

# **Series Power Capacitors**

1992-2013

Doc Type: IEEE Transaction on Power Delivery  
Title: **Directional Relaying in the presence of a Thyristor-Controlled Series Capacitor**  
Authors: P. Jena, A. Pradhan  
Ref: IEEE Transactions on Power Delivery  
Vol. 28, no 2, April 2013 page 628  
Language: English  
Abstract: This paper proposes a fault direction estimation technique for a line with a thyristor-controlled series capacitor. The method is tested for different fault situations, such as high resistance fault, close-in dfault, as well as voltage and current inversions, and is found to be accurate.

Doc Type: IEEE Transaction on Power Delivery  
Title: **Series Compensated Line Protection Enhancement by Modified Pilot Relaying Schemes**  
Authors: T.S. Sidhu and M. Khederzadeh  
Ref: IEEE Transactions on Power Delivery  
Vol. 21, no 3, July 2006 page 1191  
Language: English  
Abstract: In this paper, a comprehensive analysis of the impact of a series capacitor on the performance of communication aided distance protection schemes of transmission lines is presented.

Doc Type: IEEE Transaction on Power Delivery  
Title: **Series Compensation of Radial Power System by a Combination of SSSC and Dielectric Capacitors**  
Authors: Fawzi A. Rahman Al Jowder, Boon-Teck Ooi  
Ref: IEEE Transactions on Power Delivery  
Vol. 20, no 1, January 2005 page 458  
Language: English  
Abstract: This paper shows that the addition of dielectric capacitors lowers the cost of series compensation by static synchronous series compensator ( SSSC).

Doc Type: IEEE Transaction on Power Delivery  
Title: **Thyristor Protection for Series Capacitors in an Arc Furnace plant**  
Authors: Elena Gaio, Roberto Piovani, Loris Zanotto, Paolo Bordignon, Tito Consani  
Ref: IEEE Transactions on Power Delivery  
Vol. 19, no 4, October 2004 page 1891  
Language: English  
Abstract: In this paper, after a description of the application, the thyristor bypass design is presented with the analyses of the most peculiar aspects and interesting technological solutions.

Doc Type: IEEE Transaction on Power Delivery  
Title: **Stochastic Evaluation of Voltage Sags in Series Capacitor Compensated Radial Distribution Systems**  
Authors: S.O. Faried, S. Aboreshaid  
Ref: IEEE Transactions on Power Delivery  
Vol. 18, no 3, July 2003, page 744

Language: English  
Abstract: This paper presents a Monte Carlo- based approach to evaluate the maximum voltage sag magnitudes in series capacitor compensated radial distribution systems.

Doc Type: IEEE Transaction on Power Delivery  
Title: **Torsional Interaction Studies on a Power System Compensated by SSSC and Fixed Capacitor**

Authors: G.N. Pillai, A. Ghosh, A. Joshi  
Ref: IEEE Transactions on Power Delivery  
Vol. 18, no 3, July 2003, page 988

Language: English  
Abstract: In this paper, a static synchronous series compensator (SSSC), along with a fixed capacitor, is used to avoid torsional mode instability in a series compensated transmission system.

Doc Type: IEEE Transaction on Power Delivery  
Title: **Considerations for the Application of Series Capacitors to Radial Power Distribution Circuits**

Authors: J.M.Barcus, S. Miske Jr, J. Samuelsson and R. Sévigny  
Ref: IEEE Transactions on Power Delivery  
Vol. 16, no 2, April 2001, page 306

Language: English  
Abstract: This paper summarizes many of the considerations in the application of series capacitors on radial distribution circuits.

Doc Type: IEEE Transaction on Power Delivery  
Title: **Subtransmission System Reliability Enhancement Using a Thyristor Controlled Series Capacitor**

Authors: M.Fotuhi-Firuzabad, R. Billinton, S.O. Faried  
Ref: IEEE Transactions on Power Delivery  
Vol. 15, no 1, January 2000, page 443

Language: English  
Abstract: This paper examines the impact of thyristor controlled series capacitors (TCSC) on distribution substation system reliability.

Doc Type: IEEE Transaction on Power Delivery  
Title: **Summary of the IEEE Special Publication on Series Capacitor Bank Protection TP-126-0**

Authors: Series Capacitor Bank Protection Working Group  
Ref: IEEE Transactions on Power Delivery  
Vol. 14, no 4, October 1999, page 1295

Language: English

- Abstract: This paper summarizes the Power System Relaying Committee special publication which encompasses the protection and control philosophies of capacitor banks used on series-compensated transmission lines.
- Authors: Kin-ho Chu & Charles Pollock  
Ref: IEEE Transactions on Power Systems  
Vol. 14, no 2, April 1999, page 512  
Language: English
- Abstract: This paper describes a series compensation scheme employing a capacitor in parallel with two PWM switched reactor modules.
- Title: **Fundamentals of Series Capacitor Commutated HVDC Terminal**
- Authors: Yuriy Kazachkov  
Ref: IEEE Transactions on Power Delivery  
Vol. 13, no 4, October 1998, page 1157  
Language: English
- Abstract: The paper contains basic equations, derived long ago by Russian experts, and their analysis. The considerations on the controllability of a series capacitor commutated converter and on the transformerless arrangement of a series capacitor commutated HVDC terminal, will hopefully be useful in further development of this technology.
- Title: **Determination of Location and Amount of series Compensation to increase Power Transfer Capability**
- Authors: R.Rajaraman, F. Alvarado, A. Maniaci, R. Camfield, and S. Jalali  
Ref: IEEE Transaction on Power Systems  
Vol. 13, no 2, May 1998, page 294  
Language: English
- Abstract: This paper discusses the merits of an analytical method for determining the location and amount of series compensation to increase the steady state power transfert capability in the power system based primarily on cascading line overload considerations.
- Doc Type: IEEE Transaction on Power Systems  
Title: **Time-Optimal Control of Power Systems Requiring Multiple Switchings of Series Capacitors**
- Authors: Jaewon Chang & Joe H. Chow,  
Ref: IEEE Transaction on Power Systems  
Vol. 13, no 2, May 1998, page 367  
Language: English
- Abstract: This paper discusses the merits of an analytical method for determining the location and amount of series compensation to increase the steady state power transfert

capability in the power system based primarily on cascading line overload considerations.

Title: **GTO Thyristor Controlled Series Capacitor Switch Performance**

Authors: M.Mardani Nejad & T.II.Ortmeyer

Ref: IEEE Transaction on Power Delivery  
Vol. 13, no 2, April 1998, page 615

Language: English

Abstract: This paper presents a detailed design of the GTO series (current) snubber circuit and a fault study to determine the required characteristics for each element of the GTO-CSC compensator.

Doc Type: IEEE Transaction on Power Delivery

Title: **Predicting Life from Analysis of Field Aged 500 kV Series capacitors**

Authors: A. Kong,

Ref: IEEE Transaction on Power Systems  
Vol. 12, no 3, July 1997, page 1374

Language: English

Abstract: This paper addresses determining the electrical life of 500 kV series capacitors by analysis of field aged samples.

Doc Type: IEEE Transaction on Power Systems

Title: **Time-Optimal Series Capacitor Control for Damping Interarea Modes in Interconnected Power Systems**

Authors: Jaewon Chang & Joe H. Chow,

Ref: IEEE Transaction on Power Systems  
Vol. 12, no 1, February 1997, page 215

Language: English

Abstract: In this paper we propose a time-optimal control of switchable series or shunt capacitors requiring only a single switching for damping power system swings resulting from large disturbances. In this paper, the general case of time-optimal control of series capacitors requiring multiple switchings is investigated.

Doc Type: IEEE Transaction on Power Systems

Title: **Solving the Ferroresonance Problem when Compensating a DC Converter Station with a Series Capacitor**

Authors: D.A. Woodford,

Ref: IEEE Transaction on Power Systems  
Vol. 11, no 3, August 1996, page 1325

Language: English

Abstract: Using dc link controls judiciously, it is shown that any onset of ferroresonance can be eliminated. Benefits to series compensating a dc converter are presented

Doc Type: IEEE Transaction on Power Delivery

Title: **BPA's Pacific AC Intertie Series Capacitors: Experience, Equipment & Protection**

Authors: G.E. Lee and D.L. Goldsworthy

Ref: IEEE Transaction on Power Delivery  
Vol. 11, no 1, January 1996, page 253

Language: English

Abstract: The decision to use a gapless design, the MOV energy sizing, and the protective bypass thresholds require extensive EMTP fault simulations. A large number of staged system fault tests were performed to evaluate the integrity of the banks.

Swann, D.E.; Larsen, E.V.; Piwko, R.J. "**Major benefits from thyristor controlled series capacitors**", Journal: Power Technology International, p.109-12, 1993, UK, CODEN: PTEIE8  
ISSN: 0951-9653

Johnson, R.K.; Torgerson, D.R.; Renz, K.; Thumm, G.; Weiss, S. "**Thyristor control gives flexibility in series compensated transmission**", Author Affiliation: Western Area Power Adm., Golden, CO, USA, Journal: Power Technology International, p.99-103, 1993, UK, CODEN: PTEIE8  
ISSN: 0951-9653, English

Rajkumar, V.; Mohler, R.R. "**Adaptive nonlinear series capacitor controller for power system transient stability**", Dept. of Electr. & Comput. Eng., Oregon State Univ., Corvallis, OR, USA, p.2081-2 vol.2, American Autom. Control Council, Evanston, IL, USA, USA, 3 vol., xxxviii+3201 pp., ISBN: 0 7803 0860 3

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Chakraborti, A.; Mukhopadhyay, A.K.; Basu, D.K. "**A microprocessor-based overvoltage protection scheme of the capacitor in a series compensated EHV transmission line**", Dept. of Electr. Eng., BE Coll., Shibpur, India, Journal of the Institution of Engineers (India) Electrical, Engineering Division, vol.73, pt.EL-5, p.253-7, Dec. 1992, India, CODEN: JEELAC ISSN: 0020-3386, English

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