

Who is liable for damage when PQ supply is out of tolerance?

Real life experience in Bangkok

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PQ Synergy 2016

If you have a PQ problem
what does the Utility Say?

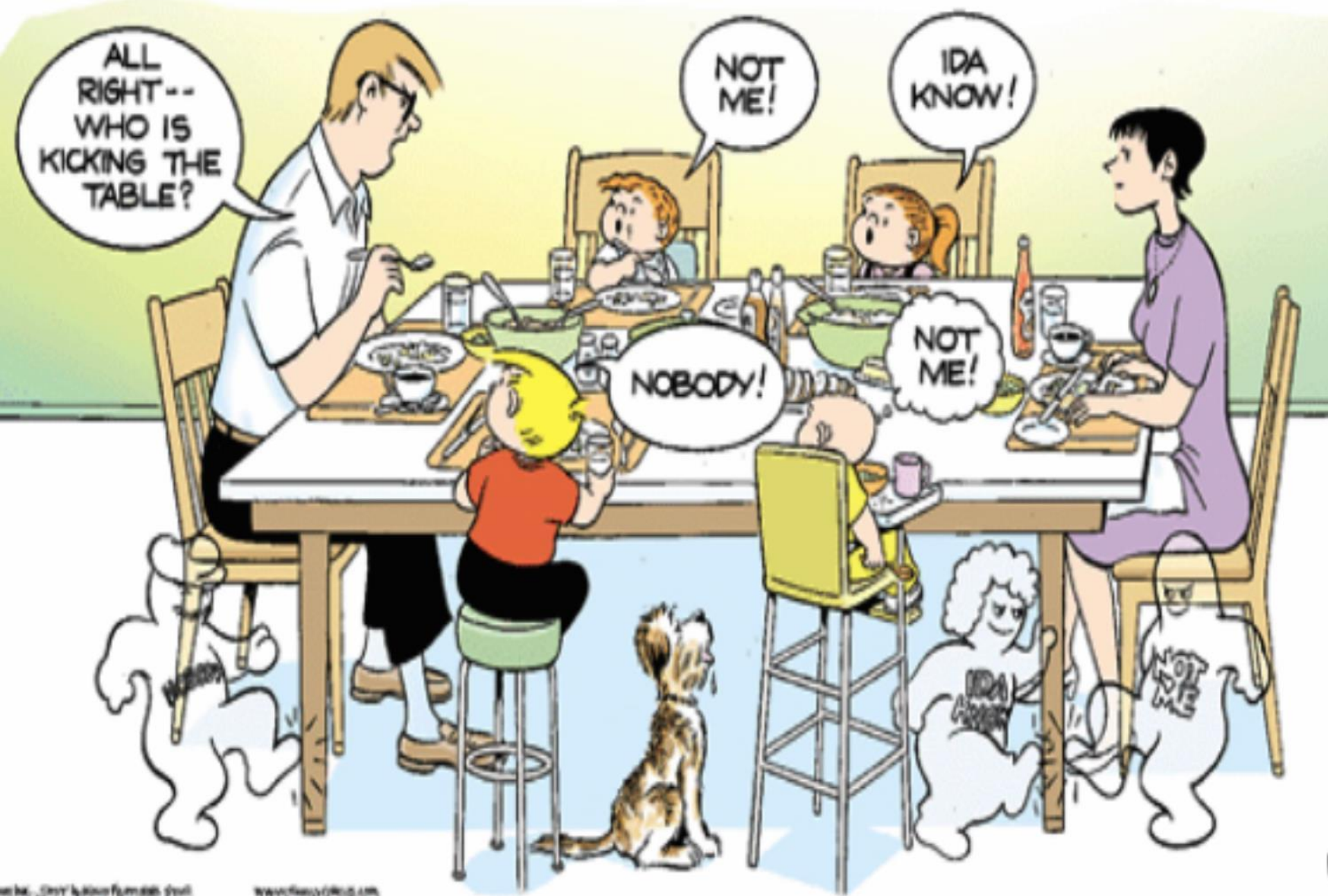
It's Not My Fault

Ida Know

Not Me

THE FAMILY CIRCUS

By Bill



Power Supply Expectations

- Customers purchase electricity and expect to receive a certain level of power quality
- What happens if the power quality does not meet the expectations/requirements
 - PEA/MEA
 - Single Phase Voltage of $230 \pm 10\%$ (207–253V) for a 3-phase supply of 400 V

PQ Voltage Supply Problems

- Voltage less than nominal (sags)
- No/limited liability for suppliers
 - Can't control cars hitting poles etc.
 - Low voltage causes slowdowns, higher current, higher temperature but rarely damages electrical components

PQ Voltage Supply Problems

- Voltage more than nominal (spike, surges)
 - Defined as Voltage greater than 253 V.
- Liability for utility suppliers
 - Over voltage causes equipment damage.

PQ Supply Problems

When an event occurs and you call up your utility supplier and say

“your supply is no good and it damaged our equipment”

What does the utility say?



**Never Admit
To Anything!**

Security Cameras tell the Truth

“Pictures or it didn’t happen”

- For PQ problems that means having a PQ monitor on the feeder

3 April 2016

- Air conditioner stopped working
- Problem with air conditioner
- Found burned bits
- Suspected PQ problem

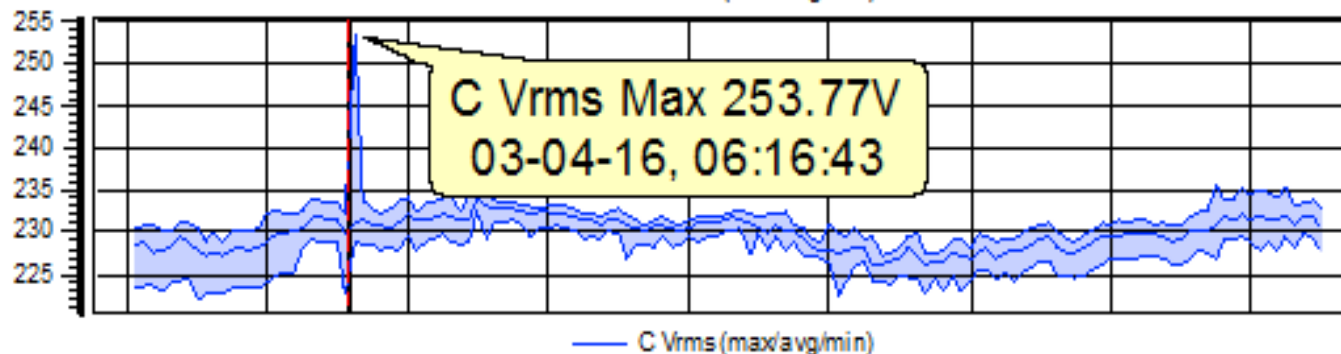
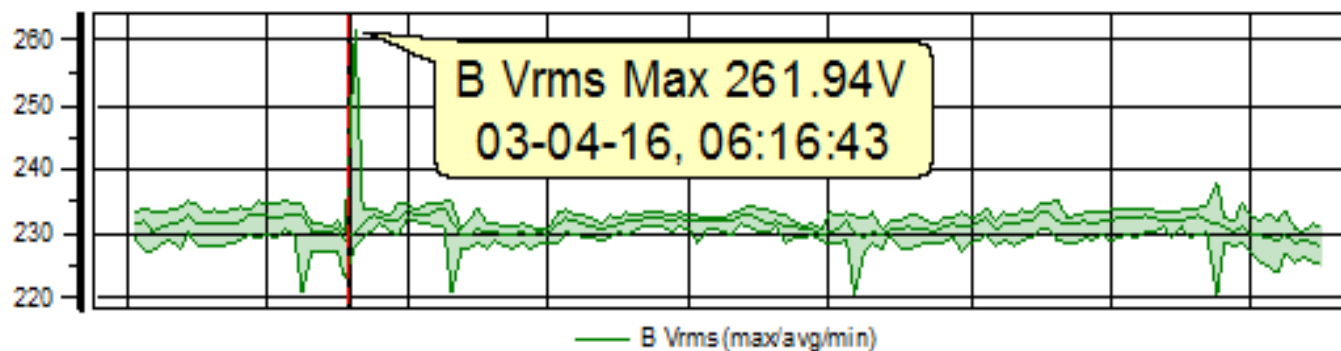
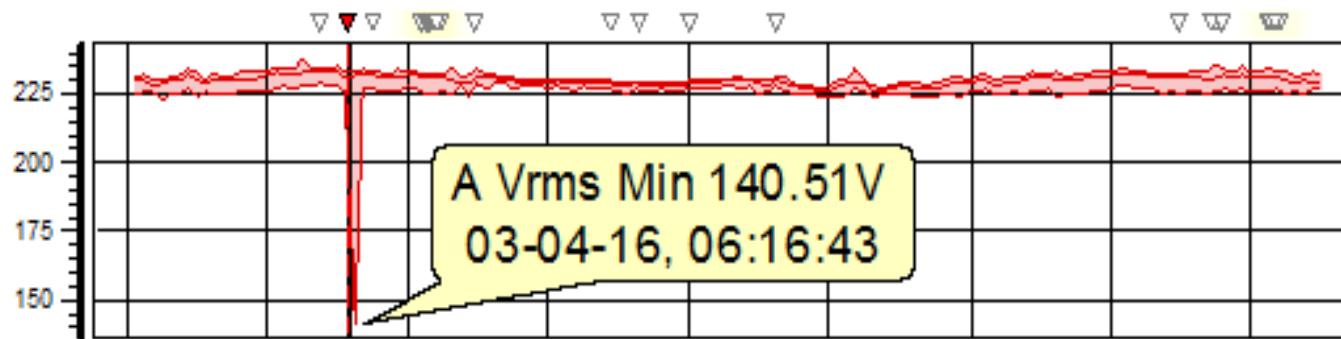


PQ Monitors on the Power Supply

- 2 monitors
 - 1 monitor monitoring power quality-Dranetz Encore
 - 1 monitor set to “energy mode”-Dranetz HDPE



Timeplot

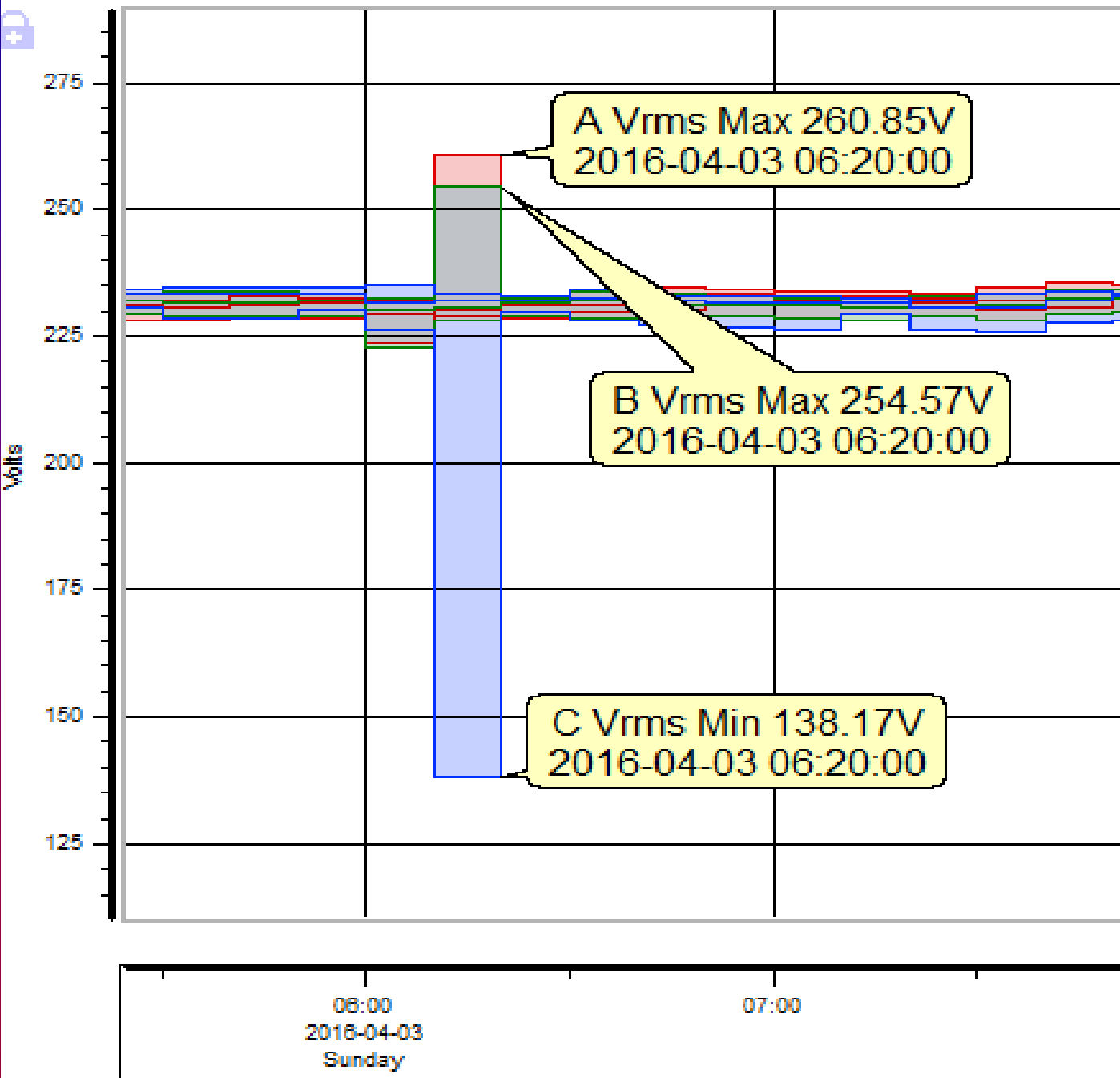


00:00 04:00 08:00 12:00 16:00 20:00 00:00 04:00 08:00
03-04-16 Sunday 04-04-16 Monday

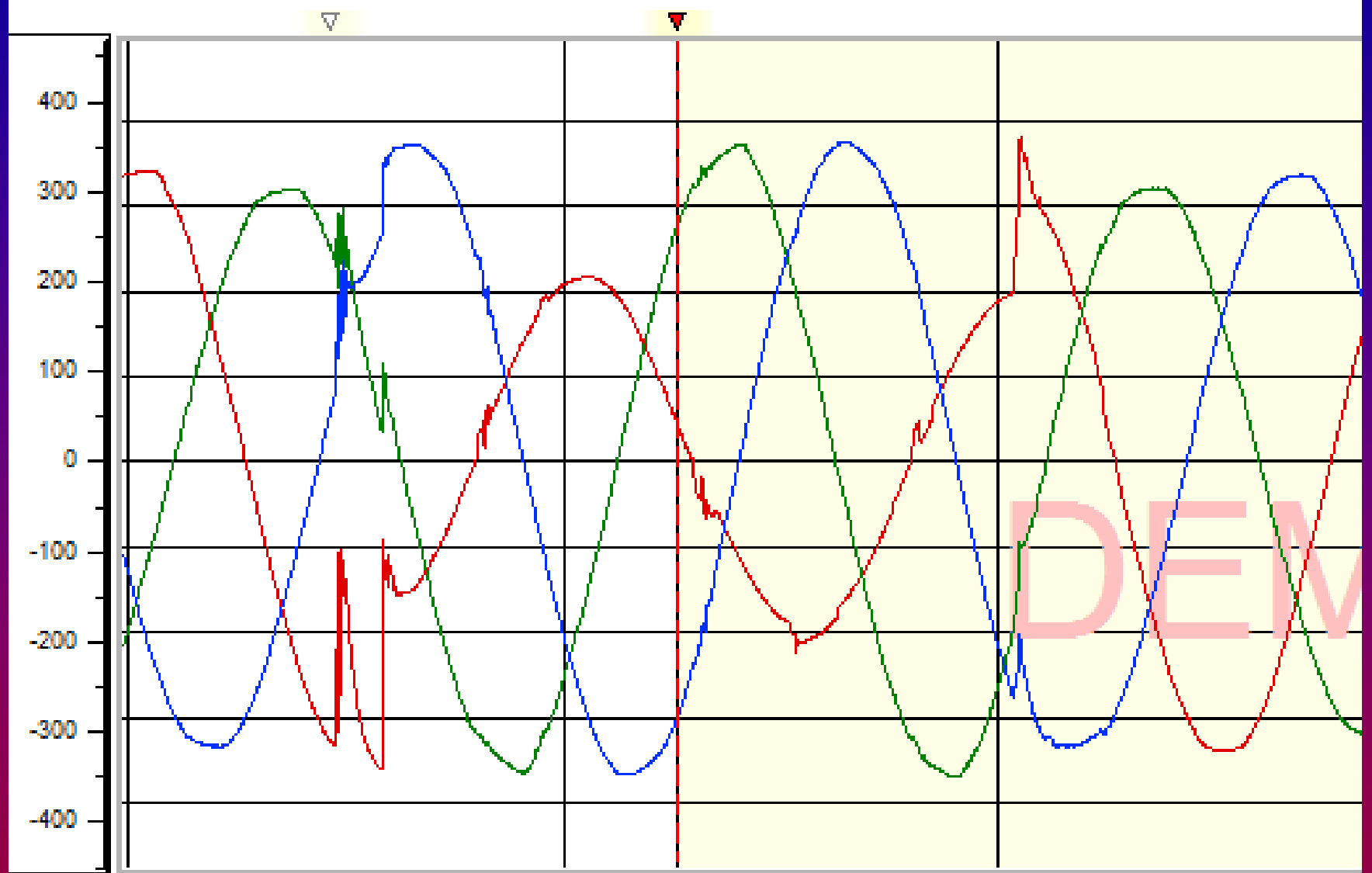
Event #5 at 03-04-16 06:16:43.045
AVrms , BVrms , CVrms Instantaneous Sag

PQ
Monitor
exceed
the limit

Energy Monitor



Event Details/Wavefo



06:16:43.02
2016-04-03
Sunday

06:16:43.04

06:16:43.06

— A — V — B

Result of Surge-Financial Cost

- Damaged air conditioner
 - Replace a/c circuit breaker
 - Replace condenser board

- 9,260 Baht
 - Parts and labor
 - VAT extra

- Small air conditioner 9,260 Baht
- What would the cost be for
 - Automotive paint line (1,000,000 Baht?)
 - Assume 5 cars at once
 - Wafer factory (Intel)
 - Plastic extruding factory
 - Bakery (oven shuts down)
- Damaged equipment
- Loss of productivity
 - Cleaning, down-time for repair, etc.
- Loss of profit

What to do?

- Claim!!!
- 7 April 2016

From: natchuda <natchudat@powerquality.co.th> Sent: Thu 2016-04-07 12:06 PM
To: callcenter@mea.or.th
Cc: 'dara duangta'
Subject: ร้องเรียน เรื่องการจ่ายไฟฟ้าเกิน อากการไฟฟ้านครหลวง ทำให้อุปกรณ์สำนักงานได้รับความเสียหาย

 Message  หนังสือร้องเรียน_กฟน.pdf (1 MB)

ร้องเรียนให้ชดใช้ค่าเสียหายของอุปกรณ์สำนักงาน เนื่องจากปัญหาคุณภาพไฟฟ้าที่จ่ายจากการไฟฟ้านครหลวง
ผู้อำนวยการฝ่ายบริการลูกค้า

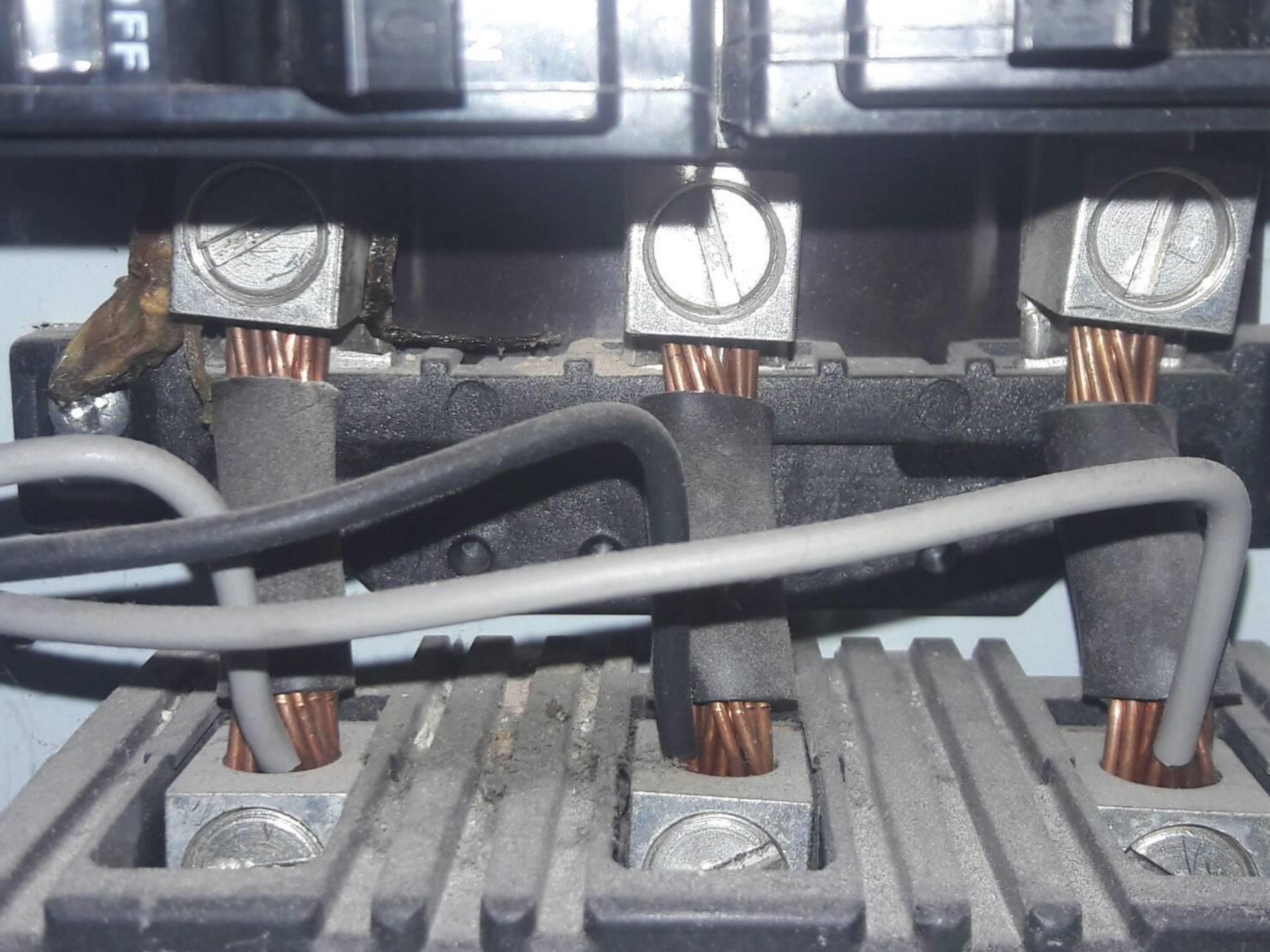
**SURELY A RESPONSE WILL
COME**

**I JUST HAVE TO WAIT
PATIENTLY...**



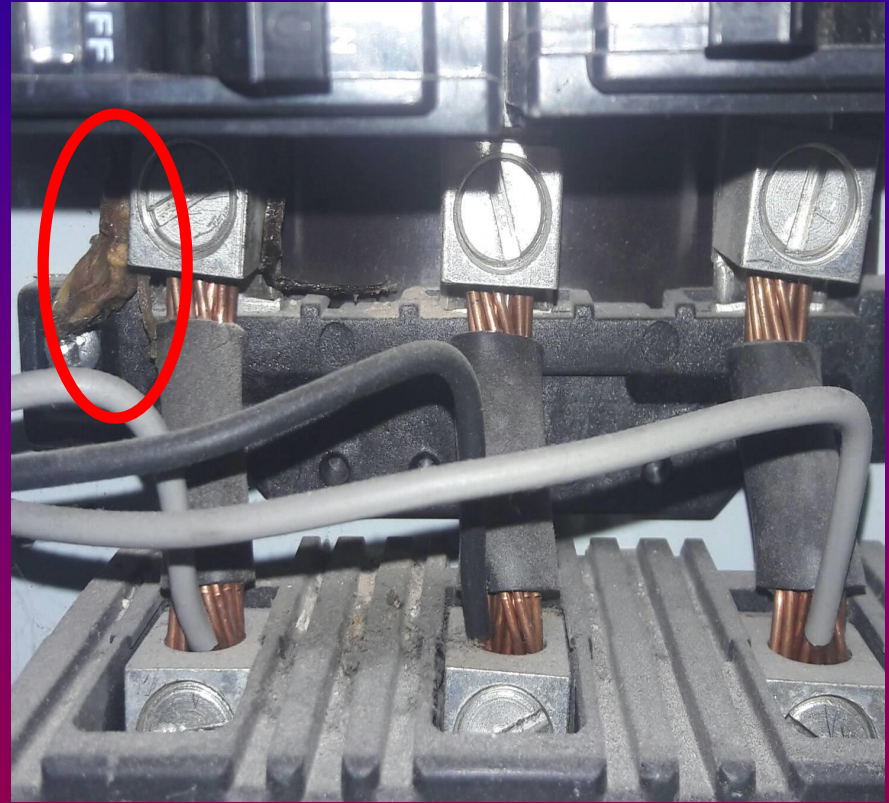
KUDOS to MEA

- Respond just after Songkran
- Site visit on 19 April 2016
- Examined the PQ on 19 April inputs
- Made measurements at the time of the visit
- Issued findings and report



The Result

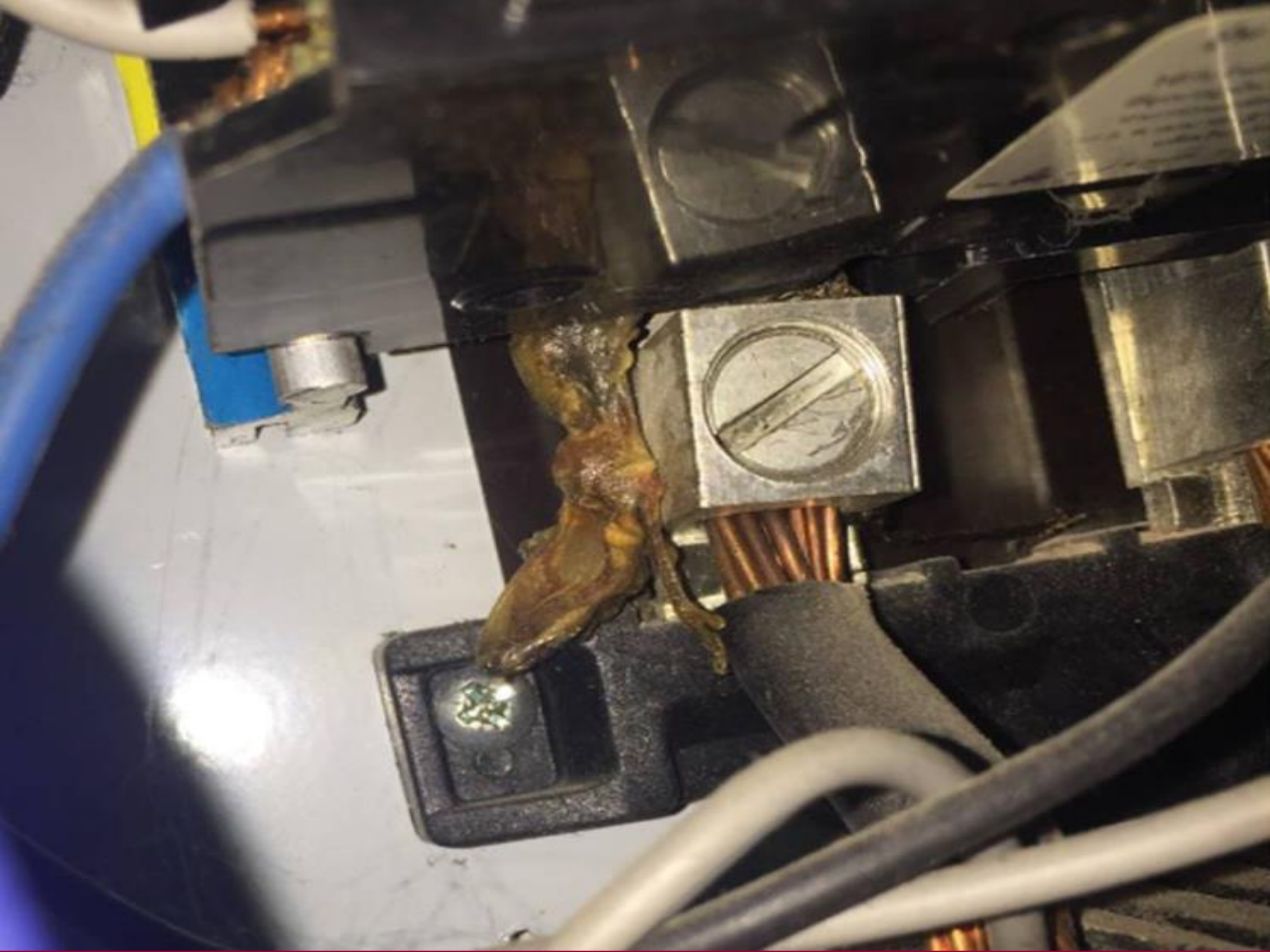
- Not ME(A)
- The lizard did it
- Claim denied
- More investigation showed inconsistencies in MEA's analyses





CSI:

Bangkok



Examination of the evidence shows



- 1 dead lizard
- Lizard is in contact with one phase only
- No external cutaneous thermal injuries
- Date/time of death could not be accurately determined
- The lizard did NOT cause a Phase-Phase short and subsequent surge
- Coincidence that the lizard died in the distribution panel.
- Will appeal to MEA

Summary

- PQ problem caused AC damage
- If there is a PQ problem and you have no monitoring system the supplier will say.....



Conclusion/Recommendation

- PQ problems happen
- Surges can be expensive
- PQ monitor provides a picture of PQ events
- All industries, facilities, buildings should have a PQ monitoring system on the input supply
- Protect their investment
- For retrofitting and repairs