*) for the East Region.

The increasing integration of renewable energy requires a robust, adaptable solution to maintain network reliability and performance. The project aims to explore and implement cutting-edge technologies & diverse proposals that address the evolving challenges of renewable connections. The ultimate goal is to ensure the East Region's grid remains stable, resilient, and capable of supporting future energy demands.

# High-level Scope

The scope of work for the recommended studies and solutions includes the following:

1. Study and Analysis
   1. Conduct a comprehensive assessment of the existing 220kV network intertripping scheme.
   2. Develop requirements and technical specifications tailored to the challenges of renewable energy integration in the East Region.
   3. Perform feasibility studies to evaluate and identify the most effective innovative technologies.
2. Engineering, Procurement, Construction, and Management (EPCM)
   1. Design, procure, and implement an enhanced intertripping scheme.
   2. Ensure seamless integration with the existing 220kV network infrastructure.
   3. Conduct rigorous testing, commissioning, and final handover to operations.
3. Integrated Service Delivery
   1. Provide an end-to-end solution that integrates study, analysis, and EPCM services, ensuring a streamlined and efficient implementation.

# General Requirements for Proposal Submission

As part of the proposal submission, please provide Western Power with the following:

1. Company profile and experience in delivering similar projects, including those involving advanced protection and control schemes for renewable-rich regions.
2. Proposed approach to the scope of work (as (1) service provider only, (2) vendor only, or the (3) combined services).
3. Demonstrated capability in evaluating, testing (i.e. HIL) and implementing various innovative solutions.
4. Indicative timeline and resource capacity for project execution.
5. Each team member’s relevant expertise and experience.
6. Consultant to provide draft detail project plan for execution.
7. Total cost of the work, including cost breakdown of each deliverable (as (1) service provider only, (2) vendor only, or the (3) combined services).
8. Any additional information highlighting expertise and unique value proposition.

# Work Arrangements

Western Power will provide access to a team of subject matter experts.

# References

1. Technical Rules, [Microsoft Word - TECHNICAL\_RULES\_-\_1ST\_DECEMBER\_2016\_VERSION\_REV\_3\_-\_FRI\_-\_RIM\_-\_EDM\_40546182.docx](https://www.westernpower.com.au/siteassets/documents/documents-and-policies/technical-rules-20161201.pdf)
2. Transmission System Plan, [Transmission System Plan - 2024](https://www.westernpower.com.au/siteassets/documents/nom/transmission-system-plan-2024.pdf)
3. Western Power published manuals and guidelines, [Distribution network documentation](https://www.westernpower.com.au/resources-education/technical-documentation/distribution-network-documentation/)
4. Wholesale Electricity Market Rules, [Microsoft Word - Wholesale Electricity Market Rules 11 January 2019.docx](https://www.erawa.com.au/cproot/20012/2/Wholesale%20Electricity%20Market%20Rules%2011%20January%202019.pdf)