U.S. Department of Transportation
Federal Aviation Administration

Commercial Space Transportation

800 Independence Ave., S.W., Rm 331
Washington, DC 20591

September 7, 2023

Shana Diez
Director of Starship Reliability
Space Exploration Technologies
1 Rocket Road
Hawthorne, California 90250

Dear Ms. Diez,

On April 20, 2023, Space Exploration Technologies, Inc. (SpaceX) conducted Starship Super Heavy launch operations from its Boca Chica, Texas site under Federal Aviation Administration (FAA) launch license VOL 23-129. During lift-off, structural failure of the launch pad deck foundation occurred, sending debris and sand into the air. On ascent, the vehicle deviated from the expected trajectory, resulting in the Autonomous Flight Safety System (AFSS) issuing a destruct command. After an unexpected delay following AFSS activation, Starship broke up, resulting in the loss of the launch vehicle.

The FAA classified the Starship Launch as a mishap, as defined in Title 14 Code of Federal Regulations (14 CFR) § 401.7 paragraphs (2), (6), and (7). [1]

Following the launch, the FAA, consistent with its statutory authority under Title 51 of the U.S. Code and 14 CFR § 450.173(e), required SpaceX to conduct a mishap investigation in accordance with its approved mishap plan under FAA oversight. The FAA conducted a final review of the mishap report, dated August 21, 2023[2]. The primary focus of this review was to ensure operator compliance with 14 CFR § 450.173 – "mishap plan requirements, including the identification of root cause(s) and implementation of corrective actions [preventative measures] to avoid a recurrence of the event." The FAA has been provided with sufficient information and accepts the root causes and corrective actions described in the mishap report. Consequently, the FAA considers the mishap investigation that SpaceX was required to complete to be concluded.

The final mishap investigation report cited a total of sixty-three (63) corrective actions for SpaceX to implement. These included actions to address redesigns of vehicle hardware to prevent leaks and fires, redesign of the launch pad to increase its robustness, incorporation of additional reviews in the design process, additional analysis and testing of safety critical

[1] Additionally, the FAA granted official observer status to National Aeronautics and Space Administration and National Transportation Safety Board representatives. In accordance with the mishap plan, SpaceX established an investigation team that utilized a well-established fault tree tool to ascertain the most likely root cause(s) of the mishap.

[2] SpaceX Starship Orbital Test Flight 1 Final Mishap Investigation Report, August 21, 2023 ("the mishap report").

systems and components including the Autonomous Flight Safety System (AFSS), and the application of additional change control practices.

Launch license VOL 23-129 for Starship authorized SpaceX to conduct one launch. SpaceX is required to apply for a modification to the VOL 23-129 license to allow for subsequent launches. When SpaceX applies for this modification, it will need to demonstrate compliance with 450.173(f) by evidencing the implementation of corrective actions adopted in response to its April 20, 2023 mishap. If FAA approves the modification, SpaceX will be required to conduct licensed activities in accordance with the representations made in its application (450.211). Failure to do so is grounds for enforcement. Once the FAA determines SpaceX has implemented the corrective actions directly tied to public safety, the agency will consider SpaceX to be in compliance with 450.173(f).

Further, the FAA's closure of the mishap investigation does not predetermine the results of any ongoing or future environmental reviews associated with Starship operations at Boca Chica.

Please contact me with any questions or concerns at (202) 267-8308 or by email at Marcus.ward@faa.gov.

Sincerely,

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Marcus Ward
Manager
Safety Assurance Division

cc: Rachel Sage
Jillian Yuricich
Kara Fambrough
Sarah Banco