

# The Alternative Line

by Joe Holzer for CNY-PCA Redline Report Copyright 2011 <http://www.holzerent.com>

## The Roving Curmudgeon Strikes Again...

A week ago as I write this a cascading disaster started with the earth moving. In some circles, sadly no longer mine, the idea that “the earth moved for me” would be taken as a compliment. Unfortunately, not this time. I have been paying more than casual attention to the goings on along the eastern coast of Japan. Clearly, as a humanist (are engineers allowed to claim such geneology?), my first concern is for those directly affected – lost family members or having their lives completely disrupted in ways my divorce can only seem puny by comparison, however overwhelming it may seem to me at the moment. My relative tsunami is but a garden hose left running too long in that light.

Although I have no specific Nuclear Power expertise, as an engineer I have been a long-term advocate with the caveat that it be well thought through, with overlapping redundancies for safety in much the same way we have (and depend upon) them in commercial airliners plying the air routes between continents over water which would rarely be any more kind to such craft than it was to eastern Japan. So I was disturbed to hear that there were four reactors, three running at the time and one down for fuel rod replacement, and that NONE of them was capable of surviving an (admittedly) strong quake in an area where they are all but predictable, and the ensuing tsunami it caused for the land where the term originated.

In thier cases, it was not the quake rupturing the containment systems, nor really the tsunami which was the root cause of the problems they are now experiencing. MORE water, as would come with a tsunami, should increase the cooling. But the problem is the cascading dependencies of the systems involved; to keep any thermal generator from overheating you must cool it, and that depends on continuous pumping and a source for coolant, which depends on a drive mechanism for that pumping, which depends on a fuel it can use, and so on. You all saw the problem demonstrated by the supposed “fuel crisis” of 2007 when a shortage of low-sulfur diesel fuel in the US led to enormous spikes in prices. There was no shortage of feedstock. There was a profit-margin driven shortage of refiners willing to make the stuff because to decide to do so was to bring upon them onerous costs for EPA upgrades throughout the plant, not just for that fuel. So, instead of rational market driven forces we had government imposed forces tilting the marketplace table at the edges.

Make no mistake; I breathe the air and want my water drinkable and want my great grandchildren to be able to see all the same species I can find on PBS, and in environments we can all share while still enjoying the reasons we WANT to live, like the simple pleasures of posted unlimited speeds on the Autobahn, and hoping for the decision on CAFÉ to be driven by market reality instead of the ideology of the politicians du jour, perhaps by TELLING us all that the price of gas will index up for taxes by a dollar a gallon every five years for the next twenty cycles, then LEAVE it instead of trying to make the FIRST thing they do be to undo the last thing the previous Congress spent so much effort trying to negotiate from the powerful naysayers only to get a law which didn't really address the original problem in the first place. Such is, and sure seems inevitably will be, the SOP in Washington. But I digress.

My curmudgeonly rant is about the fact that ALL the cooling systems at the nuclear plant in Japan failed for the same reason. How is it nobody contemplated a backup cooling system higher up the hill which could be rapidly switched in for the destroyed system on the coast? Every first year engineering student in nuclear knows that cooling must be continuous or it melts to a Cleveland syndrome (like China, but opposite Japan here) like a Boxster with a water/oil heat exchanger failure.

The real reason is the same as discovered by the 9/11 Commission – a failure of vision and a poo-poo'ing of those who suggested the emperor might be less than fully clothed. I was contacted by a recruiter recently who seemed dismayed that my resume did not show all my clients, their chronology in order, and exactly what I did for them, so he could show it to his clients who were competitors for the most recent two years' worth. I asked him whether, if they needed a physics expert, they would hire someone who flunked school. "Of course not" was his reply, to which I pointed out that Albert Einstein flunked, not because he was wrong, but because he didn't tell them what they wanted to hear. Coming from manufacturing, I am well versed in JIT, one of the concepts which was developed by the Japanese which has come to be referred to as "The Toyota System", and which stands for "Just In Time"; the concept of minimizing inventory storage and carrying costs by assuring the supplier provides the component at exactly the time it is needed for production, by being a partner to it.

So I was bemused to see the sudden and volatile stock market response to the Japan situation, and the recognition that the interconnectedness and global dependencies for production will mean that not just Prius' but perhaps even Porsches will have to sit awaiting parts, thereby depriving their makers of revenue since you wouldn't buy a \$100K Porsche which was missing the \$3 flash memory needed to make the ECU which controls all that hardware able to work, because somebody was low bidder on a nuclear power plant by using the same CAD drawing for all four reactors. As a manufacturing project manager, I can freely admit that my first inclination when I heard about "JIT" was to think "Junk In Transit", because that is a real corollary also. Remember all the cars shipped with defective parts which the dealers were then expected to fix, so the production line could continue unabated? No? Haven't owned a British car yet, huh?

So here's MY prognostication for the Japan catastrophe impact; Far from being a reason the stock market should drop precipitously, I expect the smart people will realize it is akin to war, which ALWAYS boosts economies. Hopefully the sad victims of this disaster will not feel they need to shoot back, which may limit the absolute waste somewhat. With some luck the engineers at TEPCO will get the crisis in control. With a little more luck the Japanese, who have demonstrated a rare ability to be pragmatic in the face of uncertainty, but are ALWAYS searching for improvement, will learn the lesson for teasing Mom Nature – she is a bitch you don't want to tease often. And maybe they will look for some whacky free-thinkers like me to consider the "what ifs" and frame advice in terms of "Things that must at all times be kept in mind". They can't eliminate earthquakes, nor predict their relative strength. They can't predict how far the wave will come inland. But they CAN predict with certainty that quakes will occur, and that tsunamis will occur, and that fuel deliveries can be interrupted, and that coolant will leak out if cracks develop and yada yada. And even with ALL that, at NO time can the fuel rods and core be allowed to NOT be continuously supplied with cooling from SOMEWHERE, and start making lists of all the possible ways, including piping directly from natural springs up in the mountain so even without power, Japan no longer need think about ANOTHER Hiroshima.

Sure, a lot of infrastructure was taken out, and insurers will be paying a lot of claims. That is their business, and Japan is the third biggest economy on the planet, while being little larger than our smallest state. So future insurance premiums will be a little higher. But not that much. And just think of what the fixing of all that will do for Japanese unemployment. And by globalization, maybe somebody will decide I ain't quite as crazy as they might have thought before the earth moved for them too.

