Self-Protection Flare Constituents and Consequences

Robert E. Van Tassel
Science Applications International Corporation

vantasselr@saic.com

Self-protection flares are defensive mechanisms employed in combat to avoid attack by an adversary air defense system. When employed from military aircraft, flares are high temperature heat sources designed to mislead heat-sensitive or heat-seeking targeting systems and decoy them away from the aircraft. Self-protection, or defensive, flares serve to protect aircraft in combat and are not to be confused with illumination flares, which are used to provide light at night.

The effective employment of defensive flares in combat requires the near instinctive reaction of pilots. This, in turn, requires training and frequent use by aircrews to master the use of flares. Training is conducted through simulated battle conditions in airspace above weapons ranges, electronic combat ranges, offshore warning areas, and other airspaces that have been approved for flare use.

A defensive flare consists of a pellet of magnesium that is designed to ignite upon ejection from the aircraft and burn completely within approximately 5 seconds. The extremely high flare temperature provides a heat source other than the aircraft's exhaust. A flare failure can occur if a flare (1) does not ignite and remains in the aircraft, (2) does not burn the prescribed duration or temperature, (3) ignites but is not dispensed, or (4) does not ignite after ejection (a dud flare).

The presentation will describe the constituents of defensive flares, their use in training, and the currently understood consequences of their use. Potential environmental issues include fire risk associated with approved deployment, potential risks associated with incorrect deployment, and potential consequences of flare failures. How flares are handled by the military will be described to enhance understanding of flare constituents. Additionally, the presentation will address the increased understanding of residual flare materials that has occurred within the past eight months. This understanding has broadened the consideration of environmental consequences to address potential risks and aesthetic effects of flare residual materials that reach the ground.

Key words: self-protection flares, defensive flares, fire, safety, airspace.