

**IEEE Transactions on Power Delivery**  
**Call for Paper**  
**Visionary Paper Series**  
**(On-going)**

**1. Purpose**

The Visionary Paper Series is designed for seasoned researchers or technical committees to share their visions on a significant trend or technical challenge facing power industry or to present innovative ideas/concepts that may produce a wide range of impacts. A paper of this series is intended to promote, influence or lead the research activities in the subject area. It also serves as an archive and recognition of the authors' technical leadership and contribution.

**2. General Requirements**

A candidate paper for the Visionary Paper Series is not a review paper. In consistent with PWRD's editorial philosophy, papers of interest are expected to deal with contemporary, concrete as well as realistic issues with a time horizon less than 10 to 20 years. Authors must have done some related research work. A paper should include the following components in general, with Components 3 and 4 constituting a substantial part of the paper (>50%):

1. Explanation of the subject and justification for its significance
2. Review and assessment of current developments
3. Presentation of some relevant research progresses made by the authors
4. Visions of the authors, such as research needs, strategies to move forward, methodologies and examples, how to make use of recent developments and so on.

**3. Process of Submission and Review**

We plan to publish 1 paper per issue on average in a series for the next 2 to 3 years. The submission to publication process is as follows:

1. Authors email a 2~3 page proposal to the EIC of PWRD at any time (see next page for an example)
2. The proposal is reviewed by the editorial board. Feedbacks are provided to authors
3. If the proposal is accepted, authors have 6 months to prepare and submit the paper
4. The papers are reviewed with experienced but open-minded reviewers
5. For accepted papers, a webinar will be held during the early access period of the paper
6. Reader discussions and author clauses are also collected during the period
7. The papers are published along with the discussions/closures

**4. Dissemination and Promotion of Accepted Papers**

For each accepted paper, a webinar will be held for the authors to share their visions. Furthermore, discussions submitted by readers (for example, because of the webinar) and authors' clauses will be published together with the paper. Selected comments from reviewers and responses from authors may also be published subject to the consent of authors and reviewers. If there is a sufficient interest, an interest/discussion group can be set up using the IEEE Collabratec platform for continued exchange with the authors.

**Template and Example of  
A Proposal for Visionary Paper Series**

(Note: this form contains a hypothetical example that shall be replaced by the actual proposal material)

<b>Tentative title of the paper:</b>	Low inertia and Low Short-circuit Capacity Power Systems - possible solutions and research needs
<b>Names of authors</b>	If this is a committee paper, please provide committee name and its host organization
<b>Contact information</b>	Email of the corresponding author, website of the author if available
<b>Affiliation and job title of the corresponding author</b>	
<b>Important notes:</b>	
<p>1) This Series is not interested in futuristic or speculative subjects. Papers of interest are expected to deal with contemporary, concrete as well as realistic issues with a time horizon less than 10 to 20 years. Authors must have done some related research work.</p> <p>2) The topic of interest should not be a specific research idea or issue (which is more suitable for regular papers). Ideally, it should point out a direction that can lead to many research activities. For example: using PMU to improve a specific protection scheme is not a vision. However, introducing the concept and example schemes of using synchronized measurements to power system protection is a vision.</p>	
<b>1. Brief explanation of the issue/trend to be covered by the paper</b>	
<p>Many power systems especially those in Europe and California are increasingly faced with a new challenge brought by the widespread adoption of asynchronous renewable generation. The change in generation mix in these systems creates power system level security risks. The main concerns are the reduced inertia, lower short circuit capacity, and limited voltage control. Although various research efforts are being made to investigate these issues in, for example, Great Britain and Nordic countries, a lot more research is still needed to find creative solutions to this increasingly important issue.</p>	
<b>2. Brief discussions on the current developments</b>	
<p>How to operate a low inertia and low short-circuit capacity system is a new challenge faced by transmission system operators. For example, incident XX showed that ..... As a result, efforts have been made to measure and quantify the inertia of a system. There are also proposals to use retired power plants to host synchronous condensers that can provide additional inertia and short-circuit capacity to the system. The research on the frequency-dependent load characteristics has gained renewed interest. Significant research activities are happening on the subject of creating synthetic inertias for inverter based generators. However, there is a need to establish power system level requirements for the desired characteristics of synthetic inertias.</p>	
<b>3. Relevant work done by the authors (This and the next part shall take more than 50% of the paper)</b>	
<p>The authors have collaborated with XXX company to investigate the effectiveness and specifications of using synchronous condensers as one of the solutions to the problem [X]. The cost and benefit of adding fly wheels to synchronous condensers as a further solution to the problem are determined. We also determined the frequency response characteristics of XXX system with significant renewable generation and HVDC links through computer simulation and field measurement validation. The option of using demand response to reduce frequency excursion is also investigated [Y]. These research activities enabled us to understand the significance and uniqueness of the low inertia problem for the future, asynchronous generation rich power systems. Some of the research findings will be presented.</p>	
<b>4. Visions of the authors (This and the previous part shall take more than 50% of the paper)</b>	
<p>The proposed paper will discuss the research needs in the subject area and present some preliminary ideas, strategies and examples to address the problem. Among the various potential innovations, we</p>	

believe following topics deserve the attention by research community: (1) Monitoring and modeling: This includes the development of methods for real-time determination of inertias or frequency responses of a power system, methods to estimate the frequency-dependent models of loads and asynchronous generators, (2) New apparatus and technology: examples are the development of a new type of STATCOMS that is for active power versus frequency control instead of the traditional reactive versus voltage control; the combined use of fast response supercapacitors and slow response lead-acid batteries for creating such a STATCOM; novel ideas to increase the transient fault current of inverter based generators for the purpose of increasing fault capacity of its host system, (3) Protection and control: This direction includes, for example, new protection schemes that can operate reliably for low inertia, low fault level transmission systems and a new generation under-frequency load shedding (& demand response) schemes based on event-driven concepts.

**5. Key references including those published by the proponent**

- [1] \*\*\*
- [2] \*\*\*
- [3] \*\*\*
- ....