



At the top of the photo is a Mica missile, which uses a Sagem infrared seeker. In the background is an American EA-6B Prowler.

DEFENSE. For the last 30 years, the Red Flag exercise in the United States has allowed allied air forces to carry out simulated combat missions under virtually real conditions. Four French air force Rafale fighters took part in the 2008 exercise.

RED FLAG: THE RAFALE IN ACTION

In August 2008, the shriek of the Rafale's M88 jet engines could be heard in the Nevada skies for the first time. France's new-generation fighters were headed for Nellis Air Force Base to take part in the legendary Red Flag exercise for two full weeks. Since 1975, American and allied pilots have been flying simulated missions against enemy aircraft and air defenses at this site, under very realistic conditions.

The deployment of a Rafale Red Flag team had been planned for a year and a half, and was intended to meet two main goals: ensure French air force interoperability with allies, and confirm the aircraft's performance in a full-scale exercise. The Rafale wasn't the only guest of course. It would be flying alongside South Korean F-15Ks and Indian Sukhoi Su-30MKIs, as well as the usual American contenders.

Once the four twin-seat Rafales and 14 pilots from Squadron 1/7 "Provence", Air Base 113, arrived in Arizona, they had a very busy schedule with at least two missions a day, including one at night. While the American aircraft were generally tasked with jamming and destruction of enemy radars, the Rafale, an exemplary multirole fighter, was assigned to ground strike and air defense missions.

Cutting-edge electronics

Operating in an environment dense with simulated anti-aircraft threats, the Rafale's advanced electronic systems nonetheless gave pilots a clear view of the tactical situation and facilitated actions. "Sensor fusion is an extraordinary concept, and very successful," enthuses Lieutenant-Colonel Fabrice Grandclaude, squadron commander. "There were never any discrepancies between the various sensors and datalink systems, namely the frontal sector optronics, or FSO [a search & track system], the Spectra electronic warfare and self-protection system and the Link-16 datalink." The Rafale's swing-role design allows this aircraft to carry out several missions in a single sortie – something offered by only the most advanced aircraft flying for NATO.

Participants were very impressed by the accuracy of the Rafale's sensors and weapons. It carries the Sagem AASM, nicknamed the "magic weapon" by the Americans, a modular air-to-ground weapon developed and produced by Safran Group company Sagem. The Rafale can handle six different targets simultaneously. Furthermore, the Link-16 datalink network enables two aircraft to exchange firing plans in the air, so that the best-placed one can lead the

VIEWPOINT



GENERAL BERNARD FORON,
AIR FORCE ADVISOR, SAGEM

AASM, two kits for a single unprecedented weapon

"AASM, the French acronym for modular air-to-ground weapon, is basically two kits fitted to a conventional bomb. The solid range augmentation kit is mounted in the back and allows the weapon to reach targets over 50 kilometers away. The second is a guidance kit, available in three different versions. All are based on an inertial reference unit coupled with a GPS receiver, to which are added either an infrared imager or a laser detector.

The AASM can therefore cover a wide range of operational requirements, while reducing integration costs, since these are identical for the three versions. It offers strike accuracy down to one meter, day or night and under any weather conditions. The AASM can be fired from very low or very high altitudes, at a depression angle of more than 90° in relation to the target. The only weapon of its kind, the AASM has been successfully used by French forces in Afghanistan."

attack. The SLPRM mission planning and post-flight analysis system records all possible mission scenarios on the ground. If one Rafale doesn't hit its target, another can take over and complete the mission. Also developed by Sagem,

the SLPRM supports planning for a wide range of missions, along with post-flight analysis of all information recorded during the flight.

Aerial advantage

Sagem also supplies the infrared seekers for the Mica IR air-to-air missiles, which allowed the French fighters to successfully complete their missions. The FSO infrared detection function really comes into its own during aerial combat, giving Rafale pilots a clear advantage. Sagem also developed and produces the inertial navigation system for the Rafale, as well as for India's Sukhoi Su-30MKIs.

A dozen Safran Group companies contribute to the Rafale, led by Snecma as supplier of its twin M88 engines. These high-performance military turboprops performed admirably in the summer heat of the Nevada desert, reaching 113°F in the shade (45°C), as did landing gear and brakes by Messier-Dowty and Messier-Bugatti, respectively. ■

MORE

All Safran companies contributing to the Rafale are listed on the Group's website (www.safran-group.com), in the "Aircraft Applications" section.



GENERAL JEAN-PIERRE MARTIN,
COMMANDER OF THE COMBAT AIR FORCE

"The French pilots at Red Flag were flying an aircraft that was fully the equal of their counterparts from the U.S., South Korea and India."