

# **Working Group 7 – Manpower, Personnel, and Training Analysis**

**Co-Chair: LTC Todd Minners**  
**Office of the Deputy Chief of Staff for Personnel (G-1), Washington, D.C.**  
[howard.t.minners.mil@mail.mil](mailto:howard.t.minners.mil@mail.mil)

**Co-Chair: Mr. Ed Shepherd**  
**U.S. Army Manpower Analysis Agency (USAMAA), Ft. Belvoir, VA.**  
[edward.l.shepherd.civ@mail.mil](mailto:edward.l.shepherd.civ@mail.mil)

## French Army Capabilities Rebalance using HR Data

[27 Oct 15, 1330-1400, Rm 15]

LTC Pierre-André MOURIER

FR Army Operations Research & Analysis Bureau (BARO)

Forces Employment Doctrine Center

[pierre-andre.mourier@intradef.gouv.fr](mailto:pierre-andre.mourier@intradef.gouv.fr)

**Keywords:** Resource Analysis, Manpower, Current Operations

**ABSTRACT:** Faced with the worst terrorist attacks on its national soil in decades, the French Army has been massively deployed over national territory since January 2015, in support of security forces. Meanwhile, overseas commitments remained at a high level, especially throughout Africa. Therefore, Army manpower had to be increased. Faced with the responsibility to provide several options, the Army Staff (Plans Division) had to decide which operational branches would benefit from this new manpower, with a twofold objective: to face present commitments without wearing down human resources, and to keep an Army model fit for a high intensity conflict in the foreseeable future. Previous staff work was based on Land Forces Command reports, which provided unit-based analysis of activities. This data failed to depict with accuracy the reality of activities at the individual soldier level. Therefore, Plans Division call upon BARO to provided fact-based insight into Army activities.

BARO built its answer on the data held by FR Army HR information system CONCERTO. Using several strategies, it extracted all the data related to soldiers individual deployments to provide an actual depiction of how operational branches were contributing to homeland security and overseas operations. The size of the data was way over Excel capabilities. BARO relied on SAP Business Objects extractions, the creation of a dedicated MySQL database, data processing code in .NET language, and finally R code for data presentation. It revealed that what soldiers experienced on an individual basis was very different from what could be expected by watching at unit rotations only. Hence, the capabilities rebalance and the manpower flow have been reengineered to build an Army both capable of sustaining present commitments over a long time, and to keep key capabilities for high intensity war fighting.

## Distributed Soldier Representation: M&S Representations of the Human Dimensions of the Soldier

[27 Oct 15, 1400-1430, Rm 15]

Manuel Diego  
Army Research Laboratory (ARL)  
[manuel.r.diego.civ@mail.mil](mailto:manuel.r.diego.civ@mail.mil)

Joseph McDonnell  
Dynamic Animation Systems  
[Joe.McDonnell@d-a-s.com](mailto:Joe.McDonnell@d-a-s.com)

Gary Smith  
Dynamic Animation Systems  
[gsmith@d-a-s.com](mailto:gsmith@d-a-s.com)

Lana McGlynn  
McGlynn Consulting Group  
[Lana.McGlynn@gmail.com](mailto:Lana.McGlynn@gmail.com)

**Keywords:** Manpower, Modeling, Soldier as a System, Service-Oriented Architecture (SOA), Human Dimension

**ABSTRACT:** The Army has developed Modeling and Simulation (M&S) capabilities representing platforms such as aircraft, vehicles, and weapons system for various uses and of various fidelities. The Army has represented humans – soldiers, civilians, and threats – in its M&S as well. These representations provide physical model characteristics for mobility, delivery accuracy, lethality, and sensing, as well as behavioral representation to support tactical operations, Human Intelligence (HUMINT), and treating simulated wounded. These models rarely model the soldier as a complex system, omitting factors such as stress, human physiology, leadership, unit cohesion, and morale, to name a few. Instead, the actions of the simulated soldier are often based on a deterministic model of human behavior or based on a stochastic model where random numbers provide variability across iterations, with variability provided by a random number seed, not the model. This provides unsatisfactory simulation results, as the simulated soldiers appear robotic or even superhuman.

This paper describes the two year old Distributed Soldier Representation (DSR) research and development effort at the Army Research Laboratory, Human Research and Engineering Directorate, Simulation and Training Technology Center (ARL HRED STTC). We describe our research and identify eleven areas of interest for improving soldier representation. We further describe the development of an innovative Service-Oriented Architecture (SOA) that provides a web services-based approach to integrate disparate models to address these identified representation gaps. We describe the challenges and benefits achieved, as well as the lessons learned from integrating an Effects of Stress model with One Semi-Automated Forces (OneSAF).

## Discrete Event Simulation for Modeling Officer Strength to meet Requirements during a Drawdown

[27 Oct 15, 1430-1500, Rm 15]

MAJ Kevin E. Blaine  
Deputy Chief of Staff, G-1  
Strength Forecasting Division  
[kevin.e.blaine.mil@mail.mil](mailto:kevin.e.blaine.mil@mail.mil)

**Keywords:** personnel modeling, continuation rate, forecasting, end strength

**ABSTRACT:** Faced with reductions in end strength and a fiscally constrained environment, the US Army is adjusting personnel policy to meet requirements throughout the Future Years Defense Program (FYDP). Personnel analysts must identify the proper mix of personnel levers such as accessions, separations, and promotions that will allow the Army to not only meet drawdown target gates but to sustain a proper inventory beyond the FYDP. The methodology and forecasting model to be presented was developed to model Army Competitive Category (ACC) Officers over a 2-5 year time span in order to sustain a feasible future fighting force during a drawdown. The model uses sixteen years of historic monthly continuation rates derived from the Total Army Personnel Database (TAPDB) to simulate future continuation behavior by year group. The model provides analysts an understanding of the effects that current policy decisions will have in meeting future requirements in order to more accurately forecast personnel strength.

## Contract to First Term Attrition Study

[27 Oct 15, 1545-1615, Rm 15]

CPT Lawrence M. Tobin  
Deputy Chief of Staff, G-1, Enlisted Accessions Division  
[lawrence.m.tobin2.mil@mail.mil](mailto:lawrence.m.tobin2.mil@mail.mil)

MAJ James A. Markham  
Deputy Chief of Staff, G-1, Enlisted Accessions Division  
[james.a.markham2.mil@mail.mil](mailto:james.a.markham2.mil@mail.mil)

**Keywords:** Attrition, Recruiting, Training, Policy, Enlistment, Accessions

**ABSTRACT:** Approximately 41% of U.S. Army Soldiers don't complete their first term of enlistment, defined as the period from their initial Future Soldier (FS) contract through 36 months of service. This attrition can be divided into three phases: Future Soldier Losses (contracted but not shipped to Initial Entry Training (IET)), Training Base Attrition, and First Unit Attrition. This attrition creates recruiting resource, training, and salary overhead costs. Determining distributions for attrition is a fundamental research issue for programming and forecasting recruiting, training, and readiness.

This discrete/agent based event simulation is intended to identify critical nodes during all three phases of a Soldier's first 36 months of service that can be used to shape policy with the intent of lowering this overhead cost. The simulation will use both historical pre- and post-accession (date of ship) data and attrition data to examine at a Military Occupational Specialty (MOS) level how best to recruit and retain Soldiers during their first term of enlistment. Factors such as gender, ASVAB Score, Bonuses Awarded, Training Type (OSUT vs BCT/AIT), and others will be simulated to see how changing policies for recruiting and/or training requirements would affect overhead cost while maintaining current enlistment standards and end-strength requirements.

## Drawing Down the Active Component Army to 490K in Fiscal Year 2015

[27 Oct 15, 1615-1645, Rm 15]

MAJ Christy A. R. Licklider  
Deputy Chief of Staff, G-1  
Strength Forecasting Division  
[christy.a.licklider.mil@mail.mil](mailto:christy.a.licklider.mil@mail.mil)

MAJ Kevin E. Blaine  
Deputy Chief of Staff, G-1  
Strength Forecasting Division  
[kevin.e.blaine.mil@mail.mil](mailto:kevin.e.blaine.mil@mail.mil)

**Keywords:** Strength Forecasting, Loss Analysis

**ABSTRACT:** The Strength Forecasting Division within the Plans and Resources Directorate of the Army G-1 is responsible for analyzing historical data and forecasting future AC strength to facilitate senior Army leadership decision making. The projected FY15 AC end strength was set at 490,000 to meet the National Defense Authorization Act (NDAA) 2015 minimum authorized strength. As a result of changing end strength targets in recent years our analysis showed that meeting this minimum end strength requirement would require adjustment to personnel levers. The key variables effecting total end strength in the current fiscal year are accessions and losses. With an increase to the accessions mission and lower than expected enlistments in the early summer months, our models showed the end strength dipping below 490,000 before the end of FY 15. This briefing is a synopsis of the analysis and modeling that occurred to generate the decision space that informed Army leadership on adjusting personnel policy to meet the FY15 minimum end strength.

## Assessing Strategic Messaging in the Social Domain

[28 Oct 15, 0945-1015, Rm 15]

Ms. Gina Cruz

[gina.n.cruz@gmail.com](mailto:gina.n.cruz@gmail.com)

Capt. Ashton Harvey, USAF

[ashton.e.harvey@gmail.com](mailto:ashton.e.harvey@gmail.com)

LTC Christian Teutsch, USA

[christian.g.teutsch.mil@mail.mil](mailto:christian.g.teutsch.mil@mail.mil)

**Keywords:** Strategic Messaging; Strategic Communications; Social Media; Social Network Analysis; Assessments; Sentiment Analysis

**ABSTRACT:** All major American corporations conduct strategic messaging in the social domain. In this regard, the Department of Defense is no different. Each of the armed services maintains social media accounts to communicate with the public, including critical segments of the public, such as Members of Congress. This study, undertaken toward a graduate degree at the Volgenau School of Engineering at George Mason University, examines the use of social media by the Army Office of the Chief of Public Affairs (OCA). The purpose of the analysis is to assess the efficacy of OCA's conduct of strategic messaging in the social domain, specifically through the well-known microblog site: Twitter.

The Army has over 650,000 followers on Twitter, to whom it communicates thousands of strategic messages. Due to the construct of microblogging, however, it is very difficult to determine whether the target audience is reached, and to what extent any given message resonates. To that end, this study explores methods for examining both the resonance and the response to Army tweets, assessing the characteristics of "successful" messaging, and the depth and breadth of the social media audience.

## Global Assessment Tool Exploratory Analysis

[28 Oct 15, 1045-1115, Rm 15]

MAJ Cardy Moten III  
TRADOC Analysis Center TRAC-MTRY  
[cardy.moten3.mil@mail.mil](mailto:cardy.moten3.mil@mail.mil)

**Keywords:** Global Assessment Tool, Factor Analysis, Cluster Analysis

**ABSTRACT:** The Global Assessment Tool (GAT) is an online mental health survey designed to give U.S. Army Soldiers an indication of their resilience and psychological health (R/PH) in five dimensions: emotional fitness, social fitness, family fitness, physical fitness, and spiritual fitness. The GAT is mandatory for all Soldiers and is optional for civilians and family members. TRAC investigated new interpretations of the GAT in order to provide more informed feedback to the Soldier and improve prediction of Soldier outcomes such as promotions, drug use, violent crimes, etc. Factor analysis, cluster analysis, and data visualization techniques were used to evaluate similarities and differences between the services and to provide a more comprehensive picture of the component data that Soldiers may understand more readily.

## Home Station Training Realism Improvement One Data Set at a Time

[28 Oct 15, 1115-1145, Rm 15]

Mr. Robert L. Albright / Mr. Robert "Bobby" W. Greer  
National Simulation Center (NSC)

[robert.l.albright6.civ@mail.mil](mailto:robert.l.albright6.civ@mail.mil) / [robert.w.greer.civ@mail.mil](mailto:robert.w.greer.civ@mail.mil)

**Keywords:** Home Station, training, requirements, test, validation, qualitative, quantitative, analytics, Knowledge Management, Integrated Training Environment, ITE, automate, data collection, running estimate, metric

**ABSTRACT:** One objective of the Army's Combined Arms Center for Training (CAC-T) and National Simulation Center (NSC) is to improve Home Station training realism. NSC Capability Developers influence improvements with operational requirements and validation test criteria for materiel solutions. Knowledge of user experience informs their elicitation of operational requirements and their identification of test criteria.

NSC personnel are forming multidisciplinary teams and collecting simulation and survey data, and observations, for quantitative and qualitative analysis that increases their knowledge on Army unit usage of modeling and simulation in training exercises. The knowledge informs the NSC Capability Developers on modeling and simulation functionality updates that improve realism for Home Station Training, as well as, on subsequent updates to user guide and best practices documentation.

Exercises occur daily in the Integrated Training Environment (ITE) and provide the NSC opportunity for collecting data and acquiring knowledge on user experience. The NSC challenges reside in the continuous collection and cataloguing of data, the continuous identification of metrics, the timely analysis of quantitative and qualitative data, the real-time updates to metrics as data arrives, and the development of validation tests.

The NSC is looking at how to automate the collection of data from exercises that occur in the ITE and how to automate incorporation of new data to metrics so that running estimates of user experience are concurrent with user activities. The NSC research and assessment of a few data samples from exercises demonstrates the potential for quantitative and qualitative descriptions of user experience that inform development of requirements and test criteria.

The NSC challenges are at the intersection of Operations Research Analysis and the quantitative and qualitative analytics of Knowledge Management. The work within the NSC challenges addresses the objective to improve Home Station training realism.

## In-Theater Human Capital Management: Is it time for a Job Fair in Theater?

[28 Oct 15, 1330-1400, Rm 15]

LTC Terrance W. Adams  
United States Army Central – Army Reserve Affairs  
[terrance.w.adams.mil@mail.mil](mailto:terrance.w.adams.mil@mail.mil)

CPT Estela Barrios  
1st Theater Sustainment Command  
[estela.m.barrios.mil@mail.mil](mailto:estela.m.barrios.mil@mail.mil)

CPT Steven Coon  
United States Army Central –National Guard Affairs  
[steven.j.coon2.mil@mail.mil](mailto:steven.j.coon2.mil@mail.mil)

CPT David E. Leiva\*  
United States Army Central – National Guard Affairs  
[david.e.leiva.mil@mail.mil](mailto:david.e.leiva.mil@mail.mil)

Dr. Brian Richard\*\*  
Northern Illinois University  
[brichard@niu.edu](mailto:brichard@niu.edu)

\* Principle investigator  
\*\* Project advisor

**Keywords:** In-theater Extension, Remission, Location Quotient, National Guard, WIAS, Army Reserve

**ABSTRACT:** The in-theater human capital management program employed by the Army does not always match the small supply of certain military occupational specialties with the demand for them; a mismatch between the skills and location required to fill vacant jobs and the skills and geography of unemployed workers. For instance, some position fills are needed in Kuwait, but the skillset is located in Qatar, and neither knows about each other. Economists call this "structural unemployment imbalance." In simple terms, there is no Craigslist job bank, Monster.com, Kelly's Temporary Services, or Manpower system that matches the needs of the (Active Component) employer with a potential labor pool of qualified and interested National Guard and Reservists willing to stay on for additional tours. As a result, an informal networking system has evolved that is neither efficient nor nearly as effective as one that could be developed formally. The Location Quotient model used by economic development professionals can be adopted as a means of identifying a region's highest concentration of jobs available, and justify a means of keeping Soldiers in theater where they are already clustered. This model alone can construct a region's industrial specialization relative to a larger geographic unit (usually the nation).

The formula for computing location quotients:  
 $LQ = (e_i / e) / (E_i / E)$

Where:

$e_i$  = Local employment in industry  $i$

$e$  = Total local employment

$E_i$  = Reference area employment in industry  $i$

$E$  = Total reference area employment

Location Quotient quantifies the industry's – or military occupation specialty, in this case – concentration in the region compared to a larger geographic area. The private and public sectors use the LQ:

- To indicate the industries which give the regional economy its competitive advantage
- To recognize the industries within the region which are export-oriented
- To label emerging export industries which are importing new money into the regional economy
- To detect the exporters who are most likely to fail and endanger the region's economic base

Once corroborated, the LQ relates to the supply of human capital in theater, and gives the Army Service Component Command the flexibility and wherewithal to identify and resource the personnel requirements within its own ranks. This comes without the costly process of mobilizing and deploying an individual from the United States using the Worldwide Individual Augmentation System (WIAS) or the Tour of Duty system that advertises Active Duty tours for Reserve Component Soldiers.

# Operational Requirements Casualty Assessment (ORCA) Incapacitation Criteria Recommendation

[28 Oct 15, 1400-1430, Rm 15]

Shawn Roach  
Army Materiel Systems Analysis Activity  
[shawn.g.roach.civ@mail.mil](mailto:shawn.g.roach.civ@mail.mil)

**Keywords:** ORCA, S&K, Incapacitation, Weapon Lethality, Personnel Survivability, JMAE, Effectiveness

**ABSTRACT:** Sperazza and Kokinakas (S&K) dismounted personnel vulnerability methodology has been the Army standard for use in lethality and effectiveness analysis over the past 30 years. The development of ORCA by the U.S. Army Research Laboratory's Survivability, Lethality Analysis Directorate (ARL/SLAD), combined with SLAD's announcement that S&K will no longer be supported by ARL/SLAD, prompted the U.S. Army Materiel Systems Analysis Activity (AMSAA) to team with SLAD to develop suitable ORCA criteria to replace S&K as the new standard for Army studies. AMSAA conducted a personnel vulnerability analysis to identify differences in mission effectiveness between the SLAD-recommended ORCA criteria and the legacy S&K data. Complementing this analysis is a proof-of-principle study that evaluated a new higher-fidelity method for generating personnel vulnerability at the component vs. whole-body level. Based on the assessment results of the proposed ORCA vulnerability criteria and the higher-fidelity data generation method, a final recommendation will be made on the new ORCA personnel vulnerability data criteria standard to be used in all future Army studies. The presentation will contrast S&K and ORCA methodologies, include the new SLAD recommended ORCA criteria and latest results of the S&K – ORCA comparison, and describe the vulnerable area methodology to be evaluated in FY16.

## Professional Health and Welfare of the TRADOC CP-36 Community

[28 Oct 15, 1515-1545, Rm 15]

Dr. Jen Jebo  
TRADOC Analysis Center – Fort Lee  
[jennifer.l.jebo.civ@mail.mil](mailto:jennifer.l.jebo.civ@mail.mil)

Mr. Ken Brown  
TRADOC Analysis Center  
[kenneth.f.brown16.civ@mail.mil](mailto:kenneth.f.brown16.civ@mail.mil)

**Keywords:** Personnel, Professional Development, Survey

**ABSTRACT:** At the request of the Army's Training and Doctrine Command (TRADOC) Career Program (CP) Manager for the CP36 – Analysis, Modeling, and Simulation, the TRADOC Analysis Center conducted a survey of CP36 personnel in April/May 2015. The survey was designed to provide TRADOC leadership with an overview of the professional health and welfare of the CP36 workforce. The results will enable the CP36 community leadership to assess the needs of the community and effectively address these needs in the future. In addition to its focus on training and professional development, the survey also provided the CP36 community leadership with an overview of CP36 personnel's educational backgrounds, the types of tasks they routinely perform in their jobs, and their future career plans. Analysis of the survey results revealed that while most CP36 personnel indicated they are aware of professional development opportunities and have the support of their leadership to participate, many do not feel like they can take advantage of these opportunities because of job-specific demands. The survey results also demonstrated overlap in the tasks performed by different occupational series as a routine part of their job. Despite this overlap there was some disparity in the educational backgrounds of survey participants based on their occupational series.

# Aligning Officer Personnel Requirements with a Sustainable Career Lifecycle using Historical Continuation Rates

[28 Oct 15, 1615-1645, Rm 15]

MAJ Michael Needham  
Office of the Deputy Chief of Staff, G1,  
[michael.needham.mil@mail.mil](mailto:michael.needham.mil@mail.mil)

MAJ Brandon Thompson  
Office of the Deputy Chief of Staff, G1,  
[brandon.s.thompson2.mil@mail.mil](mailto:brandon.s.thompson2.mil@mail.mil)

**Keywords:** Force Structure, Personnel Modeling, Continuation Rate, Forecasting

**ABSTRACT:** The United States Army is at a critical juncture in determining a supportable military personnel structure that is limited by mandated end strengths throughout the Future Years Defense Program (FYDP). Grade creep over the past decade has necessitated recent efforts to drive the grade structure back down, but these efforts have only achieved partial success. Additional personnel structure adjustments must be made in order to drive near-term force-shaping personnel policies, such as accessions, promotions, and separations. Many of these structure adjustments must be forecasted prior to force management decisions by Army Senior Leaders. In addition, personnel analysts must align requirements by grade with a feasible inventory. Analysts must identify the sustainable standards of grade using historical continuation behavior while accounting for future personnel management policies. In order to properly align structure requirements for the Active Component (AC) Army Competitive Category (ACC), personnel analysts developed a steady state forecasting model that uses historical continuation rates. The model uses sixteen years of historical monthly continuation rates derived from the Total Army Personnel Database (TAPDB) as a foundation to forecast future continuation behavior. The model provides flexibility by allowing for changes to future Officer management policies such as accessions, promotions, and separations. A simulation is used to account for uncertainty in future officer behavior. The forecasted 30-year inventory is then used to recommend future personnel structure requirements. The results of this analysis are currently being used to drive Active Army Officer management decisions that will shape the future Active Army Officer Corps. This presentation discusses the iterative process used to align requirements with a feasible 30-year inventory based on continuation rate modeling.

# Installation Management Command (IMCOM) Manpower Requirements Analysis

[29 Oct 15, 0945-1015, Rm 15]

Mr. Mike Pannell  
Center for Army Analysis  
[micheal.v.pannell.civ@mail.mil](mailto:micheal.v.pannell.civ@mail.mil)

**Keywords:** IMCOM, Manpower Requirement, CLS, Regression

**ABSTRACT:** From 2014 to 2019 the Army end-strength will decrease, causing every major Army command and supporting organization to reevaluate priorities. Analytic efforts often use a macro-level, top-down approach to define future manning authorizations. The IMCOM Manpower Requirements Analysis (IMRA) uses a micro-level, bottom-up approach by focusing on the manpower requirements of specific tasks and then aggregating up to the command level. The intent of this analysis is not to define future manning authorizations, but instead, to define the relationship between IMCOM manpower requirements and the size of the active Army population.

IMCOM uses common levels of support (CLS) to define manpower requirements at the installation level. A critical component of this analysis is to distinguish which CLS services are dependent upon the size of the active Army. The analysis team gathered data to define the manpower requirement of each CLS service on every non-Joint, Continental United States (CONUS) installation. The team then developed a regression model to estimate each CLS service manpower requirement as a function of the size of the active Army.

## Concept Development and Integration Directorate (CDID) Manpower Modeling Initiative (MMI)

[29 Oct 15, 1015-1045, Rm 15]

Mr. Mark Schairbaum  
TRADOC Analysis Center – Fort Lee (TRAC-LEE)  
[mark.schairbaum.civ@mail.mil](mailto:mark.schairbaum.civ@mail.mil)

Ms. Anne Lester  
TRADOC Analysis Center – Fort Lee (TRAC-LEE)  
[anne.a.lester2.civ@mail.mil](mailto:anne.a.lester2.civ@mail.mil)

**Keywords:** Manpower management, manpower modeling, CDID, Center of Excellence, concept development, requirements, capabilities, integration, force modernization proponent

**ABSTRACT:** Financial pressures stemming from sequestration have led to Army leaders mandating arbitrary “salami slice” cuts to organizational requirements, in some cases without full consideration of the organization’s ability to execute core missions and functions. Within the US Army Training and Doctrine Command (TRADOC), the Sustainment Center of Excellence (SCoE) sought a manpower model that could quantify and estimate internal Concept Development and Integration Directorate (CDID) processes, as well as matrixed integration requirements within TRADOC. The SCoE approached TRAC with a unique challenge: to develop a core-function requirements-based manpower model to estimate capability development requirements. TRAC worked with subject matter experts including TRADOC G-8, US Army Manpower Analysis Agency (USAMAA), TRADOC Manpower Force Analysis Division (MFAD), Army Capabilities Integration Center (ARCIC), and SCoE CDID, to build a prototype CDID manpower model. Insights from this effort may aid further initiatives in manpower modeling across TRADOC. This presentation will provide an overview of the CDID Manpower modeling initiative, as well as modeling approaches, references, definitions, and lessons learned that may be of use to other Army manpower analysts.

**Army Small Arms Ammunition Configuration (SAAC) Study AMSAA Delivery  
Accuracy & Sensitivity Analysis**  
[29 Oct 15, 1045-1115, Rm 15]