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ORIGINAL

BEFORE THE ARIZONA POWER PLANT

AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF ARIZONA SOLAR ONE, LLC IN CONFORMANCE WITH THE REQUIREMENTS OF ARIZONA REVISED STATUES §§ 40-360, *et seq.*, FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING THE CONSTRUCTION OF THE SOLANA GENERATING STATION, LOCATED IN SECTION 9, TOWNSHIP 6 SOUTH, RANGE 7 WEST, MARICOPA COUNTY, ARIZONA.	DOCKET NO. L-00000GG-08-0407-00139 CASE NO. 139
IN THE MATTER OF THE APPLICATION OF ARIZONA SOLAR ONE, LLC IN CONFORMANCE WITH THE REQUIREMENTS OF ARIZONA REVISED STATUES §§ 40-360, *et seq.*, FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING THE CONSTRUCTION OF THE SOLANA GEN-TIE, WHICH ORIGINATES AT THE SOLANA GENERATING STATION, LOCATED IN MARICOPA COUNTY, AND TERMINATES AT THE PANDA 230 kV SUBSTATION, LOCATED IN GILA BEND, ARIZONA.	DOCKET NO. L-00000GG-08-0408-00140 CASE NO. 140 **NOTICE OF FILING**

Staff of the Arizona Corporation Commission hereby files the slide show presentation of Ray T. Williams of the Utilities Engineer Division, in the above-referenced matter.

RESPECTFULLY SUBMITTED this 7th day of October, 2008.

Arizona Corporation Commission
DOCKETED
OCT - 7 2008
DOCKETED BY

Charles H. Hains
Attorney, Legal Division
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DOCKET CONTROL

Original and twenty-eight (28) copies of the foregoing filed this 7th day of October, 2008 with:

Docket Control
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007

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Copies of the foregoing
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Arizona Corporation Commission

Docket No. L-00000GG-08-0407-00139
Docket No. L-00000GG-08-0408-00140

Arizona Solar One, LLC
Solana Generating Station Project

Presentation of
Arizona Corporation Commission Staff Witness

Ray T. Williamson

October 14, 2008

ACC Staff Witness

Name:	**Ray T. Williamson**
Title:	**Utilities Engineer**
Employer:	**Arizona Corporation Commission**
Address:	**Utilities Division**
	1200 West Washington
	Phoenix, AZ 85007

Professional Background

Education & Certification

- B.S. (Engineering): 1970
  U.S. Military Academy, West Point, NY

- M.P.S. (Public Administration): 1976
  Western Kentucky University, Bowling Green, KY

- M.B.A. (Finance): 1982
  Arizona State University, Tempe, Arizona

- Certified Energy Manager (C.E.M.) designation
  from the Association of Energy Engineers: 1984

Professional Background (cont.)

Work Experience

- 1970 – 1976: U.S. Army
- 1976 – 1980: Employed in the Solar Industry
  - Solaron Corporation
  - Ramada Energy Systems
- 1980 – 1992:
  - Associate Director, AZ Solar Energy Commission
  - Energy Economic Analyst, AZ Energy Office
  - Manager, AZ Solar Energy Office

Work Experience (cont.)

- 1992 – 2008: Employed at AZ Corporation Commission
  - Economist
  - Senior Rate Analyst
  - Chief, Economics & Research Section
  - Acting Director, Utilities Division
  - Utilities Engineer
- 2001 – 2005: Designee of the Chairman, ACC to the AZ Power Plant and Transmission Line Siting Committee
  - Participated in Case #109 through 127

Other Solar-Related Experience

- Chairman, Solar Electricity Division, American Solar Energy Society, 1991 – 2004
- Member, Rating Methodology Committee, Solar Rating and Certification Corporation (SRCC), 1981 – 1984
- Member & Officer, SRCC Board of Directors, 1988-1991
- Member, Executive Committee, Interstate Solar Coordination Council, 1991-1992
- Member, Executive Committee, Interstate Renewable Energy Council, 1994-1995
- Member, National Photovoltaics for Utilities Steering Committee, 1994-1995

Purpose of Testimony

- Establish Hearing Record for Commission Consideration of its Balancing Test

- Staff's Technical Assessment of the Solana Project

1. Justification of Need
2. Benefits of the Project
3. System Reliability based on System Impact Studies
4. Staff's Assessment and Conclusions

ACC Balance Test
A.R.S. 40-360-07

Factors Considered:

- Adequacy
- Economics
- Reliability
- Environment
- Ecology

Adequacy and Reliability

Reliability is comprised of two parts:

Adequacy – The ability of the electric systems to supply the aggregate electrical demand and energy requirements of their customers at all times, taking into account scheduled and reasonably expected unscheduled outages of system elements.

Security – The ability of the electric systems to withstand sudden disturbances such as electric short circuits or unanticipated loss of system elements.

Project Description

On August 4, 2008, Arizona Solar One, L.L.C. filed an application with the Arizona Corporation Commission for a Certificate of Environmental Compatibility for the proposed construction of the Solana Generating Station and up to 21 miles of 230 kV transmission line and structures needed to connect the Solana Generating Station to the Panda substation.

System Impact Studies

Navigant Consulting Studies

- Abengoa Solar asked Navigant Consulting, Inc. to perform preliminary power flow and transient stability studies for Solana and for the Q31 project, a separate 102 MW photovoltaic project that will interconnect in the Gila Bend area.

- The studies looked at the Solana Project and the Q31 project connecting at either the Gila Bend 230 kV bus, or the Panda 230 kV bus, or at the Watermelon 500/230 kV substation.

- In certain situations, a second Gila Bend-Panda 230 kV line would need to be built.

- Depending on where Solana and/or the Q31 project interconnect, anywhere from 11 to 58 miles of existing 69-kV lines would need upgrades.

- The power flow impacts on the system due to the Solana Project would vary depending on its interconnection point, on the status and interconnection point for the Q31 project, and on whether or not a second Gila Bend-Panda 230 kV line was built.

- If Solana was interconnected at Gila Bend, a new 230 kV switchyard would be required at Gila Bend.

- If a second Gila Bend-Panda line was built, additions would be required at the Panda 230 kV switchyard.

Arizona Public Service Company's System Impact Study

- On August 14, 2008, APS completed a Draft Report entitled "Gila Bend/Gila River Cluster Interconnection System Impact Study."

- The Short Circuit Study portion has not been completed.

- The Study did not address interconnection at the Panda 230 kV bus.

- The Study did address interconnection by both Project Q31 and Solana at the Gila Bend 230 kV bus.

- The study showed that, with both projects in service, there could be thermal overloads on various facilities and possible voltage collapse for selected N-1 contingencies.

- The transient stability analysis concluded that the WECC transmission system remained stable for all contingency simulations and there were no NERC/WECC criteria violations in the APS or WECC transmission system.

- The Study showed, with both projects in service, the need for upgrade requirements to include:

  - Replacement of two Gila Bend transformer banks.

  - Re-conductoring of various 69 kV lines.

  - Addition of a second Gila Bend-Panda 230 kV line.

Need and Benefits of the Project

- Staff agrees with APS that the Solana Project is needed to meet the growing electricity demand of APS' customers as well as to meet the annual increases in Renewable Energy Standard & Tariff ("REST") Rule requirements for renewable generation.

- Staff believes that the Solana Project will provide clean, pollution-free electricity to APS' customers.

- Staff believes that the Solana Project, with its salt storage, will be the testing ground for the provision of "dispatchable" electricity during critical peak hours of electricity demand. The successful operation of Solana may establish a new economic paradigm for solar thermal electricity.

Staff's Assessment and Conclusions

Based on the System Impact Studies completed by APS and Navigant Consulting, and Staff's assessment of those study results, Staff concludes:

- **That the Project is needed to meet the rapidly growing load in the Arizona Public Service Company's service territory.**

- **That the Solana Project will help Arizona Public Service Company to meet its REST requirements.**

- **That the project will provide safe and reliable electricity to the APS system as long as all required upgrades recommended in the System Impact Study are made.**

Staff's Recommendations

Staff's recommendations are based upon studies received by Staff as of October 6, 2008:

Staff recommends a new Condition:

"The Applicant shall file with Docket Control the final APS System Impact Study, to include the Short Circuit Study, within 10 days of receipt by the Applicant, showing the upgrades needed to provide safe, reliable electricity from the Project."

Staff recommends an additional new Condition:

"The Applicant shall file with ACC Docket Control, confirmation of the completion of all required system upgrades at least thirty days before commercial operation of the plant and associated transmission lines."

Staff recommends a third new Condition:

"The Applicant shall maintain appropriate distance between the new 230 kV line and other existing lines in the same corridor. This distance should be at a minimum equal to or greater than the height of the tallest tower in each span."

Staff recommends approval of the Solana CEC, with the conditions recommended above.