2006 Rist Prize

Brian Engler, MORS, brian@mors.org

The DAVID RIST PRIZE, named in honor of David Rist (a Founding Director) and first presented in 1965, is awarded annually to recognize the best-implemented study submitted in response to a call for entries. Final judging took place the Monday before the MORS Symposium (MORSS).

The three finalists in alphabetical order were:

- Lt Col **Roberta Ewart** et al (Space Superiority Materiel Wing)
- LTC **Bradley Pippin** et al (TRADOC Analysis Center)
- LTC **Steven Stoddard** et al (Center for Army Analysis)

LTC Stoddard and the Winning Team Receive the Rist Prize From Col Suzanne Beers

At the 74th MORS Symposium, the David Rist Prize was presented to: LTC **Steven Stoddard**, LTC **Mark Brantley**, LTC **Clark Heidelbaugh**, LTC **Paul Hurley**, MAJ **Robert Shearer**, **Joshua Klimas** and **Brett Marvin** for their study entitled *Army Force Generation Model Simulation (AFGM)*, (endorsed by LTG **David F. Melcher**, USA, Deputy Chief of Staff, G-8 and Dr **Wm. Forrest Crain**, Director Capabilities Integration Prioritization and Analysis).

Also, a second place was recognized for an implemented study submitted in response to the RIST PRIZE call for entries. At the 74th MORSS, the runner-up check was presented to Lt Col **Roberta Ewart**, Lt Col **Derek Ho**, **James Pryzbysz**, Lt Col **Andrew Grau**, and Dr **Lee Lehmkuhl** for their study entitled *Architecting Counterspace Systems for Optimum Military Utility* (endorsed by Maj Gen **Mark Shackelford**, USAF, HQ AFSPC/DR).

Partial Abstract of Winning Presentation

Background: The Army continually examines its force structure and its ability to meet strategic requirements. Demand for forces is driven by national strategy, a force planning construct (e.g., "1-4-2-1"), and on-going operations. Supply of forces is constrained by unit lifecycles (training, readiness, deployments, and recovery), transformation, AC and RC forces levels, and rotations. The Army developed the Army Force Generation concept (ARFORGEN) to manage the supply of forces over a variety of demand scenarios. The Center for Army Analysis developed the Army Forces Generation Model (AFGM) Simulation study to model ARFORGEN and determine the appropriate size of the force.

Prior to this effort, there was no existing model that appropriately replicated the cyclical readiness that will exist under ARFORGEN. Also, no existing rotation model adequately captured the nuances of a fully rotational Army, such as variable rotation durations, in-theater overlap to accomplish battle hand-off, and rotation policy as a model output (vice a policy input). In light of these issues, we developed our own model, called MARATHON.

Summary of Methodology: We implemented the MARATHON model as a discrete-event simulation built in ProModel. This allows for deterministic and stochastic arrival and processing of contingency operation as well as visual validation that the Army generated forces as expected. In particular, this visual aspect of the model provides great insight to decision-makers who might have been less understanding of a mathematical optimization model.

MARATHON allows us to simulate the flow of active and reserve component units through their respective operational readiness cycles. Each cycle begins with a non-available period (when AC units are reset and RC units are not available for Title 10 operations), followed by periods when units train until they are ready and available, deploy, recover, and transform (as necessary). MARATHON allows us to examine a variety of force structure options and force generation policies by illustrating gaps or redundancies in capabilities, as well as associated deployment tempos. These factors drive the Army's force structure and force management decision. The Army adopted MARATHON to analyze its force structure for the 2005 Quadrennial Defense Review (QDR) as well as other analytical efforts. We also used the simulation to model various courses of action that supported the approval and implementation of the ARFORGEN concept.

To conduct our analyses, we developed two major supply and demand scenarios, as well as more than 30 different demand scenarios for sensitivity analysis. The first major scenario consisted of the real demand the Army faced from 2002 through 2004 along with anticipated near-term requirements. We modeled this scenario using the programmed force structure. This scenario provided the principal means to validate the model. We developed the second major scenario based on the Strategic Planning Guidance Analytical Agenda, including OSD-vetted vignettes for lesser contingency operation. We modeled this scenario against future force-structure alternatives.

Impacts: In support of QDR analysis effort, we conducted five separate analyses:

- *Brigade Combat Teams*
- *Support Structure*
- *Sustain-Surge*
- *ARFORGEN*
- *Access to the Reserve Component* ✪