You may replace the guidance text with your responses using the same color:

* Please remove all guidance text prior to submission.
* Please ensure that all responses are complete.
* Email [crsra@noaa.gov](mailto:crsra@noaa.gov) with any questions.

## Application Information Required

To apply for a license to operate a remote sensing space system under 51 U.S.C. 60101, *et seq.* and 15 CFR part 960, you must provide:

1. Material Facts: Fully accurate and responsive information to the following prompts under “Description of Licensee” and “Description of System.” If a question is not applicable, write “N/A” and explain, if necessary.

NOTE: If you write “N/A” for any reason outside of those examples listed in the application guide, CRSRA recommends providing a detailed explanation of the “N/A” response in order to avoid misunderstandings and delays.

2. Affirmation: Confirm by indicating below that there will be, at all times, measures in place to ensure positive control of any spacecraft in the system that have propulsion, if applicable to your system. Such measures include encryption of telemetry, command, and control communications or alternative measures consistent with industry best practice.

Please enter one of the following response options here:

* If your answer to Part B 4.d.vii. is "no", indicating that you **will not** have propulsion, enter “N/A,” and provide an explanation.
  + *EXAMPLE: N/A - the System will not have propulsion.*
* If your answer to Part B 4.d.vii. is "yes", indicating you **will** have propulsion, you must provide the affirmation requested. You will be asked to describe these measures later in the application.
  + *EXAMPLE: State College affirms that there will be, at all times, measures in place to ensure positive control of any spacecraft in the System that have propulsion.*

3. Your response to each prompt below constitutes a material fact. If any information you submit later becomes inaccurate or incomplete before a license grant or denial, you must promptly contact the Secretary and submit correct and updated information as instructed by the Secretary.

## Part A: Description of Applicant (Operator)

### 1. General Applicant Information

a. Name of Applicant (entity or individual):

Name of company, partnership, joint venture, association, university, or individual.

*EXAMPLE: State College*

b. Location and address of Applicant:

This must be a physical address, not a P.O. Box.

For businesses, organizations, etc.: Physical address of the Applicant’s principal place of business

For individuals: Applicant’s home address or reliable address for professional correspondence (not a P.O. Box)

*EXAMPLE: 1234 University Street, Collegetown, AK 99723*

c. Applicant contact information (for example, general corporate or university contact information):

General corporate or university email and telephone number. NOTE: For businesses or universities, this is not the same as the primary point of contact in "d." below; for individuals, this might be the same contact as listed in “d.” below.

*EXAMPLE:* [*contact@statecollege.edu*](mailto:contact@statecollege.edu)*; 907-555-1234*

d. Contact information for a specific individual to serve as the point of contact with Commerce:

The primary point of contact should be a knowledgeable representative with authority to speak for the Applicant, such as senior management, permanent faculty (not student), or outside legal counsel that possess authorization to represent the Applicant. Contact information includes name, title, institution, physical address (not a P.O. Box), direct email, and direct telephone. NOTE: You may also provide an alternate point of contact in the same format.

*EXAMPLE: Dr. Jessie Smith*

*Professor of Engineering*

*State College*

*99-1 Engineering Bldg*

*1937 University Street*

*Collegetown, AK 99723*

[*jessie.smith@statecollege.edu*](mailto:jane.smith@statecollege.edu)

*907-555-4321*

e. Contact information for a specific individual to serve as the point of contact with Commerce for limited-operations directives, if different than main point of contact, in the event that the applicant will receive a license in Tier 2 or Tier 3:

This point of contact should be a knowledgeable representative with authority to direct the operations of the System and who will be available **at all times** to respond to a limited-operations directive, such as a senior engineer, permanent faculty (not student), or external personnel that possess authorization to operate the System. Contact information includes name, title, physical address (not a P.O. Box), direct email, and direct telephone. NOTE: You may also provide an alternate point of contact in the same format. An alternate contact for the purpose of responding to limited-operations directives will be required if you receive a Tier 2 or Tier 3 license.

*EXAMPLE: The primary limited-operations contact is Jessie Smith, above.*

*The alternate limited-operations contact is:*

*Casey Jones*

*Chief Engineer*

*Satellite Maintenance, Inc.*

*1551 Technology Way*

*Fairbanks, AK 99712*

[*c.jones@smi.com*](mailto:c.jones@smi.com)

*907-555-9876*

f. Place of incorporation and, if incorporated outside the United States, an acknowledgement that you will operate your system within the United States and are therefore subject to the Secretary’s jurisdiction under 15 CFR Part 960:

Please use one of the following options:

* If this question does not apply, such as if the Applicant is an individual or a public university, enter “N/A” and provide an explanation.
  + *EXAMPLE: N/A - State College is a public university, chartered by the state of Alaska.*
* If the Applicant is an entity incorporated within the United States, provide the state of incorporation.
  + *EXAMPLE: Applicant Inc. is incorporated in Delaware.*
* If the Applicant is an entity incorporated outside the United States or is a non-incorporated entity located outside the United States, provide the Applicant’s country of incorporation, operation, or residence and the required acknowledgement.
  + *EXAMPLE: Applicant Inc. is incorporated in Antarctica, however, the System will be operated within the United States and is therefore subject to the Secretary’s jurisdiction under 15 CFR Part 960.*

### 2. Ownership interests in the Applicant:

a. If there is majority U.S. ownership: report any domestic entity or individual with an ownership interest in the Applicant totaling at least 50 percent:

Please use one of the following options:

* If the Applicant is an individual or a public university, enter “N/A” and provide an explanation.
  + *EXAMPLE: N/A - State College is a public university, chartered by the state of Alaska..*
* If the Applicant has majority foreign ownership, enter “N/A” and provide an explanation. NOTE: You must also provide a detailed response to Part A 2.b, below.
  + *EXAMPLE: N/A - Applicant Inc. has majority foreign ownership.*
* If the Applicant does have a majority (at least 50%) U.S. ownership, but no single entity or individual has a controlling interest (at least 50%) because the majority U.S. ownership is made up of multiple shareholders, enter “N/A” and provide and explanation:
  + *EXAMPLE: N/A - Applicant Inc. has majority U.S. ownership, however, no single entity or individual holds 50% or more ownership interest.*
* If the Applicant does have majority (at least 50%) U.S. ownership, provide the name, principal place of business address, and state of incorporation (where applicable) of any entity or individual that owns at least 50%.
  + *EXAMPLE 1: Applicant Inc. has majority U.S. ownership and the following entity owns at least 50%:*
    - *Satellite Holdings, Inc. (Incorporated in Delaware)*

*321 Mountain Valley Road*

*Fairbanks, AK 99712*

* + *EXAMPLE 2: Applicant Inc. has majority U.S. ownership and the following individual holds at least 50%:*
    - *Pat Smith*

*2552 City Street*

*Fairbanks, AK 99712*

*Pat Smith’s ownership of Applicant Inc. is divided among the following entities:*

* *Satellite Holdings, Inc. (Incorporated in Delaware)*

*321 Mountain Valley Road*

*Fairbanks, AK 99712*

* + - * *SensorCorp, LLC (Incorporated in Alaska)*

*544 Valley Mountain Road*

*Fairbanks, AK*

b. If there is not majority U.S. ownership: report all foreign entities or individuals whose ownership interest in the Applicant is at least 10 percent:

Please use one of the following options:

* If the Applicant has majority U.S. ownership, enter “N/A” and provide an explanation.
  + *EXAMPLE: N/A - Applicant Inc. has majority U.S. ownership.*
* If the Applicant does nothave majority U.S. ownership, provide the name and country of incorporation, operation, or residence of every foreign entity or individual that owns at least 10%.
  + *EXAMPLE: Applicant Inc. does not have majority U.S. ownership and the following entities or individuals each own at least 10%:*
    - *IC Holdings, LLC (Incorporated in Antarctica)*
    - *Collège de Espace (Located in France)*
    - *Alenx Z. Garcia (Resident of Canada)*

c. Report any ownership interest in the Applicant by any foreign entity or individual on the Department of Commerce’s Bureau of Industry and Security’s Denied Persons List or Entity List or on the Department of the Treasury’s Office of Foreign Asset Control’s Specially Designated Nationals and Blocked Person List:

NOTE: Relevant DOC[[1]](#footnote-1) and DOT[[2]](#footnote-2) lists are publicly available.

Please use one of the following options:

* If the Applicant is notowned in whole or in part by any entity or individual on the lists noted in 2.c, enter “N/A” and provide an explanation.
  + *EXAMPLE: N/A - no foreign entity or individual on the Department of Commerce’s Bureau of Industry and Security’s Denied Persons List or Entity List or on the Department of the Treasury’s Office of Foreign Asset Control’s Specially Designated Nationals and Blocked Person List holds any ownership interest in Applicant Inc.*
* If the Applicant is owned in whole or in part by any entity or individual on the lists noted in 2.c, provide the name and country of incorporation, operation, or residence of those entities or individuals, as well as the list (or lists) upon which they appear.
  + *EXAMPLE: The following entities or individuals hold ownership interest in Applicant Inc. and appear on one or more of the designated lists:*
    - *IC Holdings, LLC (Incorporated in Antarctica)*
      * *BIS Denied Entities List*
    - *Alenx Z. Garcia (Resident of Canada)*
      * *Denied Persons and SDN Lists*

### 3. Identity of any subsidiaries and affiliates playing a role in the operation of the System, including a brief description of that role:

Applicants should identify any person or entity that **both** plays a role in the operation of the system ***and*** is controlled by the applicant, controls the applicant, or is in common control with the applicant, as defined in CRSRA Guidance Circular 960.16-1.[[3]](#footnote-3) Other entities that will play a role in the operation of the System, such as contractors, should be identified in Part B, not here.

Please use one of the following options:

* If no subsidiary or affiliate will play a role in the operation of the System, enter “N/A” and provide an explanation.
  + *EXAMPLE: N/A - no subsidiary or affiliate will play a role in the operation of the System.*
* If any subsidiary or affiliate will play a role in the operation of the System, provide their name and contact information, followed by a brief description:
  + *EXAMPLE: The following subsidiaries and/or affiliates will play a role in the operation of the System:*
    - *Satellite Maintenance, Inc.*

*1551 Technology Way*

*Fairbanks, AK 99712*

*contact@smi.com*

*907-555-9876*

*Satellite Maintenance Inc. is a wholly-owned subsidiary of Applicant Inc. that will operate the System’s Mission Control Center and will execute orders issued by Applicant Inc. through direct control of the System.*

* + - *Applicant Inc. Antarctica*

*23 Blizzard Street*

*Snow Town, Antarctica*

[*contact@smiantarctica.com*](mailto:contact@smiantarctica.com)

*999-555-1234*

*Applicant Inc. is a U.S. affiliate of Applicant Inc. Antarctica. Applicant Inc. Antarctica will not have decision-making authority over the operation of the System but owns the System’s Backup Mission Control Center in Antarctica and will execute orders issued by Applicant Inc.*

## Part B: Description of System

### 1. General System Information

a. Name of system:

This is the official name of the System on the license. It should be the same as the name used in the Initial Contact Form (ICF), for other licenses (FCC, FAA, etc.), and when contracting launch services. If the System name has changed since the ICF was submitted, please make a note of the original name.

*EXAMPLE: KameraSatz – this System was originally called PeepleSat in the ICF.*

b. Brief mission description:

Provide a narrative description of the System’s primary mission that addresses the following questions in complete sentences.

* What are the on-orbit spacecraft and remote sensing instruments of the System, and how many are there?
* How are the spacecraft being deployed into their orbit, will imaging be conducted before their orbits are achieved (e.g., during orbit-raising), and approximately how long do you expect it to take to achieve the spacecrafts’ orbits?
* Will the System image artificial resident space objects (ARSO) and with which sensor(s)?[[4]](#footnote-4)

*EXAMPLE: KameraSatz is a constellation of three 27u cubesats in low Earth orbit that will carry a total of one multi-spectral, one hyperspectral, and three synthetic aperture radar (SAR) sensors for the purpose of remote sensing. The KameraSatz satellites will be deployed at a lower altitude than their orbit and will conduct orbit-raising over the course of three weeks. Imaging will be conducted during orbit-raising.*

* *KameraSatz will image the surface of the Earth with all sensors.*
* *KameraSatz will image artificial resident space objects (ARSO) with all multispectral and hyperspectral imagers.*

### 2. Remote Sensing Instrument(s):

a. Sensor type (Electro Optical, Multi-Spectral (MSI), Hyperspectral (HSI), Synthetic Aperture Radar (SAR), Light Detection and Ranging (LIDAR), Thermal Infrared (TIR), etc.):

Identify each remote sensing instrument (by quantity and type) in the System. Please see the definition of “remote sensing” at 15 C.F.R. § 960.4 to determine which instruments need to be listed here. Do not include any instruments that will be used primarily for mission assurance as defined in CRSRA Guidance Circular 960.2-1.[[5]](#footnote-5) Common instrument types are summarized below; this list is not, however, inclusive of all possibilities.

* Ultraviolet/Electro-Optical/Infrared (UV/EO/IR)
  + Ultraviolet Instrument (UV): An instrument sensing longer UV wavelengths approximately, but not exclusively, between 280–380 nm. If you do not believe your UV sensor will be able to detect surface features of the Earth (or, conversely, if you do believe or unsure if your UV sensor will be able to detect surface features of the Earth), please include a statement regarding your position and any supporting information or data (e.g., analogous sensors that have/have not imaged the Earth or model results).
  + Panchromatic Imager (PAN): An instrument producing a single-band, greyscale image that is formed by the collection of all detected energy for some range of visible wavelengths (approximately, but not exclusively, 380–770 nm), or by the combination of such energy after collection such that information on distinct wavelengths cannot be recovered from the preprocessed image product. Images from PAN instruments typically, but do not always, have a finer spatial resolution than multispectral (multi-band) image products in the same range of wavelengths.
  + Visible and Near Infrared Instrument (VNIR): 380–1200 nm
  + Short Wave Infrared Instrument (SWIR): 1200–3000 nm
  + Thermal Infrared (TIR): 3000–14000 nm
* An imager collecting in the wavelength categories above may also need to be categorized as a multispectral imager (MSI) or hyperspectral imager (HSI). If either of the following definitions *also* applies to your system, please include it in your instrument type.
  + Multispectral Imager (MSI): An instrument collecting energy in 2–30 spectral channels that remain separated after collection; channels may span any portion of the electromagnetic spectrum.
    - True color (composite) is a special type of MSI for which light is collected and retained separately in three visible bands [Red (R), Green (G), and Blue (B)] that are displayed together.
  + Hyperspectral Imager (HSI): An instrument collecting energy in more than 30 contiguous or nearly-contiguous, relatively narrow spectral channels that remain separated after collection; channels may span any portion of the electromagnetic spectrum.
* Synthetic Aperture Radar (SAR) Systems
  + Synthetic Aperture Radar X-Band (SARX): 9.2–10.4 GHz
  + Synthetic Aperture Radar C-Band (SARC): 5.25–5.57 GHz
  + Synthetic Aperture Radar L-Band (SARL): 1.215–1.30 GHz
* Please include if your radar system is monostatic, bistatic, or multistatic (and indicate multistatic configuration)
* If the system will use multiple identical sensors, you need only list that sensor type once, however, please note the number of identical sensors both on a single platform in the System as well as if that sensor is present on multiple platforms.
* You must individually list sensors that are not identical; please designate these by type and number (for example: PAN1 and PAN2).
* Additional information specific to each instrument type will be solicited in sections 7–11 below.

*EXAMPLE: KameraSatz will include the following remote sensing instruments:*

* *One multispectral imager (MSI) (present on one platform in the System)*
* *One hyperspectral imager (HSI) (present on one platform in the System)*
* *Two identical x-band synthetic aperture radar instruments (SARX1)*
* *One unique x-band synthetic aperture radar instrument (SARX2)*

b. Imaging/frame rate in Hertz; pulse repetition frequency for SAR or LIDAR:

Provide the full range of rates (frequencies) that each sensor listed in Part B section 2.a is capable of. Please report values in Frames per Second (FPS)for area/snapshot sensors, line scan rate in hertz and mode for line scan sensors, and pulse repetition frequency in kilohertz for SAR or LIDAR sensors.[[6]](#footnote-6)

*EXAMPLE:*

* *MSI frame rate: 1*–*30 FPS*
* *HSI frame rate: 10*–*15 FPS*
* *SARX1 pulse repetition frequency: 8*–*10 kHz*
* *SARX2 pulse repetition frequency: 6*–*8 kHz*

c. Spatial resolution in meters (show calculation for the anticipated finest ground spatial distance (GSD), impulse response (IPR), or other relevant and appropriate unit of resolution):

Use the formulas provided below to show your calculations and provide the final answer of the best achievable performance value (in meters) for each instrument listed in Part B section 2.a.

* For UV/EO/IR sensors:

where:

* p is the pixel pitch (the linear dimension of a focal plane pixel)
* f is the focal length of the instrument
* H is the lowest altitude at which the System will be operated (See 4.d.i below)
* NOTE: If circumstances will apply to your imager that irreversibly decouple spatial resolution from your orbital altitude, please complete the calculation and also provide a description of your finest spatial resolution and the processes resulting in that spatial resolution and specification that result in that processing being irreversible.
* For SAR sensors:

where:

* c is the speed of light
* B is the bandwidth of the transmitted signal

*EXAMPLE:*

* *MSI GSD = = = 3.1 meters*
* *HSI GSD = = = 8.3 meters*
* *SARX1 IPR = = = 0.5 meters*
* *SARX2 IPR = = = 0.75 meters*

d. Spectral range in nanometers:

Use the following instructions to provide a response for each sensor listed in Part B section 2.a:

* For UV/EO/IR sensors:
  + Provide the spectral response range (in nanometers) in two formats:
    - Full Width (rounded to nearest 1% of maximum amplitude) across all bands
    - Full Width Half Maximum (FWHM) across all bands
* NOTE: Additional information, including the full spectral response curve, may be requested during the license review process.
* For SAR sensors
  + Provide the following:
    - Pulse Frequency Range (in Gigahertz)
    - Pulse Bandwidth (in Megahertz)

*EXAMPLE:*

* *MSI* 
  + *Full Spectral Response Range: 435*–*900 nm*
  + *FWHM Spectral Response Range: 450*–*875 nm*
* *HSI* 
  + *Full Spectral Response Range: 490*–*930 nm*
  + *FWHM Spectral Response Range: 500*–*915 nm*
* *SARX1* 
  + *Pulse Frequency Range: 9.5*–*9.8 GHz*
  + *Pulse Bandwidth: 300 MHz*
* *SARX2*
  + *Pulse Frequency Range: 9.6*–*9.8 GHz*
  + *Pulse Bandwidth: 200 MHz*

e. Collection volume in area per unit time per spacecraft: provide an estimate of the maximum number of square kilometers of which the system can provide data/imagery per hour or per minute. If this is a fast-framing system, consider each recorded frame as a separate image collected:

Provide the maximum collection volume for each sensor listed in Part B section 2.a (in square km per hour or per minute), then combine the volumes to calculate the maximum collection volume of each spacecraft listed in Part B section 4.a, as well as for the System as a whole. [[7]](#footnote-7)

*EXAMPLE:*

* *Sensors*
  + *MSI maximum collection volume: 390 km2/min*
  + *HSI maximum collection volume: 240 km2/min*
  + *SARX1 maximum collection volume: 100 km2/min*
  + *SARX2 maximum collection volume: 150 km2/min*
* *Spacecraft*
  + *KamSat1*
    - *MSI+SARX1= 490 km2/min*
  + *KamSat2*
    - *HSI+SARX1= 340 km2/min*
  + *SatBus*
    - *SARX2 only = 150 km2/min*
* *Total System Collection Volume:*
  + *KamSat1+KamSat2+SatBus = 980 km2/min*

f. Ability of the remote sensing instrument to slew, point, or digitally look off-axis from the x, y, and z axes of travel:

PLEASE NOTE:

* This prompt is referring to the movement of each instrument independently, not the movement of the entire spacecraft.
* Assume that the z-axis is oriented in the nadir direction, the x-axis is oriented in the direction of travel, and the y-axis is perpendicular to both z and x.

Provide the maximum range (in degrees) of each sensor listed in Part B section 2.a. to slew, point, or digitally look off-nadir along the x-axis (fore to aft) and along the y-axis (left to right). If an instrument cannot move independently, enter “N/A” and provide an explanation.

*EXAMPLE:*

* *HSI: N/A - this instrument is fixed in place on the spacecraft.*
* *MSI: this sensor can point ±30° off-nadir along both the x- and y-axes.*
* *SARX1: this sensor can slew ±15° off-nadir along the x-axis and can be digitally steered between 30*–*60° off-nadir along the y-axis.*
* *SARX2: this sensor can slew ±15° off-nadir along the x-axis and can be digitally steered between 45*–*65° off-nadir along the y-axis.*

### 3. If any entity or individual other than the Applicant will own, control, or manage any *remote sensing instrument* in the System:

PLEASE NOTE:

* These prompts are referring to the individual remote sensing instruments only, not to an entire spacecraft or to the System as a whole.
* Provide information in the prompts below for any entities other than the Applicant who will own, control, or manage any of the remote sensing instruments listed in Part B section 2.a. and who are not already listed in Part A section 3 as subsidiaries or affiliates.

a. Identity and contact information of that entity or individual:

Identity and contact information include name of POC, title, institution, physical address (not a P.O. Box), direct email, and direct telephone.

Please use one of the following options:

* If no entity or individual other than the Applicant will own, control, or manage any remote sensing instrument in the System, enter “N/A” and provide an explanation.
  + *EXAMPLE: N/A - no other entity or individual will own, control, or manage any remote sensing instrument in the System.*
* If any entity or individual other than the Applicant will own, control, or manage any remote sensing instrument in the System, provide their identity and contact information:
  + *EXAMPLE: The following entities and/or individuals will own, control, or manage one or more remote sensing instruments in the System:*
    - *Pat Diaz  
      President and CEO  
      Satellite Instruments, Inc.*

*1555 Technology Way*

*Fairbanks, AK 99712*

*pat.diaz@sii.com*

*907-555-9877*

b. Relationship to Applicant (i.e., operating under Applicant’s instructions under a contract):

Please use one of the following options:

* If you entered “N/A” in Part B section 3.a., enter “N/A” again here.
  + *EXAMPLE: N/A - no entity or individual other than the Applicant will own, control, or manage any remote sensing instrument in the System.*
* If you listed any entities or individuals in Part B section 3.a., provide a brief description of their relationship with the Applicant and the role each will play with regard to the remote sensing instruments in the System:
  + *EXAMPLE 1: Satellite Instruments, Inc. is an independent contractor who collaborated with Applicant Inc. to develop and build the HSI instrument. Satellite Instruments, Inc. will retain co-ownership of the HSI instrument, but will not control or manage the operation of any remote sensing instruments.*
  + *EXAMPLE 2: Satellite Instruments, Inc. is an independent contractor who will operate the SARX2 instrument under direction from Applicant, Inc., including the issuing of commands and the downlinking of data.*

### 4. Spacecraft Upon Which the Remote Sensing Instrument(s) is (are) Carried

PLEASE NOTE:

* These prompts are referring to the spacecraft that will host the remote sensing instruments listed in Part B section 2.a., not to the spacecraft’s launch vehicle.

a. Description:

Identify and describe each spacecraft that will host one or more of the sensors listed in Part B section 2.a., including the location of each spacecraft with respect to the full constellation, if there is more than one.

*EXAMPLE:*

* *KamSat1 is a 27u cubesat that will host MSI and one SARX1 instrument.*
* *KamSat2 is a 27u cubesat that will host HSI and one SARX1 instrument.*
* *SatBus is a 27u cubesat that will host the SARX2 instrument.*
* *KamSat 1 and 2 will operate approximately 180 degrees apart in a sun synchronous orbit, while SatBus will operate in a near-circular mid-latitude orbit.*

b. Estimated launch date(s) in calendar quarter:

If the System is not yet manifested on a specific launch with a date, please respond “Not Yet Manifested.” “Not Yet Manifested” is an appropriate response for Systems for which no launch has yet been contracted or procured, or a launch has been procured or contracted, however, there is no date (in calendar quarter) yet established.

If the System is manifested on a launch, please respond “Manifested for launch in [calendar quarter]”

*EXAMPLE:*

* *KamSat 1 & 2 will launch together and are manifested for launch in 3rd quarter 2025*
* *SatBus will launch individually and is not yet manifested*

c. Number of spacecraft (system total and maximum in-orbit at one time):

Provide both the total number of spacecraft in the system and the maximum number of spacecraft that will be operating in orbit at any given time.

*EXAMPLE:*

* *Total satellites in the KameraSatz System: 3*
* *Maximum operational in orbit: 3*

d. For each spacecraft, provide the following (or if an entire constellation will have substantially the same orbital characteristics, provide these values for the entire constellation and note whether or not all spacecraft will be evenly spaced)

PLEASE NOTE:

* Responses must be provided for each spacecraft you listed in Part B section 4.a.
* Each response should be based on the intended characteristics of the orbit(s) used for modeling the performance of the sensors in Part B section 2. (if applicable) and should correspond to a defined orbital epoch date of your choosing.

i. Altitude range in kilometers:

Provide the altitude range (in kilometers) in which the System will be operated;[[8]](#footnote-8) this range may encompass multiple orbits for multi-satellite systems (see example) and also needs to reflect altitude variations within each orbit (e.g., perigee and apogee) as well as operation of the system during orbit-raising and deorbit. [[9]](#footnote-9) For UV/EO/IR systems, the lower value of this range should correspond with the altitude value used to calculate resolution in Part B section 2.c. When calculating altitude above Earth’s surface from your orbital elements, CRSRA recommends using a value of 6378 km for the radius of the Earth. Spacecraft that are in the same orbit can be grouped together, however, you must indicate phasing in that orbit.

*EXAMPLE:*

* *KamSat 1 & 2 are phased 180° apart in the same orbit: 700*–*710 km*
* *SatBus: 280*–*460 km (payload may be operated as low as 280 km, however, normal operations will occur at a mean altitude of ~410 km maintained by propulsive maneuvers)*
  + NOTE: In this example, if SatBus were carrying a UV/EO/IR sensor, 280 km would be used for the GSD calculation presented in Part B section 2.c

ii. Inclination range in degrees:

Provide the intended inclination (in degrees) that corresponds to the orbit for each spacecraft listed in Part B section 4.a. Spacecraft that are in the same orbit can be grouped together, however, you must indicate phasing in that orbit. Inclination may be expressed as a single value or as a range.

*EXAMPLE:*

* *KamSat 1 & 2 (same orbit, 180° phasing): 98.2°*
* *SatBus: 51.6°*

iii. Period (time of a single orbit):

Provide the intended period (in minutes) of the lowest orbit for each spacecraft listed in Part B section 4.a. Spacecraft that are in the same orbit can be grouped together, however, you must indicate phasing in that orbit.

*EXAMPLE:*

* *KamSat 1 & 2 (same orbit, 180° phasing): 98.8 minutes*
* *SatBus: 90–93 minutes*

iv. Longitude of the ascending node:

Provide the eastward angle (in degrees) from the Prime Meridian to the ascending node (northbound equatorial crossing) of the lowest orbit for each spacecraft listed in Part B section 4.a. at a defined epoch of your choosing. Spacecraft that are in the same orbit can be grouped together, however, you must indicate phasing in that orbit.

PLEASE NOTE:

* If the longitude of the ascending node will precess, please indicate the initial longitude of the ascending node at the defined epoch of your choosing and indicate the rate of precession (in degrees/orbit) and direction in which the node will precess (E or W).
* Please indicate if the orbit is sun-synchronous.

*EXAMPLE:*

* *KamSat 1 & 2 (same orbit, 180° phasing):325° East at epoch, precesses west at a rate of ~ 1°/day*
* *SatBus: 141° East at epoch, precesses west at rate of ~ 5°/day for mean altitude*

v. Eccentricity:

Provide the orbital eccentricity of the lowest orbit for each spacecraft listed in Part B section 4.a. Spacecraft that are in the same orbit can be grouped together, however, you must indicate phasing in that orbit. For the purposes of this application, you may report a circular orbit if your eccentricity is less than 0.001 (rounded to three significant figures).

*EXAMPLE:*

* *KamSat 1 & 2 (same orbit, 180° phasing): 0.000*
* *SatBus: 0.001*

vi. Argument of perigee:

Provide the angle (in degrees) measured from the ascending node to the perigee point along the satellite's direction of travel of the lowest orbit for each spacecraft listed in Part B section 4.a. at the defined epoch date of your choosing. Spacecraft that are in the same orbit can be grouped together, however, you must indicate phasing in that orbit.

PLEASE NOTE:

* If the orbit is a circular orbit (i.e., the orbit has no perigee), you may enter zero. For the purposes of this application, you may report a circular orbit if your eccentricity is less than 0.001 (rounded to three significant figures)
* If this value will precess, please indicate the initial argument of perigee at the defined epoch of your choosing and indicate the rate and direction of precession (in degrees/day).

*EXAMPLE:*

* *KamSat 1 & 2 (same orbit, 180° phasing): Undefined (circular orbit)*
* *SatBus: 248° at epoch, precesses at approximately ~ 4°/day in the direction of the motion of the satellite for mean altitude*

vii. Propulsion (yes/no). (If “yes,” you must complete question #2, the affirmation, in the beginning of this application):

Please use one of the following options:

* If none of the spacecraft listed in Part B section 4.a. will have a propulsion system, enter “No” and provide an explanation.
  + *EXAMPLE: No - none of the spacecraft in the KameraSatz System will have a propulsion system.*
* If any of the spacecraft listed in Part B section 4.a. will have a propulsion system, enter “Yes” and provide an explanation. Also provide an affirmation of positive control and a brief description of measures in place to ensure positive control.
  + *EXAMPLE: Yes - the SatBus spacecraft will have a propulsion system, however KamSat 1 and 2 will not have propulsion systems. SatBus has measures in place to ensure positive control; these measures are encryption of telemetry, command, and control communications.*

NOTE: If your answer "yes", indicating you will have propulsion, you must provide the affirmation requested at the beginning of the application, #2.

viii. Ability of the spacecraft to slew, point, or digitally look off-axis from the x, y, and z axes of travel:

PLEASE NOTE:

* This prompt is referring to the movement of the spacecraft as a whole, not to the movement of any individual instrument.
* Assume that the z-axis is oriented in the nadir direction, the x-axis is oriented in the direction of travel, and the y-axis is perpendicular to both z and x.
* If a spacecraft has propulsion, the response to this prompt cannot be “N/A”

Provide the maximum range (in degrees) for each spacecraft listed in Part B section 4.a. to slew, point, or digitally look off-nadir along the x-axis (fore to aft) and along the y-axis (left to right).

*EXAMPLE 1:*

* *KamSat 1 and 2 are magnetically stabilized and cannot slew, point, or digitally look along or about any axes.*
* *SatBus has three-axis stabilization and can rotate 360° about all axes.*

*EXAMPLE 2:*

* *KamSat 1 and 2 can slew ±30° along both the x- and y-axes.*
* *SatBus can slew ±45° along the x-axis and ±60° along the y-axis.*

### 5. If any entity or individual other than the Applicant will own, control, or manage any *spacecraft* in the System

PLEASE NOTE:

* These prompts are referring to the spacecraft listed in Part B section 4.a., not to any individual instrument or to the System as a whole.
* Provide information in the prompts below for any entities other than the Applicant who will own, control, or manage any of the spacecraft you listed in Part B section 4.a. and who are not already listed in Part A section 3 as subsidiaries or affiliates.

a. Identity and contact information of that entity or individual:

Identity and contact information include name of POC, title, institution, physical address (not a P.O. Box), direct email, and direct telephone.

Please use one of the following options:

* If no entity or individual other than the Applicant will own, control, or manage any spacecraft in the System, enter “N/A” and provide an explanation.
  + *EXAMPLE: N/A - no other entity or individual will own, control, or manage any spacecraft in the System.*
* If any entity or individual other than the Applicant will own, control, or manage any spacecraft in the System, provide their identity and contact information:
  + *EXAMPLE: The following entities and/or individuals will own, control, or manage one or more spacecraft in the System:*
    - *Pat Patterson  
      President and CEO  
      SatBus, Inc.*

*1155 Technology Rd*

*Fairbanks, AK 99712*

*pat.patterson@sbi.com*

*907-555-9777*

b. Whether that entity or individual is a U.S. person:

Provide a response that states whether or not each entity or individual you listed in Part B section 5.a. is a U.S. person as defined by CRSRA Guidance Circular 960.4-1.[[10]](#footnote-10)

*EXAMPLE 1:*

* *N/A - no other entity or individual will own, control, or manage any spacecraft in the System.*

*EXAMPLE 2:*

* *Pat Patterson is a U.S. person as defined by CRSRA Guidance Circular 960.4-1.*

*EXAMPLE 3:*

* *Pat Patterson is not a U.S. person as defined by CRSRA GC 960.4-1.*

c. Relationship to Applicant (i.e., operating under Applicant’s instructions under a contract):

Provide a response that states the applicant’s relationship with each individual listed in Part B section 5.a.

*EXAMPLE 1:*

* *N/A - no other entity or individual will own, control, or manage any spacecraft in the System.*

*EXAMPLE 2:*

* *SatBus, Inc. will own and operate the SatBus spacecraft, upon which the SARX2 instrument will be a hosted payload in accordance with a contractual agreement with Applicant, Inc. SatBus, Inc. will not control the SARX2 instrument nor be able to access any data collected or transmitted by the instrument.*

*EXAMPLE 3:*

* *SatBus, Inc. is an independent contractor who will operate all of the satellites in the KameraSatz System under a contract with, and solely at the direction of, Applicant, Inc.*

### 6. Ground Components

Record the information required in Part B sections 6.a. and b. in the table below. Example inputs are provided. For definitions of the different ground components discussed in this Part, including mission control centers and ground stations, please see Guidance Circular No. 960. A.-1 (Ground Components).[[11]](#footnote-11)

a. Location of Mission Control Center(s) with the ability to operate the system, including where commands are generated:

For any Mission Control Center (MCC), Backup Mission Control Center (BMCC), or other ground facility where commands can be generated that control the spacecraft, instruments, or any other portion of the System, provide the following information:

* Station operator name and physical address of station (not a P.O. Box)
* Coordinates ONLY IF no physical address exists

b. Location of other Ground Station components of the system, meaning facilities that communicate commands to the instrument or receive unenhanced data from it, and facilities that conduct data preprocessing:

* NOTE: A description of Ground Station Types can be found at:

https://www.nesdis.noaa.gov/commercial-space/regulatory-affairs/licensing/authorities

in the Guidance section, Ground Components

* NOTE: If your system will include mobile or U.S. Government owned grounds stations, please contact us at crsra@noaa.gov for additional guidance

**Using the below table:** For ground station through which data or communications with the spacecraft, instruments, or any other portion of the System are routed or preprocessed, provide the following information:

Ground Station type

* Station operator name and physical address of the station (not a P.O. Box)
* Coordinates **ONLY** IF no physical address exists

|  |  |  |
| --- | --- | --- |
| **Type** | **Operator Name and Address** | **Coordinates** |
| *MCC* | *SatBus, Inc.*  *1155 Technology Rd*  *Fairbanks, AK 99712* |  |
| *BMCC* | *Applicant, Inc., Antarctica*  *Antarctica Station* | *77.875° N, 20.975° E* |
| **Domestic** | | |
| *RGT* | *SatBus, Inc.*  *1155 Technology Rd*  *Fairbanks, AK 99712* |  |
|  |  |  |
| **Foreign** | | |
| *RGT* | *ComSatServe*  *Svalbard, Norway* | *77.875° N, 20.975° E* |
|  |  |  |

c. If any entity or individual other than the Applicant will own, control, or manage any *mission control center(s)* with the ability to operate the System

PLEASE NOTE:

* These prompts are referring to the ground stations listed in Part B sections 6.a. and b., not to the spacecraft, instruments, or the System as a whole.
* Provide information in the prompts below for any entities other than the Applicant who will own, control, or manage any of the ground stations listed in Part B sections 6.a. and b. who are not already listed in Part A section 3 as subsidiaries or affiliates.

i. Identity and contact information of that entity or individual:

Identity and contact information, including name of POC, title, institution, physical address (not a P.O. Box), direct email, and direct telephone.

Please use one of the following options:

* If no entity or individual other than the Applicant will own, control, or manage any ground station in the System, enter “N/A” and provide an explanation.
  + *EXAMPLE: N/A - no other entity or individual will own, control, or manage any ground station in the System.*
* If any entity or individual other than the Applicant will own, control, or manage any spacecraft in the System, provide their identity and contact information:
  + *EXAMPLE: The following entities and/or individuals will own, control, or manage one or more ground stations in the System:*
    - *Pat Patterson  
      President and CEO  
      SatBus, Inc.*

*1155 Technology Rd*

*Fairbanks, AK 99712*

*pat.patterson@sbi.com*

*907-555-9777*

ii. Relationship to Applicant (i.e., operating under Applicant’s instructions under a contract):

Provide a response that states the applicant’s relationship with each individual listed in Part B section 6.c.i.

*EXAMPLE 1:*

* *N/A - no other entity or individual will own, control, or manage any ground station in the System.*

*EXAMPLE 2:*

* *SatBus, Inc. will own and operate the SatBus Mission Control Center in Fairbanks, Alaska from which it will generate commands that control the SatBus spacecraft and the SARX2 instrument on board in accordance with a contractual agreement with Applicant, Inc.*

*EXAMPLE 3:*

* *ComSatServe is an independent contractor who will provide communications services to downlink telemetry and unenhanced remote sensing data directly from the KameraSatz System and relay those data to Applicant, Inc. under a contract with, and solely at the direction of, Applicant, Inc.*

### 7. Information Applicable to Multi-Spectral Imaging (MSI) and/or Hyper-Spectral Imaging (HSI). Applicants must complete this section only if the response in Part B section 2.a. is “MSI” and/or “HSI.”

a. Number of spectral bands:

Provide the number of spectral bands for each multispectral or hyperspectral instrument listed in Part B section 2.a.

*EXAMPLE:*

* *MSI: 13 Bands*
* *HSI: 46 Bands*

b. Individual spectral bandwidths (to include range of the upper and lower ends of each spectral band in nanometers):

Provide the spectral response range of each individual spectral band for each multispectral or hyperspectral instrument listed in Part B section 2.a.:

* Full Width (rounded to nearest 1% of maximum amplitude) across all bands
* Full Width Half Maximum (FWHM)

*EXAMPLE (Note that this example is abbreviated):*

* *MSI*

|  |  |  |
| --- | --- | --- |
| ***Band*** | ***Full Spectral Response Range (nm)*** | ***FWHM Spectral Response Range (nm)*** |
| *1* | *435-470* | *450-460* |
| *2* | *475-510* | *480-490* |
| *3* | *515-550* | *525-535* |
| *etc…* | *etc…* | *etc…* |

* *HSI*

|  |  |  |
| --- | --- | --- |
| ***Band*** | ***Full Spectral Response Range (nm)*** | ***FWHM Spectral Response Range (nm)*** |
| *1* | *495-525* | *500-510* |
| *2* | *495-535* | *510-520* |
| *3* | *500-545* | *520-530* |
| *etc…* | *etc…* | *etc…* |

### 8. Noise Equivalent Target (NET). Applicants must complete this section only if the response in Part B 2.c. is 5 meters or less, and the answer in Part B section 2.a. is neither “SAR” nor “LIDAR.” NET is the primary parameter used by the U.S. Government to describe an Electro Optical sensor’s light sensitivity performance for a target at the same distance from the sensor as is specified as the minimum operating altitude in Part B section 4.d.i. If NET cannot be calculated, simply report the expected minimum detectable ground target radiance in watts:

Provide a response for each PAN, MSI, HSI, VNIR, SWIR, and TIR sensor listed in Part B section 2.a. that has a ground spatial distance of 5 meters or less using the formulas below (you must show your calculations). If NET cannot be calculated, explain why not and report the expected minimum detectable ground target radiance in watts.

where:

* Δλ = Difference between lowest and highest wavelengths (in meters) used in integration (equivalent to Bandwidth)
* Apix = pixel area in square meters (pixel pitch squared)
* SR = Slant Range (Range Between Sensor and Target) in meters
* OA = Orbital Altitude in meters (if the orbit is elliptical, we will need the apogee (maximum orbital altitude) and perigee (minimum orbital altitude))
* FL = Focal Length in meters
* Q = Q (Quality)

and:

where:

* NR = Read Noise in electrons or electrons root mean square per pixel
* h = Planck Constant (6.62607015×10−34 Joules·second)
* c = Speed of Light in meters per second (2.99792458 x 108)
* Ω = Steradian/Solid Angle
* Apix = pixel area in square meters (pixel pitch squared)
* α = Aggregation Factor in ratio[[12]](#footnote-12)
* B = Bandwidth in meters
* λ = Wavelength in meters
* tint = Integration Time in seconds
* Ƭ = Transmission in ratio
* D = Integration Duty Cycle in ratio

### 9. Information Applicable to Light Detection and Ranging (LIDAR) if used for remote sensing. Responses should include the calculations used to derive the reported parameters. Applicants must complete this section only if the response in Part B section 2.a. is “LIDAR.”

a. Type (linear scanning or flash LIDAR (Geiger)):

Provide a response for each LIDAR sensor listed in Part B section 2.a.

*EXAMPLE:*

* *LIDAR1 is a linear scanning sensor*
* *LIDAR2 is a Geiger sensor*

b. Laser wavelength and pulse frequency:

Provide the wavelength (in nanometers) and the pulse frequency (in kilohertz) for each LIDAR sensor listed in Part B section 2.a.

*EXAMPLE:*

* *LIDAR1*
  + *Wavelength: 1550 nm*
  + *Pulse Frequency: 100 kHz*
* *LIDAR2*
  + *Wavelength: 1050 nm*
  + *Pulse Frequency: 150 kHz*

c. Laser pulse width:

Provide the measure of the time (in nanoseconds) between the beginning and end of the pulse, typically based on the full width half maximum (FWHM) of the pulse shape, for each LIDAR sensor listed in Part B section 2.a.

*EXAMPLE:*

* *LIDAR1*
  + *Pulse Width: 2 ns*
* *LIDAR2*
  + *Pulse Width: 5 ns*

d. Spectral linewidth:

Provide the width of the optical spectrum (in nanometers), typically the full width at half-maximum, for each LIDAR sensor listed in Part B section 2.a.

*EXAMPLE:*

* *LIDAR1*
  + *Spectral linewidth: 0.9 nm*
* *LIDAR2*
  + *Spectral linewidth: 1 nm*

e. Z/Elevation accuracy in meters:

Provide the estimated elevation accuracy (in meters) for each LIDAR sensor listed in Part B section 2.a (95% confidence level; assume nadir pointing at a horizontal opaque surface).

*EXAMPLE:*

* *LIDAR1*
  + *Elevation Accuracy: 2.44 m*
* *LIDAR2*
  + *Elevation Accuracy: 3.25 m*

### 10. Information Applicable to Synthetic Aperture Radar (SAR). Applicants must complete this section only if the response in Part B section 2.a. is “SAR.”

a. Azimuth resolution (ground plane):

Provide a response for each SAR sensor listed in Part B section 2.a. using the formula below (you must show your calculations). In addition, provide the maximum possible dwell time (in seconds) of a single coherent collection for each sensor.

where:

* λ = transmit frequency wavelength
* ρ = aspect angle (subtended synthetic aperture angle)

b. Range resolution (ground plane):

Provide a response for each SAR sensor listed in Part B section 2.a. using the formula below (you must show your calculations).

where:

* c = speed of light
* B = maximum pulse bandwidth
* = lowest grazing angle

c. SAR Signal-To-Noise Ratio (SNR):

Provide a response for each SAR sensor listed in Part B section 2.a. using the formula below (you must show your calculations).

where:

* PT = Average Transmitted Power in watts
* AA = Antenna Area in square meters
* EA = Antenna Efficiency ratio
* σ = 1
* RR = Range Resolution in meters
* π = Pi (3.14159)
* SR = Slant Range (Range Between Sensor and Target) in meters
* λCF = Wavelength of the Transmitted Center Frequency in meters
* k = Boltzmann’s Constant in Joules per kelvin (1.38 x 10-23)
* TO = Noise Temperature in kelvin
* NF = Noise Figure ratio
* LS = System Losses ratio
* Vp = Platform Velocity in meters per second
* TE = Target Elevation Angle in degrees

d. Polarization Capability (i.e. dual polarization, quad polarization):

Provide a response for each SAR sensor listed in Part B section 2.a.

*EXAMPLE:*

* *SARX1*
  + *Polarization Capability: Dual*
* *SARX2*
  + *Polarization Capability: Quad*

e. Complex data: Preservation of phase history data in standard format? (yes/no):

Provide a response for each SAR sensor listed in Part B section 2.a.

*EXAMPLE:*

* *SARX1: Yes*
* *SARX2: No*

f. Center frequency:

Provide a response in GHz for each SAR sensor listed in Part B section 2.a.

*EXAMPLE:*

* *SARX1 Center Frequency: 9.65 GHz*
* *SARX2 Center Frequency: 9.70 GHz*

g. Squint and Graze angles (include maximum and minimum), or other parameters that determine the size and shape of the area of regard of the sensor collection footprint at the ground:

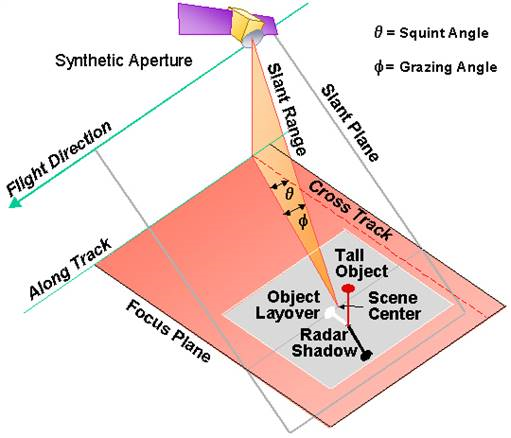
Provide a response (in degrees) for each SAR sensor listed in Part B section 2.a.

*EXAMPLE:*

* *SARX1*
  + *Squint Angle Range: ±90 degrees*
  + *Grazing Angle Range: 15–80 degrees*
* *SARX1*
  + *Squint Angle Range: ±70 degrees*
  + *Grazing Angle Range: 30–60 degrees*

Squint Angle - SAR geometry diagram showing squint angle θ. Note that θ is in the focus plane

Grazing Angle - SAR geometry diagram showing grazing angle Φ. Note that Φ is the acute angle opposite to the right angle in the orange triangle defined by the slant and ground planes



### 11. Information Applicable to Thermal Infrared (TIR). TIR is defined as collecting in the spectral range of 3.0–5.0 and/or 8.0-12.0-micrometers. Applicants must complete this section only if the response in Part B section 2.a. is “TIR.”

a. Estimated relative thermometric accuracy in degrees Kelvin (+/- x degrees of actual):

Provide a response (in degrees Kelvin) for each TIR sensor listed in Part B section 2.a.

*EXAMPLE:*

* *TIR Thermometric Accuracy: 0.5 K*

b. Noise Equivalent Differential Temperature (NEDT), or if NEDT cannot be calculated, simply provide the expected temperature sensitivity in terms of minimum resolvable temperature difference in degrees:

Provide a response (in milliKelvins) for each TIR sensor listed in Part B section 2.a.

* NEDT (noise equivalent differential temperature) is the key figure of merit which is used to qualify midwave (MWIR) and longwave (LWIR) infrared cameras.  It is a signal-to-noise figure which represents the temperature difference which would produce a signal equal to the camera’s temporal noise.  It therefore represents approximately the minimum temperature difference which the camera can resolve.  It is calculated by dividing the temporal noise by the response per degree (responsivity) and is usually expressed in units of milliKelvins.  The value is a function of the camera’s f/number, its integration time, and the temperature at which the measurement is made.
* If NEDT cannot be calculated, explain why not and report the expected temperature sensitivity in terms of minimum resolvable temperature difference (in milliKelvins).

## Part C: Requests for Standard License Condition Waivers or Adjustments

Standard license conditions are listed at 15 CFR 960.8. 960.9, and 960.10 for Tier 1, Tier 2, and Tier 3 systems, respectively. If requesting that any of these be waived or adjusted, please identify the specific standard license condition and explain why one of the following circumstances applies:

1. The requirement is not applicable due to the nature of the Applicant or the proposed system;

2. The Applicant will achieve the goal in a different way; or

3. There is other good cause to waive or adjust the condition.

*EXAMPLE: If SatCorp will be categorized as a Tier 2 or Tier 3 system, SatCorp seeks an adjustment to the requirement found in 15 C.F.R. 960.9(a) regarding encryption in the event of a limited-operations directive. The standard condition requires the ability to implement NIST-approved encryption with a key length of at least 256 bits. Instead, SatCorp has implemented the CyberSat Security Suite which exceeds the required encryption strength and key length. Therefore, SatCorp will achieve the goal of encryption in a different way.*

## OPTIONAL

You may submit evidence of the availability of unenhanced data that is substantially the same as unenhanced data you propose to produce with your system. The Secretary will take any such evidence into account, in addition to other evidence of availability, when determining the appropriate tier for your system under § 960.6.

Appendix B to Part 960—Application Submission Instructions

A person may apply to operate a private remote sensing space system by submitting the information to the Secretary as described in Appendix A of this part. This information can be submitted in one of three ways:

1. Complete the fillable form at the Secretary’s designated website, presently at www.nesdis.noaa.gov/crsra.[[13]](#footnote-13)

2. Respond to the prompts in Appendix A of this part and email your responses to crsra@noaa.gov.

When emailing, please submit the application as a Word document.

3. Respond to the prompts in Appendix A of this part and mail your responses to: Commercial Remote Sensing Regulatory Affairs, 1335 East-West Highway SSMC-1/G-101, Silver Spring, MD 20910.

1. See DOC lists at https://www.bis.doc.gov/index.php/policy-guidance/lists-of-parties-of-concern/ [↑](#footnote-ref-1)
2. See DOT lists at https://home.treasury.gov/policy-issues/financial-sanctions/specially-designated-nationals-and-blocked-persons-list-sdn-human-readable-lists [↑](#footnote-ref-2)
3. See Guidance Circular 960.16-1: <https://www.nesdis.noaa.gov/s3/2022-06/Draft%20960.16%20Affiliate,%20Subsidiary_0.pdf> [↑](#footnote-ref-3)
4. Also known as Non-Earth Imaging (NEI) [↑](#footnote-ref-4)
5. See Guidance Circular 960.2-1: https://www.nesdis.noaa.gov/s3/2022-04/Guidance\_%20Mission%20Assurance%20%20040122.pdf [↑](#footnote-ref-5)
6. Continuous wave (CW) lidar instruments need to be identified, but pulse repetition frequency is not required. [↑](#footnote-ref-6)
7. The collection volume for LIDAR systems may be reported in square km per day. [↑](#footnote-ref-7)
8. A System is operated whenever the operator maintains decision-making authority over the functioning of remote sensing instruments capable of conducting remote sensing. *See* 15 CFR 960.4. [↑](#footnote-ref-8)
9. Once a license is issued, licensees are permitted to submit modification requests regarding the altitude range. *See* 15 CFR 960.13. [↑](#footnote-ref-9)
10. See Guidance Circular 960.4-1: <https://www.nesdis.noaa.gov/s3/2022-03/Policy%20Guidance%20Example%202_%20U.S.%20Person_Operating.pdf> [↑](#footnote-ref-10)
11. See Guidance Circular 960.A-1: <https://www.nesdis.noaa.gov/s3/2022-10/GC%20-%20Ground%20Components.pdf>. [↑](#footnote-ref-11)
12. The “Aggregation Factor in ratio” refers to the number of pixels combined to make a more sensitive equivalent of a pixel. For example, if four pixels are combined into one more sensitive pixel, then your aggregation factor would be 4 (4/1, the equivalent of 400% in a ratio). [↑](#footnote-ref-12)
13. See Data Availability Notification Form: https://docs.google.com/forms/d/e/1FAIpQLSeJSPfg8k4j68YagFINDbFX7H25UQMbg-L2v-ipjilzWSXlLg/viewform [↑](#footnote-ref-13)