UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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GENERAC POWER SYSTEMS, INC.
Petitioner,

v.

PSLC LLC
Patent Owner.

_____

Case No. IPR2026-00024
U. S. Patent No. 11,967,857

PATENT OWNER'S PRELIMINARY RESPONSE

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LIST OF PATENT OWNER'S EXHIBITS

Exhibit No.	Description
2017	Patent Owner's Response to Restriction Requirement 11/18/2020

I. INTRODUCTION

Petitioner Generac Power Systems, Inc. ("Petitioner") files three serial petitions for *inter partes* review (the "Petition" or "Petitions")[1] challenging the validity of all claims of U.S. Patent No. 11,967,857 (the "'857 Patent"), owned by PSLC LLC ("Patent Owner").

This third Petition challenges a subset of the claims of the '857 Patent under 35 U.S.C. § 103 and relies upon the base combination of U.S. Patent App. No. 2006/0208574 ("Ex. 1005" or "Lasseter") and J.A. Peças Lopes et al., *Defining Control Strategies for MicroGrids Islanded Operation*, 21 IEEE TRANSACTIONS POWER SYSTEMS 916 (May 2006) ("Ex. 1011" or "Lopes"). Petitioner relies upon Lasseter and Lopes as the base combination for all three of its serial Petitions and because Petitioner fails to show a reasonable likelihood of prevailing as to any of the claims challenged in its Petitions, Patent Owner respectfully requests that the Board decline institution as to all three Petitions.

As an initial matter, to aid the Board and Director in their review, Patent owner notes that this brief mirrors the reasoning and conclusions presented in Patent Owner's Preliminary Response filed concurrently in IPR No. 2026-00022 but simultaneously accounts for nuances in the challenged claim language unique to this Petition.

[1] IPR Nos. 2026-00022-24.

Petitioner's serial challenge does no more than recast the prior art cited during examination and described in the specification of the '857 Patent and in doing so leaves substantial holes in Petitioner's challenge which require institution be denied. As described in Patent Owner's discretionary denial brief and herein, Petitioner's primary reference bears the same title and teachings as one of the references cited during initial examination and is nearly identical to prior art systems described by the '857 Patent's specification. Petitioner's secondary reference's teachings are also nearly identical to the prior art disclosed by Patent Owner in the specification of the '857 Patent, particularly Figure 3 and its corresponding text. But try as Petitioner might, it cannot and did not find a reference that discloses, teaches, or suggests the "proactive overload-prevention" Petitioner acknowledged is disclosed by the '857 Patent's claims in its Notice Ranking document. *See* Paper 2 at P. 2.

Notably, when faced with the similar art of record, the examiner did not issue a single Section 102 or 103 rejection during examination of the '857 Patent. Unsurprisingly, Petitioner's cumulative challenge leaves the same holes identified by the examiner in his Notice of Allowance and more. Specifically, Petitioner's challenge fails to disclose, teach, or suggest the claimed (1) control circuit operating to control the frequency of the AC power to have a second frequency when the power source is overloaded; (2) power source controlling the AC power such that its frequency is responsive in a manner that the frequency represents the loading of the

power source; (3) processor circuit/load manager circuit operating to control the coupling of the output AC power to at least one load helping to prevent or alleviate an overload of the power source; (4) load manager circuit providing power to at least one of the one or more plurality of loads when the power source is not overloaded and not provide AC power when the power source is overloaded; or (5) power system which provides AC power with a controlled AC frequency managing the loading of the power systems or sources.

One or more of these requirements are present within the limitations of the challenged claims of the '857 Patent, including each of the challenged independent claims, 45 and 66 at limitations [pre], [b], or [c], and thus, Petitioner has failed to meet its burden to establish a reasonable likelihood that it would prevail with respect to at least one of the claims challenged by the Petition. Institution must be denied.

II. BACKGROUND

A. The Inventions of the '857 Patent

The '857 Patent claims priority to provisional application No. 61/490,253 filed on May 26, 2011, and Petitioner has not contested the '857 Patent's claims' entitlement to priority as of that date.

The '857 Patent is directed to "[a] method and apparatus for controlling the total load presented to an AC power source" wherein through the control of the frequency of AC power, "controllable loads and load control devices can determine

the amount of remaining power available for the power source in order to determine if a given load can be connected without creating an overload." In certain embodiments, "[t]he frequency may also be controlled at the power source to indicate an overload, with the loads being responsive to that overload frequency to reduce the load and thereby alleviate the overload." Ex. 1001 at Abstract.

The '857 Patent sets forth a need "to determine and control which and how many loads are connected [to a power source] in order that the total of the loads does not create an overload" of the power source and a desire to "control the total load presented to a particular power source to keep that load at or somewhat below the maximum capability of the power source." Ex. 1001 Col. 2, L. 15-17; Col. 7, L. 26-30. The '857 Patent explains that this need is driven by the fact that "[o]verloads are generally undesirable in that they may cause deviation from power output specifications, loss of power, damage or combinations thereof" and that operating below at or near the maximum capability of the power source results in "efficiency robbing factors" due to power sources being "design[ed] to handle maximum load." Ex. 1001 Col. 4, L. 37-40. Thus, the inventions of the '857 Patent aim to balance efficiency considerations favoring operation of power sources near their maximum output capability while simultaneously preventing overloads.

Patentee explicitly defined the term "overload," which is used repeatedly in the '857 Patent's specification and claims and is essential to the understanding of the same:

> As used herein and in the claims, overload means ***a load that if not disconnected or otherwise prevented*** will either cause a departure from specifications for the power output from the power source, for example such as a deviation of AC power voltage or frequency for longer than a specified time period, a loss of power such as from a tripped circuit breaker, or damage such as overheating or exceeding mechanical stress limits. Ex. 1001 Col. 7, L. 55-62.

Immediately preceding patentee's definition of overload, the '857 Patent notes that "[i]t will be understood by one of ordinary skill that short term large loads may be allowed in that many engine driven alternator systems are designed to permit short term increases in power output above the maximum power that can be continuously delivered." Ex. 1001 Col. 7, L. 51-55. The '857 Patent elaborates on the importance of this characteristic by explaining "[m]ost generators can handle significant excessive output currents for short periods of time and that [this] is useful in providing large starting currents for motors" which "normally go away after a few seconds" upon reaching operating speed. *Id.* at Col. 18 L. 18-23. In doing so, the '857 Patent draws an important distinction between what it defines as an overload and mere short-term increases in power above maximum output that power sources readily handle without deviation from power specifications or damage.

The ‘857 Patent explains that its inventions allow for “efficient matching of a total load made up of individual loads to one or more power sources without overloading the power sources” and “sizing of power sources to accommodate less than the maximum possible load” while also “prevent[ing] overloading of the power source by preventing a load which would otherwise immediately cause or which could lead to a future overload from being connected or alternatively by restricting the power supplied to that load and/or others.” Ex. 1001 at Col. 8-9, L. 59-1. The ‘857 Patent thus allows power sources to “power the maximum number of loads and/or to operate nearer to or achieve optimum efficiency while at the same time monitoring the present and expected future load thus ensuring that the generator will not be overloaded instantly or during the duration of any particular connection. *Id.* at Col. 9, L. 21-25.

The ‘857 Patent provides multiple figures which help to explain the claimed inventions. For example, the ‘857 Patent’s Figure 4 “shows a simplified diagram of the preferred embodiment of the invention in which the power grid 12 or a generator 13 may power a group of loads including [a] set of uncontrolled loads and a set of individually switched loads.” Id. at Col. 20, L. 29-33. This preferred embodiment contains load monitor 23a to monitor the power output of the generator which is conveyed to load control 25a via generator monitor 24. Id. at Col 21, L. 28-32.

Figure 4 utilizes load switches 22a-c which are responsive to load control 25a via communications link 26a-c and operable to connect and disconnect power coming from the transfer switch to various loads. "[I]t is desirable that load control 25a be capable of sensing several parameters of the generator, and that it may be programmed or otherwise set to operate in response to those parameters and the particular generator and environment." Col. 25 at 37-41.

"After generator power is made available via the transfer switch, load control 25a operates to determine if the highest priority load 16-18 can be supported by the available power of generator 13 and if so load control 25a causes the load switch associated with that load to be closed via commands conveyed to the switch by its corresponding communications channel." Col. 26 at L. 26-32. "Load control 25a also monitors the generator 13 for overloads, and other parameters such as minor equipment failures such as slight overheating and chooses which loads to disconnect[.]" Col. 27 at L. 3-6. In this way, the '857 Patent's load control is able to use "intelligent timing for connecting and disconnecting loads to one or more power sources in order that the total load on any one power source is kept at or below the maximum output capability of that source[.]" Id. at Col. 61-62, L. 66-4.

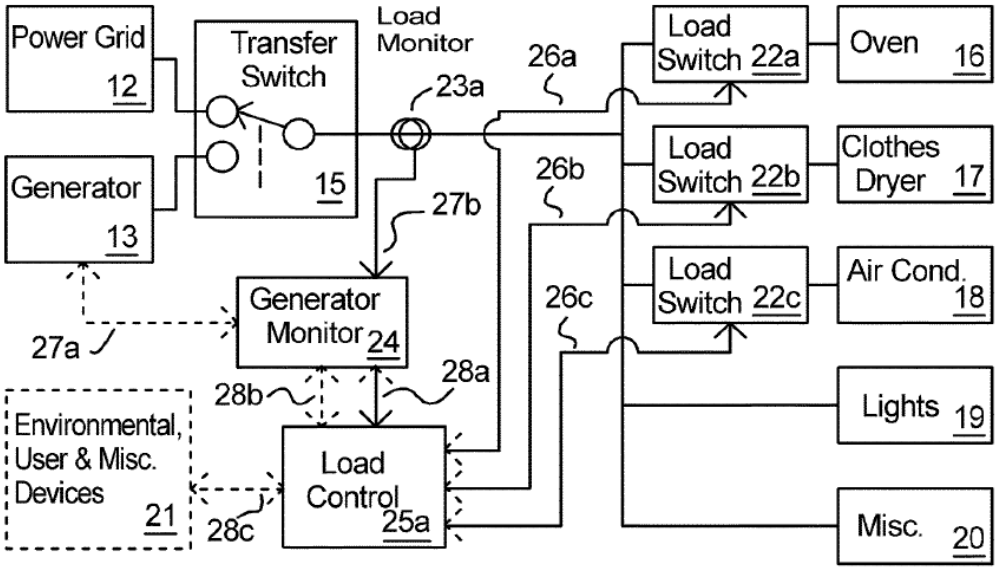


Figure 4

B. The '857 Patent's Description of the Prior Art

The '857 Patent provides a robust description of the prior art at the time which includes a description of highly similar pieces of art as to what is being cited by Petitioner in its challenge.

In doing so, the '857 Patent keys in on the reactive nature of the prior art which relies on frequency detection once a generator is in an overload condition that sheds low priority loads only "after the generator has been overloaded." *Id.* at Col. 6, L. 43. The prior art load shedding occurs because the rotation of generator engines slow when the engine cannot produce enough torque to keep the alternator rotating at the correct speed and as a result, the frequency of the AC power decreases. *Id.* at Col. 6. L. 31-35. Thus, the load shedding prior art described by the '857 Patent

responds to the departure from frequency specifications of the power source caused by the overload of the power source and subsequently sheds loads "after the overload happens." *Id.* at Col. 6. 50-52.

The '857 Patent describes this method of load shedding as not only reactive, but unreliable because the prior art's frequency detectors have issues with both speed and accuracy of AC frequency detection. *Id.* at Col. 6, L. 53-57. The '857 Patent notes that these inaccuracies in AC power frequency detection "can cause an actual overload to go undetected" and it is quite possible that "damage to the generator or its load, may have already happened by the time the overload is detected." *Id.* at Col. 6 L. 59-64. In situations where "the frequency detection is too sensitive unneeded shedding may occur, or if it is not sensitive enough, slow or no load shedding may occur with the possible result of the generator's circuit breaker tripping thus removing all power." And "[a] one size fits all frequency threshold used to cause a complete disconnect of the load from the generator may allow overheating or other damage to the generator[.]" *Id.* at Col. 18, L. 48-55.

The '857 Patent also provides diagrams of example prior art systems upon which it has improved. Figure 2 of the '857 Patent, reproduced below, shows a simplified diagram of a prior art backup generator system wherein electrical power from the grid is supplied via the transfer switch 15*a* to a home consisting of a group of electrical loads consisting of an oven, clothes dryer, air conditioner, lights, and

other miscellaneous loads. *Id.* at Col. 14, L. 30-37. The Generator & Transfer Switch Controller 14 is responsive to the grid power to control whether the transfer switch selects either grid or generator power to power the home. *Id.* at Col. 14, L. 43-47.

To prevent the generator from being overloaded, backup systems often include the pictured distribution sub panel 15*c* which is connected to high priority loads which are needed when power is lost and require power from the backup generator. *Id.* at Col. 15 L. 8-12. The rest of the loads which the generator is not capable of powering are connected to the main panel 15b and remain unpowered while the backup generator is running. *Id.* at Col. 15 L. 13-17. In this way, the prior art was able to manage the load presented to the backup power source by preemptively disconnecting lower priority loads during power outages.

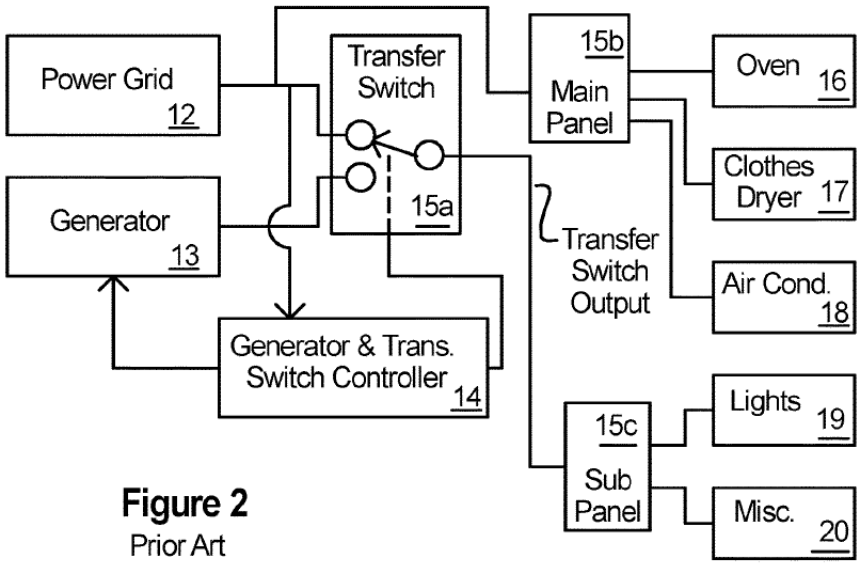


Figure 2
Prior Art

Figure 3 is a simplified example of an improved prior art version of the backup system in FIG. 2 which provides power to a group of loads, including a set of uncontrolled loads and a set of controlled loads which may be simultaneously switched off if the generator becomes overloaded. *Id.* at Col. 17, L. 45-49. After the controlled loads are simultaneously switched off they may then be automatically (and blindly) switched on in a sequential fashion according to priority, each additional load being switched a time period after the previous one. *Id.* at Col. 17, L. 50-54. "FIG. 3 additionally includes load managers 14a which are contactors to switch the high current load on and off in response to a control signal [such as a drop in frequency]. A contactor is essentially a high current relay which switches the load completely on or off." *Id.* at Col. 17, L. 56-59. These prior art load shedding methods are an "inexpensive manner of detecting and removing overloads" but their reliance on the detection of the power frequency of the generator as a means of signaling a load shed requires that "the generator must already be overloaded to the point of not being able to supply enough rotating torque to the alternator to maintain the proper speed" or nominal frequency. *Id.* at Col. 7, L. 1-3; Col. 18, L. 12-15. Thus, the reactive methods set forth by Figure 3 still expose the generator and/or its loads to "deviation from power output specifications, loss of power, damage, or combinations thereof." *Id.* at Col. 2, L. 17-20.

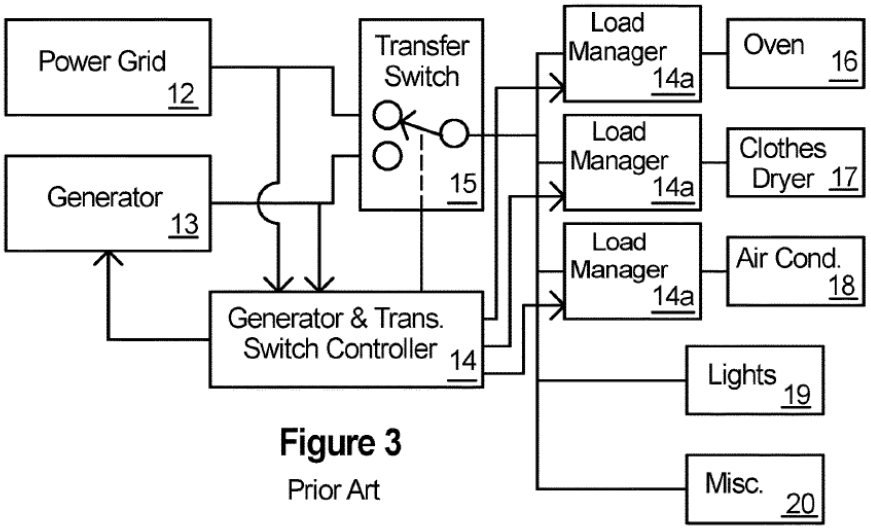


Figure 3
Prior Art

C. File History of the '857 Patent

The '857 Patent received no anticipation or obviousness rejections during prosecution but instead received a restriction requirement which the Patent Owner responded to with traverse. Ex. 2017. In responding to that restriction requirement, patentee explained that "the frequency of the AC power is controlled in [the] claims such that it conveys information" that "may be used to prevent or relieve an overload." Ex. 2017 at P. 2; 6. Patentee contrasts his invention from the prior art AC power "which is maintained at a standard frequency" and conveys "no loading information[.]" *Id.* at P. 6.

Although the examiner issued no anticipation or obviousness rejections as to the '857 Patent, when explaining why the patentee was entitled to the '857 Patent, the examiner noted the following shortcomings of the prior art, specifically, U.S. Application 2004/0051387 by Lasseter:

> Lasseter fails to teach the power source operating in such a manner as to control the frequency of the output AC power to have a first frequency when the power source is not overloaded and a second frequency when the power source is overloaded or near to being overloaded in addition to a processor circuit operating in response to the occurrence of the second frequency to control the amount of AC output power consumed by at least one load. *See* Ex. 2010 (emphasis added).

Petitioner's expert explained in his declaration that the Lasseter reference put forward by the current challenge is "consistent with and reflects the same concepts and control strategies described across many of Lasseter's academic and industry publications[.]" *See* Ex. 1003 at P. 53 ¶ 51. Consistent with the foregoing, the Lasseter reference cited by the examiner as well as the Lasseter reference put forth by Petitioner share the exact same title and discuss the same subject matter, including a relationship between output power and frequency wherein maximum power output is reached at the same time as minimum frequency, which Petitioner cites to as evidence of the claimed second frequency. *Compare* e.g. Ex. 1005 at [0117-0119] to Ex. 2011 at [0111-0112]. As will be shown in greater detail herein, Petitioner's "new" Lasseter reference also contains the same shortcomings noted by the examiner, some of which Petitioner's challenge does not so much as dispute.

D. Challenged Claims

Petitioner challenges the validity of all claims of the '857 Patent through their three Petitions filed against the '857 Patent,[2] but challenges only claims 45-60 and 66-71 through this Petition. Independent claims 45 and 66 are reproduced below.

> 45. A power system which provides AC power to one or more loads, the AC power frequency being changeably controlled to assist managing the loading of the power system at least when not sending power to a grid, the power system comprising:
> a) a non-utility type power source comprising one or more inverter which receives power from one or more of:
> i) a rechargeable power storage system;
> ii) a vehicle battery;
> iii) a solar PV system;
> iv) an other green renewable power system;
> v) an internal combustion power generator;
> the power source providing single or multiple phase output AC power to one or more loads which may include the power grid, the output AC power having one or more controlled parameter, including the AC frequency which frequency is controlled by the power source in response to the power grid frequency or another device frequency if synchronization thereto is desired, or if synchronization is not desired the one or more controlled parameter including the AC frequency may be controlled in response to the loading of the power source;

[2] IPRs 2026-00022-24.

b) a control circuit which may be part of the power source or otherwise, is responsive to one or more power source operating parameter which affects the power source operation, the control circuit operating at least when the output AC power is not synchronized to the power grid or another device, to control one or more parameter of the output AC power such that the AC power has at least first frequency when the power source is not overloaded including when it supplies excessive current which the AC power source can handle, and at least a second frequency when the power source is overloaded including when it supplies an excessive current for a period of time which if continued may risk power source damage or loss of AC power;

c) a processor circuit comprising one or more processors responsive to the one or more parameter of the output AC power, and in response to the occurrence of the second frequency operating to control the coupling of output AC power to at least one load of the one or more loads thereby helping to prevent or alleviate an overload of the power source.

66. A power system which manages the loading of at least one A.C. power sources which provides AC power with a controlled AC frequency, the power system comprising:

a) one or more non-utility type power source comprising at least an AC power generating circuit which outputs sinusoidal single or multiple phase AC power which may be controllably coupled to one or more of a plurality of loads, the AC power having a plurality of parameters including at least a frequency, a voltage, sine wave distortion and a

current which may range from zero to a maximum amount depending on the loading of the power source;

b) one or more contactor and/or transfer switch whereby the AC power may be electrically paralleled with, or connected in place of or as a backup replacement for the grid power and the power source controls the AC power such that;

i. the frequency of the AC power is responsive to the grid power frequency when the AC power is provided in parallel with grid power so that connected loads receive power from one or both of the power source and grid; and

ii. when the AC power is not paralleled with the grid, its frequency is responsive in a manner that the frequency represents the loading of the power source;

c) a load manager circuit comprising one or more processor, which load manager circuit may or may not be part of the power source, the load manager circuit responsive to the frequency of the AC power to provide AC power to at least one of the one or more of a plurality of loads when the power source is not overloaded and not provide AC power when the power source is overloaded.

E. Petitioner's Grounds of Challenge

Ground	Claims	Basis	References
1A	45-47, 49-54, 58-60, and 66-69	Obviousness	Lasseter-Lopes
1B	48, 56-57, and 71	Obviousness	Lasseter-Lopes-Baldassarre
1C	69-70	Obviousness	Lasseter-Lopes-Tsukida
1D	55	Obviousness	Lasseter-Lopes-Baldassarre-Tsukida

Patent Owner does not purport to present all of its rebuttal arguments herein and reserves its right to present further argument and evidence related to these prior art references, the combinations thereof, and the content of the Petitions later in this proceeding, consistent with the Board's Rules and practice. No waiver is intended by any argument withheld by Patent Owner at this stage of the proceeding.

III. CLAIM CONSTRUCTION

Consistent with Patent Owner's constructions in the district court proceeding, Patent Owner construes the following terms as defined by patentee acting as his own lexicographer in the '857 Patent:

Overload - a load that if not disconnected or otherwise prevented will either cause a departure from specifications for the power output from the power source, for example such as a deviation of AC power voltage or frequency for longer than a specified time period, a loss of power such as from a tripped circuit breaker, or

damage such as overheating or exceeding mechanical stress limits. *See* Ex. 1001 at Col. 7, L. 53-60.

Parameter - a quantity of one or more property or attribute (e.g. of a device, physical property, substance or environment) which is treated as a constant and which is expressed as numbers which are suitable for use by the device(s) using or responsive to such parameters. *See* Ex. 1001 at Col. 10, L. 9-12.

Power grid - any commonly known and used sources of electrical power to homes and businesses, e.g. public and private electric utility companies. *See* Ex. 1001 at Col. 15, L. 21-23.

Timely - instant, real time, close to real time or a suitable time. *See* Ex. 1001 at Col. 25, L. 60-62.

Know or **Known** - to have been previously stored in a memory and available e.g. having been previously manufactured with, programmed with or measured. *See* Ex. 1001 at Col. 26, L. 18-21.

Patent Owner further identifies the preambles of the challenged independent claims, claims 45 and 66 as limiting because they breathe life, meaning and vitality into the claim.

"[A] claim preamble has the import that the claim as a whole suggests for it." *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999) (quoting *Bell Communications Research, Inc. v. Vitalink Communications Corp.*, 55

F.3d 615, 620 (Fed. Cir. 1995)). "If the claim preamble, when read in the context of the entire claim, recites limitations of the claim, or, if the claim preamble is 'necessary to give life, meaning, and vitality' to the claim, then the claim preamble should be construed as if in the balance of the claim." *Pitney Bowes*, 182 F.3d at 1305. "The effect preamble language should be given can be resolved only on review of the entirety of the patent to gain an understanding of what the inventors actually invented and intended to encompass by the claim." *Corning Glass Works v. Sumitomo Elec. U.S.A., Inc.*, 868 F.2d 1251, 1257 (Fed. Cir. 1989).

Because the preambles of the claims speak to a core piece of the operation of the claimed inventions described both in the specification and the file history of the '857 Patent, they should be treated as limiting. As set forth above, in the file history of the '857 Patent, patentee emphasized that "the frequency of the AC power is controlled in [the] claims such that it conveys information" that "may be used to prevent or relieve an overload" a concept that is directly manifest in the preambles of the challenged claims. These claims describe power systems which provide AC power with a controlled AC frequency or other controlled power parameter to assist in managing the loading of the of the power systems by communicating information regarding the loading of a power source, namely whether it is overloaded, near overloaded, or not overloaded, in order to connect, disconnect, or control the power provided to a given load. This is consistent with the specification of the '857 Patent

which teaches that the frequency of the power system may be "controlled at the power source to indicate an overload, with the loads being responsive to that overload frequency to reduce the load and thereby alleviate the overload." *Id.* at Abstract. When viewed in light of the entire patent, the preambles provide important meaning to the claims and inform the purpose of the frequency control disclosed by the '857 Patent which is directly relied upon for proactive load management and essential to the meaning of the claims.

IV. DISCUSSION OF THE ALLEGED PRIOR ART

A. Lasseter

At a high level, Lasseter teaches frequency control methods for one or more microsources that allow for the efficient matching of power generation and load demand while simultaneously guaranteeing that the microsources will not exceed their maximum power output.

Lasseter discloses "[a] method of controlling the output inverter of a microsource in a distributed energy resource system" wherein unit or zone power controls are used to "reduce the operating frequency of the inverter to increase its unit output power." Ex. 1005 at Abstract. Lasseter discloses "methods wherein the inverter reaches maximum output power and minimum operating frequency at the same time." *Id.* Lasseter's control methods teach a range of power output from minimum power (Pmin) to maximum output power (Pmax) wherein frequency

inversely corresponds to output power. Lasseter teaches that using its control methods, minimum operating frequency (Fmin) corresponds to Pmax and maximum operating frequency (Fmax) corresponds to Pmin. *See* e.g. *id* at Abstract, [0116-0131].

Lasseter relates more particularly to "controlling the instantaneous frequency and power from one or more microsources in ways that tend to ensure the microsources stay within their normal operating ranges and otherwise operate efficiently" by focusing "on what needs to be done in response to events such as islanding or new loads to transition smoothly between stable steady state frequency and power operating points." *Id.* at [0058].

Lasseter teaches a variable slope method wherein "all units reach their maximum power output and their minimum frequency limit simultaneously. . . because the operating characteristics for all the units converge at the point of maximum power and minimum frequency." *Id.* at [0117]. "One of the advantages of [Lasseter's] variable slope method is that all sources reach their maximum output together and there are no problems with limits on minimum frequency and maximum power." *Id.* at [0118] (emphasis added). This is because Lasseter's control method "correctly enforces the limits on the frequency and power" and ensures that the "[m]inimum frequency limit cannot be exceeded as a consequence of the fact that maximum power cannot be exceeded" *Id.* at [0130]; [0132]. Put another way,

"[s]ince all units cannot exceed maximum power . . . then it follows that the units will not go beyond the lower limit for the frequency range." *Id.* at [0120]

Lasseter further teaches that the stability of power sources can be ensured through the assigning of a maximum slope value, a function of the power set point and frequency, which "would effectively translate into a limit on the maximum power setpoint" which could solve "the problem of stability" while also allowing the unit to "end up operating at full maximum power." *Id.* at [0132]. In sum, Lasseter discloses methods wherein power sources are able to utilize the entirety of their power output range, from Pmin to Pmax, while simultaneously ensuring stability. See *id.* at [0137].

B. Lopes

Lopes "describes and evaluates the feasibility of control strategies to be adopted for the operation of a microgrid [(MG)] when it becomes isolated." Ex. 1011 at Abstract. Lopes explains that by using a Voltage Source Inverter (VSI) "to provide a reference for voltage and frequency, it is thus possible to operate the MG in islanded mode, and a smooth moving to islanded operation can be performed without changing the control mode of any inverter" because the VSI is able to "provide[] a primary voltage and frequency regulation in the islanded MG." Id. at P. 5.

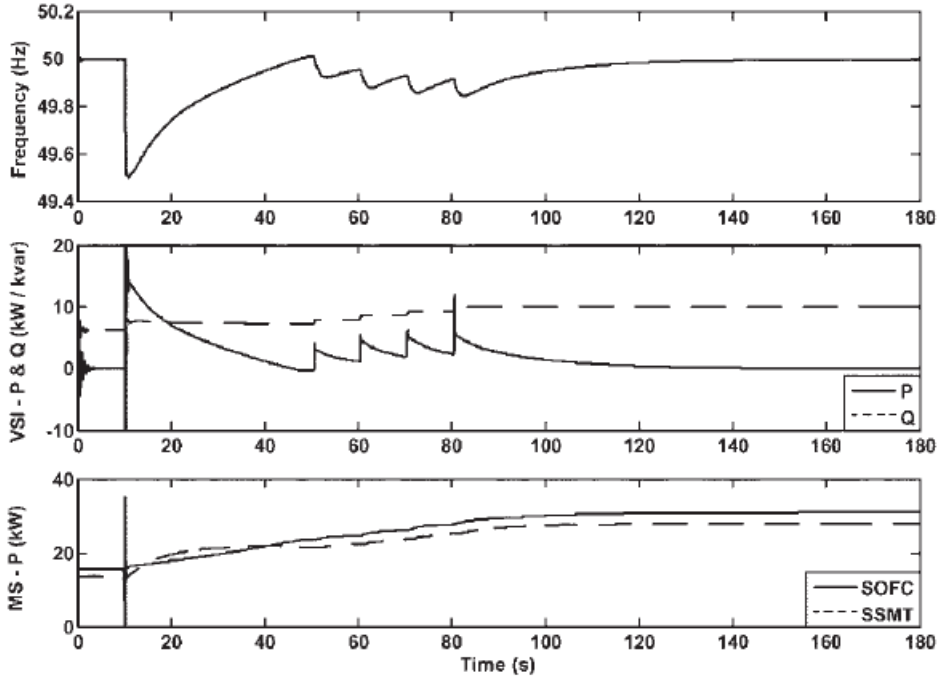
Lopes explains that "[i]slanding of the MG can take place by unplanned events like faults in the MV network" but that in the presence of such events, "MG

separation from the MV network must occur as fast as possible" because "the switching transient will have great impact on MG dynamics." Id. at P. 5. These impacts occur because "[w]hen moving to islanded operation or when a large load is connected during islanded operation, the initial high imbalance between local load and generation may lead to large frequency deviations and transient overload of the [(Voltage Source Inverter)] VSI [.]" Id. at P. 4. Lopes teaches a method of restoring frequency to a nominal value after such disturbances and explains that "correcting permanent frequency deviations during any islanded operating conditions should then be considered as one of the key objectives for any control strategy." Id. at P. 5.

Lopes teaches that "[t]wo kinds of control strategies may be used to operate an inverter" including "PQ inverter control: [wherein] the inverter is used to supply a given active and reactive power set-point" and "Voltage source inverter (VSI) control: [wherein] the inverter is controlled to "feed" the load with pre-defined values for voltage and frequency." Id. at P. 3. Lopes explains that its "[e]quation (4) shows that the VSI active power output is proportional to the MG frequency deviation" and that "[i]f the MG frequency stabilizes in a value different from the nominal one (due to the use of only proportional droop controls), storage devices would keep on injecting or absorbing active power whenever the frequency deviation differs from zero" and that "[t]his should only be admissible during transient situations[.]" Id. at 5. "The results obtained suggest that the management

of storage devices are absolutely essential to implement successful control strategies for MG operation in islanded mode with the load shedding procedure assuming also very high importance to avoid fast and long frequency deviations." Id. at 8.

Lopes demonstrates its reactive load shedding techniques through its Figure 11 shown below wherein "[a] fault in the MV side occurred at t = 10s" and islanding ensued:



Lopes explains that "[d]ue to the large initial frequency deviation, a certain amount of load is automatically shed through the activation of under-frequency load shedding relays in order to aid frequency restoration. This load is later reconnected in small load steps, to avoid load disconnection by activating the under-frequency

load shedding relays." Id. at 7. Notably, Lopes's load shedding occurs as a result of substantial frequency deviations caused by "the initial high imbalance between local load and generation" as well as "transient overload of the VSI" and is inherently reactive, acting in a similar manner to the prior art disclosed by the '857 Patent. See id. at P. 4; see also Ex. 1001 at Col. 18, L. 12-15.

C. Lopes and Lasseter are Cumulative of the Art Cited by Examiner and Discussed by Patent Owner in the Specification

As set forth in Patent Owner's Discretionary denial brief and above, Petitioner's challenge is cumulative of art previously evaluated by the examiner and described in the '857 Patent.

When presented with the '857 Patent claims, the examiner noted a prior Lasseter publication bearing the same title and disclosing same subject matter as the Lasseter reference put forth by Petitioner, including a relationship between output power and frequency wherein maximum power output is reached at the same time as minimum frequency, which Petitioner now relies on to teach the claimed second frequency. *Compare* e.g. Ex. 1005 at [0117-0119] to Ex. 2011 at [0111-0112]. Patentee's specification also described reactive load shedding modules and prior art systems at length in the specification of the '857 Patent. *See* e.g. Ex. 1001 at Col. 5-7, L. 64-4; Col 17-19, L. 45-19. Notably, in view of nearly identical art to the art cited by Petitioner, the examiner did not issue a single rejection under either anticipation or obviousness grounds.

Not only is Petitioner's "new" Lasseter reference cumulative of the reference cited by the examiner, but it is also cumulative of the prior art described in the '857 Patent's specification. [0099] of the "new" Lasseter reference all but confirms the similarity of its disclosure to Figure 2 of the '857 Patent wherein it specifically accounts for a situation wherein during islanding of the power source, the combined power capacity of the power sources "is not adequate to supply the total load of from loads M5, M7, M8, and M9" but is "adequate to supply the combined load from loads M5, M8, and M9, which are assumed to be critical loads." Ex. 1005 at [0099]. Much like Figure 2 of the '857 Patent, which uses a transfer switch as well as main and subpanels to prioritize high priority or critical loads which must be powered during islanding, Lasseter addresses such a situation by opening switch 732 to "disconnect feeder 745 and its associated load M7 from the main distribution bus 730." *Compare* Ex. 1001 Figure 2 to Ex. 1005 Fig. 7. Simply put, both Lasseter and the prior art Figure 2 in the '857 Patent ensure the stability of power sources through preemptive disconnection of non-critical loads in favor of guaranteeing steady state power to loads that are critical.

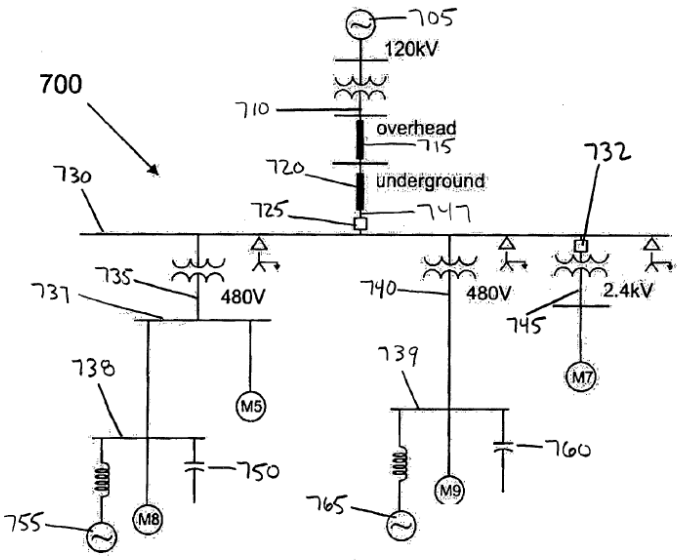


FIG. 7

Similarly, Lopes's Figure 11 and disclosure of reactive load shedding in response to large frequency deviations induced by the initial high imbalance between local load and generation and transient overload of the VSI, confirms its similarity to Figure 3 of the '857 Patent. Both Lopes and the prior art described by the '857 Patent use relays responsive to detection of the power frequency of a power source, caused by imbalance in generation capacity and load demand, as a means of reactively disconnecting loads after an overload has occurred. But neither of these methods constitute the proactive load management approach set forth by the '857 Patent because both the methods disclosed by Lopes and the prior art set forth in the specification are reacting to situations wherein there has been a departure from specifications of the power output of the power sources in the form of frequency deviation due to overload. Because the USPTO has already considered almost

identical art as to what is set forth by Petitioner in this challenge, and readily appreciated the novelty of the claimed inventions, Petitioner respectfully requests the Board deny institution.

V. THE PETITION FAILS TO DEMONSTRATE A REASONABLE LIKELIHOOD OF PREVAILING UNDER ANY ASSERTED GROUND

Institution is only permissible when the Petition establishes a "reasonable likelihood that the petitioner would prevail with respect to at least one of the claims challenged in the petition." 35 U.S.C. § 314(a). Because Petitioner fails to meet this threshold requirement because every prior art reference relied upon fails to disclose, teach, or suggest at least Limitations 45[pre], [b], [c]; and 66[pre], [b]. and [c], the Board must deny institution. *Par Pharm., Inc. v. TWi Pharms., Inc.*, 773 F.3d 1186, 1194 (Fed. Cir. 2014) (petitioner bears burden of proving every claim limitation is disclosed in the prior art); *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1164 (Fed. Cir. 2006) (consideration of any motivation to combine and reasonable expectation of success is only reached "if all the elements of an invention are found in a combination of prior art references").

A. The Asserted Art of Grounds 1A Does not Disclose, Teach, or Suggest Limitation (b) of Claim 45 or 66

1. The Asserted Art of Grounds 1A Does not Disclose, Teach, or Suggest the Second Frequency of Claim 45

Petitioner's challenge must be denied because Petitioner has failed to show that either Lasseter or Lopes teach the second frequency in claims 45 of the '857 Patent.

Limitation (b) of Claim 45 of the '857 Patent states:

> (b) a control circuit which may be part of the power source or otherwise, is responsive to one or more power source operating parameter which affects the power source operation, the control circuit operating at least when the output AC power is not synchronized to the power grid or another device, to control one or more parameter of the output AC power such that the AC power has at least first frequency when the power source is not overloaded including when it supplies excessive current which the AC power source can handle, and at least a second frequency when the power source is overloaded including when it supplies an excessive current for a period of time which if continued may risk power source damage or loss of AC power;

Limitation (b) of claim 45 is directed to the use of frequency control to communicate loading information wherein the frequency is controlled to have a first frequency when the power source is not overloaded and a second frequency when the power source is overloaded or is near to being overloaded. The limitation discloses the use of a control circuit that is responsive to either the output AC power

of a power source or another loading parameter of the power source to communicate the loading condition of the power source. This loading information is then subsequently used in claim 45's limitation [c] to prevent or alleviate an overload of the power source.

Petitioner's challenge does not cite to Lopes as evidence that limitation (b) was disclosed, taught, or suggested in the art and instead merely relies on Lasseter. But as the examiner stated in the '857 Patent's Notice of Allowance in view of a substantially similar Lasseter reference, Lasseter "fails to teach the power source operating in such a manner as to control the frequency of the output AC power to have a first frequency when the power source is not overloaded and a second frequency when the power source is overloaded or near to being overloaded[.]" Unsurprisingly, Petitioner's "new" Lasseter reference which their expert states is "consistent with and reflects the same concepts and control strategies described across many of Lasseter's academic and industry publications" fails to do the same. See Ex. 1003 at P. 53 ¶ 51.

Petitioner spends but one paragraph of its eighty-nine-page Petition addressing a key aspect of the '857 Patent claims, and in doing so mischaracterizes the claim language and the teachings of Lasseter. Patent Owner reproduces

Petitioner's ***entire argument*** regarding the claimed controlled second frequency below[3]:

> If a "load exceeds the aggregate power capacity of the units," and the microsource exceeds its "maximum power," P_{max}, the microsources drop below "minimum operating frequency." EX1005, ¶¶[0118]-[0119], ¶[0141], FIGS. 14-17. This constitutes an overload by the '857 patent, and the frequency below the minimum frequency is a second frequency. Supra, §III.A.1 (beyond P_{max} is an overload); EX1003, ¶313; supra, §III.A.2 (overload); EX1011, 4-5, 8 (overload). Operating at or below this frequency and above P_{max} for a period of time could cause "[i]nverter overcurrents," or insufficient power being provided to loads, resulting in power loss at the loads or damage to the power source. EX1011, 4, (excessive current being supplied); EX1003, ¶313.

Petitioner's argument regarding Lasseter's supposed teaching of the claimed second frequency has a fundamental and incurable flaw that requires institution be denied. Namely, Petitioner does not so much as address Lasseter's repeated, express teachings that the exact condition Petitioner points to as evidence of Lasseter's teaching of a second frequency when the power source is overloaded ***cannot occur***.

As set forth above, Lasseter teaches "methods wherein the inverter reaches maximum output power and minimum operating frequency at the same time" and expressly states that one of the advantages of its control methods is that all power

[3] *See* Paper 3 at P. 29-30.

sources reach their maximum output together and ***there are no problems with limits on minimum frequency and maximum power*** because "[s]ince all units cannot exceed maximum power . . . then it follows that the units will not go beyond the lower limit of the frequency range." Id. at [0118]; [0120] (emphasis added).

Petitioner's recasting of Lasseter to incorporate situations where "load exceeds the aggregate power capacity of the units" is an incomplete and misleading quote from Lasseter's [0119] which actually discusses the applicability of Lasseter's variable slope method which helps ensure the stability of power sources. Lasseter's [0119] simply discusses two situations: (1) one where the total load demanded by the loads could exceed the aggregate power capacity of the units and (2) one wherein the combined power capacity of the microsources naturally exceeds the total possible load of the system. *Id.* at [0119].

Lasseter explains two solutions to the first situation, where there is not sufficient capacity to power the total possible load in order to guarantee stability of the power sources and ensure that they never encounter an overloaded condition. As set forth above, Lasseter explains that assigning a maximum slope value to a given power source "would effectively translate into a limit on the maximum power setpoint" which could solve "the problem of stability" while also allowing the unit to "end up operating at full maximum power." *Id.* at [0132]. In this way, Lasseter guarantees that its microsources can operate in their full range of power from P_{min} to

P_{max} but that simultaneously "all units cannot exceed maximum power[.]" *Id.* at [0120].

Lasseter also explains that in situations where the combined power capacity of the microsources naturally exceeds the total possible loads of the system, Lasseter is able to preemptively disconnect non-critical loads during islanding in order to ensure that P_{max} could not be exceeded. *See* Ex. 1005 at [0099] and Figure 7. Using either method, Lasseter is able to ensure that its power sources P_{max} is not exceeded and that "the units will not go beyond the lower limit of the frequency range." *Id.* at [0120]. Thus, Lasseter teaches no situation where its microsources are operating above their maximum power or below their minimum frequency. This is fatal to Petitioner's challenge.

2. The Asserted Art of Grounds 1A Does not Disclose, Teach, or Suggest the Claimed Frequency Control in Claim 66

Petitioner's challenge must be similarly denied as to claim 66 because Petitioner has failed to show that either Lasseter or Lopes teach the claimed power source controlling the AC power such that its frequency is responsive in a manner that the frequency represents the loading of the power source.

Limitation (b) of Claim 66 of the '857 Patent states:

> b) one or more contactor and/or transfer switch whereby the AC power may be electrically paralleled with, or connected in place of or as a

> backup replacement for the grid power and the power source controls the AC power such that;
> i. the frequency of the AC power is responsive to the grid power frequency when the AC power is provided in parallel with grid power so that connected loads receive power from one or both of the power source and grid; and
> ii. when the AC power is not paralleled with the grid, its frequency is responsive in a manner that the frequency represents the loading of the power source;

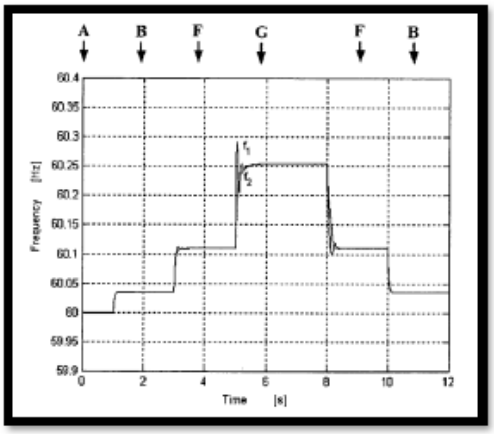
Claim 66's limitation [c] subsequently operates in response to the controlled frequency of limitation [b] to provide AC power to at least one of the loads when the power source is not overloaded and to not provide AC power to that load when the power source is overloaded.

Petitioner once again relies on Lasseter alone to teach limitation 66[b] and its claimed frequency control to represent the loading of the power source. In doing so, Petitioner relies on a sole paragraph and a token figure discussing Lasseter's supposed teaching of the claimed controlled frequency to represent the loading of the power source reproduced below[4]:

> In island mode, AC power is not paralleled with the grid. Supra [66.b.2]. When not paralleled, AC power's frequency is responsive in a manner that the frequency represents the loading of the power source,

[4] *See* Paper 3 at P. 49.

for "microsources…increase their power outputs when the system islands, by reducing their operating frequency" or "reduced when the system islands, resulting in a frequency increase." EX1005, ¶[0111]. For example, Figure 26 shows an islanded microsources' frequency responsive to loading of the power sources:



t = 0 sec	steady state, grid connected	operating at steady state A
t = 1 sec	transfer to island	transition to steady state B
t = 3 sec	first load inserted	transition to steady state C
t = 5 sec	second load inserted	transition to steady state D
t = 7 sec	third load inserted	transition to steady state E
t = 10 sec	third load removed	transition to steady state D
t = 12 sec	second load removed	transition to steady state C

t = 0 sec	steady state, grid connected	operating at steady state A
t = 1 sec	transfer to island	transition to steady state B
t = 3 sec	first load removed	transition to steady state F
t = 5 sec	second load removed	transition to steady state G
t = 8 sec	second load inserted	transition to steady state F
t = 10 sec	first load inserted	transition to steady state B

EX1005, ¶[0160], ¶[0165]; EX1003, ¶350.

But Petitioner's barebones analysis is devoid of any attempt to capture the meaning of the limitation. Petitioner attempts to equate simply altering frequency to modulate output power to the claimed frequency control that is indicative of the loading of the power source. But this simply cannot be the case. In order for the claimed controlled frequency to indicate the loading of the power source in a manner that provides meaningful information for independent claim 66's limitation [c], the frequency control must be able to signal an overloaded condition as described in the specification and the claims, not merely modulate output power. As explained above, Lasseter simply does not teach controlling frequency to correspond to an overloaded

or near overloaded condition and instead provides methods of ensuring such situations never occur. Because Lasseter does not teach controlling the frequency to correspond to such a condition, Lasseter similarly cannot teach the claimed frequency being controlled to represent the loading of the power source because using Lasseter's method, the frequency from Lasseter will always indicate that the power source is operating in steady state and would never signal a need for subsequent load shedding. Because Petitioner adds little to its already flawed challenge and fails to even attempt to grapple with the meaning of the claims, institution should be denied.

B. The Asserted Art of Grounds 1A Does not Disclose, Teach, or Suggest Limitation (c) of Claims 45 or 66

Petitioner's challenge must be denied because Petitioner has failed to show that either Lasseter or Lopes teach the processor circuit in claim 45 or load manager circuit in claim 66 of the '857 Patent.

Limitation (c) of claim 45 of the '857 Patent states:

> (c) a processor circuit comprising one or more processors responsive to the one or more parameter of the output AC power, and in response to the occurrence of the second frequency operating to control the coupling of output AC power to at least one load of the one or more loads thereby helping to prevent or alleviate an overload of the power source.

Limitation (c) of claim 66 of the '857 Patent states:

> (c) a load manager circuit comprising one or more processor, which load manager circuit may or may not be part of the power source, the load manager circuit responsive to the frequency of the AC power to provide AC power to at least one of the one or more of a plurality of loads when the power source is not overloaded and not provide AC power when the power source is overloaded.

Both of the identified limitations disclose the concept of responding to the controlled frequency of their corresponding limitation [b] which conveyed loading information indicating whether the power source was overloaded or not overloaded. In response, the claimed processor circuit of claim 45 operates to control the coupling of output AC power to at least one load to prevent or alleviate an overload of the power source and the claimed load manager circuit of claim 66 acts to provide AC power to a at least one or more of a plurality of loads when the power source is not overloaded and not provide AC power when the power source is overloaded.

Not to be lost in the mix, patentee's definition of overload is particularly important to ensure full understanding of the claims. Here, the processor circuit of claim 45 is operating to prevent or alleviate "***a load that if not disconnected or otherwise prevented*** will either cause a departure from specifications for the power output from the power source, for example such as a deviation of AC power voltage or frequency for longer than a specified time period, a loss of power such as from a tripped circuit breaker, or damage such as overheating or exceeding mechanical

stress limits." *Id.* at Col. 7, L. 55-62. Similarly, the load manager of claim 66 is operating to restrict power from at least one or more of a plurality of loads in response to a frequency indicating overload.

Thus, the claimed processor and load manager circuits in each respective limitation [c] are responding to the claimed controlled frequency to ensure the claimed power source does not suffer a departure from power specifications or damage through managing the connection and disconnection of loads to the power source, thereby proactively managing the loading of the power source. This is consistent with the '857 Patent's focus on its proactive approach to overload prevention and improvements over the prior art which sheds low priority loads only "after the generator has been overloaded." *Id.* at Col. 6, L. 38-41.

Petitioner's challenge does not cite to Lasseter as evidence that limitation [c] was disclosed, taught, or suggested in the prior art and thus, Petitioner's challenge relies solely on Lopes for this limitation. Once again, Petitioner gives surprisingly short shrift to a key limitation of the '857 Patent and relies upon but one sentence of a three-sentence paragraph to explain how Lopes teaches the proactive prevention or alleviation of overloads claimed by limitation [c] of claim 45[5]:

> Lopes supplies "controllable loads" and an algorithm for "shedding" them "based on the amplitude of frequency deviation." EX1011, 4-5.

[5] *See* Paper 3 at P. 30.

> Load shedding *controls the coupling of output A.C. power to the loads*, for load shedding "[a]llow[s] a temporary disconnection of less important loads." *Id.* Shedding loads reduces the aggregate power demanded of the microsources, *preventing or alleviating* "frequency deviations and transient *overload[s]*" including an *overload of the power source* as defined by '857 patent, *e.g.*, excursions beyond Lasseter's P_{max}. *Id.*; EX1003, ¶314, ¶¶314-316.

Petitioner subsequently adds little to its challenge as to limitation [c] of claim 66 wherein they simply state that with respect to Lasseter's minimum frequency[6]:

> Above this frequency, *AC power is provided to at least one of the one or more of a plurality of loads*. *Supra* [45.c]. Below this frequency, shedding loads *stops providing AC power* (shed loads) *when the power source is overloaded* (when microsources operate at (or below) minimum frequency). EX1011, 4, 6; *supra* [45.c]; EX1003, ¶351.

In doing so, Petitioner attempts to render key limitations of the '857 Patent claims meaningless and equate any reference that teaches "[s]hedding loads" as sufficient to disclose, teach, or suggest the claimed operations. But a closer read of the '857 Patent, Lopes, and Petitioner's own challenge and notice ranking document confirms this is simply not the case. As set forth above, the '857 Patent provides an in-depth analysis of known reactive load shedding techniques used in the prior art

[6] *See* Paper 3 at P. 50.

and their drawbacks upon which the '857 Patent improved. As confirmed by the next paragraph of Petitioner's challenge, Lopes teaches these same reactive techniques[7]:

> Moreover, Lopes' load-shedding algorithm *is responsive to* "the amplitude of the frequency deviation" (a *parameter* reflecting changes in *output A.C. power*), specifying "a certain amount of load" to be "automatically shed through the activation of under-frequency load shedding relays" and LCs based on the "frequency deviation," *i.e.*, *the second frequency*. EX1011, 6; EX1003, ¶315. As discussed, POSITA would have been motivated to implement Lopes with specified frequency deviations corresponding to a microsource's minimum frequency and below. *Id.*, 3, FIG. 4; EX1003, ¶315.

But this is exactly what the '857 Patent teaches against and has improved upon. The '857 Patent explains that in prior art systems, for the frequency to have dropped in the first place, there must have already been "a departure from specifications for the power output from the power source, for example such as a deviation of AC power voltage or frequency for longer than a specified time period[.]" See Ex. 1001 at Col. 7, L. 57-60. And Lopes explains that "[w]hen moving to islanded operation or when a large load is connected during islanded operation, the initial high imbalance between local load and generation may lead to large frequency deviations and transient overload of the VSI[.]" See Ex. 2011 at P. 4-5.

[7] *See* Paper 3 at P. 30-31.

In doing so, Lopes confirms that its load shedding solution is inherently reactive to frequency drop caused by imbalance between load and generation capacity and is incapable of proactively preventing or alleviating an overload as claimed by the '857 Patent. How could Lopes proactively prevent or alleviate or disconnect power from "a load that if not disconnected or otherwise prevented will either cause a departure from specifications for the power output from the power source" if Lopes itself teaches that such departure from specifications due to an imbalance between generation and load is the condition that triggers its load shedding methods? Petitioner does not and cannot answer that question. In fact, their notice ranking document even states that the '857 Patent "[c]oncerns proactive approaches to prevent power source overload" further confirming Lopes's inability to teach the claimed operations. Because neither the claimed processor circuit nor the claimed load manager circuit are disclosed, taught, or suggested, institution must be denied.

C. The Asserted Art of Grounds 1A Does not Disclose, Teach, or Suggest the Limiting Preambles of Claims 45 or 66

Petitioner's challenge must be denied because Petitioner has failed to show that either Lasseter or Lopes disclose, teach, or suggest a power system providing AC power with a controlled or changeably controlled AC frequency used in assisting the managing of the loading of the power system.

The limiting preamble of claim 45 of the '857 Patent states:

> A power system which provides AC power to one or more loads, the AC power frequency being changeably controlled to assist managing the loading of the power system at least when not sending power to a grid, the power system comprising:

The limiting preamble of claim 66 of the '857 Patent states:

> A power system which manages the loading of at least one A.C. power sources which provides AC power with a controlled AC frequency, the power system comprising:

As explained above, the file history of the '857 Patent makes clear that the frequency of the AC power in the claimed inventions is controlled "such that it conveys information" that "may be used to prevent or relieve an overload" and the preambles of both claims are limiting because they breathe life into the claims and provide the basis for core operation of the claimed power systems. *See* Ex. 2017.

Similarly to limitation [b], Petitioner's challenge does not cite to Lopes as evidence that the preambles were disclosed, taught, or suggested in the art and instead solely relies on Lasseter. Once again, Petitioner dedicates but a single paragraph of its eighty-nine-page Petition to discussing a key concept of the '857 Patent claims reproduced below:

> If limiting, Lasseter's "distributed energy resource system" (DER) provides the claimed *power system*. EX1005, Abstract, ¶[0063], FIG. 1; EX1003, ¶289, ¶¶289-316. DERs comprise at least one

> "microsource" power source, and output *AC power*'s "AC voltage or current at the required frequency." EX1005, ¶¶[0008]- [0011]; EX1003, ¶289. Frequency is *changeably controlled*—Lasseter discloses "control schemes for controlling the instantaneous frequency…from one or more microsources." *Id.*, ¶[0058]. This control *assists in managing the* DER's *loading*, for frequency is controlled "in response to events such as islanding or new loads." *Id.*; EX1003, ¶289. The loads include "*one or more loads* 160." EX1005, ¶[0063]. Because Lasseter can operate disconnected from the utility supply 110 (*a grid*) in island mode, it can provide changeably controlled AC power to the loads *when not sending power to* the supply *grid*. EX1005, ¶[0011], ¶[0063]-[0068], FIGS. 1-4, 8(a)-8(b), 11(a)-11(b).

Petitioner's analysis of Lasseter's supposed disclosure of the limiting preambles is not only threadbare but also completely unsupported by Lasseter's disclosure and insufficient to support that the preambles were disclosed, taught, or suggested. As set forth above, Lasseter teaches "method[s] of controlling the output inverter of a microsource in a distributed energy resource system" wherein unit or zone power controls are used to "reduce the operating frequency of the inverter to increase its unit output power" in order to accomplish "what needs to be done in response to events such as islanding or new loads to transition smoothly between stable steady state frequency and power operating points." Ex. 1005 at Abstract. Simply put, Lasseter tells the reader that it discloses methods of controlling the

power output of power sources through increasing and decreasing frequency but does not use its frequency control to connect or disconnect loads.

Thus, Lasseter's disclosure is far from the concept disclosed by the preamble of the '857 Patent claims which control frequency for the purpose of ***managing the loading of the power system***. When read in light of the specification and file history, it is unmistakable that patentee did not simply claim the idea of controlling frequency with respect to output power, but he invented a method of managing the loading of the power system through the use of a controllable frequency which transmits loading information to a processor circuit that can subsequently prevent or alleviate an overload. Patentee's disclosure of prior systems nearly identical to Lasseter confirms the same. This is also consistent with the body of each of the challenged claims, wherein the claimed controlled frequency is used as a communication signal to control the power demanded by or coupling of power to a given load, thereby managing the loading of the power system. Instead of merely using frequency to modulate the output of power sources, the '857 Patent uses frequency control to signal load disconnection or limiting to proactively alleviate overloads.

Petitioner's own challenge which does not cite to Lasseter as teaching any form of load disconnection or limiting taught by the '857 Patent and found directly in limitation [c] of the challenged claims further confirms Lasseter's failure to teach frequency control for the purpose of managing the loading of a power system.

Petitioner's attempt to simplify and misread the claims of the inventions to make the prior art's unrelated disclosures fit for the purposes of its obviousness challenge is clear. The limiting preambles are not disclosed, taught, or suggested.

D. A POSA Reading Lasseter Would have No Motivation to Find a Solution to Overloads because Lasseter had Already Done so

While Patent Owner contends that the Petition must be denied because it fails to show that either Lasseter and/or Lopes teach several key limitations of the '857 Patent claims, Patent owner also contends that a POSA would have no motivation to combine Lasseter and Lopes. In an attempt to cobble together a single motivation to combine rationale the Board would find persuasive, Petitioner goes with the classic kitchen sink approach and puts forward six alleged motivations a POSA would have to combine Lasseter and Lopes that are riddled with hindsight bias and wholly unpersuasive.

Petitioner's first motivation to combine rationale which states "because Lasseter does not detail what to do when its microsources' generation capacity is inadequate to supply the total potential load, POSITA would have looked to Lopes and its responsive frequency-based load-shedding scheme for solutions" is factually inaccurate.[8]

[8] Paper 3 at P. 13.

Lasseter explicitly details how to deal with situations where its microsources' generation capacity is inadequate to supply the total potential load. As set forth above, Lasseter's [0099] and Figure 7 demonstrate that when the combined power of the microsources' during islanding "is not adequate to supply the total load of from loads M5, M7, M8, and M9" but is adequate to supply power to a subset of the loads, Lasseter simply utilizes a switch to disconnect non-critical loads. *See* Ex. 1005 at [0999] and Fig. 7. Also described above is Lasseter's assigning of a maximum slope value which "effectively translate[s] into a limit on the maximum power setpoint" which solves "the problem of stability" while also allowing the unit to "end up operating at full maximum power." *Id.* at [0132]. In these ways, Lasseter directly addresses what to do when its microsources' generation capacity is inadequate to supply the total potential load and guarantees the stability of its microsources in a manner that guarantees they will not be overloaded. Because Petitioner's first motivation to combine rationale is fundamentally untrue, it must fail.

Petitioner's second motivation to combine rationale which states that "employing responsive load-shedding activated at or below Lasseter's minimum frequency could avoid inefficiencies from excess generation capacities"[9] is wholly illogical. As set forth above, Lasseter teaches that its methods result in power sources which reach their maximum power output at a corresponding minimum frequency.

[9] *Id.* at P. 14.

See e.g. Ex. 1005 at [0117]. Thus, when Lasseter's power sources are operating at their minimum frequency, they are conversely outputting maximum power and have ***no excess generation capacity*** and would be suffering no inefficiencies due to excess generation capacity. Further, as explained above, Lasseter repeatedly teaches that its power sources' "[m]inimum frequency limit *cannot* be exceeded" and thus teaches no frequency below its minimum. But assuming that Lasseter provided such a teaching, that frequency would correspond to a situation wherein the limit on maximum power is exceeded. Thus, the power sources would once again have no excess generation capacity and instead, would be putting out more power than their rated specifications. Because Petitioner's second alleged motivation to combine is divorced from the reality of Lasseter's teachings, it also must fail.

Petitioner's third motivation to combine rationale which states that "Lasseter teaches that one could alternatively impose an express power output limit, but this could result in providing less power than the loads demanded" is simply a truism not fixed by Lopes. *Id.* at P. 15. In concocting its third motivation to combine argument, Petitioner points to Lasseter's [0137] wherein Lasseter explains that it is more advantageous to have situations where the combined power sources have "enough generation" to power the loads rather than for Lasseter to have to actively enforce limits on power output, a simple fact true of any power source or system no matter the size.

Petitioner then states that "shedding and reconnecting "less important" loads—only as needed—ensures critical loads can continue to receive power." Paper 3 at p. 15. But Petitioner fails to acknowledge that Lasseter's [0099] and Fig. 7 similarly address situations wherein the combined power of the microsources is insufficient to supply the total load presented to the power sources and that Lasseter simply uses a switch to preemptively disconnect non-critical loads in favor of higher priority loads to ensure the same. In this way, Lasseter similarly ensures critical loads continue to receive power. Because Lopes's load shedding does not fix the inherent limitation of power sources having a maximum power output, Petitioner's third motivation to combine argument must also fail.

Petitioner's fourth motivation to combine argument states that a "POSITA would have been especially motivated to employ load shedding in systems where only some loads are truly critical" and that because "there may be periods when both critical and non-critical loads can be adequately powered" a POSA would have been motivated to delay Lasseter's shedding of non-critical loads until necessary to "preserve adequate power for critical applications[.]" *Id.* at P. 15. Petitioner further points to hospitals wherein interruption of power can have life threatening consequences to critical loads such as life support.

But in making its motivation to combine argument, Petitioner fails to meaningfully grapple with the fact that Lopes's reactive load shedding does not

guarantee stability of the power sources throughout operation. Instead, Lopes's methods experience lengthy frequency deviations and transient overload of the power sources that have the capacity to damage the precious hospital equipment Petitioner seeks to protect. Ex. 1011 at P. 4.

As noted by the '857 Patent and above, there are substantial drawbacks associated with the reactive load shedding mechanisms set forth by Lopes including slow and inaccurate frequency detection which can cause actual overloads to go undetected and damage to either the generator or the load to have happened prior to load shedding. Ex. 1001 at Col. 6, L. 59-64. Using Petitioner's example, implementing Lopes's reactive load shedding rather than Lasseter's preemptive methods may allow for a system to power non-critical loads in moments where both critical and non-critical loads can be adequately powered, but doing so comes at the risk of possible damage to machines such as life support or heart and oxygen monitoring equipment due to Lopes's inability to proactively prevent overloads. Interestingly, Petitioner's motivation to combine analysis is silent as to these potential consequences. Because a POSA would understand the risk posed to critical loads in important contexts noted by Petitioner using Lopes's reactive load shedding, a POSA would not be motivated to deviate from Lasseter's teachings which guarantee a steady state amount of power and the safety of the critical loads.

Petitioner's fifth motivation to combine arguments states that a "POSITA would have been motivated to combine Lasseter and Lopes to avoid drawbacks associated with Lasseter's preemptive load disconnection" and is for all intents and purposes, a rehashing of its fourth argument.[10] It is true, due to variations in the loads presented to a power source, there may be situations wherein a power source is able to power all loads, both critical and non-critical at times of low-power demand but not when faced with their maximum total load. But Petitioner once again fails to grapple with the potential consequences of the approach put forth by Lopes which risks damage to both the power sources and the loads via its reactive load shedding mechanisms. Sure, in certain niche circumstances, Lasseter could have excess generation capacity which results in some inefficiencies due to preemptive disconnection. But Lopes's alternative comes with even worse consequences, the guarantee of potential risk to the very power sources Lopes aims to protect as well as their critical loads. It is for this very reason that the '857 Patent's file history, specification, and claims, all consistently focus on the proactive nature of the claimed inventions which are able to circumvent the problems posed by both Lasseter and Lopes in isolation and combination. Because a POSA would understand the potential consequences of Lopes's reactive load shedding approach and the

[10] *Id.* at P. 16.

increased stability of Lasseter, Petitioner's fifth motivation to combine arguments must fail.

Petitioner's sixth motivation to combine argument states that "shedding loads only when necessary (as in Lopes) helps power sources operate near maximum-output (and most efficient), motivating POSITA"[11] and is not only highly similar to its fourth and fifth arguments but inconsistent with its own challenge.

Petitioner's challenge uses Lasseter's teaching of a minimum frequency which corresponds to its power sources' maximum power output to indicate a situation where Lopes's processor circuit would know to shed loads. Petitioner's sixth motivation to combine argument now explains that a POSA would be motivated to combine Lasseter with Lopes to operate more closely to its maximum power output. But Petitioner's own challenge applies Lopes in a way that guarantees Lasseter could never operate at its maximum power output because once it does, Lopes will shed loads based on the sensing of Lasseter's minimum frequency. In this way, Petitioner's application of Lopes actually guarantees that Lasseter is unable to utilize the entirety of its steady state operating range because Lopes's methods will not allow for such operation. Because Petitioner's sixth motivation to combine argument is in direct conflict with its challenge, it similarly must fail.

[11] *Id.* at P. 16.

VI. CONCLUSION

Petitioner's challenge does no more than repackage art substantively the same as art previously considered by the USPTO during examination and in doing so leaves the same holes identified by the examiner and more. At bottom, Petitioner's entire challenge can be summed up as a combination of the '857 Patent's prior art Figures 2 and 3 which simply fail to disclose the proactive approach to preventing and alleviating overloads claimed in the '857 Patent.

As detailed above, Petitioner's challenge fails to show that any of its references disclose, teach, or suggest critical elements of the challenged claims found in limitations [pre], [b], and [c], of challenged independent claims 45 and 66.

Because Petitioner's challenge fails to establish a reasonable likelihood that the they would prevail with respect to at least one of the claims challenged in their Petition, Patent Owner respectfully requests that the Board deny institution of Generac's Petition with respect to all grounds asserted and all challenged claims.

Dated: January 16, 2026.

Respectfully submitted,

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CERTIFICATION UNDER 37 C.F.R. §42.24(d)

I hereby certify that the word count for the foregoing Patent Owner's Preliminary Response is 12,248 words, which is within the limit set in 37 C.F.R. §42.24(b)(1).

Dated: January 16, 2026

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CERTIFICATE OF SERVICE

I hereby certify that on this the 16th day of January, 2026, a true and correct copy of the foregoing PATENT OWNER'S PRELIMINARY RESPONSE and the associated exhibits were served via electronic mail upon counsel of record for Petitioner at the following address:

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