D.1.0 APPENDIX D - SEARCH AND RESCUE/COMBAT SEARCH AND RESCUE MISSION AREAS, DESCRIPTION OF CURRENT SYSTEM/SITUATION

The Search and Rescue (SAR)/Combat Search and Rescue (CSAR) Mission Elements are addressed in this appendix. SAR and CSAR mission include the Tactical Recovery of Aircraft and Personnel (TRAP) and Non-combatant Evacuation Operations (NEO).

The following sections discuss the current mission planning process, deficiencies and limitations, and concepts for a new or modified approach for these mission elements.

D.1.1 SAR

The only automated mission planning system supporting SAR mission planning is the datum calculating decision aid available in the Meteorological and Oceanographic (METOC) departments of aircraft carriers (CVs) and large deck amphibious SAR capable platforms. Other surface assets do possess this organic decision aid. Manual datum calculation is currently accomplished with hard copy nomographs. SAR missions vary from the immediate man overboard to those with varying degrees of time line. Computation of the datum is the critical item of planning data needed for this mission. The specific elements of the SAR mission planning process is supported by NWP 3-50.1-SAR Manual and NWP 3-50.2 SAR Tactical Aid (TACAID). Based upon the use of the SAR Manual and SAR TACAID, the Rescue Coordination Team will request datum information from METOC or compute it manually. Additionally, data from the SAR satellite system is used in the computation of the datum.

D.1.2 CSAR

The mission commander should hold a Mission Orientation (brief for all crewmembers prior to beginning the planning cycle. This brief orients the crews to the mission, friendly and enemy strengths and weaknesses, terrain, and weather. At the end of the brief the Mission Commander should establish a time line and assign detailed planning responsibilities. Intelligence and weather briefs should be held. The planning phase now begins; first gather required planning data, then complete assigned tasks. Elements of the CSAR planning process are delineated in NWP 3-03.4 (formerly NSAWC TACMEMO). The following are the Required Planning Data and the Essential Planning Tasks checklists.

D.1.2.1 Required Planning Data

D.1.2.1.1 Assets Required

Aircraft See NWP 3-03.4.

D.1.2.1.2 Capability and Performance Difference Between CSAR Package Aircraft

- Navigation equipment
- Communications (secure/non-secure/phase, key-mat compatibility) critical item for joint operations Link

- Airspeed (cruise/dash) Non-combatant Evacuation Operation (NEO), Night Vision Device (NVD) Low/High Light, Max Endurance
- Altitude - max Density Altitude (DA), Hover In Ground Effect (HIGE)/Hover Out Of Ground Effect (HOGE) en-route Landing Zone (LZ)/Forward Arming and Refueling Point (FARP)
- Fuel (combat radius/endurance, joker, bingo)
- Night Vision Goggles (NVG) - lighting configuration, spotlight
- LZ requirements (size, slope, suitability, elevation, power required, power available, approach/departure, wave-off, egress route, will all aircraft fit?)
- Armament (weapons, load-out, envelope ranges, employment doctrine, Rules of Engagement-ROE)

D.1.2.1.3 Departure Data

- Airfield (normal traffic, Notice to Airmen (NOTAMS), maintenance availability, services, chokepoints, delays)
- Ship (deck space, launch/recovery cycle, servicing, NVG compatibility, communications, visual aids, launch/landing limits)
- Unprepared field

D.1.2.1.4 Ingress/Egress Data

- Maps/charts
- Photos/imagery
- En-route weather
- Computer products from onboard tactical/mission data processors
- Intelligence, threats (known and pop-up)
- Hazards
- LZ/primary & alternates (actual conditions)
- Airspace control
  - Forward Line of Own Troops (FLOT)/Forward Edge of the Battle Area (FEBA)
  - Fire Support Coordination Line (FSCL)/Coordinated Fire Line (CFL)/Restrictive Fire Line (RFL)/phase lines
  - Fire Areas (free/restricted/no)

D.1.2.1.5 Objective/Terminal Area

- LZ/primary & alternates (actual conditions)
- Timing/sequence desired Time On Top (TOT)
- Final authentication/localization

D.1.2.1.6 Return to Forces Procedures

D.1.2.2 Essential Planning Tasks

D.1.2.2.1 Communications Plan

- Command
- Operational
- Air-to-Air
- Secondaries/Backups, Very-High Frequency (VHF)/Ultra-high Frequency (UHF), Secure
- No Radio (NORDO)
- Mandatory calls (execution checklist)
- Call signs
- Fire support
- Identification Friend or Foe (IFF)/Selective Identification Feature (SIF) Procedures
- Authentication procedures/materials
- Chattermark procedures
- Emission Control (EMCON) Plan (departure/en-route/arrival)

D1.2.2.2 Threat Analysis

Prior to planning the route, a comprehensive threat analysis must be developed for the mission area. Intelligence specialists from both helicopter and fixed-wing squadrons should cover all community specific threats for the mission area. Surface-to-air threats should be degraded for aircraft specific mission altitudes. A comparison of these weapon specific threat envelopes provides a quick mission no-go assessment and sets the stage for effective route planning. Next, an in-depth terrain study to determine direct and indirect masking for both fixed- and rotary-wing aircraft should be completed. These first two studies will define mission threat level and go-no-go criteria.

D.1.2.2.3 Route Planning

If the “go” call is made, the next step is to determine the best ingress/egress routes.. “Spider Points,” are geographic locations allowing numerous avenues of approach to the survivor while minimizing threat exposure. See current theater Special Instructions (SPINS) for spider point information. Normally, two to three routes are desired, labeled or color coded for quick reference. All routes should be acceptable to the helicopter pilots with regard to survivability and aircraft performance. Spider points allow for route modification or the combination of two or more routes to allow for a safe ingress and egress contingency plan. Considerations include the following.

- Airspeeds
- Altitudes

- Ensure one hostile system cannot shut down multiple routes
- Dedicate timeline “push” points/EMCON planning

D.1.2.2.4 Formation Requirements

- Communication (comm)/lost comm procedures
- Lightning
- Inadvertent Instrument Meteorological Conditions (IMC) breakup/linkup
- Lost contact breakup/linkup
- Scatter Plan
- Downed aircraft
- Magellean/navigation system failure procedures

D.1.2.2.5 Escort Procedures

Regardless of which route selection is used, the Escorts should allow the rescue platforms to navigate their own way to the maximum extent possible. Return to Military Control (RMC) is absolute go-no-go “veto” authority; however, helicopter should be allowed more freedom in the pickup zone (to make hazard calls in the clear, call for smoke/chemlight/mirror, etc.).

a. Establish maximum time to nose-on-zone for each phase of flight
b. Clear EMCON visual signals doctrines
c. In-Flight Refueling - For capable aircraft
    1. Air Refueling Initial Point (ARIP)/Rendezvous Point (RZ)/Alternate
    2. Air Refueling Control Point (ARCP)/Alternate
    3. Altitude
    4. Airspeed
    5. EARP
    6. Comm/RZ Procedures
    d. FARP Procedures
        1. Location, fuel and time required
        2. Join-up/rendezvous procedures
    e. Abort/Divert
        1. Missed refueling
        2. Emergency divert
        3. Weather penetration abort
    f. Rules of Engagement en route
        1. Combat Air Patrol (CAP)
            a.) Commit authority
            b.) Beyond Visual Range (BVR) zones
        2. Close Air Support (CAS)
            a.) Weapons selection, safe envelopes, Nose-on-target time

b.) Defensive suppression procedures

c.) Evasion and Escape (E&E) (suppression procedures/communication)

2. Self-protection

a.) Weapons status Free/Tight/Hold changeover points

b.) Acceptable ammo depletion

c.) Defensive fire procedures

g. Emergency
1. Aircraft Emergency Abort/Continue/Ditch Plan
2. Downed aircraft enroute/LZ/Return to Base (RTB)
3. Disabled aircraft
4. Medical Evacuation (MEDEVAC)
5. Lame duck plan

h. LZ Procedures
2. Aircraft lighting
3. LZ lighting
4. On-load Procedures
5. Communications
   a) EMCON
   b) Secure
   c) Clear
   d) Emergency
   e) Authentication
2. Go-around procedures
3. Rules of Engagement Cold/Hot LZ
   a) CAS
      1) Weapons selection/safe envelope/nose on target time
      2) Suppressive Fire Support Procedure
   b) Self-Protection
      1) Weapons Status
      2) Weapons coverage/landing diagram
      3) Ammo conservation
2. Survivor Authentication Procedures
   a) Authentication prior to LZ
      1) EMCON/Radio
   b) Aircrew authentication procedures

2. Enemy locations/most likely direction of threat

D.1.2.2.6 Admin Tasks/Timeline Considerations – Preflight Actions

- Installation Requirements: Weapons/comm gear/Infrared Counter-Measures (IRCM)/Chaff/Flares/etc. and fuel tanks
- Pre-checks
- Navigation (NAV) system load
- Key-lists
- Aircrew sanitation
- E&E plan
- Aircraft destruct plan
- MEDEVAC Plan
- Aircraft Emergency Abort/Continue/Ditch Criteria
- Tactical Deception Plan
- Nuclear, Biological, Chemical (NBC) Plan

D.1.2.2.7 On-load/Departure Plan

- Headcount Procedures
- Clearance start/taxi
- Taxi sequence/separation
- Takeoff sequence/separation
- Bump plan (equipment/personnel)

D.1.3 TRAP

During TRAP planning, a Trap zone map should be developed that will graphically portray known or suspected enemy air defense weapons and radars, engagement envelopes, and current EOB (air, ground, naval, EW) information. Using this TRAP zone map, TRAP planners are be able to develop minimum risk routes (MRR) or spider routes throughout the enemy-held territory that will allow TRAP forces to circumnavigate potential threats while executing their mission. Utilizing these preplanned MRRs will expedite final mission planning as the TRAP planners and aircrews need only to plan for a navigation segment off the MRR at the survivors' location.

Current intelligence plays a vital role in the planning and conduct of all TRAP operations. The enemy threat will have the greatest impact on search criteria and the method of recovery to be used. As each TRAP incident develops, TRAP planners must continually update their intelligence data to determine if changes in TRAP plans or ongoing TRAP operations are required. Specific essential elements of information (EEI) required to plan and conduct TRAP missions include the following:

- Enemy policy, practices, and intentions

- Location, strength, capabilities, and activities of enemy units that could affect TRAP operations in the objective area, adjacent areas, and along lines of communications and infiltration and exfiltration routes
- Identification and capabilities of enemy early warning systems
- Location, capabilities of enemy early warning systems
- Current enemy air order of battle, ground order of battle, naval order of battle
- The attitude of the local populace toward isolated enemy personnel
- A current list of all selected areas for evasion, contact points, identification, codes, and designated HLZs in the objective area
- Climate and weather information
- Astronomical conditions
- Terrain information and analysis

Current intelligence information and a thorough threat analysis are essential to determining the appropriate TRAP asset to use and if recovery is possible or not.

Thorough preparation, including exhaustive navigation planning and threat analysis is the key to success.

Single unit recovery is the preferred method on recovery, but terrain and enemy activity may dictate using the trap task force (TTF method) in which case coordination with multiple platforms is required.

D.1.4 NEO

NEOs are conducted for the purpose of evacuating civilian noncombatants from locations in a foreign (host) country that are faced with the threat of hostile or potentially hostile actions. NEOs will normally be conducted to evacuate U.S. citizens whose lives are in danger, but may also include the evacuation of U.S. military personnel, citizens of the host country, and third-country nationals friendly to the United States.

A fundamental characteristic of a NEO, and one factor that makes it very different form other military operations, is who is actually in charge on site. By executive order, the Department of State (DOS) is responsible for the protections and evacuation of American citizens and nationals abroad and for safeguarding their property. The DOD, on the other hand, is charged with advising and assisting the DOS in preparing and implementing plans for the evacuation. In other words, DOS is in charge, not DOD. Planners must keep in mind that the Ambassador and staff will have significant impact on the conduct of the evacuation.

The key to a successful NEO is the Forward Command Element (FCE). The size and composition will depend on the specifics of the operation. Insertion of the FCE in-country may be accomplished months prior or hours prior to the evacuation.

The NEO will characteristically involve a limited military objective, rapid insertion, holding an evacuation site using minimal forces only long enough to safely evacuate noncombatants, and

follow by a rapid but orderly withdrawal. Accountability and correct reporting is critical in all phases of the operation.

Because of the politically sensitive nature of the NEO, command and control will remain at the highest level possible.

Expect the DOS to be actively involved in the NEO and to retain some form of evacuation control.

D.2.0 JUSTIFICATION FOR AND NATURE OF CHANGES

The lack of a timely, tailored mission planning product for each community, to include time, distance, heading, unclassified threat weapons launch envelopes or areas based upon target location, Global Positioning System (GPS) and aircraft mission data loading capability and certified fuel planning information. In addition, current mission planning systems cannot support/provide:

a. Serpentine (curvilinear) routes drawing tool
b. Map scanning and ability to import other imagery
c. Ability to use non-National Imagery and Mapping Agency (NIMA) products, oceanographic bottom topography, products describing location of submerged hulls/wrecks
d. Take-off, en-route, and landing data (TOLD)/weight and balance/load comp calculator. Note: aircraft may land in a LZ and on or offload troops
e. Hover Delay computing function
f. LZ delay computing function
g. Terrain flight profile characteristics
h. Manual Chart Update Manual (CHUM) depiction, more symbols and capabilities are required to allow improved hazard identification and avoidance
i. Moving Map needs flight plan data as well as steering cues based upon GPS data
j. Ability to use products that differentiate useable and useable water space for Anti-Submarine Warfare (ASW) targets based upon probability of detection
k. Fire support measures management & deconflict multiple routes, assault waves, and phases for concurrent operations
l. FARP operations
m. Mission planning folders with templates of generic and specific mission profiles (ASW the system should have ability to employ templates for sonobuoy and sensor patterns)
n. Air drop capability
o. Certified stores planning and weaponeering capability integrated weapon systems mission planning, allowing for simultaneous aircraft and weapon systems mission planning
p. Accurately reflect the store load-outs
q. Allow users to override stores restrictions due to operational necessity
r. Incorporate default computed solutions

s. In TDA, eliminate all solutions containing unauthorized weapons configurations, and develop an indicator of time required calculations
t. Incorporate embedded computer based training to MCM 3-1 threat data
u. Auto-routing
v. Ability to indicate to the user when GPS goes off line
w. Embedded acoustic and laser predictions
x. Hellfire octal code selection
y. Hellfire remote designator constraint cones

D.3.0 CONCEPT FOR A NEW OR A MODIFIED SYSTEM

A mission planning system should improve mission effectiveness and reduce planning time. Current doctrine allows for 6 to 10 hours for planning. Reducing this to less than 5 hours for a strike force mission would significantly improve mission effectives simply by reducing aircrew fatigue. Providing a unified dynamic mission rehearsal capability showing all participants on their respective profiles to and from the target would allow planners to resolve potential routing, tanking, and time-line conflicts. The system should include indigenous weaponeering support, including hazard identification with input to the rehearsal capability. Platform mission rehearsal should include the display of shoot cues and weapon flight profiles to fixed targets, and allow for automated display of the frag bubble over friendly aircraft/surface units/ground forces. This end to end rehearsal capability should also highlight hazards to the user that are due to platform performance limitations. Note the COTS Flight Simulator 98 product is a good example of this capability.

The planning product should be exportable to platform specific mission computers, including kneeboard type portable displays. The flexibility to change kneeboard formats in order to meet personal/individual/unit level desires is required, and should include:

- The ability to develop user defined kneeboard cards
- Takeoff performance calculations for both shore and shipboard operations.
- Ready reference to all Naval Air Training and Operating Procedures Standardization (NATOPS) performance charts and limitations with user/Data Base Administrator (DBA) revision capability for incorporation of new NATOPS changes.
- User selected actual engine performance values, specifically engine torque factor (ETF) used to calculate actual engine performance.
- Automated datum calculation as discussed in D1. From notification until the system provides the automated datum calculation for current time and expected time on top of the survivor is desired to be no more than 15 minutes.

The system should also be able to exclude water search area based upon minimum water depth constraints, provide automated access to appropriate environmental predictions, and the ability to select multiple mission specific search reference points for coordinated operations.

For NEO operations, automated access to GPLAT/vessels/target imagery is required.