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Interagency Aviation ACCIDENT PREVENTION BULLETIN



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Subject: Aerial Ignition Operations

Area of Concern: Plastic Sphere Dispensing Units (PSDs)

Distribution: All Helicopter Activities

Discussion: The number of Aerial ignition operations is increasing and so are the SAFECOM reports related to PSD maintenance and operations. Prior to commencing PSD operations, aircrews should perform a thorough preflight inspection of the PSD equipment to ensure foreign items haven't been stored in the dispenser that can ultimately result in a jam (IA Lessons Learned 10-03). Other inspection criteria should include the plastic spheres in order to ensure they meet the required specifications and a review of emergency procedures.

Here are a few recent examples:

During a routine cleaning of a PSD machine between aerial ignition operations, the lever controlling the inside chutes was discovered to be more difficult to operate (Figure 1). Upon closer inspection, one of the pins required for holding the springs in place was found to be worn beyond limits (Figure 2) and the asymmetrical shape prevented the lever from traveling smoothly. Had this discrepancy not been discovered, the PSD could have jammed in flight resulting in a cancelled mission and needless waste of resources.

Figure 1. PSD Lever

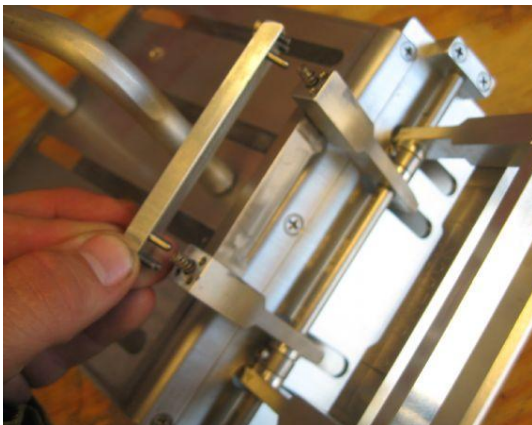


Figure 2. Pins from PSD



In a separate incident, the PSD operator noticed the two outside hopper chutes were not moving thus restricting the spheres from reaching the glycol/needles. The operator secured the machine while the helicopter returned to the helispot. After landing, the machine was removed and examined where it was discovered that the two outside chutes of the hopper were jammed with a blown fuse.

While removing the remaining spheres from the jammed hopper to change the fuse, the crew noticed some of the spheres were warped or possessed a raised blister-like bubble deformation (Figure 3). The deformed spheres caused the chute to jam, resulting in the blown fuse. The dimensions of the sphere should be 32 mm (1.25 in.) in diameter and contain approximately 3.0 grams of potassium permanganate (Figure 4).

Figure 3. Deformed spheres



Figure 4. Acceptable sphere



Additionally, there have been several documented instances where excessive permanganate residue inside the chutes caused the machine to jam which significantly increases the chance of a fire ([SAFECOM 10-0077](#) and [SAFECOM 10-0081](#)). The spheres were cracking at the seam joint allowing the permanganate to release into the PSD machine. The loose permanganate from the cracked and broken spheres caused the PSD machine to become clogged with material and jam well prior the normal cleaning cycle (Figure 5). The manufacturer (PremoFire/Vanguard Plastics) has since identified and corrected the problem. The suspect spheres were manufactured between June and November 2009, but may not be limited to those exact dates.

Figure 5.



Gummed up PSD machine after approximately 3,000 spheres were dispensed

It's important to inspect each box prior to use/loading for broken spheres or loose permanganate. If broken or deformed spheres are found, do not use them and secure them in a safe location. Afterwards, contact your Regional /State Helicopter Operations Specialist or agency aerial ignition representative. Maintaining the cleanliness and preventative maintenance of the PSD machine per the instructions in the Inter-agency Aerial Ignition Guide should mitigate most of these hazards associated with PSD operations.

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