



LEX COORS
VP DTEG &
Chief Engineering Officer

ABOUT INTERXION

11 Countries

13 Cities

36 Datacenters

75% of sustainable Energy

Approx. 80,000 m² Customer space



MILESTONES

- 2000 DER
- 2000 Standardization of vendor
- 2000 Modular buildout
- 2003 Energy Overhead monitoring (later called PUE)
- 2004 Pioneered Cold aisle containment
- 2006 Energy efficiency (Design PUE 1.3)
- 2007 Founding member of Uptime Institute EMEA
- 2008 One of the first EMEA companies to join “The Green Grid”
- 2008 Stakeholder European Commission JRC
- 2009 Member of TGG Tech Committee
- 2010 Member of TGG Advisory Council
- 2011 Coalition group for the Uptime M+O program
- 2012 ASHRAE (Associate and Speaker)
- 2013 Vice Chair position GEC (Governmental Engagement Committee)

DATA CENTER RATING TIERS & SPACE

Tier I

non-redundant capacity components and a single, non-redundant distribution path serving the computer equipment.

Tier II

redundant capacity components and a single, non-redundant distribution path serving the computer equipment.

Tier III

Concurrently maintainable data center has redundant capacity components and multiple independent distribution paths

Tier IV

Fault Tolerant data center has multiple, independent, physically isolated systems that provide redundant capacity components and multiple, independent, diverse, active distribution paths simultaneously serving the computer equipment

BE CAREFUL WITH THE NINES

SLA of 99.999% which is commonly interpreted to mean unavailability of 5.26 minutes/year or 0.44 minutes/month.

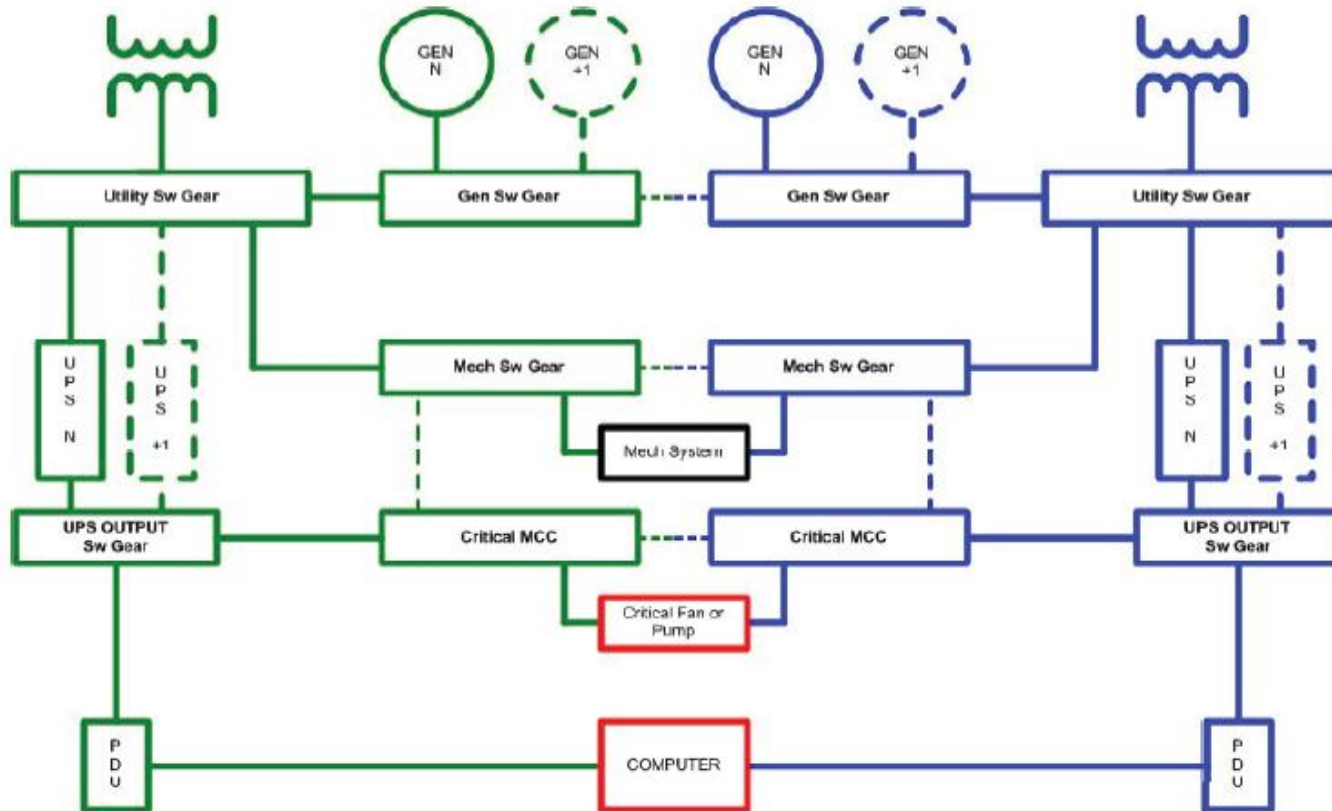
Does this look good to you?

99.999% availability means 0.44 minutes/month unavailability or 26.4 seconds/month???

Losing the data centre once every month for 20 seconds I would still stay within SLA.

NOT TO SPEAK of 1000 outages a month of 20 msec

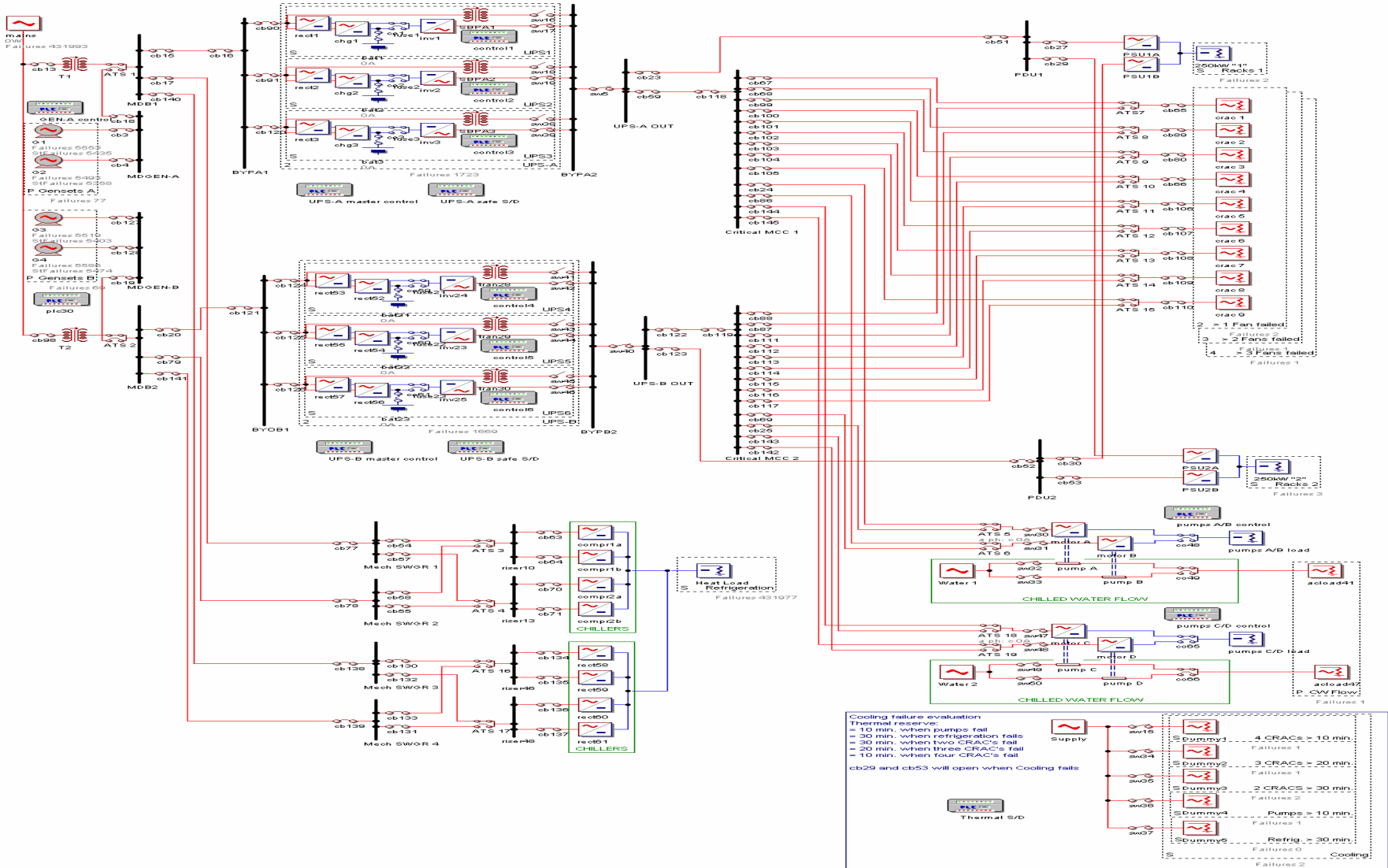
DESIGN



DESIGN

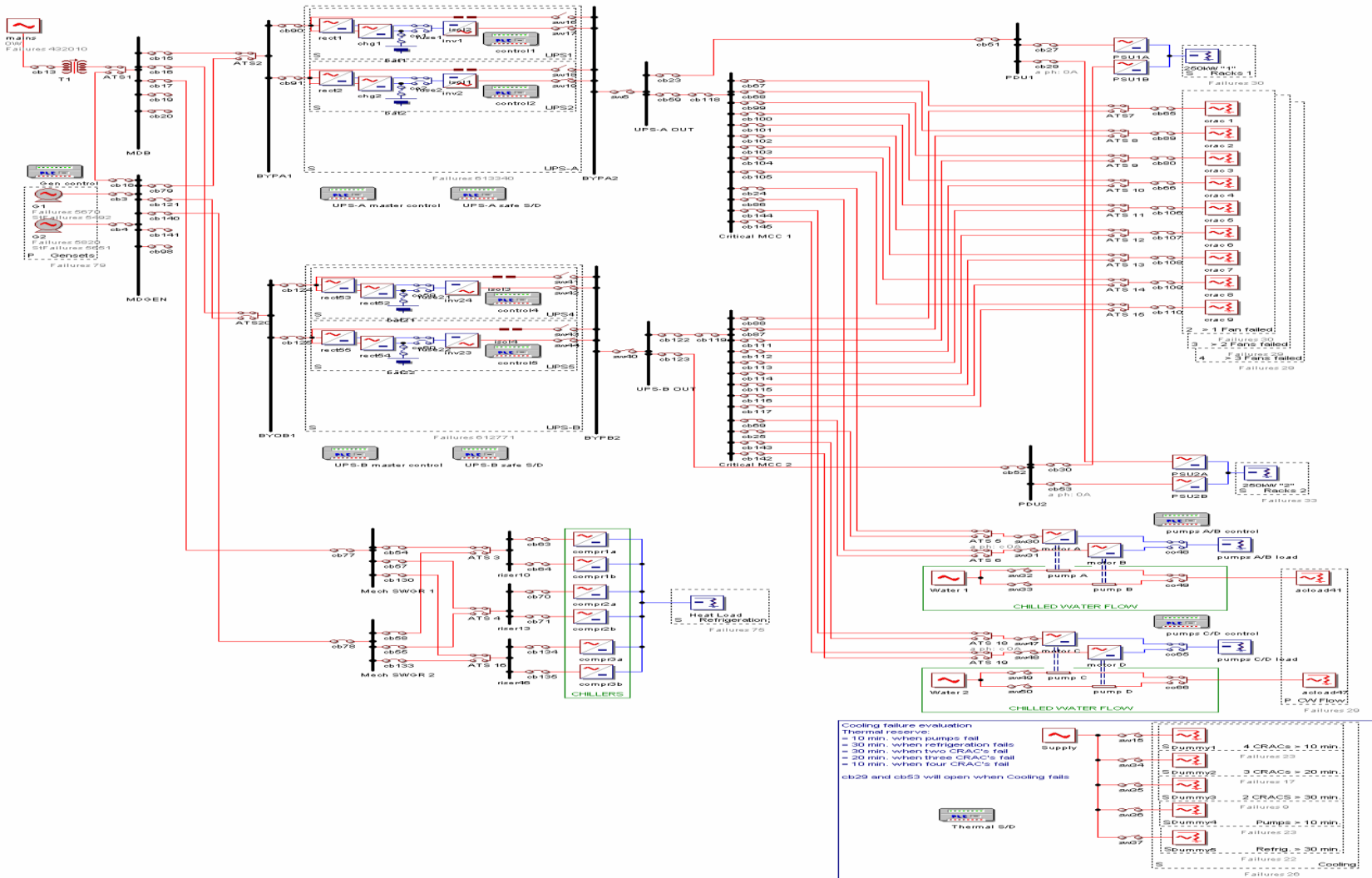
Tier IV as per the old Uptime

Component	NumFailures	MTBF(yrs)	MTTR(hrs)	Av(%)
Racks 1	2	114155	4.77964	99.99999952
Racks 2	3	76103.5	5.07108	99.99999924
Cooling	2	114155	5.67529	99.99999943
Genersets A	77	2965.07	5.72399	99.99997796
Genersets B	69	3308.85	5.73348	99.99998022
UPS-A	1723	132.507	2.97602	99.99974362
UPS-B	1669	136.794	2.93457	99.99975511



Y2000 STANDARD

System	NumFailures	MTBF(yrs)	MTTR(hrs)	Av(%)
Racks 1	41	5568.55	0.43206	99.9999911
Racks 2	43	5309.55	0.576087	99.99999876
Gensets	77	2965.07	6.04903	99.99997671
Cooling	24	9512.94	0.653932	99.99999922
UPS-A	613820	0.371249	6.02024	99.81522568
UPS-B	612185	0.372238	6.02481	99.81557608



WHY DO WE CARE

Observations from the studies:

There is hardly a difference in the “statistical” availability

CAPEX

Let us assume a 1,000 m² virtual data centre designed for 2 kVA/m² customer load

The CAPEX savings vs. Tier IV as per Uptime doc. looking at components only and assuming 30 % mark-up for installation

2 * 3,050 kVA generators = 1.2 million Euro

2 * 1,000 kVA UPS = 0.8 million Euro

Extra Switchgear/ Panels/ Cables = 0.5 million Euro

Installation cost 30% = 0,8 million Euro

Total 3.3 million extra CAPEX/ 1,000 m²

Both for construction and for replacement

OPEX

Efficiency

Idle infrastructure create extra losses

A lean infrastructure typical PUE is 1.3

On a yearly base 22,776 MWh

A Tier IV typical PUE is 1.5

On a yearly base 26,280 MWh

If we assume 70 Euro/MWh

Energy saving on design choice 245 k Euro/1,000 m²/ year

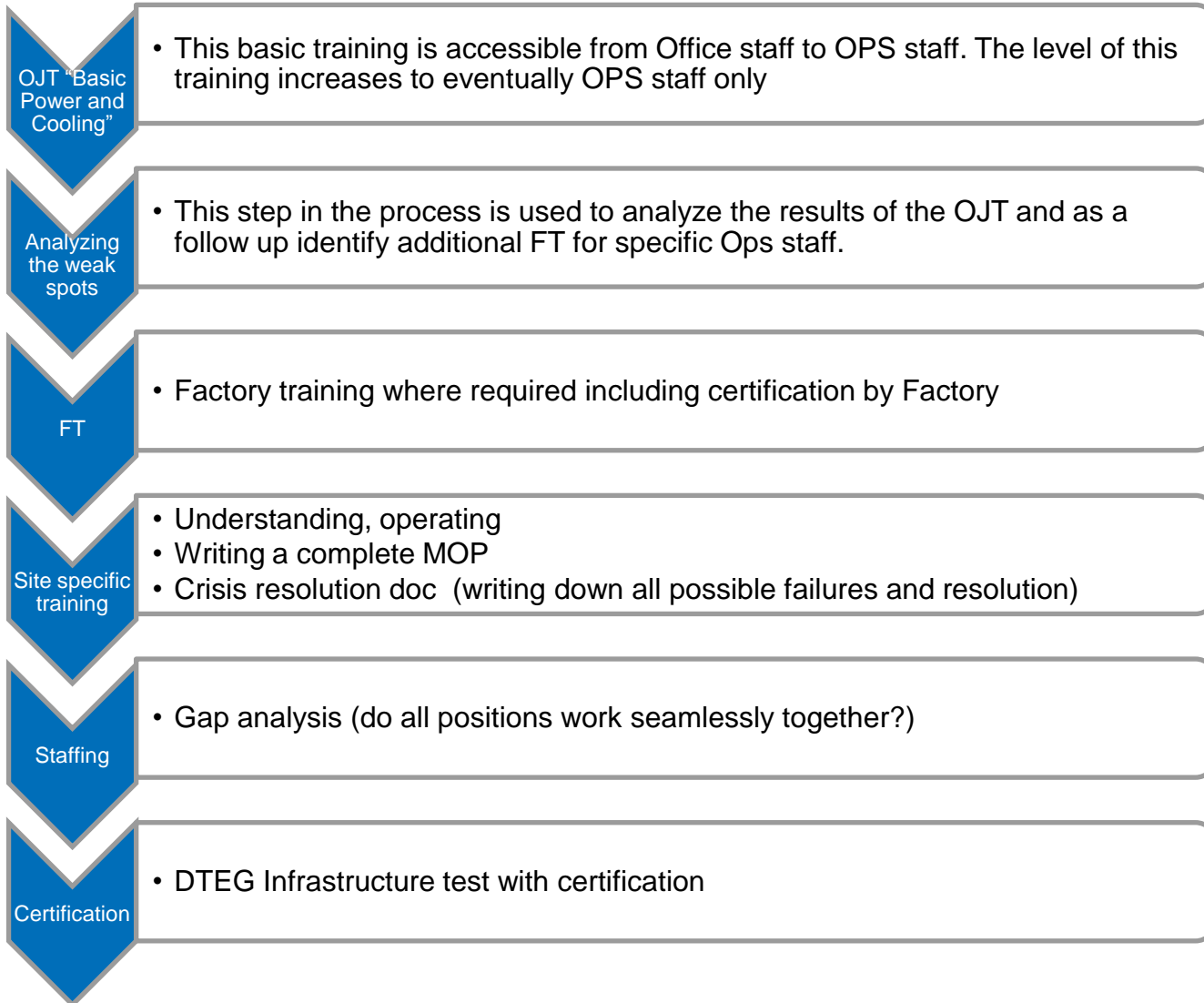
Maintenance

Approx. 30 k Euro/ 1,000 m²/ year

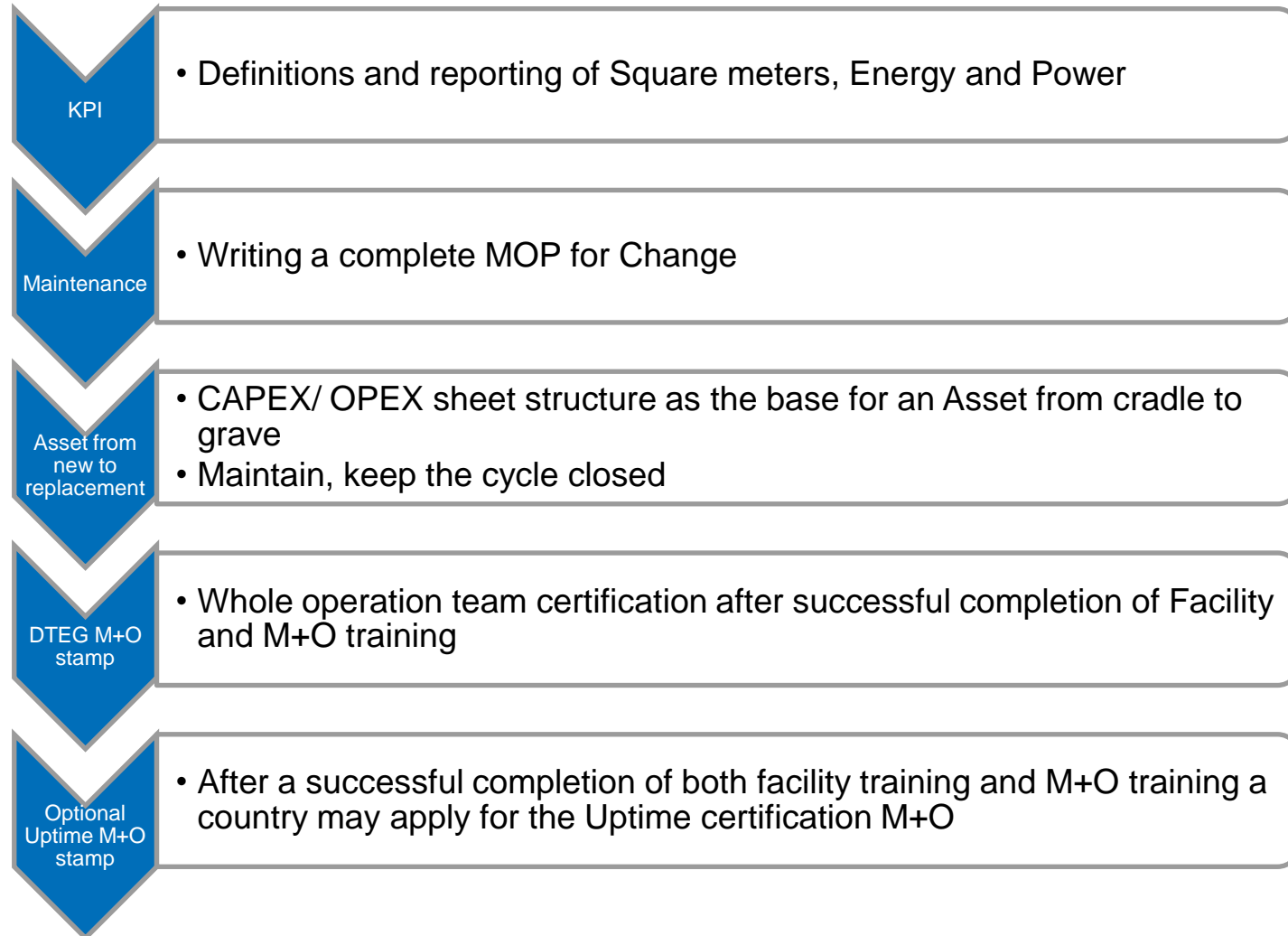
EFFICIENCY AND SUSTAINABILITY

- 1999 UPS systems with 96 % efficiency
- 2003 Measure and improve Energy Overhead
- 2005 UPS systems with 97 % efficiency
- 2005 New builds designed with free cooling
- 2006 Design PUE 1.3
- 2010 New builds designed with adiabatic “free cooling”
- 2010 Use of seawater cooling
- 2012 Use of salt water aquifer for cooling
- 2013 Design PUE 1.2
- 2013 Interxion is 75% of sustainable energy

FACILITY TRAINING



M+O TRAINING



TO SUMMARIZE

We Build & Operate

Modular, Energy efficient, Sustainable, Reliable,
CAPEX and OPEX smart Datacenters

