COLOMBIAN SYSTEM OPERATION

WEBINAR:
Emergency Communications in the Control Room
USEA – September 30, 2021
Agenda

• Basic Facts
• Power System Operation
• Control rooms in XM
• Challenges
Basic Facts
Colombian Basic Facts

- **Area:** 1,141,748 Km²
- **Population:** 49,583,637 (2017-calculated)
- **Number of ISOs:** 1
- **Number of Transmission Companies:** 16
- **Number of Generation Companies:** 73
- **Number of Distribution Companies:** 36
- **Number of Retailers/Traders:** 122
- **Peak load:** 10.6 GW
- **Annual energy consumption:** 69,127 GWh
Power System Operation
Colombian Power System

Capacity & Energy

Generation Capacity Evolution

Colombia is highly dependent on hydro generation, which makes Colombia’s power system vulnerable to dry events.

Hydro and thermal Generation

Usually:
- Hydro 80%
- Thermal 20%

Dry Season:
- Hydro 49%
- Thermal 51%

2019

- Hydro: 11.0 GW
- Thermal: 5.1 GW
- Solar: 84.8 MW
- Wind: 18.4 MW
- Other: 1.2 GW
- Total: 17.5 GW

Evolution of Hydro and Thermal Generation

Extreme Dry events - El Niño Southern Oscillation (ENSO)
Colombian Power System

Real time changes in the demand

Transmission congestions
Control Rooms in XM
Control Rooms in XM

Control Room 1

Trainning Rooms

Cibersecurity Room

Control Room 2
Communications

SCADA

- Gen
- TSO - DSO
- Market Participants

AGC
- IEC 101/104
- ICCP

Suppliers

Control Room 1

Control Room 2

PMU and WAMS

Audio Video Communications

- System CR1
- System CR 2

- Direct lines
- PSTN
- Public Tel Network
- Mobiles

Remote Site Camara & Grupal and individual Audio

Installed PMUs
Challenges
❖ Improve audio& video communications between control centres during restoration process

❖ Analyze options to improve reliability of communications during emergencies

❖ Increase the remote operation and improve the supervision in the system

❖ Improve the integration between SOC and Control Centres

❖ High level of DER requires better communications between ISO – TSO - DSO

❖ Incorporate new displays for control rooms with the new renewables resources
THANK YOU !!
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