

Power Firms Give Clocks A Big Hand

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CHICAGO — You say your kitchen clock seems to be running a little slow or fast these days. Well, it actually is.

The reason: what amounts to time-tampering by electric companies.

Like anything with a synchronous motor in the United States and Canada, clocks with a sweeping second hand or a mechanical digital display are designed to run on alternating current that has 60 cycles, or hertz, a second.

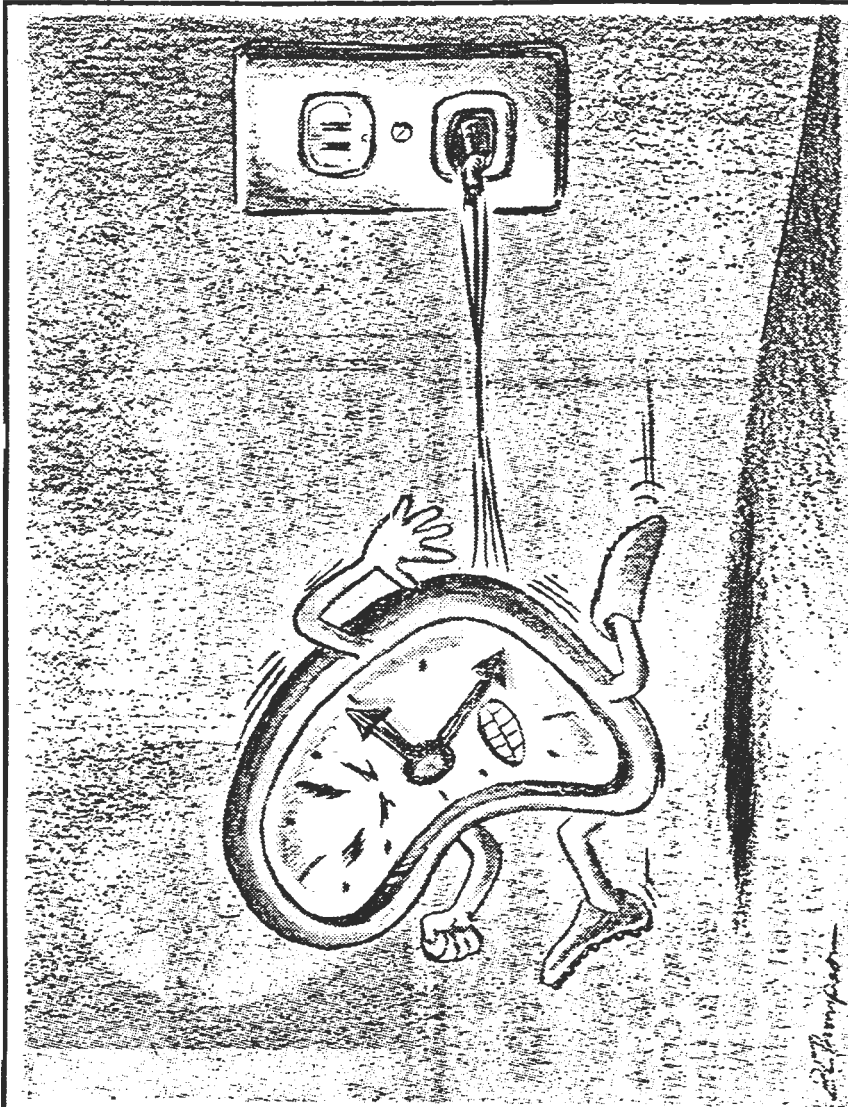
Likewise, U.S. and Canadian power generators are synchronized to spin at a frequency that produces electricity that alternates 60 times a second.

Problem is, the electricity that comes into your home is almost never exactly 60 hertz.

Whenever power consumption and output slip out of balance — an imbalance that typically occurs often in extreme weather when demand is high and rising and a generator or transmission line goes down — the power system responds by slowing down its generators, effectively stretching its output.

This means that the electricity leaving the power plant will be, say, 59.987 hertz or 59.913 hertz or some other number slightly below 60 hertz.

In turn, this means that your clock's second hand turns just a little slower, advancing not 60 seconds a minute, but 59.987 seconds or 59.913 seconds or whatever the hertz is.



Furthermore, because utilities are interconnected, an imbalance at any utility will cause an instant slowdown at all electric companies tied to the power grid.

This happened on a recent hot day, when Braidwood I tripped off-line. By mid-afternoon, clocks from Manitoba to Mississippi to Maine were more than 4 seconds slow.

The slippage is registered by computers at all the utilities' control centers and is monitored by American Electric Power Co., which acts as the official timekeeper for the United States and Canada east of the Rockies.

The Columbus, Ohio-based utility holding company assumed its timekeeper role back in the 1920s, when it used a grandfather clock with a huge pendulum as the standard against which an electric clock was measured.

Today's set-up is more sophisticated. Like Southern California Edison Co., which is the West Coast's official timekeeper, American Electric constantly receives a radio signal from the National Bureau of Standards in Denver, telling the precise time of its atomic clock.

The readings are fed into a computer and whenever the time of the atomic clock and a syn-

chronous clock in Columbus deviate by more than 4 seconds, the company orders a time correction.

American Electric calls its utility subsidiaries and they call their neighbors until, like in a pyramid game, every Eastern electric company has been notified.

Then, at a designated time, usually at night when demand is down and more capacity is available, they all change the speed of their generators to produce power at 60.02 hertz if time has lagged or at 59.98 hertz if time has gotten ahead of itself.