



JUNE, 2018

# Opportunities for Digitalization in Power Sector

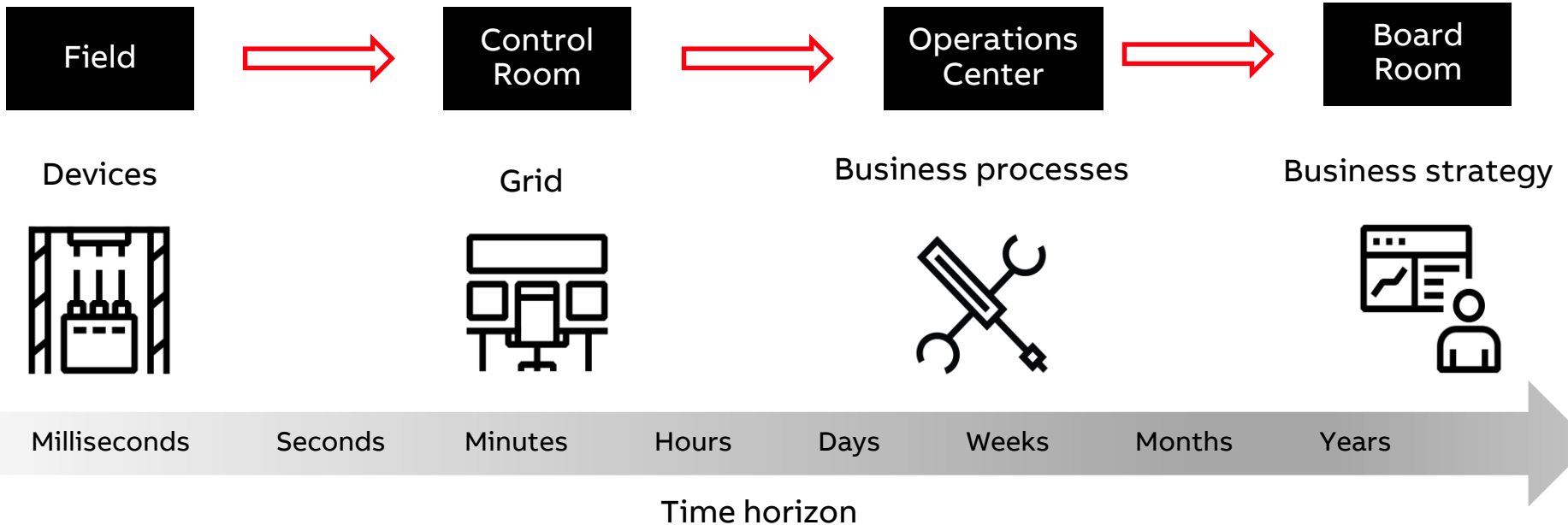
Asia Clean Energy Forum , Manila

Yogendra Patwardhan

# Digitalization

Field to Board room

The need for **faster decisions** and increased business agility requires greater **visibility** of the entire business



**Digitalization** is key for the necessary agility and speed of decision-making

# New challenges for utilities and suppliers

## Substation automation challenges

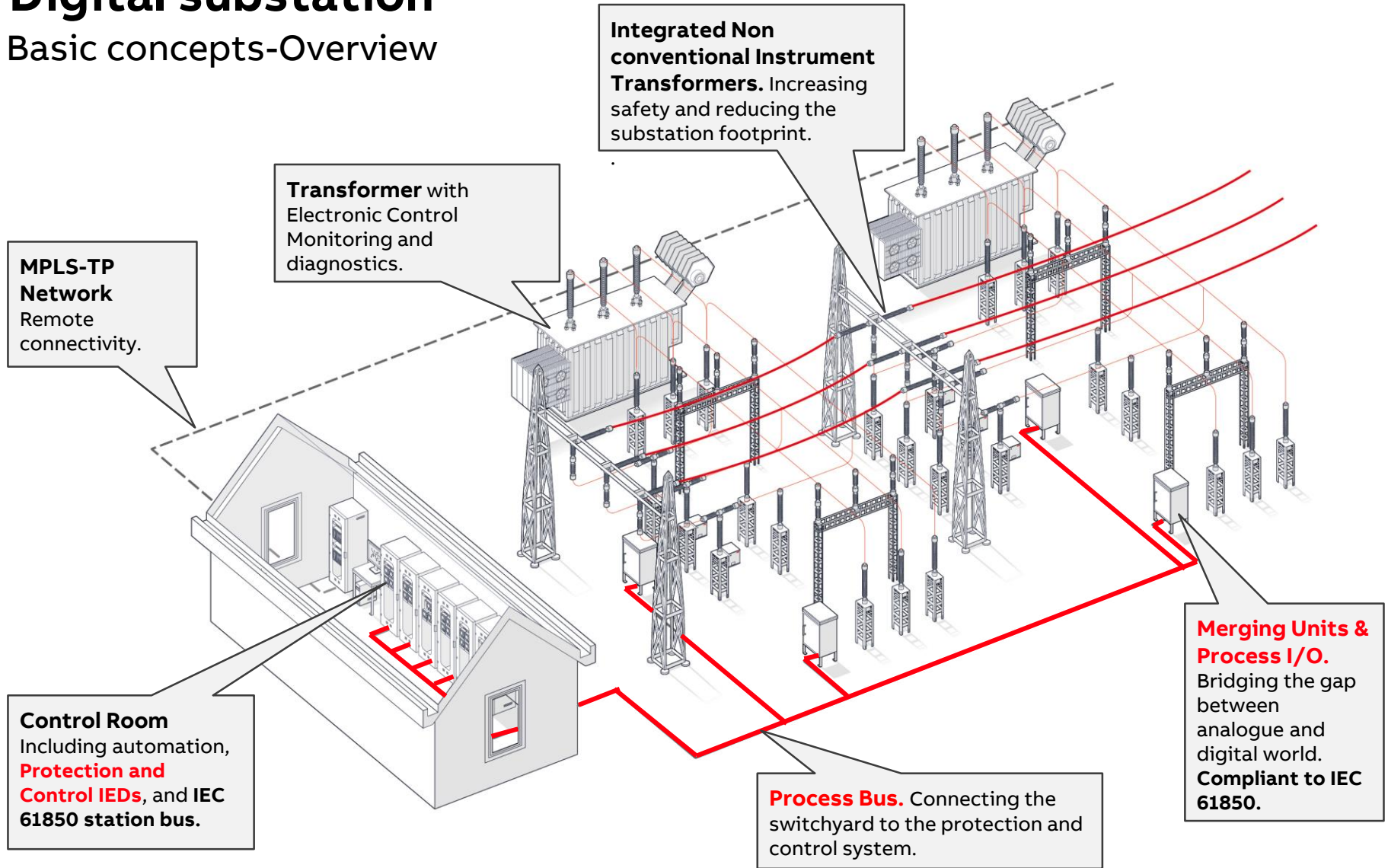
- Increasing demand on refurbishment of substations
- Project execution under increasing cost and time pressure
- Better utilization of existing assets
- Increased expectations on transmission system availability
- Safeguard investment over the entire life cycle



Digital substation respond to today's utility challenges

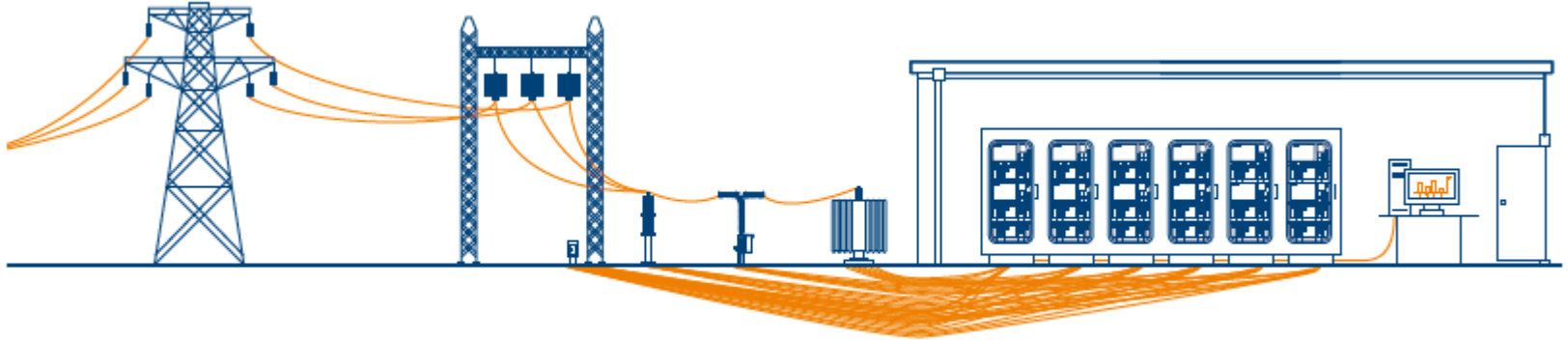
# Digital substation

## Basic concepts-Overview

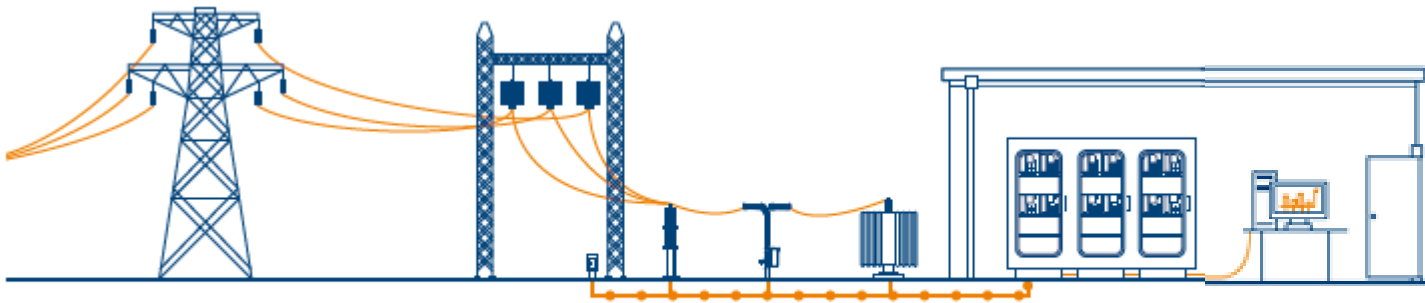


# Digital substation

Fiber optic substitutes copper signaling wires



Conventional Substation



Digital Substation

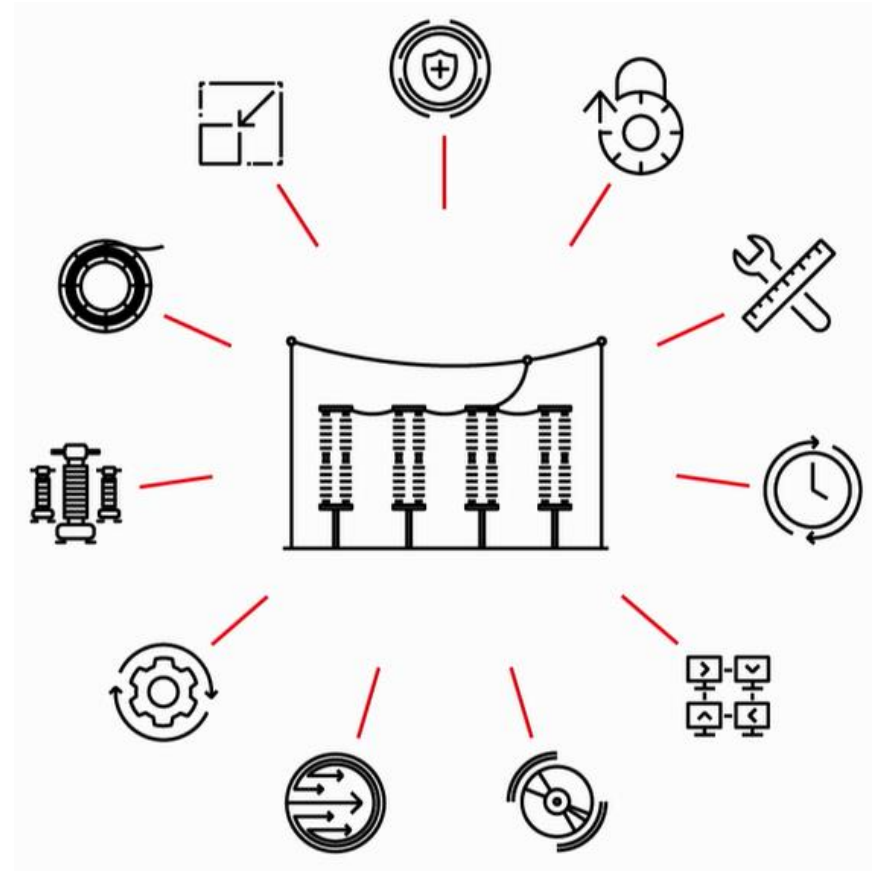
# Benefits of Digital substation

## Overview

### Main benefits

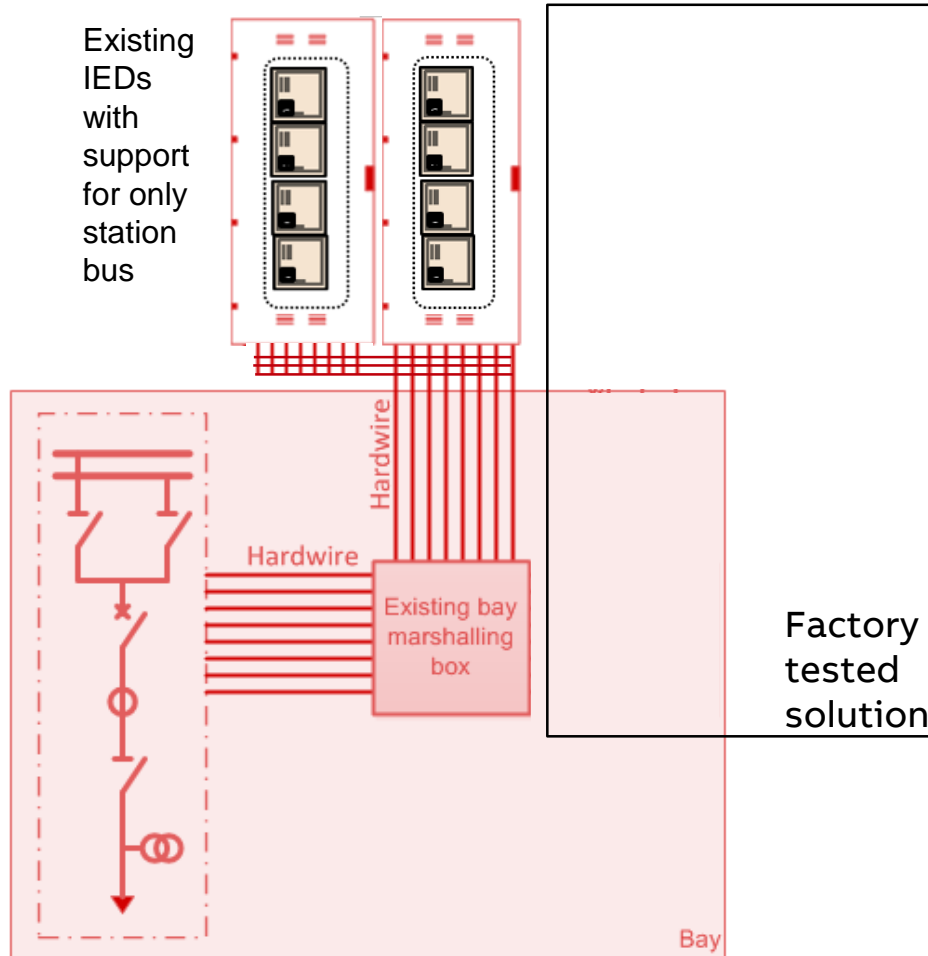
- Safety
- Reduced substation footprint
- Interoperability
- Reduces copper cabling
- Ease of configuration
- Maximum reliability and availability
- Real-time performance
- Smart Grid communications capabilities
- Reduces cost of ownership

Digital substations are safer to operate, future proof and require less space



# Digital Substation - Migration strategies

Life enhancement through retrofit



## Benefits

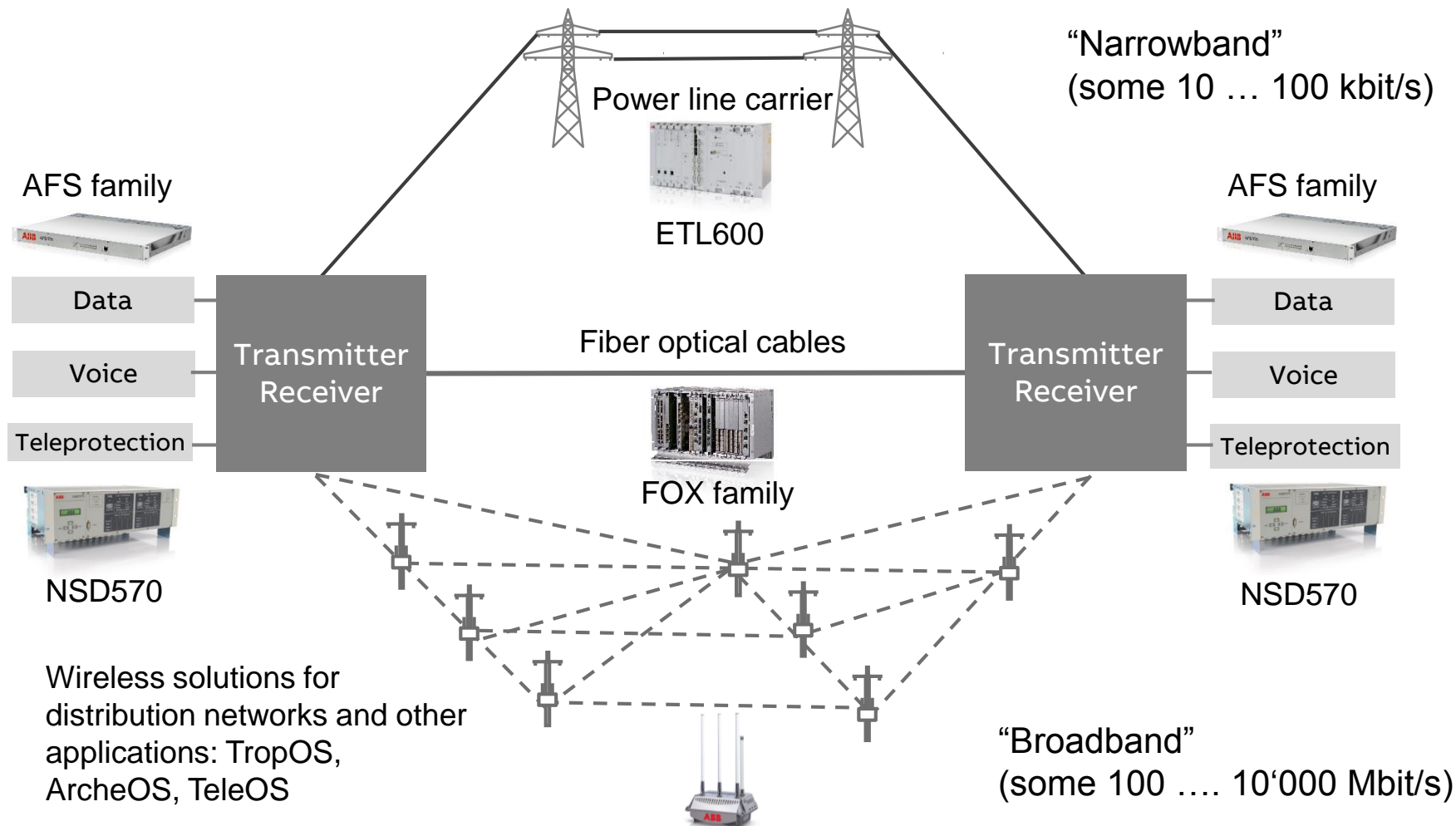
40%  
shorter  
installation  
time of P&C  
system

Up to  
80%  
copper cable  
reduction

40%  
outage time  
reduction  
during P&C  
retrofit

# Digital solutions

## Communication Networks





# Digital solutions

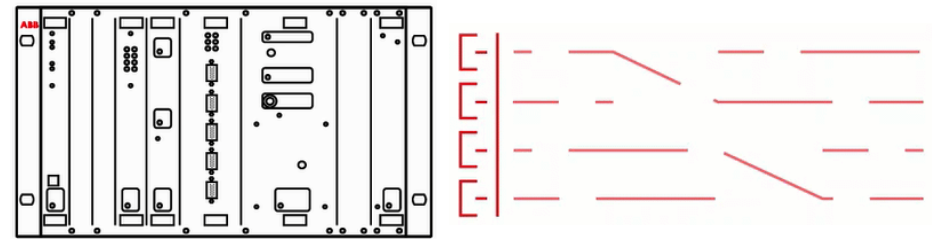
Highly available and reliable utility communication

## Technology shifts in utility communication

IEC 61850 instead of copper wires for truly digital integration of utility communication equipment

Using the benefits of IEC 61850 to communicate across substations

Move from TDM to packet-switched communication for operational, maintenance and protection data



[Click for more about communication](#)

Utility-grade equipment to ensure the reliable operation of the power grid is required

# Asset Performance Management

## Why Do Utilities Need Asset Performance Management

### Assets



### Asset Management Drivers

#### Aging Workforce

- **Digital workforce** less attracted to Asset Intensive Industries
- **Younger Workforce** have different expectations and a lower threshold

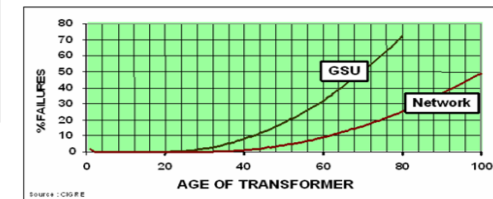
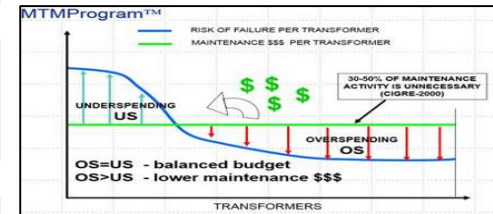
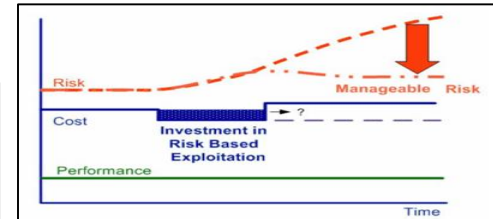
#### Aging Assets

- Regulatory pressures to improve environmental, reliability and safety standards

#### Cost Pressures

- Need to do more with less
- Improve return on assets without impacting production/service delivery

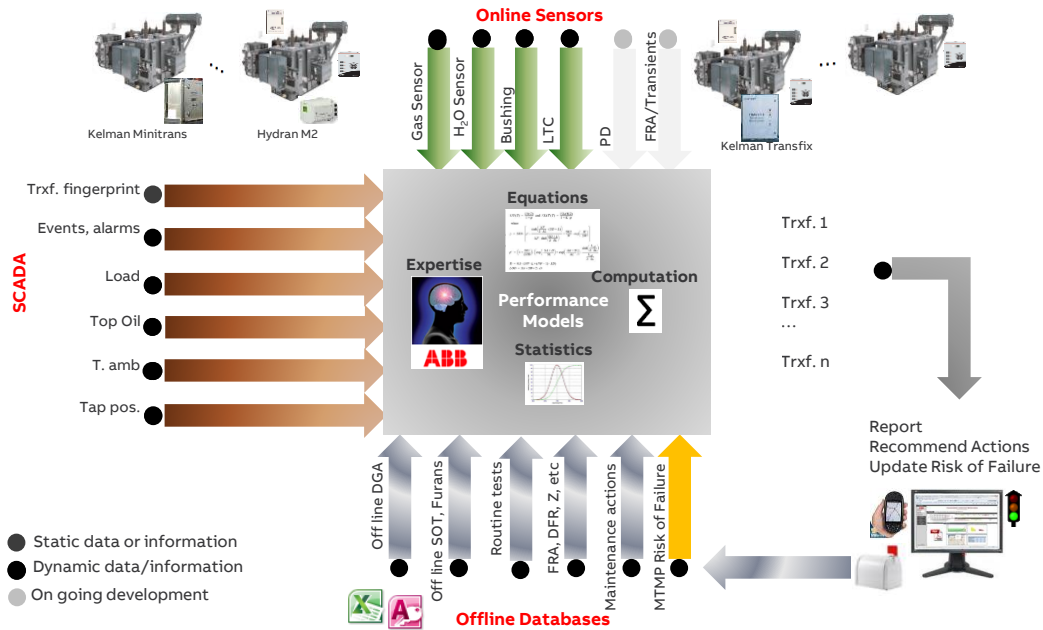
### Asset Management Challenges



Increased number of assets with fixed operation & maintenance budget

# Asset Performance Management

## Power Transformer



Risk of failure (RoF) of Transformer

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**ABB**