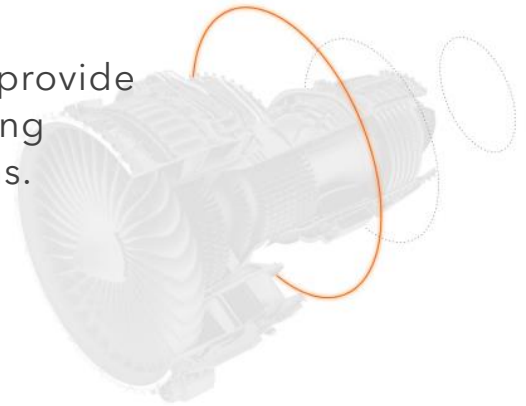# AVRA

Airborne Vehicle and Rocket Analysis

AVRA is a commercially available suite of tools which provide launch and re-entry risk analysis capabilities, supporting analysis against RCC-321 and FAA Part 450 regulations.

Powered by the same computation engines used to ensure safety at government ranges for decades in Range Risk Analysis Tool (RRAT) and Trajectory Toolkit (TTK).

AVRA-T

- *Load trajectory data (nominal, Monte Carlo, 3-sigma, failures*
- *Simulate failures with simple models: stick turn, random attitude, loss of thrust*
- *Ballistically propagate state vectors*
- *Simulate trapping for structural limits and flight safety system activation*

AVRA-DR

- *Assign failure probability to state vectors*
- *Propagate debris from breakup to impact*
- *Compute risk measures to people as probability of casualty and fatality in the open and in buildings*
- *Incorporate global population sheltering using global population density models and sheltering assignment algorithms*
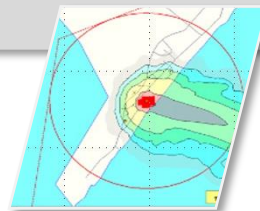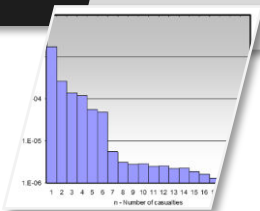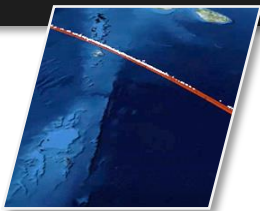
ADD-ON MODULES

- Maximum Probable Loss: provides probability estimations for high consequence events
- Ship Risk: calculate ship risk contours and hazard areas using assigned vulnerability models
- Aircraft risk: calculate aircraft risk contours and hazard areas

COMPUTATION REQUIREMENTS

- Primary application targets 64-bit Windows 11
- Analysis capability requires separate Linux compute cluster
- AWS GovCloud offered for on-demand compute managed by Arctos
- On-site certified hardware offered through partners at higher initial capital investment

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