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# BPA Fast Facts

## **General**


BPA Established	1937
Service area size	300,000
Pacific NW Population	12,799,571
Transmission Line (Circuit miles)	15,239
BPA Substations	261
Employees (FTE)	3,175

## **BPA Customers**

Cooperatives, Municipalities, Publics, Federal Investor owned, Direct, Port, Tribal Transmission	142 483
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## **Other**

RAS Schemes	21
Hourly Transactions	150,000/month
Other Balancing Authorities	17
Interchange Points	247
Flow Gates	25
Peak Load	11,000 MW
Wind	4,500 MW

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- What one thing did you want to gain from this conference?
  - What technical problem are you currently working on or see coming to the electrical utility industry?
  - How much time did you spend last week on that issue?



*Here's What I See*







Scheduling



Communication Network



Asset Management



Protection & Control



SOC/NOC

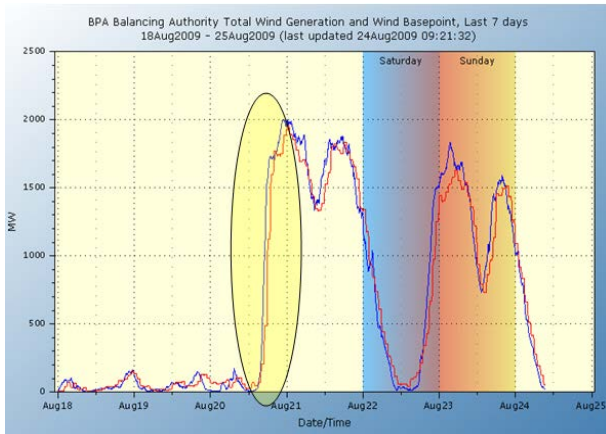


Dispatching

$$ATC_{ij} = \min \left\{ \frac{|S_{ij}^{max}| - |S_{ij}^0|}{LSP_{ij}}, \forall i \in n_i \right\}$$

Static Transfer

# Technology Changes



Wind Forecast



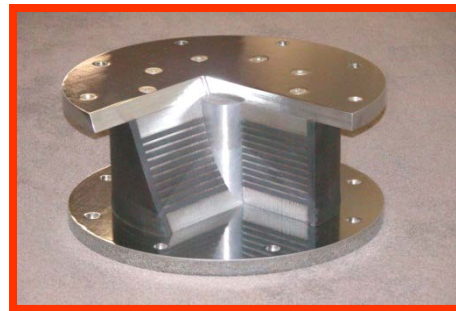
Line Shunts



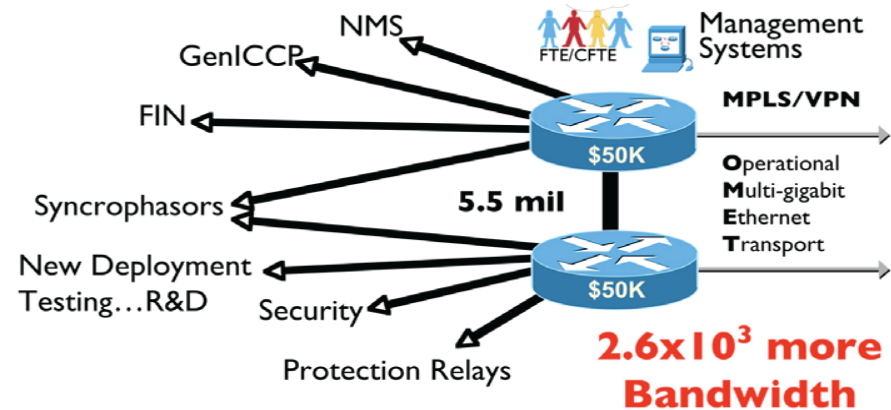
Synchrophasors



Fall Protection



Earthquake Hardening

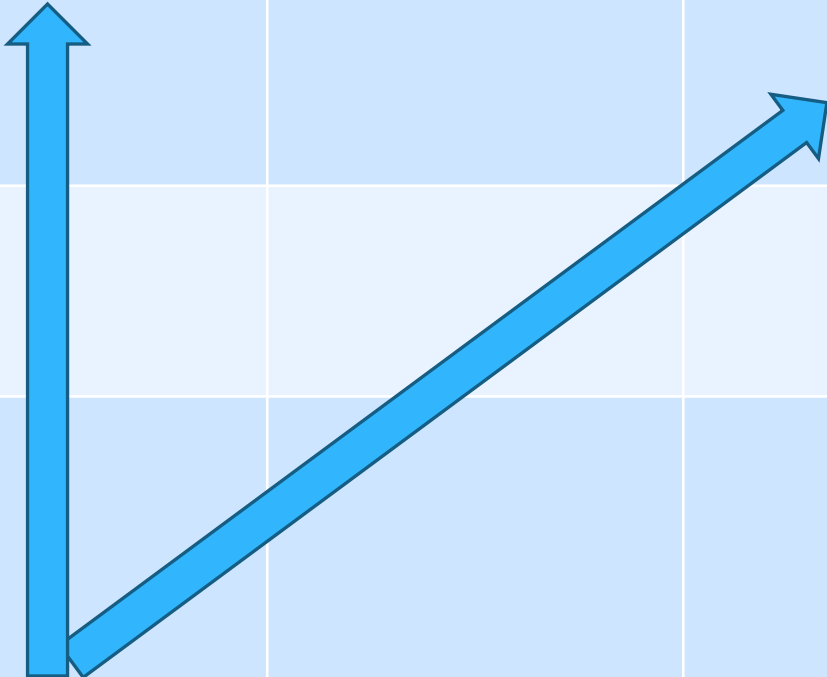


Telecommunications



# Maturity Levels Development and Adoption

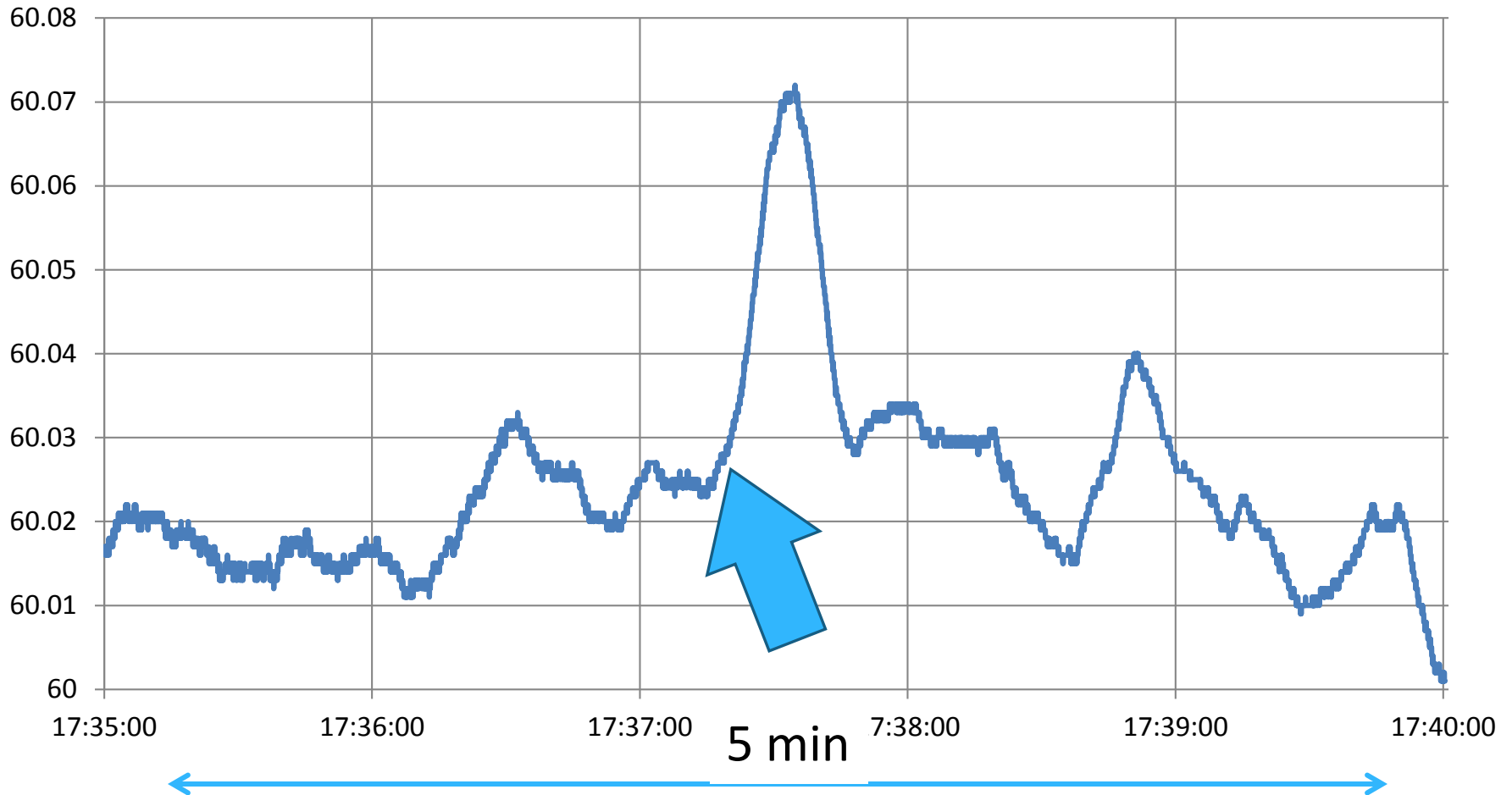
	Current State Assessment	Finding Real Time Limits	Optimizing RAS and control actions
Transient Stability Assessment			
Voltage Stability Assessment			
Thermal overload, powerflow solution			




**Table 1. Generator Reliability Scorecard – Draft 1**

		Synchronous Interconnection					Inverter based Interconnection				Demand Response	
		Coal	Natural Gas Simple Cycle	Natural Gas Combine Cycle	Nuclear	Hydro	Grid Scale Wind	Grid Scale PV	Dist. PV	Dist. Battery Storage	Large (Industrial /Comm.)	Small (Aggregated)
Volt/Var Control												
Frequency Control	Inertial Response											
	Primary Frequency Response (droop)											
	Regulation											
	Load Following / Ramping											
	Spinning Reserve											
Short-term Availability (Fuel)												
Short-term Availability (Plant)												
Long-term Availability												
Black Start												
		5	4	3	2	1	0					

# System Frequency





Data will be the basis of competitive advantage going forward, calling it “the next natural resource.” It will change how decisions are made, how value is created and how value is delivered.

Many more decisions will be based on predictive elements versus gut instincts.

In the near future, “your value will not be what you know, but what you share”.

Ginni Rometty – CEO IBM, March 7, 2013