Chapter 2 – THE OPERATIONAL CONTENT

2.1 BASIC DEFINITIONS

In order to develop common terminology and taxonomy, RTG SAS-045 has reviewed NATO glossary and STANAGs and studied NATO practices in the defined helicopter setting. Thus it has been decided that the following definitions would be adopted in the conduct of this research.

Helicopter missions to be covered in this research will focus on transportation functionality to be provided during military combat service support missions, peace support operations, humanitarian missions and disaster relief operations. Combat service support missions are defined in AC/243 TP/8[1].

Disaster is an unforeseen and often sudden event that causes great damage, destruction and human suffering. Though often caused by nature, disasters can have human origins. Disaster causes can be earthquake, hurricane, tornado, volcanic eruptions, fire, flood, blizzard, drought, chemical spill, nuclear accident, etc. Wars, civil disturbances or civil wars that destroy homelands and displace people are also included among the causes of disasters.

Disaster relief operations are conducted to relieve human sufferings, especially in circumstances where responsible authorities in the affected area are unable or unwilling to provide adequate service support to the population. It may be necessary to execute these in the context of a peace support, or as a completely independent mission. Disaster relief operations are included within the class of humanitarian missions. They are conducted in emergency situations to prevent loss of life and property providing emergency relief to victims of natural or man made disasters in response to host government request for immediate help in both non-hostile and conflict containing environment.

Although various decisions are made by the decision makers faced with such an issue, this research is limited to proposing alternative solutions for operational and tactical decisions as defined below.

Operational management is concerned with the operational decisions and tasking of a particular mission. The main aim is to allocate helicopter capacity and to identify the fleet and crew composition for a given mission assuming that the deployment plan of participating nations is known. The allocation and transportation of logistic assets and supplies (for example, transport resources, vehicles, weapons, ammunition, fuel supplies, stocks of spare parts, medical material, non-perishable food and shelter) to the operation sites is determined. Moreover, the restrictions prevailing in the air space control and management are taken into account in the process of determining the sorties for each helicopter.

Tactical management addresses the planning and re-planning of detailed flight routing, re-fuelling and transportation plans to execute the mission. Here, detailed routing plans are developed by taking into account helicopter technical specifications (mobility, flexible payload, vulnerability, life cycle cost, etc.), environmental and atmospheric conditions as well as day/night-time considerations and threat levels. The dynamic crew scheduling to helicopters is also incorporated into the mathematical models so that routing and crew scheduling decisions will be made concurrently in order to improve the quality of the solutions.

[1] Technical Proceedings of NATO Helicopter Symposium, December 1995, The Hague, The Netherlands.

The following assumptions that determine the operational context, environment, desired capability, and scope are taken into account in the development of the proposed DST.

a) An emergency event has occurred in a known area.

b) NATO has realized the mission and decided to respond to the mission, given the basic information:

- Number of operational bases is known by the decision-makers.
- Reliable information is available about helicopters, crew, logistics (facilities, fuel, etc.) (Nations declared these numbers to NATO during the Defence Planning Cycle with Defence Planning Questionnaires) (Time = 0).
- Some embarkation and debarkation nodes for traffic control, maintenance, refuelling, etc., are known at time 0 and there might be additional nodes that might arise at time t. The set of nodes can be updated dynamically and the database associated with a node identifies its type and provides the required information about it.

c) NATO planners estimate the real time requirements based upon the above data.

d) NATO may request more helicopters from nations if it is needed. Whenever there is a change in the availability of helicopters, it will be updated by the operator using the DST.

e) The requesting body within NATO will generate the needed NATO Request for Air Transport Format (NARAT).

f) The Air Transport approving authority as the decision maker will receive transport request in the form of a NARAT. The data of the NARAT will be the input for the DST. A suitable solution is calculated by the DST and allows the decision maker to choose tasks to be executed from a complete list. Thus at the time of replanning, the DM will define the current status of already defined tasks and will choose new tasks and define the workload involved in each task.

g) The DST will generate a solution for a certain time period. (The estimated remaining duration of the mission on a daily basis) and display it in the form of TRANSAR (Transportation for Airlift Response). Whenever there is a change in anyone of the system parameters, the replanning will be done on a regenerative basis with the updated databases.

Both disaster relief and military operations pose quick response situations where time is the key limiting factor and helicopter moves should be planned and conducted very rapidly. Thus, the speed in generating good solutions on a quasi real time basis affects the overall performance of helicopter operations. Since the speed of generating solutions depends upon accessibility to reliable information, a computer-based DST requires the integration of physically distributed databases available in NATO, and interoperability is needed to meet the standardization issue in such a context.

2.2 MILITARY AND HUMANITARIAN MISSION TYPES, TASKS AND FUNCTIONS

A three level taxonomy is used for missions. At the top level, there are different missions which may have different tasks and tasks may include certain functions.

a) Helicopter Mission Types:

1) Military Combat Service Support Mission;

2) Peace Support Operations;
3) Humanitarian Missions; and
4) Disaster Relief Operations (Natural Disasters, Man Made Disasters, Technological Disasters, Sabotage, Man Made Accidents, Terrorism).

b) Helicopter Tasks:

5) Transportation Tasks:
   - Transportation of human beings, equipment and material;
   - Evacuation of sick, wounded and irradiated people; and
   - Evacuation of possessions and live stocks.

6) Support Tasks:
   - Area reconnaissance (e.g. area photography);
   - Identification of radioactive contamination;
   - Engineering reconnaissance;
   - Protection of command and control systems;
   - Area security; and
   - Observation to detect and report suspicious movement.

7) Special Tasks:
   - Assembling;
   - Launching of floating devices;
   - Mining and mine clearing;
   - Search and rescue from disasters; and
   - Command and control.

NATO decision makers, crisis management centers, and military forces are the key users of DST. There might be multiple decision makers from different organizations within the scope of a given mission. One can classify the crisis situations according to the taxonomy given in Figure 2.1 and Figure 2.2.

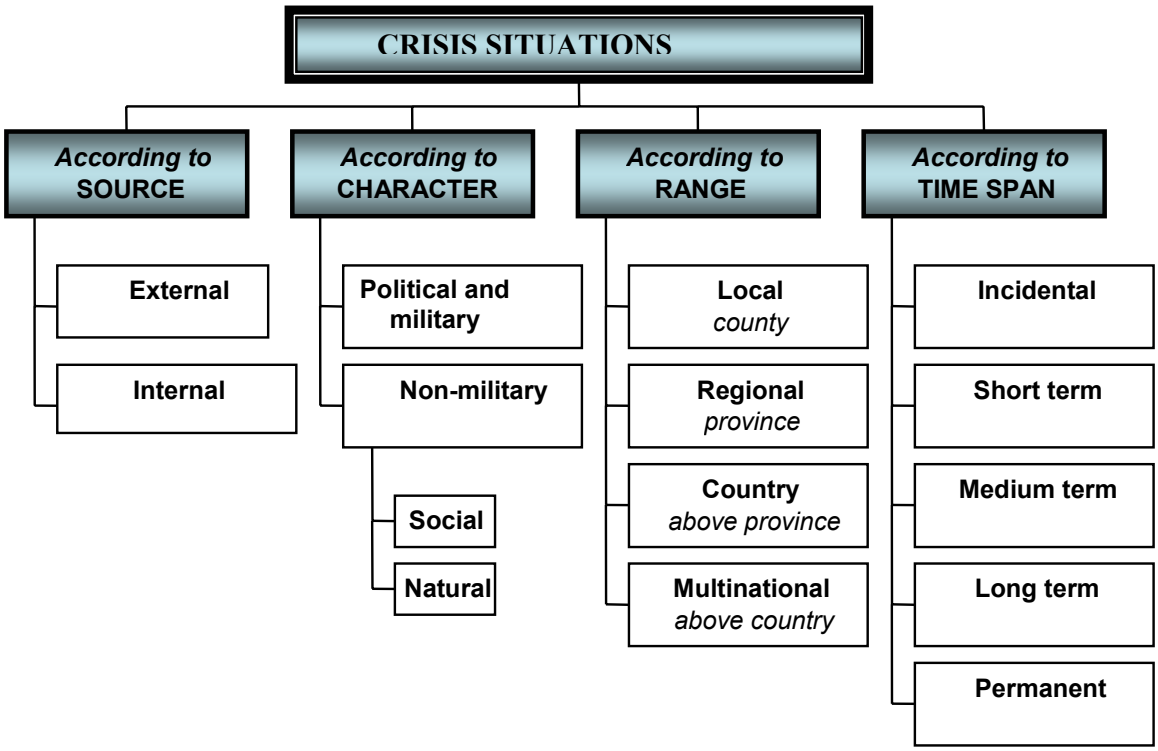


Figure 2.1: Taxonomy for Crisis Situations – 1.

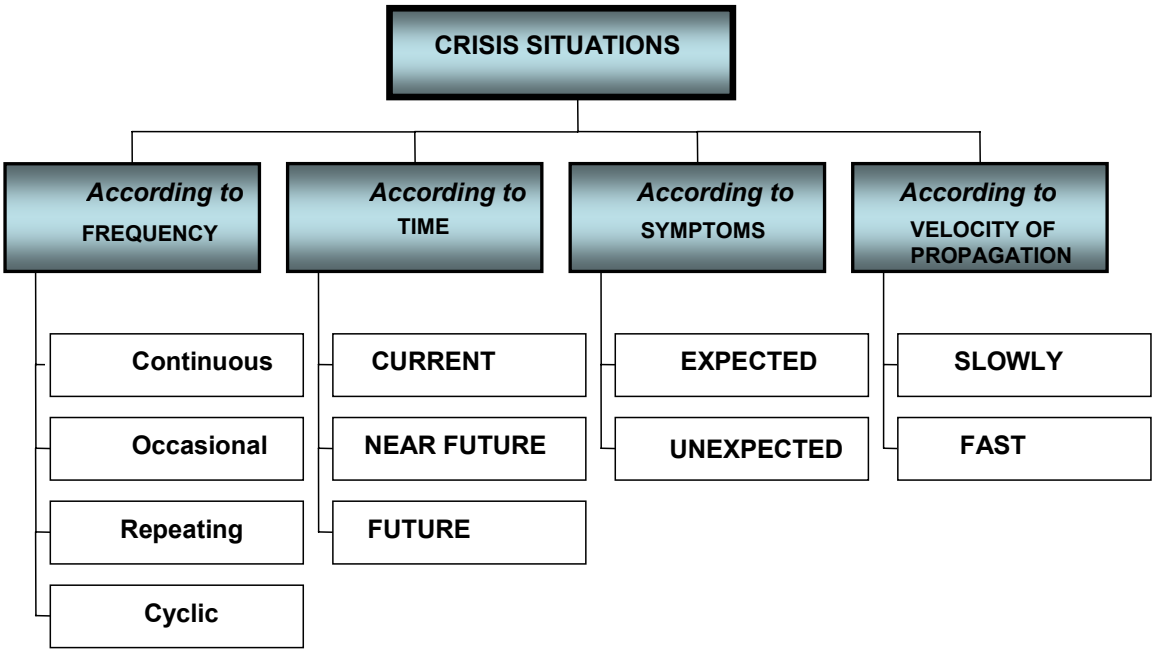


Figure 2.2: Taxonomy for Crisis Situations – 2.

2.3 DECISION-MAKING FRAMEWORKS

Two different decision making frameworks are defined for military operations and disaster relief management. Hierarchical levels, organizational structure and control over aviation units are taken into account, while developing the framework for military operations depicted in Figure 2.3.

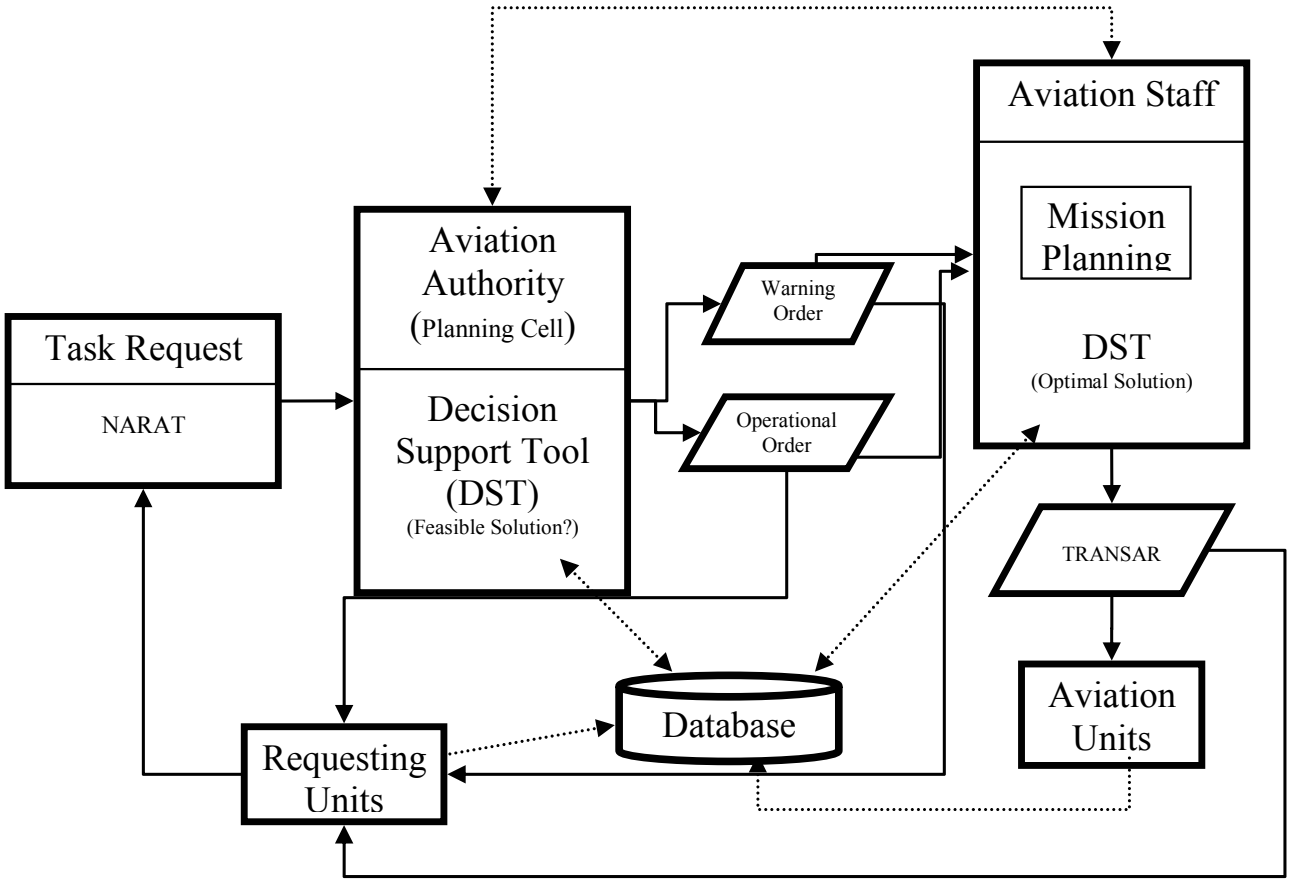


Figure 2.3: Decision-Making Framework for Military Operations.

To carry out the planning activity needed for the case described in Section 2.1, a common database is to be populated with adequate data from different sources. The aviation authority and aviation staff practice the full control of the database in order to keep it up to date. Air transport requesting and aviation units are expected to provide relevant data in order to facilitate the update of database. A unit is not permitted to edit data in database. The following information in databases is to be updated as needed on a real time basis:

a) Helicopters;

b) Crews;

c) Nodes;

d) Tasks (priority, urgency time window, reaction time);

e) Environmental Conditions:

- Air space control; and
- Weather conditions.

f) Other Resources.

Crisis management center (CMC) is to control all available helicopters for effective and timely response. Thus, CMC directly assigns both civilian and military aviation units to the tasks according to our proposed decision-making framework for crisis management. The framework is shown in Figure 2.4. Coordination between military and civilian aviation units is performed by CMC, which controls the database and aviation units provide updated date for central database.

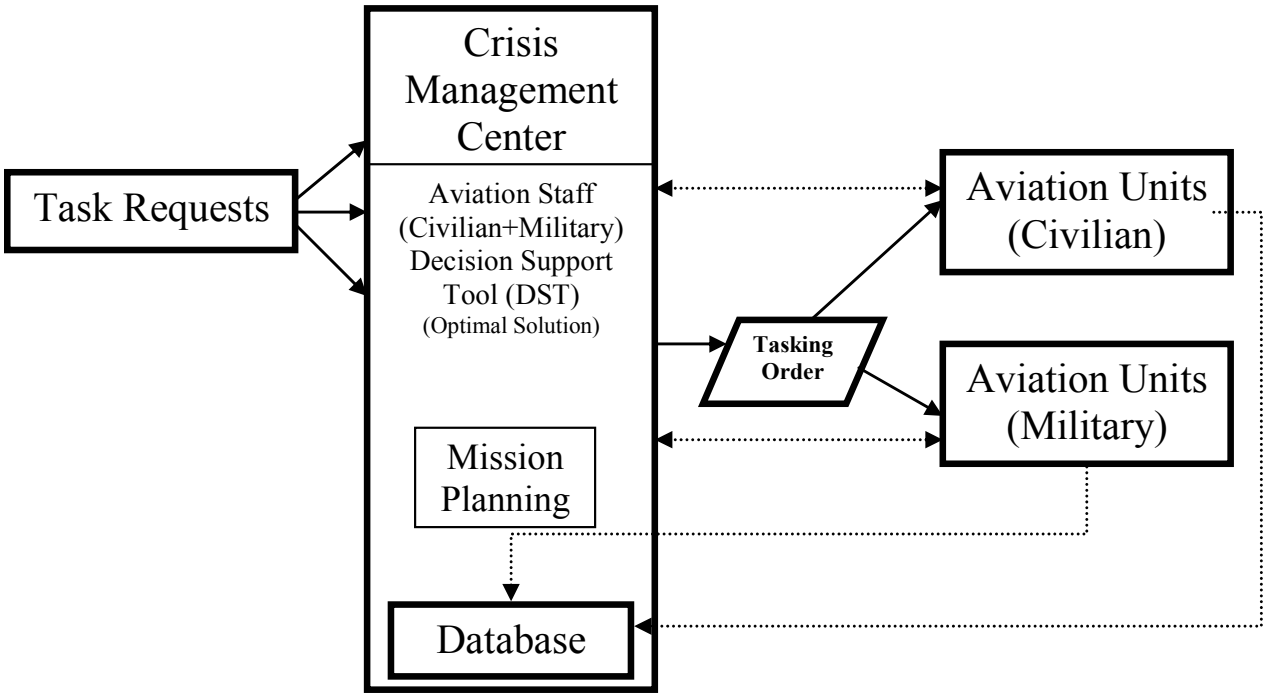


Figure 2.4: Decision-Making Framework for Crisis Management.

Mission planning is done for a certain period of time as long as no high priority task request received. When a high priority task is received or planning period is up, a replanning of missions is carried out for the tasks with no tasking order. If a tasking order is issued for a task, the task is assumed to be performed. Replanning in military operations is carried out by the aviation staff according to the operational orders issued by the aviation authority.

ATP-53(A) describes the responsibilities and procedures for implementing the policies for air transport coordination and cooperation between NATO and nations. Airlift elements and channels for communication in NATO and request-tasking channels for NATO are shown in Figure 2.5 and Figure 2.6. ACE Mobility Coordination Center (AMCC) may function as the aviation authority and JMCC and CECC may function as the aviation staff in proposed military decision making framework.

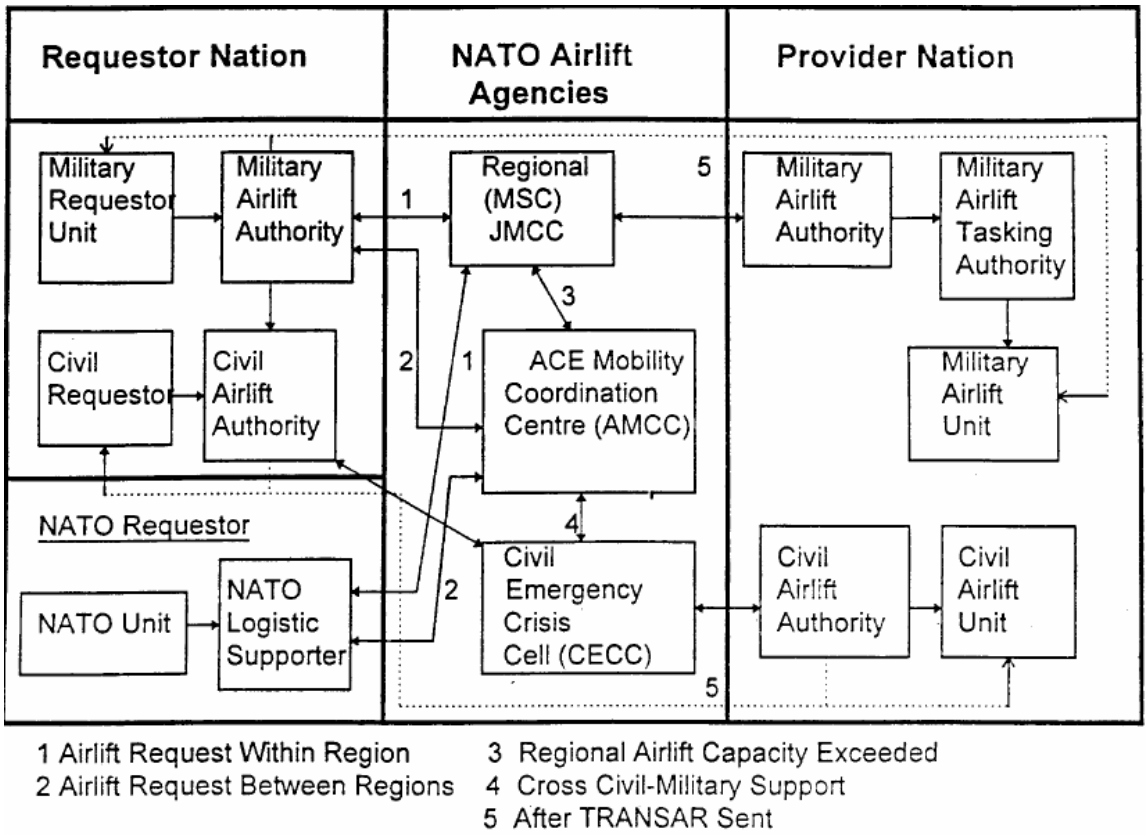
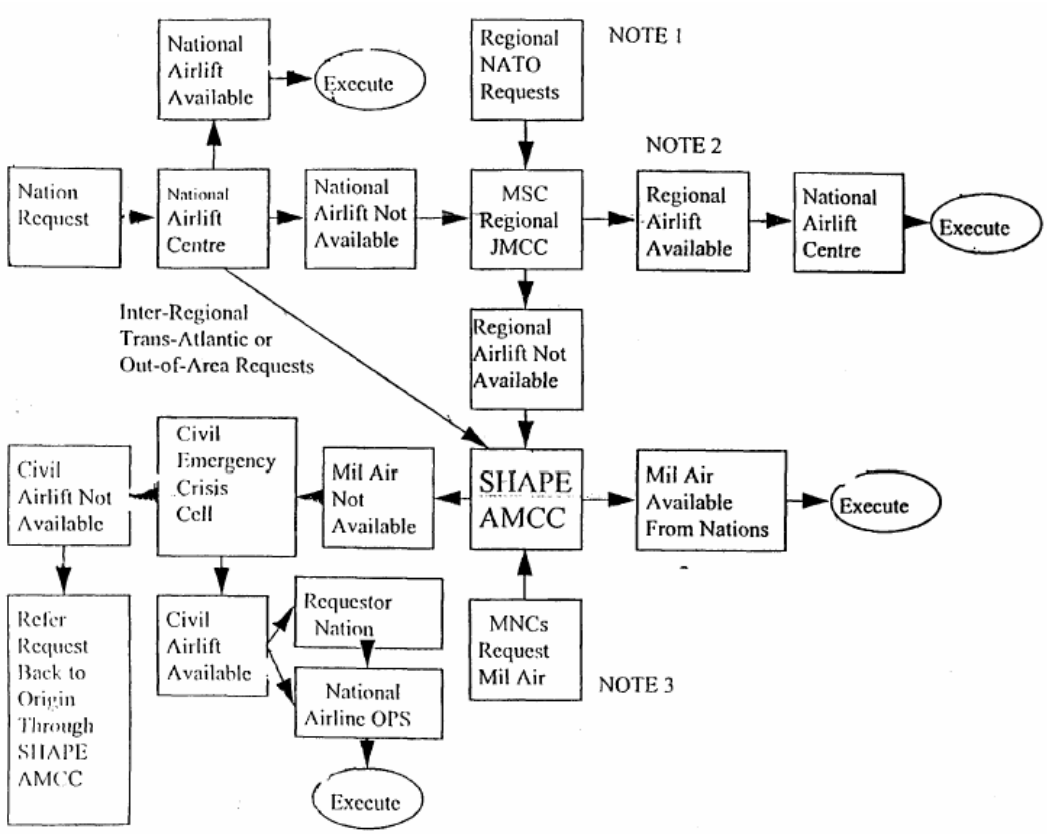


Figure 2.5: Airlift Elements and Channels for Com. in NATO (Source:ATP-53(A)).



Note 1: NATO request to be submitted when national airlift not available /appropriate. NATO agencies such as NAMSA and NATO forces such as NAEW assigned or operating within a region will use this channel.

Note 2: MSCs will consider U.S. airlift forces in their region and made available to the alliance by the U.S. CINCEUR as regional resources, and will request support directly from the regional ARC. NEC requests will be routed to the U.S. ARC.

Note 3: SACEUR may generate airlift requirements and as NATO Executive Agent for airlift will receive airlift requests directly from supported MNCs (SACLANT).

Figure 2.6: Request – Tasking Channels for NATO (Source: ATP-53(A)).