

### REPORT

# Buffalo Atlee Wind Power Projects - Noise Impact Assessment Update

Capstone Infrastructure Corporation on behalf of Buffalo Atlee 1 Wind LP, Buffalo Atlee 2 Wind LP, and Buffalo Atlee 3 Wind LP

Submitted to:

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# **Table of Contents**

| 1.0 | INTR  | DDUCTION                           | .1 |
|-----|-------|------------------------------------|----|
| 2.0 | PROJ  | ECT DESCRIPTION                    | .2 |
| 3.0 | ASSE  | SSMENT APPROACH                    | .3 |
|     | 3.1   | Assessment Cases                   | .3 |
|     | 3.2   | Noise Study Area and Receptors     | .5 |
|     | 3.3   | Compliance Criteria                | .6 |
|     | 3.3.1 | Broadband Noise                    | .6 |
|     | 3.3.2 | Low Frequency Noise                | .7 |
|     | 3.4   | Noise Prediction Methodology       | .7 |
| 4.0 | NOIS  | E EMISSIONS                        | .9 |
|     | 4.1   | Baseline Case                      | .9 |
|     | 4.1.1 | AUC-Regulated Facilities           | .9 |
|     | 4.1.2 | AER-Regulated Facilities and Wells | 12 |
|     | 4.2   | Application Case                   | 12 |
| 5.0 | ASSE  | SSMENT RESULTS                     | 15 |
|     | 5.1   | Baseline Case                      | 15 |
|     | 5.1.1 | Broadband Noise                    | 15 |
|     | 5.1.2 | Low Frequency Noise                | 15 |
|     | 5.2   | Application Case                   | 16 |
|     | 5.2.1 | Broadband Noise                    | 16 |
|     | 5.2.2 | Low Frequency Noise                | 18 |
| 6.0 | SUM   | MARY AND DISCUSSION                | 20 |
| 7.0 | ACOL  | JSTICAL PRACTITIONER INFORMATION   | 20 |
| 8.0 | REFE  | RENCES                             | 22 |

#### TABLES

| Table 1: Project Wind Turbines and Operating Modes                | 2  |
|---|----|
| Table 2: Noise Receptors  | 5  |
| Table 3: Permissible Sound Levels and Ambient Sound Levels        | 7  |
| Table 4: Environmental Inputs to Computer Noise Models            | 8  |
| Table 5: Baseline Case Noise Emissions - AUC-Regulated Facilities | 11 |
| Table 6: Application Case Noise Emissions - Project Wind Turbines | 14 |
| Table 7: Baseline Case Cumulative Noise Levels                    | 15 |
| Table 8: Baseline Case Broadband Noise Assessment                 | 15 |
| Table 9: Baseline Case Low Frequency Noise Analysis               | 16 |
| Table 10: Application Case Cumulative Noise Levels                | 16 |
| Table 11: Application Case Broadband Noise Assessment             | 18 |
| Table 12: Application Case Low Frequency Noise Analysis           | 19 |

### FIGURES

| Figure 1: Noise Study Area     | 4  |
|--------------------------------|----|
| Figure 2: Project Noise Levels | 17 |

#### APPENDICES

#### **APPENDIX A**

Total and One-Third Octave Band Noise Emissions for Project Wind Turbines

#### **APPENDIX B**

Baseline Case Noise Emissions - AER-Regulated Facilities and Wells

## **1.0 INTRODUCTION**

Capstone Infrastructure Corporation (Capstone) and Sawridge First Nation, through their subsidiaries Buffalo Atlee 1 Wind LP, Buffalo Atlee 2 Wind LP, and Buffalo Atlee 3 Wind LP, are developing the Buffalo Atlee 1, 2, and 3 Wind Power Projects east and southeast of the Hamlet of Jenner, Alberta, in Special Areas No. 2. The three Buffalo Atlee Projects will hereafter be referred to collectively as "the Project".

The Project will consist of eleven Siemens Gamesa SG 4.5-145 wind turbines. The total installed nominal capacity of the Project will be 48.16 megawatts (MW): 17.16 MW from Buffalo Atlee 1, 13.80 MW from Buffalo Atlee 2, and 17.20 MW from Buffalo Atlee 3. The Project will not require development of a new electrical substation.

Power generating facilities in Alberta are regulated by the Alberta Utilities Commission (AUC). In particular, the AUC regulates power generating facilities through Rule 007: Applications for Power Plants, Substations, Transmission Lines, Industrial System Designations, and Hydro Developments (AUC 2016), which will hereafter be referred to as Rule 007, and through Rule 012: Noise Control (AUC 2020), which will hereafter be referred to as Rule 007 lays out general requirements for regulatory applications and Rule 012 provides specific methods and criteria for assessing potential environmental noise impacts.

Capstone retained Golder Associates Ltd. (Golder) to complete a noise impact assessment (NIA) for the Project in accordance with guidance and methodology specified in Rule 012. The original NIA for the Project (hereafter referred to as the Original Project NIA) was completed on September 10, 2019 and submitted to the AUC on December 6, 2019 (Golder 2019).

In response to concerns raised by Alberta Environment and Parks (AEP) following completion of the Original Project NIA, Capstone made minor adjustments to the Project design. Capstone directed Golder to update the Original Project NIA in response to these adjustments. The results of the Updated Project NIA are summarized in this report.

The Updated Project NIA report is structured as follows:

- Section 1 provides an introduction to the Updated Project NIA
- Section 2 presents a brief description of Project equipment and planned operations
- Section 3 outlines the assessment approach used in the Updated Project NIA, including a description of:
  - assessment cases considered in the Updated Project NIA
  - noise study area and relevant receptor locations
  - applicable broadband and low frequency noise (LFN) compliance criteria
  - methodology used to predict Project noise levels
- Section 4 presents noise emissions values for sources considered in the Updated Project NIA
- Section 5 presents results for each assessment case, including a comparison of noise level predictions to Rule 012 compliance criteria
- Section 6 summarizes and discusses the results of the Updated Project NIA
- Section 7 provides information about the acoustical practitioners that completed the Updated Project NIA

- Appendix A consists of manufacturer-supplied tables showing total and one-third octave band noise emissions from the Project wind turbines
- Appendix B presents noise emissions values for some of the sources/facilities considered in the Updated Project NIA

## 2.0 PROJECT DESCRIPTION

The Project will consist of eleven Siemens Gamesa SG 4.5-145 wind turbines. The Project wind turbines will have a hub height of 127.5 m. Individual Project wind turbines will operate in one of four different modes:

- AM+1, with a nominal power rating of 4.6 MW
- AM-1, with a nominal power rating of 4.4 MW
- AM-3, with a nominal power rating of 4.2 MW
- NR-1, with a nominal power rating of 3.96 MW

Table 1 presents locations and operating modes for the Project wind turbines. Each Project wind turbine will have its operating mode configured to match the operation plan described in Table 1.

As required by Rule 012, the operating modes specified in Table 1 correspond to "...the maximum noise emitted when the wind turbine operates under the planned maximum operating conditions for both the daytime and the nighttime period..." (AUC 2020), where daytime is the period from 7 am to 10 pm and nighttime is the period from 10 pm to 7 am. As indicated in Table 1, the Project wind turbines will operate in the same modes during the daytime period and the nighttime period.

| Project<br>Phase   | Turbine<br>Identification | Description                            | Universal<br>Mercator (<br>[NAD83 | Transverse<br>Coordinates<br>, Zone 12] | Turbine<br>Mc | Operating<br>ode <sup>(a)</sup> |
|--------------------|---------------------------|--|-----------------------------------|---|---------------|---------------------------------|
|                    | Code                      |  | Easting [m]                       | Northing [m]                            | Daytime       | Nighttime                       |
|                    | BA1_T1                    | Siemens Gamesa SG 4.5-145 wind turbine | 497603                            | 5621366                                 | NR-1          | NR-1                            |
| Buffalo            | BA1_T2                    | Siemens Gamesa SG 4.5-145 wind turbine | 497083                            | 5621251                                 | AM-3          | AM-3                            |
| Atlee 1            | BA1_T3                    | Siemens Gamesa SG 4.5-145 wind turbine | 497042                            | 5620789                                 | AM-1          | AM-1                            |
|                    | BA1_T4                    | Siemens Gamesa SG 4.5-145 wind turbine | 497513                            | 5620296                                 | AM+1          | AM+1                            |
|                    | BA2_T1                    | Siemens Gamesa SG 4.5-145 wind turbine | 491659                            | 5618204                                 | AM+1          | AM+1                            |
| Buffalo<br>Atlee 2 | BA2_T2                    | Siemens Gamesa SG 4.5-145 wind turbine | 492341                            | 5617440                                 | AM+1          | AM+1                            |
|                    | BA2_T3                    | Siemens Gamesa SG 4.5-145 wind turbine | 492290                            | 5616984                                 | AM+1          | AM+1                            |
|                    | BA3_T1                    | Siemens Gamesa SG 4.5-145 wind turbine | 495415                            | 5619887                                 | AM-3          | AM-3                            |
| Buffalo            | BA3_T2                    | Siemens Gamesa SG 4.5-145 wind turbine | 495587                            | 5619362                                 | AM-3          | AM-3                            |
| Atlee 3            | BA3_T3                    | Siemens Gamesa SG 4.5-145 wind turbine | 496550                            | 5619782                                 | AM-3          | AM-3                            |
|                    | BA3_T4                    | Siemens Gamesa SG 4.5-145 wind turbine | 496243                            | 5619452                                 | AM+1          | AM+1                            |

#### Table 1: Project Wind Turbines and Operating Modes

(a) Planned operating mode corresponding to maximum noise emissions.

A map showing the locations of the Project wind turbines is presented in Section 3.2 of this report (see Figure 1). Additional details on noise emissions from Project wind turbines are provided in Section 4.2 and Appendix A of this report. The noise emissions data in Appendix A were provided by Siemens Gamesa, the manufacturer of the Project wind turbines.

## 3.0 ASSESSMENT APPROACH

The purpose of the Updated Project NIA is to assess potential environmental noise impacts from the Project within the context of regulatory requirements specified in Rule 012. Specific regulatory requirements are described in detail in Section 3.3 of this report. In general, to demonstrate regulatory compliance, Rule 012 requires that cumulative noise levels at relevant receptors be compared to a mandated permissible sound level (PSL) limit. Rule 012 considers relevant receptors to be "...the most affected dwelling(s) located within 1.5 km [kilometres] from the centre point of the tower of the closest wind turbine..." (AUC 2020). Rule 012 indicates that cumulative noise levels should be calculated as the sum of:

- an ambient sound level (ASL) meant to represent the contribution from natural noise sources, non-industrial noise sources, and industrial facilities that are not regulated by the AUC or Alberta Energy Regulator (AER)
- the noise contribution from existing facilities that are regulated by the AUC or AER
- the noise contribution from approved but not yet constructed facilities that are regulated by the AUC or AER
- the noise contribution from proposed facilities that have been deemed complete by the AUC in accordance with Rule 007
- the noise contribution from the Project under "...planned maximum operating conditions..." (AUC 2020)

## 3.1 Assessment Cases

The Updated Project NIA considered two assessment cases:

- Baseline Case, which consists of cumulative noise levels associated with natural sources, non-industrial sources, industrial facilities that are not regulated by the AUC or AER, existing AUC/AER-regulated facilities, approved but not constructed AUC/AER-regulated facilities, and proposed facilities that have been deemed complete by the AUC.
- Application Case, which consists of cumulative noise levels associated with the Baseline Case in combination with the predicted noise contribution from the Project.

For both assessment cases, the cumulative noise level at each relevant receptor was compared to the applicable Rule 012 PSL. Noise contributions from Baseline Case industrial facilities were estimated using information presented in NIAs prepared for these facilities (Innova 2016; RWDI 2018; RWDI 2019; Stantec 2019), in combination with a computer model developed in accordance with a widely-accepted calculation standard for the propagation of environmental noise (ISO 1996). The contribution from Project wind turbines to Application Case cumulative noise levels was predicted using a computer model that made use of same calculation standard as the Baseline Case computer model (ISO 1996). In accordance with Rule 012, the Application Case modelled Project wind turbines under "...planned maximum operating conditions..." (AUC 2020).



Section 4.1 and Appendix B of this report provide additional detail on the Baseline Case industrial facilities considered in the Updated Project NIA. Section 2.0, Section 4.2, and Appendix A of this report provide additional detail on the Project wind turbines included in the Application Case. Section 3.4 of this report provides additional detail on the computer modelling conducted for the Baseline Case and the Application Case.

## 3.2 Noise Study Area and Receptors

Rule 012 regulates noise from a receptor perspective and considers relevant receptors to be "...the most affected dwelling(s) located within 1.5 km from the centre point of the tower of the closest wind turbine..." (AUC 2020). The Updated Project NIA established a 2 km buffer surrounding the Project wind turbines and assessed potential Project noise impacts at all occupied dwellings located within this buffer. Note that a 2 km receptor buffer was selected instead of a 1.5 km receptor buffer based on the Rule 007 requirement that proponents notify all residents living within 2 km of a proposed facility (AUC 2016). In other words, specific receptors for the Updated Project NIA were selected such that discrete noise level predictions and assessment results would be available for all residents that Capstone was required to notify as part of the AUC regulatory process for the Project.

Receptors were initially identified using satellite imagery of the Project area. Golder subsequently verified receptor locations, heights (e.g., one-storey, two-storey), and occupancy status during a site visit on April 4, 2019. Two occupied dwellings were identified within 2 km of the Project wind turbines. These two occupied dwellings were considered receptors in the Updated Project NIA.

Table 2 presents locations and heights for the two receptors considered in the Updated Project NIA. Table 2 also identifies and provides the distance to the closest Project wind turbine. Rule 012 does not specify appropriate receptor heights to use in noise assessments but does indicate that the height of receptors should "...reflect the bedroom height of the dwellings" (AUC 2020). Golder's site visit of April 4, 2019 confirmed that both receptors are one-storey dwellings. As such, both receptors were modelled at a height of 1.5 m above ground to match the height at which noise exposure will typically occur.

Figure 1 presents a map showing the noise study area (i.e., a 2 km buffer surrounding the Project wind turbines). The map in Figure 1 includes receptors, Project wind turbines, and Baseline Case facilities considered in the Updated Project NIA. Section 4.1 and Appendix B of this report provide additional detail on the Baseline Case facilities.

| Receptor<br>Identification | Receptor                         | Universal Transv<br>Coordinates [NA | verse Mercator<br>D83, Zone 12] | Receptor   | Closest<br>Project Wind | Distance to<br>Closest Project |
|----------------------------|----------------------------------|-------------------------------------|---------------------------------|------------|-------------------------|--------------------------------|
| Code                       | Description                      | Easting [m]                         | Northing [m]                    | Height [m] | Turbine                 | [m]                            |
| R1 <sup>(a)(b)</sup>       | occupied dwelling;<br>one-storey | 498270                              | 5621337                         | 1.5        | BA1_T1                  | 668                            |
| R2                         | occupied dwelling;<br>one-storey | 490484                              | 5619719                         | 1.5        | BA2_T1                  | 1,917                          |

#### Table 2: Noise Receptors

(a) This receptor is identified as "R4" in the NIA for the Jenner Wind Power Project (RWDI 2019). The Jenner Wind Power Project uses slightly different coordinates to represent the location of this receptor. Golder confirmed the precise location of this receptor as provided in the table during a site visit on April 4, 2019.

(b) The NIA for the Jenner Wind Power Project identifies a second occupied dwelling, "R11", in the same yard site as this receptor (RWDI 2019). During a site visit on April 4, 2019, Golder spoke directly to the owner/occupant of this yard site and confirmed there is only one occupied dwelling.

## 3.3 Compliance Criteria

## 3.3.1 Broadband Noise

Rule 012 requires that broadband noise compliance be assessed by comparing cumulative noise levels to a mandated PSL limit. Appropriate PSL limits for individual receptors are calculated using a desktop technique outlined in Rule 012. The Rule 012 calculation technique accounts for time of day, population density, and proximity to transportation infrastructure such as heavily travelled roads and railways. For receptors located in areas with population density less than nine dwellings per quarter section and more than 500 m from heavily travelled roads and railways, Rule 012 sets:

- the daytime PSL at 50 A-weighted decibels (dBA)
- the nighttime PSL at 40 dBA

These PSL limits are consistent with a quiet rural environment. The quiet rural environment PSL limits are applicable at both R1 and R2.

Cumulative noise levels include the contribution from:

- natural sources
- non-industrial sources
- industrial facilities that are not regulated by the AUC or AER
- existing AUC/AER-regulated facilities
- approved but not constructed AUC/AER-regulated facilities
- proposed facilities that have been deemed complete by the AUC
- the Project

The combined noise contribution from natural sources, non-industrial sources, and unregulated industrial facilities is characterized via an ASL. Although Rule 012 "...does not require the use of a specific [ASL]...", Rule 012 does indicate that "...[t]he average nighttime [ASL] in rural Alberta is approximately 35 dBA..." and further indicates that "...[t]he assumed [ASL] is five dBA less than the applicable [PSL]..." (AUC 2019).

There are no heavily travelled roads (i.e., roads with traffic volumes greater than or equal to 90 vehicles per nighttime period) or railways with the potential to influence the ASL at receptors R1 or R2. Similarly, there are no unregulated industrial facilities with the potential to influence the ASL at receptors R1 or R2. As such, the ASL at receptors R1 and R2 is primarily influenced by natural and non-industrial sources typical of a rural area (e.g., birds, insects, rustling vegetation, traffic on small/local roads, agricultural activities).

Based on the analysis above, it is reasonable for the Updated Project NIA to make use of the assumed ASL values from Rule 012. Use of assumed ASL values in the Updated Project NIA is further justified by the fact that all of the NIAs completed for existing, approved, and proposed AUC-regulated facilities with the potential to influence cumulative noise levels at R1 and R2 have also made use of assumed ASL values (RWDI 2018; RWDI 2019; Stantec 2019).

Table 3 presents Rule 012 PSL limits and assumed ASL values applicable at each receptor considered in the Updated Project NIA.

| Persenter Identification Code | Rule 012 Permissible | e Sound Level [dBA] | Assumed Ambient Sound Level <sup>(a)</sup> [dBA] |           |  |  |
|-------------------------------|----------------------|---------------------|--|-----------|--|--|
| Receptor identification code  | Daytime              | Nighttime           | Daytime  | Nighttime |  |  |
| R1                            | 50                   | 40                  | 45   | 35        |  |  |
| R2                            | 50                   | 40                  | 45   | 35        |  |  |

#### Table 3: Permissible Sound Levels and Ambient Sound Levels

(a) In accordance with Rule 012, the assumed ambient sound level is 5 dBA less than the applicable permissible sound level.

### 3.3.2 Low Frequency Noise

LFN can be an issue even when broadband noise levels are otherwise acceptable. Consequently, Rule 012 requires a separate assessment of potential LFN impacts. Rule 012 indicates that an LFN issue exists if both of the following conditions are met:

- the value of the cumulative noise level, expressed in C-weighted decibels (dBC), minus the value of the cumulative noise level, expressed in dBA, is greater than or equal to 20 (the "Cumulative Noise Test"); and
- a clear tone is present in a one-third octave band at or below 250 hertz (Hz) (the "Tonal Test")

Rule 012 provides the following definition of a clear tone for use in the Tonal Test:

"For the one-third octave frequency bands between 20 and 250 Hz and below:

a) the linear sound level in one band must be at least 10 dB [decibels] or more above the adjacent bands within two one-third octave band widths

*b)* there must be at least a five dB drop in level within two bandwidths on the opposite side of the frequency band exhibiting the high sound level" (AUC 2019)

The guidelines under Rule 012 require that both the Cumulative Noise Test and Tonal Test be satisfied for a LFN issue to exist. Satisfaction of one of the two tests does not result in a LFN issue.

## 3.4 Noise Prediction Methodology

Computer noise models for the Baseline Case and Application Case were developed using the CadnaA software package (version 4.6.155). In accordance with Rule 012, CadnaA implements the noise propagation algorithm described in the International Organization for Standardization (ISO) 9613-2 technical standard (ISO 1996).

The computer models were used to calculate Baseline Case and Application Case cumulative noise levels at the receptors listed in Table 2. Inputs to the computer models consisted of source emissions in the form of octave band sound power levels and environmental conditions that are known to influence noise propagation (e.g., ground cover, temperature, humidity, wind conditions).

Noise source emissions for the Baseline Case and the Application Case are discussed in detail in Section 4.1 and Section 4.2 of this report, respectively. A summary of environmental inputs to the computer models is provided in Table 4. The noise modelling parameters identified in Table 4 have been selected for consistency with the most-recent NIA prepared for the Jenner Wind Power Project (JWPP), which is located immediately north of the Project (RWDI 2019). Aligning modelling parameters will provide the AUC with assessment results that are generally consistent for the JWPP and the Project and facilitate a direct comparison of the two NIAs.

| Table 4: Environmental inputs to Computer Noise Models | Table 4: Environmental | Inputs to Com | puter Noise Models |
|--|------------------------|---------------|--------------------|
|--|------------------------|---------------|--------------------|

| Parameter   | Model Setting <sup>(a)</sup>                    | Description / Notes  |
|---|---|--|
| Standard  | ISO 9613-2 (ISO 1996)                           | Models treated noise sources, noise attenuation, and noise propagation in accordance with this standard.                                 |
| Ground Factor   | 0.7 – throughout the<br>noise study area        | This value represents the acoustic properties of the ground in accordance with ISO 9613-2.   |
| Maximum Radius of Influence (also called<br>"search radius" or "fetching radius") | 10 km   | This value represents the maximum distance at which a source can contribute to noise levels at a receptor.                               |
| Temperature / Humidity  | 10ºC / 70% relative<br>humidity                 | These are typical default conditions for ISO 9613-2 intended to represent nighttime summer conditions.                                   |
| Wind Conditions   | 1 m/s to 5 m/s from source to receptor          | These represent default ISO 9613-2 wind conditions –<br>moderate temperature inversion, wind from source to<br>receptor 100% of the time |
| Terrain   | Terrain modelled using<br>Altalis Ltd. database | Ground elevation contours at 5 m intervals were included in the models.  |

(a) Modelling parameters were selected for consistency with the NIA for the Jenner Wind Power Project (RWDI 2019).

When calculating noise levels at receptors, the ISO 9613-2 algorithm used the environmental inputs listed in Table 4 to account for four noise attenuation mechanisms:

- geometric divergence
- atmospheric absorption
- ground absorption
- screening by barriers

Geometric divergence accounts for the fact that a given noise source radiates a finite amount of acoustic energy and as this finite amount of energy propagates into the environment it is spread out over a larger and larger area (i.e., the surface of an ever-expanding sphere). This geometric spreading means that the farther away a receptor is located from a source, the less energy will be received (i.e., the lower the observed noise level).

Atmospheric absorption accounts for the fact that the acoustic energy associated with a given noise source is absorbed via interaction with molecules in the air through which it propagates. Attenuation effects associated with atmospheric absorption are most substantial at high frequencies but can be important at lower frequencies for large propagation distances.

Ground absorption accounts for the fact that each time the acoustic energy emitted by a noise source interacts with the ground some of it is absorbed. The amount of energy absorbed depends on the type of ground surface. During interactions with the hard ground very little energy is absorbed but during interactions with porous ground a substantial amount of energy is absorbed. As a result, if all other factors are held constant, observed noise levels associated with sources operating in an area of hard ground will be higher than observed noise levels associated with sources operating in an area of porous ground.

Screening by barriers accounts for the fact that a physical object (either terrain-based or anthropogenic) placed between a noise source and receptor can block acoustic energy and reduce observed noise levels at the receptor.

According to the ISO 9613-2 standard, the overall accuracy of the propagation algorithm used in the Updated Project NIA computer models is ±3 dBA for distances between source and receptor up to 1 km. The accuracy for propagation distances greater than 1 km is not stated in the standard. Model accuracy also depends on the

accuracy of the noise emissions inputs, which is often ±2 dBA. Accounting for both these sources of uncertainty, the overall accuracy of the noise level predictions presented in this Updated Project NIA is expected to be ±3.6 dBA. A number of conservative assumptions regarding propagation conditions, Project operations, and Project noise emissions were made to account for the level of uncertainty inherent in the noise level predictions.

Each receptor was assumed to be downwind from each source 100% of the time. Because downwind conditions tend to enhance noise propagation, this assumption is conservative and likely overestimates the noise impact of the Project.

Ground conditions in most of the noise study area meet the definition of porous ground provided in ISO 9613-2: "...ground covered by grass, trees or other vegetation, and all other ground surfaces suitable for the growth of vegetation, such as farming land" (ISO 1996). Visual review of satellite imagery suggests that roads, waterbodies, and other reflective surfaces make up a very small fraction of the study area. As such, for consistency with ISO 9613-2, a ground factor of 1.0 (or very close to 1.0) should be used in the computer models. Instead, the computer models used a substantially more reflective ground factor of 0.7 to represent conditions in the noise study area. Because reflective ground tends to enhance noise propagation, this approach is conservative and likely overestimates the noise impact of the Project.

The Project wind turbines were modelled with maximum noise emissions 100% of the time. Because Project wind turbines will often operate with less than maximum noise emissions, this modelling approach is conservative and likely overestimates the noise impact of the Project.

Terrain features were the only acoustical screening elements considered in the noise model. Acoustical screening from anthropogenic features (e.g., buildings) and acoustical screening from vegetation were not considered in the computer model. This is a conservative approach to modelling potential Project noise impacts.

## 4.0 NOISE EMISSIONS

## 4.1 Baseline Case

As discussed in Section 3.1 of this report, the Baseline Case consists of cumulative noise levels associated with natural sources, non-industrial sources, industrial facilities that are not regulated by the AUC or AER, existing AUC/AER-regulated facilities, approved but not constructed AUC/AER-regulated facilities, and proposed facilities that have been deemed complete by the AUC. As discussed in Section 3.3.1 of this report, there are no unregulated industrial facilities with the potential to influence cumulative noise levels at receptors R1 or R2. As such, the Updated Project NIA characterized the noise contribution form natural and non-industrial noise sources using assumed ASL values from Rule 012 (see Table 3 of this report).

## 4.1.1 AUC-Regulated Facilities

Golder used the AUC eFiling system to identify AUC-regulated facilities with the potential to influence cumulative noise levels at receptor R1 and receptor R2 (i.e., AUC-regulated facilities located within approximately 3 km of the Project). A total of five such facilities were identified:

- JWPP, an approved but not constructed wind power facility located north of the Project
- Halsbury Substation, an approved but not constructed electrical substation located north of the Project
- Jenner Solar, an approved but not constructed solar power facility located northwest of the Project
- Jenner Substation, an existing electrical substation located west of the Project
- Jenner Power Plant, an approved but not constructed natural gas power plant located west of the Project

Note that the Original Project NIA also considered the noise contribution from a sixth AUC-regulated facility: the approved but not constructed NAT-3 Power Facility (Innova 2016). In the Updated Project NIA, the NAT-3 facility has been removed from the Baseline Case because the AUC approval for this facility has now been rescinded (AUC 2019).

The locations of the AUC-regulated Baseline Case facilities are shown in Figure 1 of this report. The Updated Project NIA characterized the noise contribution from these five Baseline Case facilities using information provided in the NIAs prepared for these facilities.

The noise contributions from the JWPP and from the Halsbury Substation were characterized using information provided in the most-recent NIA prepared for the JWPP (RWDI 2019). In particular, the JWPP noise contribution at receptor R1 was taken directly from the JWPP NIA (since this receptor is included in the JWPP NIA as "R4"). To estimate the JWPP's noise contribution at receptor R2 (which is not included in the JWPP NIA) and to estimate the Halsbury Substation's noise contribution at receptors R1 and R2, Golder developed a computer noise model using source locations and emissions inputs provided in the JWPP NIA. This computer noise model made use of the modelling parameters listed in Table 4 of this report.

The noise contribution from the Jenner Solar facility was characterized using information provided in the mostrecent NIA prepared for this facility (Stantec 2019). In particular, to estimate the noise contribution from the Jenner Solar facility at receptors R1 and R2, Golder developed a computer noise model using source locations and emissions inputs provided in the Jenner Solar NIA. This computer noise model made use of the modelling parameters listed in Table 4 of this report.

The noise contribution from the Jenner Substation was characterized using information provided in the mostrecent NIA prepared for the NAT-3 facility (Innova 2016). In particular, to estimate the noise contribution from the Jenner Substation at receptors R1 and R2, Golder developed a computer noise model using source location and noise emissions inputs provided in the NAT-3 NIA. This computer noise model made use of the modelling parameters listed in Table 4 of this report.

The noise contribution from the Jenner Power Plant was characterized using information provided in the most-recent NIA prepared for this facility (RWDI 2018). In particular, the noise contribution from the Jenner Power Plant at receptors R1 and R2 was estimated by superimposing these receptor locations on the noise contour map presented in the Jenner Power Plant NIA. Given the relative complexity of the Jenner Power Plant (i.e., multiple noise sources and onsite buildings) this approach was considered more appropriate than trying to develop a computer model of the Jenner Power Plant based on the limited information available in the NIA for this facility.

Based on the Rule 012 definition of proposed facilities (i.e., facilities whose application has been deemed complete by the AUC), there are no proposed facilities with the potential to influence cumulative noise levels at receptors R1 or R2. Note that applications have been filed with the AUC for the Jenner 2 Wind Power Project (Jenner 2; Proceeding No. 22866) and the Jenner 3 Wind Power Project (Jenner 3; Proceeding No. 22866), which will be located north of the Project. Because the Jenner 2 and Jenner 3 applications have not been deemed complete by the AUC, they are not proposed facilities in the context of Rule 012, and the noise contributions from Jenner 2 and Jenner 3 were not considered in the Updated Project NIA.

Table 5 presents noise emissions values used in the Updated Project NIA to represent the five AUC-regulated Baseline Case facilities. Noise emissions values are presented in the form of octave band sound power levels, expressed in unweighted decibels (dBZ), and total sound power levels, expressed in dBA.

|                     |                            | <b>a</b> 111 | Octave Band Sound Power Level [dBZ] Total Sound |                    |                    |                    |                    | Octave Band Sound Power Level [dBZ] |                    |                    |                    |                      |                |  |  |
|---------------------|----------------------------|--------------|---|--------------------|--------------------|--------------------|--------------------|-------------------------------------|--------------------|--------------------|--------------------|----------------------|----------------|--|--|
| Facility            | Noise Source               | Quantity     | 31.5 Hz   | 63 Hz              | 125 Hz             | 250 Hz             | 500 Hz             | 1 kHz                               | 2 kHz              | 4 kHz              | 8 kHz              | Power Level<br>[dBA] | Reference      |  |  |
|                     | Wind Turbine               | 29           | 117.8   | 111.4              | 109.7              | 107.0              | 106.1              | 103.0                               | 97.0               | 84.4               | 64.8               | 107.5                | (RWDI 2019)    |  |  |
| JWPP <sup>(a)</sup> | Pad-Mounted<br>Transformer | 29           | 62.5  | 74.5               | 80.5               | 79.5               | 79.5               | 71.5                                | 64.5               | 56.5               | 44.5               | 78.8                 | (RWDI 2019)    |  |  |
| Halsbury Substation | Transformer                | 3            | 95.2  | 101.2              | 103.2              | 98.2               | 98.2               | 92.2                                | 87.2               | 82.2               | 75.2               | 98.6                 | (RWDI 2019)    |  |  |
| Jenner Substation   | All Sources                | 1            | 100.0   | 100.0              | 102.0              | 91.0               | 88.0               | 86.0                                | 81.0               | 80.0               | 79.0               | 92.2                 | (Innova 2016)  |  |  |
| Jopper Seler        | Inverter Unit              | 9            | 99.8  | 98.5               | 97.1               | 103.7              | 96.9               | 90.6                                | 84.8               | 79.0               | 71.6               | 98.7                 | (Stantec 2019) |  |  |
| Jenner Solar        | Transformer                | 9            | 71.4  | 77.4               | 79.4               | 74.4               | 74.4               | 68.4                                | 63.4               | 58.4               | 51.4               | 74.8                 | (Stantec 2019) |  |  |
| Jenner Power Plant  | All Sources                | 1            | n/a <sup>(b)</sup>                              | n/a <sup>(b)</sup> | n/a <sup>(b)</sup> | n/a <sup>(b)</sup> | n/a <sup>(b)</sup> | n/a <sup>(b)</sup>                  | n/a <sup>(b)</sup> | n/a <sup>(b)</sup> | n/a <sup>(b)</sup> | n/a <sup>(b)</sup>   | (RWDI 2018)    |  |  |

#### Table 5: Baseline Case Noise Emissions - AUC-Regulated Facilities

(a) JWPP noise emissions presented in this table were only used to model the JWPP's noise contribution at R2. The JWPP's noise contribution at R1 was taken directly from the JWPP NIA (RWDI 2019).

(b) The Jenner Power Plant was not modelled for the Updated Project NIA. Instead, the noise contribution from the Jenner Power Plant was estimated by superimposing receptors R1 and R2 on the noise contour map presented in the Jenner Power Plant NIA (RWDI 2018).

### 4.1.2 AER-Regulated Facilities and Wells

Golder used information presented in the most-recent NIAs for the JWPP (RWDI 2019), Jenner Solar facility (Stantec 2019), NAT-3 facility (Innova 2016), and Jenner Power Plant (RWDI 2018) to identify AER-regulated facilities and wells with the potential to influence cumulative noise levels at receptors R1 and R2. To supplement the information presented in these third-party NIAs, Golder also reviewed AER databases ST102 (AER 2019a) and ST37 (AER 2019b) to identify additional AER-regulated facilities and wells that may contribute to cumulative noise levels at receptors R1 and R2 (i.e., facilities and wells located within approximately 3 km of the Project).

This review identified a total of 32 potentially relevant AER-regulated facilities and 139 potentially relevant AER-regulated wells. Golder developed a computer noise model to estimate the noise contributions from these 32 facilities and 139 wells at receptors R1 and R2. The computer noise model made use of the modelling parameters listed in Table 4 of this report.

Noise emissions from the AER-regulated facilities and wells were established using information presented in the most-recent NIAs for the JWPP (RWDI 2019), Jenner Solar facility (Stantec 2019), NAT-3 facility (Innova 2016), and Jenner Power Plant (RWDI 2018). Where a particular AER-regulated facility or well appeared in one of these third-party NIAs, the Updated Project NIA made use of noise emissions taken directly from the third-party NIA. Where a particular AER-regulated facility or well appeared in more than one of these third-party NIAs, the Updated Project NIA made use of the highest/loudest noise emissions from the among the third-party NIAs. Where a particular AER-regulated facility or well did not appear in any of the third-party NIAs (i.e., facilities or wells identified by Golder using the AER ST102 or ST37 databases), the Updated Project NIA used representative noise emissions for a comparable facility or well from one of the third-party NIAs. This approach to estimating noise emissions from AER-regulated facilities and wells means the Baseline Case for the Updated Project NIA is largely consistent with the most-recent NIAs prepared for nearby facilities (i.e., JWPP, Jenner Solar, NAT-3, and Jenner Power Plant).

Appendix B presents noise emissions values used in the Updated Project NIA to represent the 32 AER-regulated Baseline Case facilities and the 139 AER-regulated Baseline Case wells.

## 4.2 Application Case

Project noise sources considered in the Application Case consist of eleven Siemens Gamesa SG 4.5-145 wind turbines. In accordance with Rule 012, all Project wind turbines were modelled using "...the maximum noise emitted when the wind turbine operates under the planned maximum operating conditions for both the daytime and nighttime period" (AUC 2020).

Noise emissions data for the Project wind turbines were provided by Siemens Gamesa, the manufacturer. Noise emissions data provided by Siemens Gamesa are attached as Appendix A of this report. Noise emissions from Project wind turbines will increase with hub height wind speed, until hub height wind speed reaches 9 metres per second (m/s). Noise emissions from the Project wind turbines will remain constant for all hub height wind speeds greater than or equal to 9 m/s. Furthermore, the shape of the noise emissions spectrum will not change for hub wind speeds greater than or equal to 9 m/s.

As discussed in Section 2.0 of this report:

- five Project wind turbines will operate in AM+1 mode for both the daytime period and nighttime period
- one Project wind turbine will operate in AM-1 mode for both the daytime period and nighttime period
- four Project wind turbines will operate in AM-3 mode for both the daytime period and nighttime period

one Project wind turbine will operate in NR-1 mode for both the daytime period and nighttime period

Table 6 presents noise emissions from the Project wind turbines for each relevant operating mode. Noise emissions values are presented in the form of octave band sound power levels, expressed in dBZ, and total sound power levels, expressed in dBA. These noise emissions values were calculated directly from the manufacturer-supplied data attached as Appendix A to this report. Noise emissions values presented in Table 6 correspond to hub height wind speeds greater than or equal to 9 m/s and represent the "...the maximum noise emitted when the wind turbine operates under the planned maximum operating conditions..." (AUC 2020).

As discussed in Section 3.3.2 of this report, Rule 012 sets out a two-part test for LFN issues (the Cumulative Noise Test and the Tonal Test). The Tonal Test requires the presence of a clear tone in a one-third octave band at or below 250 Hz. Rule 012 sets out a specific procedure for testing for a clear tone. If there is no such tone, then no LFN issues can exist.

The Rule 012 procedure for identifying a clear tone was applied to the manufacturer-supplied one-third octave band noise emissions from Appendix A of this report. Based on the Rule 012 definition, noise emissions from the Siemens Gamesa SG 4.5-145 wind turbines do not include a clear tone at or below 250 Hz. As such, based on the manufacturer noise specifications, Project noise sources are not able to produce LFN issues, regardless of the outcome of the Cumulative Noise Test for LFN. In other words, even if the difference between dBC and dBA noise levels was found to be greater than 20, the absence of a clear tone in the Project noise emissions precludes the presence of a Project-related LFN issue.

| Turbine                                      | Turbine           | Hub Height             |            | 00       | ctave B   | and So    | ound Po   | ower Le  | evel [dE | 3Z]      |          | Total Sound          |   |
|--|-------------------|------------------------|------------|----------|-----------|-----------|-----------|----------|----------|----------|----------|----------------------|---|
| Identification<br>Code                       | Operating<br>Mode | Wind<br>Speed<br>[m/s] | 31.5<br>Hz | 63<br>Hz | 125<br>Hz | 250<br>Hz | 500<br>Hz | 1<br>kHz | 2<br>kHz | 4<br>kHz | 8<br>kHz | Power Level<br>[dBA] | Reference   |
| BA1_T4; BA2_T1;<br>BA2_T2; BA2_T3;<br>BA3_T4 | AM+1              | ≥9                     | 117.9      | 116.8    | 112.3     | 108.3     | 103.9     | 102.5    | 100.9    | 94.9     | 83.5     | 108.1                | Manufacturer-supplied noise<br>specification (see Appendix A of this<br>report) |
| BA1_T3                                       | AM-1              | ≥9                     | 117.5      | 116.4    | 111.8     | 107.7     | 103.3     | 101.9    | 100.3    | 94.3     | 82.9     | 107.5                | Manufacturer-supplied noise<br>specification (see Appendix A of this<br>report) |
| BA1_T2; BA3_T1;<br>BA3_T2; BA3_T3            | AM-3              | ≥9                     | 117.4      | 116.1    | 111.4     | 107.1     | 102.7     | 101.3    | 99.7     | 93.7     | 82.3     | 106.9                | Manufacturer-supplied noise<br>specification (see Appendix A of this<br>report) |
| BA1_T1                                       | NR-1              | ≥9                     | 117.2      | 115.6    | 110.4     | 105.8     | 101.4     | 100.0    | 98.4     | 92.4     | 81.0     | 105.7                | Manufacturer-supplied noise<br>specification (see Appendix A of this<br>report) |

#### Table 6: Application Case Noise Emissions - Project Wind Turbines

## 5.0 ASSESSMENT RESULTS

## 5.1 Baseline Case

## 5.1.1 Broadband Noise

As discussed in Section 3.1 of this report, Baseline Case cumulative noise levels include the contribution from natural sources, non-industrial sources, industrial facilities that are not regulated by the AUC or AER, existing AUC/AER-regulated facilities, approved but not constructed AUC/AER-regulated facilities, and proposed facilities that have been deemed complete by the AUC. There are no unregulated industrial facilities or proposed AUC facilities with the potential to influence cumulative noise levels at receptor R1 or R2. The noise contribution from natural and non-industrial sources was characterized using assumed ASL values from Rule 012 (see Table 3 of this report). The noise contributions from AUC/AER-regulated Baseline Case facilities were characterized using the information summarized in Section 4.1 and Appendix B of this report. Baseline Case cumulative noise levels for receptors R1 and R2 are presented in Table 7.

| Receptor<br>Identification Code | Period    | Ambient Sound<br>Level [dBA] | Noise Contribution from AUC/AER-<br>Regulated Facilities and Wells [dBA] | Baseline Case Cumulative<br>Noise Level [dBA] |
|---------------------------------|-----------|------------------------------|--|---|
| D1                              | daytime   | 45                           | 32.6   | 45.2  |
| KI I                            | nighttime | 35                           | 32.6   | 37.0  |
| D2                              | daytime   | 45                           | 29.1   | 45.1  |
| rKZ                             | nighttime | 35                           | 29.1   | 36.0  |

#### Table 7: Baseline Case Cumulative Noise Levels

Baseline Case compliance with Rule 012 is assessed in Table 8 by comparing cumulative noise levels to applicable PSL limits. Table 8 shows that Baseline Case cumulative noise levels are predicted to comply with Rule 012 during the daytime period and the nighttime period.

| Receptor<br>Identification<br>Code | Period    | Baseline Case<br>Cumulative Noise<br>Level <sup>(a)</sup> [dBA] | Permissible<br>Sound Level<br>[dBA] | Margin of<br>Compliance <sup>(b)</sup><br>[dBA] | Compliance<br>Assessment |
|------------------------------------|-----------|---|-------------------------------------|---|--------------------------|
| D1                                 | daytime   | 45  | 50                                  | 5   | compliant                |
|                                    | nighttime | 37  | 40                                  | 3   | compliant                |
| 50                                 | daytime   | 45  | 50                                  | 5   | compliant                |
| R2                                 | nighttime | 36  | 40                                  | 4   | compliant                |

Table 8: Baseline Case Broadband Noise Assessment

(a) In accordance with Rule 012, Baseline Case cumulative noise levels from Table 7 have been rounded to the nearest whole number before comparison to applicable PSL limits.

(b) Margin of compliance calculated as PSL minus Baseline Case cumulative noise level.

## 5.1.2 Low Frequency Noise

As discussed in Section 3.3.2 of this report, Rule 012 sets out a two-part test for LFN issues (Cumulative Noise Test and Tonal Test). The Cumulative Noise Test compares noise levels expressed in dBA to noise levels expressed in dBC. It is understood that this first LFN test should be applied to cumulative noise levels (i.e., noise levels that include the contribution from natural and non-industrial noise sources and from industrial facilities). Rule 012 provides assumed ASL values to represent the noise contribution from natural and non-industrial sources, but these ASL values are only specified in dBA. There is no accepted method of representing ASL values in dBC. Therefore, when applying the Cumulative Noise Test, it was necessary to omit the noise contribution from the natural and non-industrial sources. In addition, the NIA for the Jenner Power Plant

(RWDI 2018) did not include noise contour maps in dBC. Therefore, when evaluating the Cumulative Noise Test, it was also necessary to omit the noise contribution from this facility.

Table 9 presents a Baseline Case LFN analysis based on the Cumulative Noise Test while omitting the noise contribution from natural and non-industrial sources and from the Jenner Power Plant. Because all the facilities considered in the Baseline Case are assumed to operate continuously 24 hours per day, there is no need to conduct separate LFN analyses for the daytime and nighttime periods.

| Receptor<br>Identification<br>Code | Noise Contribution from<br>AUC/AER-Regulated<br>Facilities and Wells <sup>(a)</sup><br>[dBA] | Noise Contribution from<br>AUC/AER-Regulated<br>Facilities and Wells <sup>(a)</sup><br>[dBC] | Difference: dB<br>C minus dBA | Rule 012<br>LFN<br>Threshold | Potential<br>for LFN<br>Issue |
|------------------------------------|--|--|-------------------------------|------------------------------|-------------------------------|
| R1                                 | 32.6   | 50.8   | 18.2                          | 20                           | no                            |
| R2                                 | 28.5   | 51.4   | 22.9                          | 20                           | yes                           |

Table 9: Baseline Case Low Frequency Noise Analysis

(a) The noise contribution from the Jenner Power Plant has been omitted from the LFN analysis because information about dBC noise levels is not available for this facility.

Results from Table 9 suggest the difference between Baseline Case noise levels expressed in dBA and dBC is less than 20 for receptor R1. As such, based on the LFN criteria set out in Rule 012, there is no potential Baseline Case LFN issue at receptor R1.

Results from Table 9 suggest the difference between Baseline Case noise levels expressed in dBA and dBC is greater than 20 for receptor R2. As such, based on the LFN criteria set out in Rule 012, there is a potential Baseline Case LFN issue at receptor R2. It is again noted that the Cumulative Noise Test for LFN, as presented in Table 9, omits the ASL (i.e., the noise contribution from natural and non-industrial sources). If the ASL could be included in the LFN analysis, it is likely the predicted difference between dBA and dBC values would be reduced. Moreover, Rule 012 explicitly states that the LFN analysis "...in predictive noise impact assessments is for information purposes only" (AUC 2020). Therefore, the potential Baseline Case LFN issue predicted for receptor R2 ultimately has no bearing on compliance with Rule 012.

## 5.2 Application Case

## 5.2.1 Broadband Noise

As discussed in Section 3.1 of this report, Application Case cumulative noise levels were calculated by summing Baseline Case cumulative noise levels with the predicted noise contribution from the Project itself under planned maximum operating conditions. Baseline Case cumulative noise levels are presented in Table 7. The noise contribution from the Project itself was predicted using a computer model developed using modelling parameters from Table 4 and noise emissions from Table 6. Application Case cumulative noise levels for receptors R1 and R2 are presented in Table 10. Figure 2 presents Project noise level contours.

| Receptor<br>Identification Code | Period    | Baseline Case Cumulative<br>Noise Level [dBA] | Project Noise<br>Contribution [dBA] | Application Case Cumulative<br>Noise Level [dBA] |
|---------------------------------|-----------|---|-------------------------------------|--|
| D1                              | daytime   | 45.2  | 37.5                                | 45.9   |
|                                 | nighttime | 37.0  | 37.5                                | 40.3   |
| <b>D</b> 2                      | daytime   | 45.1  | 27.1                                | 45.2   |
| R2                              | nighttime | 36.0  | 27.1                                | 36.5   |

Table 10: Application Case Cumulative Noise Levels







Application Case compliance with Rule 012 is assessed in Table 11 by comparing cumulative noise levels to applicable PSL limits. Table 11 shows that Application Case cumulative noise levels are predicted to comply with Rule 012 during the daytime period and the nighttime period.

| Receptor<br>Identification<br>Code | Period    | Application Case<br>Cumulative Noise<br>Level <sup>(a)</sup> [dBA] | Permissible<br>Sound Level<br>[dBA] | Margin of<br>Compliance <sup>(b)</sup><br>[dBA] | Compliance<br>Assessment |
|------------------------------------|-----------|--|-------------------------------------|---|--------------------------|
| D1                                 | daytime   | 46   | 50                                  | 4   | compliant                |
|                                    | nighttime | 40   | 40                                  | 0   | compliant                |
| 62                                 | daytime   | 45   | 50                                  | 5   | compliant                |
| R2                                 | nighttime | 37   | 40                                  | 3   | compliant                |

| Table 11: A | pplication | Case Broa | dband No | ise Assessment |
|-------------|------------|-----------|----------|----------------|
|-------------|------------|-----------|----------|----------------|

(a) In accordance with Rule 012, Application Case cumulative noise levels from Table 10 have been rounded to the nearest whole number before comparison to applicable PSL limits.

(b) Margin of compliance calculated as PSL minus Application Case cumulative noise level.

## 5.2.2 Low Frequency Noise

As discussed in Section 4.2, there are no clear tones in the noise emissions spectra of the Project wind turbines that satisfy the second part of the Rule 012 LFN test (referred to as the Tonal Test herein). As such, the Project is compliant with Rule 012 requirements and is not expected to produce LFN issues.

Notwithstanding the fact that the Project is not expected to produce LFN issues, an Application Case LFN analysis was completed based on the Cumulative Noise Test for LFN. Results of this analysis are presented in Table 12. Because all the facilities considered in the Application Case are assumed to operate continuously 24 hours per day, there is no need to conduct separate LFN analyses for the daytime and nighttime periods.

Results from Table 12 suggest the difference between Application Case noise levels expressed in dBA and dBC is less than 20 for receptor R1. This result further confirms that the Project is complaint with Rule 012, and there is no potential LFN issue at receptor R1.

Results from Table 12 suggest the difference between Application Case noise levels expressed in dBA and dBC is greater than 20 for receptor R2 (similar to the results in Table 9 for the Baseline Case). It should again be noted that the LFN analysis presented in Table 12 omits the ASL (i.e., the noise contribution from natural and non-industrial sources). If the ASL could be included in the LFN analysis, it is likely the predicted difference between dBA and dBC values would be reduced. Moreover, Rule 012 explicitly states that the LFN analysis "...in predictive noise impact assessments is for information purposes only" (AUC 2020). Most importantly, the absence of LFN through the Tonal Test precludes the presence of a Project-related LFN issue at receptor R2 (or anywhere else).

#### Table 12: Application Case Low Frequency Noise Analysis

|                                    | A-Weighted Nois   | se Level [dBA]                |       | C-Weighed No  | ise Level [dBC]               |       |                              |                              |                               |
|------------------------------------|---|-------------------------------|-------|---|-------------------------------|-------|------------------------------|------------------------------|-------------------------------|
| Receptor<br>Identification<br>Code | Noise Contribution from<br>AUC/AER-Regulated<br>Facilities and Wells <sup>(a)</sup> | Project Noise<br>Contribution | Total | Noise Contribution<br>from AUC/AER-<br>Regulated Facilities<br>and Wells <sup>(a)</sup> | Project Noise<br>Contribution | Total | Difference: dBC<br>minus dBA | Rule 012<br>LFN<br>Threshold | Potential<br>for LFN<br>Issue |
| R1                                 | 32.6  | 37.5                          | 38.7  | 50.8  | 56.7                          | 57.7  | 19.0                         | 20                           | no                            |
| R2                                 | 28.5  | 27.1                          | 30.9  | 51.4  | 49.1                          | 53.4  | 22.5                         | 20                           | no <sup>(b)</sup>             |

(a) The noise contribution from the Jenner Power Plant has been omitted from the LFN analysis because information about dBC noise levels is not available for this facility.

(b) Notwithstanding the difference between dBC and dBA noise levels is predicted to be greater than 20, there can be no Project-related LFN issue at this receptor because there is no clear tone in the Project noise emissions.



## 6.0 SUMMARY AND DISCUSSION

A NIA was conducted for the Project to meet the requirements of Rule 007. The Updated Project NIA was conducted in accordance with assessment methods presented in Rule 012. The NIA characterized potential noise impacts from the Project in the context of broadband and LFN compliance criteria specified by Rule 012. As required by Rule 012, the Updated Project NIA assessed "…the maximum noise emitted when the wind turbine operates under the planned maximum operating conditions for both the daytime and nighttime period" (AUC 2020).

For both the daytime period and the nighttime period, the Updated Project NIA predicts that Application Case cumulative noise levels will comply with applicable Rule 012 PSL limits for all receptors.

Based on detailed analysis of the noise emissions spectra for the Project wind turbines, the Updated Project NIA also predicts that there will be no Project-related LFN issues at any receptors.

In summary, the Updated Project NIA predicts daytime and nighttime compliance with applicable broadband and LFN criteria for all receptors.

## 7.0 ACOUSTICAL PRACTITIONER INFORMATION

Andrew Faszer, BSc, INCE, PEng, was responsible for senior technical review of emissions calculations, modelling, and reporting related to the Updated Project NIA. Andrew also conducted the receptor-verification field work (i.e., the Project site visit of April 4, 2019). Andrew is a senior engineer with a broad environmental and industrial background, and over 20 years of consulting experience. Andrew's experience includes noise studies for oil and gas developments, conventional and wind power projects, industrial, and mining projects.

Victor Young, MSc, performed noise emissions calculations, developed the computer noise model, and authored the Updated Project NIA report. Victor has worked as an acoustic scientist in the Golder Calgary office for more than nine years. During this time, Victor has been involved in a variety of energy, utilities, and mining projects throughout Western Canada. Victor's experience includes field measurements and data analysis, computer noise modelling, and preparation of noise assessment reports.

# Signature Page

#### Golder Associates Ltd.

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APPENDIX A

Total and One-Third Octave Band Noise Emissions for Project Wind Turbines

| SIEMENS Gamoca                | G         | ENERAL C          | HARACTE               | RISTICS  | Code: GD3 | 381009-ei | n <i>Rev:</i> <b>3</b>    |
|-------------------------------|-----------|-------------------|-----------------------|----------|-----------|-----------|---------------------------|
|                               | MANUAL    |                   | MANUAL Date: 17/06/20 |          |           |           | Pg. <b>1</b> of <b>19</b> |
| KERERABEE EREROT              |           |                   |                       |          | Approval  |           | Electronic DDM Eleve      |
| Approval process:             | Title:    |                   |                       |          | process:  |           | Electronic: PDM Flow      |
| STD - Support                 | 50        | 4 6 146           | NOTCE                 | ENTECTON | Prepared: | SNOVO     |                           |
| Deliverable:                  | SG        | 4.3-143           | NOISE EMISSI          |          | Verified: | JEJGUER   | RERO                      |
| S12                           | ANALYSIS  |                   |                       |          | Approved: | RRS       |                           |
| © Siemens Gamesa Renewable Er | nergy, S. | A., 2018, All Rig | ghts Reserved         |          |           |           |                           |

## INDEX

| IN | DEX                        | 1 |
|----|----------------------------|---|
| 1  | AIM                        | 2 |
| 2  | SCOPE                      | 2 |
| 3  | ABBREVIATIONS, DEFINITIONS | 2 |
| 4  | DESCRIPTION                | 2 |
| 5  | NOISE SPECTRA              | 3 |

## **RECORD OF CHANGES**

| Rev. | Date       | Author        | Description  |
|------|------------|---------------|--|
| 0    | 29/06/2018 | SNOVO/MASHEIM | Initial Version (noise spectra for 12m/s included).  |
| 1    | 13/07/2018 | SNOVO/MASHEIM | Table 3 included with noise curves.<br>Noise spectra for additional wind speeds included (6,7,8,9,10 & 11m/s). |
| 2    | 18/07/2018 | SNOVO/MASHEIM | Misprint corrections.  |
| 3    | 17/06/2019 | SNOVO/MASHEIM | Additional Flexible Rating Application Moddes included.  |



GENERAL CHARACTERISTICS MANUAL

Date: 17/06/2019

Code: GD381009-en

Rev: 3

#### Title: SG 4.5-145 NOISE EMISSION ANALYSIS

## 1 AIM

This document aims to give an estimation of the noise spectra for the SG 4.5-145 wind turbine.

## 2 SCOPE

The values in the present document are applicable to all the existing configurations for SG 4.5-145 wind turbine, for standard and low noise operation modes.

## **3 ABBREVIATIONS, DEFINITIONS**

- WT: Wind turbine.
- Wind speed (Ws.): Expressed in m/s, it is the horizontal wind component value at the height of the hub averaged every 10 minutes.
- **Frequency (f):** Central frequency of a given band spectra, expressed in Hz.
- L<sub>WA</sub>: A-weighted sound power level, expressed in dB(A).
- Noise level: The expected sound power level values, expressed in dB(A), represent the sound power that the WT emits at the height of the hub for a given wind speed.
   The noise levels shown in this document are average expected values, called Lw in IEC-61400-14. To obtain the Lwd value, as defined in IEC-61400-14, an increase of 2 dB(A) shall be considered over said Lw values.
- **dB(A)**: An A type frequency filter is applied, in accordance with the IEC standard.

## 4 **DESCRIPTION**

When not specified otherwise, data in following sections is calculated using the parameters from **Table 1**. All noise values in this document are subject to the validity ranges presented in **Table 2**.

| 50 Hz/60 Hz              |
|--------------------------|
| 145m                     |
| Pitch control regulation |
| 1.225 kg/m <sup>3</sup>  |
|                          |

**Table 1** Calculation parameter values for the SG 4.5-145 noise spectra.

| Wind Shear (10min average)            | ≤ 0.3   |
|---------------------------------------|---|
| Turbulence intensity TI [%] for bin i | $5\% \frac{(0.75 v_i + 5.6)}{v_i} < TI_i < 12\% \frac{(0.75 v_i + 5.6)}{v_i}$ |
| Terrain                               | Not complex according to IEC 61400-12-1                                       |
| Upflow β [°]                          | $-2^{\circ} \leq \beta \leq +2^{\circ}$                                       |
| Grid frequency [Hz]                   | ± 0.5 Hz  |

**Table 2** Validity ranges of the noise spectra for the SG 4.5-145.

Noise values included in the present document correspond to the wind turbine configuration with noise reduction add-ons attached to the blade.

SIEMENS Gamesa

GENERAL CHARACTERISTICS MANUAL

Date: 17/06/2019

Code: GD381009-en

*Rev:* **3** 

Pg. 3 of 19

Title: SG 4.5-145 NOISE EMISSION ANALYSIS

#### **5 NOISE SPECTRA**

**Table 3** shows the noise curves for the SG 4.5-145 MW expressed as A-weighted sound power level in function of wind speed at hub height, for the standard, Flexible Rating and Noise Reduction System operation and application modes.

| Wind Speed [m/s]                | 6    | 7     | 8     | 9     | 10    | 11    | 12    | 13    | Up to<br>cut-out |
|---------------------------------|------|-------|-------|-------|-------|-------|-------|-------|------------------|
| SG 4.5-145 Baseline AM0 @ 4.5MW | 99.7 | 103.2 | 106.2 | 107.8 | 107.8 | 107.8 | 107.8 | 107.8 | 107.8            |
| SG 4.5-145 AM+5 @ 5.0MW         | 99.7 | 103.2 | 106.2 | 109.0 | 109.3 | 109.3 | 109.3 | 109.3 | 109.3            |
| SG 4.5-145 AM+4 @ 4.9MW         | 99.7 | 103.2 | 106.2 | 109.0 | 109.0 | 109.0 | 109.0 | 109.0 | 109.0            |
| SG 4.5-145 AM+3 @ 4.8MW         | 99.7 | 103.2 | 106.2 | 108.7 | 108.7 | 108.7 | 108.7 | 108.7 | 108.7            |
| SG 4.5-145 AM+2 @ 4.7MW         | 99.7 | 103.2 | 106.2 | 108.4 | 108.4 | 108.4 | 108.4 | 108.4 | 108.4            |
| SG 4.5-145 AM+1 @ 4.6MW         | 99.7 | 103.2 | 106.2 | 108.1 | 108.1 | 108.1 | 108.1 | 108.1 | 108.1            |
| SG 4.5-145 AM-1 @ 4.4MW         | 99.7 | 103.2 | 106.2 | 107.5 | 107.5 | 107.5 | 107.5 | 107.5 | 107.5            |
| SG 4.5-145 AM-2 @ 4.3MW         | 99.7 | 103.2 | 106.2 | 107.2 | 107.2 | 107.2 | 107.2 | 107.2 | 107.2            |
| SG 4.5-145 AM-3 @ 4.2MW         | 99.7 | 103.2 | 106.2 | 106.9 | 106.9 | 106.9 | 106.9 | 106.9 | 106.9            |
| SG 4.5-145 AM-3 @ 4.1MW         | 99.7 | 103.2 | 106.2 | 106.6 | 106.6 | 106.6 | 106.6 | 106.6 | 106.6            |
| SG 4.5-145 AM-3 @ 4.0MW         | 99.7 | 103.2 | 106.2 | 106.3 | 106.3 | 106.3 | 106.3 | 106.3 | 106.3            |
| SG 4.5-145 NRS Mode N1          | 99.7 | 103.2 | 105.7 | 105.7 | 105.7 | 105.7 | 105.7 | 105.7 | 105.7            |
| SG 4.5-145 NRS Mode N2          | 99.7 | 103.2 | 105.2 | 105.2 | 105.2 | 105.2 | 105.2 | 105.2 | 105.2            |
| SG 4.5-145 NRS Mode N3          | 99.7 | 103.2 | 103.7 | 103.7 | 103.7 | 103.7 | 103.7 | 103.7 | 103.7            |
| SG 4.5-145 NRS Mode N4          | 99.7 | 102.7 | 102.7 | 102.7 | 102.7 | 102.7 | 102.7 | 102.7 | 102.7            |
| SG 4.5-145 NRS Mode N5          | 99.7 | 101.7 | 101.7 | 101.7 | 101.7 | 101.7 | 101.7 | 101.7 | 101.7            |
| SG 4.5-145 NRS Mode N6          | 99.7 | 99.9  | 99.9  | 99.9  | 99.9  | 99.9  | 99.9  | 99.9  | 99.9             |
| SG 4.5-145 NRS Mode N7          | 99.0 | 99.0  | 99.0  | 99.0  | 99.0  | 99.0  | 99.0  | 99.0  | 99.0             |
| SG 4.5-145 NRS Mode N8          | 98.0 | 98.0  | 98.0  | 98.0  | 98.0  | 98.0  | 98.0  | 98.0  | 98.0             |

**Table 3** Noise curves for the SG 4.5-145 MW for the standard, Flexible Rating and Noise Reduction System operation and application modes (ref: SG145spectra\_4500KW\_R03\_17062018).

**Tables 4 to 11** show the 1/3 octave band noise spectra for the SG 4.5-145 MW expressed as A-weighted sound power level for a given frequency band, for the standard, Flexible Rating and Noise Reduction System operation and application modes, at different wind speeds at hub height.

**SIEMENS** Gamesa RENEWABLE ENERGY

**GENERAL CHARACTERISTICS** MANUAL Date: 17/06/2019

Code: GD381009-en

Pg. 4 of 19

Rev: 3

Title: SG 4.5-145 NOISE EMISSION ANALYSIS

| Central Frequency [Hz]   | 10   | 12.5  | 16  | 20   | 25   | 31.5  | 40   | 50  | 63   | 80  | 100  |
|--|--|---|---|--|--|---|--|---|--|---|--|
| SG 4.5-145 Baseline AM0 @ 4.5MW  | 38.0   | 43.7  | 49.4  | 54.8   | 59.4   | 64.1  | 68.3   | 72.9  | 77.2   | 79.7  | 81.6   |
| SG 4.5-145 AM+5 @ 5.0MW  | 38.0   | 43.7  | 49.4  | 54.8   | 59.4   | 64.1  | 68.3   | 72.9  | 77.2   | 79.7  | 81.6   |
| SG 4.5-145 AM+4 @ 4.9MW  | 38.0   | 43.7  | 49.4  | 54.8   | 59.4   | 64.1  | 68.3   | 72.9  | 77.2   | 79.7  | 81.6   |
| SG 4.5-145 AM+3 @ 4.8MW  | 38.0   | 43.7  | 49.4  | 54.8   | 59.4   | 64.1  | 68.3   | 72.9  | 77.2   | 79.7  | 81.6   |
| SG 4.5-145 AM+2 @ 4.7MW  | 38.0   | 43.7  | 49.4  | 54.8   | 59.4   | 64.1  | 68.3   | 72.9  | 77.2   | 79.7  | 81.6   |
| SG 4.5-145 AM+1 @ 4.6MW  | 38.0   | 43.7  | 49.4  | 54.8   | 59.4   | 64.1  | 68.3   | 72.9  | 77.2   | 79.7  | 81.6   |
| SG 4.5-145 AM-1 @ 4.4MW  | 38.0   | 43.7  | 49.4  | 54.8   | 59.4   | 64.1  | 68.3   | 72.9  | 77.2   | 79.7  | 81.6   |
| SG 4.5-145 AM-2 @ 4.3MW  | 38.0   | 43.7  | 49.4  | 54.8   | 59.4   | 64.1  | 68.3   | 72.9  | 77.2   | 79.7  | 81.6   |
| SG 4.5-145 AM-3 @ 4.2MW  | 38.0   | 43.7  | 49.4  | 54.8   | 59.4   | 64.1  | 68.3   | 72.9  | 77.2   | 79.7  | 81.6   |
| SG 4.5-145 AM-3 @ 4.1MW  | 38.0   | 43.7  | 49.4  | 54.8   | 59.4   | 64.1  | 68.3   | 72.9  | 77.2   | 79.7  | 81.6   |
| SG 4.5-145 AM-3 @ 4.0MW  | 38.0   | 43.7  | 49.4  | 54.8   | 59.4   | 64.1  | 68.3   | 72.9  | 77.2   | 79.7  | 81.6   |
| SG 4.5-145 NRS Mode N1   | 38.0   | 43.7  | 49.4  | 54.8   | 59.4   | 64.1  | 68.3   | 72.9  | 77.2   | 79.7  | 81.6   |
| SG 4.5-145 NRS Mode N2   | 38.0   | 43.7  | 49.4  | 54.8   | 59.4   | 64.1  | 68.3   | 72.9  | 77.2   | 79.7  | 81.6   |
| SG 4.5-145 NRS Mode N3   | 38.0   | 43.7  | 49.4  | 54.8   | 59.4   | 64.1  | 68.3   | 72.9  | 77.2   | 79.7  | 81.6   |
| SG 4.5-145 NRS Mode N4   | 38.0   | 43.7  | 49.4  | 54.8   | 59.4   | 64.1  | 68.3   | 72.9  | 77.2   | 79.7  | 81.6   |
| SG 4.5-145 NRS Mode N5   | 38.0   | 43.7  | 49.4  | 54.8   | 59.4   | 64.1  | 68.3   | 72.9  | 77.2   | 79.7  | 81.6   |
| SG 4.5-145 NRS Mode N6   | 38.0   | 43.7  | 49.4  | 54.8   | 59.4   | 64.1  | 68.3   | 72.9  | 77.2   | 79.7  | 81.6   |
| SG 4.5-145 NRS Mode N7   | 38.0   | 43.7  | 49.4  | 54.8   | 59.3   | 64.0  | 68.2   | 72.7  | 76.9   | 79.4  | 81.2   |
| SG 4.5-145 NRS Mode N8   | 38.0   | 43.7  | 49.4  | 54.7   | 59.2   | 63.8  | 67.9   | 72.4  | 76.6   | 78.9  | 80.6   |
|  |  |   |   |  |  |   |  |   |  |   |  |
| Central Frequency [Hz]   | 125  | 160   | 200   | 250  | 315  | 400   | 500  | 630   | 800  | 1000  | 1250   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW  | <b>125</b><br>83.1   | <b>160</b><br>84.1  | <b>200</b><br>85.3  | <b>250</b><br>86.8   | <b>315</b><br>87.2   | <b>400</b><br>86.9  | <b>500</b><br>87.0   | <b>630</b><br>88.6  | <b>800</b><br>88.4   | <b>1000</b><br>89.4   | <b>1250</b><br>90.1  |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW   | <b>125</b><br>83.1<br>83.1   | <b>160</b><br>84.1<br>84.1  | <b>200</b><br>85.3<br>85.3  | <b>250</b><br>86.8<br>86.8   | <b>315</b><br>87.2<br>87.2   | <b>400</b><br>86.9<br>86.9  | <b>500</b><br>87.0<br>87.0   | <b>630</b><br>88.6<br>88.6  | <b>800</b><br>88.4<br>88.4   | <b>1000</b><br>89.4<br>89.4   | <b>1250</b><br>90.1<br>90.1  |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW  | <b>125</b><br>83.1<br>83.1<br>83.1   | <b>160</b><br>84.1<br>84.1<br>84.1  | <b>200</b><br>85.3<br>85.3<br>85.3  | <b>250</b><br>86.8<br>86.8<br>86.8                                 | <b>315</b><br>87.2<br>87.2<br>87.2   | <b>400</b><br>86.9<br>86.9<br>86.9  | <b>500</b><br>87.0<br>87.0<br>87.0   | <b>630</b><br>88.6<br>88.6<br>88.6  | <b>800</b><br>88.4<br>88.4<br>88.4   | <b>1000</b><br>89.4<br>89.4<br>89.4   | <b>1250</b><br>90.1<br>90.1<br>90.1  |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW   | <b>125</b><br>83.1<br>83.1<br>83.1<br>83.1   | <b>160</b><br>84.1<br>84.1<br>84.1<br>84.1  | <b>200</b><br>85.3<br>85.3<br>85.3<br>85.3  | <b>250</b><br>86.8<br>86.8<br>86.8<br>86.8                         | <b>315</b><br>87.2<br>87.2<br>87.2<br>87.2   | <b>400</b><br>86.9<br>86.9<br>86.9  | <b>500</b><br>87.0<br>87.0<br>87.0<br>87.0                                 | <b>630</b><br>88.6<br>88.6<br>88.6<br>88.6                                | <b>800</b><br>88.4<br>88.4<br>88.4<br>88.4   | <b>1000</b><br>89.4<br>89.4<br>89.4<br>89.4   | <b>1250</b><br>90.1<br>90.1<br>90.1  |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW  | <b>125</b><br>83.1<br>83.1<br>83.1<br>83.1<br>83.1   | <b>160</b><br>84.1<br>84.1<br>84.1<br>84.1<br>84.1  | <b>200</b><br>85.3<br>85.3<br>85.3<br>85.3  | 250<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8                        | <b>315</b><br>87.2<br>87.2<br>87.2<br>87.2<br>87.2   | <b>400</b><br>86.9<br>86.9<br>86.9<br>86.9<br>86.9  | <b>500</b><br>87.0<br>87.0<br>87.0<br>87.0                                 | <b>630</b><br>88.6<br>88.6<br>88.6<br>88.6<br>88.6                        | <b>800</b><br>88.4<br>88.4<br>88.4<br>88.4<br>88.4   | <b>1000</b><br>89.4<br>89.4<br>89.4<br>89.4<br>89.4   | <b>1250</b><br>90.1<br>90.1<br>90.1<br>90.1<br>90.1  |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW   | <b>125</b><br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1   | <b>160</b><br>84.1<br>84.1<br>84.1<br>84.1<br>84.1<br>84.1  | 200<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3   | 250<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8                | <b>315</b><br>87.2<br>87.2<br>87.2<br>87.2<br>87.2<br>87.2   | <b>400</b><br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9  | <b>500</b><br>87.0<br>87.0<br>87.0<br>87.0<br>87.0                         | 630<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6                       | <b>800</b><br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.4   | <b>1000</b><br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4   | <b>1250</b><br>90.1<br>90.1<br>90.1<br>90.1<br>90.1  |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW  | <b>125</b><br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1   | 160         84.1         84.1         84.1         84.1         84.1         84.1         84.1         84.1         84.1         84.1   | 200<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3   | 250<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8        | <b>315</b><br>87.2<br>87.2<br>87.2<br>87.2<br>87.2<br>87.2<br>87.2<br>87.2   | <b>400</b><br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9  | <b>500</b><br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0                 | <b>630</b><br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6        | <b>800</b><br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.  | <b>1000</b><br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4   | <b>1250</b> 90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1  |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW   | <b>125</b><br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1   | 16084.184.184.184.184.184.184.184.1   | 200<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3   | 250<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86. | <b>315</b><br>87.2<br>87.2<br>87.2<br>87.2<br>87.2<br>87.2<br>87.2<br>87.2   | <b>400</b><br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9  | <b>500</b><br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0         | <b>630</b><br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88. | <b>800</b><br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.  | <b>1000</b><br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4   | <b>1250</b><br>90.1<br>90.1<br>90.1<br>90.1<br>90.1<br>90.1<br>90.1<br>90.1  |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW  | <b>125</b><br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1   | 16084.184.184.184.184.184.184.184.184.1   | 200<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3   | 250<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86. | 315           87.2           87.2           87.2           87.2           87.2           87.2           87.2           87.2           87.2           87.2           87.2           87.2           87.2           87.2           87.2           87.2           87.2   | <b>400</b><br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9  | <b>500</b><br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0 | 630<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.        | <b>800</b><br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.  | <b>1000</b><br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4   | <b>1250</b> 90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1  |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.1MW   | <b>125</b><br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1   | 160         84.1         84.1         84.1         84.1         84.1         84.1         84.1         84.1         84.1         84.1         84.1         84.1         84.1         84.1         84.1         84.1         84.1         84.1         84.1  | 200<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3   | 250<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86. | <b>315</b><br>87.2<br>87.2<br>87.2<br>87.2<br>87.2<br>87.2<br>87.2<br>87.2   | <b>400</b><br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9  | <b>500</b><br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0 | <b>630</b><br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88. | 800           88.4                      | <b>1000</b><br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4   | <b>1250</b> 90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1  |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.1MW<br>SG 4.5-145 AM-3 @ 4.0MW  | <b>125</b><br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1   | 160         84.1  | 200<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3   | 250<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86. | 315         87.2   | 400<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9   | <b>500</b><br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0 | 630<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.        | <b>800</b><br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.  | <b>1000</b><br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4   | <b>1250</b> 90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1         90.1   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.1MW<br>SG 4.5-145 AM-3 @ 4.0MW<br>SG 4.5-145 NRS Mode N1  | <b>125</b><br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1   | 160         84.1  | 200<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3   | 250<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86. | 315         87.2   | <b>400</b><br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9  | <b>500</b><br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0 | <b>630</b><br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88. | 800         88.4 | <b>1000</b><br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4   | <b>1250</b> 90.1           |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+5 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.1MW<br>SG 4.5-145 AM-3 @ 4.0MW<br>SG 4.5-145 NRS Mode N1<br>SG 4.5-145 NRS Mode N2  | 125         83.1   | 160         84.1   | 200<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3   | 250<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86. | 315         87.2   | 400<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9   | <b>500</b><br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0 | 630<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.        | <b>800</b><br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.  | <b>1000</b><br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4   | 1250         90.1  |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.1MW<br>SG 4.5-145 AM-3 @ 4.0MW<br>SG 4.5-145 NRS Mode N1<br>SG 4.5-145 NRS Mode N2<br>SG 4.5-145 NRS Mode N3   | 125         83.1   | 160         84.1  | 200<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3   | 250<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86. | 315           87.2   | 400<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9   | <b>500</b><br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0 | <b>630</b><br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88. | <b>800</b><br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.  | <b>1000</b><br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4   | 1250         90.1  |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.1MW<br>SG 4.5-145 AM-3 @ 4.0MW<br>SG 4.5-145 NRS Mode N1<br>SG 4.5-145 NRS Mode N3<br>SG 4.5-145 NRS Mode N4   | 125         83.1  | 160         84.1   | 200<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3                 | 250<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86. | 315         87.2  | 400<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9   | <b>500</b><br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0 | <b>630</b><br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88. | <b>800</b><br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.  | <b>1000</b><br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4   | 1250         90.1  |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.1MW<br>SG 4.5-145 AM-3 @ 4.0MW<br>SG 4.5-145 NRS Mode N1<br>SG 4.5-145 NRS Mode N2<br>SG 4.5-145 NRS Mode N3<br>SG 4.5-145 NRS Mode N4<br>SG 4.5-145 NRS Mode N4<br>SG 4.5-145 NRS Mode N5                           | 125         83.1   | 160         84.1  | 200<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3   | 250<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86. | 315         87.2  | 400<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9   | <b>500</b><br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0 | <b>630</b><br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88. | <b>800</b><br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.  | 100089.4  | 1250         90.1                           |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.1MW<br>SG 4.5-145 AM-3 @ 4.0MW<br>SG 4.5-145 NRS Mode N1<br>SG 4.5-145 NRS Mode N1<br>SG 4.5-145 NRS Mode N3<br>SG 4.5-145 NRS Mode N4<br>SG 4.5-145 NRS Mode N5<br>SG 4.5-145 NRS Mode N6                           | 125         83.1   | 160         84.1   | 200<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3 | 250<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86. | 315         87.2   | 400<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9   | <b>500</b><br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0<br>87.0 | <b>630</b><br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88. | <b>800</b><br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.  | <b>1000</b><br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4                                 | 1250         90.1                           |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.0MW<br>SG 4.5-145 NRS Mode N1<br>SG 4.5-145 NRS Mode N2<br>SG 4.5-145 NRS Mode N4<br>SG 4.5-145 NRS Mode N4<br>SG 4.5-145 NRS Mode N5<br>SG 4.5-145 NRS Mode N6<br>SG 4.5-145 NRS Mode N7 | <b>125</b><br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1<br>83.1 | 160         84.1 | 200<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3<br>85.3   | 250<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86.8<br>86. | 315         87.2         87.3         87.4 <tr< td=""><td>400<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9<br/>86.9</td><td><b>500</b> 87.0 87.0 87.0 87.0 87.0 87.0 87.0 87.0</td><td><b>630</b><br/>88.6<br/>88.6<br/>88.6<br/>88.6<br/>88.6<br/>88.6<br/>88.6<br/>88.</td><td>800<br/>88.4<br/>88.4<br/>88.4<br/>88.4<br/>88.4<br/>88.4<br/>88.4<br/>8</td><td><b>1000</b><br/>89.4<br/>89.4<br/>89.4<br/>89.4<br/>89.4<br/>89.4<br/>89.4<br/>89.4<br/>89.4<br/>89.4<br/>89.4<br/>89.4<br/>89.4<br/>89.4<br/>89.4<br/>89.4<br/>89.4<br/>89.4<br/>89.4<br/>89.4<br/>89.4<br/>89.4<br/>89.4<br/>89.4<br/>89.4</td><td>1250         90.1</td></tr<> | 400<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9<br>86.9 | <b>500</b> 87.0 87.0 87.0 87.0 87.0 87.0 87.0 87.0                         | <b>630</b><br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88.6<br>88. | 800<br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>88.4<br>8   | <b>1000</b><br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4<br>89.4 | 1250         90.1 |

**SIEMENS** Gamesa RENEWABLE ENERGY

**GENERAL CHARACTERISTICS** MANUAL Date: 17/06/2019

Code: GD381009-en

Pg. 5 of 19

Rev: 3

#### Title: SG 4.5-145 NOISE EMISSION ANALYSIS

| Central Frequency [Hz]          | 1600 | 2000 | 2500 | 3150 | 4000 | 5000 | 6300 | 8000 | 10000 |
|---------------------------------|------|------|------|------|------|------|------|------|-------|
| SG 4.5-145 Baseline AM0 @ 4.5MW | 90.0 | 88.9 | 87.5 | 85.3 | 82.2 | 77.9 | 72.7 | 66.9 | 62.3  |
| SG 4.5-145 AM+5 @ 5.0MW         | 90.0 | 88.9 | 87.5 | 85.3 | 82.2 | 77.9 | 72.7 | 66.9 | 62.3  |
| SG 4.5-145 AM+4 @ 4.9MW         | 90.0 | 88.9 | 87.5 | 85.3 | 82.2 | 77.9 | 72.7 | 66.9 | 62.3  |
| SG 4.5-145 AM+3 @ 4.8MW         | 90.0 | 88.9 | 87.5 | 85.3 | 82.2 | 77.9 | 72.7 | 66.9 | 62.3  |
| SG 4.5-145 AM+2 @ 4.7MW         | 90.0 | 88.9 | 87.5 | 85.3 | 82.2 | 77.9 | 72.7 | 66.9 | 62.3  |
| SG 4.5-145 AM+1 @ 4.6MW         | 90.0 | 88.9 | 87.5 | 85.3 | 82.2 | 77.9 | 72.7 | 66.9 | 62.3  |
| SG 4.5-145 AM-1 @ 4.4MW         | 90.0 | 88.9 | 87.5 | 85.3 | 82.2 | 77.9 | 72.7 | 66.9 | 62.3  |
| SG 4.5-145 AM-2 @ 4.3MW         | 90.0 | 88.9 | 87.5 | 85.3 | 82.2 | 77.9 | 72.7 | 66.9 | 62.3  |
| SG 4.5-145 AM-3 @ 4.2MW         | 90.0 | 88.9 | 87.5 | 85.3 | 82.2 | 77.9 | 72.7 | 66.9 | 62.3  |
| SG 4.5-145 AM-3 @ 4.1MW         | 90.0 | 88.9 | 87.5 | 85.3 | 82.2 | 77.9 | 72.7 | 66.9 | 62.3  |
| SG 4.5-145 AM-3 @ 4.0MW         | 90.0 | 88.9 | 87.5 | 85.3 | 82.2 | 77.9 | 72.7 | 66.9 | 62.3  |
| SG 4.5-145 NRS Mode N1          | 90.0 | 88.9 | 87.5 | 85.3 | 82.2 | 77.9 | 72.7 | 66.9 | 62.3  |
| SG 4.5-145 NRS Mode N2          | 90.0 | 88.9 | 87.5 | 85.3 | 82.2 | 77.9 | 72.7 | 66.9 | 62.3  |
| SG 4.5-145 NRS Mode N3          | 90.0 | 88.9 | 87.5 | 85.3 | 82.2 | 77.9 | 72.7 | 66.9 | 62.3  |
| SG 4.5-145 NRS Mode N4          | 90.0 | 88.9 | 87.5 | 85.3 | 82.2 | 77.9 | 72.7 | 66.9 | 62.3  |
| SG 4.5-145 NRS Mode N5          | 90.0 | 88.9 | 87.5 | 85.3 | 82.2 | 77.9 | 72.7 | 66.9 | 62.3  |
| SG 4.5-145 NRS Mode N6          | 90.0 | 88.9 | 87.5 | 85.3 | 82.2 | 77.9 | 72.7 | 66.9 | 62.3  |
| SG 4.5-145 NRS Mode N7          | 89.3 | 88.2 | 86.8 | 84.6 | 81.5 | 77.2 | 72.0 | 66.2 | 61.6  |
| SG 4.5-145 NRS Mode N8          | 88.2 | 87.1 | 85.7 | 83.5 | 80.4 | 76.1 | 70.9 | 65.1 | 60.5  |

Table 4 One-third octave band noise spectra of SG 4.5-145 @ 6 m/s (ref: SG145spectra\_4500KW\_R03\_17062018)

**SIEMENS** Gamesa RENEWABLE ENERGY

Code: GD381009-en **GENERAL CHARACTERISTICS** MANUAL Date: 17/06/2019

Pg. 6 of 19

Rev: 3

Title: SG 4.5-145 NOISE EMISSION ANALYSIS

| Central Frequency [Hz]   | 10  | 12.5  | 16   | 20   | 25   | 31.5  | 40   | 50   | 63   | 80   | 100   |
|--|---|---|--|--|--|---|--|--|--|--|---|
| SG 4.5-145 Baseline AM0 @ 4.5MW  | 41.5  | 47.2  | 52.9   | 58.3   | 62.9   | 67.6  | 71.8   | 76.4   | 80.7   | 83.2   | 85.1  |
| SG 4.5-145 AM+5 @ 5.0MW  | 41.5  | 47.2  | 52.9   | 58.3   | 62.9   | 67.6  | 71.8   | 76.4   | 80.7   | 83.2   | 85.1  |
| SG 4.5-145 AM+4 @ 4.9MW  | 41.5  | 47.2  | 52.9   | 58.3   | 62.9   | 67.6  | 71.8   | 76.4   | 80.7   | 83.2   | 85.1  |
| SG 4.5-145 AM+3 @ 4.8MW  | 41.5  | 47.2  | 52.9   | 58.3   | 62.9   | 67.6  | 71.8   | 76.4   | 80.7   | 83.2   | 85.1  |
| SG 4.5-145 AM+2 @ 4.7MW  | 41.5  | 47.2  | 52.9   | 58.3   | 62.9   | 67.6  | 71.8   | 76.4   | 80.7   | 83.2   | 85.1  |
| SG 4.5-145 AM+1 @ 4.6MW  | 41.5  | 47.2  | 52.9   | 58.3   | 62.9   | 67.6  | 71.8   | 76.4   | 80.7   | 83.2   | 85.1  |
| SG 4.5-145 AM-1 @ 4.4MW  | 41.5  | 47.2  | 52.9   | 58.3   | 62.9   | 67.6  | 71.8   | 76.4   | 80.7   | 83.2   | 85.1  |
| SG 4.5-145 AM-2 @ 4.3MW  | 41.5  | 47.2  | 52.9   | 58.3   | 62.9   | 67.6  | 71.8   | 76.4   | 80.7   | 83.2   | 85.1  |
| SG 4.5-145 AM-3 @ 4.2MW  | 41.5  | 47.2  | 52.9   | 58.3   | 62.9   | 67.6  | 71.8   | 76.4   | 80.7   | 83.2   | 85.1  |
| SG 4.5-145 AM-3 @ 4.1MW  | 41.5  | 47.2  | 52.9   | 58.3   | 62.9   | 67.6  | 71.8   | 76.4   | 80.7   | 83.2   | 85.1  |
| SG 4.5-145 AM-3 @ 4.0MW  | 41.5  | 47.2  | 52.9   | 58.3   | 62.9   | 67.6  | 71.8   | 76.4   | 80.7   | 83.2   | 85.1  |
| SG 4.5-145 NRS Mode N1   | 41.5  | 47.2  | 52.9   | 58.3   | 62.9   | 67.6  | 71.8   | 76.4   | 80.7   | 83.2   | 85.1  |
| SG 4.5-145 NRS Mode N2   | 41.5  | 47.2  | 52.9   | 58.3   | 62.9   | 67.6  | 71.8   | 76.4   | 80.7   | 83.2   | 85.1  |
| SG 4.5-145 NRS Mode N3   | 41.5  | 47.2  | 52.9   | 58.3   | 62.9   | 67.6  | 71.8   | 76.4   | 80.7   | 83.2   | 85.1  |
| SG 4.5-145 NRS Mode N4   | 41.5  | 47.2  | 52.9   | 58.3   | 62.9   | 67.5  | 71.7   | 76.3   | 80.5   | 83.0   | 84.8  |
| SG 4.5-145 NRS Mode N5   | 41.5  | 47.2  | 52.9   | 58.2   | 62.8   | 67.4  | 71.5   | 76.0   | 80.1   | 82.5   | 84.2  |
| SG 4.5-145 NRS Mode N6   | 41.5  | 47.2  | 52.8   | 58.1   | 62.6   | 67.1  | 71.1   | 75.4   | 79.4   | 81.6   | 83.1  |
| SG 4.5-145 NRS Mode N7   | 41.5  | 47.2  | 52.8   | 58.1   | 62.5   | 67.0  | 70.9   | 75.2   | 79.1   | 81.1   | 82.6  |
| SG 4.5-145 NRS Mode N8   | 41.5  | 47.2  | 52.8   | 58.0   | 62.4   | 66.8  | 70.7   | 74.9   | 78.7   | 80.6   | 81.9  |
| P  |   |   |  |  |  |   |  |  |  |  |   |
| Central Frequency [Hz]   | 125   | 160   | 200  | 250  | 315  | 400   | 500  | 630  | 800  | 1000   | 1250  |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW  | <b>125</b><br>86.6  | <b>160</b><br>87.6  | <b>200</b><br>88.8   | <b>250</b><br>90.3   | <b>315</b><br>90.7   | <b>400</b><br>90.4  | <b>500</b><br>90.5   | <b>630</b><br>92.1   | <b>800</b><br>91.9   | <b>1000</b><br>92.9  | <b>1250</b><br>93.6   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW   | <b>125</b><br>86.6<br>86.6  | <b>160</b><br>87.6<br>87.6  | <b>200</b><br>88.8<br>88.8                                       | <b>250</b><br>90.3<br>90.3   | <b>315</b><br>90.7<br>90.7   | <b>400</b><br>90.4<br>90.4  | <b>500</b><br>90.5<br>90.5   | <b>630</b><br>92.1<br>92.1   | <b>800</b><br>91.9<br>91.9   | <b>1000</b><br>92.9<br>92.9  | <b>1250</b><br>93.6<br>93.6   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW  | <b>125</b><br>86.6<br>86.6  | <b>160</b><br>87.6<br>87.6<br>87.6  | <b>200</b><br>88.8<br>88.8<br>88.8                               | <b>250</b><br>90.3<br>90.3<br>90.3                                 | <b>315</b><br>90.7<br>90.7<br>90.7   | <b>400</b><br>90.4<br>90.4<br>90.4  | <b>500</b><br>90.5<br>90.5<br>90.5   | <b>630</b><br>92.1<br>92.1<br>92.1   | <b>800</b><br>91.9<br>91.9<br>91.9   | <b>1000</b><br>92.9<br>92.9<br>92.9  | <b>1250</b><br>93.6<br>93.6<br>93.6   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW   | <b>125</b><br>86.6<br>86.6<br>86.6<br>86.6                                | <b>160</b><br>87.6<br>87.6<br>87.6<br>87.6  | <b>200</b><br>88.8<br>88.8<br>88.8<br>88.8                       | <b>250</b><br>90.3<br>90.3<br>90.3<br>90.3                         | <b>315</b><br>90.7<br>90.7<br>90.7<br>90.7   | <b>400</b><br>90.4<br>90.4<br>90.4  | <b>500</b><br>90.5<br>90.5<br>90.5<br>90.5   | <b>630</b><br>92.1<br>92.1<br>92.1<br>92.1                                 | <b>800</b><br>91.9<br>91.9<br>91.9<br>91.9   | <b>1000</b><br>92.9<br>92.9<br>92.9<br>92.9  | <b>1250</b><br>93.6<br>93.6<br>93.6   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW  | <b>125</b><br>86.6<br>86.6<br>86.6<br>86.6                                | <b>160</b><br>87.6<br>87.6<br>87.6<br>87.6<br>87.6  | 200<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8                      | <b>250</b><br>90.3<br>90.3<br>90.3<br>90.3<br>90.3                 | <b>315</b><br>90.7<br>90.7<br>90.7<br>90.7<br>90.7   | <b>400</b><br>90.4<br>90.4<br>90.4<br>90.4<br>90.4  | <b>500</b><br>90.5<br>90.5<br>90.5<br>90.5   | <b>630</b><br>92.1<br>92.1<br>92.1<br>92.1<br>92.1                         | <b>800</b><br>91.9<br>91.9<br>91.9<br>91.9<br>91.9   | <b>1000</b><br>92.9<br>92.9<br>92.9<br>92.9<br>92.9  | <b>1250</b><br>93.6<br>93.6<br>93.6<br>93.6<br>93.6   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW   | <b>125</b><br>86.6<br>86.6<br>86.6<br>86.6<br>86.6                        | <b>160</b><br>87.6<br>87.6<br>87.6<br>87.6<br>87.6<br>87.6  | 200<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8      | 250<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3                | <b>315</b><br>90.7<br>90.7<br>90.7<br>90.7<br>90.7   | <b>400</b><br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4  | <b>500</b><br>90.5<br>90.5<br>90.5<br>90.5<br>90.5   | <b>630</b><br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1                 | <b>800</b><br>91.9<br>91.9<br>91.9<br>91.9<br>91.9<br>91.9   | 100092.992.992.992.992.992.9   | <b>1250</b><br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW  | <b>125</b><br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86.6                | 160         87.6         87.6         87.6         87.6         87.6         87.6         87.6         87.6         87.6  | 200<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8      | 250<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3        | <b>315</b><br>90.7<br>90.7<br>90.7<br>90.7<br>90.7<br>90.7   | <b>400</b><br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4  | <b>500</b><br>90.5<br>90.5<br>90.5<br>90.5<br>90.5<br>90.5   | <b>630</b><br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1         | <b>800</b><br>91.9<br>91.9<br>91.9<br>91.9<br>91.9<br>91.9<br>91.9   | 100092.992.992.992.992.992.992.992.9   | <b>1250</b><br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW   | <b>125</b><br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86.6        | 160         87.6         87.6         87.6         87.6         87.6         87.6         87.6         87.6         87.6         87.6   | 200<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>8 | 250<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90. | <b>315</b><br>90.7<br>90.7<br>90.7<br>90.7<br>90.7<br>90.7<br>90.7   | <b>400</b><br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4  | <b>500</b><br>90.5<br>90.5<br>90.5<br>90.5<br>90.5<br>90.5<br>90.5   | 630<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1        | <b>800</b><br>91.9<br>91.9<br>91.9<br>91.9<br>91.9<br>91.9<br>91.9<br>91.  | 100092.992.992.992.992.992.992.992.992.992.9   | <b>1250</b><br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW  | <b>125</b><br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86. | 160         87.6         87.6         87.6         87.6         87.6         87.6         87.6         87.6         87.6         87.6         87.6         87.6   | 200<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>8 | 250<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90. | <b>315</b><br>90.7<br>90.7<br>90.7<br>90.7<br>90.7<br>90.7<br>90.7<br>90.7   | <b>400</b><br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4  | 500           90.5           90.5           90.5           90.5           90.5           90.5           90.5           90.5           90.5           90.5           90.5           90.5           90.5   | 630<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1        | 80091.991.991.991.991.991.991.991.991.991.991.9  | 1000         92.9         92.9         92.9         92.9         92.9         92.9         92.9         92.9         92.9         92.9         92.9         92.9         92.9         92.9         92.9         92.9   | <b>1250</b><br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW  | <b>125</b><br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86. | 160         87.6         87.6         87.6         87.6         87.6         87.6         87.6         87.6         87.6         87.6         87.6         87.6         87.6         87.6         87.6         87.6   | 200<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>8 | 250<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90. | <b>315</b><br>90.7<br>90.7<br>90.7<br>90.7<br>90.7<br>90.7<br>90.7<br>90.7   | <b>400</b><br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4  | <b>500</b><br>90.5<br>90.5<br>90.5<br>90.5<br>90.5<br>90.5<br>90.5<br>90.5   | 630<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1        | 800         91.9  | 100092.992.992.992.992.992.992.992.992.992.992.992.992.992.9   | <b>1250</b><br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.1MW<br>SG 4.5-145 AM-3 @ 4.0MW  | <b>125</b><br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86. | 160           87.6           87.6           87.6           87.6           87.6           87.6           87.6           87.6           87.6           87.6           87.6           87.6           87.6           87.6           87.6           87.6           87.6           87.6           87.6  | 200<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>8 | 250<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90. | <b>315</b><br>90.7<br>90.7<br>90.7<br>90.7<br>90.7<br>90.7<br>90.7<br>90.7   | 400         90.4  | 500           90.5           90.5           90.5           90.5           90.5           90.5           90.5           90.5           90.5           90.5           90.5           90.5           90.5           90.5           90.5           90.5           90.5           90.5           90.5   | <b>630</b><br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1 | 800         91.9   | 1000         92.9   | <b>1250</b><br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.0MW<br>SG 4.5-145 NRS Mode N1   | <b>125</b><br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86. | 160         87.6  | 200<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>8 | 250<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90. | <b>315</b><br>90.7<br>90.7<br>90.7<br>90.7<br>90.7<br>90.7<br>90.7<br>90.7   | 400<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>9  | <b>500</b><br>90.5<br>90.5<br>90.5<br>90.5<br>90.5<br>90.5<br>90.5<br>90.5   | 630<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1        | 800         91.9   | 100092.992.992.992.992.992.992.992.992.992.992.992.992.992.992.992.992.992.9   | <b>1250</b><br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+5 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.1MW<br>SG 4.5-145 AM-3 @ 4.0MW<br>SG 4.5-145 NRS Mode N1<br>SG 4.5-145 NRS Mode N2  | <b>125</b><br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86. | 160         87.6  | 200<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>8 | 250<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90. | <b>315</b><br>90.7<br>90.7<br>90.7<br>90.7<br>90.7<br>90.7<br>90.7<br>90.7   | 400         90.4   | 500           90.5  | <b>630</b><br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1 | 800         91.9  | 1000         92.9  | <b>1250</b><br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.0MW<br>SG 4.5-145 AM-3 @ 4.0MW<br>SG 4.5-145 NRS Mode N1<br>SG 4.5-145 NRS Mode N2<br>SG 4.5-145 NRS Mode N3   | <b>125</b><br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86. | 160           87.6   | 200<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>8 | 250<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90. | <b>315</b><br>90.7<br>90.7<br>90.7<br>90.7<br>90.7<br>90.7<br>90.7<br>90.7   | 400<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>9  | 500           90.5   | 630<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1        | 800         91.9   | 1000         92.9 | <b>1250</b><br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.1MW<br>SG 4.5-145 AM-3 @ 4.0MW<br>SG 4.5-145 NRS Mode N1<br>SG 4.5-145 NRS Mode N2<br>SG 4.5-145 NRS Mode N3<br>SG 4.5-145 NRS Mode N4   | <b>125</b><br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86. | 160         87.6   | 200<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>8 | 250<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90. | 315           90.7  | 400         90.4 | 500           90.5   | <b>630</b><br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1 | 800         91.9  | 100092.9   | <b>1250</b><br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.1MW<br>SG 4.5-145 AM-3 @ 4.0MW<br>SG 4.5-145 NRS Mode N1<br>SG 4.5-145 NRS Mode N2<br>SG 4.5-145 NRS Mode N3<br>SG 4.5-145 NRS Mode N4<br>SG 4.5-145 NRS Mode N4<br>SG 4.5-145 NRS Mode N5                           | <b>125</b><br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86. | 160         87.6 | 200<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>8 | 250<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90. | 315           90.7     < | 400<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>9  | 500           90.5  | 630<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1        | 800         91.9         91.4         90.4  | 100092.992.491.4   | <b>1250</b><br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.1MW<br>SG 4.5-145 AM-3 @ 4.0MW<br>SG 4.5-145 NRS Mode N1<br>SG 4.5-145 NRS Mode N1<br>SG 4.5-145 NRS Mode N3<br>SG 4.5-145 NRS Mode N4<br>SG 4.5-145 NRS Mode N5<br>SG 4.5-145 NRS Mode N6                           | <b>125</b><br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86. | 160         87.6         87.7         86.3         84.7   | 200<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>8 | 250<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90. | 315           90.7           89.2           87.3  | 400<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>9  | 500           90.5     < | <b>630</b><br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1 | 800         91.9         91.4         90.4         88.5              | 100092.992.491.489.5   | <b>1250</b> 93.6         93.1         92.1         90.2 |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.1MW<br>SG 4.5-145 AM-3 @ 4.0MW<br>SG 4.5-145 NRS Mode N1<br>SG 4.5-145 NRS Mode N2<br>SG 4.5-145 NRS Mode N4<br>SG 4.5-145 NRS Mode N4<br>SG 4.5-145 NRS Mode N5<br>SG 4.5-145 NRS Mode N6<br>SG 4.5-145 NRS Mode N7 | <b>125</b><br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86.6<br>86. | 160         87.6         87.7         86.3         84.0              | 200<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>88.8<br>8 | 250<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90.3<br>90. | 315         90.7         80.7         89.2         87.3         86.4   | 400<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>90.4<br>9  | <b>500</b><br>90.5<br>90.5<br>90.5<br>90.5<br>90.5<br>90.5<br>90.5<br>90.5   | <b>630</b><br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1<br>92.1 | 800         91.9         91.4         90.4         88.5         87.6 | 100092.992.491.488.6   | <b>1250</b><br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6<br>93.6   |

**SIEMENS** Gamesa RENEWABLE ENERGY

**GENERAL CHARACTERISTICS** MANUAL Date: 17/06/2019

Code: GD381009-en

Pg. 7 of 19

Rev: 3

#### Title: SG 4.5-145 NOISE EMISSION ANALYSIS

| Central Frequency [Hz]          | 1600 | 2000 | 2500 | 3150 | 4000 | 5000 | 6300 | 8000 | 10000 |
|---------------------------------|------|------|------|------|------|------|------|------|-------|
| SG 4.5-145 Baseline AM0 @ 4.5MW | 93.5 | 92.4 | 91.0 | 88.8 | 85.7 | 81.4 | 76.2 | 70.4 | 65.8  |
| SG 4.5-145 AM+5 @ 5.0MW         | 93.5 | 92.4 | 91.0 | 88.8 | 85.7 | 81.4 | 76.2 | 70.4 | 65.8  |
| SG 4.5-145 AM+4 @ 4.9MW         | 93.5 | 92.4 | 91.0 | 88.8 | 85.7 | 81.4 | 76.2 | 70.4 | 65.8  |
| SG 4.5-145 AM+3 @ 4.8MW         | 93.5 | 92.4 | 91.0 | 88.8 | 85.7 | 81.4 | 76.2 | 70.4 | 65.8  |
| SG 4.5-145 AM+2 @ 4.7MW         | 93.5 | 92.4 | 91.0 | 88.8 | 85.7 | 81.4 | 76.2 | 70.4 | 65.8  |
| SG 4.5-145 AM+1 @ 4.6MW         | 93.5 | 92.4 | 91.0 | 88.8 | 85.7 | 81.4 | 76.2 | 70.4 | 65.8  |
| SG 4.5-145 AM-1 @ 4.4MW         | 93.5 | 92.4 | 91.0 | 88.8 | 85.7 | 81.4 | 76.2 | 70.4 | 65.8  |
| SG 4.5-145 AM-2 @ 4.3MW         | 93.5 | 92.4 | 91.0 | 88.8 | 85.7 | 81.4 | 76.2 | 70.4 | 65.8  |
| SG 4.5-145 AM-3 @ 4.2MW         | 93.5 | 92.4 | 91.0 | 88.8 | 85.7 | 81.4 | 76.2 | 70.4 | 65.8  |
| SG 4.5-145 AM-3 @ 4.1MW         | 93.5 | 92.4 | 91.0 | 88.8 | 85.7 | 81.4 | 76.2 | 70.4 | 65.8  |
| SG 4.5-145 AM-3 @ 4.0MW         | 93.5 | 92.4 | 91.0 | 88.8 | 85.7 | 81.4 | 76.2 | 70.4 | 65.8  |
| SG 4.5-145 NRS Mode N1          | 93.5 | 92.4 | 91.0 | 88.8 | 85.7 | 81.4 | 76.2 | 70.4 | 65.8  |
| SG 4.5-145 NRS Mode N2          | 93.5 | 92.4 | 91.0 | 88.8 | 85.7 | 81.4 | 76.2 | 70.4 | 65.8  |
| SG 4.5-145 NRS Mode N3          | 93.5 | 92.4 | 91.0 | 88.8 | 85.7 | 81.4 | 76.2 | 70.4 | 65.8  |
| SG 4.5-145 NRS Mode N4          | 93.0 | 91.9 | 90.5 | 88.3 | 85.2 | 80.9 | 75.7 | 69.9 | 65.3  |
| SG 4.5-145 NRS Mode N5          | 92.0 | 90.9 | 89.5 | 87.3 | 84.2 | 79.9 | 74.7 | 68.9 | 64.3  |
| SG 4.5-145 NRS Mode N6          | 90.1 | 89.0 | 87.6 | 85.4 | 82.3 | 78.0 | 72.8 | 67.0 | 62.4  |
| SG 4.5-145 NRS Mode N7          | 89.2 | 88.1 | 86.7 | 84.5 | 81.4 | 77.1 | 71.9 | 66.1 | 61.5  |
| SG 4.5-145 NRS Mode N8          | 88.1 | 87.0 | 85.6 | 83.4 | 80.3 | 76.0 | 70.8 | 65.0 | 60.4  |

Table 5 One-third octave band noise spectra of SG 4.5-145 @ 7 m/s (ref: SG145spectra\_4500KW\_R03\_17062018)

**SIEMENS** Gamesa RENEWABLE ENERGY

Code: GD381009-en **GENERAL CHARACTERISTICS** MANUAL Date: 17/06/2019

Pg. 8 of 19

Rev: 3

Title: SG 4.5-145 NOISE EMISSION ANALYSIS

| Central Frequency [Hz]  | 10  | 12.5  | 16  | 20   | 25   | 31.5   | 40  | 50   | 63   | 80  | 100   |
|---|---|---|---|--|--|--|---|--|--|---|---|
| SG 4.5-145 Baseline AM0 @ 4.5MW   | 44.5  | 50.2  | 55.9  | 61.3   | 65.9   | 70.6   | 74.8  | 79.4   | 83.7   | 86.2  | 88.1  |
| SG 4.5-145 AM+5 @ 5.0MW   | 44.5  | 50.2  | 55.9  | 61.3   | 65.9   | 70.6   | 74.8  | 79.4   | 83.7   | 86.2  | 88.1  |
| SG 4.5-145 AM+4 @ 4.9MW   | 44.5  | 50.2  | 55.9  | 61.3   | 65.9   | 70.6   | 74.8  | 79.4   | 83.7   | 86.2  | 88.1  |
| SG 4.5-145 AM+3 @ 4.8MW   | 44.5  | 50.2  | 55.9  | 61.3   | 65.9   | 70.6   | 74.8  | 79.4   | 83.7   | 86.2  | 88.1  |
| SG 4.5-145 AM+2 @ 4.7MW   | 44.5  | 50.2  | 55.9  | 61.3   | 65.9   | 70.6   | 74.8  | 79.4   | 83.7   | 86.2  | 88.1  |
| SG 4.5-145 AM+1 @ 4.6MW   | 44.5  | 50.2  | 55.9  | 61.3   | 65.9   | 70.6   | 74.8  | 79.4   | 83.7   | 86.2  | 88.1  |
| SG 4.5-145 AM-1 @ 4.4MW   | 44.5  | 50.2  | 55.9  | 61.3   | 65.9   | 70.6   | 74.8  | 79.4   | 83.7   | 86.2  | 88.1  |
| SG 4.5-145 AM-2 @ 4.3MW   | 44.5  | 50.2  | 55.9  | 61.3   | 65.9   | 70.6   | 74.8  | 79.4   | 83.7   | 86.2  | 88.1  |
| SG 4.5-145 AM-3 @ 4.2MW   | 44.5  | 50.2  | 55.9  | 61.3   | 65.9   | 70.6   | 74.8  | 79.4   | 83.7   | 86.2  | 88.1  |
| SG 4.5-145 AM-3 @ 4.1MW   | 44.5  | 50.2  | 55.9  | 61.3   | 65.9   | 70.6   | 74.8  | 79.4   | 83.7   | 86.2  | 88.1  |
| SG 4.5-145 AM-3 @ 4.0MW   | 44.5  | 50.2  | 55.9  | 61.3   | 65.9   | 70.6   | 74.8  | 79.4   | 83.7   | 86.2  | 88.1  |
| SG 4.5-145 NRS Mode N1  | 44.5  | 50.2  | 55.9  | 61.3   | 65.9   | 70.5   | 74.7  | 79.3   | 83.5   | 86.0  | 87.8  |
| SG 4.5-145 NRS Mode N2  | 44.5  | 50.2  | 55.9  | 61.2   | 65.8   | 70.5   | 74.6  | 79.1   | 83.3   | 85.7  | 87.5  |
| SG 4.5-145 NRS Mode N3  | 44.5  | 50.2  | 55.8  | 61.2   | 65.7   | 70.2   | 74.3  | 78.7   | 82.7   | 85.0  | 86.6  |
| SG 4.5-145 NRS Mode N4  | 44.5  | 50.2  | 55.8  | 61.1   | 65.6   | 70.1   | 74.0  | 78.4   | 82.4   | 84.5  | 86.0  |
| SG 4.5-145 NRS Mode N5  | 44.5  | 50.2  | 55.8  | 61.1   | 65.5   | 69.9   | 73.8  | 78.1   | 82.0   | 84.0  | 85.4  |
| SG 4.5-145 NRS Mode N6  | 44.5  | 50.2  | 55.7  | 61.0   | 65.3   | 69.6   | 73.4  | 77.5   | 81.2   | 83.1  | 84.3  |
| SG 4.5-145 NRS Mode N7  | 44.5  | 50.2  | 55.7  | 60.9   | 65.2   | 69.5   | 73.2  | 77.2   | 80.9   | 82.6  | 83.7  |
| SG 4 5-145 NRS Mode N8  | 44 5  | 50 1  | 55 7  | 60.8   | 65 1   | 69 3   | 73 0  | 76 9   | 80 5   | 82.1  | 83.0  |
|   | 11.5  | 50.1  | 55.7  | 0.00   | 05.1   | 05.5   | /5.0  | 7015   | 0010   | 0211  | 0010  |
| Central Frequency [Hz]  | <b>125</b>  | <b>160</b>  | 200   | <b>250</b>   | <b>315</b>   | <b>400</b>   | <b>500</b>  | <b>630</b>   | 800  | 1000  | 1250  |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW   | <b>125</b><br>89.6  | <b>160</b><br>90.6  | <b>200</b><br>91.8  | <b>250</b><br>93.3   | <b>315</b><br>93.7   | <b>400</b><br>93.4   | <b>500</b><br>93.5  | <b>630</b><br>95.1   | <b>800</b><br>94.9   | <b>1000</b><br>95.9   | <b>1250</b><br>96.6   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW  | <b>125</b><br>89.6<br>89.6  | <b>160</b><br>90.6<br>90.6  | <b>200</b><br>91.8<br>91.8  | <b>250</b><br>93.3<br>93.3   | <b>315</b><br>93.7<br>93.7   | <b>400</b><br>93.4<br>93.4   | <b>500</b><br>93.5<br>93.5  | <b>630</b><br>95.1<br>95.1   | <b>800</b><br>94.9<br>94.9   | <b>1000</b><br>95.9<br>95.9   | <b>1250</b><br>96.6<br>96.6   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW  | <b>125</b><br>89.6<br>89.6  | <b>160</b><br>90.6<br>90.6<br>90.6  | <b>200</b><br>91.8<br>91.8<br>91.8  | <b>250</b><br>93.3<br>93.3<br>93.3   | <b>315</b><br>93.7<br>93.7<br>93.7   | <b>400</b><br>93.4<br>93.4<br>93.4   | <b>500</b><br>93.5<br>93.5<br>93.5  | <b>630</b><br>95.1<br>95.1<br>95.1   | <b>800</b><br>94.9<br>94.9<br>94.9   | <b>1000</b><br>95.9<br>95.9<br>95.9   | <b>1250</b><br>96.6<br>96.6<br>96.6   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW  | <b>125</b><br>89.6<br>89.6<br>89.6<br>89.6  | <b>160</b> 90.6         90.6         90.6         90.6         90.6   | <b>200</b><br>91.8<br>91.8<br>91.8<br>91.8  | <b>250</b><br>93.3<br>93.3<br>93.3<br>93.3   | <b>315</b><br>93.7<br>93.7<br>93.7<br>93.7   | <b>400</b><br>93.4<br>93.4<br>93.4<br>93.4<br>93.4   | <b>500</b><br>93.5<br>93.5<br>93.5<br>93.5  | <b>630</b><br>95.1<br>95.1<br>95.1<br>95.1   | <b>800</b><br>94.9<br>94.9<br>94.9<br>94.9   | <b>1000</b><br>95.9<br>95.9<br>95.9<br>95.9   | 1250           96.6           96.6           96.6           96.6           96.6   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW  | <b>125</b><br>89.6<br>89.6<br>89.6<br>89.6<br>89.6  | <b>160</b> 90.6         90.6         90.6         90.6         90.6         90.6  | <b>200</b> 91.8         91.8         91.8         91.8         91.8         91.8         91.8   | <b>250</b><br>93.3<br>93.3<br>93.3<br>93.3<br>93.3   | <b>315</b><br>93.7<br>93.7<br>93.7<br>93.7<br>93.7   | <b>400</b><br>93.4<br>93.4<br>93.4<br>93.4<br>93.4   | <b>500</b> 93.5         93.5         93.5         93.5         93.5         93.5         93.5         93.5  | <b>630</b><br>95.1<br>95.1<br>95.1<br>95.1<br>95.1   | <b>800</b><br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9   | <b>1000</b><br>95.9<br>95.9<br>95.9<br>95.9<br>95.9   | <b>1250</b><br>96.6<br>96.6<br>96.6<br>96.6<br>96.6   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW  | <b>125</b><br>89.6<br>89.6<br>89.6<br>89.6<br>89.6<br>89.6  | <b>160</b> 90.6         90.6         90.6         90.6         90.6         90.6         90.6         90.6  | 200           91.8           91.8           91.8           91.8           91.8           91.8           91.8           91.8           91.8           91.8 | 250           93.3           93.3           93.3           93.3           93.3           93.3           93.3           93.3           93.3           93.3           93.3           93.3  | 315           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7  | <b>400</b><br>93.4<br>93.4<br>93.4<br>93.4<br>93.4<br>93.4<br>93.4   | 5.0           500           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5  | <b>630</b><br>95.1<br>95.1<br>95.1<br>95.1<br>95.1<br>95.1   | 800<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9  | <b>1000</b><br>95.9<br>95.9<br>95.9<br>95.9<br>95.9<br>95.9<br>95.9   | <b>1250</b><br>96.6<br>96.6<br>96.6<br>96.6<br>96.6   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW  | <b>125</b><br>89.6<br>89.6<br>89.6<br>89.6<br>89.6<br>89.6<br>89.6  | 160           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6  | 200<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8   | 250         93.3 | 315           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7   | 400           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4   | 5.00           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5   | <b>630</b><br>95.1<br>95.1<br>95.1<br>95.1<br>95.1<br>95.1<br>95.1   | 800<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94  | <b>1000</b><br>95.9<br>95.9<br>95.9<br>95.9<br>95.9<br>95.9<br>95.9   | 1250         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW  | <b>125</b><br>89.6<br>89.6<br>89.6<br>89.6<br>89.6<br>89.6<br>89.6<br>89.6  | 160           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6   | 200<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8   | 250           93.3           93.3           93.3           93.3           93.3           93.3           93.3           93.3           93.3           93.3           93.3           93.3           93.3           93.3           93.3   | 315           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7  | 93.4         93.4         93.4         93.4         93.4         93.4         93.4         93.4         93.4         93.4         93.4         93.4         93.4         93.4         93.4         93.4         93.4   | 5.0           500           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5  | <b>630</b><br>95.1<br>95.1<br>95.1<br>95.1<br>95.1<br>95.1<br>95.1<br>95.1   | 800<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94  | <b>1000</b><br>95.9<br>95.9<br>95.9<br>95.9<br>95.9<br>95.9<br>95.9<br>95.  | <b>1250</b><br>96.6<br>96.6<br>96.6<br>96.6<br>96.6<br>96.6<br>96.6   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+2 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW  | 125           89.6           89.6           89.6           89.6           89.6           89.6           89.6           89.6           89.6           89.6           89.6           89.6           89.6           89.6           89.6           89.6           89.6  | 160           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6   | 200<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8   | 250           93.3           93.3           93.3           93.3           93.3           93.3           93.3           93.3           93.3           93.3           93.3           93.3           93.3           93.3           93.3           93.3           93.3   | 315           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7  | 93.4          | 5.00           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5           93.5  | <b>630</b><br>95.1<br>95.1<br>95.1<br>95.1<br>95.1<br>95.1<br>95.1<br>95.1   | 800<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94  | <b>1000</b><br>95.9<br>95.9<br>95.9<br>95.9<br>95.9<br>95.9<br>95.9<br>95.  | 1250         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+2 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.1MW  | <b>125</b><br>89.6<br>89.6<br>89.6<br>89.6<br>89.6<br>89.6<br>89.6<br>89.6  | 160           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6   | 200<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8   | 250<br>93.3<br>93.3<br>93.3<br>93.3<br>93.3<br>93.3<br>93.3<br>93.   | 315           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7           93.7   | 400           93.4  | 5.0           500           93.5   | <b>630</b><br>95.1<br>95.1<br>95.1<br>95.1<br>95.1<br>95.1<br>95.1<br>95.1   | 800<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94  | <b>1000</b><br>95.9<br>95.9<br>95.9<br>95.9<br>95.9<br>95.9<br>95.9<br>95.  | 1250         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6  |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.1MW           SG 4.5-145 AM-3 @ 4.0MW  | 125           89.6   | 160           90.6  | 200<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8   | 250           93.3  | 315           93.7  | 400           93.4  | 5.0           93.5   | <b>630</b><br>95.1<br>95.1<br>95.1<br>95.1<br>95.1<br>95.1<br>95.1<br>95.1   | 800<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94  | <b>1000</b><br>95.9<br>95.9<br>95.9<br>95.9<br>95.9<br>95.9<br>95.9<br>95.  | 1250         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6  |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.1MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW  | <b>125</b><br>89.6<br>89.6<br>89.6<br>89.6<br>89.6<br>89.6<br>89.6<br>89.6  | 160           90.6   | 200<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8   | 250           93.3  | 315           93.7   | 93.4          | 5.0           500           93.5  | 630           95.1  | 800<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94  | <b>1000</b><br>95.9<br>95.9<br>95.9<br>95.9<br>95.9<br>95.9<br>95.9<br>95.  | 1250         96.6   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N2  | 125           89.6           89.7           88.9 | 160           90.6           90.7   | 200<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8   | 250           93.3   | 315           93.7  | 93.4           | 5.0           500           93.5  | 630           95.1           94.6           94.1  | 800<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94  | 1000         95.9 <t< td=""><td>1250         96.6</td></t<> | 1250         96.6   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N2           SG 4.5-145 NRS Mode N3   | 125           89.6           89.7           87.8  | 160           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.7           88.4  | 200<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8   | 250           93.3           93.4     <   | 315           93.7  | 93.4         93.4 | 5.0           500           93.5           93.0           92.5           90.9  | 630           95.1           94.6           92.5 | 800<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94  | 1000         95.9         95.4         93.3   | 1250         96.6         96.7         96.8         96.9         96.1         95.6         94.0 |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.1MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N2           SG 4.5-145 NRS Mode N3           SG 4.5-145 NRS Mode N4  | 125         89.6         89.7         87.8         87.1   | 160           90.6           90.7           88.4           87.6  | 200<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8   | 250<br>93.3<br>93.3<br>93.3<br>93.3<br>93.3<br>93.3<br>93.3<br>93.   | 315           93.7     < | 93.4         93.8         89.8   | 5.0           93.5           93.0           92.5           90.9           89.9   | 630           95.1           91.5  | 800<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94  | 1000         95.9         95.4         92.3  | 1250         96.6         96.1         95.6         94.0         93.0   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N3           SG 4.5-145 NRS Mode N4           SG 4.5-145 NRS Mode N4           SG 4.5-145 NRS Mode N5  | 125         89.6         89.6         89.6         89.6         89.6         89.6         89.6         89.6         89.6         89.6         89.6         89.6         89.6         89.6         89.6         89.6         89.6         89.6         89.6         89.7         89.8         87.1         86.3  | 160           90.6           90.7           88.4           86.7 | 200<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8   | 250<br>93.3<br>93.3<br>93.3<br>93.3<br>93.3<br>93.3<br>93.3<br>93.   | 315           93.7     < | 93.4         93.8         89.8         88.7                           | 5.0           500           93.5           93.0           92.5           90.9           88.8  | 630           95.1           94.6           92.5           90.4  | 800<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94.9<br>94  | 1000         95.9         93.3         91.2   | 1250         96.6         96.7         96.8         96.9         96.9         96.1         95.6         94.0         93.0         91.9              |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.1MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N3           SG 4.5-145 NRS Mode N4           SG 4.5-145 NRS Mode N4           SG 4.5-145 NRS Mode N5           SG 4.5-145 NRS Mode N6   | 125         89.6         89.7         88.9         87.8         87.1         86.3         84.9  | 160           90.6           90.7           88.4           87.6           86.7           85.1  | 200<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8   | 250<br>93.3<br>93.3<br>93.3<br>93.3<br>93.3<br>93.3<br>93.3<br>93.   | 315           93.7     < | 93.4         92.9         90.8         88.7         86.9              | 5.6           500           93.5           93.0           93.0           92.5           90.9           88.8           87.0   | 630           95.1           94.6           92.5           91.5           90.4           88.6   | 800         94.9         93.9         92.3         90.2         88.4              | 1000         95.9         93.3         91.2         89.4  | 1250         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.6         96.1         95.6         94.0         93.0         91.9         90.1   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N3           SG 4.5-145 NRS Mode N4           SG 4.5-145 NRS Mode N5           SG 4.5-145 NRS Mode N5           SG 4.5-145 NRS Mode N5           SG 4.5-145 NRS Mode N6           SG 4.5-145 NRS Mode N7 | 125         89.6         89.7         89.8         89.6         89.7         88.9         87.8         87.1         86.3         84.9         84.2   | 160           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           90.6           80.7           88.4           86.7           85.1           84.2  | 200<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8<br>91.8   | 250<br>93.3<br>93.3<br>93.3<br>93.3<br>93.3<br>93.3<br>93.3<br>93.   | 315           93.7     < | 93.4         93.5         93.6         88.7         86.9         85.9   | 5.6           500           93.5           93.6           93.7           93.8           89.9           88.8           86.0 </td <td>630           95.1           94.6           91.5           90.4           88.6           87.6</td> <td>800         94.9         93.9         92.3         90.2         88.4         87.4</td> <td>1000         95.9         93.3         91.2         89.4         88.4</td> <td>1250         96.6         96.7         96.8         96.9         96.1         95.6         94.0         93.0         91.9         90.1         89.1</td> | 630           95.1           94.6           91.5           90.4           88.6           87.6   | 800         94.9         93.9         92.3         90.2         88.4         87.4 | 1000         95.9         93.3         91.2         89.4         88.4   | 1250         96.6         96.7         96.8         96.9         96.1         95.6         94.0         93.0         91.9         90.1         89.1  |

**SIEMENS** Gamesa RENEWABLE ENERGY

**GENERAL CHARACTERISTICS** MANUAL Date: 17/06/2019

Code: GD381009-en

Pg. 9 of 19

Rev: 3

#### Title: SG 4.5-145 NOISE EMISSION ANALYSIS

| Central Frequency [Hz]          | 1600 | 2000 | 2500 | 3150 | 4000 | 5000 | 6300 | 8000 | 10000 |
|---------------------------------|------|------|------|------|------|------|------|------|-------|
| SG 4.5-145 Baseline AM0 @ 4.5MW | 96.5 | 95.4 | 94.0 | 91.8 | 88.7 | 84.4 | 79.2 | 73.4 | 68.8  |
| SG 4.5-145 AM+5 @ 5.0MW         | 96.5 | 95.4 | 94.0 | 91.8 | 88.7 | 84.4 | 79.2 | 73.4 | 68.8  |
| SG 4.5-145 AM+4 @ 4.9MW         | 96.5 | 95.4 | 94.0 | 91.8 | 88.7 | 84.4 | 79.2 | 73.4 | 68.8  |
| SG 4.5-145 AM+3 @ 4.8MW         | 96.5 | 95.4 | 94.0 | 91.8 | 88.7 | 84.4 | 79.2 | 73.4 | 68.8  |
| SG 4.5-145 AM+2 @ 4.7MW         | 96.5 | 95.4 | 94.0 | 91.8 | 88.7 | 84.4 | 79.2 | 73.4 | 68.8  |
| SG 4.5-145 AM+1 @ 4.6MW         | 96.5 | 95.4 | 94.0 | 91.8 | 88.7 | 84.4 | 79.2 | 73.4 | 68.8  |
| SG 4.5-145 AM-1 @ 4.4MW         | 96.5 | 95.4 | 94.0 | 91.8 | 88.7 | 84.4 | 79.2 | 73.4 | 68.8  |
| SG 4.5-145 AM-2 @ 4.3MW         | 96.5 | 95.4 | 94.0 | 91.8 | 88.7 | 84.4 | 79.2 | 73.4 | 68.8  |
| SG 4.5-145 AM-3 @ 4.2MW         | 96.5 | 95.4 | 94.0 | 91.8 | 88.7 | 84.4 | 79.2 | 73.4 | 68.8  |
| SG 4.5-145 AM-3 @ 4.1MW         | 96.5 | 95.4 | 94.0 | 91.8 | 88.7 | 84.4 | 79.2 | 73.4 | 68.8  |
| SG 4.5-145 AM-3 @ 4.0MW         | 96.5 | 95.4 | 94.0 | 91.8 | 88.7 | 84.4 | 79.2 | 73.4 | 68.8  |
| SG 4.5-145 NRS Mode N1          | 96.0 | 94.9 | 93.5 | 91.3 | 88.2 | 83.9 | 78.7 | 72.9 | 68.3  |
| SG 4.5-145 NRS Mode N2          | 95.5 | 94.4 | 93.0 | 90.8 | 87.7 | 83.4 | 78.2 | 72.4 | 67.8  |
| SG 4.5-145 NRS Mode N3          | 93.9 | 92.8 | 91.4 | 89.2 | 86.1 | 81.8 | 76.6 | 70.8 | 66.2  |
| SG 4.5-145 NRS Mode N4          | 92.9 | 91.8 | 90.4 | 88.2 | 85.1 | 80.8 | 75.6 | 69.8 | 65.2  |
| SG 4.5-145 NRS Mode N5          | 91.8 | 90.7 | 89.3 | 87.1 | 84.0 | 79.7 | 74.5 | 68.7 | 64.1  |
| SG 4.5-145 NRS Mode N6          | 90.0 | 88.9 | 87.5 | 85.3 | 82.2 | 77.9 | 72.7 | 66.9 | 62.3  |
| SG 4.5-145 NRS Mode N7          | 89.0 | 87.9 | 86.5 | 84.3 | 81.2 | 76.9 | 71.7 | 65.9 | 61.3  |
| SG 4.5-145 NRS Mode N8          | 88.0 | 86.9 | 85.5 | 83.3 | 80.2 | 75.9 | 70.7 | 64.9 | 60.3  |

Table 6 One-third octave band noise spectra of SG 4.5-145 @ 8 m/s (ref SG145spectra\_4500KW\_R03\_17062018)

**SIEMENS** Gamesa RENEWABLE ENERGY

Code: GD381009-en **GENERAL CHARACTERISTICS** MANUAL Date: 17/06/2019

Pg. 10 of 19

Rev: 3

Title: SG 4.5-145 NOISE EMISSION ANALYSIS

| Central Frequency [Hz]  | 10   | 12.5  | 16  | 20  | 25  | 31.5   | 40  | 50  | 63  | 80  | 100   |
|---|--|---|---|---|---|--|---|---|---|---|---|
| SG 4.5-145 Baseline AM0 @ 4.5MW   | 46.1   | 51.8  | 57.5  | 62.9  | 67.5  | 72.2   | 76.4  | 81.0  | 85.3  | 87.8  | 89.7  |
| SG 4.5-145 AM+5 @ 5.0MW   | 47.3   | 53.0  | 58.7  | 64.1  | 68.7  | 73.4   | 77.6  | 82.2  | 86.5  | 89.0  | 90.9  |
| SG 4.5-145 AM+4 @ 4.9MW   | 47.3   | 53.0  | 58.7  | 64.1  | 68.7  | 73.4   | 77.6  | 82.2  | 86.5  | 89.0  | 90.9  |
| SG 4.5-145 AM+3 @ 4.8MW   | 47.0   | 52.7  | 58.4  | 63.8  | 68.4  | 73.1   | 77.3  | 81.9  | 86.2  | 88.7  | 90.6  |
| SG 4.5-145 AM+2 @ 4.7MW   | 46.7   | 52.4  | 58.1  | 63.5  | 68.1  | 72.8   | 77.0  | 81.6  | 85.9  | 88.4  | 90.3  |
| SG 4.5-145 AM+1 @ 4.6MW   | 46.4   | 52.1  | 57.8  | 63.2  | 67.8  | 72.5   | 76.7  | 81.3  | 85.6  | 88.1  | 90.0  |
| SG 4.5-145 AM-1 @ 4.4MW   | 46.1   | 51.8  | 57.5  | 62.9  | 67.5  | 72.2   | 76.3  | 80.9  | 85.2  | 87.7  | 89.5  |
| SG 4.5-145 AM-2 @ 4.3MW   | 46.1   | 51.8  | 57.5  | 62.9  | 67.4  | 72.1   | 76.3  | 80.8  | 85.1  | 87.5  | 89.3  |
| SG 4.5-145 AM-3 @ 4.2MW   | 46.1   | 51.8  | 57.5  | 62.9  | 67.4  | 72.1   | 76.2  | 80.7  | 85.0  | 87.4  | 89.2  |
| SG 4.5-145 AM-3 @ 4.1MW   | 46.1   | 51.8  | 57.5  | 62.8  | 67.4  | 72.0   | 76.1  | 80.7  | 84.8  | 87.2  | 89.0  |
| SG 4.5-145 AM-3 @ 4.0MW   | 46.1   | 51.8  | 57.5  | 62.8  | 67.4  | 72.0   | 76.1  | 80.6  | 84.7  | 87.1  | 88.8  |
| SG 4.5-145 NRS Mode N1  | 46.1   | 51.8  | 57.4  | 62.8  | 67.3  | 71.9   | 75.9  | 80.4  | 84.5  | 86.8  | 88.4  |
| SG 4.5-145 NRS Mode N2  | 46.1   | 51.8  | 57.4  | 62.8  | 67.3  | 71.8   | 75.8  | 80.2  | 84.3  | 86.5  | 88.1  |
| SG 4.5-145 NRS Mode N3  | 46.1   | 51.8  | 57.4  | 62.7  | 67.1  | 71.6   | 75.5  | 79.8  | 83.7  | 85.8  | 87.2  |
| SG 4.5-145 NRS Mode N4  | 46.1   | 51.8  | 57.4  | 62.6  | 67.0  | 71.4   | 75.3  | 79.5  | 83.3  | 85.3  | 86.6  |
| SG 4.5-145 NRS Mode N5  | 46.1   | 51.8  | 57.4  | 62.6  | 66.9  | 71.3   | 75.1  | 79.2  | 82.9  | 84.8  | 86.0  |
| SG 4.5-145 NRS Mode N6  | 46.1   | 51.8  | 57.3  | 62.5  | 66.7  | 71.0   | 74.6  | 78.6  | 82.2  | 83.8  | 84.8  |
| SG 4.5-145 NRS Mode N7  | 46.1   | 51.7  | 57.3  | 62.4  | 66.6  | 70.8   | 74.4  | 78.3  | 81.8  | 83.4  | 84.2  |
| SG 4 5-145 NRS Mode N8  | 46 1   | 517   | 573   | 62.3  | 66 5  | 70 7   | 74 2  | 78.0  | 81.4  | 82.8  | 83.6  |
| 30 1.5 1 15 MICS MODE NO  | 10.1   | 51.7  | 57.5  | 02.5  | 00.5  | /0./   | / 1.2   | 7010  | 0111  | 0110  | 0010  |
| Central Frequency [Hz]  | <b>125</b>   | <b>160</b>  | 200   | <b>250</b>  | <b>315</b>  | <b>400</b>   | 500   | <b>630</b>  | 800   | 1000  | <b>1250</b>   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW   | <b>125</b><br>91.2   | <b>160</b><br>92.2  | <b>200</b><br>93.4  | <b>250</b><br>94.9  | <b>315</b><br>95.3  | <b>400</b><br>95.0   | <b>500</b><br>95.1  | <b>630</b><br>96.7  | <b>800</b><br>96.5  | <b>1000</b><br>97.5   | <b>1250</b><br>98.2   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW  | <b>125</b><br>91.2<br>92.4   | <b>160</b><br>92.2<br>93.4  | <b>200</b><br>93.4<br>94.6  | <b>250</b><br>94.9<br>96.1  | <b>315</b><br>95.3<br>96.5  | <b>400</b><br>95.0<br>96.2   | <b>500</b><br>95.1<br>96.3  | <b>630</b><br>96.7<br>97.9  | <b>800</b><br>96.5<br>97.7  | <b>1000</b><br>97.5<br>98.7   | <b>1250</b><br>98.2<br>99.4   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW  | <b>125</b><br>91.2<br>92.4<br>92.4   | <b>160</b><br>92.2<br>93.4<br>93.4  | <b>200</b><br>93.4<br>94.6<br>94.6  | <b>250</b><br>94.9<br>96.1<br>96.1  | <b>315</b><br>95.3<br>96.5<br>96.5  | <b>400</b><br>95.0<br>96.2<br>96.2   | <b>500</b><br>95.1<br>96.3<br>96.3  | <b>630</b><br>96.7<br>97.9<br>97.9  | <b>800</b><br>96.5<br>97.7<br>97.7  | <b>1000</b><br>97.5<br>98.7<br>98.7   | <b>1250</b><br>98.2<br>99.4<br>99.4   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW  | 125           91.2           92.4           92.4           92.1  | 160           92.2           93.4           93.4           93.1   | <b>200</b><br>93.4<br>94.6<br>94.3  | <b>250</b><br>94.9<br>96.1<br>96.1<br>95.8  | <b>315</b><br>95.3<br>96.5<br>96.5<br>96.2  | <b>400</b><br>95.0<br>96.2<br>96.2<br>95.9   | <b>500</b><br>95.1<br>96.3<br>96.3<br>96.0  | <b>630</b><br>96.7<br>97.9<br>97.9<br>97.6  | <b>800</b><br>96.5<br>97.7<br>97.7<br>97.4  | 1000           97.5           98.7           98.7           98.4  | 1250           98.2           99.4           99.1   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW  | 125         91.2         92.4         92.1         91.8  | 160           92.2           93.4           93.4           93.1           92.8  | <b>200</b><br>93.4<br>94.6<br>94.3<br>94.0  | 250<br>94.9<br>96.1<br>95.8<br>95.5   | <b>315</b><br>95.3<br>96.5<br>96.5<br>96.2<br>95.9  | <b>400</b><br>95.0<br>96.2<br>96.2<br>95.9<br>95.6   | <b>500</b><br>95.1<br>96.3<br>96.0<br>95.7  | <b>630</b><br>96.7<br>97.9<br>97.9<br>97.6<br>97.3  | <b>800</b><br>96.5<br>97.7<br>97.7<br>97.4<br>97.1  | <b>1000</b><br>97.5<br>98.7<br>98.7<br>98.4<br>98.1   | <b>1250</b><br>98.2<br>99.4<br>99.4<br>99.1<br>98.8   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW  | 125         91.2         92.4         92.1         91.8         91.5   | <b>160</b> 92.2         93.4         93.4         93.1         92.8         92.5  | 200           93.4           94.6           94.3           94.0           93.7  | 250<br>94.9<br>96.1<br>95.8<br>95.5<br>95.2   | 315         95.3         96.5         96.2         95.9         95.6  | <b>400</b><br>95.0<br>96.2<br>96.2<br>95.9<br>95.6<br>95.3   | 500           95.1           96.3           96.0           95.7           95.4  | <b>630</b><br>96.7<br>97.9<br>97.9<br>97.6<br>97.3<br>97.0  | <b>800</b><br>96.5<br>97.7<br>97.7<br>97.4<br>97.1<br>96.8  | <b>1000</b><br>97.5<br>98.7<br>98.7<br>98.4<br>98.1<br>97.8   | <b>1250</b><br>98.2<br>99.4<br>99.4<br>99.1<br>98.8<br>98.5   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW  | 125           91.2           92.4           92.4           92.1           91.8           91.5           91.0   | 160           92.2           93.4           93.4           93.1           92.8           92.5           91.9  | 200           93.4           94.6           94.6           94.0           93.7           93.1   | 250<br>94.9<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6   | 315           95.3           96.5           96.2           95.9           95.6           95.0   | 400<br>95.0<br>96.2<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7  | <b>500</b><br>95.1<br>96.3<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8  | <b>630</b><br>96.7<br>97.9<br>97.9<br>97.6<br>97.3<br>97.0<br>96.4  | <b>800</b><br>96.5<br>97.7<br>97.7<br>97.4<br>97.1<br>96.8<br>96.2  | <b>1000</b><br>97.5<br>98.7<br>98.7<br>98.4<br>98.1<br>97.8<br>97.2   | 1250           98.2           99.4           99.1           98.8           98.5           97.9  |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW  | 125           91.2           92.4           92.4           92.1           91.8           91.5           91.0           90.8  | 160           92.2           93.4           93.4           93.1           92.8           92.5           91.9           91.7   | 200           93.4           94.6           94.6           94.3           94.0           93.7           93.1           92.8   | 250<br>94.9<br>96.1<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3   | 315           95.3           96.5           96.2           95.9           95.6           95.0           94.7  | <b>400</b><br>95.0<br>96.2<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4   | <b>500</b><br>95.1<br>96.3<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8<br>94.5  | <b>630</b><br>96.7<br>97.9<br>97.9<br>97.6<br>97.3<br>97.0<br>96.4<br>96.1  | 800           96.5           97.7           97.4           97.1           96.8           96.2           95.9  | <b>1000</b><br>97.5<br>98.7<br>98.7<br>98.4<br>98.1<br>97.8<br>97.2<br>96.9   | 1250           98.2           99.4           99.1           98.8           98.5           97.9           97.6   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-2 @ 4.3MW  | 125           91.2           92.4           92.4           92.1           91.8           91.5           91.0           90.8           90.6   | 160           92.2           93.4           93.4           93.1           92.8           92.5           91.9           91.7           91.4  | 93.4         93.4         94.6         94.3         94.0         93.7         93.1         92.8         92.5  | 250<br>94.9<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0   | 315           95.3           96.5           96.2           95.9           95.6           95.0           94.7           94.4   | 400           95.0           96.2           96.2           95.9           95.6           95.3           94.7           94.4           94.1   | 500           95.1           96.3           96.3           96.3           95.7           95.4           94.8           94.5           94.2  | 630           96.7           97.9           97.6           97.3           97.0           96.4           96.1           95.8   | 800           96.5           97.7           97.4           97.1           96.8           96.2           95.9           95.6   | 1000           97.5           98.7           98.7           98.1           97.8           97.2           96.9           96.6  | 1250         98.2         99.4         99.1         98.8         98.5         97.9         97.6         97.3  |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW  | 125           91.2           92.4           92.4           92.1           91.8           91.5           91.0           90.8           90.6           90.3  | 160           92.2           93.4           92.8           91.9           91.4           91.2                | 200           93.4           94.6           94.3           94.0           93.7           93.1           92.8           92.5           92.2  | 250<br>94.9<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7   | 315           95.3           96.5           96.2           95.9           95.6           95.0           94.7           94.4           94.1  | 400           95.0           96.2           96.2           95.9           95.6           95.3           94.7           94.1           93.8   | <b>500</b><br>95.1<br>96.3<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8<br>94.5<br>94.2<br>93.9  | 630           96.7           97.9           97.6           97.3           97.0           96.4           96.1           95.8           95.5  | 800           96.5           97.7           97.4           97.1           96.8           96.2           95.9           95.6           95.3  | 1000           97.5           98.7           98.7           98.1           97.8           97.2           96.9           96.6           96.3   | 1250           98.2           99.4           99.1           98.8           98.5           97.9           97.6           97.3           97.0   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.1MW           SG 4.5-145 AM-3 @ 4.1MW  | 125           91.2           92.4           92.1           91.5           91.0           90.8           90.6           90.3           90.1   | 160           92.2           93.4           93.1           92.5           91.9           91.7           91.4           91.2   | 200           93.4           94.6           94.3           94.0           93.7           93.1           92.8           92.5           92.2           91.9   | 250<br>94.9<br>96.1<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4   | 315           95.3           96.5           96.2           95.9           95.6           95.0           94.7           94.1           93.8  | 400           95.0           96.2           95.9           95.6           95.3           94.7           94.4           93.8           93.5   | 500           95.1           96.3           96.0           95.7           95.4           94.5           94.5           93.9           93.6  | 630           96.7           97.9           97.6           97.3           97.0           96.4           96.1           95.8           95.5           95.2   | 800           96.5           97.7           97.4           97.1           96.8           96.2           95.9           95.6           95.3           95.0   | 1000           97.5           98.7           98.7           98.1           97.8           97.2           96.9           96.3           96.0   | 1250         98.2         99.4         99.4         99.1         98.8         98.5         97.9         97.6         97.3         97.0         96.7   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.0MW  | 125           91.2           92.4           92.4           92.1           91.8           91.5           91.0           90.8           90.6           90.3           90.1           89.7  | 160           92.2           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           92.5           91.9           91.7           91.4           91.2           90.9           90.4  | 200           93.4           94.6           94.3           94.0           93.7           93.1           92.8           92.5           92.2           91.9           91.2  | 250<br>94.9<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7   | 315           95.3           96.5           96.2           95.9           95.6           95.0           94.7           94.4           93.8           93.1   | 400           95.0           96.2           96.2           95.9           95.6           95.3           94.7           94.4           93.8           93.5           92.8   | 500           95.1           96.3           96.0           95.7           95.4           94.8           94.5           94.2           93.6           92.9   | 630           96.7           97.9           97.6           97.3           97.0           96.4           96.1           95.8           95.2           94.5   | 800           96.5           97.7           97.4           97.1           96.8           96.2           95.9           95.6           95.0           94.3   | 1000           97.5           98.7           98.7           98.1           97.8           97.2           96.9           96.3           95.3   | 1250         98.2         99.4         99.1         98.8         98.5         97.9         97.6         97.3         97.0         96.7         96.0   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.1MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N2  | 125           91.2           92.4           92.4           92.1           91.5           91.0           90.8           90.6           90.3           90.1           89.7           89.3  | 160           92.2           93.4           93.1           92.8           92.5           91.9           91.7           91.4           90.9           90.4           90.9           90.4   | 97.5 <b>200</b> 93.4         94.6         94.3         94.0         93.7         93.1         92.8         92.5         92.2         91.9         91.2         90.7   | 250<br>94.9<br>96.1<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>92.2   | 315           95.3           96.5           96.2           95.9           95.6           95.0           94.7           94.1           93.8           93.1           92.6  | 400           95.0           96.2           96.2           95.9           95.6           95.3           94.7           94.4           93.8           93.5           92.8           92.3  | 500           95.1           96.3           96.0           95.7           95.4           94.5           94.5           94.2           93.9           93.6           92.4  | 630           96.7           97.9           97.6           97.3           97.0           96.4           96.1           95.8           95.5           94.5           94.0  | 800           96.5           97.7           97.4           97.1           96.8           96.2           95.9           95.6           95.3           95.0           94.3           93.8   | 1000           97.5           98.7           98.7           98.1           97.8           97.2           96.9           96.6           96.3           96.0           95.3           94.8  | 1250         98.2         99.4         99.4         99.1         98.5         97.9         97.6         97.3         97.0         96.7         96.0         95.5  |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N2           SG 4.5-145 NRS Mode N3   | 125           91.2           92.4           92.4           92.1           91.8           91.5           91.0           90.8           90.6           90.3           90.1           89.7           89.3           88.2  | 160           92.2           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           92.5           91.9           91.7           91.4           90.9           90.4           90.0           88.6  | 200<br>93.4<br>94.6<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>91.9<br>91.2<br>91.2<br>90.7<br>89.2   | 250<br>94.9<br>96.1<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>92.2<br>90.7   | 315           95.3           96.5           96.2           95.9           95.6           95.0           94.7           94.4           93.8           93.1           92.6           91.1   | 400           95.0           96.2           96.2           95.9           95.6           95.3           94.7           94.4           94.1           93.8           93.5           92.8           92.3           90.8  | 500           95.1           96.3           96.0           95.7           95.4           94.8           94.5           94.2           93.6           92.4           90.9  | 630           96.7           97.9           97.6           97.3           97.0           96.1           96.4           95.5           95.2           94.0           92.5  | 800           96.5           97.7           97.7           97.4           97.1           96.8           96.2           95.9           95.6           95.3           95.0           94.3           93.8           92.3   | 1000           97.5           98.7           98.7           98.1           97.8           97.2           96.9           96.3           96.0           95.3           94.8           93.3  | 1250         98.2         99.4         99.1         98.8         98.5         97.9         97.6         97.3         97.0         96.7         96.0         95.5         94.0                           |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.1MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N2           SG 4.5-145 NRS Mode N3           SG 4.5-145 NRS Mode N4  | 125           91.2           92.4           92.4           92.1           91.5           91.5           91.0           90.8           90.6           90.3           90.1           89.7           89.3           88.2           87.5   | 160           92.2           93.4           93.4           93.1           92.5           91.9           91.7           91.4           90.9           90.4           90.9           90.4           90.9           90.4           90.0           88.6           87.7  | 97.5 <b>200</b> 93.4         94.6         94.3         94.0         93.7         93.1         92.8         92.5         92.2         91.9         91.2         90.7         89.2         88.1                           | 250<br>94.9<br>96.1<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.7<br>93.4<br>92.7<br>92.2<br>90.7<br>89.6   | 315           95.3           96.5           96.2           95.9           95.6           95.7           94.7           94.1           93.8           93.1           92.6           91.1           90.0                                  | 400           95.0           96.2           95.9           95.6           95.3           94.7           94.4           93.8           93.5           92.8           90.8           89.7  | 500           95.1           96.3           96.3           96.3           95.7           95.4           94.5           94.5           94.5           93.9           93.6           92.9           92.4           90.9           89.8                | 630           96.7           97.9           97.6           97.3           97.0           96.4           96.1           95.8           95.5           95.5           94.5           94.5           92.5           91.4                               | 800           96.5           97.7           97.7           97.4           97.1           96.8           96.2           95.9           95.6           95.3           95.0           94.3           92.3           91.2   | 1000         97.5         98.7         98.7         98.1         97.5         98.7         98.7         98.7         98.7         98.7         98.7         98.7         98.7         96.9         96.6         96.3         96.0         95.3         94.8         93.3         92.2   | 1250         98.2         99.4         99.4         99.1         98.5         97.0         97.6         97.0         96.7         96.0         95.5         94.0         92.9                           |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N2           SG 4.5-145 NRS Mode N3           SG 4.5-145 NRS Mode N4           SG 4.5-145 NRS Mode N4           SG 4.5-145 NRS Mode N5  | 125           91.2           92.4           92.4           92.1           91.8           91.5           91.0           90.8           90.6           90.3           90.1           89.7           89.3           88.2           87.5           86.7  | 160           92.2           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           91.7           91.7           91.4           90.9           90.4           90.0           88.6           87.7           86.8  | 200<br>93.4<br>94.6<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>91.9<br>91.2<br>91.2<br>91.2<br>91.2<br>91.2<br>89.2<br>88.1<br>88.1   | 250<br>94.9<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>92.2<br>90.7<br>89.6<br>89.6   | 315           95.3           96.5           96.2           95.9           95.6           95.0           94.7           94.4           93.8           93.1           92.6           91.1           90.0           89.0                   | 400           95.0           96.2           96.2           95.9           95.6           95.3           94.7           94.4           94.1           93.8           93.5           92.8           92.3           90.8           89.7           88.7                | 500           95.1           96.3           96.0           95.7           95.4           94.8           94.5           94.2           93.6           92.9           92.4           90.9           89.8           88.8                               | 630           96.7           97.9           97.6           97.3           97.0           96.1           96.2           95.5           95.2           94.0           92.5           91.4           90.4  | 800           96.5           97.7           97.7           97.4           97.1           96.8           96.2           95.9           95.6           95.3           95.0           94.3           93.8           92.3           91.2           90.2   | 1000         97.5         98.7         98.7         98.1         97.8         97.2         96.9         96.3         96.0         95.3         94.8         93.3         92.2         91.2  | 1250         98.2         99.4         99.1         98.5         97.9         97.6         97.3         97.0         96.7         96.0         95.5         94.0         92.9         91.9              |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N3           SG 4.5-145 NRS Mode N4           SG 4.5-145 NRS Mode N5           SG 4.5-145 NRS Mode N5           SG 4.5-145 NRS Mode N6   | 125           91.2           92.4           92.4           92.4           92.1           91.5           91.5           91.0           90.8           90.3           90.1           89.7           89.3           88.2           87.5           86.7           85.3                               | <b>160</b> 92.2         93.4         93.4         93.1         92.5         91.7         91.7         91.7         91.7         90.4         90.9         90.4         90.9         90.4         90.0         88.6         87.7         86.8         85.2   | 97.5 <b>200</b> 93.4         94.6         94.3         94.0         93.7         93.1         92.8         92.5         92.2         91.9         91.2         90.7         89.2         88.1         87.1         85.2 | 250<br>94.9<br>96.1<br>95.8<br>95.5<br>95.5<br>94.6<br>94.3<br>94.0<br>93.7<br>93.7<br>93.4<br>92.7<br>92.2<br>90.7<br>89.6<br>88.6<br>88.6   | 800.3           915.3           96.5           96.5           96.5           95.6           95.0           94.7           94.1           93.8           93.1           92.6           91.1           90.0           89.0           87.1 | 400           95.0           96.2           95.9           95.6           95.3           94.7           94.4           93.8           93.5           92.8           92.8           90.8           89.7           88.7           86.8                               | 500           95.1           96.3           96.0           95.7           95.4           94.5           94.5           94.5           93.9           93.6           92.9           92.4           90.9           89.8           88.8           86.9 | 630           96.7           97.9           97.6           97.3           97.0           97.0           97.0           95.5           95.5           95.5           94.5           94.5           92.5           91.4           90.4           88.5 | 800           96.5           97.7           97.7           97.4           97.1           96.8           96.2           95.9           95.6           95.3           95.0           94.3           92.3           91.2           90.2           88.3   | 1000         97.5         98.7         98.7         98.1         97.5         98.7         98.7         98.7         98.7         98.7         98.7         98.7         98.7         98.7         97.8         97.8         97.2         96.9         96.6         96.3         96.0         95.3         94.8         93.3         92.2         91.2         89.3 | 1250         98.2         99.4         99.4         99.1         98.5         97.0         97.6         97.0         96.7         96.0         95.5         94.0         92.9         91.9         90.0 |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N2           SG 4.5-145 NRS Mode N3           SG 4.5-145 NRS Mode N4           SG 4.5-145 NRS Mode N5           SG 4.5-145 NRS Mode N5           SG 4.5-145 NRS Mode N6           SG 4.5-145 NRS Mode N6           SG 4.5-145 NRS Mode N7 | 125           91.2           92.4           92.4           92.4           92.1           91.5           91.5           91.0           90.8           90.6           90.3           90.1           89.7           89.3           88.2           87.5           86.7           85.3           84.6 | 160           92.2           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           93.4           92.5           91.9           91.7           91.4           90.9           90.4           90.0           88.6           87.7           86.8           85.2           84.3 | 200<br>93.4<br>94.6<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.5<br>92.2<br>91.9<br>91.2<br>91.9<br>91.2<br>91.2<br>91.9<br>91.2<br>91.9<br>91.2<br>88.1<br>85.2<br>88.1<br>85.2<br>84.2             | 250           94.9           96.1           95.5           95.5           95.2           94.6           94.3           94.0           93.7           93.4           92.7           90.7           89.6           88.6           86.7           85.7 | 80.3           95.3           96.5           96.5           96.5           95.9           95.6           95.0           94.1           93.8           93.1           92.6           91.1           90.0           87.1           86.1   | 400           95.0           96.2           96.2           95.9           95.6           95.3           94.7           94.4           94.1           93.8           93.5           92.8           92.3           90.8           89.7           86.8           85.8 | 500           95.1           96.3           96.3           96.3           95.7           95.4           94.5           94.2           93.6           92.9           92.4           90.9           89.8           86.9           85.9                | 630           96.7           97.9           97.6           97.3           97.0           97.3           97.4           95.5           95.2           94.0           92.5           91.4           90.4           88.5           87.5                | 800           96.5           97.7           97.7           97.4           97.7           97.4           97.7           97.4           97.7           97.7           97.7           97.7           97.7           97.7           97.7           97.4           97.1           96.8           96.2           95.9           95.6           95.3           95.0           94.3           93.8           92.3           91.2           90.2           88.3           87.3 | 1000         97.5         98.7         98.7         98.1         97.8         97.2         96.9         96.3         96.0         95.3         94.8         93.3         92.2         91.2         89.3         88.3  | 1250         98.2         99.4         99.1         98.5         97.6         97.3         97.0         96.7         96.0         95.5         94.0         92.9         91.9         90.0         89.0 |

SIEMENS Gamesa

GENERAL CHARACTERISTICS MANUAL

Code: GD381009-en
Date: 17/06/2019

Pg. 11 of 19

Rev: 3

## Title: SG 4.5-145 NOISE EMISSION ANALYSIS

| Central Frequency [Hz]          | 1600 | 2000 | 2500 | 3150 | 4000 | 5000 | 6300 | 8000 | 10000 |
|---------------------------------|------|------|------|------|------|------|------|------|-------|
| SG 4.5-145 Baseline AM0 @ 4.5MW | 98.1 | 97.0 | 95.6 | 93.4 | 90.3 | 86.0 | 80.8 | 75.0 | 70.4  |
| SG 4.5-145 AM+5 @ 5.0MW         | 99.3 | 98.2 | 96.8 | 94.6 | 91.5 | 87.2 | 82.0 | 76.2 | 71.6  |
| SG 4.5-145 AM+4 @ 4.9MW         | 99.3 | 98.2 | 96.8 | 94.6 | 91.5 | 87.2 | 82.0 | 76.2 | 71.6  |
| SG 4.5-145 AM+3 @ 4.8MW         | 99.0 | 97.9 | 96.5 | 94.3 | 91.2 | 86.9 | 81.7 | 75.9 | 71.3  |
| SG 4.5-145 AM+2 @ 4.7MW         | 98.7 | 97.6 | 96.2 | 94.0 | 90.9 | 86.6 | 81.4 | 75.6 | 71.0  |
| SG 4.5-145 AM+1 @ 4.6MW         | 98.4 | 97.3 | 95.9 | 93.7 | 90.6 | 86.3 | 81.1 | 75.3 | 70.7  |
| SG 4.5-145 AM-1 @ 4.4MW         | 97.8 | 96.7 | 95.3 | 93.1 | 90.0 | 85.7 | 80.5 | 74.7 | 70.1  |
| SG 4.5-145 AM-2 @ 4.3MW         | 97.5 | 96.4 | 95.0 | 92.8 | 89.7 | 85.4 | 80.2 | 74.4 | 69.8  |
| SG 4.5-145 AM-3 @ 4.2MW         | 97.2 | 96.1 | 94.7 | 92.5 | 89.4 | 85.1 | 79.9 | 74.1 | 69.5  |
| SG 4.5-145 AM-3 @ 4.1MW         | 96.9 | 95.8 | 94.4 | 92.2 | 89.1 | 84.8 | 79.6 | 73.8 | 69.2  |
| SG 4.5-145 AM-3 @ 4.0MW         | 96.6 | 95.5 | 94.1 | 91.9 | 88.8 | 84.5 | 79.3 | 73.5 | 68.9  |
| SG 4.5-145 NRS Mode N1          | 95.9 | 94.8 | 93.4 | 91.2 | 88.1 | 83.8 | 78.6 | 72.8 | 68.2  |
| SG 4.5-145 NRS Mode N2          | 95.4 | 94.3 | 92.9 | 90.7 | 87.6 | 83.3 | 78.1 | 72.3 | 67.7  |
| SG 4.5-145 NRS Mode N3          | 93.9 | 92.8 | 91.4 | 89.2 | 86.1 | 81.8 | 76.6 | 70.8 | 66.2  |
| SG 4.5-145 NRS Mode N4          | 92.8 | 91.7 | 90.3 | 88.1 | 85.0 | 80.7 | 75.5 | 69.7 | 65.1  |
| SG 4.5-145 NRS Mode N5          | 91.8 | 90.7 | 89.3 | 87.1 | 84.0 | 79.7 | 74.5 | 68.7 | 64.1  |
| SG 4.5-145 NRS Mode N6          | 89.9 | 88.8 | 87.4 | 85.2 | 82.1 | 77.8 | 72.6 | 66.8 | 62.2  |
| SG 4.5-145 NRS Mode N7          | 88.9 | 87.8 | 86.4 | 84.2 | 81.1 | 76.8 | 71.6 | 65.8 | 61.2  |
| SG 4.5-145 NRS Mode N8          | 87.9 | 86.8 | 85.4 | 83.2 | 80.1 | 75.8 | 70.6 | 64.8 | 60.2  |

**Table 7** One-third octave band noise spectra of SG 4.5-145 @ 9 m/s(ref SG145spectra\_4500KW\_R03\_17062018)

**SIEMENS** Gamesa RENEWABLE ENERGY

**GENERAL CHARACTERISTICS** MANUAL Date: 17/06/2019

Code: GD381009-en

Pg. 12 of 19

Rev: 3

Title: SG 4.5-145 NOISE EMISSION ANALYSIS

| Central Frequency [Hz]   | 10   | 12.5   | 16  | 20  | 25  | 31.5  | 40   | 50   | 63   | 80   | 100   |
|--|--|--|---|---|---|---|--|--|--|--|---|
| SG 4.5-145 Baseline AM0 @ 4.5MW  | 46.1   | 51.8   | 57.5  | 62.9  | 67.5  | 72.2  | 76.4   | 81.0   | 85.3   | 87.8   | 89.7  |
| SG 4.5-145 AM+5 @ 5.0MW  | 47.6   | 53.3   | 59.0  | 64.4  | 69.0  | 73.7  | 77.9   | 82.5   | 86.8   | 89.3   | 91.2  |
| SG 4.5-145 AM+4 @ 4.9MW  | 47.3   | 53.0   | 58.7  | 64.1  | 68.7  | 73.4  | 77.6   | 82.2   | 86.5   | 89.0   | 90.9  |
| SG 4.5-145 AM+3 @ 4.8MW  | 47.0   | 52.7   | 58.4  | 63.8  | 68.4  | 73.1  | 77.3   | 81.9   | 86.2   | 88.7   | 90.6  |
| SG 4.5-145 AM+2 @ 4.7MW  | 46.7   | 52.4   | 58.1  | 63.5  | 68.1  | 72.8  | 77.0   | 81.6   | 85.9   | 88.4   | 90.3  |
| SG 4.5-145 AM+1 @ 4.6MW  | 46.4   | 52.1   | 57.8  | 63.2  | 67.8  | 72.5  | 76.7   | 81.3   | 85.6   | 88.1   | 90.0  |
| SG 4.5-145 AM-1 @ 4.4MW  | 46.1   | 51.8   | 57.5  | 62.9  | 67.5  | 72.2  | 76.3   | 80.9   | 85.2   | 87.7   | 89.5  |
| SG 4.5-145 AM-2 @ 4.3MW  | 46.1   | 51.8   | 57.5  | 62.9  | 67.4  | 72.1  | 76.3   | 80.8   | 85.1   | 87.5   | 89.3  |
| SG 4.5-145 AM-3 @ 4.2MW  | 46.1   | 51.8   | 57.5  | 62.9  | 67.4  | 72.1  | 76.2   | 80.7   | 85.0   | 87.4   | 89.2  |
| SG 4.5-145 AM-3 @ 4.1MW  | 46.1   | 51.8   | 57.5  | 62.8  | 67.4  | 72.0  | 76.1   | 80.7   | 84.8   | 87.2   | 89.0  |
| SG 4.5-145 AM-3 @ 4.0MW  | 46.1   | 51.8   | 57.5  | 62.8  | 67.4  | 72.0  | 76.1   | 80.6   | 84.7   | 87.1   | 88.8  |
| SG 4.5-145 NRS Mode N1   | 46.1   | 51.8   | 57.4  | 62.8  | 67.3  | 71.9  | 75.9   | 80.4   | 84.5   | 86.8   | 88.4  |
| SG 4.5-145 NRS Mode N2   | 46.1   | 51.8   | 57.4  | 62.8  | 67.3  | 71.8  | 75.8   | 80.2   | 84.3   | 86.5   | 88.1  |
| SG 4.5-145 NRS Mode N3   | 46.1   | 51.8   | 57.4  | 62.7  | 67.1  | 71.6  | 75.5   | 79.8   | 83.7   | 85.8   | 87.2  |
| SG 4.5-145 NRS Mode N4   | 46.1   | 51.8   | 57.4  | 62.6  | 67.0  | 71.4  | 75.3   | 79.5   | 83.3   | 85.3   | 86.6  |
| SG 4.5-145 NRS Mode N5   | 46.1   | 51.8   | 57.4  | 62.6  | 66.9  | 71.3  | 75.1   | 79.2   | 82.9   | 84.8   | 86.0  |
| SG 4.5-145 NRS Mode N6   | 46.1   | 51.8   | 57.3  | 62.5  | 66.7  | 71.0  | 74.6   | 78.6   | 82.2   | 83.8   | 84.8  |
| SG 4.5-145 NRS Mode N7   | 46.1   | 51.7   | 57.3  | 62.4  | 66.6  | 70.8  | 74.4   | 78.3   | 81.8   | 83.4   | 84.2  |
| SG 4.5-145 NRS Mode N8   | 46.1   | 51.7   | 57.3  | 62.3  | 66.5  | 70.7  | 74.2   | 78.0   | 81.4   | 82.8   | 83.6  |
|  |  |  |   | 01.0  | 00.0  |   |  |  | •=   | 01.0   |   |
| Central Frequency [Hz]   | 125  | 160  | 200   | 250   | 315   | 400   | 500  | 630  | 800  | 1000   | 1250  |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW  | <b>125</b><br>91.2   | <b>160</b><br>92.2   | <b>200</b><br>93.4  | <b>250</b><br>94.9  | <b>315</b><br>95.3  | <b>400</b><br>95.0  | <b>500</b><br>95.1   | <b>630</b><br>96.7   | <b>800</b><br>96.5   | <b>1000</b><br>97.5  | <b>1250</b><br>98.2   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW   | <b>125</b><br>91.2<br>92.7   | <b>160</b><br>92.2<br>93.7   | <b>200</b><br>93.4<br>94.9  | <b>250</b><br>94.9<br>96.4  | <b>315</b><br>95.3<br>96.8  | <b>400</b><br>95.0<br>96.5  | <b>500</b><br>95.1<br>96.6   | <b>630</b><br>96.7<br>98.2   | <b>800</b><br>96.5<br>98.0   | <b>1000</b><br>97.5<br>99.0  | <b>1250</b><br>98.2<br>99.7   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW   | <b>125</b><br>91.2<br>92.7<br>92.4   | <b>160</b><br>92.2<br>93.7<br>93.4   | <b>200</b><br>93.4<br>94.9<br>94.6  | <b>250</b><br>94.9<br>96.4<br>96.1  | <b>315</b><br>95.3<br>96.8<br>96.5  | <b>400</b><br>95.0<br>96.5<br>96.2  | <b>500</b><br>95.1<br>96.6<br>96.3   | <b>630</b><br>96.7<br>98.2<br>97.9   | <b>800</b><br>96.5<br>98.0<br>97.7   | <b>1000</b><br>97.5<br>99.0<br>98.7  | <b>1250</b><br>98.2<br>99.7<br>99.4   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW   | <b>125</b><br>91.2<br>92.7<br>92.4<br>92.1   | <b>160</b><br>92.2<br>93.7<br>93.4<br>93.1   | <b>200</b><br>93.4<br>94.9<br>94.6<br>94.3  | <b>250</b><br>94.9<br>96.4<br>96.1<br>95.8  | <b>315</b><br>95.3<br>96.8<br>96.5<br>96.2  | <b>400</b><br>95.0<br>96.5<br>96.2<br>95.9  | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0   | <b>630</b><br>96.7<br>98.2<br>97.9<br>97.6   | <b>800</b><br>96.5<br>98.0<br>97.7<br>97.4   | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4  | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW   | <b>125</b><br>91.2<br>92.7<br>92.4<br>92.1<br>91.8   | <b>160</b><br>92.2<br>93.7<br>93.4<br>93.1<br>92.8   | <b>200</b><br>93.4<br>94.9<br>94.6<br>94.3<br>94.0  | <b>250</b><br>94.9<br>96.4<br>96.1<br>95.8<br>95.5  | <b>315</b><br>95.3<br>96.8<br>96.5<br>96.2<br>95.9  | <b>400</b><br>95.0<br>96.5<br>96.2<br>95.9<br>95.6  | <b>500</b><br>95.1<br>96.3<br>96.0<br>95.7   | 630<br>96.7<br>98.2<br>97.9<br>97.6<br>97.3  | <b>800</b><br>96.5<br>98.0<br>97.7<br>97.4<br>97.1   | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4<br>98.1  | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW   | <b>125</b><br>91.2<br>92.7<br>92.4<br>92.1<br>91.8<br>91.5   | <b>160</b><br>92.2<br>93.7<br>93.4<br>93.1<br>92.8<br>92.5   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7   | <b>250</b><br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2  | <b>315</b><br>95.3<br>96.8<br>96.5<br>96.2<br>95.9<br>95.6  | <b>400</b><br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3  | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4   | 630<br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0  | <b>800</b><br>96.5<br>98.0<br>97.7<br>97.4<br>97.1<br>96.8   | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4<br>98.1<br>97.8  | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW   | <b>125</b><br>91.2<br>92.7<br>92.4<br>92.1<br>91.8<br>91.5<br>91.0   | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6   | <b>315</b><br>95.3<br>96.8<br>96.5<br>96.2<br>95.9<br>95.6<br>95.0  | 400<br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7   | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8   | <b>630</b><br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0<br>96.4   | <b>800</b><br>96.5<br>98.0<br>97.7<br>97.4<br>97.1<br>96.8<br>96.2   | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4<br>98.1<br>97.8<br>97.2  | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>98.5   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW   | <b>125</b><br>91.2<br>92.7<br>92.4<br>92.1<br>91.8<br>91.5<br>91.0<br>90.8   | <b>160</b><br>92.2<br>93.7<br>93.4<br>93.1<br>92.8<br>92.5<br>91.9<br>91.7   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.5<br>95.2<br>94.6<br>94.3   | <b>315</b><br>95.3<br>96.8<br>96.5<br>96.2<br>95.9<br>95.6<br>95.0<br>95.0  | 400<br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4   | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8<br>94.8   | <b>630</b><br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0<br>96.4<br>96.1   | 800<br>96.5<br>98.0<br>97.7<br>97.4<br>97.1<br>96.8<br>96.2<br>95.9  | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4<br>98.1<br>97.8<br>97.2<br>96.9  | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-2 @ 4.2MW   | <b>125</b><br>91.2<br>92.7<br>92.4<br>92.1<br>91.8<br>91.5<br>91.0<br>90.8<br>90.6   | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.7           91.4   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5   | 250<br>94.9<br>96.4<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0   | <b>315</b><br>95.3<br>96.8<br>96.5<br>96.2<br>95.9<br>95.6<br>95.0<br>94.7<br>94.4  | 400<br>95.0<br>96.5<br>95.9<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4<br>94.1   | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>95.4<br>94.8<br>94.5<br>94.2   | 630<br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0<br>97.0<br>96.4<br>96.1<br>95.8  | 800<br>96.5<br>98.0<br>97.7<br>97.4<br>97.1<br>96.8<br>96.2<br>95.9<br>95.6  | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4<br>98.1<br>97.8<br>97.2<br>96.9<br>96.6  | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6<br>97.3   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.1MW   | <b>125</b><br>91.2<br>92.7<br>92.4<br>92.1<br>91.8<br>91.5<br>91.0<br>90.8<br>90.6<br>90.3   | <b>160</b><br>92.2<br>93.7<br>93.4<br>93.1<br>92.8<br>92.5<br>91.9<br>91.7<br>91.4<br>91.2   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>93.1<br>92.8<br>92.5<br>92.2   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7   | <b>315</b><br>95.3<br>96.8<br>96.5<br>96.2<br>95.9<br>95.6<br>95.0<br>94.7<br>94.4<br>94.1  | 400<br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4<br>94.1<br>93.8   | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.7<br>95.4<br>94.8<br>94.5<br>94.2<br>94.2<br>93.9   | 630<br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0<br>96.4<br>96.1<br>95.8<br>95.5  | 800<br>96.5<br>98.0<br>97.7<br>97.4<br>97.1<br>96.8<br>96.2<br>95.9<br>95.6<br>95.3  | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4<br>98.1<br>97.8<br>97.2<br>96.9<br>96.6<br>96.3  | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6<br>97.3<br>97.0   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.1MW           SG 4.5-145 AM-3 @ 4.1MW   | <b>125</b><br>91.2<br>92.7<br>92.4<br>92.1<br>91.8<br>91.5<br>91.0<br>90.8<br>90.6<br>90.3<br>90.1   | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.7           91.4           91.2           90.9   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>92.2<br>91.9   | 250<br>94.9<br>96.4<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4   | <b>315</b><br>95.3<br>96.8<br>96.5<br>96.2<br>95.9<br>95.6<br>95.0<br>94.7<br>94.4<br>94.1<br>93.8  | 400<br>95.0<br>96.5<br>95.9<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4<br>94.1<br>93.8<br>93.5   | <b>500</b><br>95.1<br>96.6<br>96.3<br>95.7<br>95.4<br>95.4<br>94.8<br>94.5<br>94.5<br>94.2<br>93.9<br>93.6   | 630<br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0<br>97.0<br>96.4<br>96.1<br>95.8<br>95.5<br>95.5  | 800           96.5           98.0           97.7           97.4           97.1           96.8           96.2           95.9           95.6           95.3           95.0   | 1000           97.5           99.0           98.7           98.1           97.8           97.2           96.9           96.3           96.0  | <b>1250</b> 98.2         99.7         99.4         99.1         98.5         98.5         97.9         97.6         97.3         97.0         96.7  |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.1MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW   | <b>125</b><br>91.2<br>92.7<br>92.4<br>92.1<br>91.8<br>91.5<br>91.0<br>90.8<br>90.6<br>90.3<br>90.1<br>89.7   | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.7           91.4           90.9           90.4   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>93.1<br>92.8<br>92.5<br>92.5<br>92.2<br>91.9<br>91.2   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7   | <b>315</b><br>95.3<br>96.8<br>96.5<br>96.2<br>95.0<br>95.0<br>95.0<br>94.7<br>94.4<br>93.8<br>93.1  | 400<br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.6<br>95.3<br>94.7<br>94.4<br>94.1<br>93.8<br>93.5<br>93.5   | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.7<br>94.8<br>94.8<br>94.5<br>94.2<br>93.9<br>93.6<br>93.6   | 630<br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>94.5  | <b>800</b><br>96.5<br>98.0<br>97.7<br>97.4<br>97.1<br>96.8<br>96.2<br>95.9<br>95.6<br>95.3<br>95.0<br>95.0<br>94.3   | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4<br>98.1<br>97.8<br>97.2<br>96.9<br>96.6<br>96.3<br>96.0<br>95.3  | 1250<br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6<br>97.3<br>97.0<br>97.0<br>96.7<br>96.0  |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.1MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N2   | <b>125</b><br>91.2<br>92.7<br>92.4<br>92.1<br>91.8<br>91.5<br>91.0<br>90.8<br>90.6<br>90.3<br>90.1<br>89.7<br>89.3   | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.7           91.4           90.9           90.4           90.4           90.0   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>92.2<br>91.9<br>91.2<br>90.7   | 250<br>94.9<br>96.4<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>92.2   | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0           94.7           94.1           93.8           93.1           92.6   | 400<br>95.0<br>96.5<br>95.9<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4<br>94.1<br>93.8<br>93.5<br>92.8<br>92.3   | <b>500</b><br>95.1<br>96.6<br>96.3<br>95.7<br>95.4<br>95.4<br>94.5<br>94.5<br>94.2<br>93.9<br>93.6<br>92.9<br>92.4   | 630<br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0<br>97.0<br>96.4<br>96.1<br>95.8<br>95.5<br>95.5<br>95.5<br>94.5<br>94.5  | 800           96.5           98.0           97.7           97.4           97.1           96.8           96.2           95.9           95.6           95.3           95.0           94.3           93.8   | 1000           97.5           99.0           98.7           98.1           97.8           97.2           96.9           96.6           96.3           96.0           95.3           94.8   | <b>1250</b> 98.2         99.7         99.4         99.1         98.5         98.5         97.9         97.6         97.3         97.0         96.7         96.0         95.5  |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.1MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N2           SG 4.5-145 NRS Mode N3  | <b>125</b><br>91.2<br>92.7<br>92.4<br>92.1<br>91.8<br>91.5<br>91.0<br>90.8<br>90.6<br>90.3<br>90.3<br>90.1<br>89.7<br>89.3<br>88.2   | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.7           91.4           90.9           90.4           90.9           90.4           90.0           88.6   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>91.9<br>91.2<br>91.2<br>90.7<br>89.2                                 | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.5<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>92.2<br>90.7   | <b>315</b><br>95.3<br>96.8<br>96.5<br>96.2<br>95.0<br>95.0<br>95.0<br>94.7<br>94.4<br>94.1<br>93.8<br>93.1<br>93.8<br>93.1<br>92.6<br>91.1  | 400<br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4<br>94.1<br>93.8<br>93.5<br>92.8<br>92.3<br>92.8   | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8<br>94.5<br>94.5<br>94.2<br>93.6<br>92.9<br>92.4<br>92.4<br>90.9   | 630<br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>94.5<br>94.5<br>94.0<br>92.5  | 800           96.5           98.0           97.7           97.4           97.1           96.8           96.2           95.9           95.6           95.3           95.0           94.3           92.3   | 1000         97.5         99.0         98.7         98.1         97.8         97.2         96.9         96.3         96.0         95.3         94.8         93.3   | 1250<br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6<br>97.3<br>97.0<br>97.0<br>97.0<br>95.5<br>96.0  |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N2           SG 4.5-145 NRS Mode N3           SG 4.5-145 NRS Mode N4   | <b>125</b><br>91.2<br>92.7<br>92.4<br>92.1<br>91.8<br>91.5<br>91.0<br>90.8<br>90.6<br>90.3<br>90.1<br>89.7<br>89.3<br>88.2<br>87.5   | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.7           91.4           90.9           90.4           90.9           90.4           90.0           88.6           87.7  | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>92.2<br>91.9<br>91.2<br>90.7<br>89.2<br>88.1                         | 250<br>94.9<br>96.4<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>92.2<br>90.7<br>89.6   | 315         95.3         96.8         96.5         96.2         95.9         95.6         95.0         94.7         94.4         94.1         93.8         93.1         92.6         91.1         90.0  | 400<br>95.0<br>96.5<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4<br>94.1<br>93.8<br>93.5<br>92.8<br>92.3<br>92.8<br>92.3<br>90.8   | <b>500</b><br>95.1<br>96.6<br>96.3<br>95.7<br>95.4<br>94.5<br>94.5<br>94.5<br>94.2<br>93.9<br>93.6<br>92.9<br>92.4<br>90.9<br>89.8   | 630           96.7           98.2           97.9           97.6           97.0           96.1           96.1           95.8           95.5           94.5           94.5           92.5           91.4   | 800           96.5           98.0           97.7           97.4           97.1           96.8           96.2           95.9           95.6           95.3           95.0           94.3           93.8           92.3           91.2                               | 1000           97.5           99.0           98.7           98.1           97.8           97.2           96.9           96.3           96.0           95.3           94.8           93.3           92.2  | <b>1250</b> 98.2         99.7         99.4         99.1         98.5         97.0         97.6         97.0         96.7         96.0         95.5         94.0         92.9  |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N3           SG 4.5-145 NRS Mode N3           SG 4.5-145 NRS Mode N4           SG 4.5-145 NRS Mode N5   | <b>125</b><br>91.2<br>92.7<br>92.4<br>92.1<br>91.8<br>91.5<br>91.0<br>90.8<br>90.6<br>90.3<br>90.3<br>90.1<br>89.7<br>89.3<br>88.2<br>87.5<br>86.7                         | 160           92.2           93.7           93.4           93.1           92.5           91.7           91.7           91.7           91.7           90.4           90.9           90.4           90.9           90.4           90.7           91.7           91.7           91.7           91.7           91.7           91.7           90.9           90.4           90.0           88.6           87.7           86.8 | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.7<br>93.7<br>92.8<br>92.5<br>92.2<br>91.9<br>91.2<br>91.2<br>91.2<br>90.7<br>89.2<br>88.1<br>87.1 | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>93.4<br>92.7<br>92.2<br>90.7<br>89.6<br>88.6         | <b>315</b><br>95.3<br>96.8<br>96.5<br>96.2<br>95.9<br>95.0<br>95.0<br>94.7<br>94.4<br>94.1<br>93.8<br>93.1<br>93.1<br>93.1<br>92.6<br>91.1<br>90.0<br>89.0  | 400<br>95.0<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4<br>93.8<br>93.5<br>92.8<br>92.3<br>92.8<br>92.3<br>90.8<br>89.7<br>88.7   | <b>500</b><br>95.1<br>96.6<br>96.3<br>95.7<br>95.4<br>94.8<br>94.5<br>94.5<br>94.2<br>93.9<br>93.6<br>92.9<br>92.4<br>90.9<br>89.8<br>89.8   | 630           96.7           98.2           97.9           97.6           97.3           97.0           96.1           96.3           97.0           95.5           95.5           94.5           94.0           92.5           91.4           90.4  | 800           96.5           98.0           97.7           97.4           97.1           96.8           96.2           95.9           95.6           95.3           95.0           94.3           92.3           91.2           90.2                               | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4<br>98.1<br>97.8<br>97.2<br>96.9<br>96.9<br>96.3<br>96.0<br>95.3<br>96.0<br>95.3<br>94.8<br>93.3<br>92.2<br>91.2  | 1250<br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6<br>97.3<br>97.0<br>97.0<br>95.5<br>94.0<br>92.9<br>91.9  |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.1MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N3           SG 4.5-145 NRS Mode N4           SG 4.5-145 NRS Mode N4           SG 4.5-145 NRS Mode N5           SG 4.5-145 NRS Mode N5           SG 4.5-145 NRS Mode N6                                   | <b>125</b><br>91.2<br>92.7<br>92.4<br>92.1<br>91.8<br>91.5<br>91.0<br>90.8<br>90.6<br>90.3<br>90.6<br>90.3<br>90.1<br>89.7<br>89.3<br>88.2<br>87.5<br>86.7<br>85.3         | 160           92.2           93.7           93.4           93.1           92.5           91.7           91.7           91.7           91.7           90.9           90.4           90.9           90.4           90.0           88.6           87.7           86.8           85.2  | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>92.2<br>91.9<br>91.2<br>91.2<br>90.7<br>89.2<br>89.2<br>89.2<br>89.2 | 250<br>94.9<br>96.4<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>92.2<br>90.7<br>89.6<br>88.6<br>88.6                                 | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0           94.7           94.1           93.8           93.1           92.6           91.1           90.0           89.0           87.1 | 400<br>95.0<br>96.5<br>95.9<br>95.9<br>95.3<br>95.3<br>95.3<br>94.7<br>94.4<br>93.8<br>93.5<br>92.8<br>92.3<br>92.8<br>92.3<br>92.8<br>89.7<br>88.7<br>88.7                 | <b>500</b><br>95.1<br>96.6<br>96.3<br>95.7<br>95.4<br>94.5<br>94.5<br>94.5<br>94.2<br>93.9<br>93.6<br>92.4<br>92.4<br>90.9<br>89.8<br>88.8<br>88.8   | 630           96.7           98.2           97.9           97.6           97.0           96.1           96.1           95.5           95.5           94.5           94.5           91.4           90.4           88.5  | 800           96.5           98.0           97.7           97.4           97.1           96.8           96.2           95.9           95.6           95.3           95.0           94.3           92.3           91.2           90.2           88.3                | 1000         97.5         99.0         98.7         98.1         97.5         98.1         97.8         97.2         96.9         96.6         96.3         96.0         95.3         94.8         93.3         92.2         91.2         89.3 | 1250<br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6<br>97.6<br>97.3<br>97.0<br>97.0<br>95.5<br>94.0<br>92.9<br>91.9<br>91.9<br>90.0  |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N3           SG 4.5-145 NRS Mode N4           SG 4.5-145 NRS Mode N5           SG 4.5-145 NRS Mode N5           SG 4.5-145 NRS Mode N6           SG 4.5-145 NRS Mode N7 | <b>125</b><br>91.2<br>92.7<br>92.4<br>92.1<br>91.8<br>91.5<br>91.0<br>90.8<br>90.6<br>90.3<br>90.3<br>90.3<br>90.1<br>89.7<br>89.3<br>88.2<br>87.5<br>86.7<br>85.3<br>84.6 | 160           92.2           93.7           93.4           93.1           92.5           91.7           91.7           91.7           91.7           90.9           90.4           90.9           90.4           90.9           90.4           88.6           87.7           86.8           85.2           84.3  | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>92.2<br>91.9<br>91.2<br>91.2<br>91.2<br>91.2<br>91.2                 | 250<br>94.9<br>96.4<br>95.8<br>95.5<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>93.4<br>92.7<br>92.2<br>90.7<br>89.6<br>88.6<br>88.6<br>86.7 | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0           94.7           94.4           93.8           93.1           92.6           91.1           90.0           87.1           86.1 | 400<br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4<br>94.1<br>94.1<br>93.8<br>94.4<br>93.5<br>92.8<br>92.8<br>92.8<br>92.8<br>92.8<br>92.8<br>92.8<br>92.8 | <b>500</b><br>95.1<br>96.6<br>96.3<br>95.7<br>95.7<br>95.4<br>94.8<br>94.5<br>94.5<br>94.2<br>93.6<br>92.9<br>93.6<br>92.9<br>92.4<br>92.9<br>92.4<br>90.9<br>89.8<br>89.8<br>88.8<br>86.9<br>85.9 | 630           96.7           98.2           97.9           97.6           97.3           97.0           96.1           96.3           97.0           96.4           95.5           95.2           94.5           94.0           92.5           91.4           90.4           88.5           87.5 | 800           96.5           98.0           97.7           97.4           97.1           96.8           96.2           95.9           95.6           95.3           95.0           94.3           92.3           91.2           90.2           88.3           87.3 | 1000         97.5         99.0         98.7         98.1         97.5         96.0         97.2         96.3         96.3         96.3         95.3         94.8         93.3         92.2         91.2         88.3                           | 1250         98.2         99.7         99.4         99.1         98.5         97.0         97.6         97.3         96.7         96.7         96.7         96.7         96.0         95.5         94.0         92.9         91.9         90.0         89.0 |

SIEMENS Gamesa

GENERAL CHARACTERISTICS MANUAL

Code: GD381009-en
Date: 17/06/2019

Pg. 13 of 19

Rev: 3

Title: SG 4.5-145 NOISE EMISSION ANALYSIS

| Central Frequency [Hz]          | 1600 | 2000 | 2500 | 3150 | 4000 | 5000 | 6300 | 8000 | 10000 |
|---------------------------------|------|------|------|------|------|------|------|------|-------|
| SG 4.5-145 Baseline AM0 @ 4.5MW | 98.1 | 97.0 | 95.6 | 93.4 | 90.3 | 86.0 | 80.8 | 75.0 | 70.4  |
| SG 4.5-145 AM+5 @ 5.0MW         | 99.6 | 98.5 | 97.1 | 94.9 | 91.8 | 87.5 | 82.3 | 76.5 | 71.9  |
| SG 4.5-145 AM+4 @ 4.9MW         | 99.3 | 98.2 | 96.8 | 94.6 | 91.5 | 87.2 | 82.0 | 76.2 | 71.6  |
| SG 4.5-145 AM+3 @ 4.8MW         | 99.0 | 97.9 | 96.5 | 94.3 | 91.2 | 86.9 | 81.7 | 75.9 | 71.3  |
| SG 4.5-145 AM+2 @ 4.7MW         | 98.7 | 97.6 | 96.2 | 94.0 | 90.9 | 86.6 | 81.4 | 75.6 | 71.0  |
| SG 4.5-145 AM+1 @ 4.6MW         | 98.4 | 97.3 | 95.9 | 93.7 | 90.6 | 86.3 | 81.1 | 75.3 | 70.7  |
| SG 4.5-145 AM-1 @ 4.4MW         | 97.8 | 96.7 | 95.3 | 93.1 | 90.0 | 85.7 | 80.5 | 74.7 | 70.1  |
| SG 4.5-145 AM-2 @ 4.3MW         | 97.5 | 96.4 | 95.0 | 92.8 | 89.7 | 85.4 | 80.2 | 74.4 | 69.8  |
| SG 4.5-145 AM-3 @ 4.2MW         | 97.2 | 96.1 | 94.7 | 92.5 | 89.4 | 85.1 | 79.9 | 74.1 | 69.5  |
| SG 4.5-145 AM-3 @ 4.1MW         | 96.9 | 95.8 | 94.4 | 92.2 | 89.1 | 84.8 | 79.6 | 73.8 | 69.2  |
| SG 4.5-145 AM-3 @ 4.0MW         | 96.6 | 95.5 | 94.1 | 91.9 | 88.8 | 84.5 | 79.3 | 73.5 | 68.9  |
| SG 4.5-145 NRS Mode N1          | 95.9 | 94.8 | 93.4 | 91.2 | 88.1 | 83.8 | 78.6 | 72.8 | 68.2  |
| SG 4.5-145 NRS Mode N2          | 95.4 | 94.3 | 92.9 | 90.7 | 87.6 | 83.3 | 78.1 | 72.3 | 67.7  |
| SG 4.5-145 NRS Mode N3          | 93.9 | 92.8 | 91.4 | 89.2 | 86.1 | 81.8 | 76.6 | 70.8 | 66.2  |
| SG 4.5-145 NRS Mode N4          | 92.8 | 91.7 | 90.3 | 88.1 | 85.0 | 80.7 | 75.5 | 69.7 | 65.1  |
| SG 4.5-145 NRS Mode N5          | 91.8 | 90.7 | 89.3 | 87.1 | 84.0 | 79.7 | 74.5 | 68.7 | 64.1  |
| SG 4.5-145 NRS Mode N6          | 89.9 | 88.8 | 87.4 | 85.2 | 82.1 | 77.8 | 72.6 | 66.8 | 62.2  |
| SG 4.5-145 NRS Mode N7          | 88.9 | 87.8 | 86.4 | 84.2 | 81.1 | 76.8 | 71.6 | 65.8 | 61.2  |
| SG 4.5-145 NRS Mode N8          | 87.9 | 86.8 | 85.4 | 83.2 | 80.1 | 75.8 | 70.6 | 64.8 | 60.2  |

**Table 8** One-third octave band noise spectra of SG 4.5-145 @ 10 m/s(ref SG145spectra\_4500KW\_R03\_17062018)

**SIEMENS** Gamesa RENEWABLE ENERGY

Code: GD381009-en **GENERAL CHARACTERISTICS** MANUAL Date: 17/06/2019

Pg. 14 of 19

Rev: 3

Title: SG 4.5-145 NOISE EMISSION ANALYSIS

| Central Frequency [Hz]  | 10   | 12.5   | 16  | 20  | 25  | 31.5  | 40   | 50  | 63   | 80  | 100   |
|---|--|--|---|---|---|---|--|---|--|---|---|
| SG 4.5-145 Baseline AM0 @ 4.5MW   | 46.1   | 51.8   | 57.5  | 62.9  | 67.5  | 72.2  | 76.4   | 81.0  | 85.3   | 87.8  | 89.7  |
| SG 4.5-145 AM+5 @ 5.0MW   | 47.6   | 53.3   | 59.0  | 64.4  | 69.0  | 73.7  | 77.9   | 82.5  | 86.8   | 89.3  | 91.2  |
| SG 4.5-145 AM+4 @ 4.9MW   | 47.3   | 53.0   | 58.7  | 64.1  | 68.7  | 73.4  | 77.6   | 82.2  | 86.5   | 89.0  | 90.9  |
| SG 4.5-145 AM+3 @ 4.8MW   | 47.0   | 52.7   | 58.4  | 63.8  | 68.4  | 73.1  | 77.3   | 81.9  | 86.2   | 88.7  | 90.6  |
| SG 4.5-145 AM+2 @ 4.7MW   | 46.7   | 52.4   | 58.1  | 63.5  | 68.1  | 72.8  | 77.0   | 81.6  | 85.9   | 88.4  | 90.3  |
| SG 4.5-145 AM+1 @ 4.6MW   | 46.4   | 52.1   | 57.8  | 63.2  | 67.8  | 72.5  | 76.7   | 81.3  | 85.6   | 88.1  | 90.0  |
| SG 4.5-145 AM-1 @ 4.4MW   | 46.1   | 51.8   | 57.5  | 62.9  | 67.5  | 72.2  | 76.3   | 80.9  | 85.2   | 87.7  | 89.5  |
| SG 4.5-145 AM-2 @ 4.3MW   | 46.1   | 51.8   | 57.5  | 62.9  | 67.4  | 72.1  | 76.3   | 80.8  | 85.1   | 87.5  | 89.3  |
| SG 4.5-145 AM-3 @ 4.2MW   | 46.1   | 51.8   | 57.5  | 62.9  | 67.4  | 72.1  | 76.2   | 80.7  | 85.0   | 87.4  | 89.2  |
| SG 4.5-145 AM-3 @ 4.1MW   | 46.1   | 51.8   | 57.5  | 62.8  | 67.4  | 72.0  | 76.1   | 80.7  | 84.8   | 87.2  | 89.0  |
| SG 4.5-145 AM-3 @ 4.0MW   | 46.1   | 51.8   | 57.5  | 62.8  | 67.4  | 72.0  | 76.1   | 80.6  | 84.7   | 87.1  | 88.8  |
| SG 4.5-145 NRS Mode N1  | 46.1   | 51.8   | 57.4  | 62.8  | 67.3  | 71.9  | 75.9   | 80.4  | 84.5   | 86.8  | 88.4  |
| SG 4.5-145 NRS Mode N2  | 46.1   | 51.8   | 57.4  | 62.8  | 67.3  | 71.8  | 75.8   | 80.2  | 84.3   | 86.5  | 88.1  |
| SG 4.5-145 NRS Mode N3  | 46.1   | 51.8   | 57.4  | 62.7  | 67.1  | 71.6  | 75.5   | 79.8  | 83.7   | 85.8  | 87.2  |
| SG 4.5-145 NRS Mode N4  | 46.1   | 51.8   | 57.4  | 62.6  | 67.0  | 71.4  | 75.3   | 79.5  | 83.3   | 85.3  | 86.6  |
| SG 4.5-145 NRS Mode N5  | 46.1   | 51.8   | 57.4  | 62.6  | 66.9  | 71.3  | 75.1   | 79.2  | 82.9   | 84.8  | 86.0  |
| SG 4.5-145 NRS Mode N6  | 46.1   | 51.8   | 57.3  | 62.5  | 66.7  | 71.0  | 74.6   | 78.6  | 82.2   | 83.8  | 84.8  |
| SG 4.5-145 NRS Mode N7  | 46.1   | 51.7   | 57.3  | 62.4  | 66.6  | 70.8  | 74.4   | 78.3  | 81.8   | 83.4  | 84.2  |
| SG 4.5-145 NRS Mode N8  | 46.1   | 51.7   | 57.3  | 62.3  | 66 5  | 70.7  | 74.2   | 78.0  | 81.4   | 82.8  | 83.6  |
|   | 1011   | 0 =  | 5,15  | 0215  | 0015  | , 01,   | /=   |   | 0  |   |   |
| Central Frequency [Hz]  | 125  | 160  | 200   | 250   | 315   | 400   | 500  | 630   | 800  | 1000  | 1250  |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW   | <b>125</b><br>91.2   | <b>160</b><br>92.2   | <b>200</b><br>93.4  | <b>250</b><br>94.9  | <b>315</b><br>95.3  | <b>400</b><br>95.0  | <b>500</b><br>95.1   | <b>630</b><br>96.7  | <b>800</b><br>96.5   | <b>1000</b><br>97.5   | <b>1250</b><br>98.2   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW  | <b>125</b><br>91.2<br>92.7   | <b>160</b><br>92.2<br>93.7   | <b>200</b><br>93.4<br>94.9  | <b>250</b><br>94.9<br>96.4  | <b>315</b><br>95.3<br>96.8  | <b>400</b><br>95.0<br>96.5  | <b>500</b><br>95.1<br>96.6   | <b>630</b><br>96.7<br>98.2  | <b>800</b><br>96.5<br>98.0   | <b>1000</b><br>97.5<br>99.0   | <b>1250</b><br>98.2<br>99.7   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW  | <b>125</b><br>91.2<br>92.7<br>92.4   | <b>160</b><br>92.2<br>93.7<br>93.4   | <b>200</b><br>93.4<br>94.9<br>94.6  | <b>250</b><br>94.9<br>96.4<br>96.1  | <b>315</b><br>95.3<br>96.8<br>96.5  | <b>400</b><br>95.0<br>96.5<br>96.2  | <b>500</b><br>95.1<br>96.6<br>96.3   | <b>630</b><br>96.7<br>98.2<br>97.9  | <b>800</b><br>96.5<br>98.0<br>97.7   | <b>1000</b><br>97.5<br>99.0<br>98.7   | <b>1250</b><br>98.2<br>99.7<br>99.4   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW  | <b>125</b><br>91.2<br>92.7<br>92.4<br>92.1   | <b>160</b><br>92.2<br>93.7<br>93.4<br>93.1   | <b>200</b><br>93.4<br>94.9<br>94.6<br>94.3  | <b>250</b><br>94.9<br>96.4<br>96.1<br>95.8  | <b>315</b><br>95.3<br>96.8<br>96.5<br>96.2  | <b>400</b><br>95.0<br>96.5<br>96.2<br>95.9  | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0   | <b>630</b><br>96.7<br>98.2<br>97.9<br>97.6  | <b>800</b><br>96.5<br>98.0<br>97.7<br>97.4   | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4   | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW  | <b>125</b> 91.2         92.7         92.4         92.1         91.8  | <b>160</b><br>92.2<br>93.7<br>93.4<br>93.1<br>92.8   | <b>200</b><br>93.4<br>94.9<br>94.6<br>94.3<br>94.0  | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5   | <b>315</b><br>95.3<br>96.8<br>96.5<br>96.2<br>95.9  | <b>400</b><br>95.0<br>96.5<br>96.2<br>95.9<br>95.6  | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7   | 630<br>96.7<br>98.2<br>97.9<br>97.6<br>97.3   | <b>800</b><br>96.5<br>98.0<br>97.7<br>97.4<br>97.1   | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4<br>98.1   | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW  | 125         91.2         92.7         92.4         92.1         91.8         91.5  | <b>160</b><br>92.2<br>93.7<br>93.4<br>93.1<br>92.8<br>92.5   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2   | <b>315</b><br>95.3<br>96.8<br>96.5<br>96.2<br>95.9<br>95.6  | <b>400</b><br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3  | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4   | 630<br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0   | <b>800</b><br>96.5<br>98.0<br>97.7<br>97.4<br>97.1<br>96.8   | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4<br>98.1<br>97.8   | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW  | <b>125</b><br>91.2<br>92.7<br>92.4<br>92.1<br>91.8<br>91.5<br>91.0   | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6   | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0  | 400<br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7   | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>95.4   | 630<br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0<br>96.4   | <b>800</b><br>96.5<br>98.0<br>97.7<br>97.4<br>97.1<br>96.8<br>96.2   | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4<br>98.1<br>97.8<br>97.2   | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW  | <b>125</b><br>91.2<br>92.7<br>92.4<br>92.1<br>91.8<br>91.5<br>91.0<br>90.8   | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.7  | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3   | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0           94.7   | <b>400</b><br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4  | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8<br>94.5   | <b>630</b><br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0<br>96.4<br>96.1  | <b>800</b><br>96.5<br>98.0<br>97.7<br>97.4<br>97.1<br>96.8<br>96.2<br>95.9   | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4<br>98.1<br>97.8<br>97.2<br>96.9   | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>98.5<br>97.9   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-2 @ 4.3MW  | 125<br>91.2<br>92.7<br>92.4<br>92.1<br>91.8<br>91.5<br>91.0<br>90.8<br>90.6  | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.7           91.4   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>95.2<br>94.6<br>94.3<br>94.0   | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0           94.7           94.4  | <b>400</b><br>95.0<br>96.5<br>95.9<br>95.9<br>95.3<br>94.7<br>94.4<br>94.1  | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>95.4<br>94.8<br>94.5<br>94.2   | 630<br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0<br>96.4<br>96.1<br>95.8   | 800<br>96.5<br>98.0<br>97.7<br>97.4<br>97.1<br>96.8<br>96.2<br>95.9<br>95.6  | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4<br>98.1<br>97.8<br>97.2<br>96.9<br>96.6   | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6<br>97.3   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+2 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW  | 125           91.2           92.7           92.4           92.1           91.8           91.5           91.0           90.8           90.6           90.3  | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.4           91.2   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7   | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0           94.7           94.1  | <b>400</b><br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4<br>94.1<br>93.8  | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8<br>94.5<br>94.2<br>93.9   | 630<br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0<br>96.4<br>96.1<br>95.8<br>95.5   | 800           96.5           98.0           97.7           97.4           97.1           96.8           96.2           95.9           95.6           95.3  | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4<br>98.1<br>97.8<br>97.2<br>96.9<br>96.6<br>96.3   | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6<br>97.3<br>97.0   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.1MW           SG 4.5-145 AM-3 @ 4.0MW  | 125           91.2           92.7           92.4           92.1           91.5           91.0           90.8           90.6           90.3           90.1  | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.7           91.4           91.2           90.9   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>91.9   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4   | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0           94.7           94.1           93.8   | 400<br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4<br>94.1<br>93.8<br>93.5   | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>95.4<br>94.5<br>94.5<br>94.2<br>93.9<br>93.6   | 630<br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0<br>97.0<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2   | <b>800</b><br>96.5<br>98.0<br>97.7<br>97.4<br>97.1<br>96.8<br>96.2<br>95.9<br>95.6<br>95.3<br>95.0   | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4<br>98.1<br>97.8<br>97.2<br>96.9<br>96.6<br>96.3<br>96.0   | <b>1250</b> 98.2         99.7         99.4         99.1         98.5         98.5         97.9         97.6         97.0         97.0         96.7  |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.1MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW  | 125           91.2           92.7           92.4           92.1           91.8           91.5           91.0           90.8           90.6           90.3           90.1           89.7  | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.7           91.4           90.9           90.9           90.9  | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>91.9<br>91.2   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7   | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0           94.7           94.4           93.8           93.1  | <b>400</b><br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4<br>94.1<br>93.8<br>93.5<br>92.8  | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8<br>94.5<br>94.2<br>94.2<br>93.9<br>93.6<br>92.9   | 630<br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>95.2   | 800         96.5         98.0         97.7         97.4         97.1         96.8         96.2         95.9         95.6         95.0         94.3   | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4<br>98.1<br>97.8<br>97.2<br>96.9<br>96.6<br>96.3<br>96.0<br>95.3   | <b>1250</b> 98.2         99.7         99.4         99.1         98.8         98.5         97.9         97.6         97.3         96.7         96.7         96.0   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.1MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N2  | 125           91.2           92.7           92.4           92.1           91.5           91.0           90.8           90.6           90.3           90.1           89.7           89.3  | 160           92.2           93.7           93.4           93.1           92.5           91.7           91.7           91.7           91.7           90.4           90.9           90.4           90.9           90.4           90.9   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>91.9<br>91.2<br>90.7   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>92.2   | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0           94.7           94.1           93.8           93.1           92.6   | 400<br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3<br>95.3<br>94.7<br>94.4<br>94.1<br>93.8<br>93.5<br>92.8<br>92.3   | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>95.4<br>94.5<br>94.5<br>94.5<br>94.2<br>93.9<br>93.6<br>92.9<br>92.4   | 630           96.7           98.2           97.9           97.6           97.0           96.1           96.1           95.8           95.5           94.5           94.0  | 800         96.5         98.0         97.7         97.4         97.1         96.8         96.2         95.9         95.6         95.3         95.0         94.3         93.8   | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4<br>98.1<br>97.8<br>97.2<br>96.9<br>96.6<br>96.3<br>96.3<br>96.0<br>95.3<br>94.8   | 1250<br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6<br>97.6<br>97.3<br>97.0<br>97.0<br>96.7<br>96.0  |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N2           SG 4.5-145 NRS Mode N3   | 125           91.2           92.7           92.4           92.1           91.8           91.5           91.0           90.8           90.6           90.3           90.1           89.7           89.3           88.2                | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.7           91.4           90.9           90.4           90.9           90.4           90.0           88.6   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>91.9<br>91.2<br>90.7<br>89.2   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>92.2<br>90.7   | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0           94.7           94.4           93.8           93.1           92.6           91.1  | <b>400</b><br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4<br>94.1<br>93.8<br>93.5<br>92.8<br>92.3<br>92.3  | <b>500</b><br>95.1<br>96.6<br>96.3<br>95.7<br>95.4<br>94.8<br>94.5<br>94.2<br>94.2<br>93.9<br>93.6<br>92.9<br>92.4<br>90.9   | 630           96.7           98.2           97.9           97.6           97.3           97.0           96.1           96.4           95.8           95.2           94.5           94.0           92.5  | 800         96.5         98.0         97.7         97.4         97.1         96.8         96.2         95.9         95.6         95.3         95.0         94.3         93.8         92.3  | 1000         97.5         99.0         98.7         98.1         97.8         97.2         96.9         96.6         96.3         96.0         95.3         94.8         93.3   | 1250         98.2         99.7         99.4         99.1         98.5         97.9         97.6         97.3         96.7         96.7         96.7         95.5         94.0   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.1MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N2           SG 4.5-145 NRS Mode N3           SG 4.5-145 NRS Mode N4  | 125           91.2           92.7           92.4           92.1           91.5           91.5           91.6           90.8           90.6           90.3           90.1           89.7           89.3           88.2           87.5 | 160           92.2           93.7           93.4           93.1           92.5           91.7           91.7           91.7           91.7           90.4           90.9           90.4           90.9           90.4           90.7           91.7           90.9           90.4           90.0           88.6           87.7 | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>91.9<br>91.2<br>91.2<br>90.7<br>89.2<br>88.1                                 | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.7<br>93.4<br>92.7<br>92.2<br>90.7<br>89.6                                 | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0           94.7           94.1           93.8           93.1           92.6           91.1           90.0                               | 400<br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3<br>95.3<br>94.7<br>94.4<br>93.8<br>93.5<br>92.8<br>92.3<br>92.8<br>92.3<br>90.8<br>89.7   | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8<br>94.5<br>94.5<br>94.2<br>93.9<br>93.6<br>92.9<br>92.4<br>90.9<br>89.8   | 630           96.7           98.2           97.9           97.6           97.0           96.1           96.1           95.8           95.5           94.5           94.5           92.5           91.4  | 800         96.5         98.0         97.7         97.4         97.1         96.8         96.2         95.9         95.6         95.3         95.0         94.3         92.3         91.2  | <b>1000</b> 97.5         99.0         98.7         98.1         97.8         97.2         96.9         96.6         96.3         96.0         95.3         94.8         93.3         92.2   | 1250<br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6<br>97.6<br>97.3<br>97.0<br>97.0<br>95.5<br>96.0<br>95.5<br>94.0  |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N2           SG 4.5-145 NRS Mode N3           SG 4.5-145 NRS Mode N4           SG 4.5-145 NRS Mode N4           SG 4.5-145 NRS Mode N4  | 125<br>91.2<br>92.7<br>92.4<br>92.1<br>91.8<br>91.5<br>91.0<br>90.8<br>90.6<br>90.3<br>90.6<br>90.3<br>90.1<br>89.7<br>89.3<br>89.3<br>88.2<br>87.5<br>86.7  | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.7           91.4           90.9           90.4           90.0           88.6           87.7           86.8   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>92.2<br>91.9<br>91.2<br>90.7<br>89.2<br>88.1<br>89.2                         | 250<br>94.9<br>96.4<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>92.2<br>90.7<br>89.6<br>88.6   | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0           94.7           94.1           93.8           93.1           92.6           91.1           90.0           89.0                | 400<br>95.0<br>96.5<br>95.9<br>95.3<br>95.3<br>95.3<br>95.3<br>95.3<br>94.7<br>94.4<br>93.8<br>93.5<br>92.3<br>92.3<br>92.3<br>92.3<br>92.3<br>92.3<br>89.7<br>88.7                                 | <b>500</b><br>95.1<br>96.6<br>96.3<br>95.7<br>95.4<br>95.4<br>94.5<br>94.5<br>94.5<br>94.2<br>93.9<br>93.6<br>93.6<br>92.9<br>92.4<br>90.9<br>89.8<br>88.8                                 | 630           96.7           98.2           97.9           97.6           97.3           97.0           96.1           96.1           95.5           95.2           94.5           94.0           92.5           91.4           90.4                | 800         96.5         98.0         97.7         97.4         97.1         96.8         96.2         95.9         95.6         95.3         95.0         94.3         93.8         92.3         91.2         90.2  | 1000         97.5         99.0         98.7         98.1         97.8         97.2         96.9         96.3         96.3         95.3         94.8         93.3         92.2         91.2  | 1250<br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6<br>97.3<br>97.0<br>97.3<br>97.0<br>95.5<br>94.0<br>92.9<br>91.9  |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.1MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N3           SG 4.5-145 NRS Mode N4           SG 4.5-145 NRS Mode N5           SG 4.5-145 NRS Mode N5           SG 4.5-145 NRS Mode N6   | 125<br>91.2<br>92.7<br>92.4<br>92.1<br>91.8<br>91.5<br>91.0<br>90.8<br>90.6<br>90.3<br>90.3<br>90.3<br>90.1<br>89.7<br>89.3<br>88.2<br>87.5<br>86.7<br>85.3  | 160           92.2           93.7           93.4           93.1           92.5           91.7           91.7           91.7           91.7           90.4           90.9           90.4           90.9           90.4           90.7           88.6           87.7           86.8           85.2   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>92.2<br>91.9<br>91.2<br>91.2<br>91.2<br>91.2<br>91.2                 | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.7<br>93.4<br>92.7<br>92.2<br>90.7<br>89.6<br>88.6<br>88.6         | 315         95.3         96.8         96.5         96.2         95.9         95.6         95.0         94.7         94.1         93.8         93.1         92.6         91.1         90.0         89.0         87.1                                 | 400<br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3<br>95.3<br>94.7<br>94.4<br>93.8<br>93.5<br>92.8<br>92.3<br>92.8<br>92.3<br>90.8<br>89.7<br>88.7<br>88.7   | <b>500</b><br>95.1<br>96.6<br>96.3<br>95.7<br>95.4<br>94.8<br>94.5<br>94.5<br>94.5<br>94.2<br>93.9<br>93.6<br>92.9<br>92.4<br>90.9<br>89.8<br>88.8<br>88.8<br>86.9                         | 630           96.7           98.2           97.9           97.6           97.0           97.0           96.1           96.1           95.5           95.5           94.5           94.5           91.4           90.4           90.4                | 800         96.5         98.0         97.7         97.4         97.7         97.4         97.7         97.4         97.5         95.9         95.6         95.3         95.0         94.3         92.3         91.2         90.2         88.3  | <b>1000</b> 97.5         99.0         98.7         98.4         98.1         97.8         97.8         97.2         96.9         96.6         96.3         96.0         95.3         94.8         93.3         92.2         91.2         89.3 | 1250<br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6<br>97.6<br>97.3<br>97.0<br>97.0<br>95.5<br>94.0<br>92.9<br>91.9<br>91.9  |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.1MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N2           SG 4.5-145 NRS Mode N2           SG 4.5-145 NRS Mode N4           SG 4.5-145 NRS Mode N4           SG 4.5-145 NRS Mode N5           SG 4.5-145 NRS Mode N6           SG 4.5-145 NRS Mode N7 | 125<br>91.2<br>92.7<br>92.4<br>92.1<br>91.8<br>91.5<br>91.0<br>90.8<br>90.6<br>90.3<br>90.6<br>90.3<br>90.6<br>90.3<br>90.1<br>89.7<br>89.3<br>89.3<br>88.2<br>87.5<br>86.7<br>85.3<br>84.6  | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.7           91.4           91.2           90.9           90.4           90.0           88.6           87.7           86.8           85.2           84.3  | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>92.2<br>91.9<br>91.2<br>90.7<br>89.2<br>88.1<br>85.2<br>88.1<br>85.2<br>84.2 | 250<br>94.9<br>96.4<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>92.2<br>90.7<br>89.6<br>88.6<br>88.6<br>86.7<br>85.7 | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0           94.7           94.7           94.3           93.1           92.6           91.1           90.0           87.1           86.1 | 400<br>95.0<br>96.5<br>95.9<br>95.3<br>95.3<br>95.3<br>95.3<br>95.3<br>94.7<br>94.4<br>93.8<br>93.5<br>92.3<br>92.3<br>92.3<br>92.3<br>92.3<br>92.3<br>92.3<br>89.7<br>88.7<br>88.7<br>86.8<br>85.8 | <b>500</b><br>95.1<br>96.6<br>96.3<br>95.7<br>95.4<br>95.4<br>94.5<br>94.5<br>94.5<br>94.2<br>93.9<br>93.6<br>92.9<br>92.4<br>92.4<br>92.4<br>90.9<br>82.8<br>88.8<br>88.8<br>86.9<br>85.9 | 630           96.7           98.2           97.9           97.6           97.3           97.0           96.1           96.3           95.5           95.5           94.0           92.5           91.4           90.4           88.5           87.5 | 800         96.5         98.0         97.7         97.4         97.7         97.4         97.7         97.4         97.7         97.4         97.7         97.4         97.7         97.4         97.1         96.8         95.9         95.6         95.3         95.0         94.3         93.8         92.3         91.2         90.2         88.3         87.3 | 1000         97.5         99.0         98.7         98.1         97.8         97.2         96.9         96.3         96.3         96.3         95.3         94.8         93.3         92.2         91.2         89.3         88.3             | 1250         98.2         99.7         99.4         99.7         98.5         97.9         97.6         97.3         97.0         95.5         96.0         95.5         94.0         92.9         91.9         90.0         89.0 |

SIEMENS Gamesa

GENERAL CHARACTERISTICS MANUAL

Code: GD381009-en
Date: 17/06/2019

Pg. 15 of 19

Rev: 3

Title: SG 4.5-145 NOISE EMISSION ANALYSIS

| Central Frequency [Hz]          | 1600 | 2000 | 2500 | 3150 | 4000 | 5000 | 6300 | 8000 | 10000 |
|---------------------------------|------|------|------|------|------|------|------|------|-------|
| SG 4.5-145 Baseline AM0 @ 4.5MW | 98.1 | 97.0 | 95.6 | 93.4 | 90.3 | 86.0 | 80.8 | 75.0 | 70.4  |
| SG 4.5-145 AM+5 @ 5.0MW         | 99.6 | 98.5 | 97.1 | 94.9 | 91.8 | 87.5 | 82.3 | 76.5 | 71.9  |
| SG 4.5-145 AM+4 @ 4.9MW         | 99.3 | 98.2 | 96.8 | 94.6 | 91.5 | 87.2 | 82.0 | 76.2 | 71.6  |
| SG 4.5-145 AM+3 @ 4.8MW         | 99.0 | 97.9 | 96.5 | 94.3 | 91.2 | 86.9 | 81.7 | 75.9 | 71.3  |
| SG 4.5-145 AM+2 @ 4.7MW         | 98.7 | 97.6 | 96.2 | 94.0 | 90.9 | 86.6 | 81.4 | 75.6 | 71.0  |
| SG 4.5-145 AM+1 @ 4.6MW         | 98.4 | 97.3 | 95.9 | 93.7 | 90.6 | 86.3 | 81.1 | 75.3 | 70.7  |
| SG 4.5-145 AM-1 @ 4.4MW         | 97.8 | 96.7 | 95.3 | 93.1 | 90.0 | 85.7 | 80.5 | 74.7 | 70.1  |
| SG 4.5-145 AM-2 @ 4.3MW         | 97.5 | 96.4 | 95.0 | 92.8 | 89.7 | 85.4 | 80.2 | 74.4 | 69.8  |
| SG 4.5-145 AM-3 @ 4.2MW         | 97.2 | 96.1 | 94.7 | 92.5 | 89.4 | 85.1 | 79.9 | 74.1 | 69.5  |
| SG 4.5-145 AM-3 @ 4.1MW         | 96.9 | 95.8 | 94.4 | 92.2 | 89.1 | 84.8 | 79.6 | 73.8 | 69.2  |
| SG 4.5-145 AM-3 @ 4.0MW         | 96.6 | 95.5 | 94.1 | 91.9 | 88.8 | 84.5 | 79.3 | 73.5 | 68.9  |
| SG 4.5-145 NRS Mode N1          | 95.9 | 94.8 | 93.4 | 91.2 | 88.1 | 83.8 | 78.6 | 72.8 | 68.2  |
| SG 4.5-145 NRS Mode N2          | 95.4 | 94.3 | 92.9 | 90.7 | 87.6 | 83.3 | 78.1 | 72.3 | 67.7  |
| SG 4.5-145 NRS Mode N3          | 93.9 | 92.8 | 91.4 | 89.2 | 86.1 | 81.8 | 76.6 | 70.8 | 66.2  |
| SG 4.5-145 NRS Mode N4          | 92.8 | 91.7 | 90.3 | 88.1 | 85.0 | 80.7 | 75.5 | 69.7 | 65.1  |
| SG 4.5-145 NRS Mode N5          | 91.8 | 90.7 | 89.3 | 87.1 | 84.0 | 79.7 | 74.5 | 68.7 | 64.1  |
| SG 4.5-145 NRS Mode N6          | 89.9 | 88.8 | 87.4 | 85.2 | 82.1 | 77.8 | 72.6 | 66.8 | 62.2  |
| SG 4.5-145 NRS Mode N7          | 88.9 | 87.8 | 86.4 | 84.2 | 81.1 | 76.8 | 71.6 | 65.8 | 61.2  |
| SG 4.5-145 NRS Mode N8          | 87.9 | 86.8 | 85.4 | 83.2 | 80.1 | 75.8 | 70.6 | 64.8 | 60.2  |

**Table 9** One-third octave band noise spectra of SG 4.5-145 @ 11 m/s(ref SG145spectra\_4500KW\_R03\_17062018)

**SIEMENS** Gamesa RENEWABLE ENERGY

**GENERAL CHARACTERISTICS** MANUAL Date: 17/06/2019

Code: GD381009-en

Pg. 16 of 19

Rev: 3

Title: SG 4.5-145 NOISE EMISSION ANALYSIS

| Central Frequency [Hz]   | 10   | 12.5  | 16  | 20  | 25   | 31.5  | 40   | 50   | 63   | 80   | 100   |
|--|--|---|---|---|--|---|--|--|--|--|---|
| SG 4.5-145 Baseline AM0 @ 4.5MW  | 46.1   | 51.8  | 57.5  | 62.9  | 67.5   | 72.2  | 76.4   | 81.0   | 85.3   | 87.8   | 89.7  |
| SG 4.5-145 AM+5 @ 5.0MW  | 47.6   | 53.3  | 59.0  | 64.4  | 69.0   | 73.7  | 77.9   | 82.5   | 86.8   | 89.3   | 91.2  |
| SG 4.5-145 AM+4 @ 4.9MW  | 47.3   | 53.0  | 58.7  | 64.1  | 68.7   | 73.4  | 77.6   | 82.2   | 86.5   | 89.0   | 90.9  |
| SG 4.5-145 AM+3 @ 4.8MW  | 47.0   | 52.7  | 58.4  | 63.8  | 68.4   | 73.1  | 77.3   | 81.9   | 86.2   | 88.7   | 90.6  |
| SG 4.5-145 AM+2 @ 4.7MW  | 46.7   | 52.4  | 58.1  | 63.5  | 68.1   | 72.8  | 77.0   | 81.6   | 85.9   | 88.4   | 90.3  |
| SG 4.5-145 AM+1 @ 4.6MW  | 46.4   | 52.1  | 57.8  | 63.2  | 67.8   | 72.5  | 76.7   | 81.3   | 85.6   | 88.1   | 90.0  |
| SG 4.5-145 AM-1 @ 4.4MW  | 46.1   | 51.8  | 57.5  | 62.9  | 67.5   | 72.2  | 76.3   | 80.9   | 85.2   | 87.7   | 89.5  |
| SG 4.5-145 AM-2 @ 4.3MW  | 46.1   | 51.8  | 57.5  | 62.9  | 67.4   | 72.1  | 76.3   | 80.8   | 85.1   | 87.5   | 89.3  |
| SG 4.5-145 AM-3 @ 4.2MW  | 46.1   | 51.8  | 57.5  | 62.9  | 67.4   | 72.1  | 76.2   | 80.7   | 85.0   | 87.4   | 89.2  |
| SG 4.5-145 AM-3 @ 4.1MW  | 46.1   | 51.8  | 57.5  | 62.8  | 67.4   | 72.0  | 76.1   | 80.7   | 84.8   | 87.2   | 89.0  |
| SG 4.5-145 AM-3 @ 4.0MW  | 46.1   | 51.8  | 57.5  | 62.8  | 67.4   | 72.0  | 76.1   | 80.6   | 84.7   | 87.1   | 88.8  |
| SG 4.5-145 NRS Mode N1   | 46.1   | 51.8  | 57.4  | 62.8  | 67.3   | 71.9  | 75.9   | 80.4   | 84.5   | 86.8   | 88.4  |
| SG 4.5-145 NRS Mode N2   | 46.1   | 51.8  | 57.4  | 62.8  | 67.3   | 71.8  | 75.8   | 80.2   | 84.3   | 86.5   | 88.1  |
| SG 4.5-145 NRS Mode N3   | 46.1   | 51.8  | 57.4  | 62.7  | 67.1   | 71.6  | 75.5   | 79.8   | 83.7   | 85.8   | 87.2  |
| SG 4.5-145 NRS Mode N4   | 46.1   | 51.8  | 57.4  | 62.6  | 67.0   | 71.4  | 75.3   | 79.5   | 83.3   | 85.3   | 86.6  |
| SG 4.5-145 NRS Mode N5   | 46.1   | 51.8  | 57.4  | 62.6  | 66.9   | 71.3  | 75.1   | 79.2   | 82.9   | 84.8   | 86.0  |
| SG 4.5-145 NRS Mode N6   | 46.1   | 51.8  | 57.3  | 62.5  | 66.7   | 71.0  | 74.6   | 78.6   | 82.2   | 83.8   | 84.8  |
| SG 4.5-145 NRS Mode N7   | 46.1   | 51.7  | 57.3  | 62.4  | 66.6   | 70.8  | 74.4   | 78.3   | 81.8   | 83.4   | 84.2  |
| SG 4 5-145 NRS Mode N8   | 46 1   | 517   | 57.3  | 623   | 66 5   | 70.7  | 74.2   | 78.0   | 814  | 82.8   | 83.6  |
|  | 1011   | 5117  | 0710  | 02.0  | 0010   | , 01,   | /  | 7010   | 01.1   | 0110   | 00.0  |
| Central Frequency [Hz]   | 125  | <b>160</b>  | 200   | <b>250</b>  | <b>315</b>   | 400   | 500  | 630  | 800  | 1000   | 1250  |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW  | <b>125</b><br>91.2   | <b>160</b><br>92.2  | <b>200</b><br>93.4  | <b>250</b><br>94.9  | <b>315</b><br>95.3   | <b>400</b><br>95.0  | <b>500</b><br>95.1   | <b>630</b><br>96.7   | <b>800</b><br>96.5   | <b>1000</b><br>97.5  | <b>1250</b><br>98.2   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW   | <b>125</b><br>91.2<br>92.7   | <b>160</b><br>92.2<br>93.7  | <b>200</b><br>93.4<br>94.9  | <b>250</b><br>94.9<br>96.4  | <b>315</b><br>95.3<br>96.8   | <b>400</b><br>95.0<br>96.5  | <b>500</b><br>95.1<br>96.6   | <b>630</b><br>96.7<br>98.2   | <b>800</b><br>96.5<br>98.0   | <b>1000</b><br>97.5<br>99.0  | <b>1250</b><br>98.2<br>99.7   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW   | <b>125</b><br>91.2<br>92.7<br>92.4   | <b>160</b><br>92.2<br>93.7<br>93.4  | <b>200</b><br>93.4<br>94.9<br>94.6  | <b>250</b><br>94.9<br>96.4<br>96.1  | <b>315</b><br>95.3<br>96.8<br>96.5   | <b>400</b><br>95.0<br>96.5<br>96.2  | <b>500</b><br>95.1<br>96.6<br>96.3   | <b>630</b><br>96.7<br>98.2<br>97.9   | <b>800</b><br>96.5<br>98.0<br>97.7   | <b>1000</b><br>97.5<br>99.0<br>98.7  | <b>1250</b><br>98.2<br>99.7<br>99.4   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW   | <b>125</b><br>91.2<br>92.7<br>92.4<br>92.1   | 160           92.2           93.7           93.4           93.1   | <b>200</b><br>93.4<br>94.9<br>94.6<br>94.3  | <b>250</b><br>94.9<br>96.4<br>96.1<br>95.8  | <b>315</b><br>95.3<br>96.8<br>96.5<br>96.2   | <b>400</b><br>95.0<br>96.5<br>96.2<br>95.9  | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0   | <b>630</b><br>96.7<br>98.2<br>97.9<br>97.6   | <b>800</b><br>96.5<br>98.0<br>97.7<br>97.4   | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4  | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW   | 125         91.2         92.7         92.4         92.1         91.8   | 160           92.2           93.7           93.4           93.1           92.8  | <b>200</b><br>93.4<br>94.9<br>94.6<br>94.3<br>94.0  | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5   | <b>315</b><br>95.3<br>96.8<br>96.5<br>96.2<br>95.9   | <b>400</b><br>95.0<br>96.5<br>96.2<br>95.9<br>95.6  | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7   | <b>630</b><br>96.7<br>98.2<br>97.9<br>97.6<br>97.3   | 800           96.5           98.0           97.7           97.4           97.1   | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4<br>98.1  | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW   | 125         91.2         92.7         92.4         92.1         91.8         91.5  | 160           92.2           93.7           93.4           93.1           92.8           92.5   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2   | 315           95.3           96.8           96.5           96.2           95.9           95.6  | <b>400</b><br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3  | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4   | 630<br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0  | <b>800</b><br>96.5<br>98.0<br>97.7<br>97.4<br>97.1<br>96.8   | 1000           97.5           99.0           98.7           98.4           98.1           97.8   | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW   | 125           91.2           92.7           92.4           92.1           91.8           91.5           91.0   | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9  | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6   | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0   | 400<br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7   | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8   | <b>630</b><br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0<br>96.4   | 800           96.5           98.0           97.7           97.4           97.1           96.8           96.2   | 1000           97.5           99.0           98.7           98.4           98.1           97.8           97.2  | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW   | 125           91.2           92.7           92.4           92.1           91.8           91.5           91.0           90.8  | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.7   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.5<br>95.2<br>94.6<br>94.3   | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0           94.7  | 400<br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4   | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8<br>94.5   | <b>630</b><br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0<br>96.4<br>96.1   | 800           96.5           98.0           97.7           97.4           97.1           96.8           96.2           95.9  | 1000           97.5           99.0           98.7           98.4           98.1           97.8           97.2           96.9   | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+2 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW   | 125           91.2           92.7           92.4           92.1           91.8           91.5           91.0           90.8           90.6   | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.7           91.4  | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0   | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0           94.7           94.4   | <b>400</b><br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4<br>94.1  | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8<br>94.5<br>94.2   | 630           96.7           98.2           97.9           97.6           97.3           97.0           96.4           96.1           95.8   | 800           96.5           98.0           97.7           97.4           97.1           96.8           96.2           95.9           95.6   | 1000           97.5           99.0           98.7           98.4           98.1           97.8           97.2           96.9           96.6  | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6<br>97.3   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+2 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW   | 125           91.2           92.7           92.4           92.1           91.8           91.5           91.0           90.8           90.6           90.3  | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.7           91.4           91.2   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7   | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0           94.7           94.4           94.1  | 400<br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4<br>94.1<br>93.8   | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8<br>94.5<br>94.2<br>94.2<br>93.9   | 630           96.7           98.2           97.9           97.6           97.3           97.0           96.4           95.8           95.5   | 800           96.5           98.0           97.7           97.4           97.1           96.8           96.2           95.9           95.6           95.3  | 1000           97.5           99.0           98.7           98.4           98.1           97.8           97.2           96.9           96.3  | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6<br>97.3<br>97.0   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.1MW           SG 4.5-145 AM-3 @ 4.1MW   | 125           91.2           92.7           92.4           92.1           91.5           91.0           90.8           90.6           90.3           90.1  | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.7           91.4           91.2           90.9  | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>91.9   | 250<br>94.9<br>96.4<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4   | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0           94.7           94.1           93.8  | <b>400</b><br>95.0<br>96.5<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4<br>94.1<br>93.8<br>93.5  | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8<br>94.5<br>94.5<br>94.2<br>93.9<br>93.6   | 630           96.7           98.2           97.9           97.6           97.3           97.0           96.4           96.1           95.5           95.2  | 800           96.5           98.0           97.7           97.4           97.1           96.8           96.2           95.9           95.3           95.0  | 1000           97.5           99.0           98.7           98.1           97.8           97.2           96.9           96.3           96.0  | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6<br>97.3<br>97.0<br>97.0   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.1MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW   | 125           91.2           92.7           92.4           92.1           91.8           91.5           91.0           90.8           90.6           90.3           90.1           89.7  | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.7           91.4           90.9           90.9           90.4   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>93.1<br>92.8<br>92.5<br>92.5<br>92.2<br>91.9<br>91.2   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>93.4   | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0           94.7           94.4           93.8           93.1   | 400<br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4<br>94.1<br>93.8<br>93.5<br>93.5   | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8<br>94.5<br>94.5<br>94.2<br>93.9<br>93.6<br>92.9   | 630           96.7           98.2           97.9           97.6           97.3           97.0           96.4           95.5           95.2           94.5  | 800         96.5         98.0         97.7         97.4         97.1         96.8         96.2         95.9         95.6         95.3         95.0         94.3  | 1000           97.5           99.0           98.7           98.1           97.8           97.2           96.9           96.3           95.3  | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6<br>97.3<br>97.0<br>97.0<br>96.7<br>96.0   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.1MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N2   | 125           91.2           92.7           92.4           92.1           91.5           91.0           90.8           90.6           90.3           90.1           89.7           89.3  | 160         92.2         93.7         93.4         93.1         92.8         92.5         91.9         91.7         91.4         90.9         90.4         90.4         90.0  | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>91.9<br>91.2<br>90.7   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>92.2   | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0           94.7           94.1           93.8           93.1           92.6  | <b>400</b><br>95.0<br>96.5<br>95.9<br>95.9<br>95.3<br>95.3<br>94.7<br>94.4<br>94.1<br>93.8<br>93.5<br>92.8<br>92.3  | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>94.5<br>94.5<br>94.5<br>94.2<br>93.9<br>93.6<br>92.9<br>92.4   | 630           96.7           98.2           97.9           97.6           97.0           96.1           96.1           95.8           95.5           94.5           94.0   | 800         96.5         98.0         97.7         97.4         97.1         96.8         96.2         95.9         95.6         95.3         95.0         94.3         93.8   | 1000           97.5           99.0           98.7           98.1           97.8           97.2           96.9           96.6           96.3           96.0           95.3           94.8   | 1250         98.2         99.7         99.4         99.1         98.5         97.9         97.6         97.3         97.0         96.7         96.0         95.5  |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N2           SG 4.5-145 NRS Mode N3  | 125           91.2           92.7           92.4           92.1           91.8           91.5           91.0           90.8           90.6           90.3           90.1           89.7           89.3           88.2  | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.7           91.4           90.9           90.4           90.9           90.4           90.0           88.6  | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>92.2<br>91.9<br>91.2<br>90.7<br>89.2   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>92.2<br>90.7   | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0           94.4           93.8           93.1           92.6           91.1  | 400<br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4<br>94.1<br>93.8<br>93.5<br>92.8<br>92.3<br>92.8   | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8<br>94.5<br>94.5<br>94.2<br>93.9<br>93.6<br>92.9<br>92.4<br>92.4<br>90.9   | 630           96.7           98.2           97.9           97.6           97.3           97.0           96.1           96.3           95.5           95.2           94.5           94.5           92.5   | 800         96.5         98.0         97.7         97.4         97.1         96.8         96.2         95.9         95.6         95.3         95.0         94.3         93.8         92.3  | 1000         97.5         99.0         98.7         98.1         97.8         97.2         96.9         96.3         96.0         95.3         94.8         93.3   | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6<br>97.3<br>97.0<br>97.3<br>97.0<br>95.5<br>96.0<br>95.5<br>94.0   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N2           SG 4.5-145 NRS Mode N3           SG 4.5-145 NRS Mode N4   | 125           91.2           92.7           92.4           92.1           91.5           91.0           90.8           90.6           90.3           90.1           89.7           89.3           88.2           87.5  | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.7           91.7           91.7           91.7           91.7           91.7           91.7           91.4           90.9           90.4           90.0           88.6           87.7  | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>91.9<br>91.2<br>91.2<br>90.7<br>89.2<br>88.1   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>92.2<br>90.7<br>89.6   | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0           94.7           94.1           93.8           93.1           92.6           91.1           90.0                | <b>400</b><br>95.0<br>96.5<br>95.9<br>95.3<br>95.3<br>94.7<br>94.4<br>94.1<br>93.8<br>93.5<br>92.8<br>92.3<br>92.8<br>92.3<br>90.8  | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>94.5<br>94.5<br>94.5<br>94.2<br>93.9<br>93.6<br>92.9<br>92.4<br>90.9<br>89.8   | 630           96.7           98.2           97.9           97.6           97.0           96.1           96.1           95.8           95.5           94.5           94.5           92.5           91.4   | 800         96.5         98.0         97.7         97.4         97.1         96.8         96.2         95.9         95.6         95.3         95.0         94.3         93.8         92.3         91.2   | 1000         97.5         99.0         98.7         98.1         97.8         97.2         96.9         96.6         96.3         96.0         95.3         94.8         93.3         92.2   | 1250         98.2         99.7         99.4         99.1         98.5         97.0         97.6         97.0         96.7         96.0         95.5         94.0         92.9                           |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N3           SG 4.5-145 NRS Mode N3           SG 4.5-145 NRS Mode N4           SG 4.5-145 NRS Mode N5   | 125           91.2           92.7           92.4           92.1           91.8           91.5           91.0           90.8           90.6           90.3           90.1           89.7           89.3           88.2           87.5           86.7  | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.7           91.4           90.9           90.4           90.9           90.4           90.9           90.4           90.7           88.6           87.7           86.8  | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>93.1<br>92.8<br>92.5<br>92.2<br>92.2<br>91.9<br>91.2<br>91.2<br>91.2<br>91.2<br>90.7<br>89.2<br>88.1<br>87.1 | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>93.4<br>92.7<br>92.2<br>90.7<br>89.6<br>88.6   | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0           94.4           93.8           93.1           92.6           91.1           90.0           89.0                | 400<br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4<br>94.1<br>94.1<br>93.8<br>93.5<br>92.8<br>92.8<br>92.8<br>92.8<br>92.8<br>92.8<br>92.8                                 | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8<br>94.5<br>94.5<br>94.2<br>93.9<br>93.6<br>92.9<br>93.6<br>92.4<br>90.9<br>89.8<br>89.8   | 630           96.7           98.2           97.9           97.6           97.3           97.0           96.1           96.3           97.3           97.3           97.3           97.4           96.4           95.5           95.2           94.5           92.5           91.4           90.4 | 800         96.5         98.0         97.7         97.4         97.7         97.4         97.5         96.2         95.9         95.6         95.3         95.0         94.3         92.3         91.2         90.2  | 1000         97.5         99.0         98.7         98.1         97.8         97.2         96.9         96.3         96.0         95.3         94.8         93.3         92.2         91.2   | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6<br>97.3<br>97.0<br>97.3<br>97.0<br>95.5<br>96.0<br>95.5<br>94.0<br>92.9<br>91.9   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-2 @ 4.3MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.1MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N3           SG 4.5-145 NRS Mode N4           SG 4.5-145 NRS Mode N5           SG 4.5-145 NRS Mode N5           SG 4.5-145 NRS Mode N6  | 125           91.2           92.7           92.4           92.1           91.5           91.5           91.6           90.8           90.6           90.3           90.1           89.7           89.3           88.2           87.5           86.7           85.3   | 160         92.2         93.7         93.4         93.1         92.5         91.7         91.7         91.7         91.7         91.7         91.7         91.7         91.7         91.7         91.7         91.7         91.7         91.7         91.7         90.9         90.4         90.0         88.6         87.7         86.8         85.2 | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>91.9<br>91.2<br>91.2<br>91.2<br>91.2<br>89.2<br>89.2<br>89.2<br>89.2                 | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>93.4<br>92.7<br>92.2<br>90.7<br>89.6<br>88.6<br>88.6   | 315         95.3         96.8         96.5         96.2         95.9         95.6         95.0         94.7         94.1         93.8         93.1         92.6         91.1         90.0         89.0         87.1                  | 400<br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3<br>95.3<br>94.7<br>94.4<br>93.8<br>93.5<br>92.8<br>92.3<br>92.8<br>92.3<br>92.8<br>89.7<br>88.7<br>88.7                                 | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>94.5<br>94.5<br>94.5<br>94.2<br>93.9<br>93.6<br>92.9<br>93.6<br>92.4<br>90.9<br>89.8<br>88.8<br>88.8                                 | 630           96.7           98.2           97.9           97.6           97.0           96.1           96.4           96.1           95.5           95.5           94.5           94.5           92.5           91.4           90.4           88.5  | 800         96.5         98.0         97.7         97.4         97.7         97.4         97.7         97.4         97.5         95.9         95.6         95.3         95.0         94.3         92.3         91.2         90.2         88.3  | 1000         97.5         99.0         98.7         98.1         97.5         97.7         98.4         97.8         97.8         97.2         96.9         96.6         96.3         96.0         95.3         94.8         93.3         92.2         91.2         89.3 | 1250         98.2         99.7         99.4         99.1         98.5         97.0         97.6         97.0         96.7         96.0         95.5         94.0         92.9         91.9         90.0 |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+5 @ 5.0MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+4 @ 4.9MW           SG 4.5-145 AM+3 @ 4.8MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+2 @ 4.7MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM+1 @ 4.6MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-1 @ 4.4MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.2MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 AM-3 @ 4.0MW           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N1           SG 4.5-145 NRS Mode N3           SG 4.5-145 NRS Mode N4           SG 4.5-145 NRS Mode N5           SG 4.5-145 NRS Mode N5           SG 4.5-145 NRS Mode N6           SG 4.5-145 NRS Mode N7 | 125           91.2           92.7           92.4           92.1           91.5           91.6           91.7           92.4           92.1           92.4           92.1           91.8           91.5           91.0           90.3           90.1           89.7           89.3           88.2           87.5           86.7           85.3           84.6 | <b>160</b> 92.2         93.7         93.4         93.1         92.8         92.7         91.9         91.7         91.4         90.9         90.4         90.9         90.4         90.0         88.6         87.7         86.8         85.2         84.3   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>93.1<br>92.8<br>92.5<br>92.2<br>92.2<br>91.9<br>91.2<br>91.2<br>91.2<br>91.2<br>91.2                         | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>93.4<br>92.7<br>93.4<br>92.2<br>93.4<br>92.7<br>93.4<br>93.4<br>93.5<br>83.6<br>88.6<br>88.6 | 315           95.3           96.8           96.5           96.2           95.9           95.6           95.0           94.1           93.8           93.1           92.6           91.1           90.0           87.1           86.1 | 400<br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4<br>94.1<br>94.1<br>93.8<br>93.5<br>92.8<br>92.3<br>92.3<br>92.8<br>92.3<br>92.8<br>92.3<br>92.8<br>89.7<br>88.7<br>85.8 | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8<br>94.5<br>94.5<br>94.2<br>93.9<br>93.6<br>92.9<br>93.6<br>92.9<br>93.6<br>92.4<br>90.9<br>89.8<br>89.8<br>88.8<br>86.9<br>85.9 | 630           96.7           98.2           97.9           97.6           97.3           97.0           96.1           96.2           97.3           97.4           95.5           95.2           94.5           94.5           91.4           90.4           88.5           87.5                | 800         96.5         98.0         97.7         97.4         97.7         97.4         97.7         97.4         97.5         96.2         95.9         95.6         95.3         95.0         94.3         93.8         92.3         91.2         90.2         88.3         87.3 | 1000         97.5         99.0         98.7         98.1         97.8         97.2         96.9         96.3         96.3         95.3         94.8         93.3         92.2         91.2         89.3         88.3   | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6<br>97.3<br>97.0<br>97.3<br>97.0<br>97.3<br>97.0<br>95.5<br>94.0<br>95.5<br>94.0<br>92.9<br>91.9<br>91.9<br>90.0<br>89.0     |

SIEMENS Gamesa

GENERAL CHARACTERISTICS MANUAL

Code: GD381009-en
Date: 17/06/2019

Pg. 17 of 19

Rev: 3

## Title: SG 4.5-145 NOISE EMISSION ANALYSIS

| Central Frequency [Hz]          | 1600 | 2000 | 2500 | 3150 | 4000 | 5000 | 6300 | 8000 | 10000 |
|---------------------------------|------|------|------|------|------|------|------|------|-------|
| SG 4.5-145 Baseline AM0 @ 4.5MW | 98.1 | 97.0 | 95.6 | 93.4 | 90.3 | 86.0 | 80.8 | 75.0 | 70.4  |
| SG 4.5-145 AM+5 @ 5.0MW         | 99.6 | 98.5 | 97.1 | 94.9 | 91.8 | 87.5 | 82.3 | 76.5 | 71.9  |
| SG 4.5-145 AM+4 @ 4.9MW         | 99.3 | 98.2 | 96.8 | 94.6 | 91.5 | 87.2 | 82.0 | 76.2 | 71.6  |
| SG 4.5-145 AM+3 @ 4.8MW         | 99.0 | 97.9 | 96.5 | 94.3 | 91.2 | 86.9 | 81.7 | 75.9 | 71.3  |
| SG 4.5-145 AM+2 @ 4.7MW         | 98.7 | 97.6 | 96.2 | 94.0 | 90.9 | 86.6 | 81.4 | 75.6 | 71.0  |
| SG 4.5-145 AM+1 @ 4.6MW         | 98.4 | 97.3 | 95.9 | 93.7 | 90.6 | 86.3 | 81.1 | 75.3 | 70.7  |
| SG 4.5-145 AM-1 @ 4.4MW         | 97.8 | 96.7 | 95.3 | 93.1 | 90.0 | 85.7 | 80.5 | 74.7 | 70.1  |
| SG 4.5-145 AM-2 @ 4.3MW         | 97.5 | 96.4 | 95.0 | 92.8 | 89.7 | 85.4 | 80.2 | 74.4 | 69.8  |
| SG 4.5-145 AM-3 @ 4.2MW         | 97.2 | 96.1 | 94.7 | 92.5 | 89.4 | 85.1 | 79.9 | 74.1 | 69.5  |
| SG 4.5-145 AM-3 @ 4.1MW         | 96.9 | 95.8 | 94.4 | 92.2 | 89.1 | 84.8 | 79.6 | 73.8 | 69.2  |
| SG 4.5-145 AM-3 @ 4.0MW         | 96.6 | 95.5 | 94.1 | 91.9 | 88.8 | 84.5 | 79.3 | 73.5 | 68.9  |
| SG 4.5-145 NRS Mode N1          | 95.9 | 94.8 | 93.4 | 91.2 | 88.1 | 83.8 | 78.6 | 72.8 | 68.2  |
| SG 4.5-145 NRS Mode N2          | 95.4 | 94.3 | 92.9 | 90.7 | 87.6 | 83.3 | 78.1 | 72.3 | 67.7  |
| SG 4.5-145 NRS Mode N3          | 93.9 | 92.8 | 91.4 | 89.2 | 86.1 | 81.8 | 76.6 | 70.8 | 66.2  |
| SG 4.5-145 NRS Mode N4          | 92.8 | 91.7 | 90.3 | 88.1 | 85.0 | 80.7 | 75.5 | 69.7 | 65.1  |
| SG 4.5-145 NRS Mode N5          | 91.8 | 90.7 | 89.3 | 87.1 | 84.0 | 79.7 | 74.5 | 68.7 | 64.1  |
| SG 4.5-145 NRS Mode N6          | 89.9 | 88.8 | 87.4 | 85.2 | 82.1 | 77.8 | 72.6 | 66.8 | 62.2  |
| SG 4.5-145 NRS Mode N7          | 88.9 | 87.8 | 86.4 | 84.2 | 81.1 | 76.8 | 71.6 | 65.8 | 61.2  |
| SG 4.5-145 NRS Mode N8          | 87.9 | 86.8 | 85.4 | 83.2 | 80.1 | 75.8 | 70.6 | 64.8 | 60.2  |

**Table 10** One-third octave band noise spectra of SG 4.5-145 @ 12 m/s(ref SG145spectra\_4500KW\_R03\_17062018)

**SIEMENS** Gamesa RENEWABLE ENERGY

Code: GD381009-en **GENERAL CHARACTERISTICS** MANUAL Date: 17/06/2019

Pg. 18 of 19

Rev: 3

Title: SG 4.5-145 NOISE EMISSION ANALYSIS

| Central Frequency [Hz]   | 10   | 12.5  | 16  | 20  | 25  | 31.5   | 40   | 50  | 63  | 80  | 100   |
|--|--|---|---|---|---|--|--|---|---|---|---|
| SG 4.5-145 Baseline AM0 @ 4.5MW  | 46.1   | 51.8  | 57.5  | 62.9  | 67.5  | 72.2   | 76.4   | 81.0  | 85.3  | 87.8  | 89.7  |
| SG 4.5-145 AM+5 @ 5.0MW  | 47.6   | 53.3  | 59.0  | 64.4  | 69.0  | 73.7   | 77.9   | 82.5  | 86.8  | 89.3  | 91.2  |
| SG 4.5-145 AM+4 @ 4.9MW  | 47.3   | 53.0  | 58.7  | 64.1  | 68.7  | 73.4   | 77.6   | 82.2  | 86.5  | 89.0  | 90.9  |
| SG 4.5-145 AM+3 @ 4.8MW  | 47.0   | 52.7  | 58.4  | 63.8  | 68.4  | 73.1   | 77.3   | 81.9  | 86.2  | 88.7  | 90.6  |
| SG 4.5-145 AM+2 @ 4.7MW  | 46.7   | 52.4  | 58.1  | 63.5  | 68.1  | 72.8   | 77.0   | 81.6  | 85.9  | 88.4  | 90.3  |
| SG 4.5-145 AM+1 @ 4.6MW  | 46.4   | 52.1  | 57.8  | 63.2  | 67.8  | 72.5   | 76.7   | 81.3  | 85.6  | 88.1  | 90.0  |
| SG 4.5-145 AM-1 @ 4.4MW  | 46.1   | 51.8  | 57.5  | 62.9  | 67.5  | 72.2   | 76.3   | 80.9  | 85.2  | 87.7  | 89.5  |
| SG 4.5-145 AM-2 @ 4.3MW  | 46.1   | 51.8  | 57.5  | 62.9  | 67.4  | 72.1   | 76.3   | 80.8  | 85.1  | 87.5  | 89.3  |
| SG 4.5-145 AM-3 @ 4.2MW  | 46.1   | 51.8  | 57.5  | 62.9  | 67.4  | 72.1   | 76.2   | 80.7  | 85.0  | 87.4  | 89.2  |
| SG 4.5-145 AM-3 @ 4.1MW  | 46.1   | 51.8  | 57.5  | 62.8  | 67.4  | 72.0   | 76.1   | 80.7  | 84.8  | 87.2  | 89.0  |
| SG 4.5-145 AM-3 @ 4.0MW  | 46.1   | 51.8  | 57.5  | 62.8  | 67.4  | 72.0   | 76.1   | 80.6  | 84.7  | 87.1  | 88.8  |
| SG 4.5-145 NRS Mode N1   | 46.1   | 51.8  | 57.4  | 62.8  | 67.3  | 71.9   | 75.9   | 80.4  | 84.5  | 86.8  | 88.4  |
| SG 4.5-145 NRS Mode N2   | 46.1   | 51.8  | 57.4  | 62.8  | 67.3  | 71.8   | 75.8   | 80.2  | 84.3  | 86.5  | 88.1  |
| SG 4.5-145 NRS Mode N3   | 46.1   | 51.8  | 57.4  | 62.7  | 67.1  | 71.6   | 75.5   | 79.8  | 83.7  | 85.8  | 87.2  |
| SG 4.5-145 NRS Mode N4   | 46.1   | 51.8  | 57.4  | 62.6  | 67.0  | 71.4   | 75.3   | 79.5  | 83.3  | 85.3  | 86.6  |
| SG 4.5-145 NRS Mode N5   | 46.1   | 51.8  | 57.4  | 62.6  | 66.9  | 71.3   | 75.1   | 79.2  | 82.9  | 84.8  | 86.0  |
| SG 4.5-145 NRS Mode N6   | 46.1   | 51.8  | 57.3  | 62.5  | 66.7  | 71.0   | 74.6   | 78.6  | 82.2  | 83.8  | 84.8  |
| SG 4.5-145 NRS Mode N7   | 46.1   | 51.7  | 57.3  | 62.4  | 66.6  | 70.8   | 74.4   | 78.3  | 81.8  | 83.4  | 84.2  |
| SG 4.5-145 NRS Mode N8   | 46.1   | 51.7  | 57.3  | 62.3  | 66.5  | 70.7   | 74.2   | 78.0  | 81.4  | 82.8  | 83.6  |
|  |  |   |   |   |   |  |  |   |   |   |   |
| Central Frequency [Hz]   | 125  | 160   | 200   | 250   | 315   | 400  | 500  | 630   | 800   | 1000  | 1250  |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW  | <b>125</b><br>91.2   | <b>160</b><br>92.2  | <b>200</b><br>93.4  | <b>250</b><br>94.9  | <b>315</b><br>95.3  | <b>400</b><br>95.0   | <b>500</b><br>95.1   | <b>630</b><br>96.7  | <b>800</b><br>96.5  | <b>1000</b><br>97.5   | <b>1250</b><br>98.2   |
| Central Frequency [Hz]           SG 4.5-145 Baseline AM0 @ 4.5MW           SG 4.5-145 AM+5 @ 5.0MW   | <b>125</b><br>91.2<br>92.7   | <b>160</b><br>92.2<br>93.7  | <b>200</b><br>93.4<br>94.9  | <b>250</b><br>94.9<br>96.4  | <b>315</b><br>95.3<br>96.8  | <b>400</b><br>95.0<br>96.5   | <b>500</b><br>95.1<br>96.6   | <b>630</b><br>96.7<br>98.2  | <b>800</b><br>96.5<br>98.0  | <b>1000</b><br>97.5<br>99.0   | <b>1250</b><br>98.2<br>99.7   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW  | <b>125</b><br>91.2<br>92.7<br>92.4   | <b>160</b><br>92.2<br>93.7<br>93.4  | <b>200</b><br>93.4<br>94.9<br>94.6  | <b>250</b><br>94.9<br>96.4<br>96.1  | <b>315</b><br>95.3<br>96.8<br>96.5  | <b>400</b><br>95.0<br>96.5<br>96.2   | <b>500</b><br>95.1<br>96.6<br>96.3   | <b>630</b><br>96.7<br>98.2<br>97.9  | <b>800</b><br>96.5<br>98.0<br>97.7  | <b>1000</b><br>97.5<br>99.0<br>98.7   | <b>1250</b><br>98.2<br>99.7<br>99.4   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW   | <b>125</b><br>91.2<br>92.7<br>92.4<br>92.1   | <b>160</b><br>92.2<br>93.7<br>93.4<br>93.1  | <b>200</b><br>93.4<br>94.9<br>94.6<br>94.3  | <b>250</b><br>94.9<br>96.4<br>96.1<br>95.8  | <b>315</b><br>95.3<br>96.8<br>96.5<br>96.2  | <b>400</b><br>95.0<br>96.5<br>96.2<br>95.9   | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0   | <b>630</b><br>96.7<br>98.2<br>97.9<br>97.6  | <b>800</b><br>96.5<br>98.0<br>97.7<br>97.4  | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4   | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW  | <b>125</b><br>91.2<br>92.7<br>92.4<br>92.1<br>91.8   | <b>160</b><br>92.2<br>93.7<br>93.4<br>93.1<br>92.8  | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0   | <b>250</b><br>94.9<br>96.4<br>96.1<br>95.8<br>95.5  | <b>315</b><br>95.3<br>96.8<br>96.5<br>96.2<br>95.9  | <b>400</b><br>95.0<br>96.5<br>96.2<br>95.9<br>95.6   | <b>500</b><br>95.1<br>96.3<br>96.0<br>95.7   | <b>630</b><br>96.7<br>98.2<br>97.9<br>97.6<br>97.3  | <b>800</b><br>96.5<br>98.0<br>97.7<br>97.4  | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4<br>98.1   | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW   | 12591.292.792.492.191.891.5  | <b>160</b><br>92.2<br>93.7<br>93.4<br>93.1<br>92.8<br>92.5  | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2   | <b>315</b><br>95.3<br>96.8<br>96.5<br>96.2<br>95.9<br>95.6  | <b>400</b><br>95.0<br>96.5<br>96.2<br>95.9<br>95.6<br>95.3   | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4   | 630<br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0   | <b>800</b><br>96.5<br>98.0<br>97.7<br>97.4<br>97.1<br>96.8  | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4<br>98.1<br>97.8   | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW  | <b>125</b> 91.2         92.7         92.4         92.1         91.8         91.5         91.0  | 16092.293.793.493.192.892.591.9   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6   | <b>315</b><br>95.3<br>96.8<br>96.5<br>96.2<br>95.9<br>95.6<br>95.6  | <b>400</b><br>95.0<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7   | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8   | <b>630</b><br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0<br>96.4  | <b>800</b><br>96.5<br>98.0<br>97.7<br>97.4<br>97.1<br>96.8<br>96.2  | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4<br>98.1<br>97.8<br>97.2   | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW   | 125           91.2           92.7           92.4           92.1           91.8           91.5           91.0           90.8  | 16092.293.793.493.192.892.591.991.7   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8   | 250<br>94.9<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3   | <b>315</b><br>95.3<br>96.8<br>96.5<br>96.2<br>95.9<br>95.6<br>95.0<br>94.7  | <b>400</b><br>95.0<br>96.5<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4   | <b>500</b><br>95.1<br>96.6<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8<br>94.5   | <b>630</b><br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0<br>96.4<br>96.1  | <b>800</b><br>96.5<br>98.0<br>97.7<br>97.4<br>97.1<br>96.8<br>96.2<br>95.9  | <b>1000</b><br>97.5<br>99.0<br>98.7<br>98.4<br>98.1<br>97.8<br>97.2<br>96.9   | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW  | 12591.292.792.492.191.891.591.090.890.6  | 16092.293.793.493.192.892.591.991.791.4   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5   | 250<br>94.9<br>96.4<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0   | <b>315</b> 95.3         96.8         96.5         96.2         95.9         95.6         95.0         94.7         94.4   | <b>400</b><br>95.0<br>96.5<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4<br>94.1   | <b>500</b><br>95.1<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8<br>94.5<br>94.2   | <b>630</b><br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0<br>96.4<br>96.1<br>95.8  | <b>800</b><br>96.5<br>98.0<br>97.7<br>97.4<br>97.1<br>96.8<br>96.2<br>95.9<br>95.6  | 1000         97.5         99.0         98.7         98.4         98.1         97.8         97.2         96.9         96.6   | <b>1250</b> 98.2         99.7         99.4         99.1         98.8         98.5         97.9         97.6         97.3  |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW  | 125           91.2           92.7           92.4           92.1           91.8           91.5           91.0           90.8           90.6           90.3  | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.4           91.2  | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2   | 250<br>94.9<br>96.4<br>95.8<br>95.5<br>95.5<br>94.6<br>94.3<br>94.0<br>93.7   | <b>315</b><br>95.3<br>96.8<br>96.5<br>95.9<br>95.0<br>95.0<br>94.7<br>94.4<br>94.1  | <b>400</b><br>95.0<br>96.5<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4<br>94.1<br>93.8   | <b>500</b><br>95.1<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8<br>94.5<br>94.2<br>93.9   | <b>630</b><br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0<br>96.4<br>96.1<br>95.8<br>95.5  | <b>800</b><br>96.5<br>98.0<br>97.7<br>97.4<br>97.1<br>96.8<br>96.2<br>95.9<br>95.6<br>95.3  | 1000         97.5         99.0         98.7         98.4         98.1         97.8         97.2         96.9         96.6         96.3  | <b>1250</b><br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6<br>97.3<br>97.0   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.1MW<br>SG 4.5-145 AM-3 @ 4.0MW  | 12591.292.792.492.191.591.591.090.890.690.390.1  | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.7           91.4           91.2           90.9  | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>91.9   | 250<br>94.9<br>96.4<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4   | 315         95.3         96.8         96.5         96.2         95.9         95.6         95.0         94.7         94.1         93.8   | <b>400</b><br>95.0<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4<br>94.1<br>93.8<br>93.5   | <b>500</b><br>95.1<br>96.6<br>96.3<br>95.7<br>95.4<br>95.4<br>94.5<br>94.5<br>94.2<br>93.9<br>93.6   | 630<br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2   | <b>800</b><br>96.5<br>98.0<br>97.7<br>97.4<br>97.1<br>96.8<br>96.2<br>95.9<br>95.6<br>95.3<br>95.0  | 1000         97.5         99.0         98.7         98.1         97.8         97.2         96.9         96.6         96.3         96.0  | <b>1250</b> 98.2         99.7         99.4         99.1         98.5         98.5         97.9         97.6         97.0         96.7   |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.0MW<br>SG 4.5-145 NRS Mode N1   | 125           91.2           92.7           92.4           92.1           91.5           91.5           91.0           90.8           90.6           90.3           90.1           89.7  | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.7           91.4           90.9           90.9           90.9   | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>93.1<br>92.8<br>92.5<br>92.2<br>91.9<br>91.2   | 250<br>94.9<br>96.4<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7   | 315         95.3         96.8         96.5         96.2         95.9         95.6         95.0         94.7         94.4         93.8         93.1  | <b>400</b><br>95.0<br>96.2<br>95.9<br>95.3<br>95.3<br>94.7<br>94.4<br>94.1<br>93.8<br>93.5<br>92.8   | <b>500</b><br>95.1<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8<br>94.5<br>94.2<br>93.9<br>93.6<br>92.9   | 630<br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0<br>96.4<br>96.1<br>95.8<br>95.5<br>95.2<br>95.2   | <b>800</b><br>96.5<br>97.7<br>97.4<br>97.1<br>96.8<br>96.2<br>95.9<br>95.6<br>95.3<br>95.0<br>94.3  | 1000         97.5         99.0         98.7         98.1         97.8         97.2         96.9         96.3         96.0         95.3  | <b>1250</b> 98.2         99.7         99.4         99.1         98.5         97.9         97.6         97.3         97.0         96.7         96.0  |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.1MW<br>SG 4.5-145 AM-3 @ 4.0MW<br>SG 4.5-145 NRS Mode N1<br>SG 4.5-145 NRS Mode N2   | 125           91.2           92.7           92.4           92.1           91.5           91.5           91.0           90.8           90.6           90.3           90.1           89.7           89.3                           | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.7           91.4           90.9           90.4           90.9           90.4           90.0                         | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>91.9<br>91.2<br>90.7   | 250<br>94.9<br>96.4<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>92.2   | 315         95.3         96.8         96.5         96.2         95.9         95.6         95.0         94.7         94.4         94.1         93.8         93.1         92.6  | <b>400</b><br>95.0<br>96.2<br>95.9<br>95.6<br>95.3<br>94.7<br>94.4<br>94.1<br>93.8<br>93.5<br>92.8<br>92.3   | <b>500</b><br>95.1<br>96.6<br>95.7<br>95.4<br>94.8<br>94.5<br>94.2<br>93.9<br>93.6<br>92.9<br>92.4   | 630<br>96.7<br>98.2<br>97.9<br>97.6<br>97.3<br>97.0<br>96.4<br>96.1<br>96.1<br>95.8<br>95.5<br>95.5<br>95.2<br>94.5<br>94.0   | <b>800</b><br>96.5<br>97.7<br>97.4<br>97.1<br>96.8<br>96.2<br>95.9<br>95.6<br>95.3<br>95.0<br>95.0<br>94.3<br>93.8  | 1000         97.5         99.0         98.7         98.1         97.8         97.2         96.9         96.6         96.3         96.0         95.3         94.8  | <b>1250</b> 98.2         99.7         99.4         99.1         98.5         98.5         97.9         97.6         97.3         97.0         96.7         96.0         95.5                            |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.1MW<br>SG 4.5-145 AM-3 @ 4.0MW<br>SG 4.5-145 NRS Mode N1<br>SG 4.5-145 NRS Mode N2<br>SG 4.5-145 NRS Mode N3   | 125           91.2           92.7           92.4           92.1           91.5           91.5           91.0           90.8           90.6           90.3           90.1           89.7           89.3           88.2            | 160           92.2           93.7           93.4           93.1           92.8           92.5           91.9           91.7           91.4           90.9           90.4           90.9           90.4           90.0           88.6          | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>91.9<br>91.2<br>90.7<br>89.2   | 250<br>94.9<br>96.4<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>92.2<br>90.7   | 315         95.3         96.5         96.2         95.9         95.6         95.0         94.7         94.4         93.8         93.1         92.6         91.1   | 400<br>95.0<br>96.5<br>95.9<br>95.6<br>95.3<br>95.3<br>94.7<br>94.4<br>94.1<br>93.8<br>93.5<br>92.8<br>92.3<br>92.3  | <b>500</b><br>95.1<br>96.6<br>96.3<br>95.7<br>95.4<br>95.4<br>94.8<br>94.5<br>94.2<br>93.9<br>93.6<br>93.6<br>92.9<br>92.4<br>90.9                                 | <ul> <li>630</li> <li>96.7</li> <li>98.2</li> <li>97.9</li> <li>97.6</li> <li>97.3</li> <li>97.0</li> <li>96.4</li> <li>96.1</li> <li>95.8</li> <li>95.5</li> <li>95.2</li> <li>94.5</li> <li>94.0</li> <li>92.5</li> </ul>                   | 800         96.5         98.0         97.7         97.4         97.1         96.8         96.2         95.9         95.6         95.3         95.0         94.3         93.8         92.3   | 1000         97.5         99.0         98.7         98.1         97.8         97.2         96.9         96.6         96.3         96.0         95.3         94.8         93.3   | 1250<br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6<br>97.3<br>97.0<br>97.0<br>96.7<br>96.7<br>96.0<br>95.5  |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.1MW<br>SG 4.5-145 AM-3 @ 4.0MW<br>SG 4.5-145 NRS Mode N1<br>SG 4.5-145 NRS Mode N3<br>SG 4.5-145 NRS Mode N4   | 125         91.2         92.7         92.4         92.1         91.5         91.5         91.0         90.8         90.6         90.3         90.1         89.7         89.3         88.2         87.5                           | 160         92.2         93.7         93.4         93.1         92.8         92.5         91.9         91.7         91.4         91.2         90.9         90.4         90.0         88.6         87.7  | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>93.7<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>91.9<br>91.2<br>91.2<br>90.7<br>89.2<br>88.1                         | 250<br>94.9<br>96.4<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>92.2<br>90.7<br>89.6   | 315         95.3         96.5         96.2         95.9         95.6         95.0         94.7         94.4         94.1         93.8         93.1         92.6         91.1         90.0                           | <b>400</b><br>95.0<br>96.2<br>95.9<br>95.3<br>95.3<br>94.7<br>94.4<br>94.1<br>93.8<br>93.5<br>92.8<br>92.3<br>92.8<br>92.3<br>90.8   | <b>500</b><br>95.1<br>96.3<br>96.0<br>95.7<br>95.4<br>94.5<br>94.5<br>94.5<br>94.2<br>93.9<br>93.6<br>92.9<br>92.4<br>90.9<br>89.8                                 | 630         96.7         98.2         97.9         97.6         97.3         97.0         96.4         96.1         95.5         95.5         95.2         94.5         92.5         91.4   | 800         96.5         98.0         97.7         97.4         97.1         96.8         96.2         95.9         95.6         95.3         95.0         94.3         93.8         92.3         91.2  | 100097.599.098.798.498.197.897.296.996.696.396.095.394.893.392.2  | 1250         98.2         99.7         99.4         99.1         98.5         98.5         97.9         97.6         97.3         97.0         96.7         96.0         95.5         94.0         92.9 |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.1MW<br>SG 4.5-145 AM-3 @ 4.0MW<br>SG 4.5-145 NRS Mode N1<br>SG 4.5-145 NRS Mode N2<br>SG 4.5-145 NRS Mode N3<br>SG 4.5-145 NRS Mode N4<br>SG 4.5-145 NRS Mode N4<br>SG 4.5-145 NRS Mode N5                           | 125         91.2         92.7         92.4         92.1         91.5         91.5         91.0         90.8         90.6         90.3         90.1         89.7         89.3         88.2         87.5         86.7              | 160         92.2         93.7         93.4         93.1         92.8         92.5         91.9         91.7         91.4         90.9         90.4         90.0         88.6         87.7         86.8  | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>91.9<br>91.2<br>90.7<br>89.2<br>88.1<br>87.1                         | 250<br>94.9<br>96.4<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>92.2<br>90.7<br>89.6<br>88.6                                 | 315         95.3         96.5         96.2         95.9         95.6         95.0         94.7         94.4         93.8         93.1         92.6         91.1         90.0         89.0                           | <b>400</b><br>95.0<br>96.2<br>95.9<br>95.3<br>95.3<br>94.7<br>94.4<br>94.1<br>93.8<br>93.5<br>92.8<br>92.3<br>92.3<br>92.3<br>92.3<br>89.7<br>88.7                         | <b>500</b><br>95.1<br>96.3<br>96.0<br>95.7<br>95.4<br>94.8<br>94.5<br>94.5<br>94.2<br>93.9<br>93.6<br>92.9<br>92.4<br>92.4<br>90.9<br>89.8<br>88.8                 | 630         96.7         98.2         97.9         97.6         97.3         97.0         96.4         96.5         95.5         95.2         94.5         94.0         92.5         91.4         90.4  | 800         96.5         98.0         97.7         97.4         97.1         96.8         96.2         95.9         95.6         95.3         95.0         94.3         93.8         92.3         91.2         90.2                           | 1000         97.5         99.0         98.7         98.1         97.8         97.2         96.9         96.6         96.3         96.0         95.3         94.8         93.3         92.2         91.2                           | 1250<br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6<br>97.3<br>97.0<br>97.3<br>97.0<br>95.5<br>94.0<br>92.9<br>91.9  |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.1MW<br>SG 4.5-145 AM-3 @ 4.0MW<br>SG 4.5-145 NRS Mode N1<br>SG 4.5-145 NRS Mode N1<br>SG 4.5-145 NRS Mode N3<br>SG 4.5-145 NRS Mode N4<br>SG 4.5-145 NRS Mode N5<br>SG 4.5-145 NRS Mode N6                           | 125         91.2         92.7         92.4         92.1         91.5         91.5         91.0         90.8         90.6         90.3         90.1         89.7         89.3         88.2         87.5         86.7         85.3 | 160         92.2         93.7         93.4         93.1         92.5         91.7         91.7         91.7         91.4         90.9         90.4         90.9         90.4         90.0         88.6         87.7         86.8         85.2 | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>93.7<br>93.7<br>93.7<br>92.8<br>92.5<br>92.2<br>91.9<br>91.2<br>91.2<br>91.2<br>90.7<br>89.2<br>88.1<br>87.1<br>85.2 | 250<br>94.9<br>96.4<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>92.2<br>90.7<br>89.6<br>88.6<br>88.6                         | 315         95.3         96.5         96.2         95.9         95.6         95.0         94.7         94.7         94.1         93.8         93.1         92.6         91.1         90.0         89.0         87.1 | <b>400</b><br>95.0<br>96.2<br>95.9<br>95.3<br>95.3<br>94.7<br>94.4<br>93.8<br>93.5<br>92.8<br>92.3<br>92.8<br>92.3<br>92.8<br>89.7<br>88.7<br>88.7                         | <b>500</b><br>95.1<br>96.3<br>96.0<br>95.7<br>95.4<br>94.5<br>94.5<br>94.5<br>94.2<br>93.9<br>93.6<br>92.9<br>92.4<br>92.4<br>90.9<br>89.8<br>88.8<br>88.8         | 630         96.7         98.2         97.9         97.6         97.3         97.0         96.1         96.2         96.1         95.5         95.5         95.5         94.5         94.0         92.5         91.4         90.4         88.5 | 800         96.5         98.0         97.7         97.4         97.1         96.8         96.2         95.9         95.6         95.3         95.0         94.3         92.3         91.2         90.2         88.3                           | 1000         97.5         99.0         98.7         98.7         98.1         97.8         97.2         96.9         96.6         96.3         96.0         95.3         94.8         93.3         92.2         91.2         89.3 | <b>1250</b> 98.2         99.7         99.4         99.1         98.5         97.0         97.6         97.0         96.7         96.0         95.5         94.0         92.9         91.9         90.0  |
| Central Frequency [Hz]<br>SG 4.5-145 Baseline AM0 @ 4.5MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+5 @ 5.0MW<br>SG 4.5-145 AM+4 @ 4.9MW<br>SG 4.5-145 AM+3 @ 4.8MW<br>SG 4.5-145 AM+2 @ 4.7MW<br>SG 4.5-145 AM+1 @ 4.6MW<br>SG 4.5-145 AM-1 @ 4.4MW<br>SG 4.5-145 AM-2 @ 4.3MW<br>SG 4.5-145 AM-3 @ 4.2MW<br>SG 4.5-145 AM-3 @ 4.1MW<br>SG 4.5-145 AM-3 @ 4.0MW<br>SG 4.5-145 NRS Mode N1<br>SG 4.5-145 NRS Mode N2<br>SG 4.5-145 NRS Mode N3<br>SG 4.5-145 NRS Mode N4<br>SG 4.5-145 NRS Mode N5<br>SG 4.5-145 NRS Mode N6<br>SG 4.5-145 NRS Mode N7 | <b>125</b><br>91.2<br>92.7<br>92.4<br>92.1<br>91.8<br>91.5<br>91.0<br>90.8<br>90.6<br>90.3<br>90.1<br>89.7<br>89.3<br>89.7<br>89.3<br>88.2<br>87.5<br>86.7<br>85.3<br>84.6   | 160         92.2         93.7         93.4         93.1         92.8         92.5         91.9         91.7         91.4         90.9         90.4         90.0         88.6         87.7         86.8         85.2         84.3              | 200<br>93.4<br>94.9<br>94.6<br>94.3<br>94.0<br>93.7<br>93.1<br>92.8<br>92.5<br>92.2<br>91.9<br>91.2<br>90.7<br>89.2<br>89.2<br>88.1<br>85.2<br>85.2<br>84.2 | 250<br>94.9<br>96.4<br>95.8<br>95.5<br>95.2<br>94.6<br>94.3<br>94.0<br>93.7<br>93.4<br>92.7<br>93.4<br>92.7<br>92.2<br>90.7<br>89.6<br>88.6<br>88.6<br>86.7 | 315         95.3         96.5         96.2         95.9         95.6         95.0         94.7         94.4         93.8         93.1         92.6         91.1         90.0         89.0         87.1         86.1 | <b>400</b><br>95.0<br>96.2<br>95.9<br>95.3<br>95.3<br>94.7<br>94.4<br>93.8<br>93.5<br>92.8<br>92.3<br>92.3<br>92.3<br>92.3<br>92.3<br>92.3<br>83.7<br>88.7<br>86.8<br>85.8 | <b>500</b><br>95.1<br>96.0<br>95.7<br>95.4<br>94.8<br>94.5<br>94.5<br>94.2<br>93.9<br>93.6<br>93.6<br>92.9<br>92.4<br>90.9<br>89.8<br>88.8<br>88.8<br>86.9<br>85.9 | 630         96.7         98.2         97.9         97.6         97.3         97.0         96.4         96.5         95.5         95.2         94.5         94.0         92.5         91.4         88.5         87.5                           | 800         96.5         98.0         97.7         97.4         97.1         96.8         96.2         95.9         95.6         95.3         95.0         94.3         93.8         92.3         91.2         90.2         88.3         87.3 | 1000         97.5         99.0         98.7         98.1         97.8         97.2         96.9         96.3         96.3         95.3         94.8         93.3         92.2         91.2         89.3         88.3              | 1250<br>98.2<br>99.7<br>99.4<br>99.1<br>98.8<br>98.5<br>97.9<br>97.6<br>97.3<br>97.0<br>97.3<br>97.0<br>95.5<br>94.0<br>95.5<br>94.0<br>92.9<br>91.9<br>91.9<br>90.0                                    |

SIEMENS Gamesa

GENERAL CHARACTERISTICS MANUAL

Code: GD381009-en
Date: 17/06/2019

Pg. 19 of 19

Rev: 3

## Title: SG 4.5-145 NOISE EMISSION ANALYSIS

|                                 | 1000 | 2000 | 2500 | 2150 | 4000 | F000 | 6200 | 0000 | 10000 |
|---------------------------------|------|------|------|------|------|------|------|------|-------|
| Central Frequency [Hz]          | 1000 | 2000 | 2500 | 3120 | 4000 | 5000 | 6300 | 8000 | 10000 |
| SG 4.5-145 Baseline AM0 @ 4.5MW | 98.1 | 97.0 | 95.6 | 93.4 | 90.3 | 86.0 | 80.8 | 75.0 | 70.4  |
| SG 4.5-145 AM+5 @ 5.0MW         | 99.6 | 98.5 | 97.1 | 94.9 | 91.8 | 87.5 | 82.3 | 76.5 | 71.9  |
| SG 4.5-145 AM+4 @ 4.9MW         | 99.3 | 98.2 | 96.8 | 94.6 | 91.5 | 87.2 | 82.0 | 76.2 | 71.6  |
| SG 4.5-145 AM+3 @ 4.8MW         | 99.0 | 97.9 | 96.5 | 94.3 | 91.2 | 86.9 | 81.7 | 75.9 | 71.3  |
| SG 4.5-145 AM+2 @ 4.7MW         | 98.7 | 97.6 | 96.2 | 94.0 | 90.9 | 86.6 | 81.4 | 75.6 | 71.0  |
| SG 4.5-145 AM+1 @ 4.6MW         | 98.4 | 97.3 | 95.9 | 93.7 | 90.6 | 86.3 | 81.1 | 75.3 | 70.7  |
| SG 4.5-145 AM-1 @ 4.4MW         | 97.8 | 96.7 | 95.3 | 93.1 | 90.0 | 85.7 | 80.5 | 74.7 | 70.1  |
| SG 4.5-145 AM-2 @ 4.3MW         | 97.5 | 96.4 | 95.0 | 92.8 | 89.7 | 85.4 | 80.2 | 74.4 | 69.8  |
| SG 4.5-145 AM-3 @ 4.2MW         | 97.2 | 96.1 | 94.7 | 92.5 | 89.4 | 85.1 | 79.9 | 74.1 | 69.5  |
| SG 4.5-145 AM-3 @ 4.1MW         | 96.9 | 95.8 | 94.4 | 92.2 | 89.1 | 84.8 | 79.6 | 73.8 | 69.2  |
| SG 4.5-145 AM-3 @ 4.0MW         | 96.6 | 95.5 | 94.1 | 91.9 | 88.8 | 84.5 | 79.3 | 73.5 | 68.9  |
| SG 4.5-145 NRS Mode N1          | 95.9 | 94.8 | 93.4 | 91.2 | 88.1 | 83.8 | 78.6 | 72.8 | 68.2  |
| SG 4.5-145 NRS Mode N2          | 95.4 | 94.3 | 92.9 | 90.7 | 87.6 | 83.3 | 78.1 | 72.3 | 67.7  |
| SG 4.5-145 NRS Mode N3          | 93.9 | 92.8 | 91.4 | 89.2 | 86.1 | 81.8 | 76.6 | 70.8 | 66.2  |
| SG 4.5-145 NRS Mode N4          | 92.8 | 91.7 | 90.3 | 88.1 | 85.0 | 80.7 | 75.5 | 69.7 | 65.1  |
| SG 4.5-145 NRS Mode N5          | 91.8 | 90.7 | 89.3 | 87.1 | 84.0 | 79.7 | 74.5 | 68.7 | 64.1  |
| SG 4.5-145 NRS Mode N6          | 89.9 | 88.8 | 87.4 | 85.2 | 82.1 | 77.8 | 72.6 | 66.8 | 62.2  |
| SG 4.5-145 NRS Mode N7          | 88.9 | 87.8 | 86.4 | 84.2 | 81.1 | 76.8 | 71.6 | 65.8 | 61.2  |
| SG 4.5-145 NRS Mode N8          | 87.9 | 86.8 | 85.4 | 83.2 | 80.1 | 75.8 | 70.6 | 64.8 | 60.2  |

**Table 11** One-third octave band noise spectra of SG 4.5-145 @ 13 m/s and up to cut out wind speed (ref SG145spectra\_4500KW\_R03\_17062018)

APPENDIX B

Baseline Case Noise Emissions -AER-Regulated Facilities and Wells Table 1 presents noise emissions values used in the Project NIA to represent AER-regulated Baseline Case facilities. Table 2 presents noise emission values used in the Project NIA to represent AER-regulated Baseline Case emissions values are presented in the form of octave band sound power levels, expressed in dBZ, and total sound power levels, expressed in dBA.

| Facility Identification | Operator/Licensee (or Description from       | Type of Facility (or Description from | Universal Transverse<br>[NAD83, |              | (       | Octave-E | Band Sou | und Pow | er Level | [dBZ] |       |       | Total Sound Power | Reference |   |
|-------------------------|--|---------------------------------------|---------------------------------|--------------|---------|----------|----------|---------|----------|-------|-------|-------|-------------------|-----------|---|
| Code                    | Third-Party NIA)                             | Third-Party NIA)                      | Easting [m]                     | Northing [m] | 31.5 Hz | 63 Hz    | 125 Hz   | 250 Hz  | 500 Hz   | 1 kHz | 2 kHz | 4 kHz | 8 kHz             |           |   |
| AER Facility MF025      | Cardinal/Interpipline Oil Treating           | Cardinal/Interpipline Oil Treating    | 495932                          | 5617763      | 113.0   | 116.0    | 113.0    | 110.0   | 105.0    | 105.0 | 108.0 | 97.0  | 82.0              | 111.9     | Facility location and noise emissions from<br>(Innova 2016)             |
| AER Facility GF160      | CONOCOPHILLIPS WESTERN CANADA<br>PARTNERSHIP | Compressor Station & Battery          | 488753                          | 5617065      | 122.0   | 122.0    | 116.0    | 107.0   | 96.0     | 98.0  | 94.0  | 91.0  | 89.0              | 105.4     | Facility location from (AER 2019a); noise emissions from (Innova 2016)  |
| AER Facility MF024      | TransCanada Compressor Station               | TransCanada Compressor Station        | 492951                          | 5616706      | 122.0   | 122.0    | 116.0    | 107.0   | 96.0     | 98.0  | 94.0  | 91.0  | 89.0              | 105.4     | Facility location and noise emissions from<br>(Innova 2016)             |
| AER Facility GF120      | ALTAGAS LTD.                                 | Battery & Meter Station               | 498360                          | 5617093      | 104.2   | 106.2    | 104.1    | 101.7   | 100.3    | 100.0 | 97.3  | 96.2  | 93.8              | 105.1     | Facility location from (AER 2019a); noise emissions from (RWDI 2019)    |
| AER Facility GF001      | CANADIAN NATURAL RESOURCES<br>LIMITED        | Battery                               | 497011                          | 5622876      | 104.2   | 106.2    | 104.1    | 101.7   | 100.3    | 100.0 | 97.3  | 96.2  | 93.8              | 105.1     | Facility location from (AER 2019a); noise emissions from (RWDI 2019)    |
| AER Facility GF213      | CANADIAN NATURAL RESOURCES<br>LIMITED        | Battery                               | 489228                          | 5620395      | 104.2   | 106.2    | 104.1    | 101.7   | 100.3    | 100.0 | 97.3  | 96.2  | 93.8              | 105.1     | Facility location from (AER 2019a); noise emissions from (RWDI 2019)    |
| AER Facility GF016      | CARDINAL ENERGY LTD.                         | Battery                               | 498144                          | 5617409      | 104.2   | 106.2    | 104.1    | 101.7   | 100.3    | 100.0 | 97.3  | 96.2  | 93.8              | 105.1     | Facility location from (AER 2019a); noise emissions from (RWDI 2019)    |
| AER Facility GF023      | CARDINAL ENERGY LTD.                         | Battery                               | 496347                          | 5618240      | 104.2   | 106.2    | 104.1    | 101.7   | 100.3    | 100.0 | 97.3  | 96.2  | 93.8              | 105.1     | Facility location from (AER 2019a); noise<br>emissions from (RWDI 2019) |
| AER Facility GF070      | CARDINAL ENERGY LTD.                         | Battery                               | 497928                          | 5617067      | 104.2   | 106.2    | 104.1    | 101.7   | 100.3    | 100.0 | 97.3  | 96.2  | 93.8              | 105.1     | Facility location from (AER 2019a); noise<br>emissions from (RWDI 2019) |
| AER Facility GF167      | CARDINAL ENERGY LTD.                         | Battery                               | 489359                          | 5617461      | 104.2   | 106.2    | 104.1    | 101.7   | 100.3    | 100.0 | 97.3  | 96.2  | 93.8              | 105.1     | Facility location from (AER 2019a); noise<br>emissions from (RWDI 2019) |
| AER Facility GF128      | CARDINAL ENERGY LTD.                         | Satellite                             | 492952                          | 5615965      | 104.2   | 106.2    | 104.1    | 101.7   | 100.3    | 100.0 | 97.3  | 96.2  | 93.8              | 105.1     | Facility location from (AER 2019a); noise<br>emissions from (RWDI 2019) |
| AER Facility GF008      | COR4 OIL CORP.                               | Satellite                             | 494836                          | 5620228      | 104.2   | 106.2    | 104.1    | 101.7   | 100.3    | 100.0 | 97.3  | 96.2  | 93.8              | 105.1     | Facility location from (AER 2019a); noise<br>emissions from (RWDI 2019) |
| AER Facility GF011      | COR4 OIL CORP.                               | Satellite                             | 494736                          | 5619842      | 104.2   | 106.2    | 104.1    | 101.7   | 100.3    | 100.0 | 97.3  | 96.2  | 93.8              | 105.1     | Facility location from (AER 2019a); noise<br>emissions from (RWDI 2019) |
| AER Facility GF203      | COR4 OIL CORP.                               | Satellite                             | 495254                          | 5620372      | 104.2   | 106.2    | 104.1    | 101.7   | 100.3    | 100.0 | 97.3  | 96.2  | 93.8              | 105.1     | Facility location from (AER 2019a); noise<br>emissions from (RWDI 2019) |
| AER Facility MF002      | Crestar Jenner "p" Pool 15-23                | Crestar Jenner "p" Pool 15-23         | 499443                          | 5627755      | 104.2   | 106.2    | 104.1    | 101.7   | 100.3    | 100.0 | 97.3  | 96.2  | 93.8              | 105.1     | Facility location and noise emissions from (RWDI 2019)                  |
| AER Facility MF004      | Crestar Jenner 10-32-20-8                    | Crestar Jenner 10-32-20-8             | 494689                          | 5621048      | 104.2   | 106.2    | 104.1    | 101.7   | 100.3    | 100.0 | 97.3  | 96.2  | 93.8              | 105.1     | Facility location and noise emissions from (RWDI 2019)                  |
| AER Facility MF005      | Crestar Jenner 10-7-21-8                     | Crestar Jenner 10-7-21-8              | 493175                          | 5624391      | 104.2   | 106.2    | 104.1    | 101.7   | 100.3    | 100.0 | 97.3  | 96.2  | 93.8              | 105.1     | Facility location and noise emissions from (RWDI 2019)                  |
| AER Facility MF003      | Hemisphere Jenner 11-25                      | Hemisphere Jenner 11-25               | 491011                          | 5628996      | 104.2   | 106.2    | 104.1    | 101.7   | 100.3    | 100.0 | 97.3  | 96.2  | 93.8              | 105.1     | Facility location and noise emissions from<br>(RWDI 2019)               |
| AER Facility MF006      | Hemisphere Jenner 16-31                      | Hemisphere Jenner 16-31               | 493705                          | 5631117      | 104.2   | 106.2    | 104.1    | 101.7   | 100.3    | 100.0 | 97.3  | 96.2  | 93.8              | 105.1     | Facility location and noise emissions from (RWDI 2019)                  |
| AER Facility GF058      | IPC ALBERTA LTD.                             | Battery                               | 497979                          | 5616650      | 104.2   | 106.2    | 104.1    | 101.7   | 100.3    | 100.0 | 97.3  | 96.2  | 93.8              | 105.1     | Facility location from (AER 2019a); noise<br>emissions from (RWDI 2019) |
| AER Facility GF004      | IPC ALBERTA LTD.                             | Battery & Gas Gathering System        | 498316                          | 5616618      | 104.2   | 106.2    | 104.1    | 101.7   | 100.3    | 100.0 | 97.3  | 96.2  | 93.8              | 105.1     | Facility location from (AER 2019a); noise<br>emissions from (RWDI 2019) |
| AER Facility GF072      | NOVA GAS TRANSMISSION LTD.                   | Battery & Meter Station               | 497930                          | 5617520      | 104.2   | 106.2    | 104.1    | 101.7   | 100.3    | 100.0 | 97.3  | 96.2  | 93.8              | 105.1     | Facility location from (AER 2019a); noise<br>emissions from (RWDI 2019) |
| AER Facility GF056      | PENGROWTH ENERGY CORPORATION                 | Battery                               | 494201                          | 5621604      | 104.2   | 106.2    | 104.1    | 101.7   | 100.3    | 100.0 | 97.3  | 96.2  | 93.8              | 105.1     | Facility location from (AER 2019a); noise<br>emissions from (RWDI 2019) |
| AER Facility MF001      | Pinnacle Jenner 14-12                        | Pinnacle Jenner 14-12                 | 491223                          | 5634314      | 104.2   | 106.2    | 104.1    | 101.7   | 100.3    | 100.0 | 97.3  | 96.2  | 93.8              | 105.1     | Facility location and noise emissions from (RWDI 2019)                  |
| AER Facility MF027      | Imaginea Compressor Station                  | Imaginea Compressor Station           | 495574                          | 5617854      | 114.7   | 114.0    | 110.7    | 104.5   | 101.0    | 98.6  | 97.1  | 92.6  | 86.6              | 104.8     | Facility location and noise emissions from (RWDI 2018)                  |

| Facility Identification | Operator/Licensee (or Description from          | Type of Facility (or Description from           | Universal Transverse<br>[NAD83] | e Mercator Coordinates<br>8, Zone 12] |         |       | Octave-E | Band So | und Pow | er Leve | l [dBZ] |       |       | Total Sound Power | Reference  |
|-------------------------|---|---|---------------------------------|---------------------------------------|---------|-------|----------|---------|---------|---------|---------|-------|-------|-------------------|--|
| Code                    | Third-Party NIA)                                | Third-Party NIA)                                | Easting [m]                     | Northing [m]                          | 31.5 Hz | 63 Hz | 125 Hz   | 250 Hz  | 500 Hz  | 1 kHz   | 2 kHz   | 4 kHz | 8 kHz | Level [dDA]       |  |
| AER Facility MF010      | Crude Oil Battery & Enhanced Recovery<br>Scheme | Crude Oil Battery & Enhanced Recovery<br>Scheme | 487714                          | 5621818                               | 101.7   | 103.7 | 101.6    | 99.2    | 97.8    | 97.5    | 94.8    | 93.7  | 91.3  | 102.4             | Facility location and noise emissions from<br>(Stantec 2019)               |
| AER Facility GF081      | NOVA GAS TRANSMISSION LTD.                      | Meter Station                                   | 495714                          | 5617479                               | 80.6    | 80.6  | 80.6     | 80.6    | 80.6    | 80.6    | 80.6    | 80.6  | 80.6  | 89.5              | Facility location from (AER 2019a); noise emissions from (RWDI 2018)       |
| AER Facility MF009      | Enhanced Recovery Scheme                        | Enhanced Recovery Scheme                        | 487718                          | 5620598                               | 87.4    | 89.4  | 87.3     | 84.9    | 83.5    | 83.2    | 80.5    | 79.4  | 77.0  | 88.3              | Facility location and noise emissions from<br>(Stantec 2019)               |
| AER Facility GF021      | NOVA GAS TRANSMISSION LTD.                      | Meter Station                                   | 490091                          | 5617206                               | 87.4    | 89.4  | 87.3     | 84.9    | 83.5    | 83.2    | 80.5    | 79.4  | 77.0  | 88.3              | Facility location from (AER 2019a); noise emissions from (Stantec 2019)    |
| AER Facility GF153      | NOVA GAS TRANSMISSION LTD.                      | Meter Station                                   | 496686                          | 5616902                               | 87.4    | 89.4  | 87.3     | 84.9    | 83.5    | 83.2    | 80.5    | 79.4  | 77.0  | 88.3              | Facility location from (AER 2019a); noise<br>emissions from (Stantec 2019) |
| AER Facility GF165      | NOVA GAS TRANSMISSION LTD.                      | Meter Station                                   | 490210                          | 5615423                               | 87.4    | 89.4  | 87.3     | 84.9    | 83.5    | 83.2    | 80.5    | 79.4  | 77.0  | 88.3              | Facility location from (AER 2019a); noise emissions from (Stantec 2019)    |
| AER Facility GF199      | NOVA GAS TRANSMISSION LTD.                      | Meter Station                                   | 488882                          | 5617050                               | 87.4    | 89.4  | 87.3     | 84.9    | 83.5    | 83.2    | 80.5    | 79.4  | 77.0  | 88.3              | Facility location from (AER 2019a); noise emissions from (Stantec 2019)    |

#### Table 1: Baseline Case Noise Emissions - AER-Regulated Facilities

<sup>(a)</sup> A facility code that includes "MF" (e.g., "AER Facility MF025") indicates this facility was identified in a third-party NIA. A facility code that includes "GF" (e.g., "AER Facility GF160") indicates this facility was identified from the ST102 database (AER 2019a).



| Well Identification | Operator/Licensee (or Description from | Type of Well (or Description from | Universal Transvers<br>[NAD8] | e Mercator Coordinates<br>3, Zone 12] | Coordinates Octave-Band Sound Power Le |       |        |        |        |       |       |       |       | Total Sound Power | Reference   |
|---------------------|--|-----------------------------------|-------------------------------|---------------------------------------|--|-------|--------|--------|--------|-------|-------|-------|-------|-------------------|---|
| Code                | Inird-Party NIA)                       | Inird-Party NIA)                  | Easting [m]                   | Northing [m]                          | 31.5 Hz                                | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1 kHz | 2 kHz | 4 kHz | 8 kHz | Level [dBA]       |   |
| AER Well GW483      | CANADIAN NATURAL RESOURCES<br>LIMITED  | PUMPING OIL                       | 497012                        | 5622876                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW778      | CARDINAL ENERGY LTD.                   | PUMPING OIL                       | 495799                        | 5618004                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW745      | CARDINAL ENERGY LTD.                   | PUMPING OIL                       | 496584                        | 5618090                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW725      | CARDINAL ENERGY LTD.                   | PUMPING OIL                       | 496151                        | 5617804                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise emissions from (RWDI 2018)    |
| AER Well GW599      | CARDINAL ENERGY LTD.                   | PUMPING OIL                       | 496706                        | 5617380                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise emissions from (RWDI 2018)    |
| AER Well GW494      | CARDINAL ENERGY LTD.                   | PUMPING OIL                       | 496613                        | 5618815                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise emissions from (RWDI 2018)    |
| AER Well GW452      | CARDINAL ENERGY LTD.                   | PUMPING OIL                       | 498345                        | 5617519                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW419      | CARDINAL ENERGY LTD.                   | PUMPING OIL                       | 496761                        | 5618180                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW412      | CARDINAL ENERGY LTD.                   | PUMPING OIL                       | 496399                        | 5618616                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW394      | CARDINAL ENERGY LTD.                   | PUMPING OIL                       | 496817                        | 5617790                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW393      | CARDINAL ENERGY LTD.                   | PUMPING OIL                       | 498358                        | 5617104                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW357      | CARDINAL ENERGY LTD.                   | PUMPING OIL                       | 493307                        | 5616062                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW321      | CARDINAL ENERGY LTD.                   | PUMPING OIL                       | 492972                        | 5615868                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW303      | CARDINAL ENERGY LTD.                   | PUMPING OIL                       | 496184                        | 5618091                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW207      | CARDINAL ENERGY LTD.                   | PUMPING OIL                       | 496449                        | 5616887                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW206      | CARDINAL ENERGY LTD.                   | PUMPING OIL                       | 496391                        | 5618513                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW162      | CARDINAL ENERGY LTD.                   | PUMPING OIL                       | 496393                        | 5618265                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW155      | CARDINAL ENERGY LTD.                   | PUMPING OIL                       | 497930                        | 5617520                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW154      | CARDINAL ENERGY LTD.                   | PUMPING OIL                       | 489022                        | 5617905                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW091      | CARDINAL ENERGY LTD.                   | PUMPING OIL                       | 496541                        | 5618030                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well MW069      | CARDINAL JENNER 10-18-20-8             | PUMPING OIL                       | 492952                        | 5615965                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)                  |
| AER Well MW038      | CARDINAL JENNER 10-18-20-8             | PUMPING OIL                       | 492952                        | 5615965                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from<br>(RWDI 2018)               |
| AER Well MW039      | CARDINAL JENNER 1-18-20-8              | PUMPING OIL                       | 493244                        | 5615280                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)                  |
| AER Well MW070      | CARDINAL JENNER 15-18-20-8             | PUMPING OIL                       | 492952                        | 5616954                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)                  |
| AER Well MW037      | CARDINAL JENNER 15-18-20-8             | PUMPING OIL                       | 492952                        | 5616954                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)                  |
| AER Well MW041      | CARDINAL JENNER 7-18-20-8              | PUMPING OIL                       | 493318                        | 5615132                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)                  |



| Well Identification | Operator/Licensee (or Description from | Type of Well (or Description from | Universal Transvers<br>[NAD83] | e Mercator Coordinates<br>8, Zone 12] | Coordinates Octave-Band Sound Power Le |       |        |        |        |       |       |       |       | Total Sound Power | Reference   |
|---------------------|--|-----------------------------------|--------------------------------|---------------------------------------|--|-------|--------|--------|--------|-------|-------|-------|-------|-------------------|---|
| Code                | Iniro-Party NIA)                       | Inird-Party NIA)                  | Easting [m]                    | Northing [m]                          | 31.5 Hz                                | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1 kHz | 2 kHz | 4 kHz | 8 kHz | Level [dBA]       |   |
| AER Well MW034      | CARDINAL SUFFIELD 10-21-20-8           | PUMPING OIL                       | 496072                         | 5617733                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from<br>(RWDI 2018)               |
| AER Well MW030      | CARDINAL SUFFIELD 11-21-20-8           | PUMPING OIL                       | 496181                         | 5618050                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)                  |
| AER Well MW028      | CARDINAL SUFFIELD 11-21-20-8           | PUMPING OIL                       | 496181                         | 5618050                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)                  |
| AER Well MW036      | CARDINAL SUFFIELD 14-21-20-8           | PUMPING OIL                       | 495893                         | 5618343                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)                  |
| AER Well MW029      | CARDINAL SUFFIELD 14-21-20-8           | PUMPING OIL                       | 495893                         | 5618343                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)                  |
| AER Well MW040      | CARDINAL SUFFIELD 7-21-20-8            | PUMPING OIL                       | 496039                         | 5617126                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)                  |
| AER Well GW779      | COR4 OIL CORP.                         | PUMPING OIL                       | 494978                         | 5620806                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW775      | COR4 OIL CORP.                         | PUMPING OIL                       | 492993                         | 5617347                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW771      | COR4 OIL CORP.                         | PUMPING OIL                       | 494994                         | 5620319                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW769      | COR4 OIL CORP.                         | PUMPING OIL                       | 496782                         | 5623353                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW742      | COR4 OIL CORP.                         | PUMPING OIL                       | 496018                         | 5620221                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW730      | COR4 OIL CORP.                         | PUMPING OIL                       | 494496                         | 5622872                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW729      | COR4 OIL CORP.                         | PUMPING OIL                       | 493598                         | 5621597                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW715      | COR4 OIL CORP.                         | PUMPING OIL                       | 495142                         | 5619930                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW711      | COR4 OIL CORP.                         | PUMPING OIL                       | 495273                         | 5620346                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW703      | COR4 OIL CORP.                         | PUMPING OIL                       | 494674                         | 5620779                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW683      | COR4 OIL CORP.                         | PUMPING OIL                       | 495054                         | 5620482                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW673      | COR4 OIL CORP.                         | PUMPING OIL                       | 493877                         | 5621372                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW665      | COR4 OIL CORP.                         | PUMPING OIL                       | 494388                         | 5618796                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW663      | COR4 OIL CORP.                         | PUMPING OIL                       | 494356                         | 5620836                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW661      | COR4 OIL CORP.                         | PUMPING OIL                       | 495244                         | 5620345                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW641      | COR4 OIL CORP.                         | PUMPING OIL                       | 495955                         | 5619940                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW630      | COR4 OIL CORP.                         | PUMPING OIL                       | 493923                         | 5621484                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW601      | COR4 OIL CORP.                         | PUMPING OIL                       | 494800                         | 5621481                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW574      | COR4 OIL CORP.                         | PUMPING OIL                       | 495254                         | 5620397                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW547      | COR4 OIL CORP.                         | PUMPING OIL                       | 489561                         | 5616564                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |



| Well Identification | Operator/Licensee (or Description from | Type of Well (or Description from | Universal Transvers<br>[NAD83] | e Mercator Coordinates<br>3, Zone 12] | Coordinates Octave-Band Sound Power Leve |       |        |        |        |       |       |       |       | Total Sound Power | Reference   |
|---------------------|--|-----------------------------------|--------------------------------|---------------------------------------|--|-------|--------|--------|--------|-------|-------|-------|-------|-------------------|---|
| Code <sup>(a)</sup> | I hird-Party NIA)                      | Third-Party NIA)                  | Easting [m]                    | Northing [m]                          | 31.5 Hz                                  | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1 kHz | 2 kHz | 4 kHz | 8 kHz | Level [dBA]       |   |
| AER Well GW537      | COR4 OIL CORP.                         | PUMPING OIL                       | 495573                         | 5620021                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW529      | COR4 OIL CORP.                         | PUMPING OIL                       | 494991                         | 5621763                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW524      | COR4 OIL CORP.                         | PUMPING OIL                       | 496037                         | 5620609                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW518      | COR4 OIL CORP.                         | PUMPING OIL                       | 494700                         | 5620273                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise emissions from (RWDI 2018)    |
| AER Well GW516      | COR4 OIL CORP.                         | PUMPING OIL                       | 494387                         | 5618928                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise emissions from (RWDI 2018)    |
| AER Well GW513      | COR4 OIL CORP.                         | PUMPING OIL                       | 493606                         | 5614722                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise emissions from (RWDI 2018)    |
| AER Well GW512      | COR4 OIL CORP.                         | PUMPING OIL                       | 494043                         | 5620641                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW491      | COR4 OIL CORP.                         | PUMPING OIL                       | 494285                         | 5620989                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW489      | COR4 OIL CORP.                         | PUMPING OIL                       | 495407                         | 5619674                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW465      | COR4 OIL CORP.                         | PUMPING OIL                       | 494604                         | 5623324                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW449      | COR4 OIL CORP.                         | PUMPING OIL                       | 496119                         | 5620529                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW439      | COR4 OIL CORP.                         | PUMPING OIL                       | 493901                         | 5621480                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW420      | COR4 OIL CORP.                         | PUMPING OIL                       | 496245                         | 5619998                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW400      | COR4 OIL CORP.                         | PUMPING OIL                       | 495252                         | 5621793                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW389      | COR4 OIL CORP.                         | PUMPING OIL                       | 494964                         | 5619733                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW386      | COR4 OIL CORP.                         | PUMPING OIL                       | 494802                         | 5622310                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW337      | COR4 OIL CORP.                         | PUMPING OIL                       | 495466                         | 5623371                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW333      | COR4 OIL CORP.                         | PUMPING OIL                       | 495102                         | 5619872                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW332      | COR4 OIL CORP.                         | PUMPING OIL                       | 494419                         | 5619420                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW327      | COR4 OIL CORP.                         | PUMPING OIL                       | 494404                         | 5622144                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW317      | COR4 OIL CORP.                         | PUMPING OIL                       | 494358                         | 5621039                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW310      | COR4 OIL CORP.                         | PUMPING OIL                       | 494178                         | 5621818                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW309      | COR4 OIL CORP.                         | PUMPING OIL                       | 494956                         | 5620792                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW276      | COR4 OIL CORP.                         | PUMPING OIL                       | 495081                         | 5620462                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW275      | COR4 OIL CORP.                         | PUMPING OIL                       | 494181                         | 5620947                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW274      | COR4 OIL CORP.                         | PUMPING OIL                       | 495821                         | 5621306                               | 77.6                                     | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |

| Well Identification | Operator/Licensee (or Description from | Type of Well (or Description from | Universal Transvers<br>[NAD8] | e Mercator Coordinates<br>3, Zone 12] | Coordinates Octave-Band Sound Power Le |       |        |        |        |       |       |       |       | Total Sound Power | Reference   |
|---------------------|--|-----------------------------------|-------------------------------|---------------------------------------|--|-------|--------|--------|--------|-------|-------|-------|-------|-------------------|---|
| Code <sup>(a)</sup> | Third-Party NIA)                       | Third-Party NIA)                  | Easting [m]                   | Northing [m]                          | 31.5 Hz                                | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1 kHz | 2 kHz | 4 kHz | 8 kHz | Level [dBA]       |   |
| AER Well GW272      | COR4 OIL CORP.                         | PUMPING OIL                       | 493500                        | 5615040                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW256      | COR4 OIL CORP.                         | PUMPING OIL                       | 489809                        | 5616237                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW228      | COR4 OIL CORP.                         | PUMPING OIL                       | 494100                        | 5619351                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW227      | COR4 OIL CORP.                         | PUMPING OIL                       | 495752                        | 5620215                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise emissions from (RWDI 2018)    |
| AER Well GW221      | COR4 OIL CORP.                         | PUMPING OIL                       | 494232                        | 5621583                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise emissions from (RWDI 2018)    |
| AER Well GW219      | COR4 OIL CORP.                         | PUMPING OIL                       | 495821                        | 5621276                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise emissions from (RWDI 2018)    |
| AER Well GW194      | COR4 OIL CORP.                         | PUMPING OIL                       | 492459                        | 5617345                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW192      | COR4 OIL CORP.                         | PUMPING OIL                       | 494753                        | 5623035                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW178      | COR4 OIL CORP.                         | PUMPING OIL                       | 494576                        | 5621952                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW176      | COR4 OIL CORP.                         | PUMPING OIL                       | 495407                        | 5619719                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW163      | COR4 OIL CORP.                         | PUMPING OIL                       | 496328                        | 5620185                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW160      | COR4 OIL CORP.                         | PUMPING OIL                       | 494291                        | 5618987                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW153      | COR4 OIL CORP.                         | PUMPING OIL                       | 492951                        | 5618386                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW141      | COR4 OIL CORP.                         | PUMPING OIL                       | 495714                        | 5621242                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW140      | COR4 OIL CORP.                         | PUMPING OIL                       | 494899                        | 5620032                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW137      | COR4 OIL CORP.                         | PUMPING OIL                       | 494639                        | 5623329                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW131      | COR4 OIL CORP.                         | PUMPING OIL                       | 494190                        | 5621801                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW123      | COR4 OIL CORP.                         | PUMPING OIL                       | 495187                        | 5620189                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW113      | COR4 OIL CORP.                         | PUMPING OIL                       | 495383                        | 5619674                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW110      | COR4 OIL CORP.                         | PUMPING OIL                       | 494794                        | 5620739                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW109      | COR4 OIL CORP.                         | PUMPING OIL                       | 495820                        | 5622840                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW108      | COR4 OIL CORP.                         | PUMPING OIL                       | 494829                        | 5620239                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW083      | COR4 OIL CORP.                         | PUMPING OIL                       | 494900                        | 5620690                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well MW065      | CVE 11A-16 SUFFIELD 15-16-20-8         | PUMPING OIL                       | 496017                        | 5616394                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)                  |
| AER Well MW067      | IMAGINEA JENNER 10-29-20-8             | PUMPING OIL                       | 494358                        | 5618951                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)                  |
| AER Well MW062      | IMAGINEA JENNER 10-29-20-8             | PUMPING OIL                       | 494358                        | 5618951                               | 77.6                                   | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)                  |



| Well Identification | Operator/Licensee (or Description from | Type of Well (or Description from | Universal Transverse<br>[NAD83] | e Mercator Coordinates<br>, Zone 12] | Coordinates Octave-Band Sound Power Level |       |        |        |        |       |       |       |       | Total Sound Power | Reference   |
|---------------------|--|-----------------------------------|---------------------------------|--------------------------------------|---|-------|--------|--------|--------|-------|-------|-------|-------|-------------------|---|
| Code <sup>(a)</sup> | Third-Party NIA)                       | Third-Party NIA)                  | Easting [m]                     | Northing [m]                         | 31.5 Hz                                   | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1 kHz | 2 kHz | 4 kHz | 8 kHz | Level [dBA]       |   |
| AER Well MW066      | IMAGINEA JENNER 12-28-20-8             | PUMPING OIL                       | 494769                          | 5619508                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from<br>(RWDI 2018) |
| AER Well MW046      | IMAGINEA JENNER 13-19-20-8             | PUMPING OIL                       | 492976                          | 5618376                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)    |
| AER Well MW042      | IMAGINEA JENNER 13-19-20-8             | PUMPING OIL                       | 492976                          | 5618376                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)    |
| AER Well MW051      | IMAGINEA JENNER 13-29-20-8             | PUMPING OIL                       | 494118                          | 5619333                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)    |
| AER Well MW050      | IMAGINEA JENNER 13-29-20-8             | PUMPING OIL                       | 494118                          | 5619333                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)    |
| AER Well MW048      | IMAGINEA JENNER 14-19-20-8             | PUMPING OIL                       | 493094                          | 5618226                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)    |
| AER Well MW056      | IMAGINEA JENNER 14-29-20-8             | PUMPING OIL                       | 494635                          | 5619531                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)    |
| AER Well MW064      | IMAGINEA JENNER 15-29-20-8             | PUMPING OIL                       | 494787                          | 5619827                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from<br>(RWDI 2018) |
| AER Well MW055      | IMAGINEA JENNER 15-29-20-8             | PUMPING OIL                       | 494787                          | 5619827                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)    |
| AER Well MW032      | IMAGINEA JENNER 15-29-20-8             | PUMPING OIL                       | 494787                          | 5619827                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)    |
| AER Well MW035      | IMAGINEA JENNER 16-29-20-8             | PUMPING OIL                       | 494798                          | 5619458                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from<br>(RWDI 2018) |
| AER Well MW058      | IMAGINEA JENNER 16-7-20-8              | PUMPING OIL                       | 493419                          | 5615361                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)    |
| AER Well MW057      | IMAGINEA JENNER 16-7-20-8              | PUMPING OIL                       | 493419                          | 5615361                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)    |
| AER Well MW060      | IMAGINEA JENNER 2-32-20-8              | PUMPING OIL                       | 494361                          | 5620001                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)    |
| AER Well MW049      | IMAGINEA JENNER 3-19-20-8              | PUMPING OIL                       | 493278                          | 5617341                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)    |
| AER Well MW045      | IMAGINEA JENNER 3-19-20-8              | PUMPING OIL                       | 493278                          | 5617341                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)    |
| AER Well MW061      | IMAGINEA JENNER 3-29-20-8              | PUMPING OIL                       | 494937                          | 5619261                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)    |
| AER Well MW071      | IMAGINEA JENNER 5-28-20-8              | PUMPING OIL                       | 495377                          | 5619162                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)    |
| AER Well MW044      | IMAGINEA JENNER 6-19-20-8              | PUMPING OIL                       | 493140                          | 5617871                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)    |
| AER Well MW047      | IMAGINEA JENNER 7-19-20-8              | PUMPING OIL                       | 493334                          | 5617566                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)    |
| AER Well MW043      | IMAGINEA JENNER 7-19-20-8              | PUMPING OIL                       | 493334                          | 5617566                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)    |
| AER Well MW068      | IMAGINEA JENNER 7-29-20-8              | PUMPING OIL                       | 495236                          | 5619599                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)    |
| AER Well MW063      | IMAGINEA JENNER 7-29-20-8              | PUMPING OIL                       | 495236                          | 5619599                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)    |
| AER Well MW054      | IMAGINEA JENNER 7-29-20-8              | PUMPING OIL                       | 495236                          | 5619599                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)    |
| AER Well MW033      | IMAGINEA JENNER 8-29-20-8              | PUMPING OIL                       | 494977                          | 5619242                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)    |
| AER Well MW059      | IMAGINEA JENNER 8-7-20-8               | PUMPING OIL                       | 493525                          | 5615019                              | 77.6                                      | 91.8  | 85.4   | 81.8   | 79.1   | 84.4  | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)    |



| Well Identification | Operator/Licensee (or Description from | Type of Well (or Description from | Universal Transverse<br>[NAD83] | e Mercator Coordinates<br>, Zone 12] |         |       | Octave | e-Band So | ound Pow | ver Level | [dBZ] |       |       | Total Sound Power | Reference   |
|---------------------|--|-----------------------------------|---------------------------------|--------------------------------------|---------|-------|--------|-----------|----------|-----------|-------|-------|-------|-------------------|---|
| Code                | i niro-Party NIA)                      | Iniro-Party NIA)                  | Easting [m]                     | Northing [m]                         | 31.5 Hz | 63 Hz | 125 Hz | 250 Hz    | 500 Hz   | 1 kHz     | 2 kHz | 4 kHz | 8 kHz | Levei [dBA]       |   |
| AER Well MW053      | IMAGINEA JENNER 8-7-20-8               | PUMPING OIL                       | 493525                          | 5615019                              | 77.6    | 91.8  | 85.4   | 81.8      | 79.1     | 84.4      | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from<br>(RWDI 2018)               |
| AER Well MW052      | IMAGINEA JENNER 8-7-20-8               | PUMPING OIL                       | 493525                          | 5615019                              | 77.6    | 91.8  | 85.4   | 81.8      | 79.1     | 84.4      | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from (RWDI 2018)                  |
| AER Well MW031      | IMAGINEA JENNER 9-29-20-8              | PUMPING OIL                       | 495066                          | 5619583                              | 77.6    | 91.8  | 85.4   | 81.8      | 79.1     | 84.4      | 75.4  | 75.9  | 67.4  | 86.5              | Well location and noise emissions from<br>(RWDI 2018)               |
| AER Well GW764      | IPC ALBERTA LTD.                       | PUMPING OIL                       | 496882                          | 5616302                              | 77.6    | 91.8  | 85.4   | 81.8      | 79.1     | 84.4      | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW438      | IPC ALBERTA LTD.                       | PUMPING OIL                       | 497979                          | 5616650                              | 77.6    | 91.8  | 85.4   | 81.8      | 79.1     | 84.4      | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW497      | IPC ALBERTA LTD.                       | PUMPING OIL / WATER INJECTOR      | 497160                          | 5616307                              | 77.6    | 91.8  | 85.4   | 81.8      | 79.1     | 84.4      | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW733      | IPC ALBERTA LTD.                       | WATER INJECTOR                    | 496618                          | 5616607                              | 77.6    | 91.8  | 85.4   | 81.8      | 79.1     | 84.4      | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW669      | IPC ALBERTA LTD.                       | WATER INJECTOR                    | 496042                          | 5616718                              | 77.6    | 91.8  | 85.4   | 81.8      | 79.1     | 84.4      | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |
| AER Well GW405      | IPC ALBERTA LTD.                       | WATER INJECTOR                    | 495848                          | 5616666                              | 77.6    | 91.8  | 85.4   | 81.8      | 79.1     | 84.4      | 75.4  | 75.9  | 67.4  | 86.5              | Well location from (AER 2019b); noise<br>emissions from (RWDI 2018) |

<sup>(a)</sup> A well code that includes "MW" (e.g., "AER Well MW069") indicates this well was identified in a third-party NIA. A well code that includes "GW" (e.g., "AER Well GW483") indicates this well was identified from the ST37 database (AER 2019b).



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