

## WHY I&C ROOMS DON'T MODERNIZE THEIR INSTRUMENTATION

(8/25/15)

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Nuclear I&C rooms are on the verge of serious consequences due to obsolescence and 1800's technology (analog meters & old digitals). These instruments are being replaced with salvaged/refurbished parts and being purchased for more than 200x their commercial value. Why? This practice has become acceptable because it is convenient, easy and inexpensive and requires NO change to the control room.

It is convenient to buy just a replacement that falls within the "maintenance budget," and ignore the unit's accuracy and reliability. However, is this wise given that an operator relies on it to "control" the most powerful energy we know of, nuclear energy? It is hard to believe that one of the greatest human achievements (harnessing the power of an atomic reactor) is being "controlled" by an operator using such unreliable technology. While this old technology was great in its time, think about what would happen if there was a Fukushima or Chernobyl-type failure next to one of America's largest cities.

Until recently it was uneconomical to invest \$10-20 Million in modernizing I&C rooms, especially when the plant might be ~10-20 years away from the end of its life (decommissioned). In addition, the price of alternative fuels is cheaper and nuclear power plants don't qualify for GREEN subsidies (~90% of their KWH cost is due to federal regulations). Further, converting to a state of the art SCADA/DCS monitoring system with flat screens would cost \$50-\$200 Million. For a plant that might be decommissioned in 10-20 years, this would certainly be suicidal. It is no wonder I&C rooms don't upgrade their instrumentation.

However, control room operators don't yet know that economical control system upgrades are now possible. Otek Corporation has recently introduced their New Technology Meters, which replace Form, Fit & Function any signal driven (V/A DC or AC, including the almighty **current loop**) or externally powered analog or digital meters. These replacements are available at the fraction of the cost of new or refurbished Class 1E meters, without the need to redesign or rewire existing control panels, change signals or reconfigure for emergency back-up power.

In other words, there is a new patented technology that is HMI/MMI compliant and is available with an automatic tricolor LED bargraph and digital display w/alarm pointers, has isolated Serial I/O, and can detect a failed signal (no more stuck needles) even after the current is lost (post-mortem). Some models have already been qualified for 1EEE-323 for Class 1E applications and can be economically customized for specific form & fit because of their modularity and open architecture (making them almost obsolescence proof). What's more, the meters come with the manufacturer's life time warranty.

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Dr. Fest, president of Otek Corporation stated that:

“If I was the I&C manager, I would convert all my signals to **4-20mA** current loop, convert all my instruments to **loop power** and give them all the same panel mount specifications. Imagine how easy and economical it would be to join the digital world. Since the new meters would be signal powered (like their predecessors the analog meter), all that would be needed is a simple re-scaling/calibration and they would become HMI & MMI compliant. Their isolated serial I/O would enable expansion of the current I&C process to a DCS/SCADA system, including an inexpensive DAS, at a fraction of the flat screen/SCADA cost! In addition, if you take into account the new NRC EA-12-051 mandate requiring a dual power supply source for Spent Fuel Pool (SFP) monitoring/control, you have killed 2 birds with one stone.

Attached: 1893 Dr. Weston Analog Meter (Photo credit Hannes Grobe (talk) - own work, Schulhistorische Sammlung Bremerhaven), NTM-9 & NTM-M pictures

