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# Strategic Alliances is the Key to Solve Industrial Companies' Power Quality Issues

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# PRESENTATION OUTLINE

1. Company Introduction
2. Power Supply Challenges
3. Quality of Supply (QOS) Program
4. Case Study
5. Q & A



Founded in 1968, to build semiconductor memory products, headquarter in Santa Clara, USA

In 1971, introduced the world's first microprocessor

Today, Intel is the world leader in silicon innovation, develops technologies, products, and initiatives to continually advance how people work and live.

Source: [www.intel.com](http://www.intel.com)

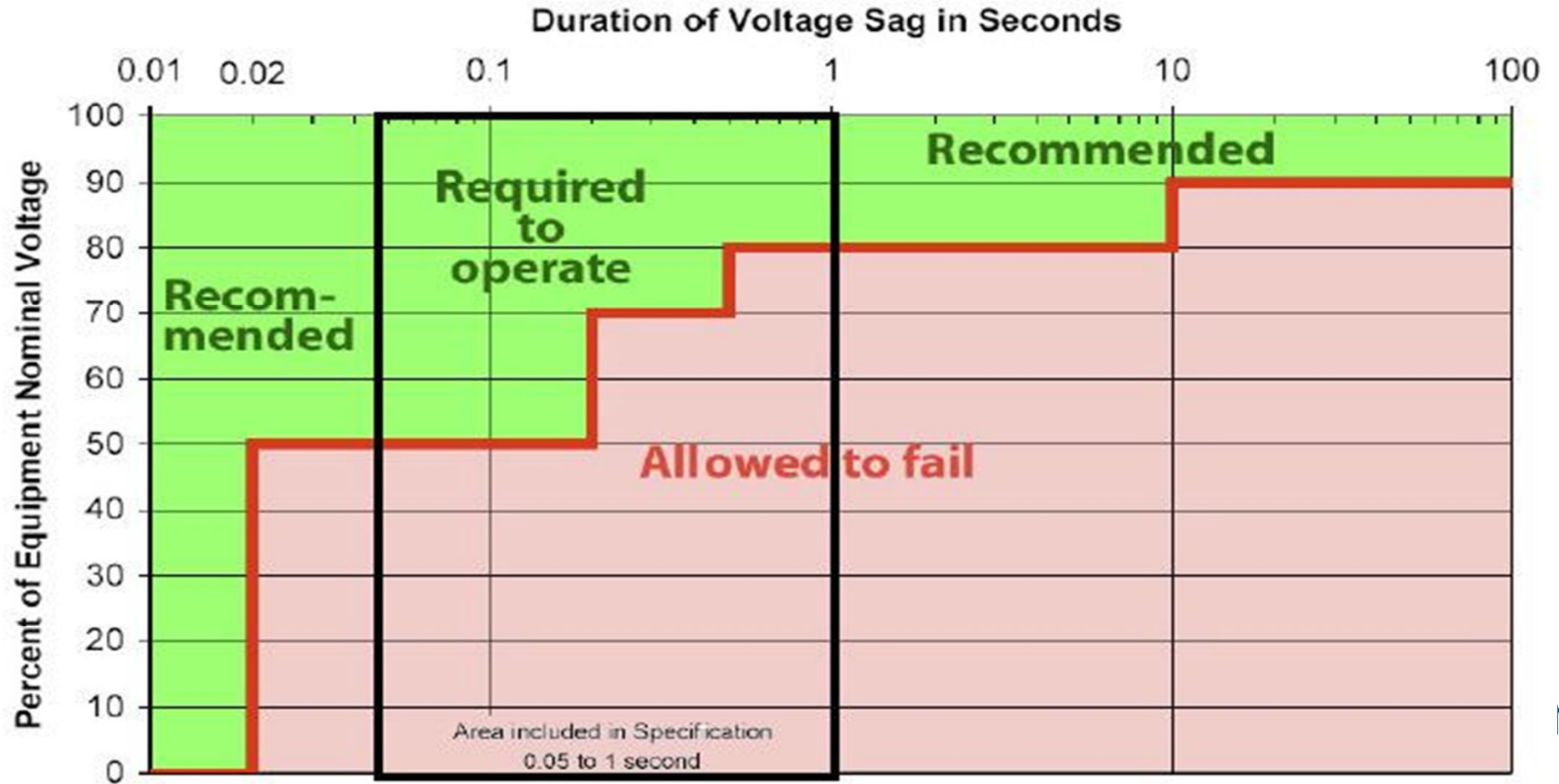


**Average Duration of Power Outages (hours) -  
Enterprise Survey Indicators (Most Recent Data)**

**.ENGES**

Rank	Country	Value
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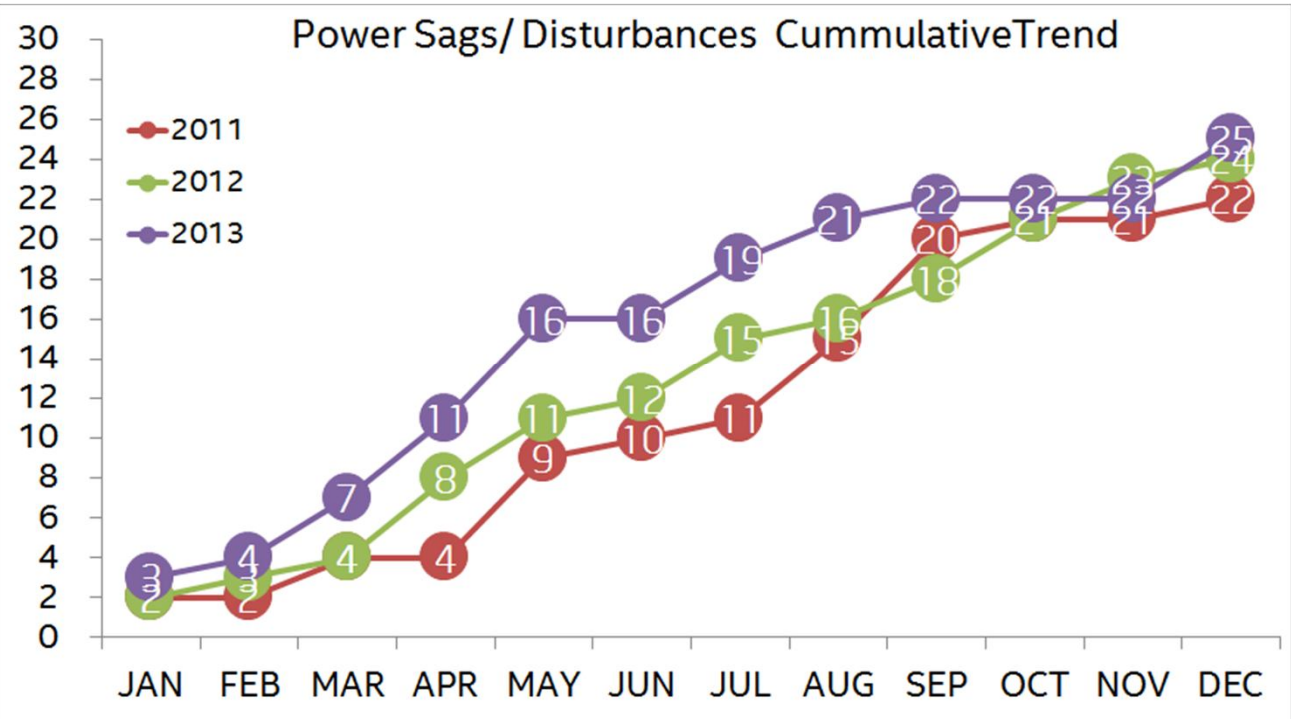
- 1
- 2
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- 8
- 9
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- 11
- 12
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- 15
- 16
- 17
- 18
- 20



**Figure R1-1  
Recommended Semiconductor Equipment Ride-Through Capability Curve  
from 0 to 100 seconds**

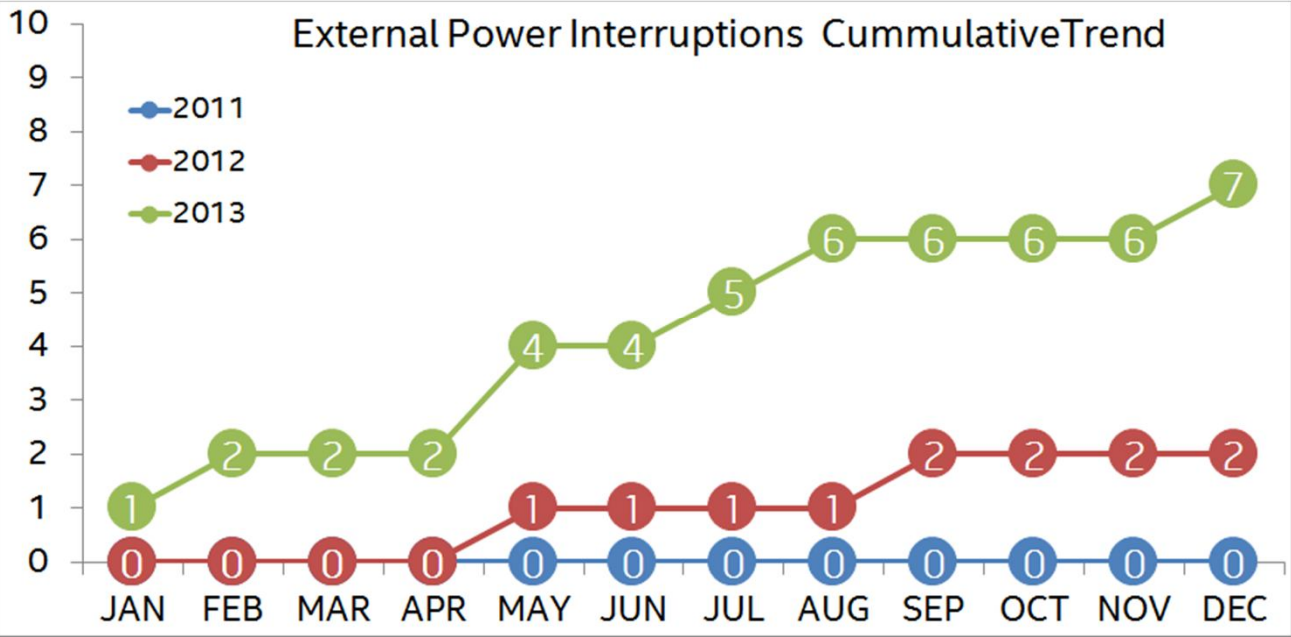
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(\* According to survey was published on [nationsencyclopedia.com](http://nationsencyclopedia.com)



## In 2013

IPV's facility has experienced **25** cases of power disturbance and **7** cases of severe power interruption.



## Caused

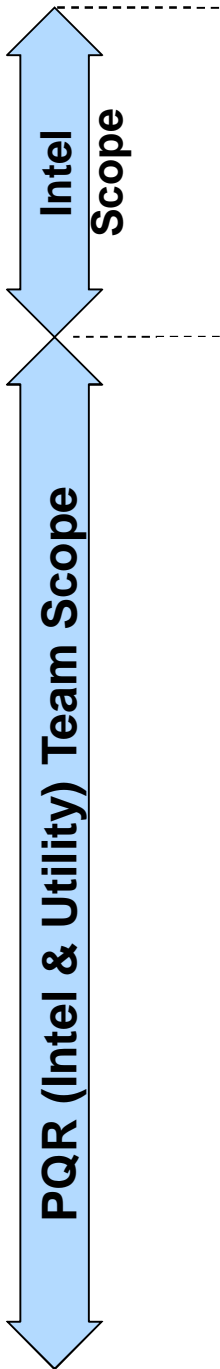
- Impacts to equipment operation.
- Long recovery hours.
- Loss of



‘ A stable and reliable power supply is highlighted as one of the challenges to Intel Products Vietnam’s (IPV) future growth ’

Therefore ...

We have to act



# Quality of Supply (QOS) program's Methodology

# CASE STUDY



‘ Good partnership, flawless communication between Utility agencies and their clients is crucial to the improvement of power quality and

□ Utility agencies and Intel formed a joint team with mission to improve quality and reliability of power supply.

➤ **Objectives**

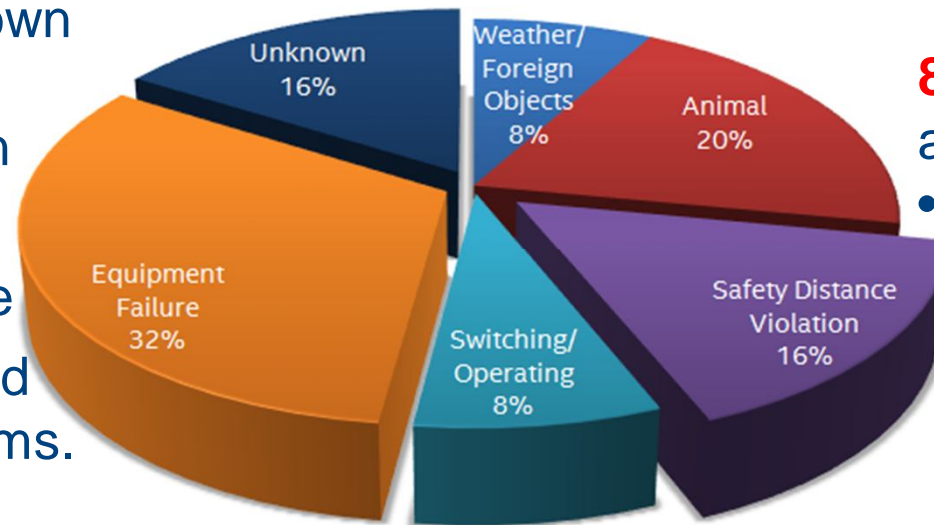
- Align expectations and requirements;
- Provide forum for communication of needs, capabilities, improvement opportunities and monitor performance

➤ **Structure**

- Tactical team to execute the activities;
- Engagement of company’s Corporate Affair Group (CAG)
- Management review committee team to ratify decisions, providing the needed supports and receiving updates.

# Collect data, categorize common causes, identify potential

2013 Power Events in Categories



**16%** unknown

- Improve the root cause identification rate

**32%** Equipment failure

- Harden operation and maintenance programs.
- Enhance predictive maintenance programs with advanced Infrared and Ultrasonic techniques to early detect issues.

**8%** Switching/ Operating

- Be informed
- Be involved into risk assessment activities
- Coordinate with other functional groups
- Alternative time or

**8%** Weather, **20%** animal

- Uncontrollable factors

**16%** Safety distance violation

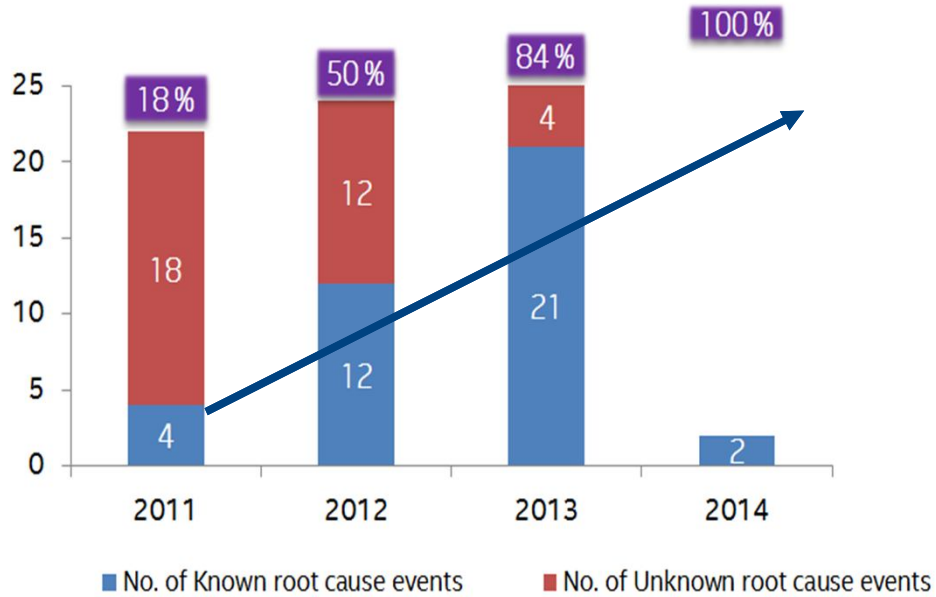
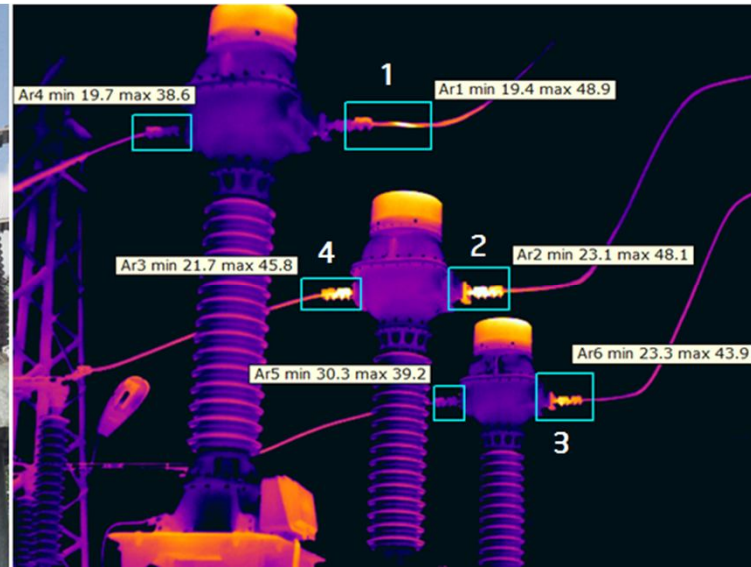
- More frequent field inspection, line patrol.
- Line upgrading
- Impose stiffer regulations and policies
- Public awareness

*"Measurement is the first step that leads to control and eventually to improvement. If you can't measure something, you can't understand it. If you can't understand it, you can't control it. If you can't control it, you can't improve it."*

resolutions

campaign and education

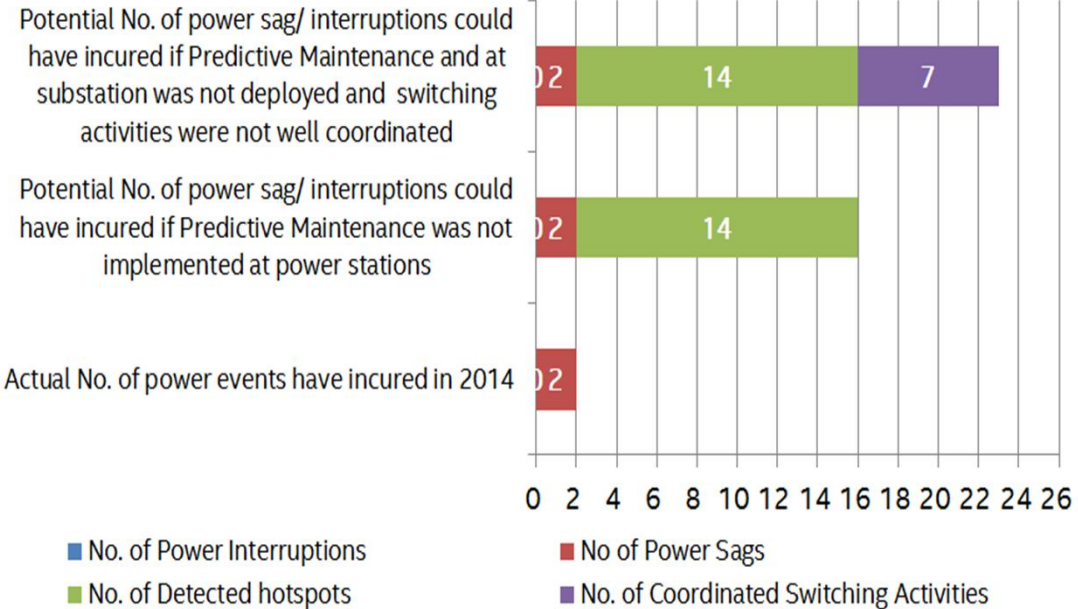
# ' Implement resolutions, programs; prioritize and evaluate '



Potential No. of power sag/ interruptions could have incurred if Predictive Maintenance and at substation was not deployed and switching activities were not well coordinated

Potential No. of power sag/ interruptions could have incurred if Predictive Maintenance was not implemented at power stations

Actual No. of power events have incurred in 2014





*Replaced existing power cable by “advanced composite material to elevate cable from ground*



*Upgraded height of existing electric poles to maintain a*



*Installed and commissioned secondary back-up transformer at 220KV Cat Lai power station, further enhance reliability and flexibility of power supply*



*Regular site patrol and inspection*



*Installed extra fences to protect electric poles in high risk areas*

# ' Information/ education exchange and continual improvement '



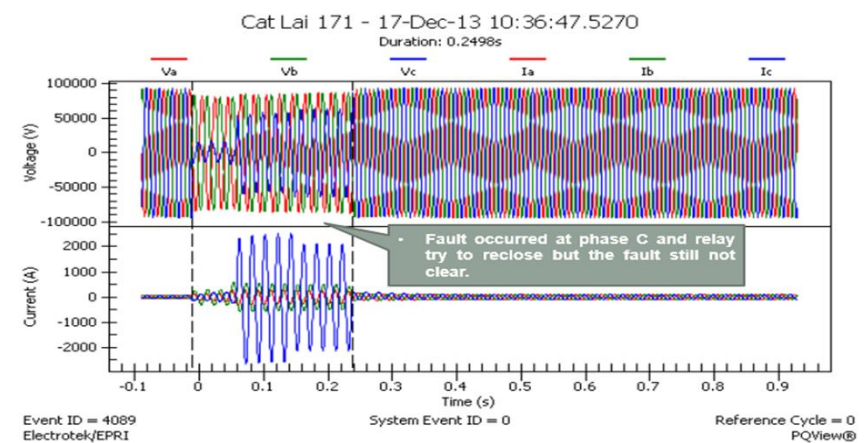
POWER QUALITY SEMINAR



INFRARED THERMOGRAPHY SEMINAR

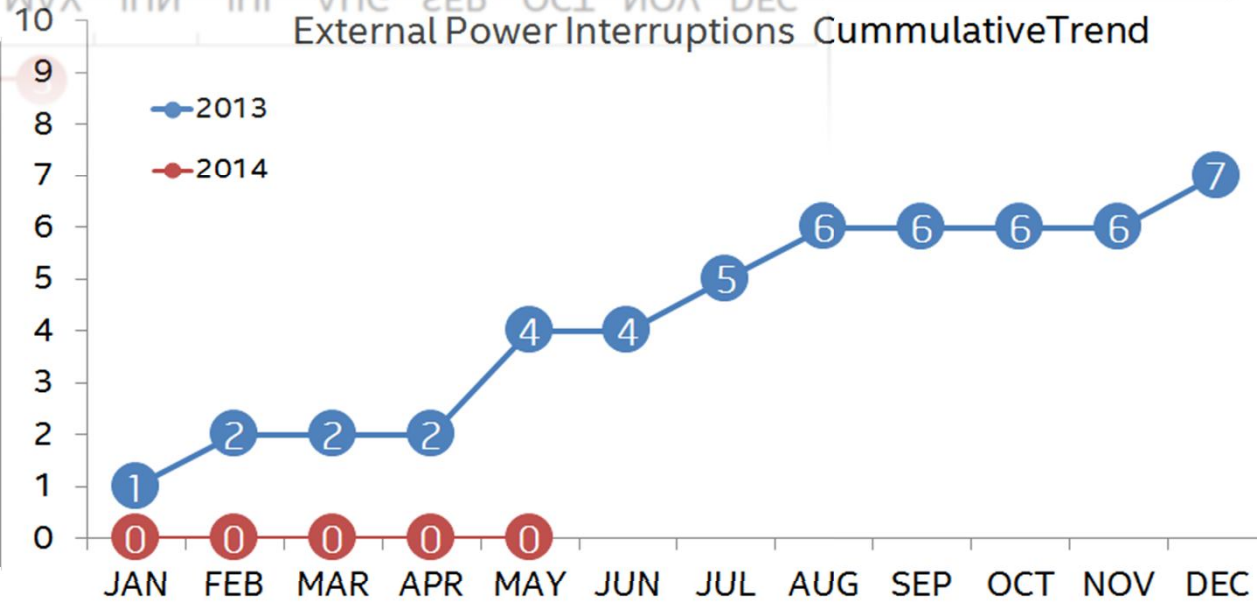
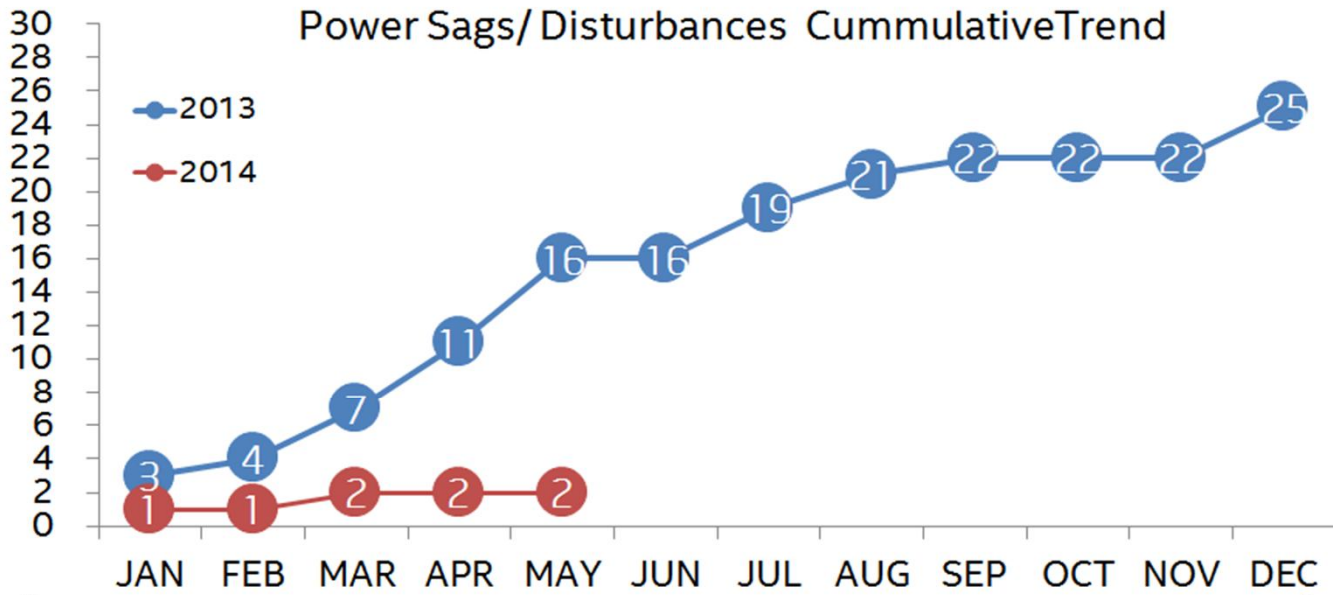


POWER QUALITY SEMINAR



Installed three (03) PQ meters at EVN's power station, collected data to be used to drive improvement solutions

# 'Initial results of the IPV's Quality of Supply (QOS) program'



‘ Internal solution - Introduced internal program to reduce voltage impacts to manufacturing tools ‘



## Facilities Equipment Hardening Program

- Implementation of voltage ride-through solutions for critical facilities equipment that supports manufacturing tools.
- Inability of any single facilities equipment to ride-through on voltage sags will impact operations of a number of manufacturing tools.

## Manufacturing Equipment SEMI F47 Program

- SEMI F47 is a methodology to identify equipment sub-components that are susceptible voltage sags

# 'Keys Take Away'

1. Effective communications and structural working methodologies are key to long term success of the QOS program
2. Data collection and root cause investigation of power events or incidents are tangible foundations to the understanding of power supply behaviors, therefore enabling the identification of improvement resolutions.
3. Strategic alliance among stakeholders, Utility agencies and clients, is crucial to the sustainability of power quality improvement.



THANK YOU

# Q & A