

Study Committee B5

Protection and Automation

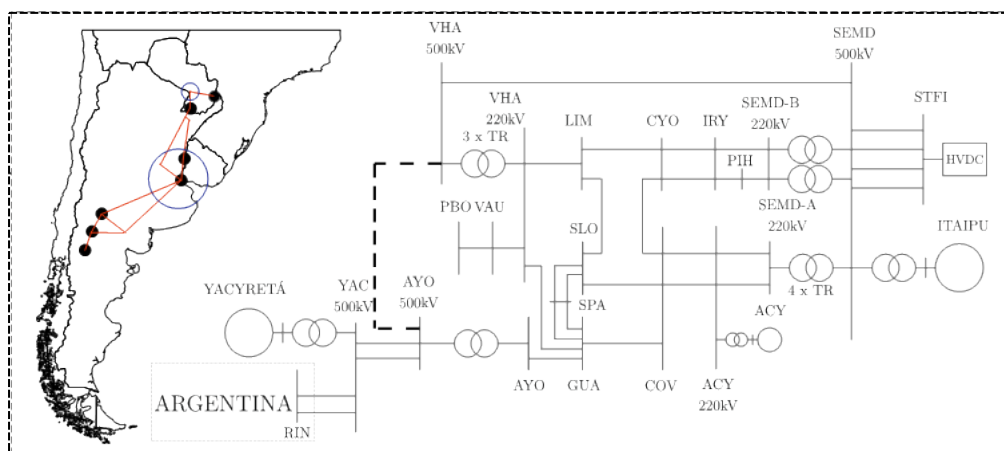
Paper 10153_2022

ITAIPU AND ANDE PREPARATION FOR THE PARAGUAYAN-ARGENTINEAN INTERCONNECTION

Jonas Roberto PESENTE, Robson Almir de OLIVEIRA, André Pagani TOCHETTO, Alfredo Mezger SZOSTAK, Jhonatan Andrade dos SANTOS, Manuel Leonardo SOSA-RIOS, Paulo Henrique GALASSI, Itaipu Binacional, Brazil
 Jose Maria Barua GODOY (in memoriam), Elizandro RODRIGUEZ, Gustavo AGUAYO, ANDE, Paraguay

Motivation

- Major interconnection between Paraguayan and Argentinean Power Systems
- Development of solutions to enable safe operation of both systems



Requirements identified:

- Design of a Special Protection Schemes with islanding control actions
- Design of backup logic functions for SPS
- Tuning of:
 - Itaipu 50Hz PSS
 - Primary and secondary loops of load-frequency control
 - Primary and secondary loops of voltage control
- Modification of existing SPS in Itaipu

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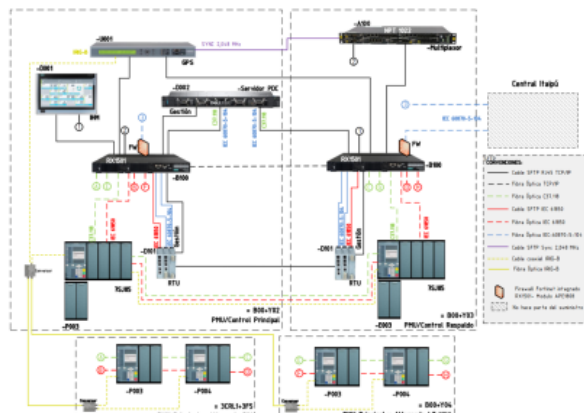
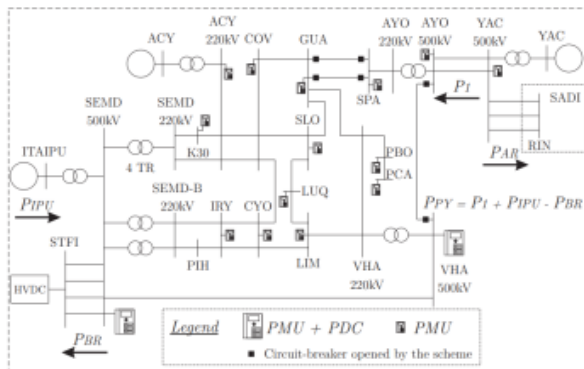
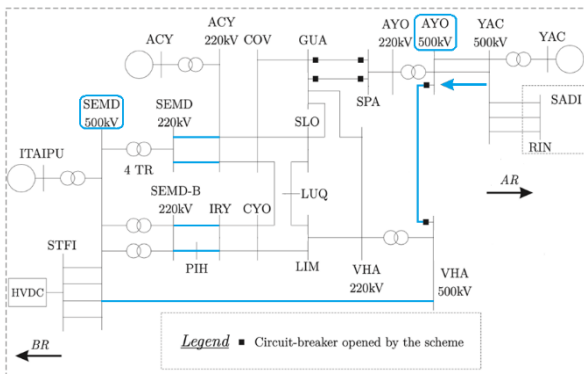
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THE ECCANDE WAMPAC:

- 7 logics, 17 substations, IEC 37.118 (SFM), IEC 61850, IEC 60870-5-104



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HIL and field testing

- Dynamical power system modeling
- FAT and HIL testing
- Interconnected operation testing

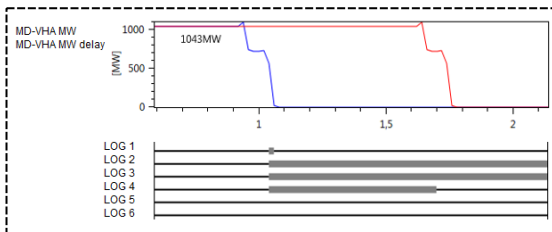
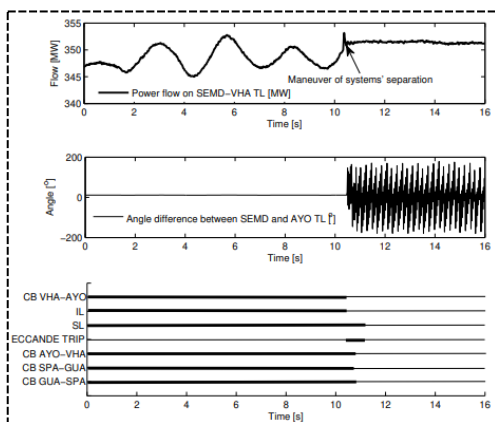
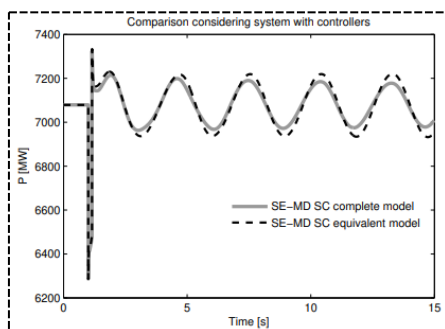


Table II
Complete and equivalent models statistics

Number of	Complete	Equivalent
Buses	3849	22
Lines	2682	28
Transformers	2507	8
Generators	292	3
Controllers	307	9
Individual loads	225	0
Shunt bus-connected	124	3
Shunt line-connected	110	0
Static compensator	5	0
Shunt bank	331	3
SPS	24	0
Protection models	118	0
Av. time sim.(50s)	44min52s	1.64s



Conclusion

- From implementations and field testing, We believe the adequate preparations for interconnected operation were performed to enable a controlled risk future operation