



Eastern Nevada Short Circuit Study Group



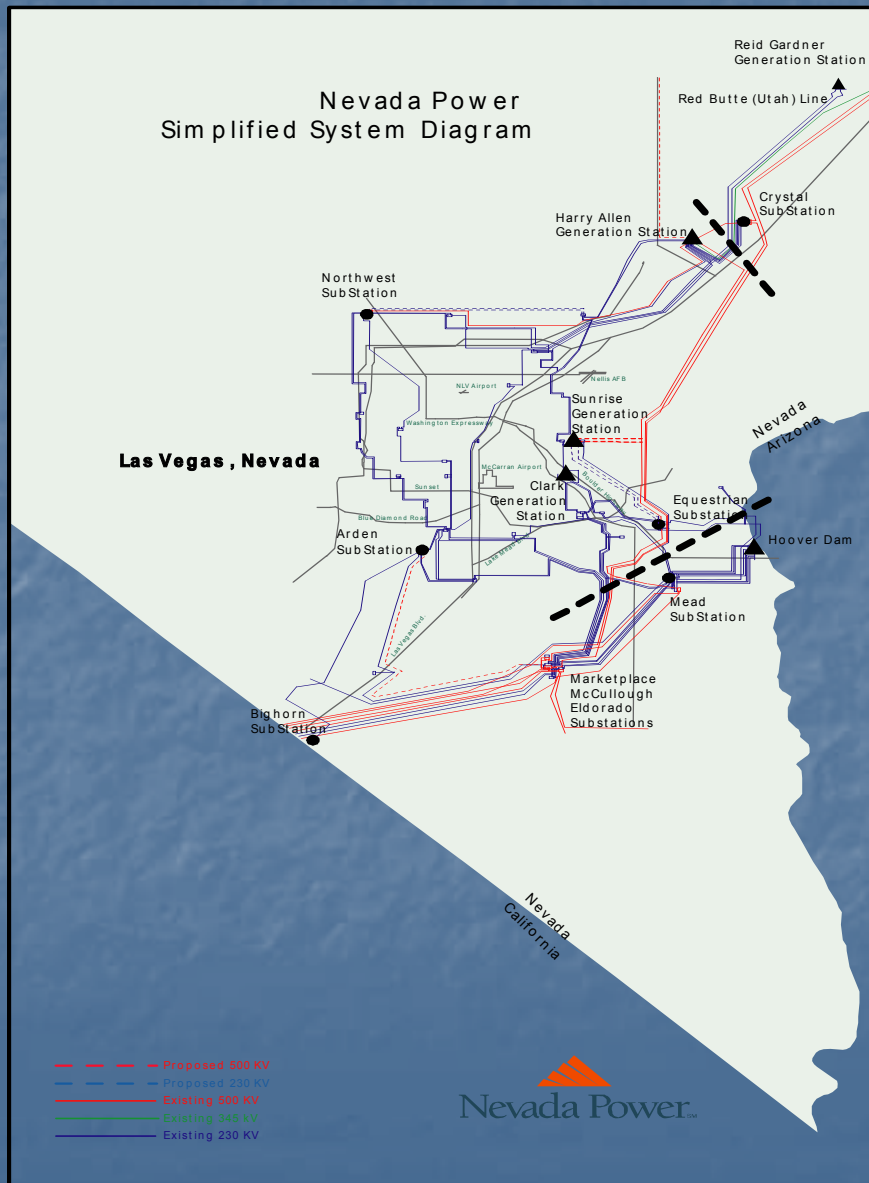
2006 NEVP/SPPC IRP Transmission Plans through 2014 Include:

- 3100 MW of new generation
- More than 700 miles of new 500 kV Lines
- 3 new 500 kV substations
- 6 to 10 new 230 kV substations

Reason for Study Group

- Need to evaluate and address regional impacts of the EN Development Plan on the fault duty
- Preliminary studies identified potential need in breaker upgrades at some 500/230 kV substation (Mead, McCullough)
- Breaker duties at other substations are not known
- More detailed case needed to evaluate all impacts

Nevada Power System Overview



■ Transmission System Composed of Three Major Sections

- Uncongested Grid
- Southern Cut Plane
- Northern Cut Plane



Major NPC Projects Revealed in 2006 IRP

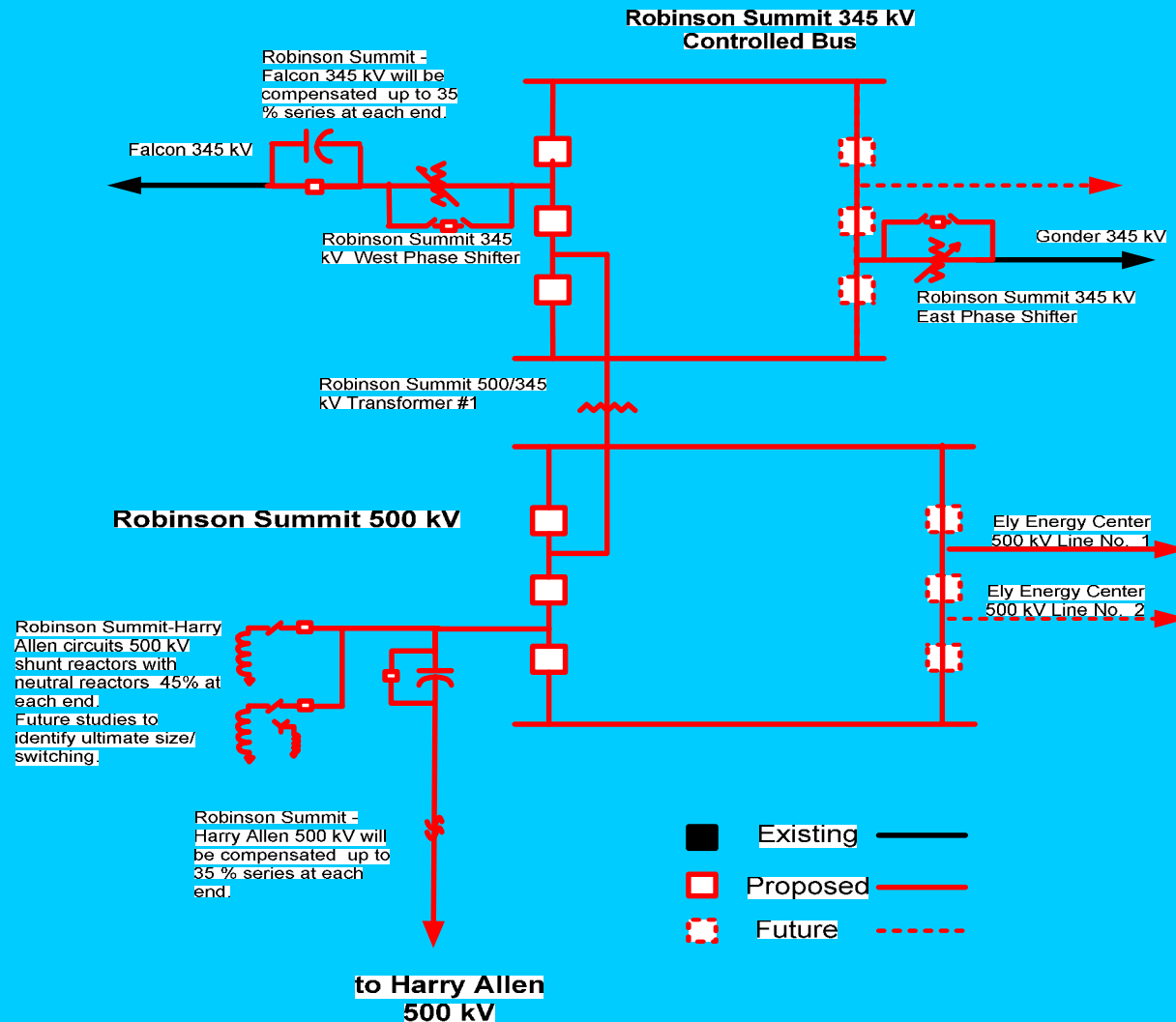
- Ely Energy Center (EEC), Including Eastern Nevada Transmission Intertie (ENTI)
- White Pine Energy Associates (WPEA) and Great Basin Transmission Company (GBT)
- East Valley Area Master Plan (EVAMP)
- Northwest Las Vegas Area Routing and Siting Master Plan (VARs)
- Other Projects : Sinatra, LV Core Service, etc.
- Also Addressed: Import / Export Capabilities, Centennial Project Status



Ely Energy Center & EN-ti Projects

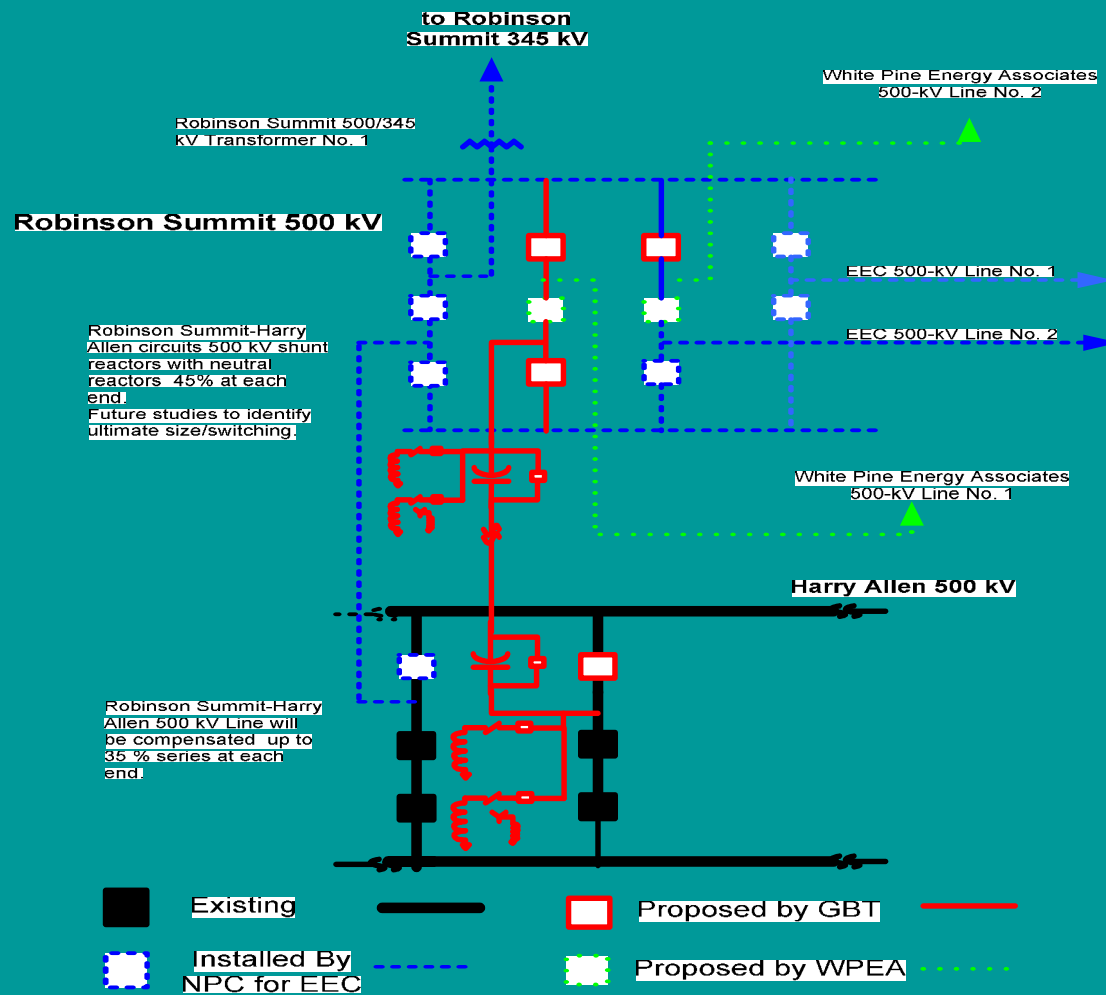
- EEC 500 kV Switching Station
- EEC – Robinson Summit 500 kV No. 1 Transmission Line
- Robinson Summit 500/345 kV Switching Station
- Fold of Falcon – Gonder 345 kV Line Into Robinson Summit Substation
- Harry Allen – Robinson Summit 500 kV No. 1 Transmission Line (ENTI)
- Harry Allen 500 kV Improvements for EEC (ENTI)

Robinson Summit Substation One-line Diagram



White Pine Energy Center / Great Basin Transmission Interconnection

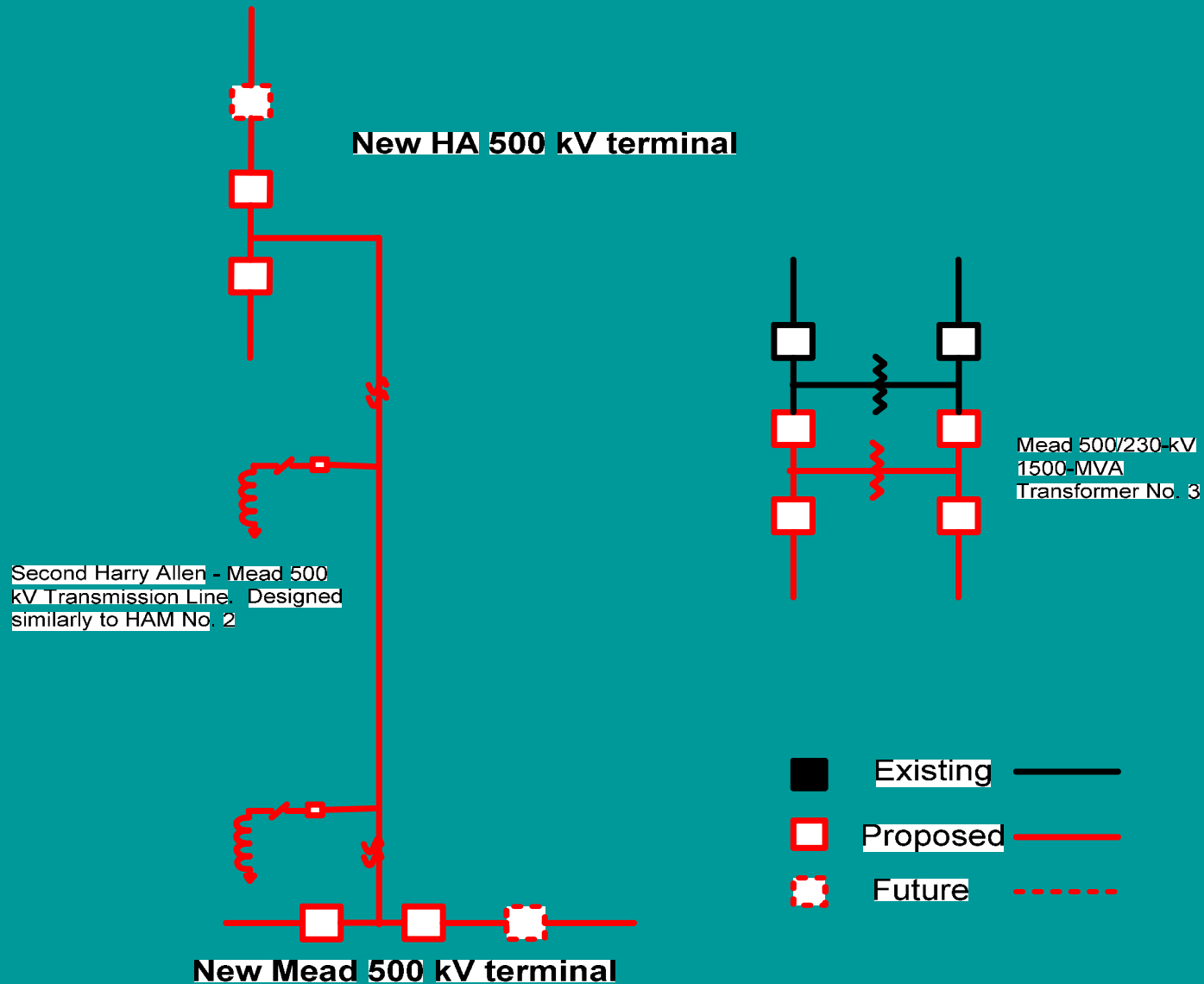
Great Basin Transmission, LLC Robinson Summit - Harry Allen 500 kV Line



Justification of EEC & EN-ti Projects

- 1,550 MW new resources to Nevada Power loads
- 300 MW new resources to Sierra Pacific loads
- Deliver IGCC plants at EEC
- Interconnect White Pine Energy Center
- Point-to-point transmission service for Great Basin Transmission additions

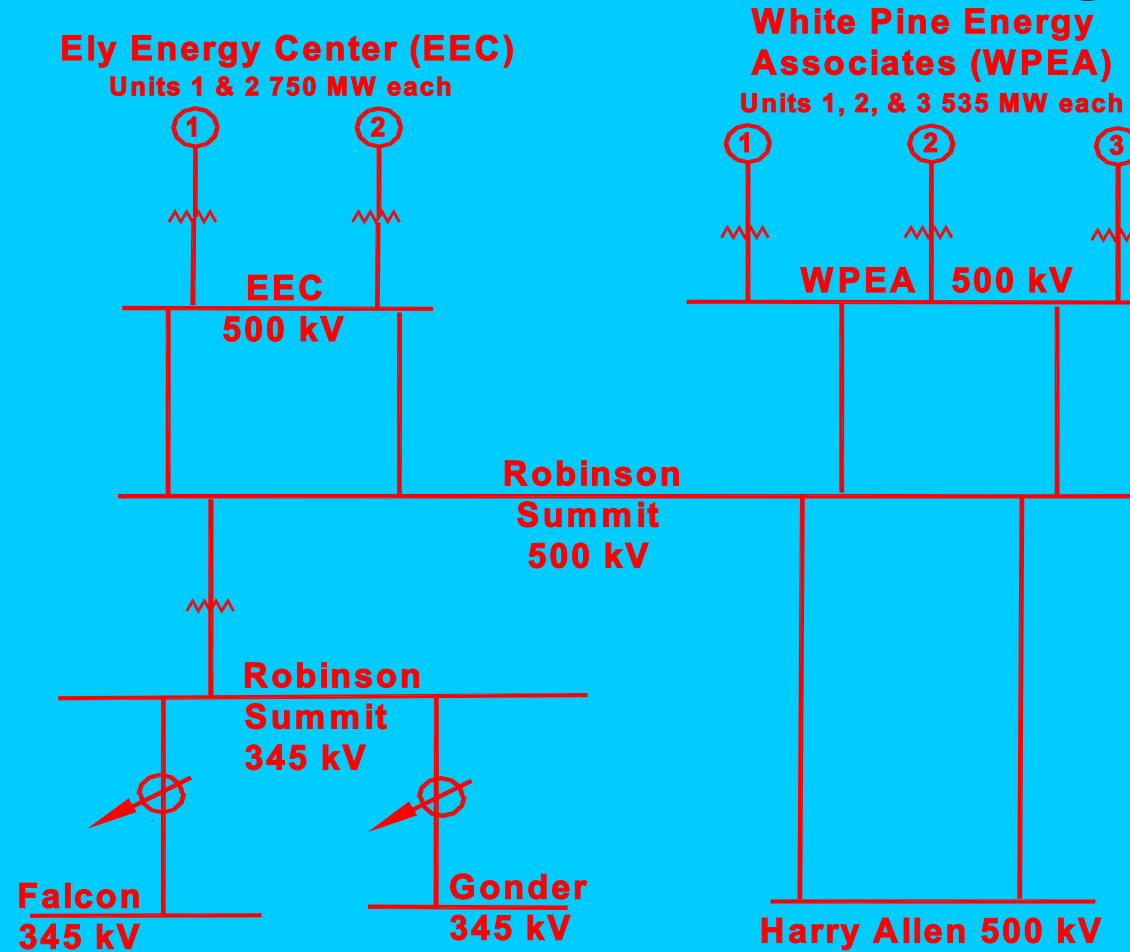
White Pine Energy Associates Transmission Service Request



White Pine (WPEA) and Great Basin (GBT) Project

- Robinson Summit 500 kV terminals for connection of White Pine Energy Center
- Robinson Summit and Harry Allen Substation for GBT (LS Power) Transmission Interconnection of its Robinson Summit – Harry Allen 500 kV line
- Harry Allen – Mead 500 kV line No. 2, substation work for the WPEA (LS Power) point-to-point Transmission Service Request, and transformer # 3 at Mead

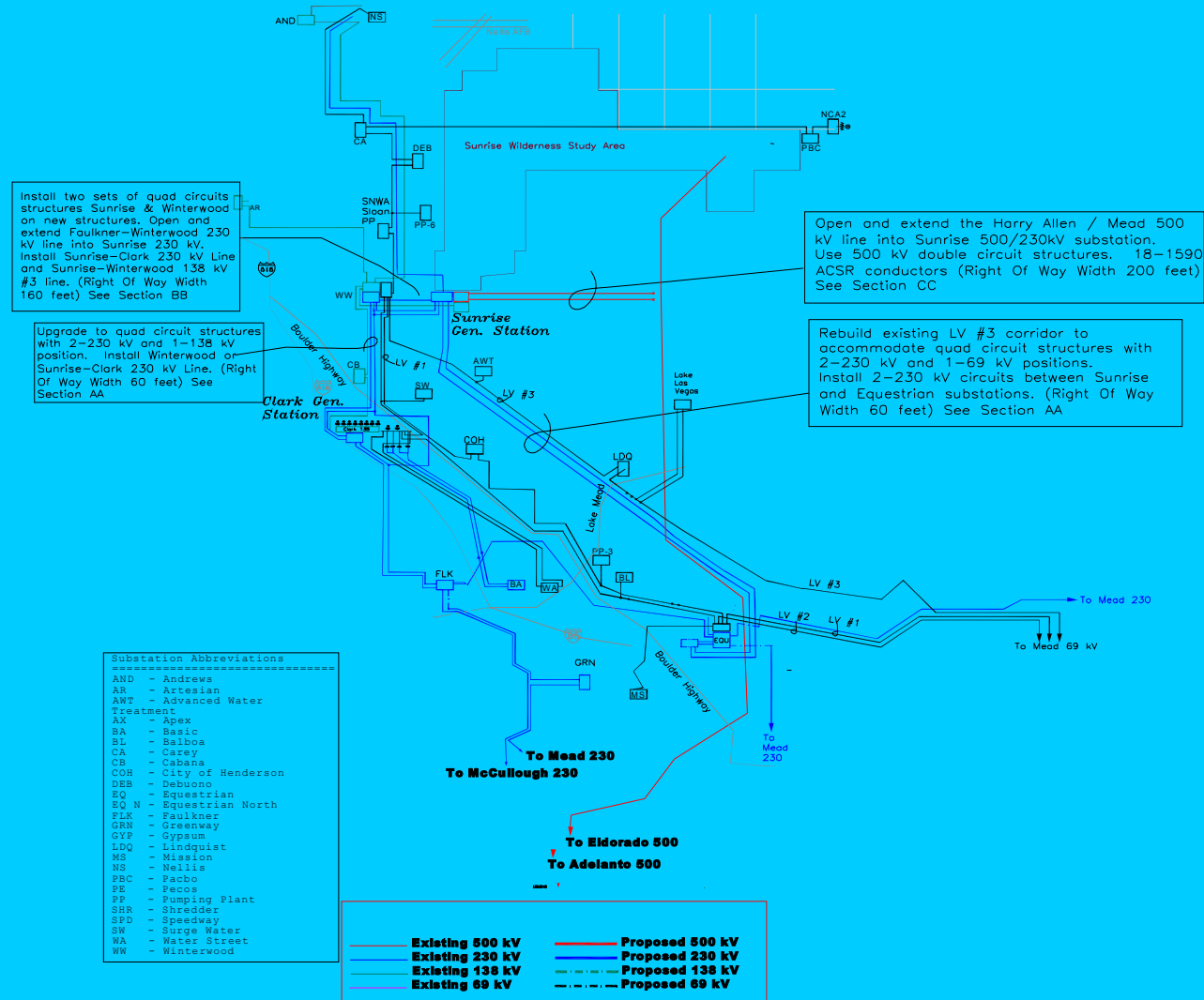
EEC & White Pine Interconnection, Final Diagram



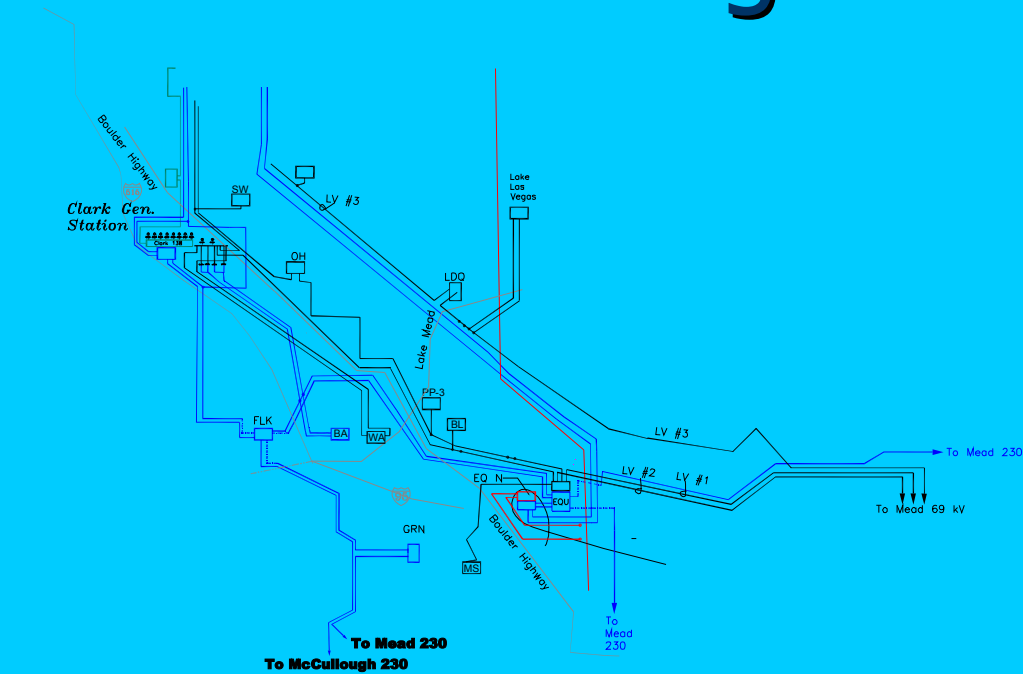
East Valley Area Master Plan (EVAMP) Projects

- Northwest Substation 500/230 kV No. 2 Transformer
- Sunrise 500/230/138 kV Substation, The 'Sunrise' Option
- Equestrian North 500/230 kV Substation, The 'Equestrian' Option

EVAMP: Sunrise Option Oneline Diagram



EVAMP: Equestrian Option Oneline Diagram



Substation Abbreviations	
AND	- Andrews
AR	- Artesian
AWT	- Advanced Water Treatment
AX	- Apex
BA	- Basic
BL	- Balboa
CR	- Carey
CB	- Cebana
COH	- City of Henderson
DEB	- Debuono
EQ	- Equestrian
EO N	- Equestrian North
FLK	- Faulkner
GRN	- Greenway
GYP	- Cypress
LDO	- Lindquist
MS	- Mission
NS	- Nellis
PBC	- Pacbo
PE	- Pecos
PP	- Pumping Plant
SHR	- Shredder
SFD	- Speedway
SW	- Surge Water
WA	- Water Street
WW	- Winterwood

Open and extend the Harry Allen / Mead 500 kV line into the Equestrian North 500 kV sub using double circuit 500 kV structures on new ROW designed for triple bundled 1590 ACSR conductor. See Section CC

Install 2-230 kV circuits on new quad circuit structures on new ROW designed for bundled 1272 ACSR conductor. (Right Of Way Width 60 feet) See Section AA

LEGEND	
Existing 500 kV	Proposed 500 kV
Existing 230 kV	Proposed 230 kV
Existing 138 kV	Proposed 138 kV
Existing 69 kV	Proposed 69 kV

Justification of EVAMP Projects

- Northwest #2 Transformer
 - Northwest valley
 - Crystal Sub
 - Crystal – McCullough 500 kV line
 - NW 500/230 kV No. 1 transformer

- Sunrise 500/230/138 kV Substation
 - Load service to Las Vegas valley
 - Bulk power transfer or EEC 600 MW block into Harry Allen
 - Close to load center and other transmission subs

- Equestrian 500/230 kV Substation - Bulk power transfer Capability
 1. New generation at Harry Allen
 2. Change in Transmission at Crystal – McCullough 500 kV line
 3. Crystal – McCullough 500 kV line / South of the Harry Allen 230 kV cut plane

- Beyond 2014
 - Further development of 500/230 kV sources into the LV valley
 - Participate in Federal Corridor Study
 - Investigate feasibility of a 500 kV loop around LV

Northwest Las Vegas Area Routing and Siting Master Plan (VARs)

- New 230/12 kV Substations
 - Grand Teton
 - Iron Mountain/Rainbow
 - Log Cabin
 - Elkhorn/Commerce
 - Elkhorn/Pecos
 - Mobile 230/12 kV substation
- Thunderbird Sub and VARs Transmission System Additions
- Iron Mountain 230/138 kV, 336 MVA Transformer
- Northwest 230/138 kV, 336 MVA Transformer
- Brooks 230/138/12 kV Substation & Pecos – Brooks 230 kV line

SPR Transmission Projects



- \$785 Million completed since 1998 or currently under construction
- \$ 740 Million proposed in-service through 2014 not including EEC transmission
- Total \$ 1.5 Billion completed since 1998, under construction, or proposed through 2014

NEVP and SPPC Development Plan in 2008 - 2014: EN-ti, WPEA/GBT and EVAMP

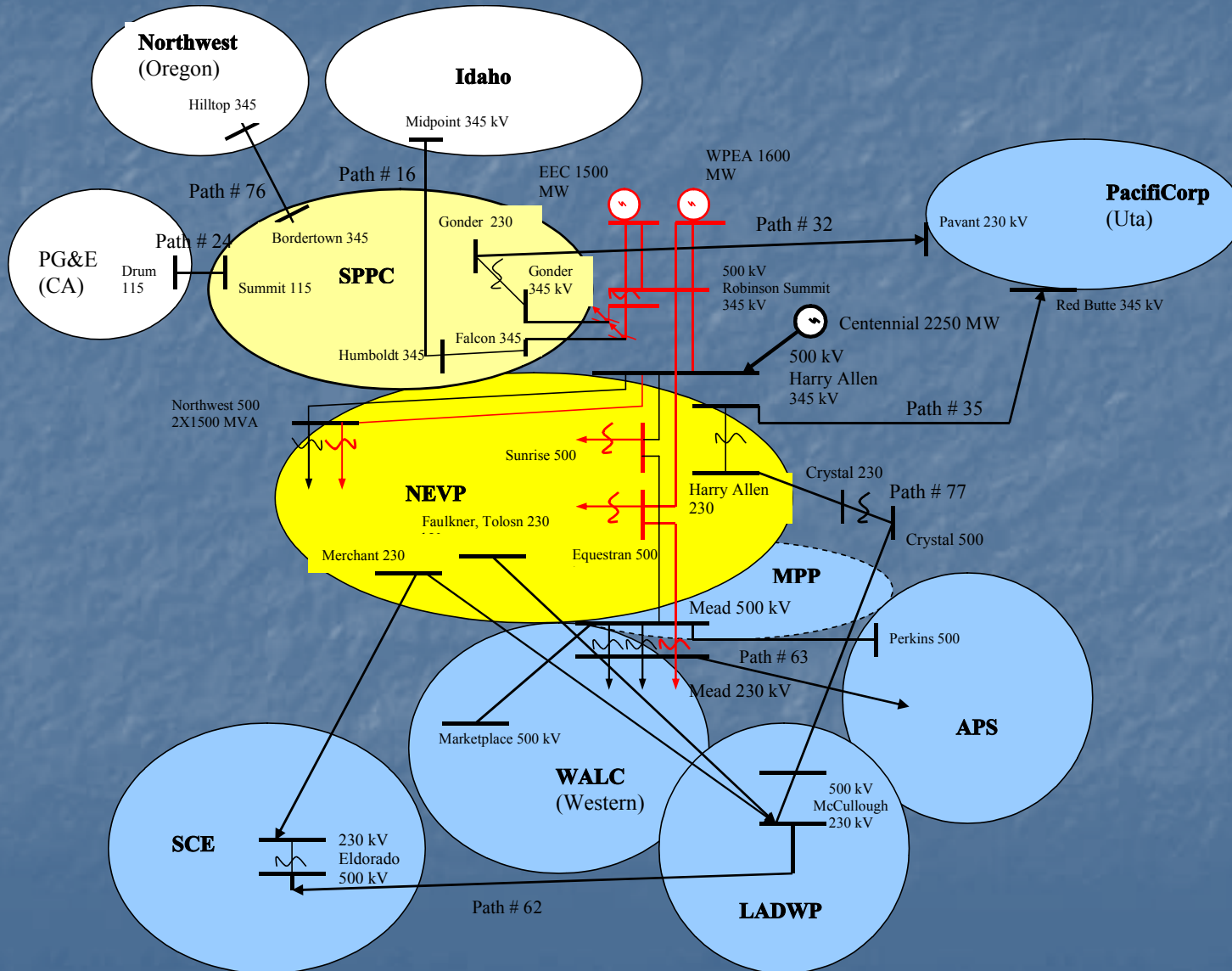


Table 1: Summary of EVAMP, EN-ti & WPEA/GBT Interconnection Facilities

#	Facility	In service	Project	Comment
1	Northwest xfmr # 2 500/230 1500MVA	2010	EVAMP	Load growth
2	Sunrise substation 500/230 kV	2010-2011	EVAMP	Load growth
3	White Pine 1600MW, Robinson 500/345, lines EEC-Robinson-HA- 500, Robinson- Falcon - Gonder 345	2010-2011	WPEA/GBT	WPEA Network Intercon./Transm. Service
4	HAM Line # 2	2011	WPEA/GBT	WPEA Transm. Service
5	Mead xfmr # 3 500/230 1500MVA	2011	WPEA/GBT	WPEA Transm. Service
6	Mead xfmr # 3 230/69 1500MVA	2011	WPEA/GBT	WPEA Network Intercon.
7	Line HA-Northwest # 2 500 Kv	2011-2013	EN-ti/WPEA	WPEA Network Intercon.
8	EEC 1500MW, Robinson 500/345, Lines: EEC-Robinson-HA-500, Robinson- Falcon&Gonder 345	2011-2013	EN-ti	Load growth
9	Equestrian subst. 500/230 kV	2014-2015	EVAMP	Load growth

Short Circuit Study Group Plan

- Solicit membership from utilities in affected areas
- Build case to analyze impacts of IRP
- Perform analysis of impacts
- Generate report with results and recommendations

Membership

- Presentations being given to NTAC, STEP, and MPP to solicit membership
- Presentation initially given to SWAT SCWG
- Scope document and application sent to NTAC, STEP, and MPP members
- Individuals requested to respond with application form

PARTICIPATION IN THE EASTERN NEVADA SHORT CIRCUIT STUDY GROUP

- The Eastern Nevada Short Circuit Study Group will operate in coordination with the SWAT SCWG and other regional Short Circuit groups (affiliated with STEP, NTAC, CAISO, etc.). **The initial meeting of the Eastern Nevada SCSG will be held in El Paso, Texas on September 28, 2006.** If you interested in participating, please contact Alex Fratkin of SPPC/NEVP:
 - E-mail: AFratkin@sppc.com
 - Phone: 775-834-4897
 - Please provide your contact information as follows:
 - Name: _____
 - Company: _____
 - E-mail: _____
 - Phone: _____

Interested in Participation

#	Name	Company
1	Alex Fratkin	SPPC/NEVP
2	Kevin Salsbury	SPPC/NEVP
3	Tim Wu	LADWP
4	Tammy Tran	LADWP
5	Chau B. Tran	Sempra Utilities
6	Ali Amirali	LS Power
7	John Evans	Southern Nevada Water Authority (SNWA)
8	Garry Chinn	Southern California Edison
9	Dallas Peavey	Vulcan Power Company

Case Development

- Base case developed first
- All planned additions by time frame added in separate cases
- Equivalents used for utilities not participating
- Cases converted to CAPE, PTI, and Aspen formats
- Error checking of each individual component

Base Case

- 3 Task Forces to be formed in SCSG
- NTAC, SWAT, and California
- Choice of program up to task force
- Develop in 3 cases in parallel
- Error checking of cases
- Combine cases after task forces complete work

TABLE 2: SCSG STUDY CASES

Case		Facilities & Projects ¹	Participants
#	Name		
1	Before WP	1,2	SPPC/NEVP
2	WP_NETWRK	1,2,3,7,9	SPPC/NEVP/WPEA
3	WP_TRANSM	1,2,3,4,5,6,9	SPPC/NEVP/WPEA/GBT
4	EEC_NETWRK	1,2,8	SPPC/NEVP
5	EEC_WP_NETWRK	1,2,3,7,8,9	SPPC/NEVP/WPEA/GBT
6	EEC_WP_TRANSM	1,2,3,4,5,6,8,9	SPPC/NEVP/WPEA/GBT/WAPA/ LADWP
7	EEC_WP_NETRANSM	1 - 9	SPPC/NEVP/WPEA/GBT/WAPA/ LADWP

¹ Numbers refer to cases in table 1

Analysis

- Impacts of Individual Projects studied
- Short Circuit Levels at all participating members stations identified
- Breaker Duty Analysis performed for all participating members with stations they want studied
- Alternative mitigation methods evaluated

Report

- Present all short circuit levels by development phases and alternatives
- Present all breaker duty evaluations
- Recommend over-duty equipment replacement by time frame

Eastern Nevada Short Circuit Study Group (EN SCSG)

- First meeting in El Paso, Texas in conjunction with SWAT SCWG
- Teleconference available for first meeting
- First meeting on September 28, 2006
- Time of first meeting is 3:30 to 4:30 PST
- Monthly meeting schedule
- Estimated duration is 1 year