ECOM+ model - Data and Weight Specifications Country specifics

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Presentation Content

- Introduction
- Power System Structure
- Transmission System Components
- Data and Weight Specifications
- Country Specifics
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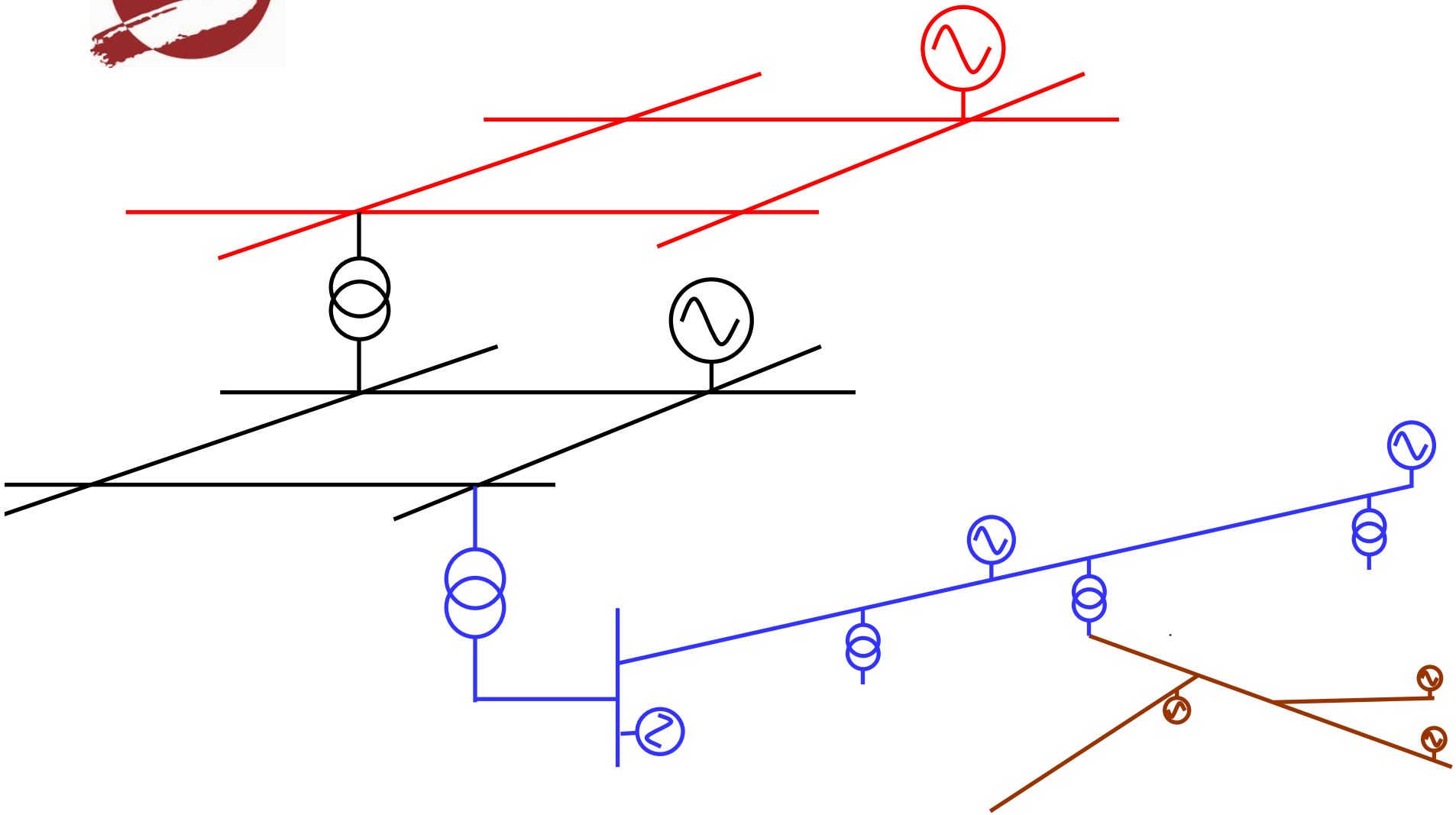
Introduction

- Background
- Principles
- Objectives

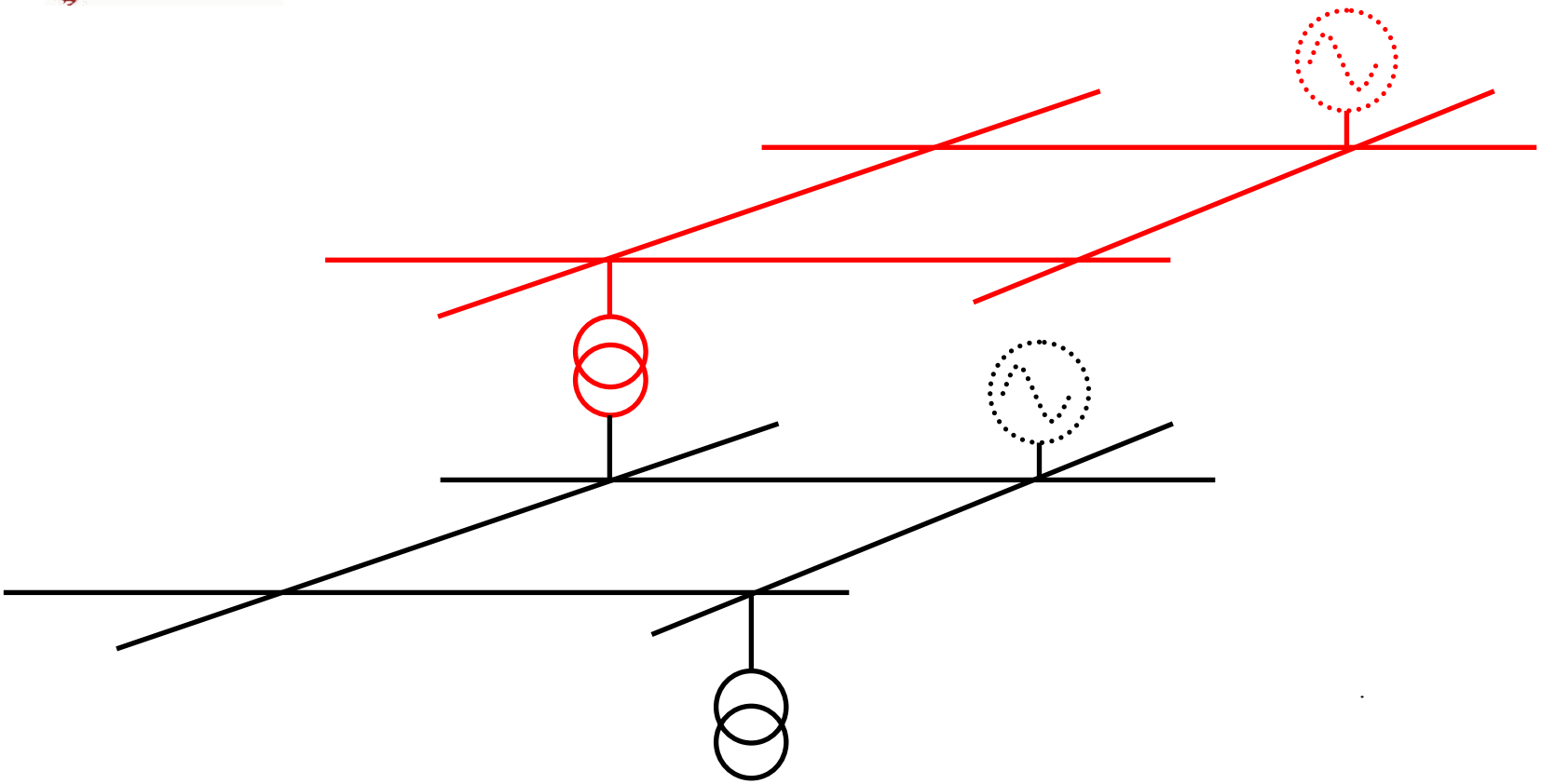
Power System Description

- Power System
- Transmission system
- System & layer composition

Power System Structure



Transmission System Structure



Layer Composition

- Substations
- Circuits within the layer
- Circuits to another layers
- Special AC devices
  - Series compensation
  - Shunt compensation
- Converter stations (AC-DC) and other devices

Layer Composition: Substations

- Number of bus bars
- In building or not
- Metal clad (SF_6 filled)

$\rightarrow$ Circuit ends

Layer Composition: Circuits

- Overhead lines
- Underground or undersea cables
- DC connection
- Transformers or auto-transformers
  - Windings
  - Phase and Voltage control
  - Off or On Load Tap Changer

Layer Composition: Compensation

- Shunt compensation
  - Inductive or capacitive, or both
  - Fixed
  - Variable, discrete or continuous
- Series compensation
  - Inductive
  - Capacitive
    - Fixed
    - Controlled

Layer Composition: HVDC & other special components

- Line commutated converter
- Self commutated converter
- No DC meshed network
- Multi-terminal
- FACTS (UPFC, etc.)

Layer Composition: remark

Voltage control concept

- Using OLTC transformers
- Using shunt compensation
- Using both

Data and Weight Specifications

Classes

- Voltage
- Cross Section
- Apparent Power

Data and Weight Specifications
Class: Voltage

V	Limit L	Limit H	UoM	Definition
1	≤	150	kV	Nominal
2	150	220	kV	Nominal
3	220	350	kV	Nominal
4	350	>	kV	Nominal

Data and Weight Specifications
Class: Cross Section

C	Limit L	Limit H	UoM
1	≤	250	mm^2
2	250	400	mm^2
2	400	700	mm^2
3	700	1500	mm^2
4	1500	>	mm^2

Data and Weight Specifications Class: Apparent Power

M	Limit L	Limit H	UoM	Definition
1	≤	150	MVA	Nominal
2	150	350	MVA	Nominal
3	350	>	MVA	Nominal

Data and weight specifications
Asset Category Definitions

Generic code XX|AA|SSS|V|C|M

- XX TSO code
- AA Asset code
- SSS Technical specific
- V Voltage class
- C Cross Section class
- M Apparent Power class

Data and weight specifications
Asset Category Definitions: Lines

Transmission line	UoM	Definition
•**XX|10|SSS|V|C|0**	km	Circuit length unadjusted

- SSS } AC or DC
- SSS } Average or Alpine conditions
- V Voltage class
- C Cross Section class

Data and weight specifications
Asset Category Definitions: Cables

Cables	UoM	Definition
•**XX|20|SSS|V|C|0**	km	Circuit length unadjusted

- SSS
- SSS

} AC or DC / Land or sea

- V — Voltage class
- C — Cross Section class

Data and weight specifications
Asset Category Definitions: Ends

Circuit ends	UoM	Definition
•XX|30|SSS|V|0|0	#	Piece count

- SSS
- SSS
- SSS

} Single or double bus bars; Outside or in building; Classic or metal clad

- V — Voltage class

Data and weight specifications
Asset Category Definitions: Tfos

Transformer	UoM	Definition
•XX|40|SSS|V|0|M	#	Nominal power, piece count
•XX|41|SSS|V|0|0	MVA	Nominal power, power count

- SSS
- SSS
- SSS

} Type / On Load Tap Changer or not / Phase shift or not

- V — Voltage class
- M — Apparent Power class

Data and weight specifications
Asset Category Definitions: Shunt

Compensating device	UoM	Definition
•XX|50|SSS|V|0|0	#	Piece count
•XX|51|SSS|V|0|0	MVA	Nominal power, power count

- SSS
- SSS
- SSS

} Type (passive, SVC, etc.)
} Fixed or adjustable
} Capacitive, inductive, both

- V — Voltage class

Data and weight specifications
Asset Category Definitions: Series

Compensating device	UoM	Definition
•XX|60|SSS|V|0|0	#	Piece count
•XX|61|SSS|V|0|0	MVA	Nominal power, power count

- SSS } Type
- SSS } Fixed or adjustable
- SSS } Capacitive or inductive
- V Voltage class

Data and weight specifications
Asset Category Definitions: Other

Other installations	UoM	Definition
•**XX|91|SSS|V|0|M**	MVA	Nominal power, power count

- SSS Type
- V Voltage class
- M Nominal Power class

Country Specifics

Operating standard

- Common operating standard
- Imposed, systematic & significant deviations
- Complicating factors & properties

Hierarchical classification

- Elementary description
- More & more detailed descriptions

Country Specifics

Complicating factors

- Climate
- Environmental restrictions
- Situation within interconnected system
- Types of towers
- Imposed obligations

Country Specifics

Complicating properties

- System control & performances
  - Normal situation (EMS)
  - Transient (protection schemes)
  - Emergency situations (defence plans)
  - Restoration (procedures)
- Dispatcher training
  - Class room
  - Real Time Simulator

FAQ