

Focus on CSIR services in store separation

The SA Air Force (SAAF) and Armscor has invested in establishing a national centre of excellence in weapons integration at the CSIR over many decades. Today South Africa boasts a superb track record of demonstrated success in store separation

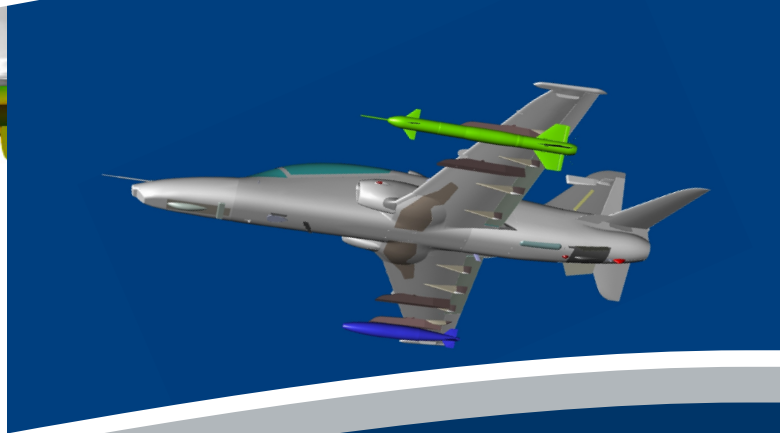
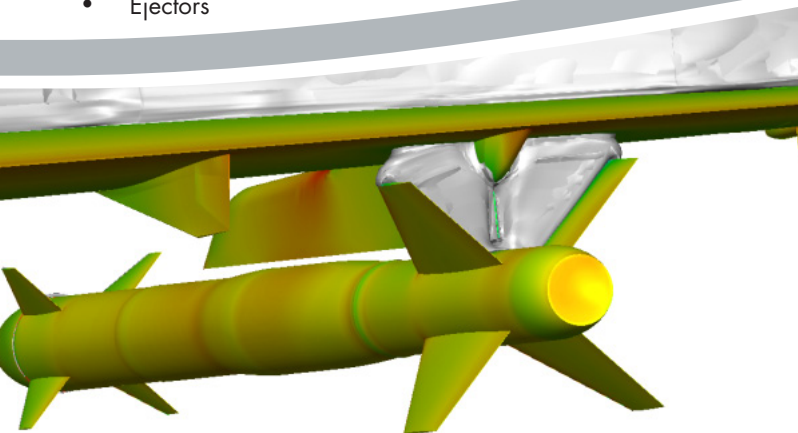


Store release analyses are very complex & require use of advanced computational & experimental tools such as

- Transonic & nonlinear aerodynamics
- Proper accounting of relative store & aircraft motions
- Fin / parachute / engine deployment
- Dynamic modelling of release mechanisms
- Ejectors
- Rail launchers
- Pivot releases
- The CSIR performs store separation analyses in compliance with MIL-HDBK-244A, 1990 and MIL-HDBK-1763, 1998
- Analyses are required to verify the safe release of stores over full

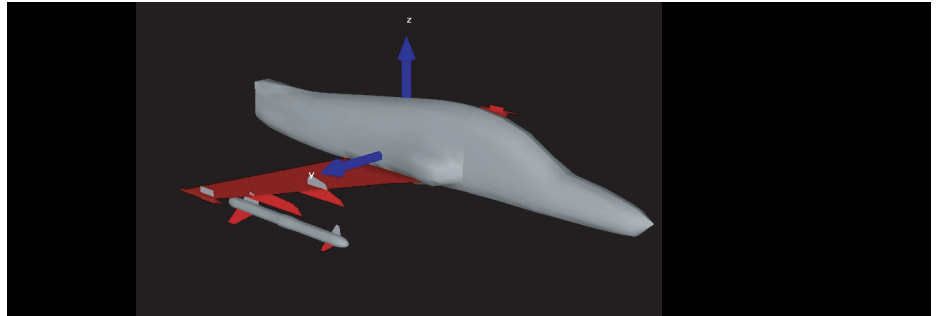
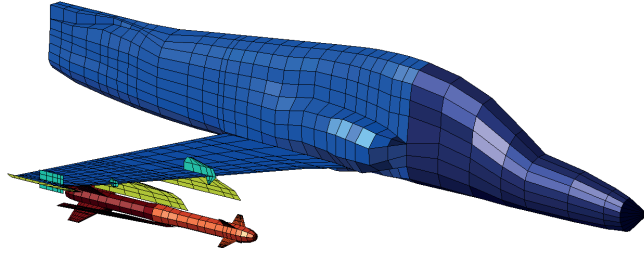
operational & jettison envelopes including all perturbations of:

- store mass and physical properties
- ejector rack performance
- aircraft release flight conditions
- stations on aircraft
- impact of neighbouring stores



Tools:

- ARUV panel code
 - Developed since 1970's
 - Extensively validated, highly reliable & robust
 - Very fast
 - Extensive store release analysis features
 - Used for bulk of subsonic analyses
- Medium Speed Wind-tunnel
 - 1.5 m x 1.5 m test section
 - Mach 0.4 to 1.4
 - Captive trajectory system
- CFD
 - CCM+, CFD-Fastran



Capabilities

- Measuring aircraft geometry to generate aerodynamic model
- High level customisation & integration
 - Have access to source code of all separation analysis tools and can address all unique requirements
- Can select and blend combination of panel code, CFD and wind-tunnel testing to find optimum solution to difficult problems
- Automated running of analysis scripts & scoring of releases
- Ejection dynamics of flexible structures
- Use of modern design of experiments to optimise effort and cost
- Close the loop with flight test data



With the ready flexibility to handle any challenge, the CSIR has the expertise and self-developed tools to deliver superior services and minimise risk to the customer.

Emphasis is placed on inviting collaboration from like-minded organisations globally to grow and benchmark capabilities.

The CSIR has a proud track record that it guards jealously. This reputation is based on a cautious, quality driven, safety-first culture

Contact details

Mr Kevin Jamison

Aeronautic Systems Competency
Defence, Peace, Safety and Security (DPSS)

dpss@csir.co.za