BOHR – OPTIMISAI.O.T.N

WORLD LEADING SOLUTIONS FOR A GREENER ENERGY FUTURE

OPERATION OF A BIOGAS PLANT – A BIOLOGICAL ANALOGY

- Machines and equipment complete physical tasks: they are the "**legs, arms and body**" of the facility that move things around and perform actions
- Instruments measure: they are the "**eyes, ears and nose (Senses)**" of the operation
- Instrument data is sent to the control system(s) – the "**Brain**"
- The Brain interprets the data received from the various Senses and sends (updated/improved) instructions to the Body to improve efficiency of operation and general wellbeing
- BUT what happens when you lose a Sense, or your Brain gets confused?
  - Sometimes the result is extreme compared to the cause…

Source: Giphy

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SOME COMMON ISSUES

- Run out of carrier or calibration gas
  - Symptom: Signal 1 Alarm (stops biomethane injection)
  - Cause: Gas Chromatograph, a key Sense, cannot function without both carrier and calibration gas. The Brain get's a signal that something "bad" has happened which cannot allow normal operation
  - Treatment: Interrogate the Brain to understand what happened, order a man to get some more gas, check the Sense (GC) has returned to normal function and tell the Brain to restart!
  - Remedy: Gas bottles have **instruments** on to tell you the remaining pressure. A Sense! Connect these to the Brain, so the Brain can report when/what preventative action can be taken

A RE-THINK OF PLANT OPERATION AND OPTIMISATION

- A biomethane plant has three principal functions (each with many subfunctions):
  - Produce biogas from organic matter, through AD or other processes
  - Upgrade biogas to biomethane, by stripping out water, carbon dioxide and other impurities
  - Verify/modify quality of biomethane and inject to grid
- Each principal function would benefit, both operationally and financially from integration of more or better measurements
  - The purpose and value of EVERY instrument should be clear. They should EARN money, not COST money!
  - The focus should be increased uptime and revenue, not lowest initial cost
- A collective “Brain” could make use of ALL useful data to take informed, coordinated, site-wide action

PLANNING YOUR I.O.T. OVERHAUL

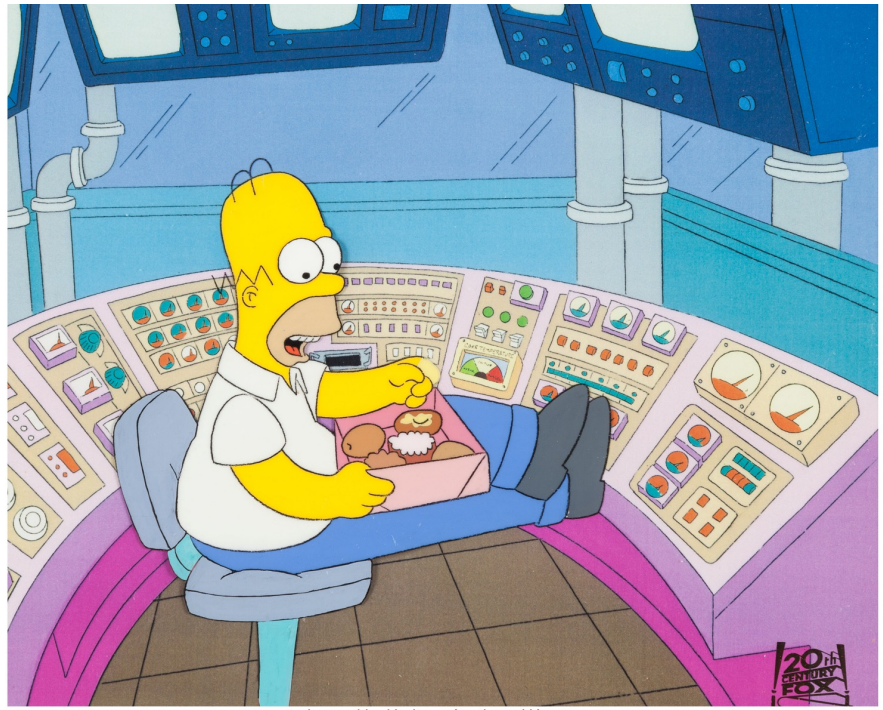
Some questions to consider in determining if an I.o.T. boost could help you:

- Where do you lose most time (and/or money) in your plant operation?
  - Do you know the root cause(s) of your issues, and do you already have instrumentation that could give you advanced indication / warning?
  - Do you have adequate protection and insight into the systems that take longest / most money to fix when they fail?
- Is there a control system running critical systems / operations, or that could be utilised, that would work better if better informed or better connected?
- Are you operationally exposed by a system that requires specialist know-how?

Ultimately, we already have the instrumentation and automation know-how to make operational life much simpler for ourselves!

Q&A

THANK YOU FOR YOUR TIME AND ATTENTION



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