**18 SPCS Launch Collision Avoidance Request**

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| |  |  | | --- | --- | | **Date (DDMMMYYYY):** |  | | **Rev:** |  | | |
| **ITEM 1**  Choose an item. | |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Mission:** |  | | | | | **Is this an ISS visiting vehicle?**  **(E.g. Cygnus, Dragon, other)** | | | | Choose an item. | | **Booster:** |  | | **Suborbital?** | | Choose an item. | | **Altitude in kms**  **(If suborbital)** | |  | | | **Payload(s):** | |  | | | | | | | | | | **Launch Range/Location:** | | | | Choose an item. | | | | **If Other, Enter Location:** | | | |
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| **ITEM 2**  Choose an item. | **A) Primary launch date & launch window:**   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Start time (DDD [J-Day], HH:MM:SS UTC)** | | | | | **Stop time (DDD [J-Day], HH:MM:SS UTC)** | | | | | | **J-Day:** | **DDD** | **Time:** | **HH:MM:SS** | **UTC** | **J-Day:** | **DDD** | **Time:** | **HH:MM:SS** | **UTC** |   **B) Secondary launch date(s) & launch window(s): (suborbital can list J-Day range)**   |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Start Time (DDD [J-Day], HH:MM:SS UTC)** | | | | | | **Stop Time (DDD [J-Day], HH:MM:SS UTC)** | | | | | | | **1. J-Day:** | **DDD** | **Time:** | **HH:MM:SS** | **UTC** | **J-Day:** | | **DDD** | **Time:** | **HH:MM:SS** | **UTC** | | **2. J-Day:** |  | **Time:** |  | **UTC** | **J-Day:** | |  | **Time:** |  | **UTC** | | **3. J-Day:** |  | **Time:** |  | **UTC** | **J-Day:** | |  | **Time:** |  | **UTC** |   **Note:** Maximum of three secondary launch dates for orbital launches per Form 22. Resubmit following expiration of last backup date. Suborbital launches may list a date range. |
| **ITEM 3**  Choose an item. | **Launch Screening Results Delivery:**   * Screening on the day of launch is the minimum service 18 SPCS provides; launch minus 7 days (L-7) is the maximum. * A customer may request up to two additional screening deliveries prior to their mission day screening delivery. (e.g. L-7; L-4; and mission day) * In the table below, specify requested delivery times (UTC) and indicate if results for a backup launch day are desired by marking “Yes” or “No” in the dropdown for each delivery. * The initial backup screening will be first secondary launch date, per Item 2. If the launch is delayed one day, the secondary 2 date will be used as backup, with secondary 3 being used as the backup for secondary 2 if the launch continues to push.   **Delivery Times for Launch Screening Results (DDD (J-Day), HH:MM:SS UTC):**   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **Screen:** | Choose an item. | **J-Day:** |  | **Time:** |  | **Backup** | Choose an item. | | **Screen:** | Choose an item. | **J-Day:** |  | **Time:** |  | **Backup** | Choose an item. | | **Screen:** | Choose an item. | **J-Day:** |  | **Time:** |  | **Backup** | Choose an item. | | **Screen:** | **Secondary 1:** | **J-Day:** |  | **Time:** |  | **Backup** | Choose an item. | | **Screen:** | **Secondary 2:** | **J-Day:** |  | **Time:** |  | **Backup** | Choose an item. | | **Screen:** | **Secondary 3:** | **J-Day:** |  | **Time:** |  | **No Backup.**  **Must Submit New Form 22** | |   **Submit new Form 22 following expiration of secondary 3 date due to delay of launch.**  New Form 22 must be received 24 hours prior to first requested screening delivery. If new trajectory files are required, these files must be received 24 hours prior to first requested screening delivery. |
| **ITEM 4**  Choose an item. | **Launch Screening Time Steps:**  **Screen for “launch on”:**  **SS**  **SS**  **A)  Top of every minute, + or – seconds**  **B)  Every 30 Seconds**  **C)  Every 10 Seconds**  **D)  Every 5 Seconds**  **E)  Every Second** |
| **ITEM 5**  Choose an item. | **Trajectory Files:**   * Trajectory files must be in kilometers. * Launch COLA requires seperate trajectory files per launch stage or RCS value. Do not include multiple RCS values for one trajectory file. * If the RCS value changes for an object at a certain time within the trajectory file, a separate trajectory must be submitted. These will be processed as seperate stages. * If a separate file is not submitted, the larger RCS value listed will be used due to processing limitations. * Reference the 18 SPCS Launch COLA Handbook for guidance on how to name trajectory files according to the standard format below.   **Trajectory Files Name(s):**   |  |  | | --- | --- | | **Object’s Trajectory File Name**  **(YY\_MISSION\_PART\_TYPE.txt)** | **RCS Value of Object (meters)**  **(For POC generation)** | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | |
| **ITEM 6**  Choose an item. | **Screening Type and Criteria:**   * Customer requests (column 3) must meet AFI 91-217 minimum values (column 3). * All trajectory files will be screened to the same value per category. * Stand-off radius must be used for manned spacecraft; PoC screening is not used * When PoC cannot be computed, minimum stand-off radius value will be used.  |  | | --- | | **Stand-Off Radius Criteria** | | |  |  |  |  | | --- | --- | --- | --- | | **Screening Category** | **AFI Minimum Values** | **Customer Request** | | | **Manned spacecraft** | **200 km** |  | **km** | | **Active satellites** | **25 km** |  | **km** | | **All Others** | **2.5 km** |  | **km** | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Probability of Collision (PoC) Criteria**   |  |  |  |  | | --- | --- | --- | --- | | **Screening Category** | **AFI Minimum Values** | **Customer Request** | | | **Manned spacecraft** | **N/A (200 km Radius)\*** |  |  | | **Active satellites** | **1x10E-5 (0.00001)** |  |  | | **All Others** | **1x10E-5 (0.00001)** |  |  | | |
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| **ITEM 7**  Choose an item. | **Additional Information:** (e.g. All\_Sorted.txt file or SIPR .res Screening/Delivery Information)   |  | | --- | |  | |
| **ITEM 8**  Choose an item. | **Contact Information:**  A Space-Track.org account is required to submit unclassified trajectory files to 18 SPCS and receive screening results from 18 SPCS. (Please include your Space-Track folder below.)  **Primary POC: Name, phone number and email address: (Used as emergency POC)**   |  |  |  | | --- | --- | --- | | **Name:** |  | | | **Unit/Squadron:** |  | | | **Phone Number:** | **COM:** | **DSN:** | | **Email Address:** |  | | | **Space-Track.org Folder:** |  | |   **Secondary POC name, phone number and email address: (Used as emergency POC)**   |  |  |  | | --- | --- | --- | | **Name:** |  | | | **Unit/Squadron:** |  | | | **Phone Number:** | **COM:** | **DSN:** | | **Email Address:** |  | | | **Space-Track.org Folder:** |  | | |

**Form 22 Instructions**

The following instructions describe how to properly fill out the 18 Space Control Squadron (18 SPCS) Form 22, Launch Collision Avoidance Request. For regular Launch CA customers, Initial Form 22 must be submitted no later than 7 calendar days from the first requested delivery.

For new customers that have not received Launch CA support before, we request that an ODR be submitted to SSA Sharing 90 calendar days in advance of the scheduled launch. This will allow us to identify specific issues or concerns.

Please choose a classification drop down **(U or S)** beneath each **ITEM** Number on the left of the Form 22.

**ITEM 1:** **Mission**

* Describe mission, booster, payload(s), launch range/location, and whether the mission is a visiting vehicle to the ISS (e.g. Dragon, Cygnus, or other).
* If the mission is going to be suborbital launch, select the dropdown for **“Yes”** and include the highest altitude in kilometers that the mission is planned to reach.
* **Mission name will remain standard across all documentation and serve as the identifier for that launch.**

**ITEM 2:** **Primary/Secondary Launch Date(s) and Launch Window(s):**

* Identify Julian day (J-day or Ordinal day) and time of launch in Universal Time Coordinated (UTC) for the primary and secondary launch dates.
* **Up to three “Secondary Launch” dates can be listed within the Form 22.** After the expiration of the last Secondary Launch date (due to a mission pushing/scrubbing) a new Form 22 must be submitted.
* New Form 22 must be received 24 hours prior to first requested screening delivery. If new trajectory files are required, these files must be received 24 hours prior to first requested screening delivery

**ITEM 3: Launch Screening Results Delivery Instructions**

* Delivery times: Provide the desired date for launch screening results (J-Days)/times. The 18 SPCS attempts to deliver screening results as close as possible to the requested delivery time requested in this section. However, mission prioritization must occur due to system and manpower limitations**.**
* **Launch mission days take precedent over launch “L-X” days.** If multiple launch mission screenings are required close to the same delivery times, a backup screening may not be possible.
* Check a **maximum** of two additional Launch Product Delivery Times, as indicated in Items 3.
* **Note:** Screening results can include the most immediate Secondary Day screening results by selecting **“Yes”** next to backup day.
* **Note:** Space-Track.org is primary means of trajectory file submission and for delivery of screening results for unclassified screenings. Unclassified e-mail will be used in emergency situations to reach points of contact to deliver results. In case of emergency communications issues, further arrangements can be made through the point of contact. Intelink and SIPR e-mail are valid options for delivery of screening results of higher classification.

**ITEM 4: Launch Screening Time Steps**

* Check one option for desired screening time specifics.
* If “Top of every minute” is selected, also include +/- seconds to accommodate for uncertainty

**\*Note: 18 SPCS will advise customers on limitations due to customer data and mission prioritization, and reserves the ability to adjust accordingly.**

**ITEM 5: Trajectory Files**

**Note: Trajectory files for the mission must be received no later than 7 calendar days prior to the first requested delivery. This should enable us enough time to address any issues with the trajectory files prior to the first delivery.**

**If there is a launch slippage that requires new trajectory files, we are requesting at least 24 hours between our receipt of new trajectory files and Form 22 to the first requested screening delivery.**

* List the trajectory files in the table using the standardized naming convention   
  (e.g. YY\_MISSION\_PART\_TYPE.txt). Reference the 18 SPCS Launch COLA Handbook for more information.
* **Files must be submitted in kilometers**.
* Each stage must have a separate trajectory file.
* If probability of collision is desired, please specify the RCS value in meters for each individual file.
  + If the RCS value changes for an object at a certain time within the trajectory file, a separate trajectory must be submitted. These will be processed as separate stages.
  + If a separate file is not submitted, the larger RCS value listed will be used.

**ITEM 6: Identify Screening Categories, Types and Criteria**

There are two types of screenings (stand-off radius and probability of collision), which screen launch trajectories against three categories of on-orbit objects (manned, active satellites, all others). Each type of screening has specific minimum screening criteria for each category as required by AFI 91-217. All trajectory files will be screened to the same criteria per category.

**\*Note: The ability to do stand-off radius and probability of collision screenings is not only based on the data provided by the customer, but mission prioritization, timing, and system limitations. The 18 SPCS will attempt to meet customer request outlined within the Form 22, but will advise customers on these limitations and reserves the ability to adjust accordingly.**

**Screening criteria must meet AFI 91-217 minimum requirements.**

* Check the desired screening type(s) (stand-off radius or PoC) and provide screening criteria in the “Customer Request” column for each screening category.
* **Screening Type: Stand-off Radius:** Reports the overall miss distance between the launch (primary) and secondary objects.
  + Column 2, “Minimum Values” lists the minimum required stand-off radius per the AFI 91-217.
  + If a larger stand-off radius is desired, enter the value in km in the “Customer Request” column.
  + If no radius (or a smaller radius than the minimum required) is provided in the “Customer Request” column, screening will be performed using the values in the “Minimum Values” column.
  + **Note:** Stand-off radius will be used against all manned spacecraft.
* **Screening Type: Probability of Collision (PoC):** uses covariance of the launch vehicle and secondary objects in order to compute and report probability of collision, as well as, miss distances.
  + **Note 1:** Covariance information for the launch vehicle (and any other launched objects for which screening is desired) **must** be provided in the trajectory files by the launch agency. 18 SPCS computes covariance for secondary objects.
  + **Note 2:** The length of the largest physical dimension of each object to be screened must be provided in the table in ITEM 6 (“RCS Value of Object) to receive PoC.
* **Screening Categories:**
  + **Manned**: Launch trajectories vs. manned or habitable spacecraft. (**Note**: All launches will be screened against manned spacecraft.)
  + **Active Satellites:** Launch trajectories vs. active payload.
  + **All Others:** Launch trajectories vs. rocket bodies, inactive (dead) payloads, debris, platforms, etc.

**ITEM 7:** Additional Information **(Can be used for SIPR Delivery instructions)**

Enter any additional information that you deem important in meeting your mission requirements.

**ITEM 8:** **Primary Points of Contact (POCs)**

Provide a primary point of contact (POC) and list their name, phone number, unit/squadron or organization, and email address. Provide sufficient information to ensure someone is available for any necessary clarifications or problems. If possible provide a 24/7 contact number.

Provide a secondary POC and list their name, phone number, unit/squadron or organization, and email address. This person will serve as a backup in case the Primary POC cannot be reached. If possible provide a 24/7 contact number.