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The work reported in this document was conducted under IDA’s Central Research Program. Its publication does not imply endorsement by the Department of Defense or any other Government Agency, nor should the contents be construed as reflecting the official position of any Government Agency.
Contingency Force Sizing

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PREFACE

This document is a briefing of the results of a study conducted under the IDA Central Research Program. This study determined, and assessed the impact of, the problems driving U.S. contingency force size, and assessed the value to the force of a reconnaissance/strike complex. The study identified four problems: inserting the force, defending against armored attack, defending against infiltration, and logistics. To assess their impact on force size, it drew upon the histories of previous operations, military literature, professional judgment, and the IDA-developed VFM combat model.

Dr. William Schultis, Dr. Victor Utgoff and Mr. John Tillson of IDA's Strategy, Forces and Resources Division reviewed the briefing, and the author presented it to the IDA Visiting Committee on June 9, 1992. The author would like to thank Ms. Erika Tildon and Ms. Barbara Fealy for their help in preparing this document.
OBJECTIVE

Assess the size of a contingency force required to seize and maintain a temporary foothold:

- in hostile territory
- against a numerically superior but militarily and technologically inferior regional opponent.

Assess the impact of a reconnaissance/strike complex (RSC) on contingency force size.
APPRAOCH

- Identify problems that affect the size and character of the contingency force.
- Assess their impact for force planning.

Problems

- Inserting the force
- Defending against armored attack
- Defending against infiltration
- Logistics
ARMOURED ATTACK

How large would a U.S. contingency force have to be to defeat an armored attack by a typical regional opponent?

Approach

- Modify the Variable Force Employment (VFM) combat model to simulate combat in an isolated circular foothold containing a strategic objective
- Simulate combat between a small, medium-weight U.S. contingency force and large, armored, but technologically and militarily inferior regional forces
Defense Against Armored Attack

Force Requirement

Regional Force (AFVEs)

North Korea

Libya

South Africa

Cuba

Iran

\( \frac{\text{D} \text{IVISIONS}}{\text{U.S. FORCE (AFVEs)}} \)
INFILTRATION

How large would a U.S. contingency force have to be to protect itself and its logistical infrastructure against infiltration?

Approach

• Look at historical examples of U.S. forces defending against infiltration—Marines around Da Nang Airbase, 1965-1971

• Draw upon military judgment regarding unit frontages and force densities required to limit enemy infiltration.
RESULTS OF INFILTRATION ASSESSMENT

Unit frontages
- Open terrain: 50 km per division
- Close terrain: 35 km per division

Security force coverage
- 190 km$^2$ per battalion, or 1500 km$^2$ per division
LOGISTICS

How much supply does the contingency force require, and how large must the foothold be to accommodate the force's logistical infrastructure?

Approach

- Look at historical examples of U.S. contingency operations and U.S. forces maintaining footholds—
  
  Desert Shield/Storm, August 1990-February 1991
  
  The Normandy buildup, June and July 1944.

- Consult Army planning factors regarding unit supply requirements and the sizes of logistical infrastructures.
LOGISTICAL REQUIREMENTS

Supply

- 24th Mechanized Div., Desert Storm: 4300 tons/day
- Medium-weight "contingency" division: 3000 tons/day
- Wing of tactical aircraft: 850 tons fuel/day, 850 tons ordnance/day

Logistical support areas

- VII Corps COSCOM, Desert Storm, and Heavy Corps Logistical Support Area plus Division Support Areas, Europe: 1600 km² per corps
- Normandy buildup—30,000 tons/day (~10 div) into 2800 km² of rear area: 860 km² per corps
- Medium-weight corps, scaled proportionally to supply requirements: 1150 km² per corps
INfiltration AND LOGISTICS—SIZING THE FORCE

Logistics defines the area required per division (D), or the minimum size of the foothold:

\[ r = 15 + (383D/\pi)^{1/2} \text{ km} \]

Infiltration defines the force required per perimeter length, or the maximum size of the foothold:

\[ r = 40D/2\pi \text{ km} \]

• Logistics and infiltration together set the minimum force size
Logistics and Infiltration
Minimum Force Size

![Graph showing the relationship between Foothold Radius (km) and Divisions for different terrains and force sizes.](image-url)
**FORCE WEIGHT**

<table>
<thead>
<tr>
<th>Division</th>
<th>Tons</th>
<th>Sorties to Lift</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armored</td>
<td>96,580</td>
<td>1062 C-141 + 787 C-5</td>
</tr>
<tr>
<td>Air Assault</td>
<td>32,547</td>
<td>1274 C-141 + 82 C-5</td>
</tr>
<tr>
<td>Contingency</td>
<td>30,000</td>
<td>835  C-141 + 107 C-5</td>
</tr>
<tr>
<td>Light Infantry</td>
<td>14,436</td>
<td>648  C-141 + 18 C-5</td>
</tr>
</tbody>
</table>

**TOTAL CONTINGENCY FORCE WEIGHT**

<table>
<thead>
<tr>
<th></th>
<th>Armored Attack</th>
<th>Infiltration</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current</strong></td>
<td>9 CD</td>
<td>5CD + 2LID</td>
<td>16 Div</td>
</tr>
<tr>
<td></td>
<td>7500 C-141 + 1000 C-5</td>
<td>5500 C-141 + 580 C-5</td>
<td>13,000 C-141 + 1600 C-5</td>
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<tr>
<td></td>
<td>60%</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td><strong>Future</strong></td>
<td>2CD</td>
<td>5CD + 2LID</td>
<td>9 Div</td>
</tr>
<tr>
<td></td>
<td>1700 C-141 + 210 C-5</td>
<td>5500 C-141 + 580 C-5</td>
<td>7200 C-141 + 790 C-5</td>
</tr>
<tr>
<td></td>
<td>25%</td>
<td>75%</td>
<td></td>
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</tbody>
</table>

**AIR TRANSPORT CAPACITY**

<table>
<thead>
<tr>
<th>Aircraft</th>
<th>Sorties Per Day</th>
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<tbody>
<tr>
<td>250 C-141</td>
<td>1/2 to 1</td>
</tr>
<tr>
<td>115 C-5</td>
<td></td>
</tr>
<tr>
<td>406 CRAF</td>
<td></td>
</tr>
<tr>
<td>210 C-17</td>
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</tr>
</tbody>
</table>

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SUMMARY

The reconnaissance strike complex can significantly reduce the armored threat to the contingency force.

However, infiltration and logistics still keep the minimum force level relatively high.

Addressing the infiltration problem appears to be the most effective way of reducing the force size.
POTENTIAL CONTINGENCY FORCE STUDIES

Advanced Anti-Infiltration Technologies

- Reconnaissance/strike complex for infiltrators
- Netted, remotely deployable, personnel-detecting sensors
- Operational techniques

Hardening the Contingency Force Logistical Infrastructure

Contingency Force Rapid Resupply
Effects of Air and ACM

Force Requirement

U.S. Force (AFVEs)

Regional Force (AFVEs)