Initial Review Process for Applications to Interconnect Generating Facilities

ISSUING DIVISION: Energy Distribution **Signed by Bob Streich's Signature on file**
SVP SPONSOR: Robert Streich, Asst. Director **Date Signed November 18, 2004**

SECTION: Protection Guidelines SD 1630

Scope:

This Initial Review Process was developed to create a path for selection and rapid approval for the interconnection of those Generating Facilities that do not require an Interconnection Study. This standard will determine the following;

1. If Generating Facility qualifies for simplified interconnection.
2. If a Generating Facility can be made to qualify for Interconnection with a supplemental review determining any potential additional requirements, or
3. If an Interconnection Study is required, the schedule for performing the Interconnection Study.

Purpose of Revision:

To standardize the interconnection of Generating Facilities to Silicon Valley Power.

References

- CPUC RULE 21

Rescissions

Definition of Terms:

- **ACTIVE ANTI-ISLANDING SCHEME:** A control scheme installed as part of the generating facility or interconnection facilities that senses and prevents the formation of an unintended island.
- **APPLICANT:** The entity submitting an application for interconnection pursuant to this standard.
- **APPLICATION:** An SVP approved standard form submitted to SVP for interconnection of a generating facility.
- **CERTIFICATION; CERTIFIED; CERTIFICATE:** The documented results of a successful certification test.
- **CERTIFIED EQUIPMENT:** Equipment incorporated into the Facility or the Interconnection Facilities that has passed the tests for certification set forth in the Interconnection Procedures certified by SVP.
- **COMMISSIONING TEST:** A test performed during the commissioning of all or part of a generating facility to achieve one or more of the following: 1) Verify specific aspects of its performance; 2) Calibrate its instrumentation; and 3) Establish instrument or protective function set-points.
- **DEDICATED TRANSFORMER; DEDICATED DISTRIBUTION TRANSFORMER:** A transformer that provides electric service to a single customer. The customer may or may not have a generating facility.
- **DISTRIBUTION SYSTEM:** All electrical wires, equipment, and other facilities owned or provided by SVP, other than interconnection facilities, by which SVP provides distribution service to its customers.
- **GENERATING FACILITIES:** All generators, electrical wires, equipment, and other facilities owned or provided by producer for the purpose of producing electric power.
- **GROSS NAMEPLATE RATING:** The total gross generating capacity of a generator or generating facility as designated by the manufacturer(s) of the generator(s).
- **HOST LOAD:** Electrical power that is consumed by the customer at the property on which the generating facility is located.
- **INTERCONNECTION FACILITIES:** The electrical wires, switches and related equipment that are required in addition to the facilities required to provide electric distribution service to a customer to allow interconnection. Interconnection facilities may be located on either side of the UCP as appropriate to their purpose and design. Interconnection facilities may be integral to a generating facility or provided separately.
- **INTERCONNECTION STUDY:** A study to establish the requirements for interconnection of a generating facility with SVP's distribution system.
- **LINE SECTION:** That portion of SVP's distribution system connected to a customer bounded by automatic sectionalizing devices or the end of the distribution

line.

- **NET NAMEPLATE RATING:** The gross nameplate rating minus the consumption of electrical power of a generator or generating facility as designated by the manufacturer(s) of the generator(s).
- **NON-ISLANDING:** Designed to detect and disconnect from a stable unintended island with matched load and generation. Reliance solely on under/over voltage and frequency trip is not considered sufficient to qualify as Non-Islanding.
- **PCC:** see UCP.
- **POINT OF INTERCONNECTION:** The electrical transfer point between a generating facility and the distribution system. This may or may not be coincident with the UCP.
- **PRODUCER:** The entity that executes an interconnection agreement with SVP. The producer may or may not own or operate the generating facility, but is responsible for the rights and obligations related to the interconnection agreement.
- **PROTECTIVE FUNCTiON:** The equipment, hardware and/or software in a generating facility (whether discrete or integrated with other functions) whose purpose is to protect against unsafe operating conditions.
- **SHORT CIRCUIT CURRENT CONTRIBUTION RATIO:** The ratio of the generating facilities short circuit contribution to the short circuit contribution provided through SVP's distribution system for a three-phase fault at the high voltage side of the distribution transformer connecting the generating facility to SVP's system.
- **SIMPLIFIED INTERCONNECTION:** Interconnection conforming to the minimum requirements under standard SD1630, and SD1631.
- **STARTING VOLTAGE DROP:** The percentage voltage drop at a specified point resulting from In-rush Current. The Starting Voltage Drop can also be expressed in volts on a particular base voltage, (e.g. 6 volts on a 120 volt base, yielding a 5% drop).
- **SUPPLEMENTAL REVIEW:** A process wherein SVP further reviews an Application that fails one or more of the Initial Review Process screens. The Supplemental Review may result in one of the following: (a) approval of Interconnection; (b) approval of interconnection with additional requirements; or (c) cost and schedule for an interconnection study.
- **UCP:** The point of delivery of electricity to a Customer's premises as determined by SVP.
- **UNSAFE OPERATING CONDITIONS:** Conditions that, if left uncorrected, could result in harm to personnel, damage to equipment, loss of System Integrity or operation outside pre-established parameters required by the Interconnection Agreement.
- **VISIBLE DISCONNECT:** An electrical switching device that can separate the Generating Facility from SVP's Distribution System and is designed to allow visible verification that separation has been accomplished. This requirement can be met by opening the enclosure to observe the contact separation.

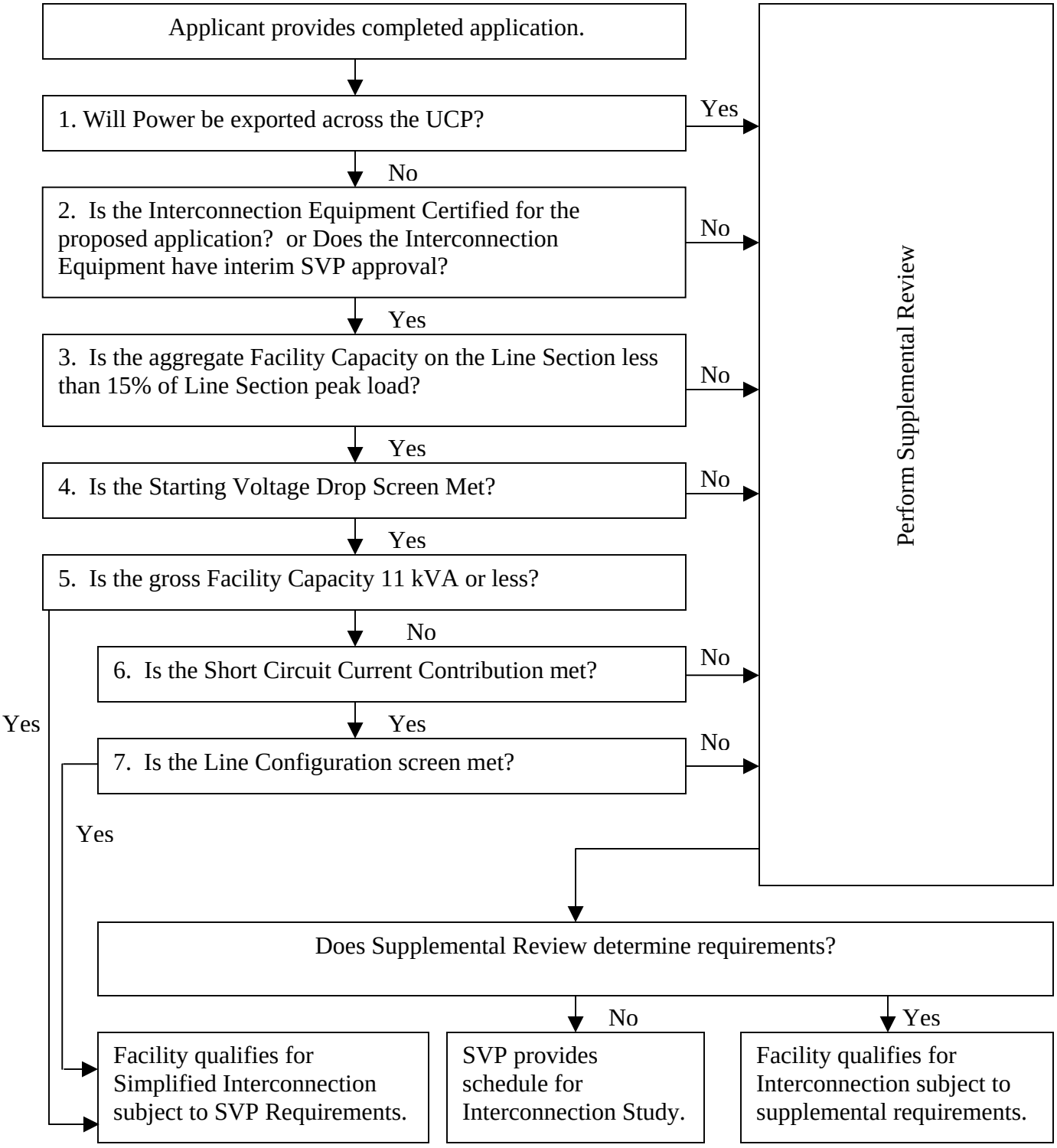

Figure 1 - Initial Review Process Flow Chart

Rev.	Date	Description	Appr.	Rev.	Date	Description	Appr.

By: A. Saenz	**Initial Review Process for Applications to Interconnect Generating Facilities**	Drawn By: A. Saenz
Approved: 11/18/04		SHEET 5 of 10
		SD 1630 Rev. 0
Bob Streich		

Screen 1. Will Power Be Exported Across the UCP?

- If Yes. Facility does not qualify for Simplified Interconnection. Perform Supplemental Review

- If No, the Generating Facility must incorporate one of the following:

  Option 1: Reverse Power Protection: To ensure power is never exported, a reverse power protective function must be implemented at the point of interconnection. The default setting for this protective function, when used, shall be 0.1% (export) of the service transformer's rating, with maximum 2.0-second time delay.

  Option 2: Minimum Power Protection: To ensure at least a minimum amount of power is imported at all times (and, therefore, that power is not exported), an under-power Protective Function may be implemented at the Point Of Interconnection. The default setting for this Protective Function, when used, shall be 5% (import) of the Generating Facility's total Gross Nameplate Rating, with a maximum 2.0 second time delay.

Significance:

- If it can be assured that the Facility will not export power, SVP's Distribution System does not need to be studied for load-carrying capability or Facility power flow effects on SVP voltage regulators as the Facility will simply be reducing load on SVP's Distribution System.

- This screen permits the use of reverse-power relaying at the point of interconnection as positive Anti-islanding protection.

Screen 2. Is The Interconnection Equipment Certified For The Application Or Does The Interconnection Equipment Have Interim SVP Approval?

- If Yes, continue to next screen.

- If No, Facility does not qualify for Simplified Interconnection. Perform Supplemental Review.

Significance:

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If the Facility has been Certified or previously approved by SVP, SVP does not need to repeat its review and/or test of the Facility's Protective Functions scheme. Site Commissioning Testing may still be required to ensure that the system is connected properly and that the protective functions are working properly.

Certification of SVP approval indicates the following criteria have been tested and verified:

- Basic protective function requirements met.
- Harmonic distortion limits met.
- Synchronizing requirements met.
- Power factor regulation requirements met.
- Non-islanding requirements met.
- If used, reverse power function requirement met.
- If used, under power function requirement met.

Screen 3. Is the aggregate generating facility capacity on the line section less than 15% of line section peak load?

- If yes, continue to next screen.

- If no, the generating facility does not qualify for simplified interconnection. Perform supplemental review to determine cumulative impact on line section.

Significance:

1. Low penetration of generating facility installations will have minimum impact on the operation and load restoration efforts of SVP's distribution system.

2. The operating requirements for a high penetration of generating facilities may be different since the impact on SVP's distribution system will no longer be minimal, therefore requiring additional study.

Screen 4. Is the starting voltage drop within acceptable limits?

- If yes, continue to next screen.
- If no, the generating facility does not qualify for simplified interconnection. Perform Supplemental review.

Note: This screen only applies to generating facilities that start by motoring the generator(s).

SVP has two options in determining whether starting voltage drop could be a problem. The option to be used is at SVP's discretion.

Option 1: SVP may determine that the generating facility's starting In-rush current is equal to or less than the continuous ampere rating of the customer's service equipment.

Option 2: SVP may determine the impedances of the service distribution transformer (if present) and the secondary conductors to customer's service equipment and perform a voltage drop calculation. Alternatively, SVP may use tables or nomographs to determine the voltage drop. Voltage drops caused by starting a generator as a motor must be less than 2.5% for primary interconnections and 5% for secondary connections.

Significance:

1. This screen addresses potential voltage fluctuation problems for generators that start by motoring.
2. When starting, generating facilities should have minimal impact on the service voltage to other SVP customers.
3. Passing this screen does not relieve the producer from ensuring that its generating facility complies with the flicker requirements in SD 1631 section 2.1.2.

Screen 5. Is the gross nameplate rating of the generating facility 11kVA or less?

- If yes, the generating facility qualifies for simplified interconnection. Skip remaining Screens.
- If no, continue to next screen.

Significance: The generating facility will have a minimal impact on fault current levels and any potential line overvoltages from loss of distribution system neutral grounding.

Screen 6. Is the short circuit current contribution ratio with acceptable limits?

- If yes, continue to next screen.
- If no, the generating facility does not qualify for simplified interconnection. Perform supplemental review.

The short circuit current contribution ratio screen consists of two criteria; both of which must be met when applicable:

1. When measured at primary side (high side) of a dedicated distribution transformer serving a generator facility, the sum of the short circuit contribution ratios of all generating facilities connected to the distribution system circuit that serves the generating facility must be less than or equal to 0.1 and

2. When measured at the secondary side (low side) of a shared distribution transformer, the short circuit contribution of the proposed generating facility must be less than or equal to 2.5% of the interrupting rating of the producer's service equipment.

Significance: If the generating facility passes this screen it can be expected that it will have no significant impact on SVP's distribution system's short circuit duty, fault detection sensitivity, relay coordination or fuse-saving schemes.

Screen 7. Is the line configuration acceptable for simplified interconnection?

- If yes, the generating facility qualifies for simplified interconnection. Note: SVP distribution system is a 3 wire system. Thus, any generating facilities connected to the SVP distribution system will pass this screen.

- If no, then the generating facility does not qualify for simplified interconnection. Perform supplemental review.

Line configuration screen: Identify primary distribution line configuration that will serve the generating facility. Based on the type of interconnection to be used for the generating facility, determine from the following table if the proposed generating facility passes the screen.

Primary Distribution Line Type Configuration	Type of interconnection to be made to primary distribution line	Results/Criteria
Three-phase, 3-wire	Any type	Pass Screen

Significance: If the primary distribution line serving the generating facility is of a "three-wire" configuration, or if the generating facility's distribution transformer is single-phase and connected in a line-to-neutral configuration, then there is no concern about over voltages to SVP's, or other Customer's equipment caused by the loss of system neutral grounding during the operating time of the Anti-islanding protective function.