- If the proposed generation is single-phase and is to be interconnected on a center tap neutral of a 240-volt service, its addition may not create an imbalance between the two sides of the 240-volt service of more than 20% of the nameplate rating of the service transformer.
- The proposed generation may not increase the generation interconnected to the transmission side of a substation transformer feeding the circuit where the interconnection customer proposes to interconnect above 10 MW in an area where there are known, or posted, transient stability limitations to generating units located in the general electrical vicinity (e.g., three or four transmission busses from the point of interconnection).
- The proposed interconnection may not cause the interconnecting utility to construct facilities on its system.

NNEC grades state interconnection procedures by determining whether they have adopted the SGIP screens. A state interconnection procedure receives no points for adopting the SGIP screens and loses one point for a partial adoption of the SGIP screens. State procedures lose two points if no screens are used or the screens are left to utility discretion. NNEC assesses penalties if more conservative screens are used and bonuses if a state drops one or more SGIP screens that do not affect safety.

CA Rule 21 passes all interconnection requests through eight screens to determine whether they qualify for a simplified interconnection. If all the screens are passed, the generating facility qualifies for simplified interconnection. If a proposed interconnection fails any of the screens, the interconnection request proceeds to a supplemental review. Because the screens applied under CA Rule 21 differ from the SGIP screens, CA Rule 21 loses a point for this criterion.

Given that CA Rule 21 screens were developed and implemented well before the SGIP was adopted and most distributed generation is installed based on the CA Rule 21 screens, it is fair to ask why Rule 21 loses a point for this criterion. Moreover, CA Rule 21 screens appear to have some advantages over the SGIP screens. For example, there is no screen in CA Rule 21 related to exceeding the equipment interrupt rating, or limiting distributed generation on a shared secondary to 20 kW. In the SGIP, the 20 kW limit is in the aggregate, in CA Rule 21, it is per applicant. These advantages would appear to justify a reevaluation of the CA Rule 21 scoring for this criterion and perhaps a broader examination of the FERC screens to determine whether they may be improved upon.

The MADRI Procedures and the IREC Procedures have very similar provisions, adopting and improving upon the SGIP screens. Both adopt all of the screens listed, except the first SGIP screen that relates to FERC jurisdictional facilities and therefore would not be applicable in state procedures. Both the MADRI and IREC Procedures use a shortened version of the SGIP screens for Level 1 review. And both adjust the fourth screen slightly to state that the proposed interconnection may not cause any distribution protective devices and equipment or interconnection customer equipment to exceed 90% of the short-circuit interrupting capability, rather than 87.5% as the SGIP does. Several states have adopted this cutoff. For simplifying the SGIP screening process, both the MADRI and IREC Procedures receive a point.

10. Spot Network Interconnection

Networks are characterized as either area networks that may supply several city blocks, or spot networks that typically serve a single customer. Both use multiple transformers in an interconnected electrical network circuit to improve reliability. The SGIP requires facilities interconnecting to the load side of spot network protectors to use an inverter-based equipment package. The facility, together with other inverter-based generation, may not exceed five percent of a spot network's maximum load or 50 kW, whichever is less (§ 2.2.1.3).

Although CA Rule 21 addresses spot network connections, if a generating facility will interconnect to an area or spot network, it does not qualify for a simplified interconnection under CA Rule 21 and a supplemental review is required (CA Rule 21(I)(3)(a)). CA Rule 21 does not adopt IEEE 1547 Clauses 4.1.4.2 (Distribution Secondary Spot Networks), which is being studied for inclusion in a subsequent version of the rule (CA Rule 21(D)). CA Rule 21 receives no points for spot network interconnection, comparable to the SGIP, though a study process is required in California. Deduction of points is reserved for rules that prohibit spot network interconnection, and the cost of any necessary study is borne by the utility for net metered systems, so there is little impact on the customer generator in these typical cases.

The MADRI Procedures follow the approach of the SGIP and allow inverter-based generators to interconnect so long as aggregate generation on the network does not exceed the lesser of five percent of the spot network's maximum load or 50 kW (§ 5.3.2). As ever, matching the SGIP gets a score of zero.

The IREC Procedures allows aggregate inverter-based interconnection on a spot network of up to five percent of the spot network's peak load, without adding the 50 kW limitation. As many spot networks experience peak loads far in excess of one MW, this lifts the allowed spot network interconnection substantially while still maintaining a low threshold in percentile terms. For this, IREC is awarded two points in the NNEC grading.

The topic of spot and area network interconnections is being investigated by the National Renewable Energy Council and others, and results of these investigations may change the scoring of network provisions in the future. Yet, the authors conclude that with no evidence of network-interconnected systems causing harm, it is reasonable to assume that some process can be developed to allow fast-track review of such systems.

11. Area Network Interconnection

Major metropolitan areas such as New York and Chicago are served by area networks, which increase reliability and reduce outages in high-density load areas by using several primary feeders suitably interlaced through an area in order to achieve acceptable loading of transformers under emergency conditions and to provide a system of extremely high service reliability.

The SGIP does not address area network interconnections. CA Rule 21 addresses area network connections, however, only to the extent necessary to determine that a generating facility that interconnects to an area network does not qualify for a simplified interconnection under Rule 21 (CA Rule 21(I)(3)(a)). This allowance does not make interconnection to area networks any more feasible than it is under the SGIP, and CA Rule 21 is not awarded points. Generally, NNEC does not award a point for this criterion if studies are required because such a provision makes small systems uneconomic. CA Rule 21's requirement that utilities assume interconnection study costs for net metered systems would appear to facilitate area network interconnections, but it is still possible that the studies will determine that costly system upgrades are necessary to interconnect a system.

The MADRI Procedures have an extended process with utility discretion to permit area network interconnections of up to 50 kVA in the aggregate (§ 7.3). The utility may study the interconnection at its own cost and determine "in its sole discretion" that the interconnection will cause adverse system impacts. With that level of uncertainty, the MADRI Procedures are not credited with any substantive improvement in the ease