

Unscheduled Interchange- A Story in Quotes

The Unscheduled Interchange (UI) mechanism has cast its magic spell on the interstate electricity market in India. Like the 'Pied piper of Hamelin' it has made the power utilities in India dance to the tune of the grid frequency. Such has been its impact on the psyche of the countrymen that if there is any other topic outside politics, cricket and Bollywood on which everyone seems to have an opinion it is UI. Experts in other countries have called it by various names- 'Real-time pricing', 'imbalance pricing', 'inadvertent interchange' pricing, but as Shakespeare said "a rose by any other name would smell as sweet". What follows is a compilation of a few remarkable words on Unscheduled Interchange and UI pricing.

"Frequency control is not a morality play"

Robert Blohm
'Economist's Assessment'
North American Electric Reliability Council Joint
Inadvertent Interchange Taskforce
10th April 2002

"Because frequency indicates the discrepancies between supply and demand, frequency is the right guide for interconnection-wide price adjustment. When frequency is high price should be reduced; when frequency is low price should be raised. This is the classical adjustment process for keeping supply equal to demand."

Steven Stoff
'Power System Economics'
Chapter-Power Supply and Demand
Section-The Signal for Price Adjustment

"A key feature of this pricing scheme is that the independent power plants can themselves monitor the frequency deviations and thus no real time signal needs to be sent by the electric utility. This eliminates the problem of how the utility could compute and transmit the price faster than the time scale to be controlled."

Arthur Berger & F.C Schweppe
'Real time pricing to assist in load frequency control'
(IEEE Transactions on Power Systems,
Vol.4, No. 3, August 1989)

"Zero UI is a coincidence rather than expectation."

-North Electricity Reliability Council,
Joint Inadvertent Interchange Task Force Report
May 2002

"It is not always possible to establish whether a deviation from schedule is inadvertent or deliberate. Besides, a deviation may have inadvertent and deliberate components and it may be very difficult to assign values to them."

Bhanu Bhushan
Comments to ECC Task Force Report on UI tariff, 08th
November 1993

"All UI is not bad. Under certain circumstances, UI of a particular polarity would be desirable and should be encouraged"

Bhanu Bhushan
Comments on ECC Task Force Report on UI tariff,
08th November 1993

"The imbalances must be settled as if they were instantaneous spot transactions i.e. sales of electricity arranged at (infinitesimally) short notice for immediate delivery."

Sally Hunt & Graham Shuttleworth
'Competition & Choice in Electricity'
Chapter-Spot Markets & Organization of Trade
Section- Settling Energy Trades

"There must be some pricing rules for imbalances...These pricing rules become central to the character of the whole electricity market"

Sally Hunt & Graham Shuttleworth,
'Competition and Choice in Electricity'
Chapter- Spot Market & Organization of Trade,
Section- Setting the Prices

"In a competitive market the real time prices are true marginal cost prices, and the forward prices are just estimates"

Steven Stoff
'Power System Economics'
Chapter-The Two-Settlement System

"The market for imbalances competes with longer-term transactions as a means for trading electricity."

Sally Hunt & Graham Shuttleworth
'Competition & Choice in Electricity'
Chapter- Spot Market & Organization of Trade
Section- Efficiency Criteria

"Unscheduled power occupies the interface between markets and reliability."

Robert Blohm
Solving the Crisis in Unscheduled Power
Public Utilities Fortnightly August 2004

"Inadvertent and energy imbalance are "unscheduled energy" which is two things: (i.1) the "energy" part, and a related (i.2) transmission congestion (loading component, and (ii) the "unscheduled aspect". The unscheduled part is the "inconvenience" factor, "hassle" factor, or degree of suddenly needing the energy."

Robert Blohm

'Economist's Assessment'
North American Electric Reliability Council Joint
Inadvertent Interchange Taskforce
10th April 2002

"A market requires an a priori determination of Good and Bad Inadvertent."

Howard F. Illian

"Defining Good and Bad Inadvertent"
January 2002

"The main tool available to the Market Operator to encourage efficiency is the price charged or paid for imbalances between contracts and actual flows."

Sally Hunt & Graham Shuttleworth

'Competition & Choice in Electricity'
Chapter- Spot Market & Organization of Trade
Section- Making Electricity Markets Work

"If these imbalances are priced at punitive rates, generators may be reluctant to offer any flexibility of output. The task of maintaining system security would then be rendered difficult, if not impossible."

Sally Hunt & Graham Shuttleworth

'Competition and Choice in Electricity'
Chapter- Spot Market & Organization of Trade
Section-Penalty Rates

"The California market meltdown may be attributed in significant part to improper pricing of unscheduled power"

Robert Blohm

'Caught in a Closing Vice'
Public Utilities Fortnightly, August 2004 issue

"If the imbalance price is too low, generators would produce less and rely on the imbalances to meet their customers' load. A cheap generator might be better off backing down, creating further imbalance"

Sally Hunt

'Making Competition Work in Electricity'
Chapter- Trading Arrangements
Section-Imbalances

"The right price for imbalances is a market-based price. A market-based price for imbalance energy is incentive-compatible... It means...that if price is low, it is a good thing that the generator reduces output from its contracted level because imbalance market is a cheaper provider of energy. It means that if the price is high, it is a good thing that the generator increases output from its contracted level because it is a cheaper provider of energy than the alternative imbalance energy providers. And it means equivalent signals are sent to loads."

Sally Hunt,

'Making Competition Work in Electricity'
Chapter-Trading Arrangements
Section-Imbalances

"UI mechanism facilitates the spot sale or purchase of electricity into or out the grid and does not require the services of a trader, as UI mechanism is an alternative to formal trading. It provides a sort of benchmark price for trading of electricity and does not allow the prices to shoot up. These developments take the market closer to other normal markets in the economy"

Economic Survey 2003-04, India

"Market is somewhat of a masonry wall. We have bricks with cement around it. Sometimes these bricks are maybe a 100-megawatt contract for an hour or for a day. If you want the wall to stay up, you've got to have this masonry, this mortar, cement to fill up the seams and also a way to price it. Else the wall will fall down. I noticed that about a year and a half ago, India decided that they were going to put in a way to price what they call **unscheduled interchange** where they provided liquidity for the market and improved their operations by a factor of 5 or 10."

Mark Lively a Consulting Economist,
to Federal Energy Regulatory Commission, USA

"The proposed standard addressing frequency control contribution will have incentives and penalties that will reward good control and penalize poor control. The incentives and penalties need to be sufficient to promote good performance."

Joint Inadvertent Interchange Task Force White Paper, Recommendations for the Wholesale Electric Industry of North America,

May 2002

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