Comments to Warren McReynolds' Presentation to the IIPTF Sept. 15/16, 2003
by Robert Blohm
Sept. 3, 2003

FOUR PROBLEMS WITH THE WESTERN INTERCONNECTION'S AUTO-TIME-ERROR CORRECTION METHODOLOGY, FOLLOWED BY A DISCUSSION.

--It BUNDLES time-error correction with Inadvertent energy payback/settlement. If Inadvertent energy is separately settled financially time-error is not "corrected" but time error is less likely to occur in the first place. There is a growing consensus in the industry that time-error correction is an anachronism from the era of synchronous-motor clocks. Clearly, time-error-correction should not be DRIVING inadvertent energy settlement. If inadvertent settlement (of energy AND frequency component) preempts time-error accumulation, so much the better. But time-error should be very much the after-thought and not the driver.

--It PHYSICALLY PAYS BACK NEW INADVERTENT ENERGY to the Interconnection (that is, unilaterally), by scheduling new inadvertent energy and such scheduling only adds new Inadvertent and risk to interconnection frequency performance. This makes reliability more expensive than under the alternative of financial settlement or scheduled immediate bilateral payback to the Interconnection. While NERC has recently approved the West's time-error-correction/inadvertent-payback methodology, it is no worse for reliability than the previous method of scheduled offset of frequency only for the parties causing the Inadvertent. That method is also used in the Eastern Interconnection, but in a way consistent with NERC's Control Performance Standard, namely by "socializing" (a) the time-error correction by scheduling offset of frequency of all parties, and therefore (b) the unilateral payback of Inadvertent. Everyone participates in time-error correction and payback according to their bias obligation share of system frequency response. The IIPTF has refused even to recognize this as bilateral payback on the Eastern Interconnection, and NERC/NAESB will seriously have to consider abandoning time-error correction once an Inadvertent energy settlement methodology is in place that can be expected to eliminate much if not all of time-error. The West's methodology changes the East's methodology by individualizing the payback obligation, and applying it just to the Control Area that caused the Inadvertent by scheduling an offset of that Control Area's Inadvertent.

--The PAYBACK IS UNECONOMIC because it's not near enough in time to the Inadvertent, but spread out over a week. This is the cost of thereby reducing the volatility caused by unilaterally paying back new Inadvertent and of doing it in a way in which the scheduled payback imbalances are likelier to sum to zero and be more compatible with NERC's Control Performance Standard CPS1.

--There is NO ENFORCEMENT of unilateral (physical) payback methodologies because enforcement can only be monetary/financial and so defeats the very purpose of the physical payback-in-kind. Bilateral paybacks are enforced in virtue of the very contract under which they are to be delivered. Accordingly, unilateral (physical) payback is subject to the very economic gaming of Inadvertent that prompted creation of the IIPTF. The party paying back can simply roll-over his obligation to period after period, with no penalty. Or, when the payback is spread out over a week, the party paying back can build weekly price volatility into the software and pay back more (less) when prices are low (high). Not just equity, but even reliability in today's grid/market, does not allow for that. The days of "gentlemen's agreements" are over and of hard enforceable "priced" contracts, or pricing/penalizing mechanisms, are here.

DISCUSSION

Time-error is a symptom of improper Inadvertent settlement. There is no direct identity between Time-error correction and Inadvertent payback-in-kind. In particular, you can bilaterally pay-back-in-kind with balanced schedules and have no effect on time error correction. However, the acid test for the efficiency of any Inadvertent settlement mechanism may be that it would on average eliminate the tendency of the Interconnection's aggregate scheduling error to be one-sided and otherwise result in accumulation, which translates into Time error. This is important not because Time-error itself is a problem. Time error is only a symptom of something deeper: improper price/cost signaling of control/scheduling behavior.

Time-error-correction does pay back Inadvertent, but improperly. In correcting time error all Interconnections are already unilaterally physically paying back inadvertent and, it is worth noting, physical payback by the responsible party is already and always has been taking place in the West through time-error correction. [But this has the drawback of being inconsistent with CPS1 zero-summability of Inadvertents and, so, has the effect of taking over frequency control from CPS1 and making it much tighter than CPS1. The West is attempting to mitigate this inconsistency somewhat by spreading out the payback

over a week and thereby making the payback less economic.] The same is partly true in the Eastern Interconnection too, except that the payback is being done by everyone in proportion to bias-share, and not by the party responsible. [But this has the advantage of being consistent with CPS1 and, so, has no effect on frequency control by CPS1.]

Time-error-correction and Inadvertent-payback are logically distinct. Since there is no logically-necessary bundling of an explicit time-error correction mechanism with Inadvertent payback-in-kind, some other justification would need to be made for bundling them. I contend no such justification exists: quite the contrary, the technological justification for time-error correction is disappearing, while the need to stop otherwise ever-accumulating Inadvertent is ever compelling, as reflected in the ever-more-frequent manual time-error corrections the West was doing (to the responsible party's scheduled frequency) before the West's new automated procedure (which adjusts the responsible party's inadvertent term automatically by a scheduled imbalance). The East is likewise beset with ever-more-frequent time-error correction.

Solving the Inadvertent problem solves the Time-error problem, not vice-versa. Furthermore, once proper methods alternative to explicit time-error-correction are found for settling Inadvertent, time-error should automatically stop and time-error-procedures ended. Theoretically, proper equitable settlement of Inadvertent should remove any tendency for the Interconnection to accrue frequency (scheduling) error. Indeed, if the IIPTF were to reject settlement of a frequency-control-component of Inadvertent, time error would continue. The West's auto-correction method doesn't "solve" the time error accumulation problem; it only "manages" it (treats the symptom) unless it removes the economic incentive to incur Inadvertent. If the West's auto time-error correction method actually works and includes all the needed economic signals such as a frequency control component, it will not function persistently in one direction (of accumulations); in other words it should operate less and less frequently once in place, and in no persistent direction, and that would be a test of its effectiveness. The graph shows that in 2002 time error deteriorated 4 % more than it improved. Automation is not the solution to managing otherwise increasingly accumulating time-error. Stopping the tendency of scheduling errors to be in one direction, and to otherwise accumulate, is the answer.

Basic problem: to (economically) disincent Inadvertent accumulation. That automatically preempts time-error. So, all agree the problem is fundamentally: how to stop the lopsided growth of scheduling errors in one direction that will continue without a remedy, and translate into ever frequent and growing time-error correction, and growing Inadvertent accumulations in the East? If we properly financially settle (both energy and frequency components) the incentive to accumulate is gone. Problem solved. If we allow a certain kind of payback-in-kind of the energy component, in the absence of hourly energy pricing, we may also solve the problem.

Two kinds of payback-in-kind to do this: bilateral balance or unilateral imbalance. The most reliability-friendly way to use payback-in-kind to solve the one-sided scheduling-error problem is by next-hour (actually next 3rd hour) bilateral payback with the Interconnection who finds the counterparty from some dispatchable pool of offered reserve. That is "transactionally" more complicated for the Interconnection. But it does solve the time-error problem because it removes the incentive to otherwise accumulate scheduling error.

Payback by unilateral imbalance is reliability-complicated but transactionally simple. Payback by bilateral balance is reliability-simple but transactionally complicated. The less reliability-friendly and less economic way to attempt to solve the problem is the West's auto time-error correction because it introduces new Inadvertent on the interconnection in the form of each of the paybacks, spread out uneconomically over a week, far from the time value of the Inadvertent causing the error; so, while it uneconomically attempts to disincent inadvertent, it does so in a way that increases frequency volatility by creating opposite inadvertent. On the other hand, it is "transactionally" simple for the Interconnection which doesn't have to go look for bilateral counterparties. However, it is still incompatible with CPS1 (for loss of zero-summability of Inadvertents, even if the loss is reduced by spreading out the paybacks over a week) and, by being tighter (while more volatile) than CPS1, it increases reliability/control cost too much compared with the cost of the Interconnection's operation of a dispatchable reserve of bilateral counteparties which itself would provide the very basis for a voluntary hourly regional spot market. Effectively, auto-time-error is a technical, but likely much higher-cost, substitute for such a market.