SEI Sling Dragon Continuing Flight Evaluation Plan

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Introduction: The Sling Dragon, made by SEI Industries, is an aerial ignition plastic sphere dispenser (PSD) machine that is slung under a helicopter as an external load. SEI designed the PSD machine with the intent of reducing personnel risk exposure by reducing the number of occupants in the helicopter during PSD operations. Since the Sling Dragon does not require manual feeding of plastic spheres, at least one occupant can be removed from the helicopter. Two occupants can be removed from the helicopter when Sling Dragon is configured for pilot-only use.

The Sling Dragon holds 5,000 Dragon Egg plastic spheres, weighs approximately 190 pounds when loaded, and is controlled either through the cyclic/collective bucket control circuitry or by an occupant of the helicopter through a pendant control. The National Interagency Aviation Committee recommends further Sling Dragon flight evaluations to investigate all flight configurations to include pilot-only and pilot plus firing boss flight. A Mission Aviation Safety Plan (MASP) and Risk Assessment will be approved prior to flight, and the pilot and helicopter shall be carded for external loads and PSD or Helitorch.

Sling Dragon requires additional wiring to allow activation through the bucket control circuitry and/or through the pendant controller wired to an internal accessory power source.

Sling Dragon can be operated in two different modes. One mode is through a pendant controller where an occupant inside the helicopter can adjust the drop speed with the controller. This occupant could be the pilot or another crewmember. The second mode is pilot control through the bucket control circuitry. In this mode, the operator presets the Sling Dragon drop speed before the flight, then the pilot turns Sling Dragon on and off with the corresponding switch on the cyclic or collective, much like a helitorch. The 9-pin plug wiring for this is the same as required for a Bambi MAX bucket and the spacing of plastic spheres is controlled by the speed of the aircraft. An additional crewmember could be onboard to direct firing. Both modes should be evaluated.

Evaluation Objectives:

A. Determine operability in pilot-only use through the bucket control circuitry and pendant control, and pilot plus firing boss operation.
B. Document use including acres treated, number of plastic spheres used, flight time, problems/malfunctions encountered, control method (pilot-only or FIRB onboard), general flight altitude above ground level, general flight airspeed, limitations encountered, pilot workload acceptability, sphere drop accuracy, pendant mounting location, and other comments from the user.

Sling Dragon should be evaluated on a planned prescribed fire to compare tactics with traditional PSD missions however wildfire use is acceptable.

Much of the evaluation will consist of discussion with the pilot and firing boss to determine flight handling, usability, and reliability, and to compare tactics and ignition performance to the traditional plastic sphere dispenser.

When the pilot controls Sling Dragon with the pendant controller in pilot-only flight, a discussion of where and how to mount the controller in the aircraft shall occur between the vendor, NTDP, and a helicopter inspector pilot and/or aviation maintenance inspector. The pilot should not frequently adjust the pendant controller drop speed when this control method is used.

Sling Dragon should be flown in a similar fashion (altitude and speed) to current plastic sphere dispenser operations to verify that it can produce results and meet project objectives. The altitude and speed should be varied to meet the objectives. Once the controls and settings are understood, the flight profile should be altered to include speeds to the maximum allowable and altitudes considered up to 600 feet or more above ground level.

If, at any time, anyone involved feels that the evaluation should stop (i.e., for safety, meeting project objectives, or problems are encountered) the evaluation should be paused until the concerns are addressed.

Minimum items to be evaluated/discussed are:

A. Flight control ability (how well Sling Dragon maneuvers and accuracy of dropped spheres)
B. Pendant controller logistics (wiring, personnel locations, attachment options)
C. Pilot control of the PSD with no crewmember on board. What are the limitations and workload?
D. Dependability (any breakdowns, failures, jams)
E. Operational challenges or successes
F. Control ability with higher and faster flight profiles, optimum conditions noted

Flight Requirements:

- ☐ MASP with Risk Assessment (approved by the appropriate line officer where the flight occurs)
- ☐ Helicopter approved for external loads and PSD or Helitorch.
- ☐ Pilot approved for external loads and PSD or Helitorch.
- ☐ Load Calculation and Passenger/Cargo manifest properly documented and acceptable.
- ☐ Additional testing and evaluation limitations, requirements, processes and hazards briefed to the pilot, PSD operator, testing and evaluation team and other participants as applicable.
- ☐ PSD Go/No Go checklist complete.

Justification for Crewmember with External Load: Other than the Sling Dragon not being on the currently approved list of aerial ignition devices, the flight(s) will be conducted in accordance with agency policy as well as the NWCG Standards for Aerial Ignition and the NWCG Standards for Helicopter Operations.

Chapter 10 of the NWCG Standards for Helicopter Operations allows a crewmember to be aboard when conducting external load operations, and the inclusion of a crewmember in this case is essential to determine the best method for operating the Sling Dragon. A crewmember may be aboard in each

operation mode to be able to compare and evaluate the methods of operation for future recommendations. A crewmember manipulating the pendant controller will reduce pilot workload and may enhance effectiveness and safety versus allowing a pilot to activate the pendant controller. Allowing a crewmember aboard when the Sling Dragon is controlled through the bucket control circuitry will maintain consistency with the way traditional PSD operations are currently completed for an effective mission.

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