

**UNITED STATES OF AMERICA  
BEFORE THE  
FEDERAL ENERGY REGULATORY COMMISSION**

**Regional Transmission Groups     )  
Notice of Proposed Rulemaking    )**

**Docket No. RM99-2-000**

**REPLY COMMENTS OF  
PROFESSOR PAUL L. JOSKOW<sup>1</sup>**

**SEPTEMBER 29, 1999**

Professor Paul L. Joskow  
Department of Economics  
MIT, E52-280B  
50 Memorial Drive  
Cambridge, MA 02142

pjoskow@mit.edu  
(T) 617-253-6664  
(F) 617-258-7070

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<sup>1</sup> Elizabeth and James Killian Professor of Economics and Management and Director, Center for Energy and Environmental Policy Research at the Massachusetts Institute of Technology (MIT), Cambridge, MA. I am submitting these reply comments on my own behalf. The views expressed here are my own and should not be interpreted as representing the views of MIT or any other organization with which I am affiliated.

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My reply comments are limited to correcting a misunderstanding about differences between physical and financial transmission rights contained in the Initial Comments submitted jointly by Automated Power Exchange, Coral Power, LLC., & Enron Power Marketing, Inc. (referred to herein as the “Commentators”). The Commentators refer to two unpublished papers which I co-authored with Jean Tirole.<sup>2</sup> The Commentators describe the papers as “concluding that physical rights designed on a use-it-or-lose-it basis so that they cannot be hoarded more effectively prevent the exercise of market power than financial rights, which can always be hoarded.”<sup>3</sup> This is *not* what the papers conclude and it is hard for me to understand how such an inference could be drawn from them.

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<sup>2</sup> Paul Joskow and Jean Tirole, *Transmission Rights and Market Power on Electric Power Networks I: Financial Rights* and *Transmission Rights and Market Power on Electric Power Networks II: Physical Rights*, MIT Center for Energy and Environmental Policy Research, January, 1999. The November 30, 1998 (I) and December 2, 1998 (II) versions of these papers which the Commentators appear to have relied upon are the same except for cover pages, abstracts, and pagination. For convenience, I will refer to the November 30 (I) and December 2 (II) versions of our papers in these comments. These papers can be downloaded from my web site <http://web.mit.edu/pjoskow/www/>.

<sup>3</sup> Initial Comments of Automated Power Exchange, Coral Power, L.L.C., & Enron Power Marketing, Inc., August 24, 1999, page 55, footnote 27.

These two papers analyze theoretically the interactions between financial and physical transmission rights and market power in the generation markets when there is transmission congestion, focusing on whether and how the ownership of transmission rights could enhance seller or buyer market power in generation markets. Contrary to the Commentators' description, one of the primary differences we identified between physical and financial rights, as they affect generation market power, is that physical rights *can* be withheld to reduce transmission capacity in order to enhance market power in generation markets while financial rights *cannot* be withheld to reduce transmission capacity to enhance market power in generation markets:

“There are two major differences [between physical and financial rights]. The first difference is that a physical rights system introduces the possibility that owners of transmission rights can withhold these rights from the market, effectively reducing the capacity of the congested interface.... The withholding of rights leads to production inefficiency that does not arise in a financial rights system.”<sup>4</sup>

“... unlike the case with financial rights, the operation of the physical rights market might lead to a reduction in the effective capacity of the transmission link.”<sup>5</sup>

“One of the primary differences between a financial transmission rights system and a physical transmission rights system arises as a result of withholding of physical rights from the market which leads to an artificial contraction of the capacity of the transmission system.”<sup>6</sup>

It is because physical transmission rights systems, unlike financial rights systems, carry the risks of transmission capacity withholding that “Potential withholding problems leads naturally to the consideration of regulatory rules requiring ‘capacity release’ by physical rights holders when they do not use their rights to schedule deliveries of

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<sup>4</sup> Joskow and Tirole (II), December 2, 1998, page 4.

<sup>5</sup> Joskow and Tirole (II), December 2, 1998, page 8.

electricity supplies.”<sup>7</sup> Capacity release rules are not required for financial rights systems because financial rights cannot be used to reduce transmission capacity. Our analysis of capacity release rules for physical rights systems leads us to conclude that a *use-or-lose-it rule* “appears to provide the most powerful incentives for physical rights holders not to withhold rights from the market.”<sup>8</sup> Accordingly, I agree with the Commentators’ conclusion that *if* a physical transmission rights system is adopted it should be accompanied by appropriate capacity release rules to guard against inefficient withholding of transmission capacity from the market.

The ownership of financial rights may, under certain conditions, enhance seller or buyer market power in generation markets as well. However, these market power problems do not arise as a consequence the withholding of transmission capacity. Rather, they arise as a consequence of the financial relationships between the market value of transmission rights and the market prices for generation service. Similar potential financial incentive problems arise for physical rights too, in addition to market power problems associated with the withholding of physical rights. Whether a physical or a financial rights system is “worse” purely from a market power perspective depends on the structure of the generation markets, the microstructure of the markets for trading rights, regulatory rules, and other factors.

Finally, let me note that my papers with Jean Tirole cited by the Commentators do not attempt to examine all of the costs and benefits of financial vs. physical rights

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<sup>6</sup> Joskow and Tirole (II), December 2, 1998, page 25.

<sup>7</sup> Joskow and Tirole (II), December 2, 1998, page 4.

<sup>8</sup> Joskow and Tirole (II), December 2, 1998, page 27. We note, however, that a richer model that incorporates uncertainty may reveal some hidden costs to this rule. We left further analysis of this issue to future research.

systems. These papers focus only on whether and how transmission rights may enhance seller and buyer market power in generation markets:

“It is not our objective here to discuss the full set of reasons why a physical rights mechanism might be preferred to a financial rights mechanism or vice versa. The relevant considerations include the transactions costs associated with using, trading and enforcing the different types of rights to facilitate efficient supply of the competitive service given network constraints, the need to adjust the supply of rights to reflect rapid changes in the quantity of network capacity actually available at any particular point in time, market power in both the rights market and the energy market, and other considerations.”<sup>9</sup>

However, our analysis of physical rights in the presence of loop flow does lead us to observe that:

“Even in the absence of market power associated with the production or purchasing of electricity, the efficient implementation of a physical rights system on a network with loop flow must confront a number of significant challenges. These challenges must be understood to talk intelligently about physical rights systems for managing congestion on electric power networks.”<sup>10</sup>

“In the case of physical rights, designing a workable physical rights system in the presence of loop flow, even on a simple three-node network without market power, is a significant challenge.”<sup>11</sup>

Our paper goes on to discuss the complexities of operating a physical rights system on a three-node network with loop flow in some detail. My own view is that, market power issues aside, on complex electric power networks with loop flow, a financial rights system can more easily be designed and can work more smoothly and efficiently than can a physical rights system. If it’s a challenge on a three-node network it is close to impossible to get a physical rights system to work well on a 1,500 node network.

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<sup>9</sup> Joskow and Tirole (I), November 30, 1998, page 5.

<sup>10</sup> Joskow and Tirole (II), December 2, 1998, pages 20 - 21.

<sup>11</sup> Joskow and Tirole (II), December 2, 1998, page 29.

These issues aside, I believe that the Commentators' Initial Comments presented many useful and constructive ideas. I commend in particular their comments on TransCos and on incentive regulation issues.

Respectfully submitted,

Paul L. Joskow  
Department of Economics  
MIT, E52-280B  
50 Memorial Drive  
Cambridge, MA 02142

pjoskow@mit.edu  
(T) 617-253-6664  
(F) 617-258-7070