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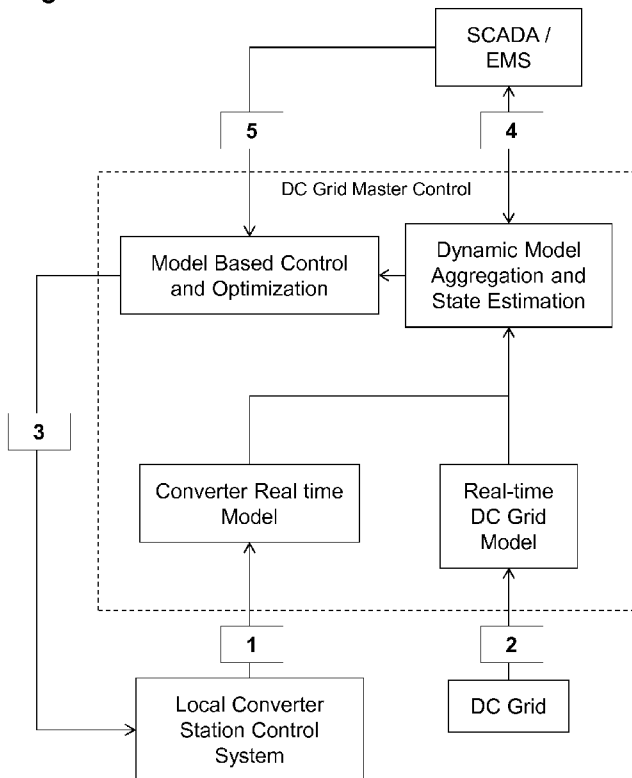
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[Continued on next page]

(54) Title: MULTI TERMINAL HVDC CONTROL

Fig. 3



(57) Abstract: The present invention is concerned with a master control system layer for a Voltage Source Converter (VSC) based Multi-Terminal High Voltage Direct Current (MTDC) system. The invention is applicable to general topologies of the MTDC grid, including meshed topologies and isolated islands, and its benefits become specifically apparent in MTDC systems with five or more terminals where management of all possible different operating condition will require unacceptable engineering efforts if only simple feedback control loops are used. The invention includes mathematical optimization procedures to determine, in real-time and based on actual operating conditions, controller settings that minimize a cost criterion or optimize any other objective function. Controller settings include set-points or reference values as well as controller parameters such as droop constants or gains. Furthermore, it introduces model predictive control to include predictions of the effect of control actions on the system state evolution and predictions of future operating conditions in the optimization procedure.

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A. CLASSIFICATION OF SUBJECT MATTER  
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B. FIELDS SEARCHED  
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Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	<p>MEAH K ET AL: "A new simplified adaptive control scheme for multi-terminal HVDC transmission systems", INTERNATIONAL JOURNAL OF ELECTRICAL POWER &amp; ENERGY SYSTEMS, JORDAN HILL, OXFORD, GB, vol. 32, no. 4, 1 May 2010 (2010-05-01), pages 243-253, XP026906056, ISSN: 0142-0615, DOI: 10.1016/J.IJEPES.2009.09.011 [retrieved on 2009-10-25] page 243, right-hand column, line 1 - line 3; figure 1 item 3.1; page 245, line 1 - line 4; figure 2 item 2; page 244, left-hand column ----- -/--</p>	1-10

Further documents are listed in the continuation of Box C.

See patent family annex.

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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer <b>Kruip, Stephan</b>
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International application No

PCT/EP2013/064995

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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Y	----- WO 2009/016113 A1 (ABB RESEARCH LTD [CH]; PAPAFOTIOU GEORGIOS [CH]; HARNEFORS LENNART [SE]) 5 February 2009 (2009-02-05) page 2, line 17 - line 25	5
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A	column 7, line 35 - line 38; claims 1,17-20 column 5, line 3 - line 4	1-6,9,10
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Information on patent family members

International application No PCT/EP2013/064995
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