

Report on the COO's Meeting of March 26th, 2018

Provided by John Tharakan, Professor (Faculty Senate Chair Representative)

The meeting took place in the Trustee Board Room in the A Building.

Present were the President, Provost, COO, CFO, VP PFM, Several off their staff; Around eight (8) executives from ENGIE and about five (5) executives from BurnsMcDonnell. I was the sole faculty member in the room.

Two handouts were distributed at the meeting: A Technical Assessment and Strategic Path Forward (a presentation put together by Engie) and an Assessment Report (Developed by BurnsMcDonnell after their inspection and assessment of the steam plant and piping and tunnel systems). I was present for the presentation of the Technical Assessment and Strategic Path Forward by Engie. After Engie's presentation, the President left the meeting with the admonishment "to all faculty members present (only me!) that all material from this meeting was confidential and not for general distribution". On further clarification, the President advised the Faculty Senate Chair that I could speak about the presentation but could not share the actual presentation copy or the Assessment Report (both of which I left with the Chair of the FS).

The meeting began with the presentation by Engie. Engie is a self-described global energy corporation that provides energy solutions for several entities including many college and university campuses. One of the examples touted is their partnership with the Ohio State University in providing a comprehensive sustainable energy solution for OSU. The presentation was broadly divided into three parts: a first technical assessment followed by proposals for containment, a near term plan and a long term plan to comprehensively address HU's steam, heat and utility needs.

Engie: A global energy company with over 150,000 employees and \$60 billion in revenue. They "provide individuals, cities and businesses highly efficient and innovative energy solutions."

Burns-McDonnell (BM): "A full service engineering, architecture, construction, environmental and consulting solutions firm." Engie contracted to BM to undertake the assessment of the HU system.

Technical Analysis – Root Cause:

- Multiple failure points in tunnel piping system leading to large volumes of steam and condensate release flooding utility tunnels
- **Condensate system was not properly designed**
- Improper steam traps installed**
- With severe weather on Jan 2/3 driving heat demand, **multiple leaks lead to large losses of steam** forcing increased steam plant output
- **Inadequate operation and maintenance of boiler water tubes and inadequate feed water treatment** resulted in **ineffective heat transfer** into boiler water.

-overheating of boiler tubes lead to their failure causing water to leak out and extinguish the furnace and eventually shut down of boilers 1 and 3, which remain inoperable.

Containment Plan:

Currently, seven temporary boilers have been deployed to support steam demand. One boiler dedicated to hospital. Steam distribution and condensate piping repairs are on-going.

Visual inspection shows significant reductions in steam escaping.

Near Term Plan:

The near term plan is the proposal from Engie on how to move forward.

- First steps would be to place major steam plant equipment on order
- Begin abatement and demolition of steam plant
- Stabilize the tunnels and piping and implement proper operation and maintenance (O&M) procedures.

Long Term Plan:

- Complete overhaul of the steam system
- On-site generation through rooftop solar and combined heat and power (CHP) systems
- Steam distribution piping systems

These are quite brief descriptions of what is involved at the different stages but for this report I believe that is sufficient. In terms of costs, the near term work is projected to be \$30 million. Steam piping replacement is another \$23 million and the long term solutions with replacement of the distribution network would be \$70 million. Engie's presentation continued with how this had been done at OSU with the long term vision of being an net energy supplier to the neighbourhood and grid.

At this point the presentation stopped and there was a round of questions. One of the key concerns expressed by the CFO was whether the issues around maintenance and operation had any impact on the insurance. I don't believe the answer was clear.

A key component of the discussion was the issue of percentage of condensate return. Percentage condensate return is simply the percentage of the water that was sent into the system as steam that returns to the power plant as condensate. The lower the percentage goes from 100%, there are more leaks in the system. The best practices in industry probably look for a condensate return level of greater than 70%. According to what I heard at the meeting, Howard's steam plant was operating at a 50% condensate return as of last July 2017; this condensate return percentage had apparently dropped to about 5% by December 2017, indicating that the HU piping system was losing over 90% of the steam and for operation of the steam plant, almost all the water had to be made up, another huge load on the system.

At this point, due to the time available, the COO said she was ending that part of the meeting and the cabinet and the faculty senate rep were excused, as they went into an executive session where the Assessment Report from B-M was to be discussed. Hence, I was not present for that report. Having reviewed the document, which is now in the possession of the now-resigned Faculty Senate Chair, the assessment presented in brief summary above holds true, specifically in terms of the root causes.