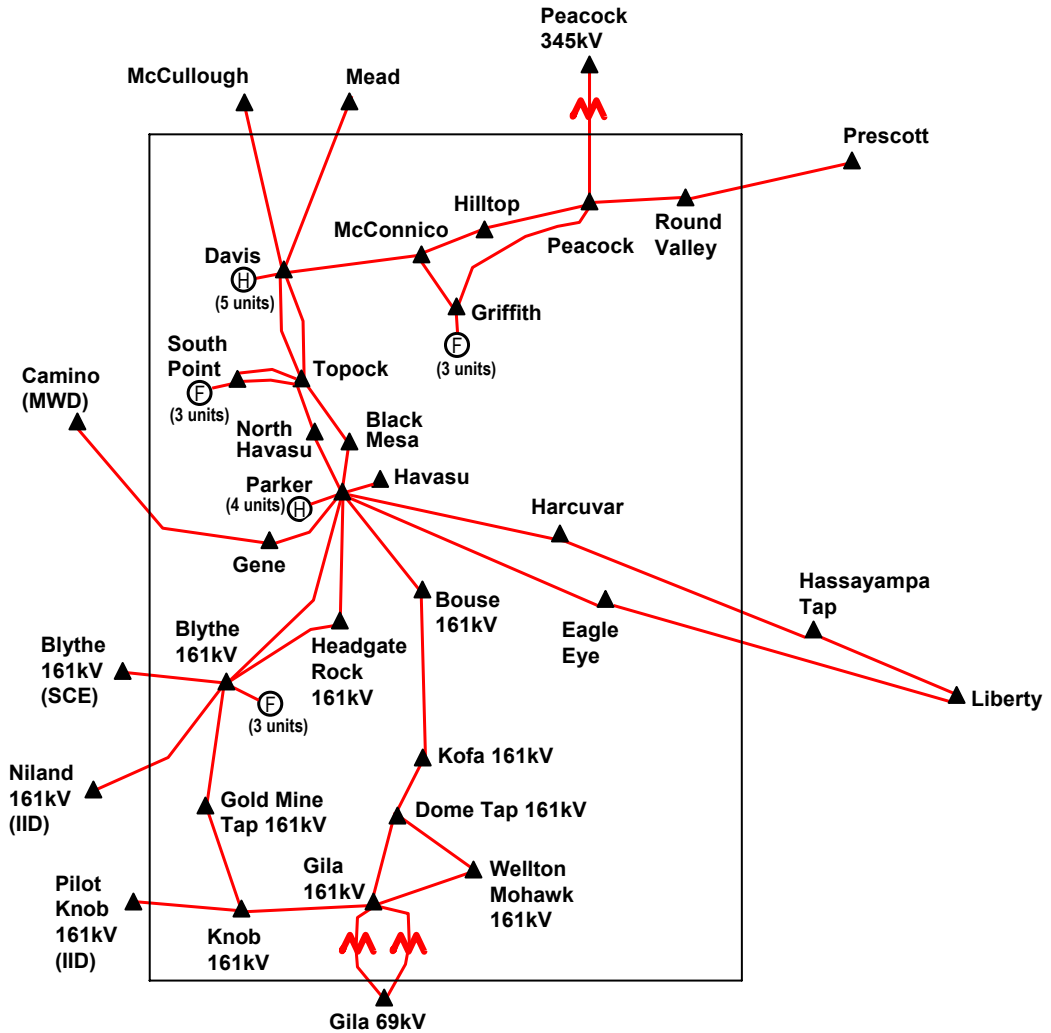


RMR Study Objectives

- 1. River System Import Limit (SIL)** – The maximum import level that the River System can reliably support when none of the River System generators are on-line.
- 2. River System Maximum Load Serving Capability (MLSC)** – The maximum load level that the River System can reliably support when all of the River System generators are at maximum dispatch.
- 3. River System Generator List** – List includes generator ratings.
- 4. Reliability Must Run (RMR) conditions** – RMR conditions exist only if the River System cannot reliably support its projected peak load without dispatching some of its generators.
- 5. Effectiveness of New Facilities** – A new facilities effectiveness evaluation is to be done only if new facilities (transmission or generation) are needed to mitigate RMR conditions in the River System.
- 6. Comparative Analysis of Alternatives** – Comparative analysis of alternatives is to be done only if such alternatives are needed to mitigate RMR conditions in the River System.

Figure 1 River System for RMR Study



Notes:

1. All facilities are 230kV unless otherwise noted.
2. Line or transformer flows that cross the boundary are measured at the station inside the River System.
3. Encircled F denotes fossil generation; encircled H denotes hydro generation.
4. Number of generating units are shown in parentheses. Refer to Table 1 for Generator List.

Table 1

River System Generator List

Fossil Units	Rating [MW]
BLYTHE	
Combustion Turbine #1	155
Combustion Turbine #2	155
Steam Turbine #1	193
TOTAL BLYTHE GENERATION	503
GRIFFITH	
Combustion Turbine #1	230
Combustion Turbine #2	230
Steam Turbine #1	320
TOTAL GRIFFITH GENERATION	780
SOUTH POINT	
Combustion Turbine #1	182
Combustion Turbine #2	182
Steam Turbine #1	177
TOTAL SOUTH POINT GENERATION	541
TOTAL FOSSIL GENERATION	1824

(cont'd)

Table 1
River System Generator List

Hydro Units	Rating [MW]
DAVIS	
Unit #1	52
Unit #2	52
Unit #3	52
Unit #4	52
Unit #5	52
TOTAL DAVIS GENERATION	260
PARKER	
Unit #1	26
Unit #2	26
Unit #3	26
Unit #4	26
TOTAL PARKER GENERATION	104
TOTAL HYDRO GENERATION	364

Table 2

River System Projected Peak Loads

Description	MW
Aha Macav (AMPS @ DAD)	8.7
Arizona Public Service (APS @ RVL,EGL,PAD,BSE,HDR,BLY)	103.6
Central Arizona Project (CAP)/Central Arizona Water Conservation District (CAWCD)	
@ Havasu – Pumping Station total	293.0
@ Harcuvar – Pumping Station total	62.0
CAP/CAWCD Total	355.0
Citizens Utilities Corporation (CUC @ DAD,HLT,BMA,N.HAV)	344.0
Desalter (U.S. Gov @ KNB)	10.0
Metropolitan Water District (MWD @ GNE)	108.0
Mohave Electric Cooperative (MEC @ TOP,RIV) - excludes SWTC	40.0
Northstar Steel (McConnico-Harris)	50.0
Southwest Transmission Cooperative (SWTC @ RIV, TOP, RVL)	161.4
Western Area Power Admin. (WAPA-DSW)/Wellton-Mohawk	116.0
TOTAL	1296.7

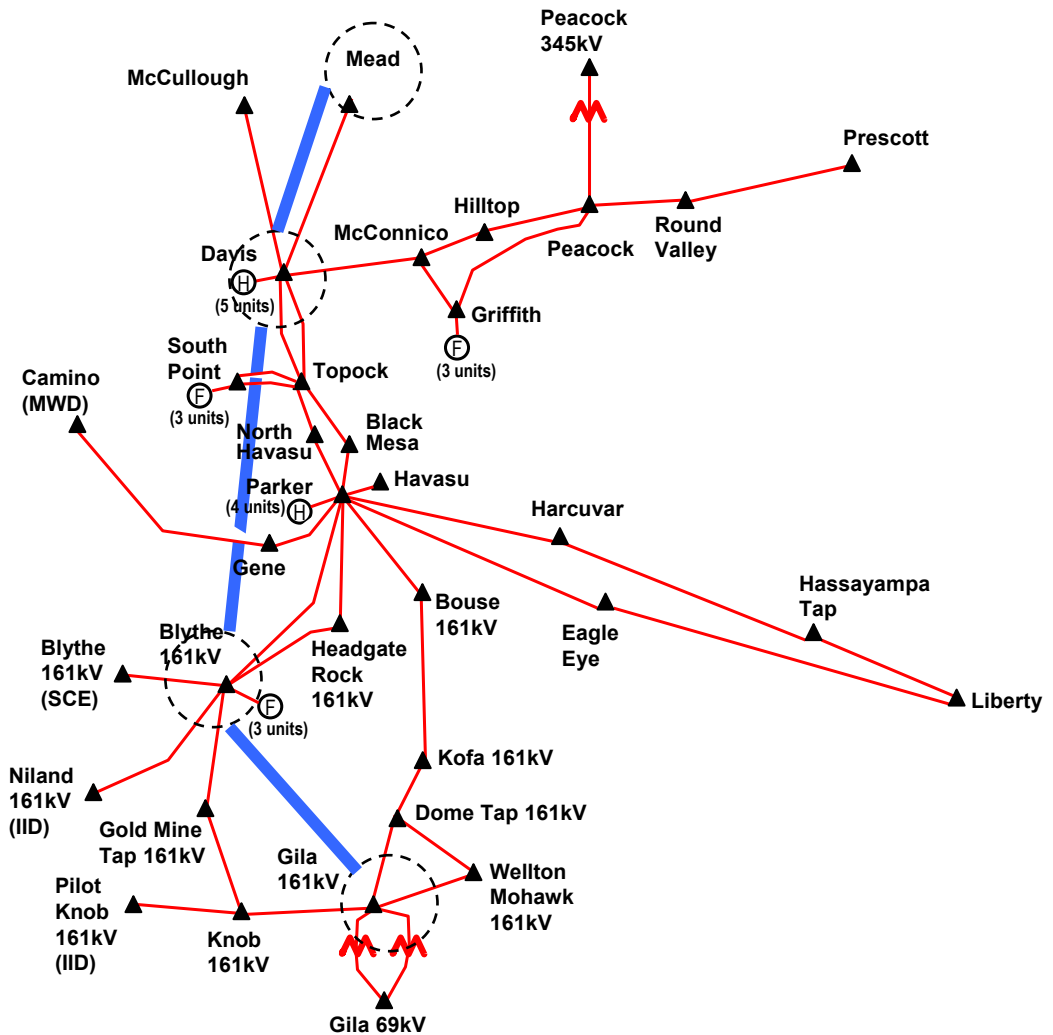
RMR Study Conclusions

- 1. River System Import Limit (SIL)** – At River System Import Limit (SIL) conditions, in which no River System generation is on-line, the River System did not require its generators in order to support its year 2005 projected peak load of 1297 MW. This projected peak load excludes generating station auxiliary loads (about 53 MW if the units were at maximum dispatch) because all River System generators are off-line when determining the SIL value. The SIL is limited to 1335 MW. The SIL is limited by a WECC 5% post-transient voltage deviation at the Peacock 230kV station for the single contingency outage of the Peacock 345/230-kV transformer.
- 2. River System Maximum Load Serving Capability (MLSC)** – The Maximum Load Serving Capability (MLSC), in which all River System generation is near maximum, is limited to 1698 MW. The MLSC is limited by a WECC 5% post-transient voltage deviation at the Bouse 161kV station for the single contingency outage of the Parker-Bouse 161kV line. This maximum River System load includes 53 MW of River System generating station auxiliary loads for the dispatch of 1746 MW of total gross River System generation. Net flow across the River System boundary is 0 MW.
- 3. River System Generator List** – The River System generators with ratings are listed in Table 1.
- 4. Reliability Must Run (RMR) conditions** – RMR conditions do not exist for the River System because it can reliably support its projected peak load without dispatching any of its generators.
- 5. Effectiveness of New Facilities** – No RMR conditions exist for the River System. Therefore, an effectiveness evaluation for new facilities (transmission or generation), that mitigate RMR conditions in the River System, is not needed.
- 6. Comparative Analysis of Alternatives** – No RMR conditions exist for the River System. Therefore, no comparative analysis of alternatives that mitigate RMR conditions in the River System is needed.

RMR Study Methodology

- **YEAR 2005:** Because no transmission or generation changes were expected for the River System by the year 2005, only the year 2005 was evaluated.
- **CATS_HV:** To develop a Starting Case for the year 2005 heavy summer River System, the latest available CATS_HV case (revision 7a) was modified according to the utilities within the River System. Incorporated into the Starting Case were the year 2005 projected peak loads within the River System. Table 2 summarizes these year 2005 peak load projections.
- **SIL:** To develop a System Import Limit (SIL) case, the Starting Case described in bullet 2 above was modified so that all generators within the River System were taken off-line. Replacement generation for the River System was scheduled from the following sources: 25% from Glen Canyon generation, 25% from Hoover generation, 50% from southern California generation. The SIL case was evaluated for NERC Category A (i.e. no contingency outage) and NERC Category B (i.e. single contingency outage) conditions in the River System.
- **SIL Voltage Stability:** To verify post-transient voltage stability in the SIL case, the “Voltage Support and Reactive Power” section of the NERC/WECC Planning Standards (section I.D.WECC-S2) was applied so that total River System load in the SIL case was increased 5%. The this SIL margin case was evaluated for NERC Category A (i.e. no contingency outage) and NERC Category B (i.e. single contingency outage) conditions in the River System.
- **MLSC:** To develop a Maximum Load Serving Capability (MLSC) case, the Starting Case described in bullet 2 above was modified so that all generators within the River System were on-line at maximum dispatch. The increased River System generation was scheduled to an equal amount of increased River System load. The MLSC case was evaluated for NERC Category A (i.e. no contingency outage) and NERC Category B (i.e. single contingency outage) conditions in the River System.
- **MLSC Voltage Stability:** To verify post-transient voltage stability in the MLSC case, the “Voltage Support and Reactive Power” section of the NERC/WECC Planning Standards (section I.D.WECC-S2) was applied so that total River System load in the MLSC case was increased 5%. Then this MLSC margin case was evaluated for NERC Category A (i.e. no contingency outage) and NERC Category B (i.e. single contingency outage) conditions in the River System.

Possible 500kV Transmission Between Yuma Area and Mead Area



Transmission Key

- 500kV █
- 230/161kV █