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Development of Cheetah C-RAM/C-PGM missile on track

Making its official debut at the 2016 African Aerospace and Defence (AAD) show in Pretoria, the Denel Cheetah C-RAM/C-PGM missile has already passed a number of important development milestones. The product can be integrated into the Oerlikon Skynex, Skyranger, Skyshield or Skyguard gun-based air defence systems made by Rheinmetall. It constitutes an enhanced, highly effective force protection system for countering conventional, unconventional and terrorist attacks, specifically assuring low-cost neutralization of the threat posed by guided aerial bombs, mortars and rockets. The capability will be a major pillar of future full-spectrum air defence solutions such as the "Patriot and Below Concept" unveiled by a team comprising Raytheon, KONGSBERG and Rheinmetall at the 2018 Air Defence Systems Group and Full Spectrum Air Defence conference in Switzerland.

In partnership with Rheinmetall Denel Munition, Denel Dynamics and Rheinmetall Air Defence and Radar Systems, the Cheetah missile is currently being developed as a counter-missile to be deployed against RAM projectiles – rockets, artillery and mortars – often used by militias and terrorist groups. These weapons are used in hit-and-run tactics which are difficult to counter and defeat. Moreover, recent conflicts like the one in the Donbas region in eastern Ukraine have shown that force protection against artillery rockets is an urgent priority, and the day when forces will have to fend off aerial guided bombs seems bound to come. Analysts at the three companies see a significant capability gap if the defence against RAM combined with aerial bombs and precision guided munition (PGM) becomes part of the future threat to be managed by ground-based air defence systems. Some countries are already factoring this into their requirements for future air defence systems.



A number of field tests at South African firing ranges have confirmed initial simulations of a new threat-defeating concept which will enable extremely high-precision, highly efficient engagement of incoming threats. High accuracy guidance and control coupled with a specialized warhead allows the missile to destroy hardened RAM and PGM targets. Cheetah will be integrated into the inner layer of the Patriot and Below Concept, and queued in along with other inner-tier shooters from the overarching command and control system, generating the necessary situational awareness. Automated target assignment algorithms select the best effectors to engage targets in rapid succession. Cheetah will be available in containers of up to 60 missiles and can be integrated into mobile platforms such as trucks or armoured vehicles.

Working in conjunction with other inner-tier effectors such as future high-energy lasers and the famous 35mm Oerlikon guns using Rheinmetall's proprietary Ahead ammunition technology, Cheetah will form part of a solid, ruggedized system for protecting vital assets, units on the move, and small areas from a full spectrum of symmetric and asymmetric threats at distances of up to six kilometres with maximum resistance against saturation. Larger targets such as fixed-wing and rotary aircraft can be engaged at distances of up to 10 km.

Rheinmetall Denel Munition, Denel Dynamics and Rheinmetall Air Defence and Radar Systems are currently finalizing a plan to achieve the technology readiness level TRL 4 with a first set of semi-dynamic warhead tests by the end of 2019, and are in discussion with various potential customers to secure the timeline for the remainder of the development programme.

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