

Nicolas Vargas

Search history

Search FT=(track* and thevenin and phasor*) (Results 18)

1:

Search IC=(WO2015179139) (Results 0)

2:

Search PN=(WO2015179139) (Results 1)

3:

Search 4: [SP]: 1. a method of monitoring voltage stability of a transmission corridor through which power flows between different parts of a power system, the method comprising the following performed by a voltage stability monitoring apparatus: monitoring an equivalent load impedance at an interface between the transmission corridor and a part of the power system designated as generating said power, the equivalent load impedance at said interface comprising a ratio of a voltage phasor at said interface to a current phasor at said interface; tracking a thevenin equivalent voltage and impedance of said designated part by separately updating that voltage and impedance, wherein updating the thevenin equivalent voltage comprises updating the imaginary part of the voltage to reflect the magnitude of any changes in said voltage phasor that are associated with large variations in the magnitude of the equivalent load impedance at said interface, said large variations including variations greater than a threshold-defined variation; computing an index indicating said voltage stability as a function of the tracked thevenin equivalent voltage and impedance and performing one or more actions, based on the computed index, as needed to control the transmission corridor's voltage stability and/or mitigate system degradation or disturbance propagation. 2. the method of claim 1, wherein updating the thevenin equivalent voltage further comprises setting the real part of the voltage to said voltage phasor for a current phasor measurement time. 3. the method of claim 1, wherein said updating the thevenin equivalent voltage comprises, for each of a plurality of phasor measurement times, determining whether or not variation in the magnitude of the equivalent load impedance at said interface since a previous phasor measurement time is greater than the threshold-defined variation, and, if so, adjusting the imaginary part of the thevenin equivalent voltage computed for the previous phasor measurement time by the magnitude of the change in said voltage phasor since that previous phasor measurement time. 4. the method of claim 1, wherein updating the thevenin equivalent impedance comprises solving a set of two linear equations with two unknown variables that comprise the real and imaginary parts of the thevenin equivalent impedance, wherein known variables in the set of two linear equations include the imaginary part of the thevenin equivalent voltage as updated to reflect the magnitude of any changes in said voltage phasor and the real part of the thevenin equivalent voltage as set to said voltage phasor for a current phasor measurement time. 5. the method of claim 1, further comprising dynamically adjusting a threshold defining the threshold-defined variation, as a function of the thevenin equivalent voltage. 6. the method of claim 1, further comprising dynamically adapting which of said parts of the power system is designated as generating said power, responsive to detecting a change in direction or magnitude of power flowing through one or both interfaces between the transmission corridor and said parts of the power system. 7. the method of claim 1, further comprising monitoring whether a breaker for each line associated with said interface is open or closed, and wherein monitoring the equivalent load impedance at said interface comprises dynamically computing the equivalent load impedance at said interface exclusively from phasor measurements taken at lines whose breakers are closed. 8. the method of claim 7, wherein, responsive to detecting the opening or closing of one or more of said breakers, said updating comprises updating the imaginary part of the thevenin equivalent voltage to reflect the magnitude of the resulting change in said voltage phasor, as dynamically computed, without re-initializing the imaginary part of the thevenin equivalent voltage. 9. the method of claim 1, wherein updating the thevenin equivalent voltage further comprises, responsive to small variations in the magnitude of the equivalent load impedance at said interface, decreasing or increasing the imaginary part of the thevenin equivalent voltage by a predefined percentage change when said small variations do or do not have the same polarity as estimated variations in said thevenin equivalent impedance, respectively, said small variations including variations less than the threshold-defined variation. 10. the method of claim 9, wherein, responsive to small variations in the magnitude of the equivalent load impedance at said interface, increasing the imaginary part of the thevenin equivalent voltage comprises computing the imaginary part of the thevenin equivalent voltage as $eg_{ii} = eg_{ii-1}(1 + |eg_{ii-1} - 1xk|)$ and decreasing the imaginary part of the thevenin equivalent voltage comprises computing the imaginary part of the thevenin equivalent voltage as $eg_{ii} = eg_{ii-1}(1 - |eg_{ii-1} - 1xk|)$, where eg_{ii} is the imaginary part of the thevenin equivalent voltage for a current phasor measurement time i , eg_{ii-1} is the imaginary part of the thevenin equivalent voltage for a previous phasor measurement time $i-1$, and k is a pre-specified parameter configured to constrain tracking error within predefined bounds, and wherein updating the thevenin equivalent voltage further comprises setting the real part of the thevenin equivalent voltage eg_{ri} for the current phasor measurement time i as $eg_{ri} = vint\ g\ i$. 11. the method of claim 10, wherein, responsive to small variations in the magnitude of the equivalent load impedance at said interface, increasing the imaginary part of the thevenin equivalent voltage comprises unconditionally computing the imaginary part of thevenin equivalent voltage as $eg_{ii} = eg_{ii-1}(1 + |eg_{ii-1} - 1xk|)$ and decreasing the imaginary part of the thevenin equivalent voltage comprises unconditionally computing the imaginary part of the thevenin equivalent voltage as $eg_{ii} = eg_{ii-1}(1 - |eg_{ii-1} - 1xk|)$. 12. the method of claim 1, wherein said performing comprises automatically performing a prescribed action based on the computed index. 13. the method of claim 1, wherein said performing comprises displaying the computed index. 14. a voltage stability monitoring apparatus configured to monitor voltage stability of a transmission corridor through which power flows between different parts of a power system, the voltage stability monitoring apparatus comprising one or more processing circuits configured to: monitor an equivalent load impedance at an interface between the transmission corridor and a part of the power system designated as generating said power, the equivalent load impedance at said interface comprising a ratio of a voltage phasor at said interface to a current phasor at said interface; track a thevenin equivalent voltage and impedance of said designated part by separately updating that voltage and impedance, wherein updating the thevenin equivalent voltage comprises updating imaginary part of the voltage to reflect the magnitude of any changes in said voltage phasor that are associated with large variations in the magnitude of the equivalent load impedance at said interface, said large variations including variations greater than a threshold-defined variation; compute an index indicating said voltage stability as a function of the tracked thevenin equivalent voltage and impedance and perform one or more actions, based on the computed index, as needed to control the transmission corridor's voltage stability and/or mitigate system degradation or disturbance propagation. 15. the voltage stability monitoring apparatus of claim 14, wherein the one or more processing circuits are configured to update the thevenin equivalent voltage further by setting the real part of the voltage to said voltage phasor for a current phasor measurement time. 16. the voltage stability monitoring apparatus of claim 14, wherein the one or more processing circuits are configured to update the thevenin equivalent voltage by, for each of a plurality of phasor measurement times, determining whether or not variation in the magnitude of the equivalent load impedance at said interface since a previous phasor measurement time is greater than the threshold-defined variation, and, if so, adjusting the imaginary part of the thevenin equivalent voltage computed for the previous phasor measurement time by the magnitude of the change in said voltage phasor since that previous phasor measurement time. 17. the voltage stability monitoring apparatus of claim 14, wherein the one or more processing circuits are configured to update the thevenin equivalent impedance by solving a set of two linear equations with two unknown variables that comprise the real and imaginary parts of the thevenin equivalent impedance, wherein known variables in the set of two linear equations include the imaginary part of the thevenin equivalent voltage as updated to reflect the magnitude of any changes in said voltage phasor and the real part of the thevenin equivalent voltage as set to said voltage phasor for a current phasor measurement time. 18. the voltage stability monitoring apparatus of claim 14, wherein the one or more processing (Results 8)

Search 4 and tgevenin (Results 0)

5:

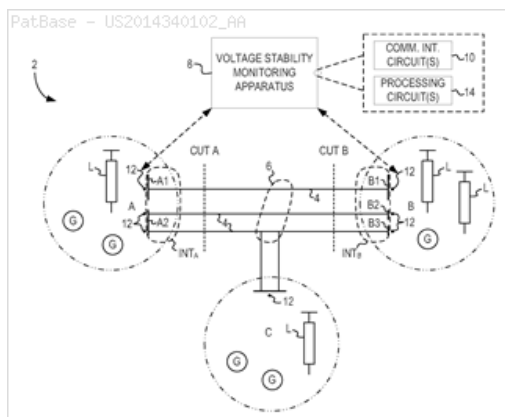
Search 4 and thevenin (Results 6)

6:

Abstract: Source: US2014340102A [EN] A voltage stability monitoring apparatus monitors the voltage stability of a transmission corridor through which power flows between different parts of a power system. The apparatus monitors an equivalent load impedance at an interface between the transmission corridor and a part of the power system designated as generating the power. This equivalent load impedance at the interface comprises a ratio of a voltage phasor at the interface to a current phasor at the interface. The apparatus tracks a **Thevenin** equivalent voltage and impedance of the designated part by separately updating that voltage and impedance. Notably, the apparatus updates the **Thevenin** equivalent voltage to reflect the magnitude of any changes in the voltage phasor that are associated with large variations in the magnitude of the equivalent load impedance at the interface. The apparatus computes an index indicating the voltage stability as a function of this tracked **Thevenin** equivalent voltage and impedance.

Classifications:

International (IPC 8-9): G01R19/25 G01R27/16 G01R27/32
G01R29/00 G01R31/42 H02J13/00 H02J3/00
H02J3/24 (Advanced/Invention);
G01R19/06 G01R27/32 G01R31/42 H02J3/00 (Advanced/Non-invention)
CPC: G01R27/32 G01R31/42 G01R19/2513 G01R27/16 H02J3/00
H02J3/24
US: 1/1 307/130 324/704 702/64



Family:

Publication number	Publication date	Application number	Application date
CA2925602 AA	20160324	CA20152925602	20150508
CO20160005490 A2	20170331	CO20160005490	20161219
DE602015001676 D1	20170413	DE201560001676T	20150508
EP3039763 A1	20160706	EP20150725152	20150508
EP3039763 B1	20170301	EP20150725152	20150508
US2014340102 AA	20141120	US20130071167	20131104
US2014343879 AA	20141120	US20140281336	20140519
US2016169946 AA	20160616	US20160050570	20160223
US9291655 BB	20160322	US20140281336	20140519
US9502900 BB	20161122	US20130071167	20131104
US9588156 BB	20170307	US20160050570	20160223
WO15179139 A1	20151126	WO2015US29834	20150508

Priority:

EP20150725152 20150508 US20130071167 20131104 US20130825121P 20130520
US20140281336 20140519 WO2015US29834 20150508 US20160050570 20160223

Probable Assignee: QUANTA TECHNOLOGY

Assignee(s): (std): QUANTA TECHNOLOGY ; QUANTA TECHNOLOGY LLC ; QUANTA TACHNOLOGY LLC ; QUANTA TECH ; QUANTA TECH LLC

Assignee(s): QUANTA TECHNOLOGY LLC RALEIGH ; BANK OF AMERICA NA ADMINISTRATIVE AGENT AS ; GLAVIC MEVLUDIN ; MADANI VAHID ; NOVOSEL DAMIR

Inventor(s): (std): GLAVIC MEVLUDIN ; MADANI VAHID ; NOVOSEL DAMIR

Inventor(s): NOVOSEL DAMIR RALEIGH ; VAHID MADANI ; DAMIR NOVOSEL ; MADANI VAHID RALEIGH ; MEVLUDIN GLAVIC ; GLAVIC MEVLUDIN RALEIGH

Agent(s): OSLER HOSKIN AND HARCOURT LLP; LUIS FELIPE CASTILLO GIBSON; APPELYARD LEES IP LLP; COATS AND BENNETT PLLC; LEONARD JUSTIN J

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

2) Family number: 15255828 (US6219591B)

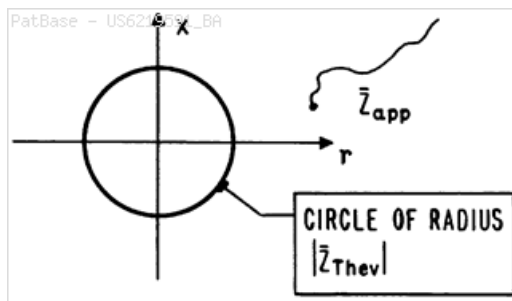
© PatBase

Title: VOLTAGE INSTABILITY PREDICTOR (VIP)-METHOD AND SYSTEM FOR PERFORMING ADAPTIVE CONTROL TO IMPROVE VOLTAGE STABILITY IN POWER SYSTEMS

Abstract: Source: US6219591B [EN] A Voltage Instability Predictor (VIP) estimates the proximity of a power system to voltage collapse in real time. The VIP can be implemented in a microprocessor-based relay whose settings are changed adaptively to reflect system changes. Only local measurements (voltage and current) at the bus terminal are required. Contrary to the most common strategy to maintain voltage stability, which is to shed blocks of load when the voltage drops below a certain fixed threshold, which threshold is difficult to select since voltage magnitudes are a poor indicator of how close the system is to a collapse, the inventive VIP detects this proximity to collapse by monitoring the relationship between the apparent impedance {overscore(Z)}_{app} and the **Thevenin**-impedance circle.

Classifications:

International (IPC 8-9): G05D5/00 H02J3/00 H02J3/12
H02J3/24 (Advanced/Invention);
G05D5/00 (Core/Invention)
International (IPC 1-7): G05D5/00 G05F7/00 H02J3/04 H02J3/18
H02P9/10
CPC: G01R31/085 H02J2003/001 H02J3/12 H02J3/00 H02J3/24
European: G01R31/08D3 H02J3/00 H02J3/12 H02J3/24
US: 700/286 700/292 700/295



Family:

Publication number	Publication date	Application number	Application date
AU200057388 A1	20010102	AU20000057388	20000614
AU200057388 A5	20010102	AU20000057388D	20000614
US6219591 BA	20010417	US19980079983	19980515
US6249719 BA	20010619	US19990333185	19990614
WO0077908 A1	20001221	WO2000US16389	20000614

Priority:

US19980079983 19980515 US19990333185 19990614 WO2000US16389 20000614

Probable Assignee:

Assignee(s): (std): ABB POWER T AND D CO ; ABB POWER T AND D CO INC

Assignee(s): ABB POWER T AND D COMPANY INC ; ASEA BROWN BOVERI INC ; D COMPANY INC ; ABB INC ; ABB POWER T AMP AMP

Inventor(s): (std): GJERDE JAN OVE ; JULIAN DANNY E ; NOVOSOL DAMIR ; SAHA MURARI M ; VU KHOI TIEN

Inventor(s): DANNY E JULIAN ; KHOI TIEN VU ; MURARI M SAHA ; JAN OVE GJERDE

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BY CA CF CG CH CI CM CN CR CU CY CZ DE DK DM DZ EE ES FI FR GA GB GD GE GH GM GN GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LK LR LS LT LU LV MC MD MG MK ML MN MR MW MX MZ NE NL NO NZ PL PT RO RU SD SE SG SI SK SL SN SZ TD TG TJ TM TR TT TZ UA UG UZ VN YU ZA ZW

3) Family number: 41697822 (US2008086239A)

© PatBase

Title: METHOD FOR VOLTAGE INSTABILITY LOAD SHEDDING USING LOCAL MEASUREMENTS

Abstract: Source: US2008086239A [EN] A method of voltage instability load shedding, that includes the steps of measuring current and voltage waveforms of an electrical system at a local bus estimating the **Thevenin** equivalent admittance based on Kalman Filter techniques, then a voltage stability margin index is calculated using the voltage magnitude. The determined **Thevenin** admittance and the load at the local system bus and the calculated voltage stability margin index is compared with a predetermined threshold value to determine whether to initiate a load shedding action.

Classifications:

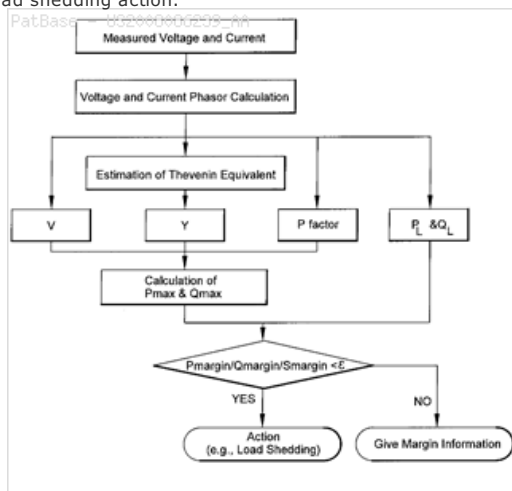
International (IPC 8-9): G05D5/00 G05F3/02 H02J3/14 H02J3/24 (Advanced/Invention);

G05F3/02 (Core/Invention)

CPC: H02J3/14 H02J3/24 Y02B70/3225 Y04S20/222

European: H02J3/14 H02J3/24 Y02B70/32B4 Y04S20/22C

US: 700/292 700/294 700/295 700/295P



Family:

Publication number	Publication date	Application number	Application date
DE602007035858 D1	20140515	DE200760035858T	20070718
EP1912304 A2	20080416	EP20070112705	20070718
EP1912304 A3	20130327	EP20070112705	20070718
EP1912304 B1	20140402	EP20070112705	20070718
US2008086239 AA	20080410	US20060539758	20061009
US7603203 BB	20091013	US20060539758	20061009

Priority:

EP20070112705 20070718 US20060539758 20061009

Probable Assignee:

Assignee(s): (std): ELECTRIC POWER RES INST

Assignee(s): ELECTRIC POWER RESEARCH INST ; ELECTRIC POWER RESEARCH INST INC ; ELECTRIC POWER RESEARCH INST INC CHARLOTTE ; ELECTRIC POWER RESEARCH INSTITUTE INC

Inventor(s): (std): MIN LIANG ; ZHANG NAN ; ZHANG PEI

Inventor(s): ZHANG PEI CAMPBELL ; ZHANG NAN SANTA CLARA ; MIN LIANG SANTA CLARA
Agent(s): SHERRARD SMITH HUGH; INSTONE TERRY; TREGO HINES AND LADENHEIM PLLC
Designated states: AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL PL PT RO RS SE SI SK TR

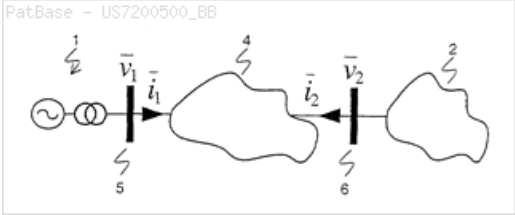
4) Family number: 30466876 (US2004073387A) © PatBase

Title: DETERMINING PARAMETERS OF AN EQUIVALENT CIRCUIT REPRESENTING A TRANSMISSION SECTION OF AN ELECTRICAL NETWORK

Abstract: Source: US2004073387A [EN] In a method, computer program and apparatus for determining parameters of an equivalent circuit representing a transmission section of an electrical network, the transmission section (4) is representable as having at least two interfaces (5,6,7) with other sections (1,2,3) of the network, and the method comprises the steps of a) determining, for each of the interfaces (5,6,7), a voltage phasor ($\overline{v_1}, \overline{v_2}, \overline{v_3}$) at the interface (5,6,7) and a phasor of a current ($\overline{i_1}, \overline{i_2}, \overline{i_3}$) flowing through the interface (5,6,7), the measurements at the different interfaces (5,6,7) being made essentially simultaneously, and b) computing, from said voltage ($\overline{v_1}, \overline{v_2}, \overline{v_3}$) and current ($\overline{i_1}, \overline{i_2}, \overline{i_3}$) phasors, values of impedances ($\overline{Z_T}, \overline{Z_{sh}}$) constituting the equivalent circuit. This allows determining the equivalent circuit from a single set of essentially simultaneous measurements.

Classifications:

International (IPC 8-9): G01R19/00 G06F19/00
H02J3/00 (Advanced/Invention);
G01R19/00 G06F19/00 H02J3/00 (Core/Invention)
International (IPC 1-7): G06F19/00 H02J3/00
CPC: H02J3/00 H02J2003/007 Y02E60/728 Y02E60/76 Y04S10/265 Y04S40/22
European: H02J3/00 T02J3/00S Y02E60/72N2 Y04S10/26B
US: 307/105 323/207 700/292 702/57 702/57P 702/64 703/3



Family:

Publication number	Publication date	Application number	Application date
EP1408595 A1	20040414	EP20020405872	20021010
EP1408595 B1	20170614	EP20020405872	20021010
US2004073387 AA	20040415	US20030671561	20030929
US7200500 BB	20070403	US20030671561	20030929

Priority:

EP20020405872 20021010

Probable Assignee: ABB RESEARCH LTD

Assignee(s): (std): ABB RESEARCH LTD

Inventor(s): (std): LARSSON MATS ; REHTANZ CHRISTIAN ; ZIMA MAREK

Agent(s): ABB PATENT ATTORNEYS

Designated states: AT BE BG CH CY CZ DE DK EE ES FI FR GB GR IE IT LI LU MC NL PT SE SK TR

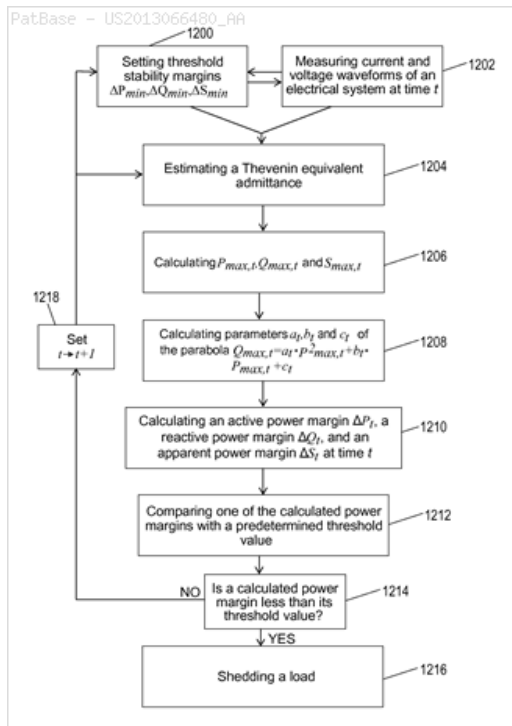
5) Family number: 53194852 (US2013066480A) © PatBase

Title: REAL-TIME MONITORING OF ELECTRIC POWER SYSTEM VOLTAGE STABILITY MARGINS

Abstract: Source: US2013066480A [EN] The disclosure relates to a method of detecting and managing voltage instability in power systems operations. The disclosed method identifies and follows **Thevenin** and load impedance values as they fluctuate in a power system using synchrophasor measurements. The values are recursively estimated and entered into calculations to identify stability margins through a simple P-Q plane representation to determine if load shedding is necessary.

Classifications:

International (IPC 8-9): G01R21/06 G01R31/08
G05F5/00 (Advanced/Invention)
CPC: H02J3/24 H02J13/0006 H02J2003/007 H02J3/14 Y02B70/3225 Y02E60/728 Y02E60/74 Y02E60/76 Y04S10/265 Y04S10/30 Y04S20/222 Y04S40/22
US: 700/286 700/295



Family:

Publication number	Publication date	Application number	Application date
US2013066480 AA	20130314	US20120607496	20120907
WO13036855 A2	20130314	WO2012US54290	20120907
WO13036855 A3	20130502	WO2012US54290	20120907

Priority:

US20110531923P 20110907 US20120607496 20120907

Probable Assignee: QUANTA ASSOCIATES LP

Assignee(s): (std): GLAVIC MEVLUDIN ; LELIC MUHIDIN ; NOVOSSEL DAMIR ; QUANTA ASSOCIATES LP ; QUANTA ASSOCIATES L P

Assignee(s): BANK OF AMERICA NA ADMINISTRATIVE AGENT AS

Inventor(s): (std): GLAVIC MEVLUDIN ; LELIC MUHIDIN ; NOVOSSEL DAMIR

Agent(s): OATHOUT MARK A

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

6) Family number: 36003036 (US2009009349A)

© PatBase

Title: METHOD OF DETERMINING VOLTAGE STABILITY MARGIN FOR LOAD SHEDDING WITHIN AN ELECTRICAL POWER SYSTEM

Abstract: Source: US2009009349A [EN] A method of monitoring voltage stability within an electrical power system comprises the steps of establishing a dynamic power system stability margin based on an operating characteristic of the power system; indicating that the power system has become unstable when the dynamic power system stability margin falls below a predetermined value; and initiating dynamic load shedding and/or restoration depending on stability margin.

Classifications:

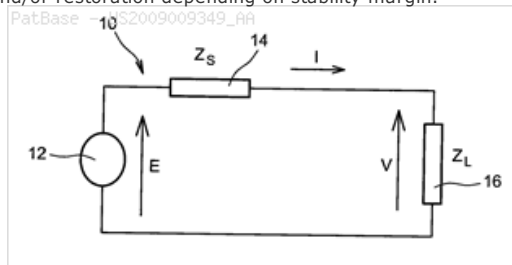
International (IPC 8-9): G01R29/00 G01R31/08 G05D11/00 G05D17/00 G05D3/12 G05D5/00 G05D9/00 G08B21/00 H02J13/00 H02J3/14 H02J3/24 (Advanced/Invention);

G01R29/00 G08B21/00 H02J13/00 H02J3/12 (Core/Invention)

CPC: Y10T307/406 H02J3/14 H02J3/24

European: H02J3/14 H02J3/24

US: 307/31 324/522 324/525 340/635 340/635P 700/293 700/295 700/298



Family:

Publication number	Publication date	Application number	Application date
CA2636524 AA	20090102	CA20082636524	20080630
CA2636524 C	20170131	CA20082636524	20080630
CN101340090 A	20090107	CN200810128482	20080701
CN101340090 B	20130814	CN200810128482	20080701
DE602008033276 D1	20140821	DE200860033276T	20080630
EP2079143 A2	20090715	EP20080159312	20080630
EP2079143 A3	20130424	EP20080159312	20080630

EP2079143 B1	20140716	EP20080159312	20080630
ES2502892 T3	20141006	ES20080159312T	20080630
GB200712749 A0	20070808	GB20070012749	20070702
GB200715760 A0	20070919	GB20070015760	20070814
GB2450762 A1	20090107	GB20070015760	20070814
GB2450762 B2	20120516	GB20070015760	20070814
US2009009349 AA	20090108	US20070966055	20071228
US7996116 BB	20110809	US20070966055	20071228

Priority:

EP20080159312 20080630 GB20070012749 20070702 GB20070015760 20070814

Probable Assignee: AREVA T AND D UK LTD

Assignee(s): (std): ALSTOM TECHNOLOGY LTD ; AREVA T AND D UK LTD ; SCHNEIDER ELECTRIC ENERGY UK LTD

Assignee(s): WISZNIEWSKI ANDRZEJ ; KLIMEK ANDRZEJ ; REBIZANT WALDEMAR ; AREVA T AND D UK LIMITED

Inventor(s): (std): ANDRZEJ KLIMEK ; ANDRZEJ WISZNIEWSKI ; KLIMEK ANDRZEJ ; REBIZANT WALDEMAR ; WALDEMAR REBIZANT ; WISZNIEWSKI ANDRZEJ

Inventor(s): WISZNIEWSKI ANDRZEJ 51 144 ; REBIZANT WALDEMAR 53 678

Agent(s): GOUDREAU GAGE DUBUC ; ILGART JEAN CHRISTOPHE ; CARPINTERO MARIO ; PEARNE AND GORDON LLP

Designated states: AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK TR