Arizona Extreme Contingency Analysis
2013 & 2021 – Phoenix
2014 & 2021 – Tucson

Arizona Corporation Commission
2012 Biennial Transmission Assessment

Jason Spitzkoff – CATS Chair

7th BTA Workshop #1

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aps

AZ Extreme Contingency Analysis

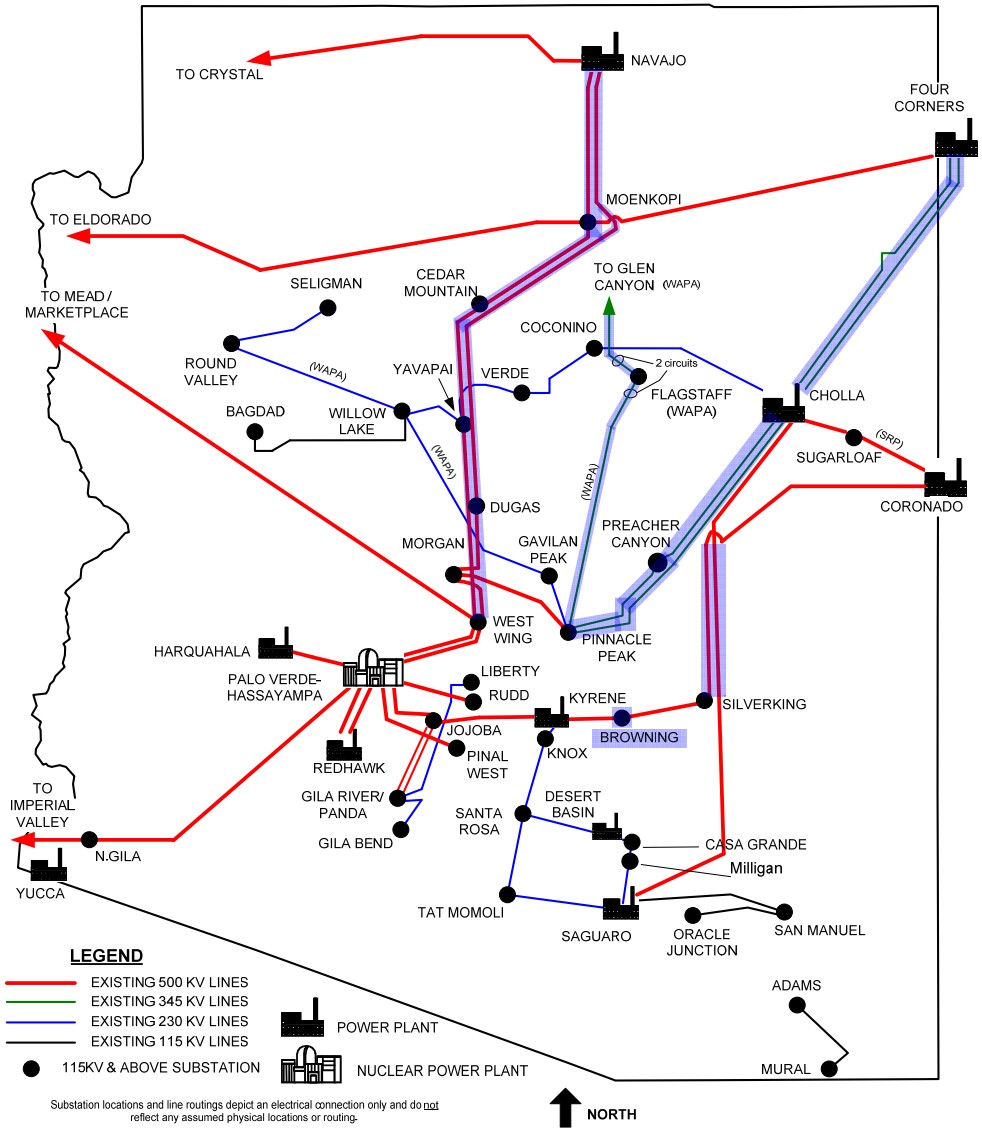
- Filed under a NDA with the ACC
- CEII information
- Presentation is a high level summary of study results
- Phoenix Area Results
- Tucson Area Results

Phoenix Area Analysis

Study Assumptions - Phoenix

- Utilize the 2013 and 2021 heavy summer power flow cases
- The integrated Arizona power system is represented
- Corridors are chosen based upon exposure to forest fires and other extreme events
  - Cholla-Saguaro and Coronado-Silverking 500kV lines
  - Navajo South 500kV lines
  - Four Corners-Cholla-Pinnacle Peak 345kV lines
  - Glen Canyon-Flagstaff-Pinnacle Peak 345kV lines

ARIZONA EHV SYSTEM



Study Assumptions

- Transformer banks studied
  - Browning 500/230kV
- Transformer banks not studied
  - Rudd 500/230kV transformer outage
    - Equivalent to single contingency of Palo Verde-Rudd 500kV line
    - This outage is studied under normal planning for 10 year plans
  - Pinnacle Peak 345/230kV & 500/230kV transformer outages
    - Equivalent to outages of the 345kV lines into Pinnacle Peak
    - Equivalent to outage of the Morgan-Pinnacle Peak 500kV line

SUMMARY OF RESULTS (2013)

- For all outages studied, all load can be served & local Phoenix reserve requirements met
  - Some outages from remote generation would require redispatching from other available sources
    - Maximum redispatch requirement is ~1400MW @ Cholla/Coronado
    - Generation made up or purchased from available AZ and CA units
  - Some outages would require some system reconfiguration to alleviate overloads

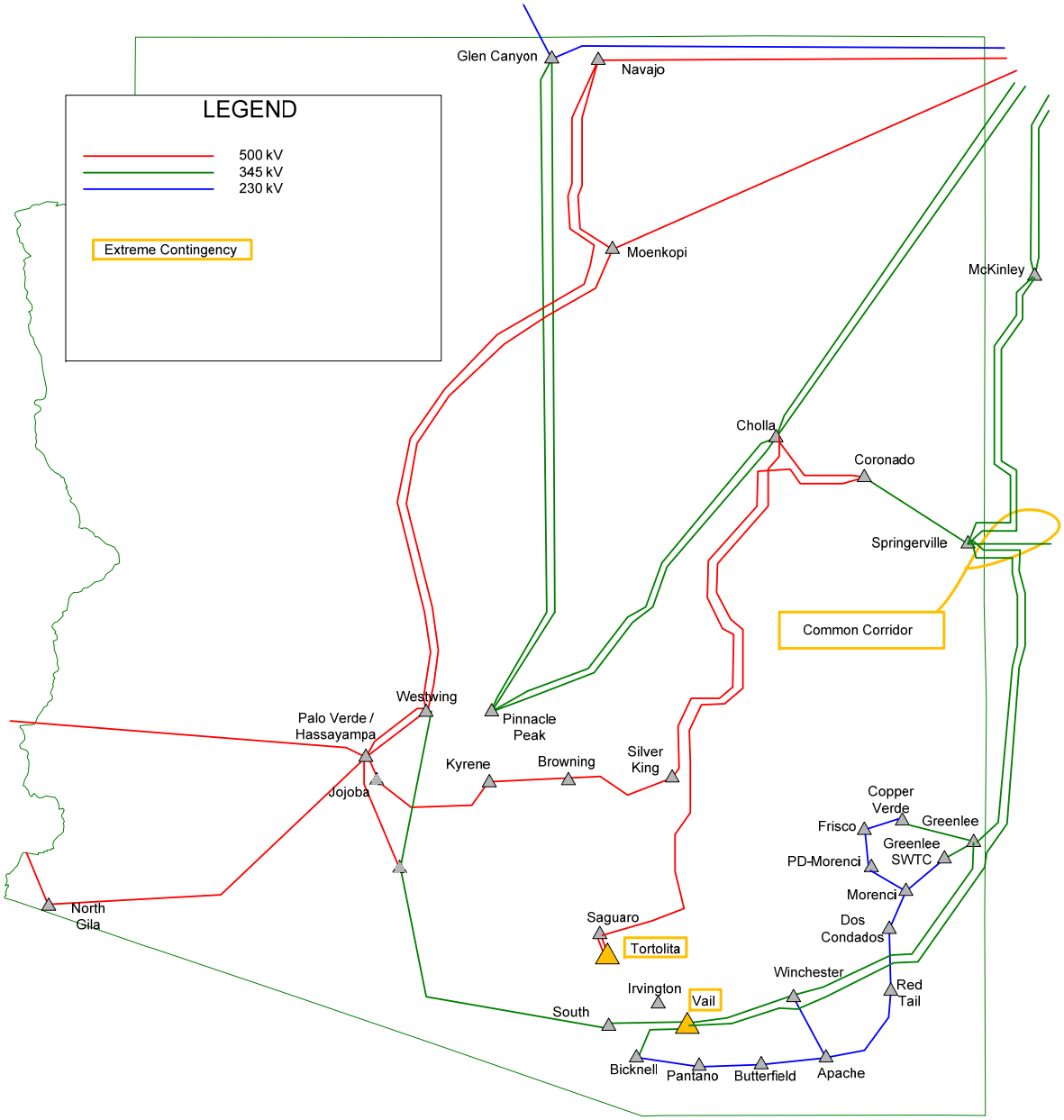
SUMMARY OF RESULTS (2021)

- For all outages studied, all load can be served & local Phoenix reserve requirements met
  - Some outages from remote generation would require redispatching from other available sources
    - Maximum redispatch requirement is ~727MW @ Cholla/Coronado
    - Generation made up or purchased from available AZ and CA units
  - Some outages would require some system reconfiguration to alleviate overloads

Tucson Area Analysis

Study Assumptions - Tucson

- Springerville Common Corridor
- Tortolita 500/138kV Substation
- Vail 345/138kV Substation


LEGEND
500 kV
345 kV
230 kV
Extreme Contingency
Glen Canyon
Navajo
Moenkopi
McKinley
Cholla
Coronado
Springerville
Common Corridor
Westwing
Palo Verde / Hassayampa
Pinnacle Peak
Kyrene
Browning
Silver King
Jojoba
North Gila
Copper Verde
Frisco
Greenlee
Greenlee
PD-Morenci
SWTC
Morenci
Dos Condados
Saguaro
Tortolita
Winchester
Irvington
Vail
Red Tail
South
Bicknell
Pantano
Butterfield
Apache

Extreme Contingency Study - SUMMARY OF RESULTS

- All load can be served & local Tucson reserve requirements are met

- For the outages studied, there is prescriptive load-shed and re-dispatch required within the TEP retail franchise area

Questions?