1. **REPORT DATE (DD-MM-YYYY)**
   02-06-1999

2. **REPORT TYPE**
   Briefing

3. **DATES COVERED (FROM - TO)**
   xx-xx-1999 to xx-xx-1999

4. **TITLE AND SUBTITLE**
   LIA Rock Drill Laboratory
   Unclassified

5a. **CONTRACT NUMBER**

5b. **GRANT NUMBER**

5c. **PROGRAM ELEMENT NUMBER**

5d. **PROJECT NUMBER**

5e. **TASK NUMBER**

5f. **WORK UNIT NUMBER**

6. **AUTHOR(S)**

7. **PERFORMING ORGANIZATION NAME AND ADDRESS**
   U.S. Army Logistics Integration Agency
   5001 Eisenhower Ave.
   Alexandria, VA22333-0001

8. **PERFORMING ORGANIZATION REPORT NUMBER**

9. **SPONSORING/MONITORING AGENCY NAME AND ADDRESS**
   United States Department of Defense
   Defense Modeling and Simulation Office
   1901 N. Beauregard St., Suite 500
   Alexandria, VA22311-1705

10. **SPONSOR/MONITOR’S ACRONYM(S)**

11. **SPONSOR/MONITOR’S REPORT NUMBER(S)**

12. **DISTRIBUTION/AVAILABILITY STATEMENT**
    A PUBLIC RELEASE

13. **SUPPLEMENTARY NOTES**

14. **ABSTRACT**
    Provide a cost effective, non disruptive means of testing and experimenting with policy, procedures and technology insertion in a virtual environment i.e. Reengineering Lab

15. **SUBJECT TERMS**

16. **SECURITY CLASSIFICATION OF:**
    a. **REPORT** Unclassified
    b. **ABSTRACT** Unclassified
    c. **THIS PAGE** Unclassified

17. **LIMITATION OF ABSTRACT**
    Public Release

18. **NUMBER OF PAGES**
    15

19. **NAME OF RESPONSIBLE PERSON**
    Fenster, Lynn
    lfenster@dtic.mil

19b. **TELEPHONE NUMBER**
    International Area Code
    Area Code Telephone Number 703767-9007
    DSN 427-9007

---

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std Z39.18
Thank You!!

Rock Drill Lab Team

- John “Jack” Mellinger, LIA
- Len D’Amato, LIA
- Nancy Johnson, LIA
- Lorraine Johnson, LIA
- Fern Gaffey, LIA
- Rick Callahan, LIA
- Doug Korba, Innolog
- Chris Ogburn, Gensym

Outstanding Senior Leadership Support and Encouragement
Rock Drill
Visualization of Class IX supply process, materiel flow and financial interfaces

**IPRs**
- Demonstrated added mathematics to visualization and the “what if” capability
- Interim Credit Policy and SSF
- Class V and Depot Maintenance processes

**A cost effective, non disruptive means of doing BPR analyses**

**DCSLOG Guidance**
- Continue to work with PM-SSF and other staff to provide policy insights
- Continue working Class V and Depot Maintenance
- Continue to market capabilities
- Provide CD-ROM to trainers
LIA Rock Drill Laboratory Objectives

Provide a cost effective, non disruptive means of testing and experimenting with policy, procedures and technology insertion in a virtual environment i.e. Reengineering Lab

- Improve understanding of the existing process --possibly leading to immediate improvements
- Identify areas needing improvement (bottlenecks)
- Identify potential problems associated with implementing new policy, procedures and technology
- Identify potential efficiencies of new ideas in terms of cost / time

Creating capability
Not software to “sit on the shelf”
LIA Rock Drill Laboratory Approach

Reengineering Lab

Perform Experimentation and Assessments

Idea Generated Experience Lab Analysis Current Research Future Challenges

Problem Formulation Definition of Problem Objective (quantify a what if?/solve a problem) Identify Metrics Required

Validate Simulation Model Use Stakeholder Experts

Construct Simulation Model of the Process (Model Development) Code Process in G2/ReThink Identify Data Sources and Gather Data

Prototype the Process (Model Design) G2/Rethink Visualization Identify Data Required Stakeholder Experts Validate Prototype Identify Potential Issues

Develop “as is” base models Data links/warehouse
Proficiency in G2/ReThink Foundation Stakeholder functional expertise
Proficiency in process modeling and simulation
Modern Simulation Technology

- Gensym’s G2/ReThink software tool

- Design:
  - Provides an "electronic canvas" to do hands-on modeling
  - Quick graphical way to see processing task sequences and interdependencies.

- Discrete Event Simulation:
  - Measure the performance of existing & proposed business processes.
  - "What if" analysis - test re-engineering ideas before implementation -- Questions like:
    - "How will restructuring impact my cycle-time and stockage requirements?"
    - "How much will throughput increase if I add additional resources?"

- Process data:
  - Input data can be simulated or loaded from external files and databases so that historical process data can drive the models.
  - Output data can be captured and displayed as it’s developed or stored in external files for in depth analysis.
Verification & Validation

**Definitions**
- **Verification** - model operates as intended
- **Validation** - model is an acceptable representation of the “real world” system

**Approach**

<table>
<thead>
<tr>
<th>Verification</th>
<th>Validation</th>
</tr>
</thead>
<tbody>
<tr>
<td>- “Face validation” methodology: SMEs review the visualization of the process to determine if it represents the Army process</td>
<td>- “Historical data” methodology: comparing actual data with data produced by the model</td>
</tr>
<tr>
<td>- “Structured walk through” methodology: all members of the modeling team walk step-by-step through the computer program</td>
<td>- “Sensitivity Analysis” methodology: changing the values of inputs or parameters to determine whether the effect on the model’s output is reasonable and expected</td>
</tr>
</tbody>
</table>
Applications

Class IX
- Single Stock Fund
- Interim Credit Policy
- Low Dollar Value Excess Policy
- Root Causes of Excess
- Repair vs. Long Supply Pricing
- Affect of Apache PVS on AWCF

Class V
- Installation Ammunition Management System
- Just-In-Time Distribution
- Stock Reduction

Maintenance
- Depot Maintenance Planning Process
- Redundancies
- Depot Maintenance Parts Problems
- PMCS/5988-E
- National Maintenance Manager
Single Stock Fund Project

Re-engineer logistics and financial functions to give the Army:
- A Single Point of Sale
- A Single Credit System that is simple, needs based & gradually de-links credit from OPTEMPO
- An Integrated Requirements Determination System
- A National manager responsible for supply, maintenance & finance

Rock Drill Lab Objectives

• Develop and use credible, quantitative tools to test SSF business rules prior to and during field testing
• Facilitate common understanding of end-to-end “As Is” and “To Be” business processes
Single Stock Fund Project

• Accomplishments:
  - Developed & validated Forces Command (FORSCOM) “As Is” and “To Be” models and ran 1 years worth of data for Ft Campbell and Ft Stewart to test initial business rules and estimate
  - Developed & validated Training & Doctrine Command (TRADOC) models
  - Tailored models for Ft. Sill & Ft. Lewis
  - Developed visualization of the Army Material Command (AMC) model for Redstone Arsenal Support Activity

• To Do:
  - Execute model for SSF demonstration sites (Ft. Sill / Ft. Lewis / Redstone Arsenal Support Activity)
  - Incorporate features needed to test integrated requirements determination and integrated maintenance
Model Run Approach

Model Logic

Model Settings

Input Data

Model Run

Output
Class IX - “As Is” Requisition Flow
Class IX - Wholesale

IMMC - WHOLESALE

DAAC INCLUDES:
AMC, DLA, NAVY, USAF & USMC ICP’s

SMA-AMC-INPUT
“DAAS”
route to ICP
receive inte. CCSS
requests
“validate request”
“Data to Demand database”
“controlled item”

ITEM MGR renders decision.

spic
“execute release decision”

Obligate Inventory
“DVC’s”
“Order Process”
“Cancel/Adjust Substitute Process”

REQUEST TO DEPOT
“issue NRO to DEPOT”
“financial transactions occur 24 hours from MRC”

Analyze Inventory “ROP/FAP breached”
“Supply Control Study to Item MGR”
“Wholesale”

“WHOLESALE DIRECTED REPAIR PROCESS”

“repair or procure ?”
repair
yes
REPAIR
“Whole sale”

procure
yes
“WHOLESALE DIRECTED PROCUREMENT”

“Whole sale”

yes

FORECASTING “Forecasting”
report of excess
no
3.5%

“Material Returns Program”

“Cancel and Notify Customer”

“REQUEST or
REPORT of
EXCESS from
CLASS-IX”

“no replenishment action required”