

Thai Nam Pham

From: Sheri Hartz
Sent: Tuesday, July 9, 2019 3:39 PM
To: Thai Nam Pham
Subject: FW: PG&E Shutdown Challenges for Life Science Companies

Thai –

Please handle this as late correspondence for Item 12.1.

Thanks - Sheri

From: Rich Robbins

Subject: Fwd: PG&E Shutdown Challenges for Life Science Companies

From: Chris Barlow

Date: July 8, 2019 at 11:05:31 AM PDT

To: Rich Robbins

Subject: PG&E Shutdown Challenges for Life Science Companies

Thoughts from Sears and Barlow regarding special challenges facing life science companies from prolonged PG&E outages:

- Research and development (R&D) laboratories differ from office buildings in that the proper operation of the facility - Heating, Ventilation and Air Conditioning (HVAC), power, cold rooms, warm rooms, use of chemical fume hoods, availability of specialty gas delivery systems etc. - is critical to the operation of the company. If the building is not operating properly, then many aspects of the research and development itself cannot proceed.
- Experiments can be sensitive to not only temperature but also changes in temperature which can result from power fluctuations.
- Unlike a traditional office space, the facilities operate around the clock as experiments can run for days.
- Research scientists work in the laboratory - in the event of a power outage, they cannot simply "work from home".
- Many facilities have emergency generators however these do not cover 100% of the building's electrical requirements. Typically critical parts of the HVAC systems and key research equipment are supported by emergency power on the assumption that power will be restored within a short number of hours
- There are, however, often millions of dollars' worth of research stored at -80° centigrade in freezers that can hold their temperature for 24 hours but then start to heat up which can result

in the loss of research materials that may have taken months and even years to generate. These freezers are often not all supported by emergency power on the assumption that power outages will be less than 24 hours.

- The HVAC systems also serve to provide pressure differentials between rooms and corridors which are important for cleanliness and safety. Disruption to the HVAC system can also result in disruption to the pressure cascades.
- R&D companies will need as much notice as possible of pending outages – one hour is insufficient.
- Similarly, our maintenance engineers will need as much notice as possible to make preparations. Websites and text alerts would be helpful in this regard.

Chris Barlow

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