

OH NO !!!!!!!  
Data Centre Disasters

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# Oh No !!!

## Agenda

- Several Quick Examples
- UPS and Water don't Mix
- Low voltage Nightmare
- Summary

Oh NO !!!

## Example One : Previous Company

- December 24<sup>th</sup> 1999
- Ready for Y2k
- UPS and Generator PM's completed
- Can enjoy the Holidays

OR CAN WE?

# Oh NO !!!

## Example One - Previous Company

- 6:00 am receive page from Operations
  - Power hit, both generators started , two of 4 UPS units in alarm
  - Determined neither had synchronized to generator – 1 on each generator working and 1 on each generator not working
  - Used Y2K list to get systems shutdown normally
  - Called UPS and generator vendors
- 6:15 left home for site, picking up OPS MGR on my way
- 7:00 am arrive on-site - so did UPS and Generator vendors
  - Determine 1 was a generator frequency and corrected
  - Determined other was a UPS CSA safety switch – repaired
- 8:00 All systems up and working before needed by clients

# Oh NO !!!

## Example Two

- In Kickoff Meeting for Site Emergency Management
- Receive several pages – Explosion in Data Centre
  - Responded to Data Centre
  - Determine Halon System had dumped
  - Determine cause was FA Technician not bypassing properly
  - Waited for Indoor Air quality tests before allowing staff back
  - No Systems had been affected
- Post Incident
  - Technician had been doing re-programming to add new Dry pre-action which was replacing 80% of the Halon
  - Added external disconnect switches
  - Refilled last 20% of Halon until those areas could be done (Asbestos)

# Oh NO !!!

## Example Three

- Multiple Roof Leaks Over Data Centre
- Landlord Slow in repairing roof
- Found temporary solution
- Purchased and installed more than 10
- Roof has been repaired but still have not taken them down

# Oh NO !!!

## Example Three



# OH NO !!!

## UPS & Water Don't Mix

- 6:00 am Friday Ups 3 , holding 30% of the load fails, taking down several singled powere devices. Dual powered devices remained operational
- 6:05 Determined UPS 3 has been hit with very large amount of water. Facilities and building management notified.
- Building management determines cause is a burst boiler in the penthouse and shuts off water feed.
- 6:45 Facilities arrives on site to assess situation.
- 7:00 Facilities restores power to down devices through by installing static switches on these devices. (had been planned but no outage window had been obtained)

# OH NO !!!

## UPS & Water Don't Mix

- 8:00 water no longer dripping and UPS technician arrives on site
- Battery power to UPS cut in battery room
- Power feed to UPS cut from electrical room
- Wrap bypass invoked and capacitors discharged
- 9:00 Contacted UPS vendor to obtain 2 160 kva Ups units with batteries
- Prepared old battery room to accept new UPS units

# OH NO !!!

## UPS & Water Don't Mix

- 6:00 pm received new UPS
- Midnight – UPS installation complete , ready for power
- Saturday 8:00 am Power connected
- Noon – Temporary UPS online
- 
- This did not delay the 4 module UPS delivery the following Tuesday
- Someone did not get the UPS they had ordered and was ready for delivery. Vendor did not tell me who

# OH NO !!!

## Low Voltage Nightmare

- 18:20 High temperature alarm in data centre. Operations checks and finds about 50% of AC units down. Facilities on-call notified. Facilities contacts HVAC vendor to come on site- ETA 20:30 due to Blizzard Conditions.
- 19:35 – Fire Alarm activated – small server room
- 19:45 – remaining AC units down – loss of power
- 20:00 – fire department silences but can't clear alarm. Allows re-entry to building
- 20:30 – HVAC technician arrives and determines most AC's down – loss of power. On Call electrician contacted by Facilities
- 21:15 – Facilities On call person and electrician arrive. Determine 2 main panels feed HVAC loads 1 and 2 had tripped
- 21:25 Power restored to AC units
- 21:45 Temperature back into normal range. Fire Panel heat alarm cleared

# OH NO !!!

## Low Voltage Nightmare

### What happened

- 17:00 Low voltage from Hydro. Voltage protection units lock out compressors
- 17:20 Voltage back in normal range. Voltage protection units restore power to all compressors on feed 1 at the same time. Inrush trips breaker
- 19:15 Thermal runaway begins
- 19:45 Breaker on feed 2 trips

# OH NO !!!

## Low Voltage Nightmare

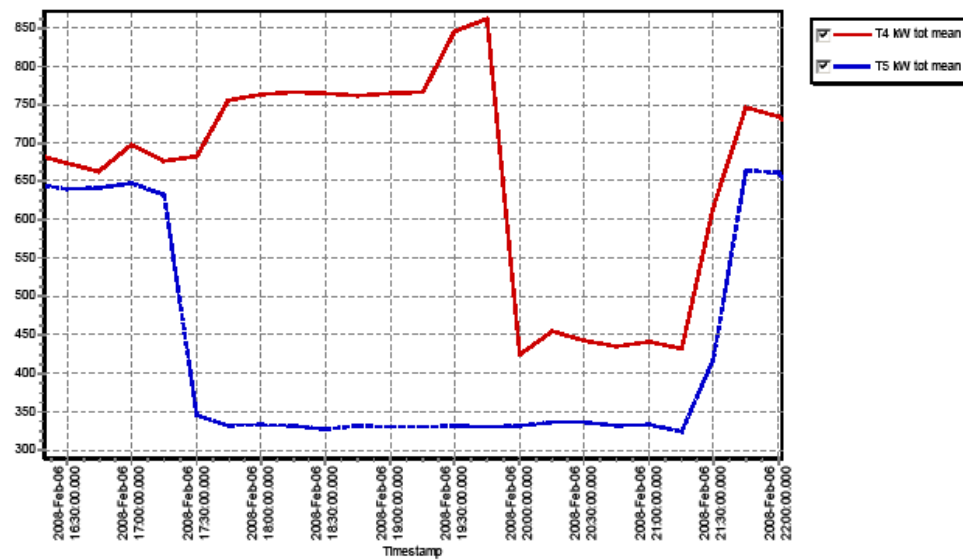
### What happened

WebReach - Graph

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Meter Diagram Change Date Range Show Table

[Edit Graph](#)



Left-click and drag to zoom. Right-click and drag to pan.

# OH NO !!!

## Low Voltage Nightmare Prevention

- Modified timing parameters on voltage protectors
- Modified Operating parameters on AC units
  - Humidification, reheats, etc to reduce power draw
- Installed ducting and used false ceiling plenum for hot aisles to control hot air better
- Split the 2 main HVAC Power feeds into 3 feeds
- Have survived similar low voltage occurrences since then with no issues

# OH NO !!!!!

## Summary

- Being Prepared is Essential
  - Documentation
  - Contracts with reliable companies
  - Dedicate Staff
- Proper Analysis Reduces Recurrences
  - What actually happened and when
  - What can be done to protect
  - What can be done to avoid
- A Little luck never hurts