NIE NETWORKS PROVIDING DISTRIBUTION GENERATION EXPORT OFFERS TO APPLICANTS LESS THAN 5MW – DECISION PAPER

NIE Networks Connections
31/08/2023

Contents

EXECUTIVE SUMMARY

This decision paper follows a consultation process that sought to gain feedback from stakeholders on NIE Networks proposal to amend existing distribution connection offer policy for exporting generators with a registered capacity less than 5MW. The consultation closed on the 19th May 2023 and a total of 14 responses were received.

NIE Networks welcomes the level of engagement received from all sections of industry throughout the entire process, including the mid consultation stakeholder event. This engagement has provided a helpful insight on stakeholder views on the topics raised in the consultation and has influenced the decision presented within this paper.

The consultation document explained that NIE Networks and SONI are developing actions to manage and mitigate against system security risk, in an effort to enable generation under 5MW export offers to be issued. There are two workstreams being progressed, in system operations and in connections, to meet this objective. They are detailed below:

1. System Operations – NIE Networks and SONI are collaborating to investigate and implement operational solutions to the concerns around system security being at risk with erosion of minimum load due to uncontrollable generation.
2. Connections – The consultation and this decision paper look to implement an amendment to Small Scale Generation (SSG) Distribution Connection Offers and Agreements to ensure offers can be issued for generators under 5MW with export.

The amendment NIE Networks proposed was to terms within SSG Distribution Connection Offer and Agreements that details control requirements. The proposed updated terms was to edit wording so that control requirements may be utilised for system security reasons. It was explained in the consultation paper that this requirement would only be enacted in emergency circumstances when the system is at risk and that the requirements would only apply to generators who have submitted an application after the 7th **November 2023** at **10:00am** (the Go Live date).

It was emphasised that without the proposed update to SSG Distribution Connection Offers and Agreements NIE Networks would remain in the position that it could not issue SSG export Distribution Connection Offers as per SONI's recommendation on the grounds of system security concerns.

While some queries were raised, which will be responded to in this decision paper, the overwhelming majority of respondents agreed with NIE Networks proposal.

Decision

NIE Networks and SONI recognise the important role SSG plays in achieving the wider objectives of the Energy Strategy for Northern Ireland[1], and as a result of this NIE Networks will update Distribution Connection Offers and Agreements, to include wording that entitles NIE Networks to instruct the generator to cease or reduce parallel operation for system security reasons, to enable generation under 5MW export offers to be issued. As there was overwhelming agreement with the proposals outlined in the consultation paper, the proposals are accepted as proposed, specifically;

NIE Networks has updated SSG Distribution Connection Offer and Agreements to include edited wording that permits control requirements to be utilised for system security reasons.

This updated clause will be in Distribution Connection Offer and Agreements that arise from applications received after **7th November 2023 at 10:00am.**

[1] https://www.economy-ni.gov.uk/publications/energy-strategy-path-net-zero-energy

1. INTRODUCTION

1.1 Background

NIE Networks and SONI have connected and accommodated 1,774MW of renewable generation capacity,[2] to the Northern Ireland grid to date, which in turn has accounted for 51% of electricity consumed in Northern Ireland coming from renewable energy in the 12 months ending December 2022. 322MW of the generation connected is made up of SSG projects, while 97MW is made up of microgeneration projects.

NIE Networks and SONI have continued to play a critical role in providing connections for renewable energy sources, including showing a willingness to embrace new technologies and adapt to a changing energy landscape.

The renewable future of Northern Ireland hinges on good partnership working and collaboration, not only with other industry experts but with our customers and stakeholders too. NIE Networks and SONI are separate companies, with different responsibilities, who work in partnership. NIE Networks and SONI recognise the need to support industry in meeting the RES-E target while also considering efficient network utilisation.

1.2 Current Connection Process

For the avoidance of doubt generators less than 5MW refers to G99/NI Small Scale Generation (SSG) offer with export capability (>3.68kW single phase, >11.04kW 3 phase up to 5MW). SSG connects exclusively to the distribution system, while larger generators may connect to either the distribution system or the transmission system. Generation connections to the distribution system are subject to the Distribution Generation Application and Offer Process Statement (DGAOP)[3].

Under the current process, there are 4 criteria that all need to be met in order for NIE Networks to issue a G99/NI Small Scale Generation (SSG) offer with export:

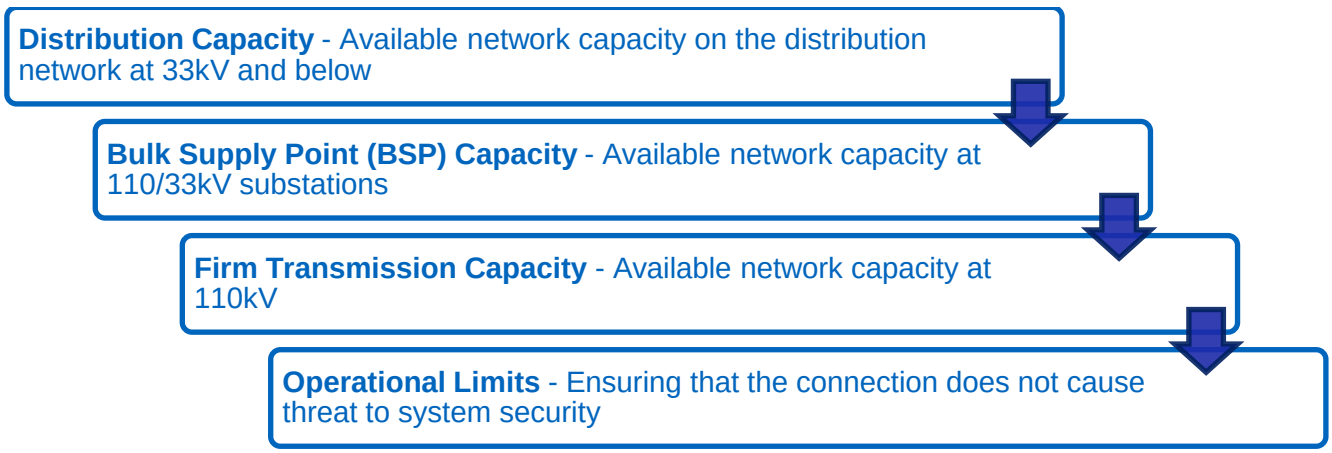

FIGURE 1 – CURRENT SSG CONNECTIONS ASSESSMENT CRITERIA

For each connection application NIE Networks must seek confirmation from SONI to ensure:

- BSP capacity
- Firm transmission capacity
- The connection doesn't cause the system to exceed operation limits of system security

[2] Source: NIE Networks Generation Data
[3] https://www.nienetworks.co.uk/documents/connections/distribution-application-offer-statement-jan-2022.aspx

With increased penetration of uncontrollable SSG and the continued increase in domestic micro-generation, maintaining a stable and secure power system has become more challenging. SONI has confirmed that there is no firm transmission capacity remaining in NI under the terms of the Alternative Connection Application and Offer Process (ACAOP),[4] and the operational limit has been reached. This means that under the criteria of the current connection policy, the ACAOP, NIE Networks can no longer issue any further SSG export offers for generation <5MW.

1.3 SONI System Operations

Generation connected to the distribution system under 5MW is deemed to be uncontrollable in normal system operation as it cannot be curtailed or constrained by the Transmission System Operator (TSO). DSU/AGU sites include multiple individual SSG sites that are grouped and controlled by an aggregator central entity, however each SSG has a separate distribution Connection Agreement and cannot be controlled individually by the TSO. As the TSO for Northern Ireland, SONI is required to ensure system operational balance between demand and generation at all times. With increased levels of uncontrollable generation, there is a risk of increasing the likelihood of generation exceeding system demand in a specific scenario. Recently, SONI informed NIE Networks that it is no longer possible to ensure security of supply during this scenario due to the high levels of uncontrollable generation.

SONI has confirmed that the level of uncontrollable generation that is connected in Northern Ireland has reached a point where it is no longer possible to ensure security of supply during a specific set of circumstances. These circumstances are as follows:

- at times of minimum system demand;
- high levels of wind on the system; and
- the loss of the Moyle Interconnector or the North South Interconnector, when there is an outage of the other.

This is due to operational constraints on the Northern Ireland system. SONI review and publish operational constraints[5] on a weekly basis. The Northern Ireland system must be operated such that it is secure for the loss of any item of plant on the system. In the above scenario, SONI is unable to operate within operational security standards[6]. To ensure the transient and frequency stability of the Northern Ireland system, three large machines must be online at any time. In a minimum demand scenario, the sum of the minimum stable generation output of three large machines, coupled with the output of uncontrollable generation could result in a minimum demand level in Northern Ireland that cannot be securely met. In the event of the loss of North-South or Moyle double pole SONI need to be able to take steps to secure the system for the loss of the other. This is to ensure Northern Ireland does not become islanded from Ireland and GB. This scenario could result in a generation and demand imbalance and system instability.

The scenario described would only occur in emergency situations. SONI work in close collaboration with EirGrid, National Grid, and Mutual Energy (owner of the Moyle Interconnector) to minimise the risk of this scenario occurring and it is not a scenario that is expected to be experienced regularly. The potential for Northern Ireland to be islanded from GB and ROI will be further reduced when the proposed second North South interconnector is constructed. At present the forecast completion date for the NS interconnector is 2026.

[4] https://www.nienetworks.co.uk/documents/generation/alternative-connection-application-and-offer-p-(1).aspx
[5] https://www.soni.ltd.uk/customer-and-industry/general-customer-information/operational-constraints/
[6] https://www.soni.ltd.uk/media/documents/Operations/SONI%20Operating%20Security%20Standards%20v1.pdf

3. CONSULTATION RESPONSES

There were three questions set out in the consultation paper. All fourteen respondents provided answers to these questions. Some respondents had queries which will be answered below.

3.1 Consultation Question 1

The first consultation question asked: **Are you in support of NIE Networks' proposal to amend the Distribution Generation Application and Offer Process Statement in accordance with Figure 5 above to ensure connection offers can be issued for exporting generators with a registered capacity less than 5MW?**

Almost 90% of respondents were in support of the proposal. One respondent said 'It is essential for our economy and our environment that connections for renewable projects of less than 5MW are facilitated.' Another respondent outlined that they 'expect a rise in the volume of grid connection applications that NIE Networks will be receiving following a positive outcome from this consultation. We would ask NIE Networks to ensure connection applications and offers are reviewed promptly, with those unfeasible or those with a lack of applicant engagement are discarded to ensure those who are serious about developing projects are not being queued unnecessarily.'

NIE Networks realises that this positive change in the DGAOP will result in an influx of connection applications. As such, NIE Networks has been proactive in preparing internally for this influx and would like to point out the queuing principles for connection offers as outlined in the DGAOP. Section 3 of the DGAOP contains details on what is typically required for a generation application to be deemed valid. This list should be reviewed by the applicant to ensure completeness before an application is submitted to NIE Networks, as missing information will impact the applicants queue position.

NIE Networks intends to publish an updated version of the DGAOP that reflects changes proposed in this consultation and will include an updated list of what makes an application competent in Appendix 1. In addition to this, NIE Networks would advise that prior to the Go Live date, a list of BSP's where there is limited capacity will be published. The intention behind this is to allow customers to assist customers in deciding on an application. These documents will be available on the company website (www.nienetworks.co.uk) prior to the Go Live date.

With regards to applications, NIE Networks wishes to draw attention to the Network Planning Milestones (Planning Approval, Longstop and MEC Utilisation) that are detailed in a Connectee's Terms Letter. These milestones are in place to ensure that connection capacity is withdrawn where connection applications are not progressing within reasonable timelines in order to prevent applicants from hoarding capacity. Should the need arise, NIE Networks will utilise the extension process allowed for in Condition 30(7) of the NIE Networks Electricity Distribution Licence. This process will involve NIE Networks consulting with the party requesting connection and other affected or interested parties. Applications for extensions will be submitted to UR on an individual basis for approval.

One respondent who didn't agree said 'by limiting the distribution generation export offers to applicants with a capacity of less than 5MW, NIE Networks is effectively excluding small-scale producers from accessing these opportunities.' NIE Networks wishes to point out again that without the proposed update to SSG Distribution Connection Offers and Agreements NIE Networks would remain in the position that it could not issue SSG export Distribution Connection Offers as per SONI's recommendation on the grounds of system security concerns.

3.2 Consultation Question 2

The second consultation question asked: **Do you have any comments on the proposed update to Distribution Connection Offers and Agreements to include wording that permits control requirements to be utilised for system security reasons and thus ensure distribution**

connection offers can be issued for exporting generators with a registered capacity less than 5MW?

Some respondents took the opportunity to respond to this question by adding comments. There were multiple respondents who requested information on how often the reduction of an SSG export was likely to occur, and for what duration it was likely to last. One respondent highlighted that there was no probability/impact analysis or figures available. SONI would like to respond by explaining that the mechanism outlined in the consultation paper would only be enacted in emergency scenarios. The variables influencing this risk include continued growth in uncontrollable generation including zero export, rate of demand growth/erosion and availability of key export routes of interconnectors. The key risk periods are when the North South interconnector and/or the Moyle interconnector is on planned or forced outage. Planned outages typically align with seasonal periods of lower demand.

Significant planned outages for North South (double circuit) and Moyle (dual pole) do not occur very frequently as single circuit or single pole outages are more common. It is unlikely that a double circuit or double pole outage would be scheduled any more that once in a five year period. If this occurs during periods of high wind SONI would likely have to seek reductions from NIE Networks. This would also be a requirement in the event of the unscheduled outage (i.e. fault scenario).

Some respondents stated frustration at the availability of network capacity on the distribution network. NIE Networks acknowledges this but would like to point out that the recently announced RP7 business plan[7] sets out to invest almost £2.6bn over the RP7 period, or well in excess of £3bn over the next 10 years (2023 to 2032). While this is a positive proposal, it is still likely that some connections will require network reinforcement, given the volumes of generation and demand forecast to connect in order to reach Energy Strategy targets. NIE Networks would like to see a review of the current connections charging structure in Northern Ireland with a view to adopting a new charging system, whereby, the costs for the network reinforcement required for a new or increased connection are shared between all customers. In addition to this NIE Networks aims to review internal connection policies to ensure we can maximise the use of existing assets.

Some SSG applications may be refused where there is either no distribution capacity or no BSP capacity. Those intending to apply are strongly encouraged to refer to the NIE Networks capacity map [8] including the list of BSP/primary substations, to determine existing availability capacity in the area they intend to connect.

One respondent asked if NIE Networks could explore if SCADA is still financially viable for small generators in a post-subsidy era. While this is recognised, NIE Networks is a regulated utility and therefore have to operate within the parameters of the applicable legalisation, which requires SCADA for generators of the size discussed here. NIE Networks makes best efforts to ensure that costs are minimised, and the generator is permitted to procure their own Remote Terminal Unit (RTU) if that is the preferred approach. Under current policy, SCADA is required for installations >100kW.

Another respondent queried how the connection process might work for 'off grid' turbines that are stall regulated machines. Off grid turbines that apply to connect to the NIE Networks distribution system will require a new distribution Connection Agreement. If the application is received and is less than 5MW MEC, post the 7th of November 2023 at 10:00am, then it's distribution Connection Agreement will include wording that entitles NIE Networks to instruct the generator to cease or reduce parallel operation for system security reasons as instructed by SONI to NIE Networks. This will apply to all generators, including those connected off grid prior to April 2019. As part of their SCADA install the connectee would provide a means of control either by active power set point or on/off signal. In relation to concern regarding the impact on the stopping of a stall regulated turbine, NIE Networks would be sending a shutdown signal via SCADA to the turbine and it is then the connectee's responsibility on how they enact the shutdown. If there were concerns around the impact of

[7] https://www.nienetworks.co.uk/rp7-business-plan
[8] https://www.nienetworks.co.uk/connections/capacity-map

emergency stopping turbines, then a controlled shutdown over a number of minutes would be acceptable for this type of system contingency.

It is worth highlighting that an application received before the 7th **November 2023** at **10:00am** will be processed under the existing ACAOP and thus will be refused connection they seek export. If an applicant has already applied, they will need to reapply after the **7th November 2023** at **10:00am** to be considered for the updated SSG process.

3.3 Consultation Question 3

The third consultation question asked: **Do you believe there are other approaches NIE Networks could be considering to provide Distribution Connection Offers and Agreements for exporting generators with a registered capacity less than 5MW?**

While no respondents offered alternative approaches to that proposed in the consultation, some respondents highlighted the role and importance of system operation. One respondent said "Mitigation of the oversupply problem outlined in the consultation could also be achieved by rolling out other interventions which increase system load. For example, by investing in battery storage, or less directly, through electrification of heating and transport. "

SONI wish to respond by highlighting that as this generation is deeply embedded in the distribution system SONI do not have sight of the specific technologies of these at risk periods. SONI view the issue of demand erosion driven by SSG as high risk and relatively low probability and will be mitigated with growth in electric vehicles, heat pumps and the delivery of the second North South Interconnector. The updates proposed by this decision paper are essential in managing this interim risk period.

3.4 Miscellaneous Consultation Queries

There were various other miscellaneous queries as part of the responses. One respondent said "The 120% TIC limit to be relaxed as an urgent priority. We appreciate this is envisaged and support the suggested consultation 'early in 2023', hopefully with a prompt decision to follow." NIE Networks and SONI recently released a consultation on the Over Install limit, which can be found at https://www.nienetworks.co.uk/generation-consultation and which closed at 5pm on Friday 21st July 2023. NIE Networks and SONI are currently drafting a decision paper on the Over Install consultation with publication expected in September 2023.

Various respondents mentioned the need for a review of connection charging policy. NIE Networks continue to advocate for a review of distribution connection charging and are in ongoing discussions with the Utility Regulator surrounding this.

Some respondents included complaints about the duration of the planning process for generation applications, however this falls outside the scope of this consultation. NIE Networks notes that the Department for Infrastructure are currently conducting a public consultation on a Review of Regional Strategic Planning Policy on Renewable and Low Carbon Energy[9].

One respondent had a query on the current G99/NI three phase limits suggesting they can be limiting to commercial businesses. NIE Networks wishes to respond that 16 Amps/phase fit and inform limits are set based on Regulation 23 of the ESQCR(NI) therefore this issue would have to be addressed by other industry and governmental bodies. As the legalisation currently is written, generation >16 Amps/phase wishing to connect in parallel cannot avail of the fit and inform process set out in Regulation 23 (2) and therefore must comply with Regulation 23(1).

One respondent made a recommendation that the <100kW category of generator should be able to utilise a set point signal if desired. In response, for Type A generators (<100 kW) the minimum

[9] https://www.infrastructure-ni.gov.uk/consultations/draft-renewable-and-low-carbon-energy

requirement is an on/off input, however if they wish to install additional equipment to enable set point control then that would be acceptable.

One respondent asked for an update on the North South interconnector project progress. Latest forecast completion dates for the 400 kV North – South Tie-Line and other approved transmission projects can be found as part of the quarterly Associated Transmission Reinforcement (ATR) Status Updates on the SONI website[10]. At present the forecast completion date for the NS interconnector is 2026. The forecast completion date of the ATR has been changed due to the lengthy planning process and subsequent legal challenges to the decisions to grant planning approval in Ireland and Northern Ireland.

Two respondents commented on Demand Side Units (DSU) & Aggregated Generator Units (AGU) : "DSU and AGU are dispatched by SONI during periods when Renewables are less likely to be available. We therefore suggest that applications by DSU and AGU should not be treated/assessed along with other forms of generation such as renewables."

AGU's are made up of multiple individual SSG and controlled by an aggregator, however each SSG has a separate distribution Connection Agreement and cannot be controlled individually by the TSO. A distribution Connection Agreement for an SSG who is participating as part of an AGU is the same as the distribution Connection Agreement for an SSG who is not. This is because the unit may at some point in the future cease to be part of an AGU and so from that point will operate only as an individual SSG. So, while the AGU is controllable as part of the aggregator, there is no such control available on an individual unit level. AGU's and DSU's have separate connection processes and agreements with SONI that fall outside the remit of this consultation and will not be affected by any changes proposed in this consultation.

[10] https://www.soni.ltd.uk/customer-and-industry/general-customer-information/faqs-atrs/index.xml

4. FUTURE CONNECTIONS PROCESS

NIE Networks will update wording within its Distribution Connection Offers and Connection Agreements for generators with a registered capacity less than 5MW that entitles NIE Networks to instruct the generator to cease or reduce parallel operation for system security reasons as instructed by SONI to NIE Networks. Amendments will be made to the relevant clauses within Distribution Connection Agreement. Since SSG can connect at LV or HV, both HV Connection Offers and Agreements and LV Connection Offers and Agreements will be updated.

As future connection policy will be governed by the DGAOP it is intended that the SSG connections process contained within the ACAOP, which was developed through consultation with industry and stakeholders and implemented in 2016, will no longer be applied to applicants received after the of **7th November 2023** at **10:00am.** .

Since 2019, increased controllability requirements are already in place for SSG as part of COMMISSION REGULATION (EU) No 2016/631 Requirements for Generators (RfG)[11]. The RfG updates were incorporated into the NIE Networks Distribution Code and Engineering Recommendation G99/NI. This means that any SSG that has connected since the introduction of RfG (27th April 2019) will have the capability to be controlled and that SSG connecting going forward will have the capability to be controlled. The controllability clause currently included in SSG Distribution LV Connection Agreement's relative to the RfG updates is clause 6, and reads:

Where the operating mode of any generating unit or storage unit referred to in Schedule 1, Table 3 or 4 as relevant, is described as "Long Term Parallel" or "Infrequent Short-Term Parallel" this shall be construed in accordance with Engineering Recommendation G99/NI. Where the operating mode of the Generator's Installation is described as Infrequent Short-Term Parallel NIE Networks shall be entitled to instruct the Generator to cease or reduce parallel operation of the Generator's Installation for such period of time as NIE Networks may in its absolute discretion determine.

Notwithstanding the description of the operating mode of any generating unit or storage unit referred to in Schedule 1, Table 3 or 4 as relevant, NIE Networks shall be entitled to request the Generator to cease or reduce parallel operation of the Generator's Installation for a period of time in circumstances where the NIE Networks Distribution System is operating abnormally (for example, but without limitation, due to a network fault, due to a programmed outage or due to temporary network re-configuration). The Generator shall not be entitled to payment from NIE Networks during a period of required cessation or reduction of parallel operation of the Generator's Installation.

The update to this clause will entitle NIE Networks, following direction from SONI, to instruct the generator to cease or reduce parallel operation for a period of time in circumstances where whole system security is at risk, not limited to distribution system security. This risk will be identified by SONI as the TSO, and passed to NIE Networks, based on agreed criteria and procedure. The clause will therefore be revised (with change highlighted in red) as below to read:

Where the operating mode of any generating unit or storage unit referred to in Schedule 1, Table 3 or 4 as relevant, is described as "Long Term Parallel" or "Infrequent Short-Term Parallel" this shall be construed in accordance with Engineering Recommendation G99/NI. Where the operating mode of the Generator's Installation is described as Infrequent Short-Term Parallel NIE Networks shall be entitled to instruct the Generator to cease or reduce parallel operation of the Generator's Installation for such period of time as NIE Networks may in its absolute discretion determine.

Notwithstanding the description of the operating mode of any generating unit or storage unit referred to in Schedule 1, Table 3 or 4 as relevant, NIE Networks shall be entitled to request the Generator to cease or reduce parallel operation of the Generator's Installation for a period of time in circumstances

[11] https://www.entsoe.eu/network_codes/rfg/

where the ~~NIE Networks Distribution~~ Transmission or Distribution System is operating abnormally (for example, but without limitation, due to a network fault, due to a programmed outage or due to

temporary network re-configuration). The Generator shall not be entitled to payment from NIE Networks during a period of required cessation or reduction of parallel operation of the Generator's Installation.

With regards to HV Connection Agreements, wording already exists within generator only Connection Agreements that permits control. For sites with both generation and demand, wording has been updated in HV Connection Agreements to include the entitlement to request the Generator to decrease parallel operation due to the Transmission or Distribution System operating abnormally.

This change aligns with wording in LV Connection Agreements as outlined above. Similar wording to that detailed above in the Distribution Connection Agreement will also be included in relevant Distribution Connection Offers.

There are two high-level scenarios that will arise:

1. Forecasted system security risk – A risk that can be identified ahead of real-time operations due to planned outages of transmission assets and forecasted generation and demand.
2. Forced system security risk - A risk that cannot be identified ahead of real-time operations, and arises due to the forced outage of transmission assets during times of high wind and low demand.

The notice period given to generators will vary depending on the scenario.

For the avoidance of doubt, NIE Networks is not proposing any changes to the design criteria for distribution connections. Connections will continue to be designed on the basis of continuous access to the distribution system while it is operating normally. These requirements would only apply to generators who have submitted an application after the **7th November 2023** at **10:00am**. This update will be included in all SSG Distribution Connection Offers and Connection Agreements going forward and will only apply from the **7th November 2023 at 10:00am.**

This update means that operational limit for system security is no longer an applicable criteria when it comes to determining if SSG Distribution Connection Offers seeking export can be issued, and thus is removed as a criteria.

Therefore, due to the reasons outlined above NIE Networks is updating the DGAOP SSG Connections Assessment criteria to the following:

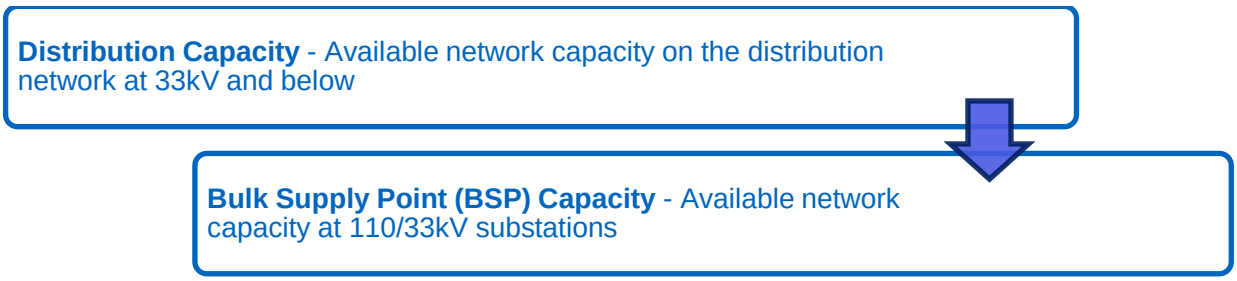

FIGURE 2 -UPDATED DGAOP SSG CONNECTIONS ASSESSMENT CRITERIA

The page overleaf features a flowchart that defines the updated Generation Connection Process (for Generators less than 5MW) following changes outlined in this decision paper. In addition to alterations proposed to the flowchart, the DGAOP contains text where the current process is explained for applications less than 5MW. This text will also be updated to reflect the proposed changes. This includes section 3 of the DGAOP, which outlines the process for determining if connection capacity is available.

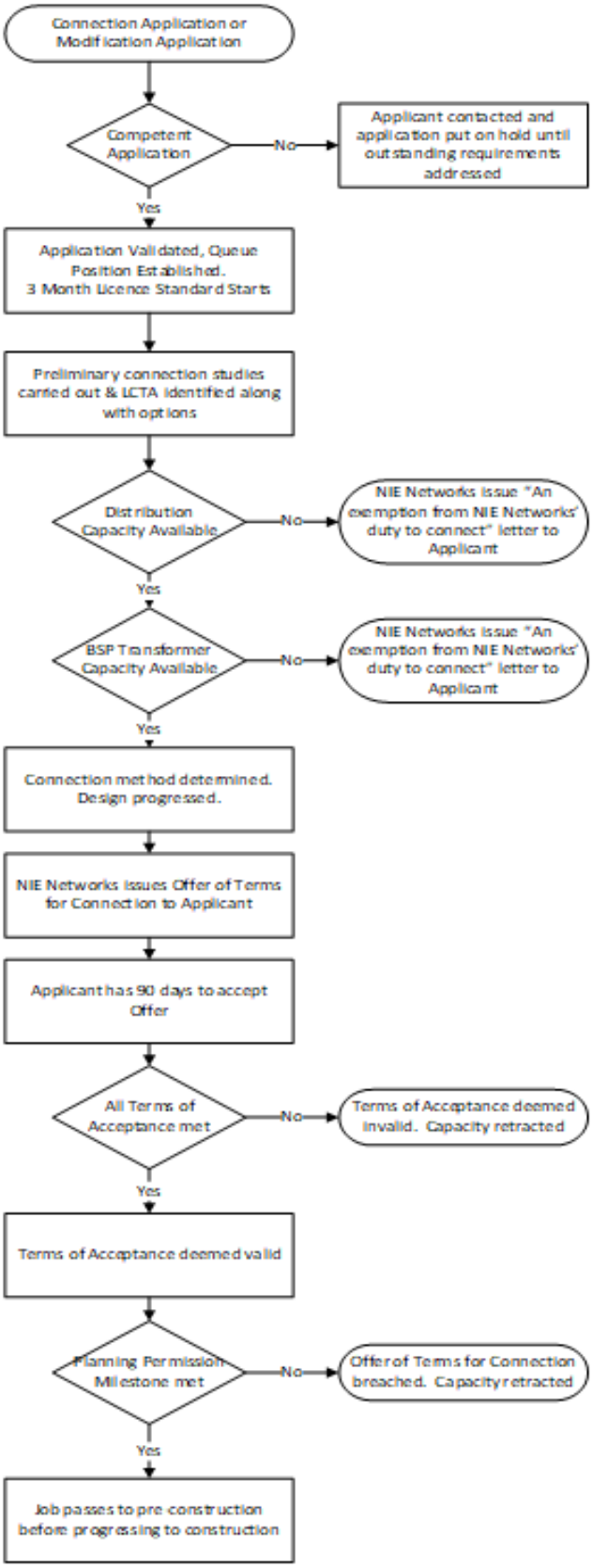

FIGURE 3 - UPDATED SSG CONNECTION PROCESS

5. NEXT STEPS

NIE Networks has updated its Distribution Connection Offer and SSG Distribution Agreement that details control requirements. The updated clause will now include edited wording that permits control requirements to be utilised for system security reasons.

This updated clause will be in Distribution Connection Offers and Agreements from the **7th November 2023 at 10:00am.**

NIE Networks also intends to publish a new version of the DGAOP that reflects changes proposed in this consultation and will include an updated list of what makes an application competent, as shown in appendix 1. In addition to this, NIE Networks would advise that prior to the Go Live date, a list of BSP's where there is limited capacity will be published. The intention behind this is to allow customers to assist customers in deciding on an application. These documents will be available on the company website (www.nienetworks.co.uk) prior to the Go Live date.

APPENDIX 1 –

Generation Application Checklist

Essential

- Completed G99/NI application form
  - Correspondence details
  - Payment Details
  - Installer details
  - Legal Details
  - MPRN (Existing connections)
  - Connection details
    - MEC
    - MIC (Load details required for MIC > 138kVA)
    - TIC
- Applicable Connection application fee
- Location map showing
  - meter position
  - Site boundaries
  - Substation location (if required)
  - If wind turbine then location of wind turbine on site location.
- Easting and Northing co-ordinates of each Generating Unit (Wind Turbine)
- Easting and Northing co-ordinates of customer Substation (if applicable)
- MPRN
- Details of any existing generation
- Proposed make and model of generator including datasheet which includes
  - Starting currents and type of starter for each Generating Unit installed
  - Impedance data for each Generating Unit installed and connecting network to the point of connection
  - Fault level data for total generation site
- For synchronous machines we need 2 x datasheets:
  - 1 x for the engine
  - 1 x for the alternator (note: the customer should confirm the exact make & model of the alternator as the datasheets typically include a number of variants of the same alt)
- Single line diagram showing:
  LV connected:
  - LV incoming supply point
  - Customer LV switch-boards
  - Connection points of all existing generation with inverters labelled
  - Connection points of all proposed generation with inverters labelled
  - Location of all protection schemes (G99/NI, G100, RPP, NVD, etc)
    - G99/NI protection must be referenced on SLD

  HV connected:
  - 11kV incoming supply point
  - Customer 11kV switch-gear
  - Customer transformers including:
    - Tx voltage ratios

    - Tx ratings
    - Tx voltage impedance (Z%)
- Customer LV switch-boards
- Connection points of all existing generation with inverters labelled
- Connection points of all proposed generation with inverters labelled
- Location of all protection schemes (G99/NI, G100, RPP, NVD, etc)
    - G99/NI protection must be referenced on SLD

Desirable

- Photo of supply showing meter serial number
- Planning Ref number (if applicable) and location of proposed generation
- Harmonics report