

Value of electric interconnection links in remote island power systems: The Spanish Canary and Balearic archipelago cases

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Abstract— This paper tackles the technical and economical value of island interconnection links in remote island power systems. For this purpose, a novel deterministic hourly unit commitment on a weekly basis is formulated including the possibility of interconnection links between islands. The unit commitment reflects the common practice of the majority of real island power system operators when operating their systems: the economic dispatch is constrained in order to cover the loss of any on-line generating unit and the loss of any interconnection link between islands. Several islands of the Spanish Balearic and Canary archipelagos are used as illustrative real cases to assess the impact of existing and projected links between islands. The paper shows on one hand how reserve constraints drive the economical operation of real island power system. On the other hand, how the use of interconnection links not only enable the flow of cheaper generation power between islands, but also significantly contribute to the fulfillment of reserve constraints which translates into a cheaper and more sustainable island operation.

Index Terms— Frequency stability; Unit commitment; Island power systems

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