

RAINMAKER TECHNOLOGY CORPORATION

Response to FAA Request for Information

AFS-26-02197-E

Docket No. FAA-2025-1630 | Exemption No. 25287

Petition for Amendment

Company: Rainmaker Technology Corporation

Date: 17APR2026

Submission Deadline: 30APR2026, 11:59 PM ET

RAINMAKER



Introduction

Rainmaker Technology Corporation (“Rainmaker” or “Petitioner”) respectfully submits this response to the Federal Aviation Administration’s (“FAA”) Request for Information (RFI), reference AFS-26-02197-E, dated April 15, 2026. This response addresses each of the ten (10) items identified by the FAA during its technical evaluation of Rainmaker’s petition to amend Exemption No. 25287, Docket No. FAA-2025-1630.

Rainmaker’s petition seeks to amend the existing exemption from 14 CFR § 107.36 to allow the carriage of up to six (6) pyrotechnic flares on the Rainmaker Elijah Quadcopter Series small UAS for precipitation enhancement operations. Since the original exemption was granted, Rainmaker has safely conducted 245 mishap-free flight hours spanning over 1,252 flights carrying two flares with zero safety incidents, demonstrating the maturity and reliability of its operations.

The information herein is organized to correspond directly to each numbered item in the FAA’s RFI. Where information is proprietary, it is clearly marked as “PROP” in accordance with the FAA’s instructions.



1. Clarification of Relief Requested

Rainmaker requests the following amendment to Exemption No. 25287:

1.1 Proposed Maximum Takeoff Weight (MTOW)

Rainmaker requests an increase in the authorized MTOW from the currently approved 50 pounds (lbs.) to up to 55 lbs. This increase reflects the regulatory ceiling under 14 CFR Part 107 for small unmanned aircraft and accommodates the additional weight of up to six flares. The total aircraft weight with full six-flare payload remains within the 55 lb. Part 107 limit. Note: The current operational takeoff weight with a full six-flare payload is approximately 50 lbs.; the 55 lb. MTOW provides margin for future payload configurations while remaining compliant with Part 107.

1.2 Applicability to Authorized Flare Types

The requested relief applies to both flare types currently authorized under the original exemption:

- **Zeus (BIP)** – UN0432, Articles, pyrotechnic for technical purposes, 1.4S
- **Ikarus (Ejectable)** – UN0431, Articles, pyrotechnic for technical purposes, 1.4G

The amendment does not introduce any new flare types. The maximum explosive material per flare remains unchanged at 50 grams (g).

1.3 Other Changes to Previously Authorized Operations

In addition to the increased flare quantity and MTOW, Rainmaker requests the FAA acknowledge the following updated operational parameters of the Elijah platform, which reflect demonstrated and tested capabilities:

- **Maximum Flight Time:** Increase from 60 minutes (as evaluated in the original exemption) to 90 minutes.
- **Maximum Altitude:** Increase from 15,000 feet MSL (as evaluated in the original exemption) to 20,000 feet MSL, subject to applicable location-specific altitude waivers.
- **Waiver Reference Update:** Update references from Waiver No. 107W-2025-00728 to Waiver No. 107W-2025-04440A, or subsequent version.
- **Termination System Enhancement:** The Elijah platform now incorporates an integrated Parachute Recovery System (PRS) that engages upon termination system activation, cutting power to motors and deploying the parachute for controlled descent.



No other aspects of the previously authorized operation are changed. All operational parameters including Class G airspace restriction, rural privately contracted land operations, 1 SM operational radius, crew composition (RPIC + VO minimum), geofencing, autopilot, anti-collision lighting, and all other safety mitigations remain in effect.



2. Revised Conditions and Limitations Crosswalk

The following table identifies each condition and limitation in Exemption No. 25287 and its proposed status under the amendment:

C&L #	Subject	Status	Proposed Revision / Reason
1	UAS type and MTOW	Revised	Amend MTOW from 50 lbs. to 55 lbs. to accommodate increased flare payload and maintain Part 107 compliance margin.
2	Compliance with manuals and procedures	Remains applicable without revision	No revision required. Most restrictive terms continue to apply.
3	Updates/revisions to operating documents	Remains applicable without revision	No revision required. Updated manuals reflecting 4- and 6-flare configurations will be submitted per this C&L.
4	RPIC deviation/exemption notification	Unchanged	No revision required.
5	OEM maintenance and service requirements	Unchanged	No revision required. OEM requirements apply to all configurations.
6	Documents accessible at control station; waiver reference	Revised	Amend waiver reference from "Waiver No. 107W-2025-00728, or subsequent version" to "Waiver No. 107W-2025-04440A, or subsequent version."
7	Flare type, quantity, and explosive material limits	Revised	Amend "no more than two flares per aircraft" to "no more than six flares per aircraft." The 50 g explosive material per flare limit remains unchanged. Adds total explosive material per sortie limit of 300 g.
8	Compliance with operational waiver and altitude waivers	Revised	Amend waiver reference from "Waiver No. 107W-2025-00728, or subsequent version" to "Waiver No. 107W-2025-04440A, or subsequent version."
9	§ 175.9(b)(6)(ii) manual submission to AFS-750	Unchanged	No structural revision to the C&L.



Proposed New Condition and Limitation

Proposed C&L 10 (Two-Phase Rollout): Operations under this amendment shall follow a two-phase rollout. Phase 1 authorizes a maximum of four (4) flares per aircraft. The Operator shall not transition to Phase 2 (six (6) flares per aircraft) until:

- A. The Operator has completed a minimum of 50 successful operational flights under Phase 1 with zero safety anomalies; and
- B. The Operator has provided written notification to AFS-750 at 9-AVS-AFS-750-Correspondence@faa.gov, including a summary of Phase 1 flight data and confirmation that all Phase 1 criteria have been met. Phase 2 operations may commence 14 calendar days after notification unless the FAA objects in writing.



3. Aircraft Configuration and Performance at Increased Payload

3.1 Aircraft Configuration per Flare Load

The Rainmaker Elijah Quadcopter Series accommodates flares mounted on the landing legs via an aluminum Flare Holder Assembly. Each flare is secured with a vibration-resistant clevis pin, and the Flare Holder Assembly is attached to the landing leg with a close-fitting shaft collar and two M4 button head set screws. An aluminum tube shroud covers each flare to contain debris during burn. The following configurations are proposed:

Phase 1 Configuration (4 Flares):

- Two (2) flares mounted per side, one on each of two landing legs, or distributed across landing legs as balanced by weight.
- Mix of Zeus (BIP) and/or Ikarus (Ejectable) flares are not anticipated.

Phase 2 Configuration (6 Flares):

- Up to six (6) flares distributed across landing legs in a symmetric configuration to maintain center-of-gravity balance.
- Mix of Zeus (BIP) and/or Ikarus (Ejectable) flares are not anticipated.

3.2 Total Weight Calculations

Component	2-Flare (Current)	4-Flare (Phase 1)	6-Flare (Phase 2)
Aircraft (dry weight)	24.72 lbs.	24.72 lbs.	24.72 lbs.
Battery	20.4 lbs.	20.4 lbs.	20.4 lbs.
Flare payload (approx. 280 g/flare incl. holder)	~1.23 lbs.	~2.47 lbs.	~3.70 lbs.
Total Takeoff Weight	~46.35 lbs.	~47.59lbs.	~48.82 lbs.
Margin to 55 lb. MTOW	~8.65 lbs.	~7.41 lbs.	~6.18 lbs.

3.3 Weight and Balance

Flares are mounted symmetrically on the landing legs of the quadcopter airframe. The Flare Holder Assembly is secured at fixed positions on the landing legs, ensuring the center of gravity (CG) remains within the manufacturer's acceptable envelope for all proposed configurations.



Because the Elijah is a symmetric quadcopter with flares distributed evenly, CG shift from flare addition is minimal and within tested limits.

3.4 Effect on Performance

Rainmaker has conducted simulation, ground testing, and tethered flight testing at the proposed increased payloads. The following summarizes performance effects:

- **Endurance:** The additional weight of four additional flares (approximately 2.47 lbs. incremental over the current 2-flare configuration) has a negligible impact on battery life and flight time. Maximum flight time remains 90 minutes.
- **Controllability:** The PX4 flight controller has been tested with all proposed payload configurations. No adverse controllability effects have been observed. The symmetric flare distribution ensures balanced flight characteristics.
- **Climb and Descent:** Climb rate is marginally reduced at the 6-flare configuration but remains within acceptable operational parameters. Descent rates are unaffected as they are managed by autopilot and are not weight-limited.
- **Hover:** Hover performance remains stable across all configurations. The KDEDirect 8218XF-120 motors (120Kv, 110A continuous) provide substantial thrust margin at maximum payload.
- **Return-to-Home (RTH):** RTH function operates identically across all configurations. Battery reserves required for RTH are programmed conservatively and account for maximum payload weight.

3.5 Revised Operating Limitations

No new operating limitations are required beyond the existing limitations. The maximum speed remains 35 mph. The MTOW limit of 55 lbs. serves as the controlling limitation. All existing geofencing, altitude, and operational radius limitations remain in effect.



4. Two-Phase Rollout Details

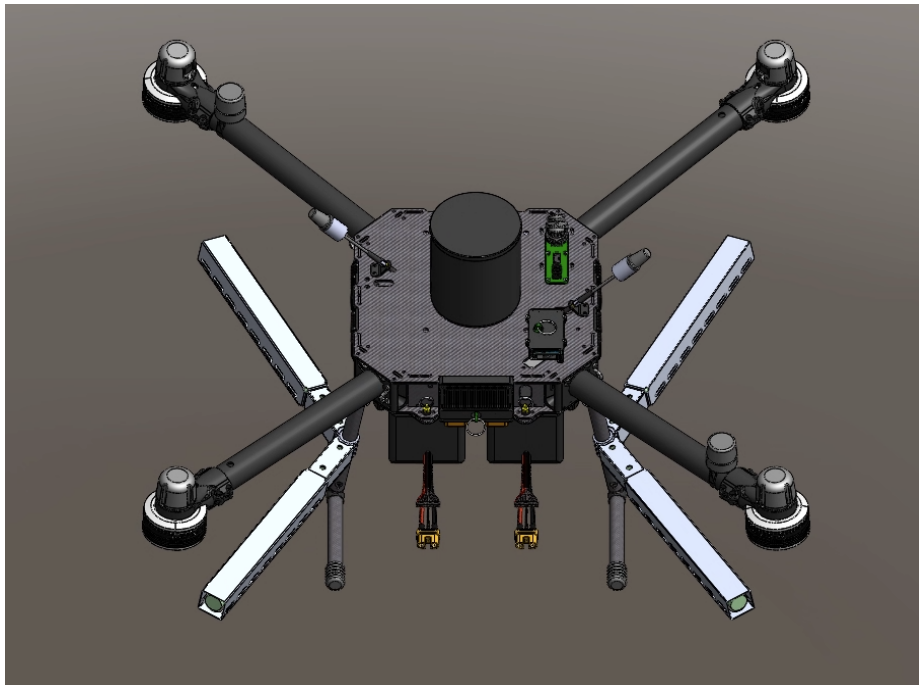
4.1 Phase 1 (4 Flares)

Description: Phase 1 authorizes operations with a maximum of four (4) flares per aircraft. This phase serves as an operational validation period to confirm system integration, structural integrity, and safety performance of the increased flare payload before progressing to the full six-flare configuration.

Aircraft and Flare Configuration: Rainmaker Elijah Quadcopter Series with up to four (4) Zeus (BIP) or Ikarus (Ejectable) flares, mounted symmetrically on landing legs using the aluminum Flare Holder Assembly with vibration-resistant clevis pins and shaft collar retention. Total takeoff weight not to exceed 55 lbs.

Duration: Phase 1 continues until a minimum of 50 successful operational flights with 4 flares have been completed with zero safety anomalies due to malfunctions of the flares or holder assembly.

Figure 1: Graphical representation of the 4 flare configuration



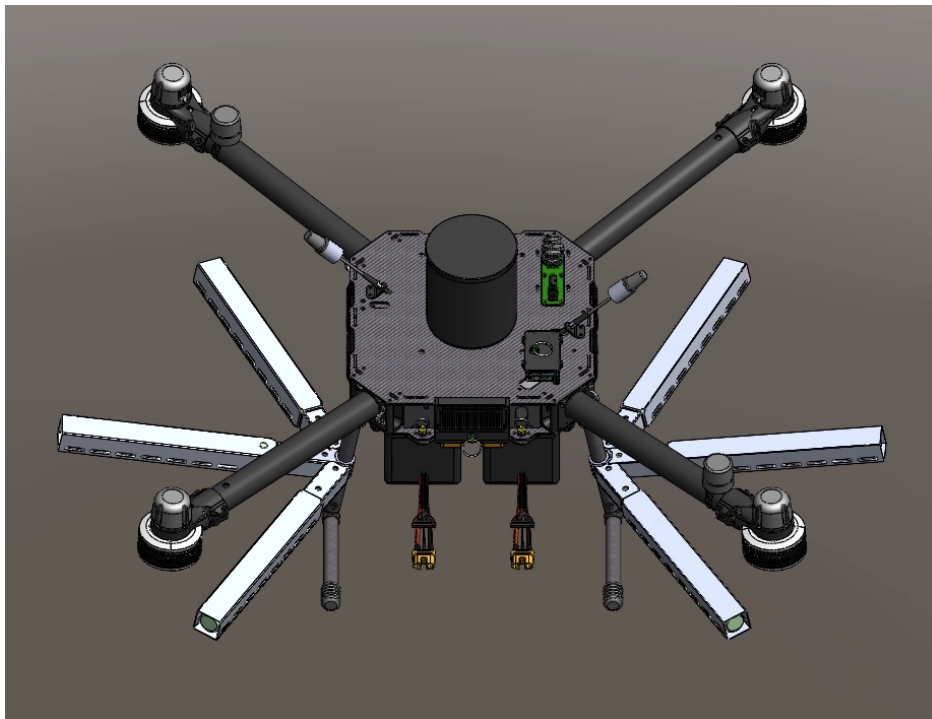


4.2 Phase 2 (6 Flares)

Description: Phase 2 authorizes operations with a maximum of six (6) flares per aircraft, representing the full amended capability.

Aircraft and Flare Configuration: Rainmaker Elijah Quadcopter Series with up to six (6) Zeus (BIP) or Ikarus (Ejectable) flares, mounted symmetrically on landing legs. Total takeoff weight not to exceed 55 lbs.

Figure 2: Graphical representation of the 6 flare configuration



4.3 Criteria for Progression from Phase 1 to Phase 2

Transition to Phase 2 requires all of the following criteria to be satisfied:

- A minimum of 50 successful operational flights completed under Phase 1 with four (4) flares.
- Zero safety anomalies during Phase 1 operations. A safety anomaly is defined as: any unplanned flare ignition or failure to ignite; any flare detachment or structural failure of the mounting system; any uncommanded descent, flyaway, or loss of control attributable



to the increased payload; any fire incident on the ground or in the air; or any event requiring activation of the flight termination system due to payload-related causes.

- All Phase 1 flight data collected and reviewed internally by Rainmaker's Director of Regulatory and Compliance and Director of Field Operations.
- Written notification submitted to AFS-750 at 9-AVS-AFS-750-Correspondence@faa.gov containing: a summary of all Phase 1 flights (total flights, total flight hours, flare types used, locations); confirmation that zero safety anomalies occurred; and a statement that Rainmaker intends to commence Phase 2 operations.

4.4 Data Collected During Phase 1

Rainmaker will collect and retain the following data during every Phase 1 flight:

- Flight log data: date, time, location, duration, altitude, flare configuration (type and quantity), and RPIC identity.
- Flare performance data: ignition success/failure for each flare, burn duration, extinguishment verification via onboard camera.
- Aircraft performance data: battery consumption, motor temperatures (if telemetry available), GPS track, any anomalies in autopilot or flight control behavior.
- Structural inspection data: pre-flight and post-flight inspection of flare mounting hardware, landing legs, and airframe for signs of stress, fatigue, or damage.
- Incident/anomaly reports: any event, regardless of severity, documented per Rainmaker's Safety Management System (SMS).

4.5 Acceptance Thresholds and Decision Criteria

The acceptance threshold is binary: zero safety anomalies (as defined above) across a minimum of 50 operational flights. If any safety anomaly occurs during Phase 1, Rainmaker will:

1. Immediately suspend Phase 1 operations pending investigation
2. Conduct a root cause analysis
3. Implement corrective actions

Phase 1 flight count will restart from zero following any anomaly that required corrective action to the aircraft design, flare mounting system, or operational procedures.

4.6 FAA Review Between Phases

Rainmaker proposes to provide written notification to AFS-750 prior to commencing Phase 2 operations, as described in Section 4.3. Rainmaker proposes that Phase 2 operations may commence 14 calendar days after notification is submitted, unless the FAA objects in writing



within that period. Rainmaker welcomes FAA input on whether a formal approval (rather than notification) should be required between phases, and will comply with whichever approach the FAA determines is appropriate.



5. Safety Risk Analysis for Increased Flare Quantity and MTOW

Rainmaker has conducted a revised Safety Risk Analysis addressing the hazards introduced or affected by the proposed amendment. This Safety Risk Analysis details the lack of change in the overall risk profile as a separate attachment.

6. Revised Manuals, Procedures, and Emergency Procedures

The following table identifies the specific revisions to Rainmaker's operating documents resulting from the amendment request. Full revised pages are provided as attachments to this response.

Document / Section	Page(s)	Description of Revision
Operator's Knowledge Handbook (Doc ID: 05.02) §3.2.4 Loading and Arming Procedures	p. 38-39	Update to reflect loading procedures for 4-flare and 6-flare configurations, including symmetric mounting positions on landing legs. Add reference to Phase 1 and Phase 2 loadout limitations.
Operator's Knowledge Handbook §3.2.1 Hazards and Safety Precautions	p. 37	Add precaution regarding sequential ignition requirement for multi-flare configurations. Add reference to Flare Controller Board ignition protocol.
Operator's Knowledge Handbook §3.2.3 Inspection and Rejection Criteria	p. 38	Add requirement to inspect all flare mounting positions (up to 6) and verify symmetric loading. Add post-flight structural inspection requirements for all mounting hardware.
Unmanned Operations Manual (Doc ID: 01.01) §2.5.1 Carriage of	p. 17–18	Update to reflect amended exemption authorizing up to 6 flares. Add two-phase rollout description.



Hazardous Materials		
Rainmaker Emergency Response Plan (Doc ID: 06.02) §3.11	p. 17	Update emergency landing procedures to address scenarios with up to 6 active flares. Add PRS-specific emergency procedures. Update fire response checklist for increased flare quantity.



7. Flare Carriage Limitations and Pyrotechnic Controls

7.1 Proposed Flare Quantity Limitations

- **Maximum number of flares per aircraft:** Six (6) flares (Phase 1: four (4) flares; Phase 2: six (6) flares).
- **Maximum explosive material per flare:** 50 grams (g) – unchanged from original exemption.
- **Total explosive material per sortie:** 300 grams (g) maximum (6 flares × 50 g/flare).

7.2 Attachment and Retention Method

For all configurations (2, 4, or 6 flares), the attachment and retention method is as follows:

- Each flare is inserted into an aluminum Flare Holder Assembly.
- The flare is secured within the holder with a vibration-resistant clevis pin.
- The Flare Holder Assembly is secured to the landing leg with a close-fitting shaft collar and two M4 button head set screws, arresting all degrees of freedom.
- A pocketed aluminum tube shroud is placed over each flare to contain any debris produced during burn while allowing airflow.
- For Zeus (BIP) flares, the flare is additionally secured into its bracket using M8 x 30mm socket head cap screws with a clamping bracket.
- For Ikarus (Ejectable) flares, the flare is loaded into the dispenser mechanism with orientation matched to the ejection feed path.

This retention method is identical to the method approved under the original exemption, scaled to additional mounting positions on the landing legs.

7.3 Ignition Monitoring and Extinguishment Verification

The ignition and monitoring system for the revised loadout operates as follows:

- **Ignition Command:** The RPIC commands flare ignition via the Seraph ground control station. The flight computer sends a CAN protocol message to the dedicated Flare Controller Board, which charges a capacitor bank to ignite the specified flare.
- **Sequential Ignition:** Flares are ignited one at a time, sequentially. The RPIC verifies successful ignition and monitors burn status via the onboard camera system before commanding the next flare.



- **Telemetry Monitoring:** The Flare Controller Board provides telemetry feedback on ignition status for each flare to the GCS.
- **Extinguishment Verification:** The RPIC uses the onboard camera system to visually verify that each flare has fully extinguished before commanding descent of the sUA. Descent is not initiated until all flares are confirmed extinguished.
- **Post-Flight Verification:** Upon landing, ground crew physically inspects all flare positions to confirm full extinguishment and verify no unburnt pyrotechnic material remains, per OKH §3.2.5.



8. Effect on the Original Exemption Safety Basis

Rainmaker believes the fundamental safety basis supporting Exemption No. 25287 remains sound. The amendment introduces incremental changes that are addressed by existing mitigations, enhanced by the Parachute Recovery System, and validated through the two-phase rollout approach. The following specifically addresses each area identified by the FAA:

8.1 Aircraft Performance

The additional weight of up to four additional flares (approximately 2.47 lbs. incremental) does not materially degrade aircraft performance. The Elijah platform's four KDEDirect 8218XF-120 heavy-lift motors provide substantial thrust margin. All proposed configurations have been tested on the Rainmaker Vertical Test Stand (VTS) and during tethered flight operations. The maximum speed (35 mph), operational radius (1 SM), and flight profile (vertical ascent/descent with limited horizontal movement) remain unchanged.

8.2 Flare-Related Hazards

The flare-related hazards are the same in kind as those analyzed in the original exemption; the amendment increases quantity but does not change the nature of the hazard. Each individual flare remains limited to 50g of explosive material and retains the same UN classification (UN0431/1.4G for Ikarus; UN0432/1.4S for Zeus). The sequential ignition protocol ensures that multiple flares are never active simultaneously in an uncontrolled manner. The dedicated Flare Controller Board, which is decoupled from flight control systems, has been EMI-tested with the full 6-flare configuration. The existing mitigations, bolted retention, onboard camera verification, and RPIC-controlled ignition, scale directly to the increased quantity.

8.3 Emergency Recovery

The amendment strengthens emergency recovery capability through the addition of the integrated Parachute Recovery System (PRS). Under the original exemption, the termination system halted propulsion via an immediate flight termination switch. The PRS now provides a controlled descent capability upon termination, reducing both the speed of ground impact and the potential area of impact. The PRS trajectory is estimated by the Seraph GCS based on atmospheric readings and live positioning data. All other emergency recovery procedures, including ground crew positioning, fire extinguishment equipment, and the 200-foot upwind crew position, remain in effect.

8.4 Off-Nominal Landing Scenarios



In the event of an uncommanded or emergency landing with active flares, the same response protocols apply: ground crew equipped with fire extinguishment tools respond immediately, leveraging the limited horizontal travel (no more than 1 SM from launch point). The PRS reduces descent velocity, which reduces the risk of flare detachment upon impact. The two-phase rollout provides additional confidence, as 50 flights with 4 flares will validate the system's behavior in off-nominal conditions before 6-flare operations commence. Rainmaker's emergency procedures will be updated to address the scenario of landing with up to 6 active flares.

8.5 Fire Response Procedures

Fire response procedures remain fundamentally unchanged. Ground crews are equipped with fire extinguishment equipment for all flare operations and are positioned within 200 feet of the launch point. The operational restriction to rural, privately contracted land minimizes the risk to structures or populations. The onboard camera system allows the RPIC to verify extinguishment of all flares before descent, and the post-landing inspection protocol (OKH §3.2.5) ensures any residual hazard is identified. Rainmaker will update its fire response checklist to enumerate inspection of all flare positions (up to 6) during the post-landing fire safety check.



9. Revised § 175.9(b)(6)(ii) Manual Status

The manual required by 14 CFR § 175.9(b)(6)(ii), previously submitted and approved under Exemption No. 25287 per Condition and Limitation No. 9 will require revision as a result of the proposed amendment.

9.1 Revised Manual Sections

The following sections of the approved manual will be revised:

- Operational guidelines for dispensing HAZMAT: Updated to reflect 4-flare and 6-flare configurations, sequential ignition protocol, and two-phase rollout.
- Handling procedures for ground personnel: Updated loading and arming procedures for multi-flare configurations per OKH §3.2.4 revisions.
- Maintenance procedures: Updated pre-flight and post-flight inspection checklists for all flare mounting positions.
- Emergency procedures: Updated to address emergency scenarios with increased flare quantity and PRS deployment.

9.2 Summary of Changes

Changes are limited to: increasing the authorized flare quantity from 2 to 6 (via two-phase rollout); adding the Flare Controller Board ignition protocol for multi-flare sequential ignition; incorporating PRS deployment into emergency procedures; updating pre-flight and post-flight checklists; and updating the waiver reference number. No changes to the fundamental structure or safety philosophy of the manual are required.

9.3 Submission for FAA Review and Approval

Rainmaker confirms that it will submit the revised manual to AFS-750 at 9-AVS-AFS-750-Correspondence@faa.gov for review and approval before conducting any amended operations, consistent with C&L No. 9. Rainmaker understands that amended operations may not commence until written approval of the revised manual is received from AFS-750.



10. Operational Experience Supporting Amendment

10.1 Total Operations Under Exemption No. 25287

Since being granted Exemption No. 25287, Rainmaker has conducted:

- **Total flight hours:** 245 mishap-free hours
- **Total flights:** Over 1,252 flights carrying two flares
- **Safety incidents:** Zero

Operations have been conducted in support of state government contracts in coordination with research entities, executing cloud seeding sorties to combat drought conditions.

10.2 Flights Using Currently Authorized Flare Configurations

All 1,252+ flights were conducted with the currently authorized two-flare configuration (Zeus BIP and/or Ikarus Ejectable).

10.3 Anomalies, Aborts, and Abnormal Events

Rainmaker reports zero anomalies, aborts, ignition issues, extinguishment issues, emergency recoveries, or other abnormal events during operations under Exemption No. 25287. This clean operational record across 1,252+ flights and 245 hours demonstrates the maturity and reliability of the Elijah platform and the effectiveness of Rainmaker's operational protocols.

10.4 Corrective Actions Taken

No corrective actions have been required, as no anomalies or incidents have occurred. Rainmaker's Safety Management System (SMS) remains active and operators complete the Operators Debrief Survey after each mission to track any potential issues.

10.5 Developmental and Engineering Testing

In preparation for the proposed amendment, Rainmaker has conducted the following testing to support the increased flare carriage and MTOW:

- **Simulation Testing:** Flight dynamics simulations at 4-flare and 6-flare configurations to model performance impacts on endurance, climb, and controllability.



- **Ground Testing:** Static structural load testing of flare mounting hardware at rated loads plus safety margin. EMI testing of the Flare Controller Board with full 6-flare ignition circuit installed.
- **Vertical Test Stand (VTS) Testing:** Tethered motor and propulsion system testing at maximum payload to verify thrust margin, motor temperatures, and system stability. EMI testing during simulated flare ignition sequences.
- **Tethered Flight Testing:** Tethered flight operations at 4-flare and 6-flare configurations to validate controllability, stability, and flare system integration in realistic flight conditions.



Conclusion

Rainmaker Technology Corporation submits this petition to amend Exemption No. 25287 and provides this response to ensure the FAA has complete and consistent information to support its technical evaluation.

The proposed amendment represents a measured, data-driven expansion of Rainmaker's proven precipitation enhancement operations. With 1,252+ flights and 245 mishap-free hours under the current exemption, Rainmaker has demonstrated the safety and reliability of its operations. The two-phase rollout approach, combined with extensive simulation, ground, and tethered testing, ensures that the increased flare payload does not reduce the equivalent level of safety established by the original exemption.

Respectfully submitted,

Samuel Kim
Director of Regulatory and Compliance
Rainmaker Technology Corporation



Appendix: Submission Checklist

The following files are included with this submission:

- This RFI Response (non-proprietary) – submitted as a comment to Docket FAA-2025-1630 at www.regulations.gov
- Proprietary submission (marked “PROP”) – submitted to 9-AVS-ARM320-Exemptions@faa.gov and 9-AVS-FS-AFS-700-Correspondence@faa.gov, containing:
 - Revised manual pages (for Items 6 and 9):
 - Operator’s Knowledge Handbook (Doc ID: 05.02) – revised pages 38, 39.
 - Unmanned Operations Manual (Doc ID: 01.01) – revised pages 17, 18.
 - Rainmaker Response Plan (Doc ID: 06.02) – revised pages 17, 18.
 - Flight log summary for operations under Exemption No. 25287