Improving the Prospects for Future International Peace Operations: Workshop Proceedings

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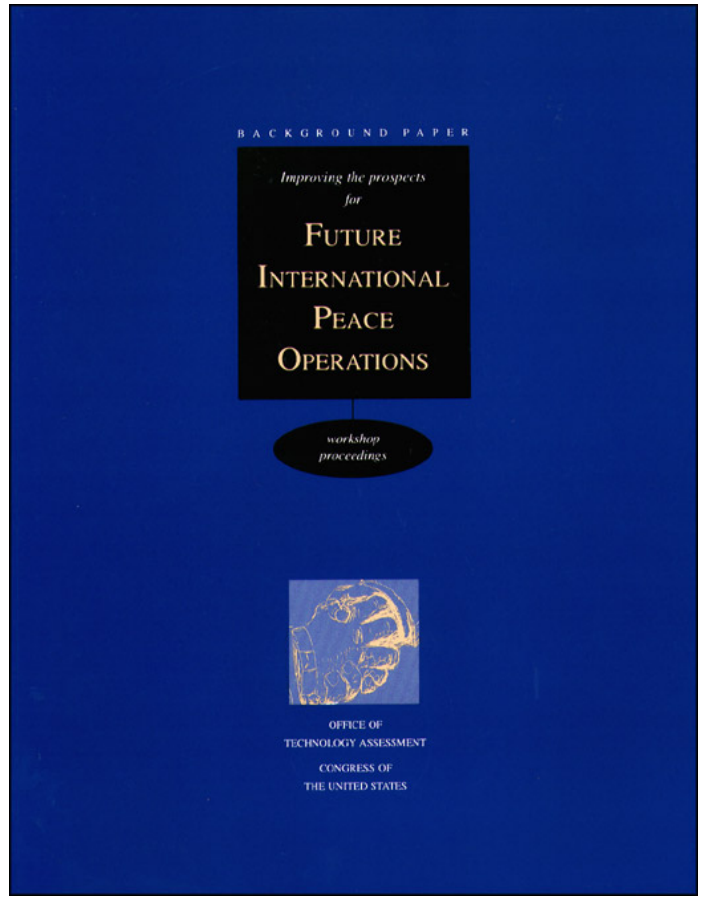

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Foreword

The years following the collapse of the Soviet Union and the consequent end of the Cold War have seen a rapid expansion in both the number and scope of international peace operations. Most of these endeavors have been carried out under the aegis of the United Nations, although there are some notable exceptions. Many of these operations have been of the traditional peacekeeping type, in which a truce, to which all parties agree, is maintained by the international force whose presence is accepted by all sides (e.g., Cyprus, Multinational Force and Observers in the Sinai). However, there has been an increasing tendency of these operations to go well beyond this traditional mold. In these operations, there may be an inclination for the international force to be caught up in processes that go well beyond maintaining a cease-fire or promoting a peace settlement. Unfortunately, as the scope of these interventions has increased, the United Nations has been unable to keep up with all the demands that they present. Severe setbacks in Somalia and Bosnia have demonstrated glaring weaknesses in its responses. Difficulties have been in part due to a scarcity of resources and a major increase in the number of operations to deal with. But another overriding problem has been an incoherence of organization, planning, doctrine, and policy on the part of the international body.

In 1994, the Office of Technology Assessment was asked by the House Armed Services Committee and by members of the Senate Armed Services Committee to examine the role that technology could play in improving the prospects for international peace operations. In June 1995, OTA convened a workshop that brought together some of the world's leading practitioners, academic experts, experienced diplomats, and leading technologists in order to study and discuss this issue.

This report contains a summary of the results of the workshop, along with the original papers presented. The chief conclusions are that the main problems with past peace operations have been political in nature. The participants suggested a number of means to deal with these issues, which are reported here, with the understanding that they reflect not OTA conclusions, but a consensus among these individuals. Further, most participants agreed that, although political and policy issues play a primary role in determining the performance of peace operations, the proper application of technologies, both new and old, can add significantly to the prospects of success for an operation, should one be initiated. Technological contributions can be made in the areas of sensors (especially for monitoring in the more traditional types of peacekeeping operations), intelligence gathering, communications, data fusion, countersniping technologies, mine clearance, and crowd control. Some technologies are well in hand, and others are being rapidly developed and may be available in a very few years. The use of several options among the less-than-lethal weapon categories may be quite effective, but will require some consideration of policy issues to determine a) compatibility with current or future international treaties and b) the vulnerability of U.S. forces to such weapons, if used against them.

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Contents

Introduction and Summary 1

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INTRODUCTION

As part of a study of the role of technology in peace operations, the Office of Technology Assessment conducted a workshop on "Improving the Prospects for Future Peace Support Operations: Tactics, Technology and Training." The workshop was held from June 12–16, 1995 at the Rockefeller Foundation's conference center in Bellagio, Italy.

The workshop helped OTA obtain the views of practitioners, policymakers, technologists and analysts on the potential benefits and limitations of technology in enhancing the effectiveness and reducing the risks and collateral effects of such operations. Accordingly, OTA assembled a small but highly distinguished international panel of experts that included the senior military commanders and civilian directors or their senior aides responsible for several recent or ongoing operations, notably Bosnia, Somalia, Cambodia, Macedonia and the Sinai. Perspectives on technology were presented by high-level representatives from U.S. national laboratories and by European technical specialists. Issues of strategy and policy were addressed by senior American and foreign officials and analysts, several of whom are or have been responsible for directing or advising on such operations. A complete list of participants appears in the front of this report.

This summary presents workshop discussion highlights, identifying observations and findings that were broadly endorsed by the participants. Issues on which a significant divergence of opinion was evident are also noted. Readers should be aware that there was no attempt to poll the panel formally on their views. These contents represent the rapporteurs' summary of the major issues as the panel discussed them. The summary is

intended to complement, not substitute for a reading of the papers presented during the meeting that are the bulk of this report.

The following workshop highlights deal first with the panel's view of policy issues, which sets the context for the equipment and technologies that may, as a result, be required in future peace operations. After defining these issues, this report presents those highlights dealing with the relationship of technology to peace operations and the prospects for newly developed equipment to improve future performance of international peace forces.

The views expressed are those of the panelists and do not necessarily represent the views of the Office of Technology Assessment, the Technology Assessment Advisory Council, or the Technology Assessment Board. Individual panelists are not cited directly in their views, a policy deliberately taken by the workshop organizers to encourage openness among the panel.

WORKSHOP HIGHLIGHTS—THE CONTEXT

Demands for International Involvement in Peace Operations Will Persist

Workshop participants agreed that, following the end of the bipolar, post-Cold War period, the world community will continue to encounter situations where conflicts and disasters arise that will create pressures for international intervention. These situations will range in character.

Some will be consensual in nature. In such cases, the parties to a dispute may look to other countries or to international organizations to provide: a) their good offices and influence to help resolve outstanding differences; and, b) the organizational and technical expertise and the technology and personnel required to monitor and otherwise carry out a peace agreement. The Multinational Force and Observers (MFO), which operates in the Sinai in support of the Israel-Egypt Peace Treaty of 1979 is a current example. In the near future, there may be demands for a similar mission in the Golan Heights, should the ongoing negotiations between Israel and Syria bear fruit.

Some of these situations will be humanitarian in character. In the face of natural and, increasingly, manmade disasters, countries and international organizations will be compelled to respond to demands for outside assistance. The manmade famine in Somalia and the epidemic that followed the genocide in Rwanda are two recent examples. With this era of instant global communications and imagery, the world's attention may increasingly be drawn to catastrophic situations by the news media. Outside parties may feel compelled by the outcry of domestic opinion to act, responding more to the horrors conveyed in television images than by pleas for help from the victims or their spokespersons.

Other cases will involve conflicts between and within states that require outside intervention to reestablish calm and create an environment for immediate conflict avoidance and eventual conflict resolution. Such intercessions may require both diplomacy and a force of well-equipped observers and peacekeepers. The long civil war in the former Yugoslavia may be a case in point.

Yet other cases will involve situations in which public safety and political legitimacy need to be restored, if peace is to be firmly implanted after a long period of conflict and insecurity. The conditions surrounding the United Nations Transitional Authority in Cambodia (UNTAC) may fall into this category. UNTAC was intended to serve as a catalyst for national healing in Cambodia, under a political agreement, by underwriting stability and safety for a free and fair election and by providing technical expertise and resources to ease socioeconomic recovery.

Finally, other instances may involve proactive engagement in regions in conflict. The desire to defuse tensions and to prevent the spread of a conflict may lead to calls for intervention by outside parties. The intervention may include the insertion of observers, equipped with monitoring capabilities and, possibly, with weapons. The preventive deployment of United Nations military observers to Macedonia in 1993 is an example of this category of intervention. Macedonia

contains many competing and, sometimes hostile, ethnic groups found in the Balkans. The unstable situation elsewhere in former Yugoslavia caused concern that, unless a protective buffer of peacekeepers were sent to Macedonia, the Bosnia conflict could spread there, or, worse, become the ignition point of a wider European war.

Often, not one but a hybrid of several challenges will confront the world community in a given location. This could increase pressure on outside parties to intervene. Some participants argued that in cases of extreme violence and human suffering, pressures on individual governments and the United Nations to act could prove determinant. As the above suggests, participants believed that the news media are increasingly playing a significant role in giving immediacy to conflicts and tragedies occurring in remote regions, continents away.

In helping OTA assess the role of technology, workshop participants spent considerable time addressing the requirements of effective peace operations. To this end, workshop deliberations sought to identify the key questions that must be addressed whenever events that may demand intervention appear on the horizon.

According to participants, *whether to intercede* is a question that cannot be fully answered without also determining:

- *when to intercede*; that is, when does an action need to be launched to be effective?
- *how to intercede*; that is, what form should the intervention take to be effective?
- *who should intercede*; that is, which party or parties and organizations are best suited to lead and/or contribute to an operation?

Some participants appeared to believe that in the recent past, the international community and its constituent parts have moved too quickly to intervene in places or in ways that were less than appropriate, although others felt that they often moved too late.

A Clear Definition of the Situation and its Challenges

Conferees agreed that **clarity in defining a situation, including a grasp of its causes, is vital to the success of any intervention** that hopes to improve human conditions, while simultaneously limiting the risks faced by peacekeepers.

An accurate understanding of the situation is vital to structure mission mandates that incorporate realistic operational goals, develop military doctrine appropriate to the specific circumstances, and arrive at a full appreciation of the possible consequences of particular courses of action before the fact. In addition, thought must be given at this stage to the problems of reconstruction after resolution of the conflict. Deficiencies in this area have been evident at the United Nations.

Sometimes the absence of clarity may be due to political differences among members of the Security Council. However, panelists agreed that the absence of clarity has often been the product of a lack of: a) solid intelligence; b) adequate awareness of historic and cultural contexts; and, c) sound military advice reaching the highest decision-making levels of the United Nations at which operational mandates are written. Two remedies to these problems recommended by several conferees appeared to have the panel's endorsement: 1) when feasible, preparation of a joint technical survey for predeployment planning purposes; and, 2) establishing the post of Senior Military Adviser to the United Nations Secretary General and Security Council. Panelists suggested several means for effectively instituting each remedy.

A Joint Technical Predeployment Survey

Preparation of a joint technical survey for predeployment planning rests on having time to conduct this exercise in advance of action. Participants recognized that time may not always be available, but, given foresight in identifying situations where future intervention might be required, it would often be possible to gain time

for planning. Making predictions on future trouble spots is in itself a product of solid intelligence.[1]

Preparing a thorough planning survey requires the participation of all components that would be involved in executing a prospective operation, including military advisers, civilian governmental and non-governmental organizations, political experts who understand the politics and cultures involved, and representatives of contributing countries. Participants agreed that a predeployment planning survey should address all the following elements:

- the nature of the conflict and its root causes;
- the historic and cultural context;
- the full range of military requirements for intervention;
- the costs of intervention—financial and otherwise;
- the possible consequences of intervention;
- a plan for post-conflict reconstruction, including its requirements; and
- a list of mission-specific assets, identifying sources of specialized skills, capabilities, and equipment.[2]

Post-Conflict Reconstruction

One participant thought it vital to emphasize the importance of having a plan for post-conflict reconstruction in hand before deployment. This would help assure that those who write mission mandates, for example, at the United Nations Security Council, recognize from the outset the long-term commitment of resources needed to bring an operation to a successful conclusion.

In this panelist's view, an operation is not truly finished until it restores a country to membership in the community of nations. This goal must be borne in mind from the beginning of the conflict resolution process. Among reasonable goals of a restoration plan would, therefore, be to reestablish "the normal conditions of law and order." This plan should be executed by "a preordained structure," put in place during an early phase of an operation—and well ahead of a conflict's end.

Further, again in the view of this panelist, a reconstruction plan in effect provides an exit strategy. Too often in the past, the UN has found it easy to get involved but impossible to disengage, even, in some cases, after decades. Citing the ongoing UN mission in Cyprus as a case in point, this panelist argued that open-ended peacekeeping commitments are failures. A viable reconstruction plan, that allows a country to function without a foreign crutch, should be given equal weight to military requirements in intervention decisions.[3] Using the restoration of normal law and order as the criterion, this panelist judged that UNTAC left work unfinished. The Transitional Authority ended after the formation of the constitutional authority to which the elections, staged by UNTAC, had led. But elections alone did not restore normality to Cambodia—the instability persists. Ongoing international involvement is still required, although in a different form.

One way to assure that post-conflict reconstruction receives the attention it deserves, in the context of a given peace operation, is to establish a Director of Reconstruction—as a standard feature of the organizational structure of peace operations, this participant argued. The panelist envisioned this director as having equal standing with the force commander and the humanitarian relief coordinator.

A key role in preparing predeployment surveys would be played by an independent senior military adviser, discussed below.

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[1] Operational intelligence requirements—as distinct from indications and warning—are in the next section of this summary.

[2] For instance, the list could be used to identify countries and organizations that are sources of essential, operation–specific communications systems, mission unique surveillance assets, transportation vehicles, demining systems, runway repair and other engineering tasks, and, if required, specialized warfare skills and warfighting assets, including weaponry.

[3] Several participants shared this assessment of Cyprus and other ongoing long term operations. They thought these open ended commitments drained limited resources and undermine support for intervention in cases where the need is more urgent. Other participants disagreed. They thought that operations that continued for lack of alternative mechanisms for maintaining peace were worth the investment.

Senior Military Adviser

Participants noted that while there currently is a military adviser for peacekeeping at the United Nations, he reports to an Under Secretary General and not directly to the top echelon of the organization (i.e., the United Nations Security Council and Secretary General). The UN Charter does, in fact, provide for a Military Staff Committee (Articles 45-47), which has never been allowed to function. The Military Adviser could, it was proposed, be the Chair of this reestablished Committee. The Committee itself could consist of Chiefs of Staff of nations contributing to UN missions, with each mission overseen by the subset of members that from the nations active in that particular mission. The force commander should have a direct relationship with the Chair and the relevant members.

Currently, by the time military advice reaches senior mandate writers, it potentially has undergone an organizational and bureaucratic filtering process that may alter its content and reduce its relevance to and impact on senior decision-makers. Furthermore, military advisers serving at the United Nations are on temporary loan to the UN Secretariat from member states. This can fetter their ability to render truly independent advice—if not in fact, then at least as perceived by recipients. Raising the adviser's position to serve directly the Secretary General and making the adviser a direct hire of the United Nations are key to obtaining military advice that is responsible and responsive to the Secretary General and Security Council.

Participants cautioned that the influence of the senior military adviser would not rest on independent status and position within the UN hierarchy alone. The appointee's military standing and stature with the major powers who sit on the Security Council is equally important. Without such recognition, his assessments would likely be ignored.

Military participants, in particular, felt strongly that military advice rendered to the Secretary General and Security Council needs to address clearly the operational consequences of a proposed mandate. These participants asserted that at the United Nations, mandates are often written in an operational vacuum by civilians who may not fully appreciate the military implications of undertakings made with immediate diplomatic and political considerations in mind. The commitment to defend a series of so-called "safe areas" in Bosnia was cited as a case in point. Several participating military officials thought that had United Nations mandate writers recognized the operational difficulties posed by safe areas, including the size and character of the forces required to protect them, they might have had second thoughts and moved to adopt other less militarily challenging objectives.

Participants also felt that mandates built on a clear understanding of the situation on the ground and a militarily realistic view of operational realities were the best guarantee of avoiding "mission creep"—an incremental widening of mission objectives, without an appreciation of their advisability or practicality.

The Commanders' Requirements for Operational Intelligence

Once a mandate has been written, a mechanism for assuring a continued flow of intelligence throughout the course of an operation must be established. Given the sensitive nature of intelligence sources and methods, countries have been reluctant to provide intelligence to foreign nationals involved in multinational operations. This is reinforced by doubts among potential intelligence providers that the information would be used in ways they consider appropriate.

One panelist called for the routine preparation of "Commander's Critical Intelligence Requirements" (CCIR) as a way to overcome reticence by intelligence providers. This procedure has been developed within NATO and includes political, as well as military, information. The CCIR would identify the intelligence that the Commander regards as indispensable to mission operations, and not just nice to have. In this view, governments would more readily supply intelligence on a Commander's priority list.

Procedures for protecting sensitive information transferred to the UN are also crucial in gaining intelligence support for peace operations. As one participant put it, this requires a change of attitude away from the notion that "the UN has no secrets." However, there are secrets and the UN must learn to manage sensitive information, if potential providers are to be forthcoming. One illustration of the problem was the trunk of classified documents reportedly found by US Marines, after having apparently been abandoned by UN personnel in Mogadishu.

Preventive Action

The question of the appropriate time for peacekeepers to intervene was addressed by several participants. Opinion was divided between those who saw great danger in intervening too late to make a difference, potentially foregoing an action that might stop the cancer before it grows out of control, and those who saw grave risks in intervening too early, potentially taking a step that would compound the problems.

Those who saw a quick reaction to crisis as posing the higher risk were concerned that peacekeepers would be deployed and committed to a mission before a situation was sufficiently understood. This could expose the force to a danger for which it is not appropriately trained, deployed or equipped. Others who favored erring on the side of caution warned that a precipitous dispatch of forces in and of itself could have the adverse effect of igniting the hostilities that the deployment was intended to contain.

One former commander strongly disagreed, arguing that these considerations have weighed too heavily in United Nations response to several recent crises. The result has been an overly cautious reaction to situations where early action could have made a difference. In emergencies, such as Somalia and Rwanda, getting involved "too much, too early" would have been the wiser course, this participant asserted. In his view, it is easier to "fine tune" a deployed robust force than to introduce or augment forces after conditions deteriorate. Several other panelists appeared to share this assessment.

As a middle position, several participants suggested that, in many instances, intermediate measures could be adopted as the initial response, which might avoid the dangers of either a premature or a belated force deployment.

Some panelists thought that preventive diplomacy was one step that should be taken as an alternative to inaction during the initial phase of a crisis. Preventive diplomacy held the potential of defusing the conflict, perhaps making other forms of intervention unnecessary. Failing that, preventive diplomacy would at least buy the time needed to evaluate the situation and learn which further measures were best suited as a remedy.

Alternatively, humanitarian assistance—by governments, international organizations or private non-governmental organizations—is, in some instances, a potent form of preventive action. Often conflicts arise from competition for scarce resources in which potentially manageable environmental conditions or repairable economic difficulties are to blame. These problems might improve through a proactive program of assistance, a panelist held.

Several participants felt that the proactive deployment of peacekeepers should itself be viewed as a potent tool of preventive diplomacy. As one participant argued, what better way to show the interest and resolve of the international community than the deployment of peacekeepers? Another panelist added that preventive deployment can serve as a tool for obtaining the ground truth required to better "inform the diplomatic process."[4]

To be effective as an arm of diplomacy, much depends on how the force is configured, the manner in which the deployment is executed, and the way the force and its mission are portrayed. The intervention in Macedonia was offered as a les-

[4] One panelist included arms control of land mines and conventional weapons that could fuel the escalation of conflict as another form of preventive action.

son in how peacekeepers can be effectively used to bolster diplomacy.

The successful deployment of peacekeepers for preventive action rests on operational transparency, to assure all parties of the force's impartial and nonbelligerent status. Conducting briefings on the force's mission and arranging visits to peacekeeping units for all parties is essential in establishing the non-offensive character of the force. Limiting the force's weaponry to light arms and establishing ongoing communications channels with the parties on the ground are also keys in winning their confidence.

Training that prepares soldiers for a "change in mind set ... from warfighting to peacekeeping" and alters military operating posture from defensive to "visible and vulnerable" is essential for preventive peacekeeping, a participant asserted. Some U.S. military experts have stated, in fact, that up to six months is required for training soldiers to participate in peace operations and then to retrain them again for warfighting (although the time estimates are somewhat controversial). The panel took note that the Nordic countries have specialized in training forces for this class of peace operations.

Peacekeeping and Peace Enforcement: Operational Continuum or Dichotomy?

Throughout the course of workshop deliberations, participants repeatedly returned to address the differences between peacekeeping and peace enforcement. The expression "Mogadishu line"—alluding to the shift in Somalia from peacekeeping and humanitarian relief to an operation to subdue Somali warlords—became shorthand for addressing differences between the two types of operations and their distinctively different operational requirements. The resulting consequences are often radically different in the two cases.

Some participants warned that the division between peacekeeping (operating with the consent of all the parties) and peace enforcement (operating without the consent of some or all the parties) amounted to a firebreak that should not be breached lightly. Once crossed, the impartial peacekeeper becomes a co-belligerent in a conflict and prospects are slim of ever reestablishing the perception of impartiality. Other panelists further argued that violence has a dynamic of its own. Once used in a peacekeeping operation, the use of force can spiral out of control as violence breeds more violence.

But after further exploration, panelists who had earlier drawn a divide between peacekeeping and peace enforcement seemed to adopt a more qualified assessment. In their view, peacekeeping should not be equated with passivity. **In some circumstances, the resort to force may be required to maintain the ability of UN peacekeepers to fulfill their mission.** What is crucial is that the use of force be confined to the following circumstances. It must be used basically in self-defense, although the definition of what constitutes self-defense may be stretched. One participant emphasized that a clear consensus by all parties on this point will be required. Force cannot be used in offensive operations. Further, it is to be used strictly in response to violations of pre-agreed understandings among all parties on what constitutes acceptable and expected forms of behavior. Also, the use of force should be limited in scale and duration and be unambiguously connected with fulfilling peacekeeping and humanitarian relief objectives.

For instance, force was used, without compromising the peacekeeping mission, in Cambodia against threats to the electoral process that UNTAC was committed to safeguard. Several participants noted that even in Bosnia, force has been used without damaging the neutral standing of peacekeepers, in instances where it was a last resort in removing threats against activities that are unambiguously connected to the peacekeeping mandate. Strikes against mortar positions responsible for attacks on food convoys constitute an example.

One participant attempted to sum up the panel's thinking with the following observations: between peacekeeping and peace enforcement one will often find a gray area—"soggy zone." In this zone, force may be selectively applied in

response to direct challenges to the peacekeeping mission.

Panelists suggested that problems arise when force is used against targets that do not directly threaten the international peace operations, say, a remote arms storage site. However, one participant cautioned, that even when these guidelines are followed that the risk of falling into a quagmire would remain. Another panelist added that an attempt to operate simultaneously in both regimes in one area—such as imposing a "no fly zone" in the air over Bosnia, or in announcing the creation of "safe areas" and weapons exclusion zones, while attempting peacekeeping on the ground directly below—confuses the situation and can compromise the ground force's neutral status.

The United Nations Should Keep the Peace; Enforcement Is Best Left to Powers and Coalitions

This appears to be a controversial conclusion, but, in fact, seemed to be the universal feeling of the panelists. Peacekeeping and warfighting each dictate different types of leadership, organization, and participation in executing a mission. Each also sets different parameters for mission training, force posture and equipment. Accordingly, the panel broadly agreed that from the outset of any operation an understanding of whether an operation would be confined to peacekeeping or whether it could involve substantial enforcement activities was crucial.

The panel strongly believed that **the United Nations is best suited for traditional peacekeeping, including humanitarian relief,** rather than other peace operations. The United Nations Charter is a document that reflects the shared views of 185 countries. This gives the organization a special license to troubleshoot worldwide and offer its good offices and humanitarian assistance, among other things. As one panelist noted, the UN is especially effective in sponsoring peace operations in which the weight of its broad membership is brought to bear, such as the 34-nation contingent UNTAC operation.

Outside the UN, specialized bodies and regional organizations can also play a role in managing peacekeeping operations. The panel specifically considered the work of the Multinational Force and Observers, an organization created specifically to monitor the Israel-Egypt peace accord. Discussions suggested that it is adopting cost-effective practices that the UN would do well to follow, including staffing, training, and procurement.

Regional organizations likely have an understanding of local conditions, including a familiarity with language, customs and personalities, and the operational environment in their region, unmatched by countries from outside. On the negative side, regional groupings sometimes carry political baggage that could make them unacceptable to one or more of the parties to a conflict. Further, countries in developing regions may lack basic resources for peacekeeping.

The United Nations' Strengths are a Liability for Peace Enforcement

The disturbing experiences in Bosnia and Somalia formed a persistent theme throughout workshop deliberations. Participants repeatedly looked to those cases for lessons on what can go wrong in peace operations. **Reflecting on that experience, participants concluded that the UN is structurally and organizationally ill-prepared to be an arm of peace enforcement.**

According to several participants, the very thing that is the source of the UN's unique strengths in peacekeeping—the organization's broad and diverse membership—is a liability for peace enforcement. With 185 disparate members, each with distinct and often incompatible military capabilities and practices, resource limitations, and competing stakes and interests in any particular situation, the organization is not realistically able to conduct warfighting operations under Chapter VII of the UN Charter.

In theory, at least, the United Nations is a club of coequals. In practice, the equality may be restricted to the five permanent members of the Security Council. But, even if only at this level,

decision–making is consensual in nature. This state of affairs is incompatible with effective military operations that require a hierarchical command structure. Further, many organizational components in the UN system appear to feel that they have a right to override orders by direct appeal to the Secretary General. Every national military contingent of a UN operation can ignore military directives (and many have done so, although the practice may be frowned upon by UN officials) by contacting its national capital and invoking national command prerogatives.

Several panelists argued that such breakdowns in command are not only possible but inevitable in UN-led operations, since different countries supply contingents for different purposes and with different interests in mind. For instance, in UNOSOM II—the UN-mandated enforcement operation in Somalia—few UN member states were willing to serve in policing operations, and fewer still were prepared to participate in peace enforcement. Even countries that initially claimed a readiness to join in enforcement operations failed to do so when asked. Some made commitments that were clearly limited in length of time of participation. A few countries even withdrew their military contingent when difficulties arose, midway through an operation, leaving their partners terribly exposed to dangers. Were it not for the fact that the Somali gangs "couldn't shoot straight," many more UN troops would have been killed, a participant claimed.

UN involvement in enforcement operations undermines its credibility in peacekeeping and related activities—a regime in which its expertise is unchallenged. One commander made a particularly forceful case in this regard. In his view, the United Nations' credibility in peace operations rests on having "no enemies but parties and partners." Accordingly, UN participation in enforcement operations is an action of virtual suicide for the organization's impartial status. Furthermore, given the relatively vulnerable posture required for peacekeeping, wisdom dictates that peacekeepers should be withdrawn, once warfighting takes over. To "operate a peacekeeping force ... somewhere between peacekeeping and large-scale enforcement is madness," this panelist argued. This remark was seconded by others.

Among the countries that have shown a readiness to join in UN-led enforcement operation are the world's developing states. But contingents provided by many of these countries often lack rudimentary tools and training to seriously contribute to operations. For instance, some states contribute troops who have never operated an automobile to serve as drivers. Other contingents arrive without essential fighting gear, expecting the UN and wealthier nations to equip them and provide on-the-spot training in weapons use. Occasionally, some even arrive without appropriate clothing.

Many panelists emphatically held that, once a peace enforcement operation is mandated, a single power, or else a small coalition of powers, should lead it. Improvisation can be deadly in enforcement operations. While countries may prefer to act in coalition rather than alone—allowing countries to share resources and spread the risks—coalitions should be built around countries with well-established military links, panelists said. Countries with shared memberships in defense alliances, e.g., the North Atlantic Treaty Organization (NATO), are obvious candidates for executing enforcement operations.

Participants felt that even if enforcement is best performed outside the United Nations structure, a mechanism for handing-over operations to, as well as from, the United Nations needs to be established. Given the organization's special qualification for undertaking peacekeeping and post-war reconstruction, a process for disengaging and re-engaging the institution and its resources when conditions warrant needs to be instituted.

It is through the mandate-writing process that a link between the UN and peace enforcement is most effectively created, a participant said. The UN may have limitations in conducting enforcement operations but, as discussed earlier, the organization is uniquely suited to determine when intervention is warranted and the form it

should take. Participants appeared to agree that the Security Council's authority under Chapter VII of the Charter to mandate enforcement operations and then assign the execution to a lead nation, a small group of nations, or a regional organization needs to be sustained. For those charged with conducting enforcement operations, having a UN mandate to invoke is an invaluable instrument in legitimizing their mission.

Operational Unity is Key to Mission Success

Panelists strongly agreed that operational unity is indispensable for both peacekeeping and peace enforcement. Conference participants identified the absence of operational unity as a common denominator of failed operations. The breakdown of operational unity in UNOSOM II in Somalia has been mentioned in this context.

For military commanders, firm and unambiguous command authority is a fundamental rule of operation. This holds equally for peacekeeping and peace enforcement. Assuring that troops do not compromise mandates by taking unilateral actions that stray from agreed missions objectives is vital in either type of operation. In particular, a tight rein on peace enforcement is key to the precise orchestration of operations that are successful, while keeping the use of force and the dangers faced by troops to a minimum.

Peace enforcement is not intended to subjugate any of the parties. Its purpose is to create conditions where nonviolent forms of conflict resolution and the restoration of normality are possible. The controlled use of minimum force is more promising than the unleashing of massive violence in keeping the door open to cooperation.

Operational unity is most easily achieved by unity of command. However, unity of command is practical only in operations where a single power, with a clearly defined command structure, dominates. In multinational coalitions, where countries will likely retain control of national contingents, "unity of purpose" is a more realistic operational goal, according to participants.

Among other things, unity of purpose requires agreements among coalition partners, reached before a deployment, that commanders of national contingents will not at every turn seek to renegotiate the terms of their participation with the UN (or other lead) force commander, or worse—appeal to their respective capitals to overrule the force commander whenever it suits them.[5]

Both civilians and military members of the panel added that effective civil-military coordination is no less important in achieving unity of purpose. Peace operations typically involve major civilian components. In some operations, civilians are in charge, as in Yugoslavia. Accordingly, there can be little hope of achieving unity of purpose unless coordination encompasses both civil and military components in the field. In past UN operations, civilian and military staff have sometimes never met before the inception of an operation.

As has already been suggested, some participants were troubled that the UN operates as "a stove-pipe operation." Whether civilian or military, everyone who works for the organization routinely contacts UN headquarters in New York to make decisions and resolve disputes. Participants believed that, at a minimum, there should be one person in the field with the authority to coordinate the activities at least of all UN elements, if not also of the independent non-government organizations associated with an operation.

Another panelist suggested that "diplomatic unity" was yet another ingredient necessary for mission success. Behind diplomatic unity is a commitment by the governments (responsible for initiating an operation) and the military authorities (responsible for executing it) to work in unison.

[5] The UNTAC Commander attempted to avoid the latter problem by asking all contingent commanders to keep him informed of developments in their countries relevant to the mission. The results of this initiative were mixed.

Parties to a conflict may, at one time or another, be dissatisfied with a peace mission and its objectives. In those instances, they may seek to exploit fissures between coalition partners to sabotage an operation. A sustained, unified diplomatic front is key to maintaining the pressure on all parties on the ground. The common front of the major powers and interested regional states in support of UNTAC was indispensable in bringing the mission to a successful conclusion, a participant observed.

To address the various aspects of unity of purpose in peace operations, panelists held that the following requirements had to be met:

- a single command authority directing an operation;
- a clear and agreed set of rules of engagement for all forces;
- a preexisting civil-military organization that could rapidly be moved to the field to serve as headquarters staff;[6]
- a single command, control, communications and intelligence structure (C3I), including the technology to support it;
- a unified doctrine, even if less than perfect, addressing roles and responsibilities at strategic, operational and tactical levels of command;[7] and
- serious commitments in advance by countries participating in an operation to stay the course, under the mandate, and not abandon their peacekeeping partners, should conditions deteriorate.

Panelists viewed UNOSOM II as a lesson of what can go wrong in a peace operation when unity of purpose and the political and organizational underpinning are absent. UNTAC was viewed as offering lessons in how unity of purpose can be established, sustained and effectively put to use.

Gearing Up for Peacekeeping

The panel was divided on how peacekeepers should be equipped. As previously noted, some commanders felt that the manner in which a force arms itself sends a message to parties on the ground. Vulnerability is proof of impartiality and this should be transparently obvious. Accordingly, troops should be deployed with light weapons needed for peacekeeping, and not much more. Otherwise, there is a risk that "excesses will occur" or that the force may be drawn into becoming a belligerent.

Other commanders took exception to this perspective. Peacekeepers may arrive with peaceful intentions but this is no guarantee that all factions will share in the goodwill. Accordingly, peacekeepers would be advised to be prepared for "the worst case." This means being equipped to fight, if necessary. Recalling the earlier discussion on the "Mogadishu line," a commander added that since most situations tend to be messy, operations rarely fit neatly into boxes marked "peacekeeping" or "enforcement." Given the uncertainties inherent in peacekeeping, in this view, prudence dictates arming the deployed force.

Sharing Responsibilities and Dividing the Labor

Participants appeared to agree on the need for a division of labor among countries in participation and contribution to peace operations. One non-American panelist argued that the inclination to look to the United States to lead and/or partake in every operation had to be curtailed. Over-reliance on the US is not advisable, for, in the longer term, it could heighten American aversion to foreign involvement. The US has specialized and often unique capabilities, including transportation, communications, intelligence and special operations. Expecting the US to solve every world crisis risks exhausting resources

[6] Participants strongly argued that practice rather than improvisation is essential. Accordingly, this organization should consist of people with extensive experience working as a unit. Such experience takes months to acquire. Days or weeks are not enough.

[7] As one participant put it, an imperfect doctrine is preferable to no agreed doctrine. See the paper of Lt. Col. Damien Healy and Lieutenant General J. M. Sanderson for a detailed discussion of the strategic, operational and tactical levels of command in peace operations.

(and good will) best kept in reserve for selective use. The same can be said of overdependence on the other major powers.

The provision of equipment is another area where a division of labor is not only possible but essential. Communications systems were at the very top of the list of technologies viewed by panelists as being critical to effective peace operations. Panelists warned of the dangers inherent in routinely deploying operations that lack interoperable communications. Similarly, we cannot afford the cost and inefficiencies of expecting troops to operate and maintain a host of different types of equipment, and somehow stock spares and repair gear associated with each. This problem runs the gamut of provisions, from major items, such as tanks, to expendable ones, such as ordnance.

What one participant termed "a lead country model" should be adopted for the provision of assets. Under this concept, specific countries would be given responsibility for the provision of specific items or classes of items.

Professionalism in Training and Hiring

Panelists spoke repeatedly about the importance of training and professionalism, viewing the current system as an Achilles' heel of peace operations. They suggested several remedies for the problems.

First, senior officers, especially those expected to operate in headquarters, should exercise and, where possible, work together in advance of operations. Such familiarization is vital for smooth operations. As for senior commanders, they should, at a very minimum, have the opportunity to confer before they are dispatched to the field. This would provide a much needed opportunity to reach consensus on appropriate responses to possible challenges in advance of their occurrence. Currently, senior officers of different nationalities charged with running an operation together typically meet one another for the first time in the field.

Second, junior officer training is equally important, in the panel's view. Junior officers are the front line of the mandate of any peace operation and are expected to shoulder a considerable burden. They are typically given responsibility for carrying out a mandate over large areas with relatively small units. Their job requires mastery of a variety of skills. Junior officers must have the interpersonal and negotiating skills to defuse conflicts and the restraint to avoid unnecessary violence that would sabotage a peace operation, whether by crossing the "Mogadishu line" in peacekeeping or by an unwarranted escalation in Chapter VII operations. Training must also prepare junior officers to undertake tasks unique to peacekeeping, including establishing and operating checkpoints and roadblocks.

Officer training for peace operations should be international in character, ideally involving the United Nations. International training is key to promoting familiarity with foreign counterparts and their practices and to establishing standard operating procedures for officers designated for assignment to future peace operations. It should also expose officers, particularly those from less technologically advanced nations, to new equipment that may offer tactical advantages in peace operations.

Conscript training is also important. The ethos and, often, the practice of peace operations are often closer to law enforcement than to warfighting. Accordingly, conscripts will need to learn to act with appropriate restraint. The workshop discussion indicated that necessary conscript training should rest with contributing nations.

Civilians taking part in peace operations should also participate in predeployment training. Civilians, as well as soldiers, can provide the language and cultural skills that are essential for headquarters operations. Often civilians are charged with administrating field operations. Training before operations is essential in promoting effective coordination between civilian and military staffs that have no tradition of working in tandem. Creating a rapidly deployable headquarters staff, with extensive experience working together in advance of emergencies, was previously noted as a way to promote smooth civil–military collaboration. One participant suggested using political–military wargames as another

training device for both civilian and military personnel.

Panelists were quick to add that training is no substitute for real-world experience. Longevity of service in the field is the best training tool. Unfortunately, many nations that contribute to operations routinely reassign officers just when they have gained the practical knowledge to be of added value to a mission. A difficulty arises when a nation has more serious commitments than peacekeeping. This may then require retraining soldiers back and forth from one mode of operation (peace) to another (war).

Hiring practices are important to civilian professionalism in peace operations. The place to start is to depoliticize the hiring process at the UN, panelists held. Personnel need to be hired for skill, not by means of a national job quota system. Incompetence cannot be tolerated, especially in the field where it can endanger a mission. The same holds for military personnel. If national contingents are not up to the task, they should be sent home, a commander emphatically urged. Another military panelist cautioned, however, that the diplomatic and practical implications would have to be weighed heavily in such a case.

Finances and Resources

Lack of finances is a major hindrance to future operations. Panelists noted the negative mood in the US toward funding international programs in general and peace operations in particularly. This perspective pervades Congress.[8] Support for even the most successful operations is waning for reasons of finance and use of significant manpower. The MFO is not immune from these pressures. Good or bad, it is viewed by some as a persistent drain on resources, which has led to calls for the US "to declare victory and walk away from the Sinai."

Even prior to recent demands for greater efficiency, the MFO adopted many practices that could serve as a model for other organizations. Among other things, the MFO:

- uses commercial sources, selected on a competitive basis, for the provision of supplies to avoid receiving inferior or outdated items from contributing countries;
- limits the number of suppliers for any one item to the smallest number possible to ease training, and operations and maintenance;
- contracts operations and maintenance activities to commercial firms, able to provide a local work force;
- is reducing personnel, and using technology where applicable as a substitute; and
- focuses on predeployment training and "training the trainers."[9]

Further, creating a regional headquarters for several operations in any one region was suggested as another potential cost saver.

Where Technology Can Make a Difference: A Survey of Practitioners

Some interesting survey results were obtained by the United Nations Institute for Disarmament Research, as part of their project on Disarmament and Conflict Resolution are relevant to the question of what technologies would be most useful for international peace operations. These results were reported upon by Virginia Gamba, who is director of the project. A detailed questionnaire, regarding many aspects of UN peace operations was given to a large number of individuals with personal experience in them. These included commanders, other military personnel, and civilian practitioners. Several questions were related to the potential or actual use of technologies, and the responses provide a useful indication of what may be needed in the field.

First, a strong minority (about 40 percent) of those responding reported the use of sensors for verification. In general, these individuals were from technologically advanced countries. Also,

[8] See Steve Simon's paper on the growing resistance to funding international programs.
[9] K. Scott Gudgeon's paper provides a further discussion of MFO practices.

some 40 percent reported being trained at home in verification technologies. Equipment used included radar and infrared sensors, intelligence-gathering equipment, communications systems, countermine equipment, and intelligence fusion aids.

Second, when asked whether on-site and remote sensing equipment was adequate for verifying weapons control and disarmament missions within peace operations, the response was evenly divided between yes and no; an interesting note was that the more technologically advanced the country of the respondent, the **less** satisfied he/she was. However, respondents overwhelmingly supported the potential benefit of sensor systems in support of peace operations. Likewise, a great majority of respondents reported the view that satellite surveillance has a role to play in peace operations.

Of greatest import to this conference, however, was the list, reported by the practitioners, of the roles which sensor technologies could play in peace operations. These included what one might imagine: **force protection; monitoring and detecting weapon caches; monitoring of truce agreements and cease-fires; monitoring and controlling troop and weapon movements; providing night vision capability to international forces; monitoring crowds; and aiding in perimeter defense of installations.**

Where Technology Can Make a Difference: The Panel

Conference panelists identified several areas where they agreed technology could make a difference in peace operations. Panelists hoped that the workshop marked the start of a much-needed dialogue that promotes "cross-talk" between practitioners and technologists. An ongoing exchange would serve two purposes. First, it would make practitioners aware of technology that holds the potential of enhancing operations. Second, it could give direction to technologists in developing systems that address practical problems faced by operators.

A brief look at technologies addressed by practitioners (as opposed to the technologists) follows. Much of the technology judged of highest value by practitioners is available off-the-shelf. Therefore, from the perspective of the user, appropriate technology, instead of high technology, should be the goal.

Communications

Communications systems were at the top of many participants' list of essential technologies. Communications are vital for rapid decision–making and maintaining tight reins over delicate operations. The biggest problems are to assure interoperability of communications among units in the field, and to facilitate high speed and secure communications between the field and authorities overseas.

Commanders can expect to find the communications infrastructure in the field to be inadequate or nonexistent. This makes a self-contained and rapidly fieldable communications system an essential piece of technology for peace operations. Regarding field operations, panelists noted deficiencies in both ground-to-ground and air-to-ground communications. Also noted were deficiencies in communications links between official personnel and non-governmental organizations in the field. Remedies are to be found in a change of procurement practices as well as in technological advances.

Sensors

Sensor systems were viewed as another category of critical technologies for peace operations. Sensors are especially useful, for example, in peace monitoring. They hold promise in allowing some missions to reduce personnel and associated costs. Some sensors could allow small peacekeeping elements to patrol large parcels of territory by detecting approaching intruders. In this way, it may be possible to construct a quickly deployable defense perimeter for peace operators.

Sensors are also important to intelligence collection in the field, providing effective situa-

tional awareness for commanders who cannot be at all places at all times. For intelligence purposes, it is essential to have 24 hour wide area coverage that can quickly spot trouble and determine the veracity of intelligence claims, a participant suggested. One promising approach is to use airborne systems, including unattended aerial vehicles (UAVs) and helicopters. Panelists agreed that airborne assets are likely beyond the financial reach of international organizations. Here, reliance on a lead country supplier to draw these systems from national inventories when needed, makes sense.

Demining

Demining systems received considerable attention from participants. Panelists were interested in systems designed to locate mines intended to harm peace operators and slow their movement, and technologies that might be used in post-conflict restoration of mined areas for habitation.

Interfacing with the Media

Many developing countries are "oral societies," a participant noted. Getting the peacekeepers' message out to the population is often best achieved by the deployment of a radio transmitter and the distribution of cheap portable radios to the population. The use of video recorders is another media tool with proven utility in peace operations.

In both Cambodia and Somalia, UN officials resisted field commanders' requests to set up a public radio system. Initially, officials in New York reflexively viewed the dissemination of information as engaging in a propaganda campaign and feared that UN-sponsored radio broadcasts would be seen as psychological warfare. Later, when New York's political inertia was overcome, the UN Finance Committee balked at the cost and slowed the process further. In Somalia, the delay gave warlord Farah Aideed a considerable lead in getting out his message, undermining the UN operation. On the other hand, once distributed by UNTAC in Cambodia, radios and videos aided in convincing the Cambodian people to trust the electoral process and vote. UNTAC broadcasts have even been credited with producing Khmer Rouge defections.

Crowd Control

In the wake of UNOSOM II, the ability to operate against hostile forces that have no inhibition in using civilians as shields has emerged as a concern. In response, systems that allow peace operators to separate combatants from women and children and provide means for breaking up crowds without harming the innocent are a priority.

Training

Tools that would allow commanders and civilians from around-the-world to train together without traveling to a single location, such as distributed/interactive simulations were suggested as both cost cutters and time savers. Other training tools noted in discussions included the use of CD-ROM for disseminating data on culture, language and conditions in operating areas, and the use of simulators for job training and mission rehearsal purposes.

WORKSHOP HIGHLIGHTS—THE TECHNOLOGIES

Introduction

Peace operations, including both peacekeeping and peace enforcement, impose a broad set of requirements for equipment and capabilities. A rich field of emerging technologies exists that could have many applications for these operations, if equipment based on these new possibilities can be brought to fruition in operationally practical modes.

Although much equipment already exists, there have been several cases (e.g., UNOSOM II in Somalia) where even such fundamental off-the-shelf equipment as telephones were not always available in adequate supply to the international force commanders. There has been a major problem with the distribution and deployment of necessary equipment for many interna-

tional operations, including some humanitarian relief efforts (e.g., Rwanda). Apparently, the United Nations has not been optimally organized in carrying out peace operations. As an extreme, but not uncommon example, some contingents even arrive in the field without adequate clothing, let alone weaponry. Such problems are due both to insufficient resources and lagging contributions from member states in support of peace operations on the one hand, and to inadequate managerial tools and organization on the other. The difficulty shown by the UN in deploying and properly employing established and well-understood technology raises doubts about its capacity in dealing with entirely *new* types of equipment. **If the UN is to be able to employ usefully radical new tools in future peace operations, radical improvements will be necessary in the organization's management ability. Further, minimal levels of supply for each contingent, must be assured.**

This workshop, nevertheless, concerned itself with discussing equipment and capabilities that technology may provide for peace operations *in the near future*, and with the question of how such items may fit into likely scenarios for their use in the field. Technology can provide both improved and new capabilities for a wide variety of equipment. Such equipment includes sensors, weapons (including "less-than-lethal" weapons), and mine detection and clearance techniques. Some categories may be more useful for traditional peacekeeping, others for more proactive operations.

The goals of applying technologies for peace operations are several:

- to increase the effectiveness of the operation;
- to reduce the costs of the operation;
- to reduce the number of personnel needed; and
- to reduce casualties, among the international force and civilians, but potentially, even among adversaries, for both humanitarian and political considerations.

Although technologies primarily raise technical, rather than political, questions, policy issues connected with technologies will, on occasion, also arise. There are several kinds of policy issues that may arise.

First, increased prospects for success of an operation may increase the prospects for the intervention itself. Second, the availability of more technical solutions to military problems would present a military commander with more options to pursue in a given situation. Third, in the case of less-than-lethal weapons, use might be read as a sign of weakness by an adversary, possibly resulting in a rapid escalation to lethal means. Fourth, the use of some technologies, notably chemical and biological agents, and also less-than-lethal laser weapons, may violate current or near-future international arms limitation agreements, and thus would likely be unacceptable for an international peace operation. Finally, some technologies may easily be replicated (or reverse engineered) by many countries, not necessarily only advanced technical ones. The possibility of new military or peace enforcement tools proliferating and being employed against the international forces (or against the nation developing the technology) must be reckoned with. Occasionally, mini-arms races, involving countermeasures and counters to those counters, might occur. A related issue, raised by one participant, is the possibility of an entirely new set of arms races starting, if the United States, as a world leader in weapons research, begins to develop and deploy some of the suggested devices, especially laser weapons. The resistance of technologies to countermeasures may be a major criterion to consider in deciding whether to pursue a given line of research.

From the purely operational viewpoint, a number of factors need to be considered in deciding whether or not to develop a technical solution to a military or police problem arising from peace operations. One is the likelihood of the technology succeeding, at least on a laboratory level. If the likelihood of success within a reasonable time is remote, the technology cannot be considered as a basis for planning in the near- to mid-term.

Secondly, even if the proposed equipment is demonstrated in the laboratory, a clear military

application must be conceptualized. The equipment must be developed into a military item that has a well-defined doctrinal use. It must function not just at normal room temperature and controlled humidity, but under a variety of environmental extremes. Also, if it needs substantial amounts of power, the mating of the equipment with the power source in the field must be accomplished in an operationally feasible way.

Third, the cost must be affordable. In fact, the proposed new equipment would be more acceptable if it could be shown to reduce, rather than increase costs, as noted in the first set of criteria, above. Cost will be a major factor in determining the likely application of a given new tool to peace operations.

Fourth, it must be feasible to train the personnel of an international force to use the equipment effectively within a few weeks at most (a few days would be preferable). It is likely that some soldiers who have not received advanced technical training will have to operate the equipment. In fact, some contingents that have participated in peace operations have not received or, at least, not demonstrated a high level of technical training. (As an aside, such problems are *not* confined to third-world contingents; in fact, some such contingents have displayed highly proficient levels of technical capabilities.) While, presumably, all are able to learn to operate many sorts of standard military equipment, a "hi-tech" device, if not appropriately user friendly, may take considerably more training effort. Techniques for training all potential users may have to be developed in parallel with deployment, but a new item will be far more probable to be useful if it is, in fact, reasonably user friendly.

Finally, the measure-countermeasure game must be thought out. How would the peace force be able to respond to the use of such equipment against them and how could they respond to possible countermeasures developed by their adversaries? Further, there seems universal agreement that, if non-lethal weapons and devices are used, they should always be backed up by lethal weapons, both to protect international forces and to maintain a necessary, healthy respect for them by potential adversaries.

Technical Viewpoints

Several papers dealing with specific technical issues applicable to peace operations were presented at the workshop. One, by Mr. Courregelongue, defined the problem and context of mine clearing requirements, a principal concern for peace operations and post-conflict reconstruction. He provided a summary description of the variety of anti-personnel mines employed in the world, the magnitude of the problem, and the many potential candidate technologies that may help solve this massive, worldwide problem. Another, by Col. Roland-Price, discussed "non-" or "less-than-lethal" weapons, in terms of their application to peace operations, listing a large number of generic applications—some devices are already available and have been used by the military, but most have not yet reached this stage of development. A table in this paper lists different types of these weapons, with respective uses and disadvantages. Two other technical experts, Dr. Milton Finger from Lawrence Livermore National Laboratory and Dr. Gerold Yonas from Sandia National Laboratories, presented an intriguing variety of emerging technologies and devices, covering mine detection, sensors, less-than-lethal weapons and information and communications.

Mine Clearance

Regarding mine clearance, there are several techniques that show promise in a variety of situations. However, there is no single "magic bullet" that will solve the problem of finding mines in all, or even most, environments. The eventual solution is, therefore, likely to be a combination of technologies, each of which will work in a specified set of conditions.

There are currently estimated to be roughly 100,000,000 mines buried in the world and about 2,000,000 new ones are emplaced each year, while only around 100,000 are removed. One political means of dealing with this matter in the

long term would be to achieve a global agreement to produce only mines that automatically deactivated themselves after a relatively short (say, one year at most) period. Even if guerrillas and renegade states did not comply, the size of the problem would still eventually be greatly reduced, if such an accord were reached.

The classic method of detection, employing personnel who use nonmetallic earth probes, is labor-intensive, time-consuming, and dangerous. Metal detectors, usually magnetometers, only work when the mine contains metal. Some all-plastic mines now exist, and many others only use a few grams of metal. For these mines, it is better to detect either the explosive, which is a unique characterization of mines or other unexploded ordnance, or the anomaly in the soil, due to the emplacement of a foreign object.

In many cases, explosives may be directly detectable due to the minute amount of their vapors leaking out of the mine. Dogs are very sensitive detectors, probably 100-1000 times as sensitive as any electro-mechanical device. They have been used for many years to detect explosives as well as trace quantities of molecules exuded by contraband materials (including drugs). A mine detection system relying on canines has been developed by commercial firms in South Africa and the United States. It has been used in South Africa and Mozambique and will probably be used in Angola in the near future. A certain amount of success has been reported; apparently, this system is especially useful for clearing roads. One method is to take air samples over the road, using a vehicle that minimizes danger to its operators. The dogs, at another location, sniff the samples, and may be later transported to the site to home in on any positive detections among the samples. Another method that looks directly at explosives, being developed at Sandia National Laboratories, uses backscattering from x-rays, which can differentiate between the lighter elements present in explosives and the heavier elements present in most soil.

The two scientists from the U.S. National Laboratories discussed other mine detection options in various stages of development. One technique uses multispectral analysis of radiation in the infrared region to detect changes in the soil's emissivity and temperature, where it has been disturbed by a (more or less recently) emplaced mine. Ground penetrating radars of several types have been tested. Anti-personnel mines, the greatest danger to people, are relatively small (perhaps 10 cm in diameter), however, and hard to detect by radar, although they are only located 5–10 cm below the surface. Moist soil serves as a conductor and hampers or stops ground penetrating radars. Nevertheless, one technique, a microimpulse radar (using a broad range of wavelengths at high radio frequencies), has, in tests, detected metallic and plastic surrogate mines at depth of 5 to 10 cm in moist soil.

The problem of mine deactivation is an entirely different one. At present, the U.S. military insists on exploding mines to get rid of them, sometimes after they are dug up by large plows. One technique recently developed can clear areas up to about an acre, using several small shaped charges deployed on a net. Other techniques, using helicopters or large vehicles (often remotely operated) that drag plows, rollers, or flails, are in existence or are being developed.

Less-than-Lethal Technologies

Many "less-than-lethal" technologies were described in the various contributions. Uses of these techniques in peace operations are described in Col. Roland-Price's paper. Obvious potential uses could be for crowd control (especially when armed adversaries are interspersed with women and children); special operations to disable adversary equipment; protection of enclosed perimeters, such as observation posts of the international force or refugee camps. In many contexts, a principal advantage of such weapons would be the option to use less-than-lethal, but effective, force in a situation where the infliction of casualties by a peace force could further inflame a situation, leading to an escalation of

violence. **Panelists frequently cautioned, however, that less-than-lethal force should always be supported by proximate lethal capability, to deter an adversary from taking advantage of perceived restraint by a peace force.**

Less-than-lethal weapons may be divided into anti–personnel and anti–materiel categories. As one example of the latter, Dr. Finger suggested that high power microwave weapons, delivered by munitions, may be effective against an adversary's military electronics and may be soon feasible for operational use. Regarding anti-personnel possibilities, he suggested that the employment of acoustical weapons, causing nausea or discomfort, but not permanently disabling, was a near-term possibility. There is a multitude of other examples, some already in existence, others only in early laboratory testing. Sandia National Laboratories developed "sticky foams" years ago for protecting fixed, highly sensitive sites. These are able to immobilize intruders in enclosed areas, although there has been some investigation into their possible application for crowd control purposes. Other anti-materiel weapons mentioned were superlubricants (which, if spread on the ground, would make it difficult for many vehicles to operate or even for people to stand upright and move about); supercaustics; chemicals that can jellify petroleum products; chemicals to disable internal combustion engines (considered a very difficult problem); chemicals to attack many organic compounds, such as rubber; and metal embrittlement chemicals. Effective utilization for most of these suggested technologies would require the development of specialized delivery systems, except in the case of covert deployment by special forces.

Anti-personnel items include laser weapons (for dazzling or blinding adversaries, or for disabling electro-optic equipment), acoustic weapons (which may cause severe nausea or other extreme gastrointestinal distress), radio frequency weapons, entangling equipment, and sublethal munitions. The last are highly developed and in the arsenal of many nations, mostly for domestic police use.

There are also items that fit into the class of less-than-lethal weapons by some definitions, but are difficult to regard as real weapons. Equipment to aid in "psyops," or psychological operations, may include banal technologies such as radios, for example. Automated language translators, which may soon become practical, would greatly ease the problems experienced by many "blue berets" of the UN in dealing with local parties, often at relatively low ranks, on both sides.

It was not clear whether some of the above-mentioned possibilities, currently researched at the laboratory level, would be available for operational use in the near future. In the past, some items that appeared promising in the laboratory were not workable in the field. For example, some superlubricants were rejected for use in Northern Ireland by British forces, because the material rapidly washed away in the rain.

Sensors and Information

Advanced sensors will certainly be useful for purely peacekeeping operations as well as for any other type of military operation. When a cease-fire accord or peace agreement is in place, sensors could provide real-time information to both parties, ensuring that each will be convinced that the other is fulfilling his part of the bargain, for example, regarding limitations on the deployment of military equipment or troops near lines of demarcation. Suggestions have been made to use unattended ground sensors to facilitate a peace agreement between Israel and Syria that may include the demilitarization of the Golan Heights. These sensors might serve to make an agreement more acceptable to both parties and would reduce the number of third-party forces needed to police the agreement, making it easier to obtain the number of troops needed to carry out such an accord. Another zone of conflict in which sensors could serve to facilitate a peace agreement could be around the Siachen Glacier in Kashmir, where divisions of Indian and Pakistani soldiers face each other at altitudes over 5000 meters. The cost in resources and, even, in lives, of this stand-off is considerable. There is

some reason to think both sides would accept the presence of sensors, installed by neutral third parties, with output available to both sides, to assure each side of the other's compliance with a truce.

Sensors to monitor an agreement could also be mounted on overhead platforms, such as airplanes, unmanned air vehicles (UAVs), satellites, or even aerostats. The appropriate architecture to employ would depend heavily on the circumstances and on the physical environment governed by the agreement.

Dr. Yonas emphasized the importance of information and of controlling information flow, both in warfare and in peace operations. Sensors already exist that can transmit detailed information on both adversary deployments and the current battlefield situation. They may be placed on a variety of platforms, based in space, in the air, or on the ground (where they could be unattended most of the time). Sensors would operate over a broad part of the electromagnetic spectrum, including the visual range, near and far infrared, and microwave. Synthetic aperture radar is capable of providing high resolution data through cloud cover with resolution independent of altitude. A considerable advantage may lie in placing sensors on UAVs, if practical from the point of view of cost and power requirements. This addition to the arsenal of a commander could provide a powerful tool for obtaining reliable, real-time information from a relatively cheap platform that could be difficult for an adversary to detect and, therefore, to attack.

A unique promising sensor device is the SAFEGUARD system, developed at Lawrence Livermore National Laboratory. This system can detect a bullet or a mortar or artillery shell in real time by means of an infrared staring array. With the use of fast computing capability and clever algorithms, the device can locate the position of a sniper to less than a meter, *even before the bullet actually hits its target*. This system device has been tested outdoors under a variety of environmental conditions and needs to be tested under realistic military scenarios. Funding for this work has been limited thus far.

This system could facilitate countering snipers directly by means of either conventional munitions or, even (at least at night) a dazzling laser, which could prevent rapid refire. The last suggestion may be controversial, in that the use of lasers for this purpose could be countermanded by a future international convention; also, some countermeasures might be developed. But, whatever riposte is chosen, equipment that can locate a sniper virtually instantaneously would confer a great advantage on its possessor. Its utility in situations like those in Mogadishu and Sarajevo can be easily imagined.

Training Technologies

Finally, in the field of training, technologies to assist in training and simulation for the military do exist, and many more, of increasing sophistication, are being developed. A subset could easily be designed with the purpose of training peace operation forces in a number of relevant techniques, ranging from negotiations, to use of certain weapons and sensors systems, to operations in urban areas. Especially given the difficulty of some contingents (already noted) in learning to operate unfamiliar systems, the use of such techniques, especially if available in the field, would be of great use to many UN operations.

Conclusions on Technologies

A number of technologies and related equipment currently in existence have the potential to radically alter the course of peace operations, improving their chances for success. These include many forms of sensors, sensor platforms, less-than-lethal weapons, and information techniques (one key to improving sensor performance and to improve the ability to sift through massive amounts of data rapidly is to rely on remote pre–processing of information at the site of the unattended sensor).

As to the ultimate benefits of new technologies for future peace operations, there was some division of opinion on the panel. Many of the technologists among them were, quite naturally,

technological optimists. They appeared convinced that at least some, if not all, of the proposed technologies would turn out to be technically feasible, operationally practical, and cost effective in a variety of future operations, including peacekeeping and peace enforcement efforts and in war. Others were somewhat skeptical on a number of counts.

Skepticism was not directed so much at the ability of the technology to develop the required equipment: indeed, some of the items mentioned (e.g., in the less-than-lethal area, sticky foam, rubber bullets, superlubricants, and lasers) already exist, and some have been used operationally, although not always in the context conceived for peace operations. Rather, some of the problems seen were those implied in the criteria listed at the beginning of this section. First, the ability of peace forces (unless belonging exclusively to advanced industrialized powers) to purchase new, "hi-tech" equipment may be very limited, unless the devices turn out to be inexpensive. Second, the operational need for some equipment may not always be compelling. For example, crowd control, which is a police-type requirement that often surfaces during peace operations, may often be well handled by an appropriately trained and sized force without need for recourse to the products of new technologies. Further, concern was expressed that some contingents would have difficulty in handling adequately some of the advanced equipment envisioned, at least without a large amount of training. Moreover, some items could be quite lethal to children or the infirm, even though not lethal, under most circumstances to a healthy adult.

Finally, several panelists cautioned that some possible new weapons might be too susceptible to countermeasures, considerably reducing their utility. Further, other technologies could be appropriated by an adversary (by theft, or, in some cases, where the technology was not very difficult to reverse engineer, by indigenous manufacture) and lead to an escalation in violence, to the detriment both of the peace force and of the local population.

These cautions, however, did not imply a universal Luddite point of view. Rather, it meant that the employment, and, in some cases, the development of many possible new devices need to be thought out quite carefully in advance. Regarding laser weapons in particular, one panelist felt that a global prohibition on their use was, on balance, a desirable and a feasible end, notwithstanding the potential utility of such devices, e.g., dazzling enemy snipers. Further, the development of many less-than-lethal weapons could lead to their broad proliferation, and the world, including peace operations of the future, might eventually be the worse off for their development. The pivotal role of the United States was invoked, in that many other nations were likely to follow the U.S. lead in deciding whether or not to pursue many of these weapons. The conclusion, in the view of this panelist, was that the United States should be especially careful in choosing which path it should follow in developing new military tools, since the repercussions could extend far beyond direct U.S. concerns, but could have serious negative impacts on a global scale.

Therefore, no consensus on the use of various sorts of less-than-lethal weapons was expressed by the panel. On the one hand, a raft of near–term technologies appeared feasible, many of which could add substantially to the "kit" available to the commander of a peace operations force. Some appeared to have the potential for exciting and radical changes in the business of peace operations, especially in terms of protecting forces and civilians. On the other, for some of the possibilities and for some of the panelists, there were doubts that their application would be practical in most cases likely to arise.

Also, there was a view that the main problems that past peace operations have faced were not primarily due to a deficiency of available technologies or equipment but more to inadequate planning by the agency of intervention (usually the UN), confusing mandates from the UN Security Council, and to inadequate coordination among civilian and military commanders. In this view, technology may continue to play only a

minor role in determining success or failure of such missions.

However, regarding sensors, there was much less skepticism. A consensus appeared to exist that sensors were less likely to be provocative or to cause some of the problems that could arise from the utilization of certain less-than-lethal weapons by peace forces. There would be no issue of violation of international conventions or of triggering an arms race. The greater transfer of information to all parties, enabled by sensors, could well function to reduce tensions in many cases involving past or potential conflict by greatly increasing transparency. Further, the possibility that sensors can actually facilitate as well as help monitor future peace agreements has made their development and perfection for such purposes an attractive goal from any point of view.

Organization and Planning Requirements: Lessons Drawn from Past Operations

2

by
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INTRODUCTION

It is an open question whether it is productive to draw conclusions from past operations for future thinking and planning. First, by the end of the cold war era there was an explosive development in the number of peacekeeping missions without a fundamental discussion about possible changes in force organization and methods for controlling the operation. Second, the nature of conflicts has changed drastically from an international character into a more interstate nature. Ethnic, religious, and national contrasts have created uncontrolled turbulence and violence. Third, UN finances exploded out of control and put extra pressure on the Secretariat to find other ways to organize and other means to save money.

Most of the peace operations from the past were established under the cold war era with their specific presuppositions. Trying not to be too hypothetical, I'll base my views on experiences with the United Nations Interim Force in Lebanon (UNIFIL) operation. UNIFIL was selected mainly for two reasons: first, this mission was established under the cold war era and second, it has slowly changed its modus operandi into a better defined concept of operation reflecting overall changes in the regional situation.

ORGANIZATIONAL REQUIREMENTS

The conflict per se, the time factor, and available troops will together form the basis for the specific method of planning. With some few exceptions, the forces have been structured along functional lines and on the principle of minimal use of force. "Follow on Forces," operational, or strategic reserves have

never been established by the UN—mainly because it was almost impossible to find troops.

If we go back and examine the way UNIFIL was established, the methodology employed was ad hoc.[1]

The organizations are often structured with the following elements:

- Information/Intelligence
- Command and Control
- Operations
- Support

INFORMATION/INTELLIGENCE

The information element is often very vaguely defined and, consequently, vaguely executed.

The importance of exact and timely information-flow must again be underlined. In several instances, information collection and intelligence analysis were reduced to nearly useless activities. But these are critical requirements for a commander. Exact and timely information is essential to safeguarding your troops and knowing the actions taken by the belligerent.

This element of the organization has almost never been subject to studies and professional discussions. The sensitive nature of the information services is highly exaggerated—mostly for the lack of understanding.

In my mind, we can only succeed making "military information" real and effective through realistic planning and training. The training must cover tactical and strategic levels, and include political analysis.

COMMAND AND CONTROL

It is natural to move from the organization's information-elements to command and control.

Like the main body of a UN-force, the command structure also reflects the multinational character of the mission. The complexity and sensitivity of peace-operations create unique situations at all command levels. International media participation often increases the operation's complexity, especially in the command and control arena. Time factors make the command structure sensitive to media-actions. A quick media action can affect the decision-making process. In other words, no commander wants his superiors learning of an adverse situation first through a media report. Consequently, the command and control structure must be equipped with the right high-speed communication technology.

Incidents occurring locally can assume a high profile in political terms. This fact underlines the importance of having headquarters personnel adept at accessing and analyzing information, supported by integrated data processing systems.

The staff procedures must be direct and quick. A disadvantage is that not all nations can participate in such a staff-environment.

OPERATIONS

In this examination, "peace enforcement" is excluded based on doctrine and two assumptions:

1. the "rules of engagement" and "use of force" are not adaptable to a peace-operation; and
2. to enforce peace is, in reality, to replace one conflict with another.

Intervention could often be used as a synonym for peace enforcement. Such operations are better left to groups of nations requested by the Security Council and based on a Security Council Resolution.

In this case, only peace operations are examined. A fundamental examination consists of three main elements:

1. the task,
2. analysis of the current situation and the desired situation, and
3. needed improvements and support.

Based on tasks given to present and past peacekeeping and peace-support missions, certain characteristic activities occur:

[1] For a systematic analysis of methods it would be useful to start with "An Agenda for Peace" and the description of "Wider Peacekeeping."

- observing and reporting
- reacting
  —erect checkpoints
  —motorized patrols
  —foot patrols
  —blocking positions, on and off roads
  —intercept
  —tactical reinforcement (company/platoon)
- escorting
- defense
- covering actions
- tactical and general support
- training
- maintenance.

Further guidelines usually provided for the operations will be to keep the operation at the lowest possible cost with the lowest possible casualty rate. The guidelines are generally accomplished through the four following elements:

- observation and reporting,
- mobility,
- reaction and show of force, and
- protection.

A description of these elements will give a good picture of the current situation and consequently lead to our ideas about future requirements.

The detection capability today is limited. Equipment consists mainly of binoculars (day and night), surveillance radars and thermal vision equipment. Most of the observations are made from fixed positions.

It is easy to hide from UN observation posts, which means reduced UN control. UN checkpoints can easily be "outflanked," due to the limited UN surveillance capacity. Today we compensate for the lack of modern equipment through manpower and, hopefully, being at the right place at the right time with a patrol. The cost-to-benefit ratio is very low. Analyses of reports given also show that the situations are often misunderstood or—worst case—there are no reactions at all.

Based on accurate reporting, the UN units and subunits are supposed to react adequately in the situation. The UN reaction should also reflect a balanced use of force and simultaneously avoid the possibilities of escalation. This requires skills and a very good understanding of the nature of peacekeeping and peacekeeping techniques.

Concerning protection, most efforts have been put into passive means. This is too expensive and contains too many tactical disadvantages. More mobile protective ideas create better tactical possibilities and protection for the local population.

ORGANIZATIONAL APPLICATIONS

To specify organizational requirements for future operations could lead to a colorful picture. However, let's draw from the above some central ideas adaptable to modern organizations.

The normal modus operandi of a Security Council resolution develops into an operational concept, primarily described by its static nature—generally a network of positions able to observe, report, and react.

Changes are needed in the conceptual thinking that would allow a reduction in manpower (to make the operation less expensive), and also increase the operational capability of the force. These changes call for two main options:

1. Change to a more mobile concept. Where we have activities between parties, it is advisable to adjust from the traditional static model to a semi-mobile concept. This is important for two main reasons:

a. A mobile concept allows UN troops to patrol more with a greater presence in villages, farm-areas, along roads, in towns etc. This presence creates better contact between the local population and UN troops resulting in increased safety for the population and confidence in the UN operation.

b. Better controls with the belligerents. Knowing what is going on increases the possibilities of making the right decisions and reacting adequately to incidents. This again results in mutual confidence between the UN troops and the belligerents.

Two main factors must be introduced, namely: increased communication between the troops and the population, and impartial behavior.

2. Another method—maybe in combination with the previous—is to introduce modern military technology. One method of reducing manpower while also maintaining operational efficiency is to introduce a number of high technology aids. With proper training, these would more effectively allow the UN Force to observe and report activities in its area. At battalion level such equipment could include portable ground surveillance radars and ground sensors. For the Force as a whole consideration could be given to coastal radars, air surveillance radars, low light level television (LLTV), thermal vision equipment, ground sensors (seismic, acoustic, infrared, radio, laser technology, etc.) with all components combined into integrated systems. But, there are limitations on how far the technology can go.

The balance between moving troops on the ground and technology is delicate and must favor the presence of soldiers and the local population's confidence in the troops. How the organization will look on a piece of paper will vary with the national organizations and technical and educational composition of the Force.

So far we have been occupied with examining organizational requirements based on past and present models. However, future international crises and conflicts will probably change in nature and represent new challenges to the peace operations and their organizations.

To conclude this part a look into the future might unveil new elements and organizational thinking. Some analysts consider the old strategic elements; time, space and capacity to be too narrow a framework for modern thinking. Another limiting factor in present thinking is the concentration on the regional perspective. The problem—to find a balancing method between local conflict-solutions and regional ones—is a basic strategic and tactical challenge for the future. This change in conceptual thinking can be examined in light of regional conflicts like the former Yugoslavia and the central Middle-East.

As we look into the future the basic strategic elements in any regional conflict would include:

- ground/sea,
- air,
- the ballistic missile sphere, and
- the environment.

There are also serious problems like genocide and other grave violations of international laws and conventions. An expression like "ethnic cleansing" should be abandoned because it is an ethnic impossibility.

The first two elements could be called "old" dimensions. The new elements reflect the need to deal with the ballistic missile sphere, and environmental problems.

The environmental question must not be underestimated, in particular the issues of water and pollution. These are elements that can pose a threat to one or more nations, and therefore have security implications. Therefore it is one of the elements that must be contained in any regional security mechanism (e.g., the need to protect and cultivate water resources will lead to either a high level of cooperation or confrontation among the region states).

Concerning the ballistic sphere, the last wars in the Middle East (Iran-Iraq, Kurdistan, Gulf War) have clearly shown that the traditional strategic concepts are almost obsolete. One important result is—as we approach the 21st century—that "strategic depth" has little meaning. Medium and long-range ballistic missiles have turned the rear areas into the front line. Based on these new realities, any overall security system must deal with such ballistic weapons. Arms control and arms reduction also become vital elements in the picture.

Security systems that might be put in place will serve both the local and the regional dimensions:

- a local mechanism, based on bilateral and even multilateral arrangements, and

- a regional mechanism, based on arrangements where each nation is put in a regional context.

The first local mechanism serves as a deterrent to possible aggression and surprise attacks. In this regard, a UN-force could fill a role as a monitoring force in the mechanism. In addition, the duties imposed by the regional mechanism will help enforce activities supporting the peace. This is because only regional arrangements will lead to a dismantling of negative or threatening power structures. And, further on, work toward disarmament and arms control programs. For example, a program can be carried out at the regional level to collect data on military activities and the environmental situation. This data can be reported to all parties involved, and thereby ensuring stability.

These kinds of arrangements will have to employ space satellites and operate in collaboration with the major powers.

Such mechanisms are probably the only way of ensuring a reasonable level of regional and national security in an era characterized by space technology and nuclear, chemical, and biological threats.

The UN appears to not have both the capability and capacity to operate such mechanisms. It is therefore another argument to work with the establishment of a General Staff at a central level with subordinated regional headquarters.

A vital issue in the force structure is the determination of which weapon systems will characterize the force. In the situation evaluation, the organizations and weapon systems that the belligerents possess and their ability to use the systems are essential to understand.

On the other hand, the structure of the UN force decides the belligerents' reaction to the UN's activities in the same way. The force's structure itself sends signals to the parties concerned.

The effectiveness of any peace operation necessarily depends on the degree to which the parties concerned are prepared to cooperate with the force, and the manner in which the commander and his personnel are able—by tact and firmness—to carry out their mandate.

FORCE STRENGTH

When the decision about force structure has been made, the Secretary General decides the strength of the force. Logically, this decision is based on the mandate and the tasks of the proposed force.

The organization is not filled out without mentioning the medical component, helicopter capacity, logistic, and engineering components. There are additional support functions, such as humanitarian aid and the essential liaison to the parties concerned. A highly active liaison unit is vital in the confidence building activities; their credibility rests on their integrity.

From ideas concerning the organization, we now turn to the planning aspects.

PLANNING REQUIREMENTS

This examination will also point to the interaction between operational planning and force organization. During the operational planning, organizational requirements will fall out as part of the conclusions.

Before going into the planning procedure in more detail, we need to clarify the interactive mechanisms between peace operations and peacemaking activities. The interactions have three main dimensions: geographical, organizational, and operational. Any changes in one or more of these fields will cause political and/or diplomatic reactions—and vice versa.

Theoretically, we agree on the principle that no military action can be viewed as an end in itself. A pragmatic analysis of recent conflicts, and actions tells us this is not 100 percent true.

Military and civilian planners must therefore recognize and allow for the subordination of military operations to diplomatic and humanitarian activities and consider the likely effect of such subordination on military objectives. The political goal or goals constitute the principle criteria of the military plans.

REQUIREMENTS

The following applies to many important areas. It is expressed in general terms and is only meant as framework for the planning process.

Detailed guidance will always be developed for each aspect of the operation—both military and political. Detailed knowledge about the conflict concerned is vital.

COMMAND AND CONTROL

The command and control structure derives from the actual situation. In addition to the military units' chain of command, an overall regional command should be identified (the force HQ)—all organized into a single chain of command. Military and civilian elements should be integrated.

A robust, high-performance communication system must be available before reconnaissance and deployment is undertaken. Most important is to create interoperability, common language definitions, common procedures, and common message text formats.

The communications (signal unit) between the Force Commander and the units should be provided by one nation.

Liaison should be established to the parties from the earliest possible stage in the establishing process. Liaison and coordination may require the force to deploy specialists to meet requirements for translating and interpretation. These elements are some of the cornerstones of confidence building measures.

Information and intelligence are also vital elements in peace operations. Liaison is one of the channels for military information. Consequently, the liaison activities have to be protected. Through intelligently organized liaison, the force will build its integrity and its confidence. Therefore it is important that the sponsoring nations and organizations do not interfere with information activities. These information activities should only involve the force and the single party of the conflict.

LOGISTICS

For smoothly running logistic services, one nation should have complete logistic responsibility. The common working language is critical, both internally for the force and to interface with the local populace. To the medical units this is vital, in order to build up the credibility of the medical services. Civilian hospitals can provide the higher echelon in the medical organization. In other fields, it is not recommended to use civilian contractors. The overall organization of the logistics must be tailored to each mission.

PUBLIC RELATIONS

An offensive—as opposed to a reactive—relationship with the media is needed (i.e., initiative, quick communication means, and adoption of media techniques to control information). However, reliable information is essential. A positive attitude toward the media will create a constructive atmosphere and lead to a more supportive role.

OPERATIONAL PROCEDURES

The establishment of standard operational procedures is extremely important. The rules of engagement, education, training, and exercises, and the use of force are the central chapters to emphasize in these procedures. These are unique for each force and are products of the mission, the force, and the parties involved in military actions.

THE LEGAL ASPECTS

The Force Commander should concentrate his work along three lines:

- internal, legal, and disciplinary aspects;
- international law, conventions, and regulations; and
- legal aspects of the relationship between the force and the host-nation.

BUDGET AND FINANCE

Special consideration should be given to the funding issue, which must be resolved in the early stages of the planning process. The political authorities must establish a general policy on the source of funds for such operations. Operational commanders with budgetary responsibilities need to know the policy and, in addition, when funds will be made available. Due to the dynamic nature of peace operations, renewal of funds will probably be approved on a case-by-case basis. Funding requirements for assets used jointly by participating states and organizations need to be resolved as quickly as possible, preferably in advance.

CONCLUDING REMARKS

Tensions, rivalries and conflicts are germinating. Activities such as terrorism and mass migration will call for peace keeping, preventive deployment, or humanitarian relief operations.

One of the risks to peace operations is the reopening of hostilities in defiance of an agreed cease-fire by one or more of the parties involved. If peacekeeping forces are deployed in a buffer zone they face an imminent and direct risk.

Potential crisis areas comprise the full spectrum, from direct hostilities in certain developed regions to emerging political rivalries in more remote areas. In general, a mixture of political instability, economic failure or deadlock, and over-armament, could influence dormant border and ethnic disputes or form the basis for undemocratic expansionism.

Technological developments have affected peace operations and humanitarian activities considerably. Modern communications allow direct access to crisis areas. Developments within surveillance technologies allow continuous supervision of all kinds of terrain, troop movements, natural resources, etc. in given areas. All of this creates new challenges for military planners. Forces put into action in peace operations should be tailored to each mission.

It can be dangerous to generalize from the lessons learned in earlier missions. It will therefore take extra efforts from the planners to extract the right elements from earlier missions when new organizations are made.

However, certain principles can be laid down as guidelines:

a. deployment of peacekeeping forces is based on the consent of the parties directly involved;
b. deployment does not imply specific attitudes toward the conflicting parties' rights, demands, or positions; and
c. weapons are only used in self-defense.

To the extent that deployments deviate from one or more of these principles, the operation assumes a more enforcing role.[2]

In practical terms, the more the deviation from the above principles, the more there will be an overall increase in requirements for actual combat power and survivability. Survivability is determined by the unit size, equipment, operational concept, background training, and logistic support. However, the same elements will also characterize the force tailored for peace operations.

The elements of the organization create political signals. Military means and political activities are interactive mechanisms.

The readiness for peace operations are built on two pillars:

a. the material standards within the deployed force; and
b. the level of tailored training among officers and men for that particular peace operation.

"The professionals in violence" must put a lot of work into peacekeeping techniques. Their professionalism will be measured against the training standard established for this particular job.

Success will be built on credibility and confidence.

[2] Reference the United Nations Charters' Chapters VI and VII.

Case Study: The Multilateral Force in The Sinai

3

THE MULTINATIONAL FORCE AND OBSERVERS

Since 1982, the Multinational Force and Observers (MFO) has performed its peacekeeping mission under the 1979 Treaty of Peace between Egypt and Israel, and the 1981 Protocol to the Treaty. The MFO's uniqueness lies in its role as a confidence-building measure (CBM) under a definitive Treaty of Peace. As such, it is not an interim or transitional mission that fits under Chapter VI or Chapter VII of the UN Charter. The MFO was created by the Protocol to the Treaty, and reports directly to the two Treaty Parties. It lies outside the United Nations system, with its own independent international legal personality pursuant to the Protocol. It has a Headquarters Agreement with Italy and a network of participation agreements with 11 troop contributing countries. This bilateral origin has profound implications as to how Treaty-related confidence-building measures are structured, funded, and managed. The MFO was originally modeled in the field along the lines of familiar Chapter VI United Nations peacekeeping entities. However, over time the MFO has been free to evolve its own practice and innovate in the areas of management, operations, logistics, and finance.

For over 13 years, the MFO has discharged its mission as set forth in the Treaty of Peace, specifically its Annex I concerning security arrangements, and the Protocol. The accomplishment of the MFO mission has been an anchor for the broader regional peace process, and a potential model. The lessons learned from the MFO experience are of interest to any future architects of new peace treaties who contemplate their own, non-UN, confidence building measures. MFO's successful liaison structure

by

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grown up between the two formerly warring parties is a model worth copying.

Shared Funding

The success of the MFO mission rests on the underlying commitment of the Parties to the peace and support of their own creature the MFO. The MFO is funded primarily by the two Treaty Parties themselves; the MFO budget of $51 million is provided in equal measure by the three Funds-Contributing States, Egypt, Israel, and the United States, with smaller financial donations by Germany, Japan, and Switzerland. MFO finances are on a pay-as-you go basis funded by draws against letters of credit or similar arrangements. The Parties have daily oversight, in the field, of what we do and how we do it. This cost-conscious environment is both healthy and interactive. As the United States, the patron and witness of the peace, intended, the MFO structure has helped to reduce the U.S. financial burden, and shift the third-party role in day-to-day support of peacekeeping to MFO management. Visitors to the MFO have found a private sector flavor to the MFO management style, with our annual Trilateral Meeting compared more to a shareholders' meeting than a typical diplomatic conference.

The liaison system created by the Protocol has fostered cooperation, and adjustments to the Treaty regime consider political, economic, and other developments. The Treaty and Protocol mandate is clear, but the drafters could not foresee all the changes and situations the MFO has faced on the ground over time. Through the liaison system, the drafters provided the mechanism for necessary adaptation. In itself, it is a model for regional cooperation.

The credibility of the MFO as an independent agency has attracted durable participation from countries that recognize the need for continuity in support of a confidence building measure under a permanent Treaty. Troop contributors currently include Australia (which provides the present Force Commander), Canada, Colombia, Fiji, France, Italy, New Zealand, Norway, the United States, and Uruguay. The latter eight countries have served in MFO uninterruptedly since 1982; the Parties and MFO owe them a great debt of gratitude. Hungary is completing formalities to participate, replacing a contingent from the Netherlands that served from 1982 until April of this year. The U.K. was also a participant for the MFO's first ten years. Support from participants has included contributions of critical specialties and, with the U.S., France, and Italy, key capitol equipment [in the past, Australia and Canada also contributed capitol equipment]. Previous Force Commanders have come from Norway, New Zealand, and the Netherlands.

Organization

In Treaty Zone C, the MFO operates two main camps, and 31 remote sites manned by personnel of three light infantry battalions provided by Colombia, Fiji, and the United States. These are supplemented by mobile and foot patrols, and temporary observation posts. Deployed in the Strait of Tiran is a Coastal Patrol Unit of three vessels provided by Italy. A small, 15-person Civilian Observer Unit (COU) is the specialized arm of the MFO that alone verifies Treaty compliance in all four of the Treaty Zones. The large distances of the Sinai are covered by one DHC-6 aircraft provided by France, ten UH-1H helicopters provided by the United States, and the MFO vehicle fleet. Except for vessels and aircraft, all equipment is MFO-owned and procured, standardized where possible on one or two manufacturers, and interoperable by our contingents. We perform many support activities through a U.S.-based support services contractor, which in turn subcontracts for labor with an Egyptian services company. Logistics are done by a mix of soldiers, contractor personnel, and direct hire civilians. Most MFO procurement is by competitive bidding from commercial sources in Egypt, Israel, United States, and to a much lesser extent, other sources. We also procure from the U.S. Defense Department about 20 percent of our total requirements, in particular aviation parts

and supplies, medical supplies, and food and general supplies when cost-effective.

Cost-Conscious Management

The attention of MFO management increasingly has been directed toward reducing costs. With the consent of both Treaty Parties and the United States, coordinated through the annual Trilateral Meeting, the MFO has steadily cut away at its overhead, absorbing annual inflationary impacts and reducing its cost to the contributors. The MFO budget has declined 31 percent since MFO FY 89.

Budget reductions have resulted from a number of initiatives. We have reduced personnel at the Rome Headquarters (currently 25, down 41 percent since FY 89) and military strength at the Force (currently 1,952, down 17 percent since FY 90, and down 28 percent since its peak in FY 87). We have not adopted UN financial practices for peacekeeping and we have arranged troop contributions at less cost. The MFO has closed nine of its original remote sites, reduced its aircraft fleet by 50 percent in FY 90, and reduced the vehicle fleet by 24 percent since FY 88. Logistical savings have been achieved by reliance on commercial, competitive procurement (inverting the 80 percent dependence on the U.S. DoD supply system that the MFO had at its inception); by applying commercial warehouse management concepts to stocking and inventory management; and by reduction in the cost of our support services contract. The quality of performance of our mission and our support for the troops has remained high. Since 1986, the MFO has sought to reduce further the burden on the three Funds Contributors by seeking, with their diplomatic support, other financial donors, resulting in annual contributions by Germany, Japan, and, last year, Switzerland. These collectively amount to just under $2 million per year. At the same time, MFO disbursements in the two Treaty Parties provide about a 60 percent "return" on their MFO financial contribution, and, in the U.S., exceed current U.S. "incremental costs" of participation as defined in a recent study by the General Accounting Office, an arm of the U.S. Congress.

The flexibility and independence of the unique MFO management structure and its conscious political insulation, unfettered by quotas, are two reasons for its successes. They allow cost-effective innovation with a minimum of intrusion by national political agendas and the bureaucracy that hamper change in other environments. Constructive trilateral review of the MFO has proven to be a continuing feature, with a declining budget and personnel count as the result.

The United States plays the combined roles of troop-contributor, Funds-Contributing State, and patron and formal witness of the Peace Treaty. The MFO Director-General, nominated by the State Department and appointed by the Parties, embodies, day-to-day, the third-party assistance implicit in the role of patron and witness in ensuring the success of the peacekeeping mission. We draw the observers in the MFO's all-civilian unit from the United States, as a further reflection of the U.S. role as witness to the peace. This does not in any way diminish the important roles of other countries that contribute critical specialties or equipment. But the MFO could not have been created from scratch and taken up its mission without the generous financial, diplomatic and military support provided by the United States. Creating future MFO-like entities would also entail the support of one or more key external diplomatic, financial, and military patrons to ensure that requirements are met. Future creations would also require an existing management structure like the MFO's or the creation de novo of its analogue.

The MFO will continue to serve the two Treaty Parties as long as we are called upon by them to do so. The Governments of Egypt and Israel, in light of the evolution of the peace process, will define the MFO's future. They have agreed that now is the time for stability in the MFO, and continuity of its structure and participation, as the peace process expands in the face of the ever-present setbacks and the hostility of its enemies. Only time will tell if new peace trea-

ties in the region might produce similar, MFO-like entities to serve the interested parties.

TECHNOLOGY IN THE STRUCTURE OF TREATY CBMS

Any consideration of technology as an adjunct to peacekeeping depends on many factors, including the context, mission, specific monitoring or other objectives, terrain and environment, and cost. The architecture of the Egyptian-Israeli Peace Treaty presumes the development of a strong, stable, peaceful, and "normal" relationship between the two former combatants. In a material degree, this has been achieved, although full normalization is still linked to regional issues external to the bilateral process. The barometer of bilateral political relations therefore goes up and down, but within a band that for the Middle East is rather normal looking indeed. The discussion of the use of technology for the Egyptian-Israeli Peace Treaty, as it relates to CBMs and to aids to observation and verification, falls within the framework of "traditional," fully consensual peacekeeping.

The Treaty presumption of development of positive bilateral relations was bolstered by a series of CBMs, the MFO being the key third-party mechanism. In the sphere of verification of security arrangements contained in Annex I to the Treaty, there are three levels of confidence-building and security measures, each with its own technological assumptions.

First, the Parties themselves retain national capabilities for early warning. These are explicitly recognized in Annex I to the Treaty; the presence of Early Warning Systems is expressly sanctioned in two of the Treaty Zones in which the implementation of the Treaty is supervised by the MFO. The MFO Civilian Observer Unit routinely calls at these sites in Zones A (in Egypt) and D (in Israel). The Treaty places no limitation on their size or capabilities within the specified Zones, but associated military manning and protective features fall within the general military limitations articulated in the security Annex I of the Treaty. Aerial platforms for reconnaissance activity are also permitted in these two Zones. Thus, national means are not merely assumed, but are woven expressly into the fabric of security arrangements.

Second, by agreement among Egypt, Israel, and the United States, U.S. high-altitude surveillance flights periodically take images of the Treaty Zones, and a narrative report of the interpretation resulting from the raw data is shared with Egypt, Israel, and the MFO. This activity is reflected in the Appendix to Annex I to the Treaty, and in side letters to the Treaty dated March 26, 1979.

Third, the MFO itself, is, by design, a low-technology force and observer unit, relying primarily on visual, on-the-spot verification throughout the Treaty Zones.

The decision not to endow the MFO with sophisticated radar, sensor, or other monitoring assets was conscious. This decision was taken fully in light of previous experience in the Sinai with such assets. The U.S.-sponsored Sinai Field Mission (SFM) from 1976–1980 assisted the two Parties with monitoring of the strategic Giddi and Mitla Passes. The SFM used four unattended ground sensor fields, TV and infrared scanner technology to supplement human effort in monitoring the passes, which separated Israeli and Egyptian Forces at that time during the staged withdrawal process.

There are several relevant factors behind this decision:

- Most importantly, the symbolic, political role of the MFO required a Force size that had credible political "weight," a consideration not directly linked to strict operational or technical criteria. The operational concept becomes meshed with the political requirement. From a technical point of view, there are many possible theoretical variations for accomplishing a mission like the MFO's; the drafters of the Protocol intentionally picked a model that was manpower- and not technology-intensive.
- The existence of the technical means discussed above diluted the need to endow the MFO itself with advanced technology. In par-

ticular, the third-party assistance of the United States in conducting aerial photographic reconnaissance provides a synergy with the MFO. Weaknesses of photographic interpretation, particularly when it comes to counting personnel, identifying unit affiliations, distinguishing civil from military construction, or differentiating between certain types of equipment, are well complemented by the strengths of ground-based observation by the MFO.

- There were also structural factors. The MFO covers a large mission area (56,000 km^2), which includes multiple historical access and invasion routes; the SFM used technology in the Sinai to monitor only two of these during its existence. The MFO mandate does not include security, per se, of the border between Egypt and Israel. Anti-smuggling and antiterrorist protection of the frontier is the responsibility of Egyptian and Israeli authorities, not the MFO. There are areas along the border where sensor equipment is useful to the Parties in dealing with such intrusions, but the MFO role regarding unauthorized crossings is an incidental one as we carry out our other functions. Moreover, the MFO has no focus on particular plants, facilities, sites, or processes, like those the subject of UN surveillance equipment in Iraq, although it does have checkpoints focused on specific road monitoring.

Technology is present, in a supporting role, in the MFO. Communications are essential to any force, and the more so in our large and environmentally hostile mission area; we have redundant HF (high frequency), VHF (very high frequency), and telephone communications, with all sites having at least two communications means. Computers are now as standard in our staff functions as the typewriter used to be. As a safety feature, global positioning satellite (GPS) systems are installed in our COU vehicles, and on the French and American aircraft in MFO service. Our remote sites have night vision goggles, as do our American helicopter aviators. GPS and marine radar are on our three Italian coastal patrol unit vessels, and we have had ground-based commercial radar at one site near the Strait of Tiran. This ground-based radar has proven costly to maintain for the relatively limited benefit it provides us. It will be turned off and sold, and we are considering whether we will replace it with some other equipment. We have basic mine detection capabilities, since the Sinai is awash with mines that we must clear from the areas of our sites and foot patrol/temporary observation post missions, and that we must dispose of when Bedouin bring unexploded ordnance to our locations, which happens frequently.

Visual Observation Is Key

But the focus of the MFO mission is on people and their visual observation, usually assisted by no more than binoculars. If, for example, our personnel think they observe an aerial intrusion over the international boundary, successful identification and violation confirmation depends on such factors as aircraft altitude, speed, heading, and markings, as our personnel attempt to make visual recognition and find out if the aircraft has, in fact, strayed over the boundary. Obviously, not every sighting will lead to a certain conclusion, but we can still raise with the Parties cases that do not result in formal Treaty violations. These kinds of technical limitations reflect the will of the two Parties, and in context, do not materially limit the MFO in accomplishing its mission.

It is our ability, based on our freedom of access throughout the Treaty Zones, to be physically present and verify any site that is key. This is the bottom line for any system of verification, no matter what technology may be usefully deployed to assist the mission, as it was also for the SFM.

Our experiences with the equipment we have has led us to several conclusions. Equipment must work in the relevant environment. In our case, heat extremes and sand infiltration constitute the norm; all our equipment must work under such conditions. There are many, more significant environmental factors in terms of a wider use of technology. The SFM, to which I

have referred, had two hundred "alerts" a day on its sensors, a good cure for operator boredom. However, the registrations primarily consisted of wildlife, illegal economic activity (the Sinai has been a smuggling and military corridor), aircraft overflights, Bedouin movements, UN and SFM members, and authorized personnel of the Parties, including joggers. By contrast, in four years of monitoring of the two passes, SFM reported only 90 violations.

Equipment must be user-friendly. Our military personnel are from several different countries, they rotate frequently (maximum tour lengths are one year, but many serve less than that), and prior familiarity with our largely commercial equipment may be minimal. Training requirements, operation, and operator-level maintenance must be straightforward—the famous "KISS" (keep it simple, stupid) principle. Other levels of maintenance must be locally supportable (by the Force itself or local vendors, not always feasible in a remote location). Hardy, rather than hypersensitive, equipment is the goal. The benefit the MFO has derived from using MFO-owned equipment, standardized in terms of procurement of parts and maintenance effort, and interoperable by all our contingents, cannot be overemphasized.

Given MFO's inspector-based verification and our practice, any proposal to add new technology faces strict scrutiny on operational, financial, technical and policy grounds. Equipment needs must be fully justified. The maintenance cost tail of a procurement decision, as well as the purchase price resulting from competitive bidding, must be recognized up-front. Vendor warranties and capabilities to deliver on local servicing commitments are no less important.

These considerations may seem clinically obvious, but in practice they are not; sadly, some of this knowledge comes only with experience, some of it expensively acquired.

TRAINING PROGRAMS

Relentless turnover of military personnel is a reality in any peacekeeping environment, but it is a critical operational consideration. The discontinuity it provokes impinges on operational efficiency, and on evaluation of new technological assets. We combat the effects of this phenomenon on two tracks. One is the emphasis on civilian personnel in key positions at the Headquarters, at the Force, and in our Cairo and Tel Aviv offices to provide institutional memory and seasoned experience to support the military officers and personnel to whom much of the mission is entrusted. The other is an emphasis on training to maximize the contribution of military personnel to the MFO and to ensure a proper transition of thinking from the arts and science of war to those of peacekeeping.

The MFO is a well-established mission with a relatively clear mandate. We have had the time in place and experience to develop training programs tailored to our particular needs. The principal components have been shared with participating governments and the UN.

In the face of tours that vary in our three infantry battalions from 6 to 12 months, and given the diverse levels of prior training and experience, MFO training must begin prior to deployment to be effective.

Predeployment

We have developed a predeployment training package designed for the three light infantry battalions, with practical skills and suggested drills to ensure retention and understanding. The training at this stage remains a national responsibility. The package we provide, aimed at the trainers, provides basic guides and information, and a series of lessons. The lessons cover running a field site, patrolling, observation and recognition skills, reporting procedures, communications, survival skills and first aid, explosive ordnance disposal, cooking, and operation and operator-level maintenance of small generators of the type we have at our remote sites. We encourage units in predeployment training to put together mock check points and observation posts, and simulate situations that cover on-site incident observation and reporting, and also communication and coordination of response actions staffed through higher echelons. The transition in thinking and

approach from a defense to a peacekeeping force begins here, including our rules of engagement, limitations on our response to situations arising outside our facilities, and emphasis of the MFO mission focus: "Observe and Report." This entails emphasis as well of the unique elements of the MFO, as opposed to other peacekeeping missions, going from the fact that we work directly for the two interested Parties with their full support under a definitive Treaty of Peace. We have to remind soldiers that we have our own practices, regulations and management philosophy. What works "back home" or in the UN is not necessarily the way we do it at the MFO.

As part of the package, we provide color posters to assist in recognition of military grades and ranks, military, police and other license plates, and aircraft of both Treaty Parties. The posters are also intended for day-to-day use at remote sites. More comprehensive picture-book recognition guides are produced for company level use and above.

The predeployment training package is critiqued by those who have used it, and we intend to update the package biennially. In time we will likely make better use of videotaped training courses.

Deployment

Arrival at the MFO triggers our programs of basic orientation and hand over. A Newcomer's Brief is presented as early as possible to all new arrivals. It is conducted by the Force Commander and key staff with briefings on the mission, the human and natural mission environment, key functional sections of the staff, unexploded ordnance hazards, and energy and water conservation, followed by a remote site orientation for staff personnel.

We have a formal hand-over program for each key staff position, based on a hand-over book, updated by each incumbent. The hand-over book provides both general orientation information, and specific information relevant to the staff job and function to be assumed, including daily routines, established MFO procedures, required coordination, and key MFO regulations and Force orders. The book is intended to lend structure and discipline to personal hand-over and provide a substitute for that personal contact when there is no overlap between the departing member and replacement. Quality over time frankly varies with the degree of attention given to updating the materials by the incumbent, and with command emphasis and review placed on maintaining and improving these tools. The orientation and hand-over programs apply to military and civilian personnel alike.

All new arrivals receive driver training and testing. This and other training discussed below are conducted or coordinated by a small but critical staff element called the Training and Advisory Team provided by New Zealand (NZTAT); they reflect the MFO commitment to systemic training, and they do their job superbly.

Driver training and testing for an MFO driver's license are required to ensure a common standard of driving skills among all the contingents, and to sensitize personnel to the rules and many hazards of the road in the desert. In our non-hostile situation, our losses of personnel stem from accidents and carelessness in coping with a demanding physical environment in particular from not driving safely and at appropriate speed. The desert is not empty, hazards abound, and we periodically have fatalities and serious injuries from avoidable accidents. These are a tragic waste of young life. We therefore take our safety training very seriously. We want all our soldiers to return home safe and sound, enriched by a rewarding professional experience and having seen at least some of the major tourist destinations in our host countries.

NZTAT trains the trainers; contingent trainers are prepared by NZTAT to conduct the actual training in a four-day course. To qualify, trainees must pass a written test, a practical driving assessment, and an in-cab test of instructional skills. Once qualified, trainers conduct both initial training leading to the MFO license test, and continuation training. When they determine that drivers are ready for MFO license testing, for reasons of standardization, NZTAT conducts the

test and decides if a license will be issued. For persons who will be designated contingent drivers, there is a special 2-day defensive driver's course emphasizing driver attitudes, car control, and road hazard prediction and identification. There is also a special course for, and assessment of, drivers who will be assigned to drive MFO buses. Follow-up by NZTAT includes driver components of the semiannual Force Skills Competition, quarterly snap driver tests, snap vehicle inspections, technical advice when accidents occur, and collaboration with the Force Safety Officer.

NZTAT also conducts a critical remote Site Commander's Course, a four-day preparation of site commanders for duty at our observation posts and checkpoints. The course reviews operations, observation and recognition responsibilities, and site maintenance. Other specialized courses address training for the range officers, duty investigators who assist the Force Commander in on-site investigation of possible Treaty incidents, and quick reaction units at each camp.

Ongoing Training

Continuing training is provided throughout tours of duty with the MFO. Battalion training in MFO skills, primarily a contingent responsibility, is ongoing. Validation of the success of this training is a NZTAT responsibility, conducted by means of quarterly operational readiness checks of each infantry battalion to review standards of remote site personnel in key skills areas. The Force Commander also has a site inspection program that semiannually evaluates performance and conditions at each of the remote sites. After-action analysis with relevant personnel of what went right and what went wrong in actual Treaty incident cases, in terms of observation, reporting, and follow-up, is a standard feature. There are periodic training exercises such as mass casualty and medevac (medical evacuation) drills, assisted by NZTAT, and, as noted, reinforcement of driver safety. We seek feedback from contingents on the successful and weak points of all of our training efforts.

National training is not interrupted during the period of MFO deployment. Except for mission-imposed operational limitations (for example, no parachute jump training or large unit exercises), basic skills are maintained. The MFO experience provides many positive adjuncts. Infantry battalion operations, with the emphasis on remote site missions, allow the consolidation of small unit skills, and development of junior officer and non-commissioned officer leadership proficiency. Valuable peacekeeping skills, learned in a model, "textbook" environment, are taken home. While many militaries face doctrinal, manpower and financial challenges in integrating peacekeeping business, it is a reality that the business is growing. The inventory of peacekeeping skills to which the MFO contributes is one of the pay-backs of MFO service.

Civilian Observer Unit Training

Specialized training for the 15-person Civilian Observer Unit (COU) is provided by the Unit itself. Approximately one-half of the complement of this Unit consists of officers seconded from U.S. foreign affairs agencies, most of them serving on one year tours. The other half of the Unit, recruited directly by the MFO, consists of seasoned ex-military veterans who typically stay in the COU far longer. Just as these observers are the continuing institutional memory of the COU, they also train the new class of seconded foreign affairs agency personnel as quickly as possible to conduct MFO missions. The COU program emphasizes recognition and observation skills, knowledge of the Treaty and the operations area, map reading and navigation skills, radio procedures, COU practice and conventions, and awareness of environmental hazards. Each new observer is assigned a more senior observer as mentor reinforcing classroom training in the field, to instruct new personnel on detailed characteristics of each of the COU mission areas, and to participate in evaluation and eventual "team leader" qualification of new personnel.

In the face of a revolving work force, the MFO emphasizes its hand-over and training program to promote standardized required skills across our diverse contingents, and to communicate effectively who we are, what we do, and how we do it. At the heart of the program is the use of our own resources to train the trainers, provide key materials and technical assistance, and perform systemic evaluations to validate the results of MFO and contingent training. We believe we have been successful in developing and standardizing the core skills required for the mission, but the challenge recurs with touchdown of each new rotation.

Extended Peacekeeping: Planning and Technical Requirements: Lessons from Recent Operations

4

INTRODUCTION

Rapidly losing interest in their global confrontation, in the late 1980s the two superpowers handed over a number of old regional conflicts to the United Nations for management or resolution. In cases such as Namibia-Angola, Cambodia, the Iran-Iraq war, Afghanistan and Nicaragua, the world organization appeared up to that expanded role and in fact created increasing expectations about its ability to deal with important crises whenever they would appear. Free from their relationship with two competing global subsystems, most such conflicts—and new ones, such as Yugoslavia, Somalia and Rwanda—revealed the underlying and hard-to-deal-with nature of civil and ethnic strife.

Responding to the new pressure for intervention, the dimension and functions of the UN peacekeeping forces expanded enormously. The number of UN personnel (mostly military) brought into Cambodia starting in 1991, was close to 20,000. In 1993 the UN operation in Somalia (UNOSOM II) included more than 30,000 people. Even larger was the total force deployed in three republics of former Yugoslavia—Croatia, Bosnia-Herzegovina, and Macedonia—beginning in 1992.[1]

The UN operations became increasingly multidimensional in character and came to be carried out in ever more complex operational environments (compared with past peacekeeping operations). The list of tasks performed expanded to include, besides the most traditional one of separation of forces, also electoral support, humanitarian assistance and movement of refugees and displaced persons; mine clearance; observation and verification of cease-fire agreements; foreign troop withdrawal; preventive deployments; demobilization of forces; collection, custody and

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destruction[1] of weapons; and disarming paramilitary forces, private, and irregular units.[2] As indicated in the following pages the lists of tasks further expanded with the international interventions in former Yugoslavia and in Somalia.

Responding to the pressure that the United Nations must manage or solve complex crises, the UN Security Council has increasingly authorized, in recent operations, the use of military force to achieve different humanitarian or political goals. Depending on the environments, the results are different. However, most notably in former Yugoslavia, the difficulty of mixing the humanitarian operation on the ground with limited elements of peace-enforcement has come dramatically to the surface.

The expanded role of the UN has also produced a wealth of analyses and proposals that argue for the international community to be given broader rights to intervene in the internal affairs of troubled states. Many analyses suggest ways to enhance the effectiveness of UN peacekeeping missions, and ways to adapt the organizational structure of the UN—and of the Secretariat in particular—to the new demand. A sort of taxonomy has been adopted in the writings of UN staff and scholars classifying the different peace-support operations of the UN on the basis of its broader objectives. Successes and failures of different UN operations were then explained on the basis of such typology.

Much of the analyses contributed importantly to clarify the conditions and the environment for UN peace-support operations. And of course improvements in the organizational structures and organizational capabilities of the UN were and are very much needed. However, those analyses and proposals also risk feeding the illusion that the issue is essentially technical in character, that there existed the analytic and doctrinal capability to define the path to the achievement of most objectives. They contribute to legitimize a political conception of the United Nations as an organization responsible for and capable of—beyond its establishing the legitimacy of a given position—"policing" the world.

By looking at the international interventions in Somalia and in former Yugoslavia, the present essay focuses on the genesis of and conditioning present in recent UN operations. Its aim is to clarify the reasons for the difficulties in which the United Nations has found itself in such operations.

PEACEKEEPING AND PEACE–ENFORCEMENT

As further clarified in another chapter of the present volume, the first thing the commanders of UN forces need is a clear and achievable mandate for their mission.[3] The mandate determines the appropriate military doctrine. The doctrine employed is essential for the operation on the ground: it shapes the organization, training and force equipment. Those leading UN peace operations know precisely what they can achieve with the kind of forces at their disposal. However, the mandate for the forces is what has become increasingly confused in recent UN operations.

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[1] The deployment figures given here for recent operations are approximate figures of actual forces deployment. The strength of the force deployed changes in long–lasting operations. Authorized strength was different in most cases. And in cases such as UNOSOM II, the large UN contingent had some U.S. military personnel in it and was closely supported by other U.S. forces. In comparison with those recent operations, older ones required much smaller peacekeeping contingents. The Cyprus UN operation, started in 1964, included about 2,200 people, and 1,100 military personnel were deployed in the Golan Heights after the Golan Agreement of 1974. In the 1980s there was a UN force of 5,600 people in Lebanon, and one of about 6,000 people in Namibia. An exceptional case during the Cold War was the Congo UN operation in the early 1960s, involving almost 20,000 people. See *The Blue Helmets* (New York, United Nations, 1990); Joseph Preston Baratta, *International Peacekeeping: History and Strengthening* (Washington, D.C., Center for U.N. Reform Education, November 1989); UNDPI, "Background Note: United Nations Peace–Keeping Operations" (January 1993); Bo Huldt, "Working Multilaterally: The Old Peacekeepers' Viewpoint," in Donald C.F. Daniel and Bradd C. Hayes, *Beyond Traditional Peacekeeping* (New York, St. Martin's Press, 1995).

[2] See Mats R. Berdal, *Adelphi paper 281: Whither UN Peacekeeping?* (Brassey's for The International Institute for Strategic Studies, London, October 1993), pp. 11–ff; Paul F. Diehl, *International Peacekeeping* (Baltimore, The Johns Hopkins University Press, 1994), especially Ch. 6.

[3] See paper by John O.B. Sewall in this report.

The then UN Under Secretary General for Special Political Affairs, Sir Brian Urquhart, warned in early 1990 about the need to maintain the classical conditions for peacekeeping missions:

- impartiality, and consent of all parties involved,
- a clear and practicable mandate,
- and the non-use of force except for self-defense.[4]

These were the classical conditions of UN "holding operations," carried out by UN troops interposed between the combatants while a solution to the conflict was negotiated.

Inevitably, in the context of the enormously expanded responsibilities of the UN, those criteria were bound to be eroded. Boutros Boutros-Ghali's *Agenda for Peace* (early 1992) first blurred important definitions. While recommending a clear distinction between peacekeeping and peace-enforcement operations, and separating the role of the UN Military Staff Committee from peacekeeping, he still came to the conclusion that "there may not be a dividing line between peacemaking (a concept in which he included peace-enforcement) and peacekeeping."

We are clearly, with "An Agenda for Peace," in the post-"Gulf operation" era. And in fact Boutros-Ghali went on defining the requirements for peace-enforcement missions (to respond to acts of "outright aggression") and advocating the implementation of Article 43 of the UN Charter, that is the creation of UN permanent armed forces available to "dete[r] breaches of the peace." On the same line of thinking, in 1993 he began to promote and articulate the idea of a standby force structurse for the United Nations, "able to be deployed ... anywhere in the world, at the Secretary General's request."[5]

Important, recent analyses are critical of that stretching of the confines of the peacekeeping operations. To former UN Assistant Secretary-General Giandomenico Picco the intrusion of the Secretary-General into the peace-enforcement domain has compromised the most important and successful functions of that institution—based, as they need to be on absolute impartiality.[6] The author of the British Army Peacekeeping manual, Charles Dobbie, concludes, in a recent article, that "peacekeeping and peace-enforcement are... separate and mutually exclusive activities that cannot be mixed."[7] While it is easy to share such criticism, it is also important to find out the reasons for the more ambitious, present disposition of the UN and of its Secretary General. The Somali and Yugoslav experiences may be particularly illustrative in this respect.

INTERNATIONAL INTERVENTION IN SOMALIA

Starting with the first deployment of UN military observers, there were three phases of the UN and multinational military intervention in Somalia. After a small contingent of military observers had been deployed in Somalia (decided upon in March, carried out in July 1992), with its Resolution 751 (April 24, 1992) the UN Security Council decided to establish a UN Operation in Somalia (UNOSOM). In August the UN Secretary General proposed the deployment of 500 more security personnel in the capital Mogadishu. Eventually this first phase of the UNOSOM will include over 4,200 individuals in different capacities.

When the UN Secretary General, Boutros-Ghali, asked for the deployment of the 500 peacekeepers in the capital, he clarified that such deployment had the consent of the main faction leaders. Already in this phase, however, the mandate of the UN forces begun to expand. In July, the Secretary General suggested that the UN needed to "adapt" its involvement in Somalia. Besides charging the UNOSOM with the task of

[4] "Beyond The Sheriff's Posse," *Survival*, May–June 1990.
[5] Briefing by Colonel Gerard Gambiez, at the United Nations, April 14, 1994.
[6] "The UN and the Use of Force. Leave the Secretary–General Out of It," *Foreign Affairs*, September–October 1994.
[7] "A Concept for Post–Cold War Peacekeeping", *Survival*, Autumn 1994.

protecting the humanitarian convoys and distribution centers, Boutros-Ghali in August was also asking that the UN forces establish a "preventive zone" on the Kenya-Somali border.[8]

The second phase was brought about by the worsening situation in Somalia and was characterized by the decision of the United States to intervene in the region. The offer made by then Acting Secretary of State, Lawrence Eagleburger, to the UN Secretary General on November 25, 1992 brought the creation of a Unified Task Force (UNITAF), the first elements of which reached Mogadishu on 9 December.[9]

Led by a United States commander, General Robert Johnston, UNITAF's main objective was to establish a secure environment for the delivery of humanitarian assistance. Once this task was accomplished, the military command of the international force was to be turned over to the United Nations. There was an open and rather noisy disagreement about the scope of the mission UNITAF was to carry out, with Washington wishing to keep it well defined and limited. The UN Secretary General, in contrast, maintained that Washington had committed itself originally to disarm the warring factions.[10] When fully deployed, UNITAF was composed of about 37,000 troops from 24 countries, deployed in the capital and Southern and Central Somalia. The United States contingent was over 20,000 strong.

The next phase began on May 4, 1993 with the transfer of the military command. On March 3 the UN Secretary General had advised the Security Council (SC) that such steps be taken.[11] In the same letter the Secretary General defined the mandate for UNOSOM II in a never-seen-before long list of tasks. The SC acted on those proposals and adopted Resolution 814 on March 26, 1993.

Subsequently, the Secretary General appointed a United States retired admiral, with good connections in Washington, Jonathan T. Howe, as his new Special Representative for Somalia, and a Turkish general, Cevik Bir as Force Commander of UNOSOM II.

The originally authorized strength of UNOSOM II was approximately 28,000 military personnel and 2,800 civilian staff. In addition, there were about 17,700 troops in the U.S. Joint Task Force in Somalia, including the Quick Reaction Force deployed in support of UNOSOM II. The total number of countries participating in the force was 29. An important feature of this phase of the intervention is that the U.S. forces were not under the operational command of General Bir. However, the commander of the U.S. forces, General Thomas Montgomery, was also the deputy Force Commander of UNOSOM.

Too Little and Too Much Force, and the Expectations Created by the U.S. Intervention

A specific feature of the international operation in Somalia is the high level of force employed almost from the beginning. The rule of consent of the contending parties was applied only at the very beginning, in phase one. Unquestionably there was a problem of general anarchy and of lack of interlocutors. However the high level of force used has also to do with the conditioning created by the participation of individual countries, beginning with the United States, and with the pressure on the United Nations to stretch its capabilities.

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[8] UN documents S/24343, S/24480.

[9] UNSC Resolution 794, December 3, 1992. The Resolution, "[w]elcomes the offer by a Member State... concerning the establishment of an operation to create [a secure environment for humanitarian relief operations in Somalia], and, [a]cting under Chapter VII of the Charter of the United Nations, authorizes the Secretary–General and Member States cooperating to implement the [above mentioned] offer... to use all necessary means" to assure the conditions for the delivery of humanitarian aid.

[10] The UN Secretary General recommended, in a report presented to the Security Council in late December (S/24992), that the Council defer its decision on the transition from the United States to the UNOSOM II, and wait for the establishment of a cease–fire, the control of heavy weapons, the disarming of the gang and the formation of a new police force. Washington wanted the UN to take over on January 22, 1993.

[11] UN document S/25354.

Moreover, the character of the operation and the level of risk for all international forces appears to have changed dramatically with the decision to single out General Aidid (Mohammed Farah Assan) as the enemy. While force before had been used mostly against independent armed bands, such decision made UNSOM side with one and against the other of the two main factions fighting for the control of the capital.

How deeply such a decision affected the environment in which the international forces operated was shown by the ambushes in which first a group of Pakistani peacekeepers fell on June 5, and the resulting 25 killed with more than 50 wounded. The response authorized by the Security Council only further characterized the UN operation as a war against General Aidid.[12]

If the commanding officers of the Italian contingent had hoped to escape the difficulties of this phase, especially in Mogadishu, because of the dialogue they had established with the different parties, their hope was shattered on July 2, when three Italian peacekeepers were killed in another large–scale battle, and the Italian contingent had to abandon an important checkpoint in the city it had manned for some time. Then came the turn of the U.S. forces. When U.S. Rangers (in coordination with the UN command), on October 3 and 4, launched an operation in Southern Mogadishu aimed at capturing some of Aidid's men, they encountered a fierce resistance that resulted in the downing of five United States helicopters and the deaths of 18 men. The hatred treatment to which the dead bodies were subjected reached the American homes through the TV screen and was decisive in bringing President Clinton to set a deadline for the withdrawal of the U.S. troops. In the remaining months of its presence there, the American contingent drastically lowered its profile in the attempt to contain the number of possible casualties.

Expectedly the increased level of danger brought to the fore conflicting viewpoints and controversy about the chain of command. Most acutely the controversy flared between the UN command and that of the Italian force (ITALFOR). ITALFOR leaders vented out their frustration by accusing the Americans of using needless force.[13] Aidid on his part made clear, after the killing of the Italian soldiers, that he had intentionally punished the Italians for their increased alignment with Admiral Howe's policies.[14] The incident grew worse out of the demand by the UN command that the Italians reconquer the checkpoint they had abandoned—and out of the explicit invitation of Italian Defense Minister Fabio Fabbri telling ITALFOR Commander, General Bruno Loi, to disregard the UN demand.

When the Italian command instead negotiated a return of the UN troops to the checkpoint, that negotiation was harshly criticized by the UNOSOM commanders. And when the U.S. Quick Reaction Force unleashed its Cobra helicopters against militia men and leaders of Aidid faction (killing 70 people), and the enraged population in South Mogadishu stoned and clubbed to death 4 journalists and photographers who were covering the incident. The Italian Council of Ministers went as far as to issue a declaration of disassociation from the UNOSOM operation.

These harsh exchanges often found extra fuel in stories and second hand information run by some newspapers and magazines. On the other side, in an article aptly titled "Machiavelli vs. Rambo" the *New York Times* suggested that the policy of dialogue and compromise attempted by the Italians seemed in the end more productive than the offensive tactics of the American forces and of the UN command.[15] After the first American casualties, at the end of September, United States President Bill Clinton abandoned the aggressive policy supported up to that point. And, notwithstanding the strong reaction by the

[12] UNSC Resolution 837, June 6, 1993.
[13] See, for instance, General Loi's interview in *La Stampa*, June 17, 1993.
[14] See his interview with *Famiglia Cristiana*, July 14, 1993.
[15] July 20, 1994.

UN Secretary General, after the incidents of October 3 and 4, the President set the deadline for the withdrawal of the American contingent and announced that the U.S. forces were no longer going to wage a "personal" war directed at General Aidid.

In retrospect, it appears that force employed in Somalia was too little and too much at the same time.[16] It was too little for the task set out by the UN Security Council of disarming the warring factions and of disposing of General Aidid. Therefore it was too much, and somewhat counterproductive, for an operation supporting humanitarian objectives, or if a strategy of negotiation and compromise was the necessary way to approach the situation in Somalia.

There have been attempts to precisely characterize the international intervention in Somalia. Some observers have pointed out that it was "peace-making," rather than "peace-keeping...." UN Secretary General Boutros Boutros–Ghali chose to qualify it as "peace-enforcing." But, more than the category in which to box the Somali operation, it is important to explain the ineffective—and in the end counterproductive—use that was made of military force there.

The American administration's decision to intervene in Somalia is central to such explanation. Washington had its political reasons (both domestic and international), in late November 1992, for staging a large-scale operation to support humanitarian relief in that country. And the offer made by Eagleburger was hard to pass up for the UN Secretary General due to the pressure he felt to deal effectively with the issue. From a UN perspective, the UNITAF operation initiated a phase of "subcontracting" UN operations to individual powers or multinational forces. (There were parallel talks with NATO, at the time, about possible forms of military intervention by the Atlantic allies in Bosnia-Herzegovina.)

In his letter to the Security Council of 29 November 1992, Boutros-Ghali outlined, for the Council consideration, five options for creating conditions for the delivery of humanitarian aid inside Somalia. If a country-wide show of force (rather than an operation limited to the capital) was the preferred option, it was impossible for the United Nations to carry out such missions because, the Secretary General noticed, the UN did not have the capability of command and control for an operation of the size required. The last option, that, based on Washington's offer, the UN authorizes a group of member states to carry out such operation, was the one that Boutros-Ghali advised the Council to choose.[17]

Most relevant, once more, was that it was a United States-led operation. It was, in other words, a small-scale "Gulf" operation, with other countries joining the United States. The fact that the American commander, General Robert Johnston, had been the deputy commander in the Gulf war, further enhanced his authority and the willingness of other national contingents to be led. Like in the Gulf, there was a main actor on the stage and a number of minor interpreters around him. And the expectations with regards to the solution of the ugly Somali problems grew accordingly—results here expected to be Gulf-style, decisive.

However, in contrast with the Gulf crisis (where the United States took early action and then obtained UN authorization), in Somalia the United States took over an operation already initiated by the UN. And the United States intervention suggested to the UN Secretary General the possibility of setting more ambitious objectives. The option he advised the Security Council to choose, was also the one containing the most ambitious objectives. Indeed, rather than the executer being the variable and the objectives the constant, it was the other way around, that is to say the objectives were defined on the basis of the United States being the executer. Only the United States could achieve those goals. And, as I have already indicated, the UN Secretary General kept putting pressure on the United States

[16] Such observation was offered, in an interview with me, by a senior Italian foreign service official who had been involved with the Italian operation in Somalia.

[17] UN document S/24868. As a consequence, the SC adopted Resolution 794, on December 3, quoted in footnote 9, above.

for acting more forcefully and moving to disarm the warring factions.

If phase two (UNITAF) of the international intervention in Somalia had been a small "Gulf" operation, phase three (UNOSOM II) did not have one of the positive features of such operation—especially tight command and control, and the weight that carried the United States leadership—while it received a lot of negative conditioning from it. The attempt by the UN Secretary General to maintain much of the same character to the operation by putting Admiral Howe at its head, made some foreseeable, emerging problems only sharper.

In his report to the Security Council concerning the transition from UNITAF to UNOSOM II, Boutros-Ghalialso laid out in detail the possible mandate for the new UN operation.[18] UNOSOM II would attempt to bring to completion, through disarmament and reconciliation, the task begun by UNITAF for the restoration of peace, stability, law and order. Among specific military tasks, UNOSOM was to monitor the cessation of hostilities, preventing the resumption of violence also by taking action, when necessary, against factions violating the cessation of the hostilities, seizing small arms and maintaining control of heavy weapons, securing and maintaining the security of ports, airports, and lines of communications needed for the delivery of humanitarian assistance.

The report also contained overambitious goals of nation-building: UNOSOM II would help the Somali people to rebuild their economy and social and political life, to restore the country's institutions and the Somali State. It was more than UNITAF had set out to achieve. At the same time the individuals under the UN commander were fewer and less well coordinated than in the previous phase.

THE UNITED NATIONS IN FORMER YUGOSLAVIA

The United Nations first entered former Yugoslavia under what could be considered classical UN-peacekeeping conditions. UNSC Resolutions 743 and 749 (February 21 and April 7, 1992) established and authorized full deployment of the UN Protection Force (UNPROFOR) to consolidate the cease-fire in Croatia and assure the demilitarization of a number of designated UN "protected areas" there (areas with large Serb population).

Already envisioned by UNSC Resolution 721 of November 27, 1991, the peacekeeping operation was made conditional to the compliance by all warring parties of the Geneva cease-fire agreement earlier negotiated by the UN Secretary General's Special Envoy, Mr. Cyrus Vance. Before he finally recommended to the Security Council the establishment of the force in mid-February, the Secretary General had reported on a number of occasions that the necessary conditions for its establishment did not exist.

The original mandate was then enlarged a number of times (UNSC Resolutions 762, 769 and 779)—both to expand the areas under UN control and to solidify the control of those areas. However those tasks were established and carried out always in a context of consent at least by the main contending parties. The same applies to UNSC Resolution 758, of June 8, 1992, that enlarged the UNPROFOR's mandate to Bosnia-Herzegovina. The Resolution was adopted after the Secretary General reported that UN personnel had negotiated an agreement for the handing over to the UN of the airport in Sarajevo.

In the context of the Yugoslav conflict it is impossible to precisely define the conditions for consent. The "consent" to open the Sarajevo airport to humanitarian flights in mid-1992 was obtained through strong pressures by different Western capitals, the European Community (EC) and other international organizations. Different means of influence were brought to bear on the Bosnian Serbs. And in the following years, that airport would stay open only intermittently. Moreover, the consent was not always negotiated

[18] UN document S/25354, March 3, 1993.

with the individual armed groups controlling a specific territory.[19]

Finally, even if the intervention is clearly defined as a humanitarian mission, the limits of such a mission are very difficult to establish. In Bosnia-Herzegovina, the early mandate of protecting the humanitarian convoys organized by the UN High Commissioner of Refugees and other organizations broadened with time to include a multiplicity of tasks related to such an objective and to the need to protect civilians: silencing of sniper fire, taking control of heavy weapons to stop the shelling of cities, and protecting six Security Council-designated "safe areas."[20] However, when it decided on the specific measures to make possible delivery of humanitarian aid or took initiatives such as the creation of the "safe areas" to protect the Muslim population against "ethnic cleansing," the Security Council necessarily entered the fray, challenging and resisting the policies of one or more of the contending parties.

If keeping a humanitarian mission within the consent confines is already difficult, the character of the intervention changes profoundly when the Security Council decides to authorize the use—however selective—of force to reach its goals. In the case of former Yugoslavia it was the pressure from the Western European and American publics—in the face of ineffective international action and terribly upsetting news reports—that kept pushing those already hard-to-define boundaries of the humanitarian mission toward an increasingly assertive use of military force and the attempt to redress the balance of forces on the ground.

Because of that pressure of the public and because Washington, after a long period of abstention, decided to participate in the international response to the crisis, NATO first made itself available in support of CSCE and UN operations in June 1992. Washington selected NATO as the most suitable channel for its positions and objectives. And in the following years, Washington would be the main thrust behind the escalatory intervention of the Western alliance, in particular from August 1993 (when NATO intervened to stop the strangulation of Sarajevo) on.

NATO participation in the international response necessarily changed the character of that response and of the UN operations in particular. In fact the environment for the UN humanitarian operation always remained very uncertain despite commitments undertaken by all the parties at the London Conference of August 1992. Moreover, even when considered in isolation, the very availability of NATO tended to lower the threshold of the conditions considered necessary for successful implementation of peacekeeping and humanitarian operations. Thus, for instance, in March 1994, after the show of international resolve that followed the Sarajevo market-place massacre, UN officers promised a more "muscular" approach and the decision was taken to send a relief convoy to the Muslim enclave of Maglaj in central Bosnia, with the assistance of NATO aircraft circling overhead. The town had been under Serb siege and shelling for months and subsisting on supplies dropped from the air.[21]

In general, the availability of NATO air power afforded the international intervention the possibility of pursuing broader objectives and thus responding to the increasing pressures of the Western publics on governments. It offered the only possibility for enforcing a tangle of Security Council's decisions poorly coordinated and in most cases unenforceable. NATO took over operations that the UN by itself could not carry out. The enforcement of the "no-fly-zone" is a case in point.

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[19] Henry Wynaendts in *L'engranage. Croniques yougoslaves. Juillet 1991–août 1992* (Paris, Editions Donoel, 1993) chronicles the painstaking negotiations carried out as representative of the EC Presidency with individual military commanders in Croatia to obtain their agreement to the terms of different cease–fires.

[20] On the broad range of tasks connected with "humanitarian" operations in the recent UN experience see Larry Minear and Thomas G. Weiss, *Mercy Under Fire: War and the Global Humanitarian Community* (Boulder, Westview Press, 1995).

[21] For a chronicle of the Western intervention see Mario Zucconi, "The former Yugoslavia: Lessons of war and diplomacy," *SIRPI Yearbook 1995* (Oxford, Oxford University Press, 1995).

UNSC Resolutions 781 and 786 (October 9 and November 10, 1992) established a ban on military flight in the airspace of Bosnia-Herzegovina and mandated the monitoring of the ban to UNPROFOR. NATO took over the enforcement of the ban after a report of the UN Secretariat listing 465 violations (including planes that bombed Bosnian villages) prompted UNSC Resolution 816 (March 31, 1993). The Resolution called on member states to take "all necessary measures... in the event of further violation." NATO's "Deny Flight" operation started April 12, 1993. The Serb planes downed on February 28, 1994 were the first fixed-wing aircraft to violate the ban since the start of the allied operation.

The same can be said of the "safe areas." When established by the Security Council (Resolutions 819 and 824 of April 16 and May 6, 1993), the UN Secretary General estimated that 34,000 troops were necessary to enforce the decision. Later the UN commander of the time lowered the requirement to some 900 peacekeeper for each of five such areas, and a larger number for Sarajevo. However, such force—possibly capable of preventing a Serb attempt to take over those areas—was never deployed (in Gorazde, at the beginning of the April 1994 Serb attack, the UN had only four observers). And the continued Serb pressure on those areas put the few UN troops there in danger.

Therefore, with Resolution 836 of June 4, 1993 the UNSC greatly expanded the mandate of UNPROFOR—authorized now to reply to the bombardment and to respond to the obstruction to the freedom of movement of its personnel or of the humanitarian convoys. In that context, it also decided that "Member States...may take, under the authority of the Security Council and subject to close coordination with the Secretary-General and UNPROFOR, all necessary measures, through the use of air power... to support UNPROFOR in the performance of its mandate." On that basis, NATO's "Close air support" operation was decided at the Athens Atlantic Council of June 10, 1993 and launched beginning in late July.

The character of the international response changed most sharply when the Atlantic alliance was itself the proponent of specific operations. Such was the case of threats of air strikes in August 1993, of the ultimata and the establishment of "exclusion zones" around Sarajevo and Gorazde, and finally of the air strikes conducted in response to the attack against Bihac in late 1994. Such initiatives followed requests of the UN Secretary General or authorization by the Security Council. However, even more clearly than when NATO played a supporting role of UN operations, in these cases the allied intervention was directed against one of the parties in conflict and weighted in the balance of forces among them.

PEACEKEEPING ON THE GROUND, PEACE-ENFORCEMENT FROM THE AIR

More than in other multilateral interventions in regional crises, the response to the conflict in Bosnia-Herzegovina has brought to the fore the possible contrast between UN-managed operations on the ground and concurrent broader initiatives of the Security Council—between the attempt to carry out a humanitarian operation on the ground while peace-enforcement comes from the air. And, more generally, the fundamental lesson of former Yugoslavia may reside in the outright contradiction that emerges in complex operations carried out under the UN banner and implying the application of increasing—but still limited—levels of force.

Consent and coercion cannot be mixed. The humanitarian operation on the ground needs the consent of the warring parties to be carried out, and that consent tends to be taken away by the party that becomes the target of other initiatives of the Security Council or of NATO itself. Indeed the operation on the ground may become—as it became in Bosnia-Herzegovina—a hostage in the hands of those trying to defend themselves from attacks from outside.

To the UN authorities in charge of the operation on the ground, threatening or resorting to the air strikes was, at most, one of the instruments

they had at their disposal in a difficult, unceasing negotiation mostly with the Bosnian Serbs aimed at gaining their assent, case by case, to specific humanitarian initiatives (the general reference framework of the London Conference was never effective).

To those using coercive force, that is to the NATO authorities, basic conditions for their involvement were consistency and credibility. That was stressed on a number of occasions by NATO Secretary General Woerner. Credibility needed to be maintained if the Alliance's participation in the Bosnian operations was to be effective.[22] And force, as already mentioned, in many cases was used in the attempt to influence the evolution of the conflict itself, or as a way to control the violence. The two positions were moving from different premises. The quarrel that in fact ensued between the UN and NATO about when to intervene (and the consequent blaming of each other for ineffective action) was, to a large extent, unavoidable.

Significantly, there were fewer problems in those operations in which the implementation—and the decision on when to act—was left entirely in the hands of NATO. Both "Deny Flight" and the Adriatic Sea operations could be considered cases of UN "subcontracting" to the Atlantic allies. Much more complex, instead, and beset with the difficulties indicated above, were those combined operations where NATO air power was used both to protect UNPROFOR personnel and to respond to violations of UN decisions and NATO ultimata. The problems here were threefold: who gives the order to attack, how and how expeditiously the order reaches those who carry it out, and the problem of consistency and credibility, that is of consistently carrying out punishment in case of violation. Leaving aside some technical problems related to the transmission of information and command, those problems were in fact all related to one: the decision of when to strike. This is the issue on which the two organizations tended to diverge.

CONCLUSIONS

The international interventions in Somalia and in former Yugoslavia differ in many respects—but also point to the same problem related to the decision to use considerable amounts of force, but still not overwhelming force. The mix of operations under conditions of consent and of coercion is simply impossible.

In Bosnia-Herzegovina, the use of force—and NATO's participation—introduced its own logic and requirements in the international response to the conflict, while, as already noted, the United Nations strived to keep the use of force subordinated to the operation and needs on the ground. The UN authorities in Bosnia were abundantly criticized for their reluctance to make use of NATO's might. It is hard however not to be sensitive to their plight. "Bombing is a last resort—declared UNPROFOR commander General Rose in an interview in the *New York Times* at the end of September—because then you cross the Mogadishu line.... If somebody wants to fight a war here on moral or political grounds, fine, great—but count us out. Hitting one tank is peacekeeping. Hitting infrastructure, command and control, logistics, that is war, and I am not going to fight a war in white painted tanks."[23]

After the European Community failed to find a contextual solution to the different and interconnected aspects of the Yugoslav conflict in late 1991, the international community has never had an overall strategy for dealing with the issue—a strategy that would go beyond the humanitarian operation and a stopgap response to some particular developments there. In this condition the use of force tended to become a substitute for policy. In addition, among other effects, the coercive use of military power establishes its own standards for assessing effective-

[22] *Nouvelles Atlantiques*, vol. 28, no. 2602, 2 March 1994, pp. 1–2).
[23] Roger Cohen, "U.N. General Opposes More Bosnia Force," *New York Times*, 29 September 1994.

ness and raises expectations concerning the possibility of solving the conflict.

In former Yugoslavia, the UN built the most complex operation and suffered the heaviest casualties of its history. It also came increasingly under criticism for what many saw as indecision and the limited results of its action. Still, NATO can only be used as what it is: an instrument to a policy. The UN cannot pacify Bosnia-Herzegovina. It cannot even adequately perform its limited mission if other capabilities—especially political and economic—are not brought back in large scale to deal with this extremely complex crisis.

Despite frequent changes by columnists, academics and politicians, the issue is not a technical one—of incompetence of the United Nations or of other international organizations. Rather, it is a problem of tasks—too broad for their capabilities—we have laid on the steps of those organizations. The Western influential countries are counting on international organizations as never before in the postwar history. However, unfortunately, they are treating those organizations as independent international actors, as if they had a political will of their own, as if they had capabilities and resources independent of them.

The point is that, for all the improvement we have introduced in the working of those organizations, there remains an enormous gap between the power structures that regulated the international system during the Cold War and those multilateral mechanisms we are relying on today for dealing with issues of international stability. Thus, most important is to realize that the main problem we have facing us today in dealing with sources on international instability, is a political problem—not a technical one. Because of that political problem that they cannot possibly control, international organizations often find themselves in serious difficulties. The history of the Western response to the Somali and Yugoslav crises—and in particular of the combined use of the United Nations' and others' capabilities—is most indicative in this respect.

Lessons from Cambodia: Strengthening United States Intervention

5

THE CHALLENGE FOR PEACEKEEPING

Learning the Lessons

by
Lieutenant Colonel J.D. Healy, International Policy Division, Department of Defence, Australia, on behalf of Lieutenant General J.M. Sanderson, Commander Joint Forces Australia and Force Commander, United Nations Transitional Authority in Cambodia, 1992 to 1993

Thank you for the opportunity to present this paper on behalf of Lieutenant General Sanderson. Since completion of the mandate of the United Nations Transitional Authority in Cambodia (UNTAC), I have had the good fortune to accompany him while he has participated in many such conferences, seminars, and workshops on United Nations issues and peacekeeping in particular. The success of that operation has aroused considerable interest in various parts of the world especially in view of the complexity, its precedent-setting nature, and its intrusiveness into the affairs of a failed sovereign state.

The interest has been heightened in view of the increased scope and frequency of United Nations operations and the crisis image that many convey. I hasten to add that in no way is this intended as criticism of commanders, staff, and contingents in those other operations. Each operation is unique and each has its own successes and failures. Cambodia was certainly no exception in this regard. However, if we are to strengthen the capacity of the United Nations to intervene in pursuit of the high morality of its Charter, we need to build on the successes and learn from the failures.

Involvement in the international debate has enabled General Sanderson to discuss his views with a diverse range of observers, practitioners, analysts, and authorities. The reception he has received has been excellent and has helped him refine his position over the last 12 to 18 months. I have tabled a paper: Peace-

keeping or Peace Enforcement? Global Flux and the Dilemmas of United Nations Intervention, which reflects this position. The title of this paper recognizes that, confronted with increasing turmoil of a cultural and racial nature following the end of the Cold War, the critical issue for the World is to make the United Nations Charter work in a way that can preempt or resolve these crises effectively and lawfully. The difficulties faced in this regard by the United Nations Organization have been all too manifest in recent missions, in Somalia, in Rwanda and in the former Yugoslavia.

Also, there is little question that the United Nations Charter continues to provide the best available mechanism for the resolution of international conflict. It draws its authority from the 185 sovereign Member states that have ratified its provisions and are bound by them. The Charter is a document with highly moral foundations, which obliges settlement of disputes by peaceful means, respect for fundamental human rights, conformity with international law, and social progress. How to translate these high ideals into action is the question challenging the international community.

In analyzing United Nations operations, one is often surprised to find that many problems manifest in UNTAC have been experienced elsewhere. In view of the awesome responsibilities of the United Nations, lessons should not have to be relearned in this way. Also, the keys to success in UNTAC do not yet seem to have been fully comprehended. Several measures have been proposed to address the difficulties experienced there and elsewhere, but regrettably, these are all-too-often peripheral. None really comes to grips with the key issues.

A close analysis of the UNTAC and other operations suggests that many difficulties are due to deficiencies in the philosophical approach to the conduct of peacekeeping operations. Moreover, there are serious problems in the way the United Nations plans for, mounts and directs peacekeeping operations, and also issues of an ethical nature. The first requirement is to address these in a fundamental way. Once this has been done, the benefits accruing from measures such as improved readiness, doctrine, training, tactics, and technology can increase the effectiveness of peacekeeping. But it is important to make the point that these measures can never be solutions in themselves. The main focus of General Sanderson's paper, therefore, is the more fundamental issues, from which broad areas can be identified for specific programs of interest to the Bellagio Workshop.

THE USE OF FORCE

Among the most vexing of the matters which have damaged the United Nations' credibility is the issue of the use of force. United Nations personnel often seem confused over whether and when to use force, and how much is too much. The problem is that any use of force can create its own dynamic of escalating violence. The established peacekeeping ethos recognizes three fundamental principles: consent, impartiality, and the use of force only in self-defense. These principles are interdependent and any use of force beyond self-defense would be inconsistent with impartiality and would be likely to undermine consent.

Peacekeeping operations are authorized under Chapter VI of the Charter. While peace enforcement is an option under Chapter VII, it represents a totally different ethos to peacekeeping, being more akin to war. It is critical that a clear line is drawn between the two to avoid confusion over objectives and commitments by participating nations. Peacekeepers are instruments of diplomacy, not of war.

Strategic Objectivity

At the political level, it is important for the United Nations to be seen to be working for the interests of all Member states. Through their accession to the Charter, Member States have given their consent to the exercise of authority according to its provisions by the organs of the United Nations Organization. Inevitably, in exercising that authority, compromises are needed between the disparate interests involved to gen-

erate consensus. However, objectivity in United Nations resolutions must not be sacrificed to achieve this consensus. Mandates must draw their moral authority from the Charter. There has to be a clear and objective moral foundation in United Nations mandates to develop and sustain international consent.

It is also essential that political objectives are passed to those who must implement them in the field in a way that focuses and inspires action. Most military structures identify three levels of command for this purpose: strategic, operational, and tactical (these will be covered in more detail shortly). In the United Nations Transitional Authority in Cambodia, for example, these were respectively: the Security Council in New York, the United Nations Headquarters in Phnom Penh, and the units and various agencies in the field. The success in Cambodia was due to the operational level in Phnom Penh binding the others into harmony through horizontal and vertical collaborative structures established for the purpose. These provide a ready model for other United Nations operations.

Regrettably, under existing arrangements, a major weakness exists at the strategic level, where the United Nations Secretariat is unable to function as an effective strategic headquarters, one capable of providing comprehensive advice to the Security Council and giving strategic direction to operations. The United Nations Charter never envisaged such a role for the Secretariat, which is neither structured nor equipped to run complex military operations. Instead, the Charter provides for a Military Staff Committee to assist the Security Council; this serves to underline the need for the structures envisaged in the Charter for very necessary purposes and based on sound precedent in wartime to be put in place.

General Sanderson's paper urges the empowerment of the Military Staff Committee, provided for in the United Nations Charter, to fulfil the essential functions identified for it. This is the key issue and the priority area for reform of the way the United Nations does business. Once this is done, the multiplier effect of supporting measures can be brought to bear to strengthen United Nations peacekeeping. What I propose to discuss here are issues very important in supporting operations that are strategically well planned and directed.

SUPPORTING ENHANCED UNITED NATIONS INTERVENTION

Strategic Context-Operational Focus

When seeking ways to improve United Nations peacekeeping, it is unfortunate that a great deal of energy seems to be expended on the secondary issues. For example, one of the more recent responses from the United Nations Secretariat to react quickly to crises has been to seek solutions that place forces more readily at its disposal. While international consensus supports a more rapid or preemptive response to crises, employment of forces in a way that could lead to failure is likely to be counterproductive. Similarly, there seems to have been considerable effort over the years directed at the tactical level. Examples include tactical training in rules of engagement (ROE), laws of armed conflict (LOAC) and international humanitarian law (IHL) generally, as well as training in specific peacekeeping activities in the field such as the conduct of check points, negotiating skills and the like.

These important initiatives need to continue. But they also need to be able to be placed in their proper strategic context without which they can have no meaningful purpose. Their development needs to occur while contributing to an effectively functioning strategic framework. It is their link to the collective strategic objectives of the Member states of the United Nations, which gives any conflict resolution measures their relevance and therefore defines what they might be and the form they should take. Besides ensuring effective strategic planning and direction, the central role of the operational level in linking tactics to strategy needs to be recognized. In peacekeeping, as in war, it is at the operational level that political objectives are won or lost. This suggests that the operational level should be

the main focus of priority efforts to support enhanced United Nations intervention.

It is critical for the operational level to establish the bona fides of the mission as early as possible and to maintain it until the operational objective is secured. This involves relationships with the international supporters of and contributors to the operation, the parties in conflict, and the population in the mission area. Operations have to be conducted in a way that fosters their cooperation. In particular, if the support of the people is lacking, the continued viability of the presence of the United Nations peacekeepers will be placed in doubt. Discrimination in the conduct of operations is the key issue here.

Doctrine

The issue of doctrine is central to effectiveness at the operational level. Peacekeepers from diverse Member states need to have their unity of purpose reflected in the adherence to common principles and procedures. Regrettably, much of the operational doctrinal focus in recent times has been directed at reconciling the dilemmas confronting the United Nations in places such as Bosnia. However, preoccupation with problems in Europe, many of which are the result of disunited strategic decision-making, risks distorting the approach to United Nations peacekeeping in a way that might make it irrelevant for other missions in other parts of the World.

Peacekeeping operations in Africa, Asia, and the Americas and also the United States-led Chapter VII operation in Haiti, have led the way in a new age of successful United Nations intervention supported by focused diplomacy. The successes there must not be held hostage to problems elsewhere. In this regard, it is important for peacekeeping doctrine to be based on proven success.

The central doctrinal lessons that can be drawn from the Cambodian experience are in the two related areas that have already been touched on, namely, command and control, and the use of force. To conduct operations in pursuit of the strategic purpose, peacekeepers, both military and civilians, need to be able to operate in a secure environment. Security is normally guaranteed by the parties in conflict when they agree to the United Nations presence. However, general political protection might not always ensure tactical security and defensive measures by military peacekeepers might be necessary. With this focus, it is possible to approach issues such as the use of force and other acts by peacekeepers in a more rational and comprehensive way. Force defends the agreement, it does not impose it.

In his paper, General Sanderson emphasizes that force carries enormous political implications. It must therefore, simultaneously be constrained and used with discrimination to ensure consistency with the political objective. To do this, it has to be directed by effective structures. Sustainment of coalitions is the issue that will drive those considerations.

Command and Control Doctrine

An important first step in our doctrinal work is to define the command and control framework within which United Nations operations will be executed. Doctrine needs to identify the three different command levels noted earlier, their different roles and their complementary nature. In brief, these are as follows:

- **Strategic level.** In the case of the United Nations intervention, the focus of the strategic level must be especially broad, involving issues of ongoing harmony between member states, groupings, and international bodies. It is at the strategic level that the ambiguities of the political nuances have to be absorbed and focused into directives to the next level, which are at once designed to provide clarity, flexibility, and inspiration to action. This is a hugely demanding task. Decisions made by member states are collective, but the purposes of pursuing and balancing the objectives of the Charter must be paramount. While the Security Council is in a position to provide a lead, its capacity for action will be limited without broad international commitment. The central task lies in determining the international will

on issues raised within the context of the Charter.

- **Operational level.** The operational level of command is that level at which field elements are orchestrated to achieve the objectives of command strategy. The key determinant of success at this level of command is the military principle of the selection and maintenance of the aim. This is the principle that connects the strategic level to the operational level of command and should therefore emerge from strategic level analysis to which the operational level commander must be a contributor. A combination of insight and superior knowledge is most conducive to the achievement of the desired psychological effects. At the operational level, it is unity of command that provides strength and cohesion. While the complexity of many post Cold War peacekeeping operations usually means that they are civil-military affairs, it nevertheless remains critical that all elements engaged come under one common authority.
- **Tactical level.** The tactical level is more finite, with objectives being defined in the more material terms of boundaries, time, numbers, and resources. In peacekeeping operations, the tactical level involves much more than military units and, in some circumstances, military forces might only be in a supporting role. It could, for example, involve electoral teams, human rights monitors, police, and monitors of the Parties' administrations, as it did in Cambodia. It is very important within this complex framework that tactical units do not respond to national or other chains of command on operational matters. Nor can they be allowed to develop their own interpretations, outside the operational level commander's intent, especially on critical issues such as the use of force.

If one of these levels is deficient, or their roles become merged, the capacity of the others to function effectively is severely limited. If the strategic level becomes involved with tactics, it is likely to lose its broad perspective and diminish the power of commanders on the ground. At the same time, tactical actions that are not focused can impact adversely on the strategic plan. Each level collects and analyzes information to define tasks, then empowers subordinate commanders to accomplish them. The operational level both separates and binds the strategic and tactical levels, ensuring that tactical actions are coordinated to achieve strategic objectives.

In Cambodia, the strategic level objective of the Paris Agreements was the creation of a unique legitimate government that could be recognized by the international community as the sovereign authority for Cambodia and the formal international actor with whom they could conduct their relations. The electoral process was the only way that this could be achieved which would be acceptable to all concerned. The conduct of the election was the operational level objective and tactical level elements were orchestrated to this end.

The first strategic level task was to generate and maintain diplomatic support for the operation. The second task was to develop a plan for the overall operation and to obtain troops and civilian elements according to it, deploy them to Cambodia, and put in place arrangements to support them there. It is fair to say that the first of these was only done up to the signing of the Paris Agreements and also, it had largely been effected by interested member states. After their signing, the same member states continued to do so in concert with the operational level. With the second task, it was not done well, nor was it done in a timely manner sufficient to maintain the momentum for peace.

The operational level of UNTAC largely worked with the Security Council through the diplomatic missions. In effect, it functioned without a strategic headquarters. Interventions from the United Nations Secretariat were frequently on tactical or operational level issues in response to media reports, and reflected an almost complete lack of comprehension of the realities on the ground. In particular, when a change to the operational level plan was required by political developments, the operational level

had to generate its own diplomatic support. It would appear that much of the difficulties experienced on other missions have been due to similar incapacities. It is critical for the United Nations Organization and deployed United Nations missions to comprehend these different levels, their different roles and their complementary nature, and to function accordingly.

Self-Defense and Offensive Force

At a Workshop in Stockholm in mid-April, the issue of the use of force in peacekeeping operations was examined. The Workshop was jointly sponsored by the Swedish and Australian foreign ministries and was attended by personnel from the United States, Australia, and Europe, (mainly Nordic countries), and included many former Force Commanders. Although no formal outcomes were sought, a consensus seemed to emerge on the need for a clear separation between operations conducted under Chapter VI, on the one hand, and Chapter VII, on the other. This would classify operations as follows:

- **Chapter VI.** These are characterized by consent, impartiality, and the use of force only in self-defense. They include:
  - — traditional peacekeeping (i.e., observer and) separation of forces missions, such as UNTSO and UNDOF respectively); and
  - — wider or expanded peacekeeping (i.e., the more complex post-Cold War missions such as UNTAG and UNTAC).
- **Chapter VII.** These operations involve the use of force beyond self-defense and could include:
  - — "peace-enforcement," meaning low-level pacification operations, such as in Haiti, which might include activities resembling those used in peacekeeping; and
  - — war-fighting operations such as Korea and the Gulf War.

It should be noted that wider or expanded peacekeeping provides considerable flexibility for the defensive use of force. But if offensive force is to be used, then, in the prevailing view of the Stockholm Workshop, it is not peacekeeping and Chapter VII authorization is required. However, Chapter VII operations do not necessarily mean all-out force. It might be possible to conclude operations with little or no force. The essential point is that consent is lacking and the necessary political protection cannot be afforded to peacekeepers. Force levels must be sufficient to defeat the threats posed.

Following the difficulties in places such as Somalia and the former Yugoslavia, the Security Council might have reservations about mandating further multinational United Nations peace enforcement operations (as opposed to a coalition-led one). The point that emerged from the Stockholm Workshop is that the United Nations has more options than simply traditional peacekeeping, war-fighting or doing nothing, as the conceptual framework above shows. Resources are always a major constraint, but it nevertheless needs to be borne in mind that under-resourced missions have reduced prospects for success, and normally end up either costing more or failing.

The precise definitions might require some further development before being accepted as agreed doctrine, but the distinctly separate frameworks established by the two Chapters are germane.

Training and Tactics

With the rapid increase in the size and complexity of peacekeeping operations in recent years, there has been much discussion on the need for training of military peacekeepers to improve their effectiveness. It is important to make the point that even with the best trained troops available, a campaign can be lost if command or planning is deficient. These must be included in training for peacekeeping.

It is particularly important to develop skills in the planning and conduct of peacekeeping operations at the operational level. I repeat that it is at the operational level that peacekeeping operations are won or lost. It seems that the problem with many missions is due to a disconnect between the strategic and tactical levels. This is

almost inevitable if the operational art bringing the capabilities of diverse elements into harmony working toward the common objective is not exploited to its fullest extent. Despite enormous difficulties, in UNTAC we established this essential link, which is clearly explained in General Sanderson's paper.

The UNTAC operation also showed that peacekeepers are often obliged to deal with people without honor. This requires considerable self-control, and the steadfastness and forbearance of the military profession is the key to success under these circumstances. Only the military has the organizational characteristics and the ethos to operate under the conditions generally prevailing in a peacekeeping mission. This is an important issue because it is suggested from time-to-time that civilians might better perform peacekeeping tasks. This view is normally accompanied by some account of failure in military behavior, which is destructive of the United Nations' credibility as a compassionate and reliable organization. Failures do occur, but clearly the military peacekeepers' task cannot be performed by anything less than a trained professional.

It is true that the quality of troops involved in peacekeeping varies widely and some units are better prepared than others. To correct this, there are good grounds for some form of an inspector general's office within the United Nations structure, preferably as part of a secretariat attached to the Military Staff Committee. The purpose of this office would be to identify potential contingents that meet minimum standards and advising on the needs of those that do not. The varying capacities would be known, but rather than being exclusive, the objective should be to find ways to bring those with deficiencies up to the minimum in a way that enhances broad international participation in peacekeeping.

With 34 nations contributing military contingents to UNTAC, it was possible to make comparisons of the preparedness of military units to participate in a formation of the Cambodian type. Cambodia demonstrated that nothing substitutes for sound and solid military training. The idea of throwing together a group of untrained reservists and shipping them into an environment like Cambodia, Somalia or Yugoslavia does not make sense. In Cambodia, the deeper the training, the more able units were to respond to changes in the operational environment.

The Cambodian operation showed that circumstances can also arise where peacekeepers have to take a firm stand in defense of the mandate. In peacekeeping, combat skills are still essential for self-defense. Specific training for peacekeepers should involve combat training to instil confidence and familiarity with their weapons. The nature of the mandate will define the tasks, which in turn will identify the extent of defensive force to be used. Many of the tactical techniques used in low-level pacification or internal security operations are similar, such as defense of key posts, selective engagement of targets, patrolling, road blocks, and the development of relations with the civilian community. Training can therefore readily cover both. However, for peacekeeping, the international nature and the different ethical and jurisdictional foundations need to be emphasized.

Supporting units including logistics, engineering, and medical units must also have the capacity to secure and defend themselves. Otherwise they can make excessive demands on the rest of the force if the tactical situation changes. Some nations might take the view that to deploy a completely passive logistic unit into a peacekeeping environment somehow reinforces their humanitarian intent. This might be all that is politically acceptable at home, but it is not really humanitarian to place soldiers in a dangerous environment for which they are not mentally and physically prepared. It is also not really fair to charge a United Nations force commander with the responsibility for this deficiency.

While some units were better equipped for operations in Cambodia than others, and also had the benefits of deeper and more costly training, this was not necessarily a measure of their ability to create a successful peacekeeping environment around them. This is a very difficult thing to measure. On the one hand, United Nations civil-

ians might feel more secure with a certain unit. On the other hand, some units had a greater affinity with the Cambodians and could generate confidence by at least being perceived to share the daily experiences of the people in a way that generates understanding. This is one demonstration of the advantage to be drawn from international diversity. It is important from a training point of view for contingents to understand the culture as much as possible. It is also important to have a number of linguists who can communicate with the people from the very beginning of an operation and explain why they are there.

Of critical importance from the perspective of a Cambodian type operation is the ability to be able to operate in small groups across large areas, while remaining secure. This demands junior leadership of a very high order. Young officers and non-commissioned leaders have to be confident of their ability to take the initiative, communicate and command soldiers. This demands a form of directive control, where mission objectives are clearly understood to a deep level and junior leaders are expected to get on with the job. Standing operating procedures have to be clear, but not too prescriptive, and the staff has to work hard to reinforce the confidence of the soldier in the field.

Training is important for civilians also. The increasing size and scope of peacekeeping operations have brought many deficiencies in this area into stark relief. The reluctance of some civilians to work with the military in an integrated environment is an established fact with missions. It is not simply the linguistic and cultural barriers that have to be broken down, but sociological ones as well. United Nations civilians are generally individuals rather than team members. Very few of them have any leadership training, and not many have previous experience working with the military. Some, particularly those coming straight out of academia, have a positive aversion to the military.

In Cambodia, several civilians denigrated the Military Component and made decisions that were destructive to morale and effectiveness. Many were reluctant to take military advice and were prone to make demands about their own security without being prepared to sacrifice any of their own freedom of action to achieve it. In the end, absolute necessity forced the civilians into a closer working relationship in UNTAC, but this required great patience by commanders at all levels and, for most commanders, this would have been one of the great learning experiences of the mission.

The question of integrated training is an issue of great concern because in the past, the United Nations has more often than not relied on the international amateur rather than the trained professional when it comes to civilian recruitment. This is not to say that there are no gifted professionals in the United Nations; there are many dedicated and talented people. It is simply that there are not enough, given the scope of these types of operations. Many people were selected for UNTAC and appointed to positions for which they were not equipped by either training or experience. When doing something as serious as attempting to run a conflict-ridden country, this is really not good enough. UN member states are either going to have to make people of the right quality available, or accept and be honest about the inability of the organization to fulfil responsibilities of the magnitude given in the Paris Agreements.

Some serious operational level deficiencies were the result of the procedural approach to financing peacekeeping missions. This delayed initial deployment and impeded adjustments to plans in the light of emerging dynamics. It is quite reasonable to have control of finances in the hands of experts, provided they follow operational priorities and are flexible enough to respond to changing circumstances. Civilian staff in such positions must have a comprehensive understanding of the potential cost of their decisions in lives, infrastructure, and wasted effort.

An important area for integrated civil-military training is in civic action. In an environment such as Cambodia, hearts and minds activities form a central part of military operations. The purpose is to establish the critical link with the people to convince them of the United Nations commit-

ment. The military of many nations have deep experience in nation-building and a close relationship with humanitarian agencies and those non-governmental organizations that perceive benefits from integration can be mutually supporting.

All staff need to focus on their raison d'être, with an integrated approach to timely planning—across the components and involved agencies—from the Secretariat to the forward area. Personnel need to be trained to plan and operate in an integrated environment. Civilian peacekeepers need to understand the obligations to mission outcomes and their broader responsibilities to the international community. They also need to comprehend the need to work within a functioning command and control system designed to ease coordination and foster unity. In particular, they must understand the objectives of peacekeeping and the implications and necessary constraints on military operations.

Technology in Support of Peacekeeping

Peacekeeping is not part of the conflict spectrum and the demands it imposes are quite different to those of combat. The protection afforded to peacekeepers is political and the openness of their operations is an overt political act. The philosophical approach to technology support to peacekeeping achieves its best effect if it enhances the peacekeepers' capacity to affect their political purpose.

Experience suggests that, generally, the systems needed for effective peacekeeping are readily available commercially. Military systems are usually more than adequate, but of course the redundancy leads to some unnecessary additional expense. For example, peacekeeping operations are unlikely to require the full capacities of the observation, combat support systems, or the armored protection and firepower used during the Gulf War. Peacekeepers normally do not need these levels of sophistication since, by their nature, they do not use offensive force and the presence of such systems could prove provocative.

On the other hand, there could be much more focus on methods of weapons destruction in a non-conflict environment. For example, the requirement for de-mining is often more extensive in peacekeeping than in combat. But the existing military technology and methods are equally inadequate. Any technologies that could increase the rate at which areas can be cleared of the polluting effect of mines should command a high priority.

In many cases, the most efficient de-mining is achieved through training numerous local personnel. Consequently, improved training technology can help. The de-mining equipment used in these circumstances should be robust and simple, so that it can be used by local personnel with little technical background. The safety of the deminers remains a key issue in enhancing their confidence and the pace of their work. Active support to provisions in the Inhumane Weapons Conventions that help detection and destruction, and limit proliferation, is also important. This would form a critically important complement at the political level to the development of detection and destruction technology in the field.

Similarly, where the confidence building process requires disarmament of forces, ready and safe means of weapons destruction might be the key ingredient in developing a peaceful environment that can foster conflict resolution. This involves destruction of armaments ranging from pistols to tanks and aircraft, and the disposal of all types of ammunition, much of which is likely to be unstable.

With peacekeeping equipment generally, the development of non-lethal technologies that provide options for greater discrimination in the use of defensive force could form a priority area. The risks of these making force easier to use would need to be overcome by doctrine, training and clear orders. Warning technologies would also be useful.

In addition, the increasing complexity of peacekeeping operations requires a higher degree of sophistication than is presently evident in two particular areas:

- First, command, control, and communications systems are required for the strategic level, and for dispersed forces over a large area for both the operational and tactical levels. Cohesion between levels remains a central need.
- Second, systems are required for information gathering and analysis for strategic and operational decision-making, including surveillance and reconnaissance capabilities.

Access to national systems could provide a cost efficient way of achieving these ends, however, there are political risks in this. Using several sources could help overcome this, but in any case, independent analysis is critical.

In training for peacekeeping, the use of simulation for planning and analytical exercises, including command training, is an important area for focus.

Ultimately, as the United Nations Charter indicates, peacekeeping is about people. A critical area for technology focus is in areas that help United Nations peacekeepers establish their bona fides with the population in the mission area. In Cambodia, the civic action campaign was key in forging alliances with the Cambodian people in a way that convinced them of our commitment and allowed us to bypass the power struggles between and within the factions. Simple systems to support civic action, such as agricultural and road-building equipment, and management packages could prove helpful.

A closely related instrument for transmitting UNTAC's message was its own radio station. This used established technology. However, initially this was opposed by the United Nations Secretariat on the grounds of expense, although its utility and cost-effectiveness have been recognized since the successful conclusion of the operation.

Also required was a more effective means of getting the UNTAC message to the broader international community in a way that could overcome the distortions inherent in contemporary journalism. Media reports influenced the international support to UNTAC and at times came close to undermining a mission that was ultimately shown to be achievable. Advancement of the broader message of the United Nations Charter is a highly desirable general international objective. Development of effective public communications systems, such as an area broadcast facility for peacekeeping operations would be a particularly useful area of focus. Adaptation of existing satellite communications might achieve this.

It is perhaps in the area of communications and information technology that enhance effectiveness at both the strategic and operational levels that a most significant impact can be made on the success of peacekeeping operations.

New Zealand and Collective Security

6

by
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INTRODUCTION

It is said that in a court case in the mid-south a railway company was being charged with responsibility for a grievous accident. A key witness was a local employee of the railroad who came across the evidence that his friend Jim had been run over by a train. He described how he had seen the victim's head on one side of the track, his torso and limbs scattered about. "And what did you think" the defense attorney asked "when you saw these grisly remains?" "Well," he said, "I thought something serious has happened to Jim."

For our purposes something serious has happened to peace operations. A good, but limited idea has been run down, because—in the cases of Bosnia and Somalia—the collective mind was not focused on where we were going and how we were going to get there. The politics were not synchronized with the military realities. As a result the soldiers were asked, like Alice in Wonderland, to believe 25 impossible things before breakfast. The implications of this serious accident spread beyond the fate of any one particular peace operation. They raise a question about the future, not so much of peace operations, but of collective action itself.

For the ball has been lost among the great collective institutions so painfully put together in the past 45 years. Between the UN and NATO, the European Community and the European Union, and between the Security Council and the central agencies of the United Nations, itself, we have seen a painful set of disconnects open up. Now none of this is irreparable. Unlike poor Jim, collective action can be put together again. But we shall need the will and the leadership to do it.

THOROUGH PREPARATION PAYS OFF

Many things have been done in the name of peace operations and done well. To sum up: those operations where there was sound and fully-engaged diplomatic preparation, where the combined civilian-military elements in a peace operation have been fitted in as part of a well-conceived peace process, have worked well. Namibia, Cambodia, El Salvador, Mozambique are shining examples. The element of consent, but not the absence of violence (and the two are sometimes thought to be the same thing), has been a constant. Where things have gone badly the constant factors have been: failure to conceive and articulate a political strategy and plan, problems with liaison between the agencies already mentioned, "ad hocery" (sometimes inspired, mostly not), and failure to know how to deal with violence (our famous Mogadishu line).

There may well be, as some of us heard Professor Michael Brenner say the other day in Washington, "a flight from responsibility everywhere." I am not sure that this is how I would put it. I see, from the perspective of one of the smaller—but nevertheless active—players in the international system, little shrinking from responsibility among the smaller and middle-sized countries. But there is a near calamitous lack of consensus, cohesion, and clear objectives as to how to go about upholding the peace. The major powers cannot stand aside from the search for a solution. Indeed they must lead it. The flight is not so much from responsibility as from a sense of the collective.

FUTURE OPERATIONS REQUIRE SIMILAR COMMITMENT

In looking to the future, we must start with where we came from. Of course we can all look back, with some awe, now, at the singleness of purpose and high resolve with which the West held to its course under the leadership of the United States for upwards of 40 years. Of course it was to be expected that the eye would slip off the mark, the grip slacken, after so major a victory. Equally, it is easier to hold to a commitment to a large and vastly compulsive cause than to find the way through the web of problems associated with civil strife and breakdown, which so enmeshes us now. But that is the point. We must live in our own times. The challenges we face are a great deal less demanding than those we have been through. They are to do with holding on to what we have, by way of a collective commitment. Ironically, the fact that the problems are less immediate and of a much lower order of difficulty and responsibility exacerbates, rather than eases, the challenge. As Samuel Johnson reminded us, the mind is concentrated wonderfully by the thought that one might be hanged next week.

Peace operations represent a collective commitment. Without a strong strand of collective resolve they will soon be reduced to a very low level of capability and effectiveness. We are told that peace operations can only be effective when there is peace to keep. This is trite and unhelpful. For the evidence is everywhere, we live in a very violent world, a world awash with high-powered weaponry, much of it controlled by characters with an only distant relationship with military discipline and the regimental ethos. Plainly if we are to take it that peace operations are worth doing only when peace has broken out, the technique is not going to be much use to us for trying to meet some of the challenges of the times in which we live. The lion is not likely soon to learn to lie down with the lamb, let alone the other way around. The key is in making the level of military effectiveness commensurate with the particular problems on the ground. The willingness to do that in turn is determined by the degree of political resolution.

Some peace operations—in Somalia (under UNITAF), Haiti and in Northern Ireland—have plainly been very effective although there has been no peace, as usually defined (i.e., the absence of violence) to keep in these places. The forces deployed were well-trained and equipped, militarily more than capable of meeting any opposition they encountered; they had the capacity to defend themselves and their mission. The key lay in the commitment, the political will, of

the authorities responsible for those operations. Without that, peace operations will always be able to function only at the margins of our concerns. Of course, the UNITAF phase in Somalia, like the initial deployment to Haiti and, of course, the British commitment to maintaining the peace in Northern Ireland, were not among the usual run of multinational operations. In each case these operations were carried along by an unusual degree of national commitment and engagement. There is the rub.

INTERNATIONAL COMMITMENT IS CONSTANTLY TESTED

This issue of commitment is about to be tested again and in a different setting. The British-French-Netherlands combined force now being deployed to Bosnia represents a new approach to what has become the central conundrum of peace-keeping: how to add military punch to enable a peace operation to carry out its mandate and protect its people without becoming engaged in the conflict? Will it work? Already the very idea is being dismissed. As the Holy Roman Empire was said to be neither holy, nor Roman, nor an empire, so this idea of a rapid reaction force is dismissed as nether rapid nor reactive nor a force. Perhaps cynicism is at the heart of our problems. There is argument about the command structure, who will pay and how much, the lines of responsibility, whether it is a blue helmet or a NATO operation or simply a series of conjoined national initiatives. All this is true to form.

For it is self-evident that without a clear consensus and a well-defined set of aims no coalition can hold together. There can never be an effective coalition without agreement about the key commitments and obligations of the partners. What is it that we should be coalescing around? On what do we have, or ought we to have, a consensus?

INTERNATIONAL CONSENSUS EXISTS

Slowly, since the end of the 19th century, a corpus of international treaty commitments has been built up on matters to do with offenses against the laws of war. The nations have signaled support for definitions of war crimes that include the murder, ill-treatment or deportation of civilian populations. Crimes against humanity are generally held to include political, racial or religious persecution of civilian populations. A United Nations Convention on the Prevention and Punishment of Genocide has been widely endorsed. Few countries refuse to subscribe to the broad principles relating to the conduct of war, the treatment of prisoners of war and the protection of civilians in time of war enshrined in the Geneva Conventions; many have even endorsed the two 1949 protocols extending protection under the Conventions to guerrilla fighters in wars of self-determination or participants in civil wars able to claim control over significant territory.

All this is enough. In theory, at least, such commitments should provide more than sufficient justification for international action. Most of the principles upheld under this fragile framework of international agreement have in fact been wilfully flouted in the aftermath of the collapse of former Yugoslavia. However, there has been no sustained sense of outrage sufficient to generate a forcible response. Equally, it could be said that all members of the United Nations have, in signing on, made commitments under Chapter VII of the Charter to taking collective action (the emphasis is on *action*) in response to threats to the peace, breaches of the peace, and acts of aggression. Again it is not easy to relate that commitment to the present disarray in the international community over what to do about Bosnia.

At this conference, I met with General Nambiar. He said this morning that peace operations are here to stay. The occasional setback will not remove the concept from the collective memory. Beleaguered leaders in countries falling apart will continue to want to turn for help to the international community just as the Security Council will instinctively think in terms of fashioning collective responses to crises. No doubt the Bosnian trauma will inspire caution. That may be no

bad thing. The need is to generate much new thinking about how to do better.

As even a casual consideration makes clear, peace operations come in many guises. The concept offers a great range of options for dealing with a world, which in more than a few places, is coming apart at the seams. We rehearsed those options at this workshop in John Sewall's development of the Gerry Yonas model. But all the way through from peacemaking; peacekeeping; expanded peacekeeping; peacebuilding (reconstruction); protective engagement (which General Rupert Smith calls containment); deterrence; to peace enforcement, there are options galore for the policy makers. There is scope for all-comers—the great and the small. What is needed is the effort, the will, and—dare I say it— the leadership to draw it all together to make the pattern cohere. Then all things are possible, a more effective and fair division of peacekeeping labor, more clear-cut directives to the force commanders, coupled with the military means to allow them to use force to defend their people and their mandate.

SMALLER COUNTRIES ALSO PLAY A VITAL ROLE

Now I know all too well from my years in Washington that Americans have trouble looking through the wrong end of the telescope, to see the world of the smaller actors. Smaller countries can usually be expected to support collective action. Perhaps I might be forgiven for observing that New Zealand has done so *cum laude* through all the wars of our terrible century. I like to think of this role as a model of collective security in action. For by all the standards of *realpolitik* where was the direct threat to New Zealand? Indeed, by whatever standards we are applying to Bosnia—of realpolitik or otherwise—where is the New Zealand interest in sending troops there, other than as a mark of a commitment to collective security? Of course there aren't many of them—a company of well-trained, professional infantry, 260 soldiers. If we think about it, that number gives an index of what could be done in this untidy world if we all accepted an equivalency of contribution. I'm not going to get into the old question of whether one New Zealander is worth three Englishmen—or at least five Australians! But New Zealand is a country of only 3.6 million people. There are about 72 times as many Americans. I simply point out that 260 New Zealanders represent the same level of collective commitment as 18,200 Americans.

Involvement in Bosnia has not caused a revolution in New Zealand. Polling, in fact, suggests that New Zealand support for United Nations collective security has gone up several percentage points to 75 percent, since the commitment was made. Support for maintaining effective armed forces has equally increased to 69 percent. The arguments heard in Washington against United States involvement on the ground in former Yugoslavia have nevertheless also been made in New Zealand—and of course, quite shrilly. Plenty of New Zealanders have urged on the government that we too should let this one pass: Bosnia is a long way away, no direct national interests of ours are at stake, New Zealand should stop getting entangled in other people's wars, the Balkans is a quagmire and the people obsessed by ancient hatreds etc., etc. The UN is a mess, couldn't fight it's way out of a paper bag. We too have heard all that. No doubt the same noises are made in Ottawa, London, and Paris.

Clearly collective security will wither away if such arguments prosper. As I said, smaller countries have an instinct for the collective approach; that way, there is scope for covering more of the security imperatives and for maximizing their own, necessarily limited, military capabilities. They gain a seat at the table; a lesser known member of the international community—or one seeking to reposition itself—can claim credit as a constructive player, and so on. The collective principle can, however, obviously work only if the commitment is broadly shared. What is needed is coherence among all interested parties and an ability to interact until the whole process is mutually supportive. This calls for the major players to drive a collective security concept

along. This has always been how alliances have worked. Now it is necessary to apply some of the same impetus to developing the concept of peace operations.

There is a leadership role here, of the highest potential, for the United States. In the broadest sense it would call for articulation of a new collective approach to peace operations. In practical terms it would involve taking the initiative to arrange comprehensive collective military training for peace operations, working with partners and the United Nations to put together a new military doctrine, devising appropriate rules of engagement and ensuring that whatever force is put into the field is backed with the capabilities, so it is not militarily ineffectual when challenged.

I have the feeling—which may be unfair—that over the past five or six years, the liberal international community has suffered from something of a collective rush of blood to the head. In our enthusiasm to believe in a new world order we neglected the importance of the tough old military nuts and bolts needed to make even the palest of collective systems work. The American wit and coiner of aphorisms, Josh Billings, wrote:

> If you want a good crop and a sure yield, sow wild oats.

For the plain fact is that, in respect of former Yugoslavia, the international community—or more accurately the Security Council—handed the United Nations what in rugby football is known as a "hospital pass." This means that you are given the ball in hopeless circumstances and at the very moment when the opposition is best able to do you serious bodily harm. Did UNPROFOR (the UN Protection Force in the former Yugoslavia) ever have much of a chance of reacting firmly and decisively to harassment and obstruction when the military provisions had not been made? In almost all of its dealings on the Gulf War, the Security Council acted with firmness and cohesion. No Fly Zones, Weapons Exclusion Areas, a solid peacekeeping effort in relation to Kuwait, a major intrusion in Northern Iraq, and an extraordinarily intrusive process of weapons inspection and destruction were all pushed through and backed by the necessary shows of force.

What made the difference? Of course, major strategic interests were engaged in the Gulf; considerations of high security interest were at stake. And then there was the decisive role played by the United States . . . .

This raises the question, can comparable will be summoned up where the direct interests may be less pressing, where the issues are to do not with power and grand strategy, but with humanitarian relief and violations of international law? What degree of effectiveness can we hope to attach to peace operations if the major powers are not fully engaged in making the concept work?

At the San Francisco Conference 50 years ago, New Zealand strenuously opposed inclusion in the United Nations Charter of the right of veto to be held by the Permanent Members of the Security Council. Smaller countries, which were not going to get on the Council very often, clearly did not appreciate a concentration of power in the hands of the Permanent five. The rationale for this authority was, of course, the responsibility accorded to the major powers for the maintenance of international peace and security. Decisions of the Council to do with peace and security issues that are not backed by the provision of the necessary military capabilities by the major powers, are clearly not going to increase respect either for the Council or for the powers concerned.

The issues are urgent on several counts: unless it is possible to inspire a certain respect for the will of the international community as expressed, however imperfectly, through the Security Council the broad peace keeping concept will unravel. Without the demonstration of some firmness and resolve to back the commitments states have made to international law, what is sure to be a very untidy opening to the 21st century could become disastrously unstable.

THE PEACEKEEPING PROCESS NEEDS REEXAMINATION

In thinking again about what is needed to improve the future for peace operations—the subject of our conference—I suggest that we must focus on the point that so called "first generation" peace keeping cannot simply be expanded, as we have tended to do in the past few years. Rather it is necessary to rethink ways and means. If the central problem is to control violence to promote peace processes, it will no longer be sufficient simply to deploy lightly armed peacekeepers, entirely subject to the whim of every local warlord. If war is the continuation of politics by other means, peace operations are perhaps the continuation of diplomacy by other means. However, where violence is a fundamental part of the equation, the pursuit of peace is compromised, unless the peacekeepers can, at least, defend themselves. This makes at least some parts of the peace operations spectrum a form of diplomacy by military means.

It is properly said that good soldiers make good peacekeepers. The reference, however, is not to military aggressiveness but to the key soldierly qualities of discipline, restraint in the use of force, the ability to communicate and manage what is going on. Effective command and control are also fundamental. Dag Hammarskjold's oft-quoted remark still holds true, "It's not a job for soldiers, but only soldiers can do it." This does not mean that the good soldiers must always turn the other cheek. Humiliation of the kind meted out by the Bosnian Serbs in the past few days is plainly unacceptable.

Effective capabilities for self-defense seem to be a minimum requirement for future deployments in areas where violence is endemic. This includes close fire support and close air cover. Can such capabilities be used without crossing the so called "Mogadishu line" and involving the United Nations itself in war? I suggest that they can, if we make a sufficient distinction between upholding the mandate and taking war to an enemy. A reality check makes it quite clear that the world community cannot entertain the notion of putting together comprehensive capabilities actually to "enforce peace" very often; the Gulf and Korea are the only clear-cut examples. This is not the same issue as the provision of sufficient military capabilities to allow a peace operation to defend itself and to carry out the mandate it has been given. That can be done and the Great Powers can rally a great deal of support from the rest of the international community to do it, if they can themselves summon up the will.

PUT PEACEKEEPING OPERATIONS IN PERSPECTIVE

I sense that peace operations are in tune with the temper of our times. Only a fool would pretend that war is going out of fashion. But equally it is plain that the liberal democracies' distaste for war is now a major factor in political life. How things have changed from the early years of this century: a headlong charge at the guns yielded 60,000 casualties in a morning on the opening day of the First Battle of the Somme; today there is concern that even a single American casualty could compromise a, so far, very successful peace operation in Haiti! Whatever their faults, peace operations stand for prudence and restraint in military matters. Perhaps things do get better after all. Immediately before the First World War there was an all-in Balkans War of extreme ferocity and with much bloodletting. The major countries of the West paid little attention. Now a similar event shames us all. Hopefully we can now move on to finding effective techniques for making the modest, but useful tool of peacekeeping more useful. It will not end war or solve the grand strategic issues, but to adjust peace operations to the modern realities must offer new hope. That way the collective principle will be given new life. The military establishments are responding to this new challenge. The political establishments must follow.

Peace Enforcement Organizational Planning and Technical Requirements

7

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LESSONS FROM RECENT OPERATIONS

> "Their (the UN Security Council's) work must be based on the (UN) Charter."
>
> *Mr. Makins, Australia, first President of the Security Council, on its first meeting, London, January 17, 1946.*
>
> "The world has failed, and is continuing to fail to help me with support to get the job done."
>
> *Shaharyar Mohammed Khan, UN Secretary-General's Special Representative in Rwanda, March 1995.*

The above two statements are repeated to provide a theme for this paper. The statements were written at a time when the willingness and ability of the world to provide the resources required for the execution of an operation were being questioned around the world. In this case, it relates to the UNPROFOR (UN Protection Force in the former Yugoslavia) operations being carried out under the mandate of the UN Charter. In its preparation, the author read again an article by Australian Senator Gareth Evans, in the Fall 1994 issue of *Foreign Policy*, in which he wrote:

> Although many of the criticisms are justified, most responsibility rests not with the UN as an institution so much as with the failure of member states to provide the commitment and resources necessary to enact the needed reforms. It is hardly reasonable for states to deny the UN desperately needed funds, then blame it for the failures that lack of resources inevitably generate. Nor is it reasonable to blame the UN as an institution for the

failures of member states in the Security Council to provide the decisive leadership.

This paragraph contains three words on which the author intends to concentrate, conscious that this may duplicate what others have already contributed, or will contribute: reform, resources and leadership.

Requirements in organization, planning, and operations are examined as they relate to the UN and its capacity for organizing and planning such operations, because it is from there that all else stems. These requirements are also examined where the application of technologies could have significantly improved the prospects for success, based on lessons learned from examples of "Extended Peacekeeping" and "Peace Enforcement." Several technological essentials, rather than desirables, will be mentioned and a suggestion as to what the UN must do if reforms and requirements are to be satisfied. However, the UN's bible, the Charter, must be looked at first.

PEACE ENFORCEMENT LESSONS

In strict UN Charter terms, only Korea, the Congo, Somalia and Kuwait qualify as true Chapter VII Peace Enforcement operations. Somalia is being covered as a special case by Admiral Jonathan Howe, and it would be impertinent of me to tiptoe into his territory. Korea and the Congo, both hardly recent, were special cases of a different nature; furthermore military technology has moved on since then, making many of their lessons less than currently relevant. Desert Storm also could be said to have been special because, in the field, it was essentially United States and not UN led. It has been evaluated often, and in many different ways, the inevitability of its outcome being explained as much by the differing standards of technology available to each side as by the ability of their soldiers to exploit it. So what are the relevant lessons from recent operations, that can help to improve the prospects for future peace operations?

PEACEKEEPING DEFINITIONS

Before attempting to identify those, and in order to eliminate confusion, the definitions of Traditional Peacekeeping, "Extended" Peacekeeping and Peace Enforcement that will be used are those contained in the recently published U.K. Army Field Manual Volume 5, Operations Other Than War, Part 2, "Wider Peacekeeping" (the term the United Kingdom prefers to "Extended").

- Traditional Peacekeeping is: "Operations carried out with the consent of belligerent parties, in support of efforts to achieve or maintain peace, in order to promote security and sustain life in areas of potential or actual conflict."
- Wider Peacekeeping: "The wider aspects of peacekeeping operations carried out with the general consent of the belligerent parties but in an environment that may be highly volatile."
- Peace Enforcement: "Operations carried out to restore peace between belligerent parties who do not all consent to intervention and who may be engaged in combat activities."

THE UN CHARTER

The action that the UN may take "with respect to Threats to the Peace, Breaches of the Peace, and Acts of Aggression," called Peace Enforcement, is mandated by Articles 41 and 42 of the UN Charter. Article 41 says:

> The Security Council may decide what measures not involving the use of armed force are to be employed to give effect to its decisions, and it may call upon the Members of the United Nations to apply such measures. These may include complete interruption of economic relations and of rail, sea, air, postal, telegraphic, radio and other means of communication, and the severance of diplomatic relations.

and Article 42:

> Should the Security Council consider that measures provided for in Article 41 would be inadequate or have proved to be inadequate, it may take such action by air, sea, or land forces as may be necessary to maintain or restore international peace and security. Such actions may

include demonstrations, blockade, and other operations by air, sea or land force of Members of the United Nations.

Any examination of potential improvements to the execution of such operations must look at whether conditions will allow the various demands to be satisfied, and suggest what needs to be done to ensure that they can. But, referring back to Mr Makins, it must also include an examination of the Charter to see whether it too is adequate for its task, on the assumption that all action must be based upon it.

So far this Workshop has concentrated on Traditional and Wider Peacekeeping, usually conducted by ad hoc contributions from Member Nations. There has been much criticism of such ad hoc grouping, because of the problems present from trying to integrate many individual elements with widely differing capability and equipment. The one overarching lesson from all Peace Enforcement operations, including Desert Storm, is that any ad hoc grouping will not do in what is essentially war fighting, which must be conducted by a commander and staff trained and equipped for war fighting. The UN does not possess such a capability, although the pressure for it to maintain some form of standing force is again mounting, and a proposal will be mentioned later. Therefore, it has to fall back on Articles 43, 48 and 52. Article 43 states that:

1. All Members of the United Nations, to contribute to the maintenance of international peace and security, undertake to make available to the Security Council on its call and according to a special agreement or agreements assistance, and facilities, including rights of passage, necessary for the maintenance of international peace and security.
2. Such agreement or agreements shall govern the numbers and types of forces, their degree of readiness and general location, and the nature of the facilities and assistance to be provided.

Article 48 allows particular forces to be employed in particular circumstances:

> The action required to carry out the decisions of the Security Council for the maintenance of international peace and security shall be taken by all the Members of the United Nations or by some of them, as the Security Council may determine.

Article 52 says that:

> Nothing in the present Charter precludes the existence of regional arrangements or agencies for dealing with such matters relating to the maintenance of international peace and security as are appropriate for regional action, provided that such arrangements of agencies and their activities are consistent with the Purposes and Principles of the United Nations.

Because Peace Enforcement amounts to little less than war fighting, many suggest that all that is required is the deployment of national contingents trained and equipped for high intensity conflict acting in the name of the UN. NATO nations will suggest that the most effective Peace Enforcement grouping can only come from NATO itself, using NATO procedures designed to deal with such a demand, employed under the Charter Articles quoted above. The Partnership for Peace countries involved in the current Enlargement of NATO, have been quick to recognize that the imperative of being able to take part in a NATO led Peace Enforcement operation provides a very valid reason for mastering and adopting those operational techniques and procedures that will enable them to do so effectively. In fact Desert Storm could be described as a NATO deployment in the name of the UN, to which non-NATO forces were added. However, because these forces were not familiar with operational procedures (which is not to say that they were not combat capable) they were given discrete missions, which contributed to the overall concept. NATO troops operated together on one part of the front, and non-NATO on another. In essence that is true, and suggests one way for the future, which has already been advocated by Kofi Annan, the Under Secretary-General for Peacekeeping Operations. Namely, that a lead nation should always be appointed in such circumstances, responsible not just for providing a command Headquarters, but for laying down

interoperability requirements and procedures to enable the force to operate coherently.

But when looking to the future, the political implications of NATO involvement cannot be ignored, because of its limited geographical area of interest. There are no similar politico/military structures in other regions such as the OAS or OAU. Therefore, unless NATO is to act "out of area," this important operational lesson can only be "noted" elsewhere, hopefully encouraging the UN to find out how Peace Enforcement operations might be conducted outside the NATO area. Cambodia, as we have heard, was not a Peace Enforcement operation. Somalia contains several examples of how not to do it, with the whole U.S. contingent not being under the command of the Force Commander and some elements being commanded and controlled from Florida rather than Mogadishu. This is an organizational and planning point rather than a technological one, but is has implications for the employment of technology.

To revert to the employment of an agent such as NATO as military force provider, one particular benefit of current operations in the former Yugoslavia is that the UN and it have had to hammer out "dual-key" arrangements. These arrangements concern the use of air power in Bosnia and Herzegovina, in support of the relevant UN Security Council resolutions. NATO as an agent of the UN under the authority of the Security Council responds to requests made following violations of those resolutions. This is a pattern familiar to those who have been involved in internal security operations, as the British call them. To take Northern Ireland as an example, should the Police find that a situation is beyond their capacity to deal, such as a riot or a cordon and search, they hand it over to the Army, who use military means to solve the problem, and then hand back command to the Police. Translated into Peace Enforcement terms it should be possible for the UN to hand a situation over to a lead nation or an organization such as NATO, invite them to enforce a solution by military means, and then take over the post conflict "Peace Building" or "Reconstruction" part of a mandate. Problems should only arise if the agent is tempted to take unilateral military action, which may seem perfectly reasonable, and even desirable, in military terms, but which conflicts with the overall direction of the UN Mission.

The example that most readily comes to mind is the NATO wish to take out air defense assets before bombing airfields from which air attacks had been mounted in Bosnia. Their removal, and the technology to facilitate this, entirely normal in war, could have made the UN look like a participant in, rather than a preventer of war. But the example introduces the point that because the UN does not own any high technology equipment, it must determine what is required and then ask for it to be made available. Who is to make that appreciation? After a brief look at the world in which the UN must plan and organize, the Organization itself must be examined to see exactly what special provision for Peace Enforcement is required.

THE CURRENT AND FUTURE SECURITY

There now exists a multiplicity of non-military threats to the way of life, safety, and well-being of the peoples of this planet, which deserve all our attention. In the future the most serious risk to the security of a nation may come from ethnic and religious conflicts, border disputes, civil wars (many of which could spill across international borders), the collapse of governmental authority within a state or states, or many other problems with a potential for regional destabilization. Among these must be included: international terrorism, international crime, drugs and overpopulation in poorer and more troubled countries, which could lead to a migratory flood from them to the richer and more peaceful, bringing not only social chaos but rising racial antagonisms. This in turn could lead to resource wars over diminishing stocks of water, grazing land, timber and the like, nor should the effects of environmental damage be excluded.

What all this adds up to is that national security is becoming increasingly inseparable from international security. Threats to the security of a

nation must include anything, anywhere on the globe, which threatens the health, economic well-being, social stability and political peace of its people. Such threats can only be countered by the peoples of the world, but this will require the same kind of coordinated response as is afforded to countering military threats.

THE UN RESPONSE

The Charter, and the United Nations Organization itself, are children of World War II, and describe the world of the founding fathers, in which it was presumed that the problems with which it would have to deal were between nation states. Similarly the League of Nations, and its Charter, were the children of World War I. The UN was an update of the League of Nations, but there has been no such update since the end of the Cold War, other than the two documents (*An Agenda for Peace* and *An Agenda for Development*), on which member states have commented. That is not to say that many member states, and individuals, have not put forward many ideas about what needs to be done, but, so far, without any major result. The fact remains, that intervention in any of the circumstances described above risks breaking a cardinal principle of the UN, namely that it will not interfere with the internal affairs of any state. That was all very well when the world was made up of nation states, and it was disputes between them that had to be umpired, with their consent. The break up of these states however, leading to situations where any internal dispute is likely to spill across international borders, and where the only way to prevent this is to interfere, is changing the name of the game.

It is not suggested that a new Charter or a new United Nations is required, but rather a fundamental review of both, to ensure that they reflect current needs, and satisfy member states that their organization is both structured and mandated to cope with the problems thrown up by the break up of the 1914-1989 World order, and the emergence of its successor. But, to carry out that revision, member states must have a vision of what additions and alterations they would like to be made, and why, so that they can instigate and evaluate what is required and proposed.

It is suggested that such a revision should be based on the premise that all UN activities are interventions in one form or another. And, that Peace Operations are a continuum of several interrelated activities, designed to cater for many different situations that may require action. Like all revisions it will require compromise between conflicting national views, but, if the end is agreed, the means should be easier to achieve.

Describing how the UN should tackle its tasks, Boutros-Ghali, in *An Agenda for Peace*, lists six "instruments for peace and security":

- preventive diplomacy and peace making,
- peacekeeping,
- post-conflict peace-rebuilding,
- disarmament,
- sanctions, and
- enforcement action.

In a recent article in *Survival*, Shashi Tharoor, Special Assistant to Kofi Annan in the Department of Peacekeeping Operations, lists five "different, though sometimes overlapping" kinds of activity in which UN peacekeepers are currently engaged in Europe:

- traditional peacekeeping—in Central Bosnia and Croatia,
- preventive deployment—in Macedonia,
- observation of a non-UN peacekeeping force-UNOMIG (in the nation of Georgia), and
- humanitarian relief—in Bosnia and Herzegovina
- conflict mitigation—in Bosnia and Herzegovina.

Shashi Tharoor describes humanitarian relief as:

> deploying UN peacekeepers tasked to mitigate an ongoing conflict by limiting the parties' recourse to certain military means (in this case, maintaining an interdiction on the use of aircraft for combat purposes) or to attacks upon certain cities (protection of 'safe areas'), in both cases backed up by the threat of military force pro-

vided by a regional security organization (the North Atlantic Treaty Organization (NATO)).

The Secretary-General's six, and Tharoor's five can be compressed into three instruments:

1. preventive action,
2. conflict or chaos resolution, and
3. post-conflict rebuilding.

These instruments are not mutually exclusive and all of which are being implemented now in UNPROFOR. The deployment of peacekeepers in Macedonia is to deter rather than resolve conflict, therefore preventive; traditional peacekeeping and conflict mitigation are being used to attempt to resolve; humanitarian relief is attempting to do all three. But they represent the application of military and humanitarian means to political direction, if not a political aim, the lack of which has been so cruelly and starkly exposed in recent weeks. Those who preach that it is now time to switch to Peace Enforcement should bear in mind that Enforcement is the extreme method of Resolution. Its introduction must be weighed against the effect that it would have on all the other UN-related activities that are being conducted in the area.

Peace Enforcement will only be undertaken when Preventive Action has failed, and should be followed by planned and structured Reconstruction. Any intervention against or within a country without its consent, is nothing short of war, declared by the world community, for a particular purpose, and, hopefully, for a limited time. Therefore, unlike contributions to Traditional or Wider Peacekeeping, the major lesson for all contributors to Peace Enforcement operations is that, besides being under conflict capable command, all committed forces must be conflict capable, anything less being wholly inappropriate in circumstances in which all the modern technologies of war will be employed. It simply is not acceptable to send anyone naked on to the modern battlefield, which means being ill-trained or ill-equipped to fight and survive. This is seen very starkly in Yugoslavia, where some contingents lack any form of personal protection against the wide range of weaponry that can be brought to bear against them. Only the British, French, Canadians, and Danes can be said to be satisfactorily equipped, which limits the deployment options of the Force Commander. The UN must establish a mechanism for evaluating contingent capability, which will now be considered.

ORGANIZATION AND PLANNING IN THE UN

The organizational and planning shortcomings of the UN, and such essentials as unity of command, with full and common operational control of all assigned and contributed assets being vested in the force commander, will have been discussed already in the workshop, and therefore only a check list of points will be made here. None of them are new, but all arise from lessons learned. They are in no order of priority, but are based on an appreciation that it is the task of the UN to plan, mount and sustain, not command, operations.

The role of the Secretary General will remain the same. Every Mission mandate must be endorsed by the Security Council.

One has only to look through the bewildering number of Security Council resolutions on the former Yugoslavia to realize how unsatisfactory this process is in military terms. This state of affairs is understandable, given that resolutions reflect the political and diplomatic compromise possible among current members of the Security Council. But incredible and undeliverable mandates reflect on the credibility of the organization as a whole. This may not matter too much when more general activities are at stake, but it must not be so when Peace Enforcement is involved. By its very nature it implies military action, and that needs clear and unambiguous direction, particularly if it is being effected in the name of the world community. This highlights the need for such clear direction, from the UN, and again it is worth looking back at what the founding fathers intended for that purpose.

All military operations must have a clear aim. The problem of Security Council resolutions is that they translate into neither an aim, nor a clear military directive. The founding fathers, foresee-

ing this problem, intended there to be a Military Staff Committee under Article 47 of the Charter, whose responsibility and role would be to guide the Security Council. This was to consist of the Chiefs of Staff of the Permanent Five members of the Security Council, and the Committee is now a vital missing link that could provide the solution to many of the problems mentioned. It should be reinstated now, not as the Chiefs of Staff of the Permanent Five, but separately for each Mission, consisting of the Chiefs of Staff of all nations contributing to a Mission. Its Chairman desirably, but not essentially, an ex-UN Force Commander should also be Military Advisor to the Security Council, and Secretary-General. This committee should be served by a small International Military Staff that would act as a military judgement panel on all Security Council resolutions with a military content.

The Committee should convene to confirm such essentials as force structures, the command status of national contingents and the powers of force commanders over them, rules of engagement, interoperability guidelines, intercommunication, staff procedures, equipment scales and technology requirements. All these are looked at in an ad hoc way, by inexperienced and limited staffs, at present. This is one of the principal reasons why there are so many shortcomings in the conduct of UN operations. Whether or not a nation has been invited to take the lead, ideally Force Commanders should be appointed early enough for them to take part in all this work, as well as having a say in the composition of their own Headquarters. This is an organization and planning essential, and a lesson from every single UN operation.

The role and responsibility of the Department of Peacekeeping Operations will not change, but its staffing must be enhanced. A key element in this is the expansion of the role of the recently appointed Assistant Secretary General for Planning and Support, who is, in effect, Inspector General for Doctrine and Training, whose responsibilities should include:

- The preparation, issue and supervision of a common UN Peacekeeping doctrine.
- Identifying which nations can provide operational force multipliers such as Intelligence, Communications, Air, Logistics and Special Forces.
- Ensuring commonality of training standards.
- Laying down minimum interoperability standards for both battlefield procedures and logistics, and inspecting Member Nations to ensure compliance.
- Staff College training, to ensure that common procedures are understood.

He is the natural candidate for the task of contingent capability evaluation. Other organizational support to the UN points include:

- On the subject of a standing force, something much advocated to enable the Secretary-General to be able to undertake more effective Preventive Action, whether or not it is to be followed by Peace Enforcement deployment, it is suggested that the Allied Mobile Force (Land) (AMF(L)) be adopted as a model. Nations contribute troops, who live and train in their own countries, coming together only for exercises. It has a Headquarters, Communications, Fire Coordination Center and Logistics Headquarters, into which all contributing nations can plug. It is a model not just for the UN but for regional organizations such as the OAS and OAU, to enable them to act quickly in their own region.
- Field Operations Division, is increasing in capacity and competence. The Stand By Forces and Logistics studies have provided a much better data base of what resources are available among member nations.
- The newly appointed Under Secretaries General for Administration and Management and Internal Oversight Services have introduced a new spirit of realism into the commercial and procurement side of the UN which has long been needed. New personnel staffs are tackling the problem of identifying suitable people to serve on UN staffs, at all levels.
- Contingency planning remains the province of the Department of Political Affairs, as does the obtaining of political and strategic intelligence from member nations.

- The Department of Peacekeeping Operations remains responsible for maintaining 24 hr contact with an operational Headquarters, and for the provision of operational intelligence if this is required.
- On the subject of intelligence, although equipment is discussed later, a plea is made for the adoption of the Commander's Critical Intelligence Requirements (CCIR) procedures. Under this a commander is required to assess what intelligence is critical to him in the execution of his mission. His staff, and his superiors, will assess from where that information can be obtained, and then ask for it, on the grounds that it is "Mission critical." That obtaining includes the tasking of sources, technical or otherwise. When introduced within NATO, this procedure was designed to help staffs filter the increasing amount of information that was becoming available to them. If introduced within the UN, from the Security Council downwards, it could help to overcome the inhibitions of nations who, for entirely understandable reasons, are concerned that intelligence that they regard as a national asset might get into the hands of some who might use it against them. The reputation of the UN as a leaking sieve as far as information is concerned needs to be rectified if full advantage of the procedure is to be taken.

ORGANIZATION AND PLANNING IN THE FIELD

The principal command and control lesson from Desert Storm has been mentioned already, namely that it is essential that only properly trained operational headquarters should be used to command Peace Enforcement operations, particularly if they are in the high-intensity conflict spectrum. That stricture applies to sea, land, and air operations, over which it may be tactful and sensible to appoint a Joint Force Commander, as was done on that occasion. At the tactical level it will always be better to leave national force contingents together, rather than be tempted to break them up. They have trained together, understand their own battle procedures and techniques that apply at the level at which they will be fighting, and will make a far more effective contribution if allowed to operate in that way.

Within the assigned operational Headquarters, some branches must be internationalized, to enhance cohesion and understanding. This applies to four branches in particular—intelligence, personnel, logistics and public affairs, based on the premise that nations tend to be much more ready to cooperate if they are dealing with one of their own. The sensitivities of intelligence operations have already been mentioned. Personnel issues, particularly if casualties are suffered, are a major cause of political sensitivity, and disciplinary issues also have national overtones. Catering for logistic special needs and interoperability shortcomings is a major factor to be considered. Finally, there is the matter of public affairs. Nations also prefer to hear the story from their own people, told in their own way. The numbers of correspondents, and the ease of communicating, make censorship a practical impossibility, but control of operational information is an essential, particularly in Peace Enforcement, where secrecy is as much a need on occasions as in any other form of warfare. There are many other roles for the media, in the country of operations, and national media also have a most important role to play in the vital activity of encouraging governments and people to stay the course. Therefore, they must be handled with care, and coordinated direction of this process directed from the top.

TECHNOLOGY REQUIREMENTS

All this is spelled out to suggest that the overriding organizational, planning and technical requirements of Peace Enforcement operations match those required in war, some of which are inherent in national armed forces and some of which must be ensured by the UN if such a Mission is to be conducted in its name. Weaponry requirements will have to be worked out in relation to the needs of a particular operation and the capability of the opponent. Desert Storm is an

admirable example of high technology contributing to the speedy execution of a Mission, something that the world community will always be anxious to achieve.

But the technology that is essential to the conduct, let alone the success, of a Mission is in the command and control area, particularly for communications and intelligence collection, collation, and dissemination. **The lunacy of not having secure communications was most recently illustrated in Bosnia, where the Bosnian Serb artillery fire was corrected onto Tuzla airfield by Bosnian Serbs listening in to the Norwegian contingent deployed at the airfield reporting on the artillery fire.** Thankfully, Joint Deployable Intelligence Support System (JDISS) has been made available by the United States and so there is a degree of security between the UN Headquarters and Mission Headquarters. But it needs to go further than this, as operations in Somalia proved with secure communications down to sub-unit level, and even UN monitor level, must be the procurement aim.

But if communications are an essential for successful command and control, and only the best systems, such as the British Ptarmigan, will do. The UN attitude to intelligence, for far too long regarded as a dirty word, is another subject deserving at least a paper on its own. To quote from the report of the Commission of Enquiry established by the Security Council to investigate armed attacks on UNOSOM II personnel:

> The need to satisfy the UN's requirement for reliable information and intelligence gathering capability is important if peace enforcement operations are to be successfully carried out.

Peace Enforcement intelligence requirements are the same as in war, namely:

- Strategic intelligence, obviously required to understand the political situation between the parties to a conflict before UN involvement, and, once peacemakers are deployed, to anticipate the political moves of governments or factions, especially if there is a risk of violence.
- Political intelligence.
- Information about the economy and society of the country concerned.
- Operational intelligence, required to plan the most effective deployment of resources and to carry out the UN mandate. It will be particularly important in fluid and political situations.
- Tactical intelligence, needed by troops on the ground, to support Peacekeeping activities, such as monitoring cease fires in border areas, and to alert personnel to potential dangers. The management of intelligence at the tactical level can be influential in maintaining or losing the UN's credibility among the parties to a conflict.
- Counter intelligence against the parties hostile to the UN.

The UN cannot provide for all these, nor is it suggested that it should obtain them. All its needs can be met by member states, who own the technology, and who should be asked to provide it. This is where CCIR procedures come into play. Traditionally, nations collect, analyze and use intelligence for their own national purposes, retaining it under national control, and sharing it only with those whom they wish to share it. The UN, which presumably qualifies as a friendly government, requires intelligence for the good of the international community, and in the spirit of that integrity and impartiality that it seeks to maintain, must be quite open about what it needs and why. If, within a Peace Enforcement command and control structure, a commander assesses a piece of information as "Mission critical," then he should be able to ask for it, confident that it will be provided under that tag. That may require the tasking of collection means, such as satellites, information from which has just been offered by the United States in Bosnia. To divert to Wider Peacekeeping for a moment, the author is firmly of the opinion that lack of intelligence gathering, analyzing and disseminating capability is one of the most severe limitations on the capability of the Force Commanders, which is why the offer of U.S. assistance in Bosnia is to be applauded. But, in Peace Enforcement it would be sensible if one nation were

asked to provide a C3I system, which limits those nations with the necessary technology as the only viable providers.

There are two other high technology issues that must be mentioned, both associated with Peace Enforcement, but both relating to other instruments as well. The first, connected to Arms Control, a key ingredient of Preventive Action, which impacts on Conflict resolution and Post-conflict Reconstruction, is battlefield Explosive Ordnance Disposal. There is not enough space to cover this vast subject either in this paper, but the conference to review the 1980 *Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons which may be Deemed to be Excessively Injurious or to Have Indiscriminate Effects* is an important one for the world community. Land mines, for example, are all too accessible, and, without demining, there can be no development. Therefore any UN Peace Mission must be equipped not just to take action to enable armed forces to move around a battlefield, but also to begin the task of clearing up afterwards so that normal life can be resumed.

The second is the burgeoning problem of non-lethal weaponry. The point is that the possession of these multiplies the effectiveness of any potential opponent, and defensive techniques against them are not only expensive in terms of men, money and machines, but also risk crossing the dividing line of impartiality and consent, that takes Wider Peacekeeping into Peace Enforcement. This is a subject that must not be ignored in the future, either in terms of what it may be appropriate to employ, or whose availability must be monitored.

CONCLUSION

So where does this leave us? Two major conclusions can be drawn, within each of which are a multiplicity of implications.

- First, as far as Peace Enforcement is concerned, every recent and current operation confirms that there is an urgent requirement for the UN to be reorganized so that it is capable of organizing and planning operations of that complexity. The lessons suggest that this reorganization must include all parts of the UN, for which the foundations are there for this to be done without a major upheaval, but without which command and control will continue to be flawed, and the credibility of the Organization diminished.
- Second, and arising from that, unless the best communications and intelligence handling technologies are employed, the UN will be unable to conduct such operations. It should not be tempted to try to establish these for itself, but rather to employ them, and those who can operate them, from those nations who own them. This may infuriate the Fifth Committee, who will seek a more international involvement in the process. But their involvement is that of a user, not a provider, of a force multiplier that they would be foolish to jeopardize. It may be that use in Peace Operations encourages more nations to procure such equipment, which is all to the good, provided the UN lays down the interoperability standards, because that should ensure swifter cohesion in any global force structure needed to enforce peace.

UNOSOM II: Could Technology Have Made a Difference?

8

OPERATION WAS FAR FROM A FAILURE

It is commonly believed that the UN effort in Somalia was a failure of policy or simply too hard a problem given the unwillingness of nations to sacrifice more to get that failed country back on its feet. In fact, much was accomplished in Somalia. Thousands were saved from starvation and disease. Time was bought for various Somali elements to reconcile or, failing that, to better protect themselves in semi-autonomous clan regions. Clearly, however, the costs to the UN and participating nations were too high. The ambitious Security Council objectives of restoring some sort of transitional government, basic services, a nearly sustainable economy, and law and order in the hands of legitimate Somali authorities were not achieved.

In reviewing the UN experience in Somalia, it is often overlooked that the means available to the UN mission were not equal to the tasks assigned by the Security Council. The UN was so unready for that complex peace enforcement and nation building operation that it is difficult to make a valid judgment about what might have been possible with proper preparation, resources, and technology.

A frustrating UN attempt to use a small force (UNOSOM 1) under Chapter VI (of the UN Charter) limitations was one of the reasons that a large coalition spearheaded by the United States (UNITAF) was authorized in December 1993. But in relieving UNITAF in May 1994, UNOSOM II clearly was not ready for the stresses of a Chapter VII operation. Such a mandate recognizes the potential need to use force to achieve its goals and implies that there may be armed opposition. Two years later the UN is still not ready for similar operations.

by

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The post-Cold War period has unleashed a number of instabilities, many of which are ethnically based and internally centered. These very complex situations require a skillfully applied mix of political, humanitarian, and military resources. Whether under Chapter VI or VII, a peacekeeping mission needs to minimize the use of force whenever possible and to take extra precautions to avoid collateral damage. It is important to maintain the support of the majority of the population, whose good will is essential to any recovery, even if force must be used against troublemakers.

However, in many situations ahead this new world disorder will require determination, commitment, and readiness to use force. Often the UN will face obstructionists who have no interest in reasonable solutions to conflicts. Coercion or the recognition that force could be used will be necessary to convince them to cooperate with international authorities. This has been true in the case of external aggression (e.g., Iraq's invasion of Kuwait), and the internal disintegration of countries with growing anarchy and humanitarian catastrophes (e.g., ethnic cleansing in Bosnia, genocide in Rwanda, and manmade starvation in Somalia).

CAN PEACEKEEPING BE ACCOMPLISHED BY THE UN?

Some veteran peacekeepers believe it is impossible for the UN to use force without seeming to be taking sides among disputing groups. Others would oppose the use of a technological advantage if it gave the appearance of being "unfair." It is argued by some that peacekeepers should be unarmed or only lightly armed and that any fighting should be on a near even playing field. These arguments may have some merit in unusual circumstances, but generally technology should be exploited to its full advantage to prevent casualties to peacekeepers, to minimize damage to opponents, and to convey a clear message to those who would oppose a UN operation that cooperation is the only sensible alternative. Technology can help minimize forces required as well make an emphatic point.

The similarity of recent problems faced by peacekeepers in differing situations around the world is striking. Many of the problems encountered by the UN mission in Somalia, for example, were similar to those experienced by other missions in Cambodia and Bosnia.

In Somalia, the challenges were more political than technical, more dependent on commitment and perseverance of nations than on technique and technology. Nonetheless, it is likely that with better technical capabilities the story would have been different. This paper briefly examines the problems associated with a hastily organized international military force in Somalia, and then considers where technology might have made a difference given the tasks that needed to be accomplished.

THE CHALLENGE OF A CHAPTER VII UN FORCE

In its first Chapter VII operation in a failed nation, the UN developed a force along the familiar lines of Chapter VI. However in conducting an operation in which consent from various contesting factions might not be obtainable (nor was it a prerequisite for entry of the UN), the force needed a high degree of political and military cohesion. Organized opposition quickly exposes weaknesses and requires greater mutual protection, cooperation, integration and unity.

In preparing for this peacemaking force, the UN solicited countries from a wide range of backgrounds and capabilities. Nations that normally are rivals (e.g., Pakistan and India) were thrown together and expected to cooperate. By way of contrast, the NATO alliance has many political and military weaknesses, but it has prepared for potential combat through forty years of training exercises and has developed political and military procedures for coordinating and unifying the policy interests of nations. In addition, it is an alliance of nations with shared values and is designed to defend the territory of its nations, not for intervention in other parts of the world.

Participating Units and Equipment Varied Significantly

For UNOSOM II, some thirty nations were brought together in small units. Desert Storm and the UNITAF part of the Somalia operation were benefited by a single dominant unifying force. The United States provided the overwhelming bulk of the military strength. When UNITAF left Somalia, responsibilities shifted from a superpower to a weak and diverse international organization.

Almost all of the nations involved limited what their troops could do, where they could work (e.g., some refused to be located in Mogadishu), and how they would react to various situations. Nations frequently rotated their units, delayed for months in sending promised troops and arbitrarily pulled them out on short notice. The UN military commander was frequently unable to move ahead with strategic plans because of the need to cover gaps of departing units or readjust the disposition of forces.

The state of training and quality of equipment of various units varied significantly. In trying to find replacements, UN headquarters in New York tended to simply count numbers of troops. But one is not equal to one when evaluating soldiers. Some units simply did not have the training to do what the Force Commander required. For example, they were uncomfortable patrolling at night or expanding the perimeters around compounds to help prevent short range mortar attacks.

When heavier or more capable equipment was urgently requested by the commander, the UN was dependent on nations for immediate results. It had no reserve of its own to draw on in emergencies. After the attacks of June 5, l993 against the Pakistani force, for example, the Security Council called for member states urgently to contribute "armored personnel carriers, tanks and attack helicopters." More than a month later when eight old M-48 tanks finally arrived for the Pakistanis, their breech blocks were inoperative.

From ammunition to maintenance to language, interoperability of this force assembled from all over the world was a continuing challenge. Such problems are to be expected. But an even more difficult problem is the inherent tendency of nations to micro-manage their units from distant capitals. It is understandable that nations would want to control their units facing dangerous situations, but this inclination presents a nearly insurmountable obstacle for a commander trying to marshal limited resources and to implement a coherent strategy. On one occasion a unit was stopped by its capital from counterattacking in mid-battle. Instead of receiving an important message, the "enemy" was emboldened. Some units were even suspected of colluding with opponents of the United Nations, at least to the extent of providing them a de facto sanctuary.

Another problem was that each nation seemed to have a different political threshold for casualties. No nation had an easy time justifying casualties in what is basically a humanitarian situation, but some seemed to believe that Chapter VII still meant a relatively risk free operation. When it did not, the result was often inaction, accommodation, or departure. This series of reactions produced a much less effective force. Given how the force in Somalia had been assembled, expectations should not have been high that it could accomplish much if tested. The UN demonstrated that it is not yet ready for Chapter VII peace enforcement operations.

TASKS FOR TECHNOLOGY

With more effective technology, the tasks faced by UN military forces could have been made easier and might have helped produce better outcomes. However, for the most part, the UN did not face overwhelming, sustained, or even skillfully executed attacks. Somalia has a large land area but a relatively small population. Although there were different types of challenges throughout the country, most of the opposition was limited to part of the capital city. The tactics used against the international force were typical of guerrilla warfare in many areas of the world. Nonetheless, in an urban setting such as Mogadishu these tactics can be difficult to combat

even with a well-trained force. The following are some of the requirements of the UNOSOM II forces that could have been met more effectively with better technology.

Good Intelligence

In order to do their jobs, military commanders needed to be able to detect the movement of opposing forces, determine the locations of hidden arms stockpiles, and anticipate the plans of those who might attack the UN. In trying to control a city at night and to ensure that various transportation routes remained open and were not used for smuggling arms into the city or relocating militias, twenty-four-hour surveillance was necessary. Helicopters were the best means for active reconnaissance in the city, but these were not always available. Commanders requested the support of remotely piloted vehicles that could maintain good coverage over a sustained period. These might have provided a better picture around the clock, but were never made available.

Intelligence, of course, was also critical to the civilian effort to understand the political situation and to facilitate the complex reconciliation process between multiple factions and clans.

Frustrating Attacks

Related to good intelligence was the need to be a step ahead of the opposition and to anticipate their moves. When confronted with periodic random attacks such as ambushes and mortar attacks, it is important to prepare for them by taking proper defensive measures. Those in the military compounds were subjected to frequent mortar and rifle-propelled grenades (RPG) shelling, and had to sprint from soft Quonset huts and tents to makeshift shelters. Civilians, as well as military personnel, were equipped with flak jackets and helmets, but were constantly at risk.

Early warning helped, but it was often incorrect or unavailable. Warning also allows more effective countermeasures and provides an opportunity to disrupt attacks before they are launched. This, however, requires good intelligence and the ability to evaluate, disseminate, and react rapidly. In an unsophisticated society very ancient means of collection need to be fused with the most modern methods.

Protecting People

A constant worry in Somalia was how to protect UN civilians and international relief workers. Protection from shelling was just one of the dangers they encountered. Civilian vulnerability was the Achilles' heel of the operation. Their safety was paramount if the job of facilitating the recovery of the country was to be accomplished. Military units were organized, had the training and means to protect themselves, and faced danger as part of their responsibilities. Civilians, on the other hand, were often assigned to remote areas where there were no nearby military forces or lived in compounds that did not have military protection. This made them vulnerable to criminals and to those trying to disrupt UN operations for political reasons. Locally hired guards were of uncertain reliability. There were frequent accusations that guards hired by the non-govenmental organizations (NGOs) protected them by day and robbed them by night.

In the case of civilians living outside the military compounds in Mogadishu, it was decided in mid-May, before the attacks of June 5, l993, that the best way to improve their security was to deploy a Nepalese Gurkha battalion. Eventually a civilian protection service, which could give some assurance of the reliability of locally trained Somalis, would be hired. In spite of the urgency of this need, it was four months before the first Gurkhas arrived and protection improved for the civilians. This was typical of the unresponsiveness of the UN system to pressing needs in the field.

Fortunately, only one UN civilian was lost. Ironically, this came after the cessation of hostilities and resulted from a carjacking attempt by common criminals. Clearly, there need to be ways of reducing the individual risks to these courageous men and women.

Protecting Fixed Installations

Fixed positions and facilities required sensors that would give early warning of attacks or of the nearly continuous criminal activity. Night vision was essential, but very few UN units were trained in it and very little equipment was provided. There was every reason for the UN to control the night, but it did not have the training or equipment to do so.

Light mortars shelled UN facilities on many evenings, wounding civilians and military alike, damaging unprotected helicopters on the ground, and contributing to a sense of vulnerability and insecurity. Mortars would be pulled from vans and quickly set up; after a few shells were fired the attackers would speed away. Greater vigilance at check points and more active patrols outside the perimeter would have helped make it more difficult to reach the compounds with short ranged mortars and with other weapons such as RPGs.

There was also concern that terrorist raids would be initiated from inside. Large Somali trucks visited the compounds daily to bring supplies or to pump water or fuel; workers entered by the hundreds for construction or other services. Truck bombs could easily have been brought into the compounds. Gate inspection procedures were tightened, but this is not easy to accomplish in a multi-cultural organization. Technology would have improved detection possibilities.

Crowd Control

A favorite opposition tactic was to stage a demonstration and attempt to provoke peacekeepers. Women and children would be deliberately mixed into organized crowds to complicate the problem of control. A classic example was on June 13, l993, when a demonstration was staged in front of a Pakistani strong point. Not by accident, the site selected was next to the only press center in the city. As the mob converged on the Pakistani position, shots were fired at the soldiers from on top of nearby buildings and from the crowd. The beleaguered Pakistanis returned fire, wounding some Somalis in the crowd. However, there was evidence that some in the crowd were also shot from behind by their own people to present an image for the press of a UN out of control. This incident was one of the reasons that it was decided four days later to declare that faction leader Aidid had become a menace to public safety who should be detained.

It would have been far preferable to have been able to disperse this organized crowd with nonlethal means and thus have prevented a contrived demonstration from becoming damaging in terms of world opinion. Although the Pakistanis were supposed to have riot control equipment and training in how to use it, preparations were inadequate. It was believed, however, that prevailing winds would have prevented the use of tear gas if it had been available. Equipment was flown in urgently and some training was subsequently conducted with the help of US forces.

Capabilities improved but crowds continued to be a problem. There was a need for a nonlethal means for breaking up crowds under prevailing weather conditions and at least separating out non-combatants. Women and children were repeatedly mixed in with gunmen and used as shields. On June 17 they were used to close a Moroccan column to hand grenade range, resulting in serious casualties to perplexed soldiers. Women and children were often used to construct roadblocks and were mixed into ambush groups. Aidid reportedly boasted that these tactics would intimidate UN soldiers. If women and children were hurt by UN peacekeepers, he could count on a media propaganda victory.

In one incident, a combination of US engineers and Pakistani escorts trying to remove a roadblock on a main artery was confronted by several hundred Somalis. With women mixed in their group, male shooters attacked from behind walls and buildings. The resulting defense by tanks and helicopters, in order to extract UN personnel from the ambush, resulted in heavy casualties to the Somali attackers. But the media reports were much more damaging to the UN.

Not only Aidid used these tactics. During the UNITAF period, Belgians watched helplessly in

Kismayo while fighters from one faction (Morgan's) infiltrated the town and a mixed gender crowd chased out the supporters of another faction (Jess). The Belgians were accused by Jess followers of deliberately allowing this to happen, but the Belgian troops were actually at a loss as to how to break up these mixed groups of combatants and non-combatants.

Swarming was also a difficult tactic to combat. It was evidently assumed that if enough people ran at a vehicle or a cordon protecting a search operation, UN soldiers would face the difficult choice of either having to shoot unarmed civilians or retreat.

In these situations, an effective means of breaking up crowds and isolating shooters would have been useful. At one point, a multi-purpose anti-riot control vehicle was offered to the UN by the French, but the price for this new technology was extremely high and there was only one of them available.

Communications

For a widespread community of workers, both UN and NGO, there was a glaring need for flexible communications, both within the cities and towns and between isolated posts and regional or national headquarters. In a country with no telephone system, the problem for the UN was to be able to talk reliably with representatives in widespread and remote areas of the country. This was necessary for safety and for timely reporting and policy discussions. Portable phones and radios were finally acquired in sufficient numbers to help short range communications within cities, but these were insecure. When phones were stolen or lost, Somalis were soon on the nets with disruptive chatter.

Movement

The ability to move throughout the city was important to the resupply and reinforcement of isolated positions and bases. Relief supplies needed transporting within and outside the city from the port. Personnel needed to move from their quarters to their place of work or to do business or conduct meetings within the city. These movements were countered by roadblocks sometimes combined with ambushes, buried mines, and remotely detonated explosives. Bypass roads were constructed and guarded, routes were swept in advance and posted, times of convoys were varied and routes were changed regularly, helicopter transportation was used as an alternative, and escorts were provided. Nonetheless, there was a need for better detection and protection to reduce the dangers of ground movement. Work was hampered by the need to move during daylight hours, and it was difficult to hold meetings when people had to come from different locations. Heavy armored vehicles for breaking down roadblocks were not available until after organized hostilities had been concluded. Technology may have some answers for the safer movement of people and vehicles in a dangerous city.

Controlling Movement

The opposite of ensuring UN movement was to deny it to potential attackers or those smuggling arms and ammunition into the city. A system of citywide strong points and check points manned by UN military forces was developed, but these were only partially effective. Inadequate searches at check points and simple evasion techniques contributed to the inadequacies of this system. An integrated network was needed to spot and counter those moving with trucks and other vehicles around checkpoints. More thorough inspections of vehicles were required to detect arms and other illicit goods. Indiscriminately shooting from the air anything that moved was not feasible given the potential for collateral damage, misidentification, and hurting innocent individuals.

Helicopters were of value, but eventually became a target for massed gun fire when flying low to the ground. There were rumors of shoulder fired surface-to-air missiles and precautions had to be taken to reduce vulnerability, but no missiles were actually detected. The "eyes over Mogadishu" program of surveillance with helicopters had some deterrent effect on movement,

but observations from the air needed to be better integrated with effective monitoring and inspection on the ground. When AC-130 gunships were available they had success in detecting and countering activities at night and were a respected deterrent.

Disarmament

There was a need to find, contain, and destroy heavy weapons. Faction weapons were moved out of central storage sites and hidden in various clandestine sites around the city. While many weapons were found and destroyed, an improved capability was needed to detect their presence and to destroy them from standoff distances without causing a high degree of collateral damage.

Tracking "Elvis"

Finding a few prominent individuals in a third world city is not easy. Capturing them without significant casualties on either side requires a high degree of training and technology. Given a number of unsuccessful experiences worldwide, this is an area in which technology may one day provide some better answers. Part of the problem in Somalia was that specially trained forces did not come for more than two months, losing valuable time and adding to the degree of difficulty.

It was also important to have the ability to locate and rescue hostages and prisoners. In Somalia, those who had been kidnapped or captured were only retrieved by negotiation. Human intelligence is important, but technology may be able to help. For example, people going into dangerous situations may need hidden devices that could be tracked if they were captured.

Security

Security of information and military/diplomatic planning is essential. In a UN operation, individual units from different countries of a rapidly assembled force bring a diversity of standards. In Somalia, information protection over the telephone and other communications was nearly nonexistent and classified information was loosely handled. Surprise Ranger raids into Aidid areas uncovered sensitive documents from various UN and military organizations.

On the civilian side, where there were many sensitive strategy papers and other documents that needed protection, the small UN staff came from 80 different nations. With traditional peacekeeping operations, UN personnel have been used to a wide-open system. The precautions required during a dangerous peace enforcement mission were not understood. It was not a case of carelessness and occasional lapses; training and good habits were nonexistent. Somalis, who were not regular staff members, were constantly around in significant numbers, hired as cleaners and for other work requirements. Many came from the local neighborhoods where Aidid's clan was predominant. Aidid bragged to the UN political division chief that he saw papers intended for the Special Representative before the UN chief did.

Some training and tightening resulted in security improvements. Safes and file cabinets with locks were ordered. Documents were shredded and burned and doors were locked when UN staff left their offices. Nonetheless, the whole operation was very loose and undoubtedly too much sensitive information was easily accessible.

Months went by before the mission could communicate in a semi-secure fashion with the UN in New York from a few phones. Secure phones also were only available to a handful of the officials in New York, meaning considerable amounts of sensitive information undoubtedly were passed in the clear. Secure fax helped with the most sensitive written communications, but it was a laborious procedure and many documents did not have this modest degree of protection.

Countering Criminality

Even in times when there was no organized opposition to the UN, criminals were a constant problem. In a society of 90 percent unemployed and desperate human needs, this is not too surprising. Compounds would be infiltrated regularly by thieves. NGO facilities were regularly

robbed of cash, and even the UN payroll was stolen. Once the UN received vehicles, shipped from the winding-down Cambodian operation, vehicles began to disappear, even from the UN compound. There were numerous attempts at carjacking on the street. Simple anti-theft devices and countermeasures were needed. For example, a stolen car needed to shut down automatically, etc.

Civilian Needs

The civilian programs for providing humanitarian assistance, supporting the selection of District Councils in remote areas, and restoring the legal system needed help in many ways. One area recognized as critical from the beginning was the ability to reach the Somali population with information. The UNOSOM newspaper helped, although there were constant distribution problems, and it only reached a small percentage of the population.

But Somalia is an oral society and one in which destructive misinformation is often believed. Somalis listen to the radio, and UNOSOM needed to be able to reach audiences throughout the country. A broadcast system, inherited from UNITAF, reached Mogadishu and a little beyond, but a system was needed for the whole country. This was not the result of a technological gap. Equipment existed on the shelf. The challenge was to convince bureaucrats and committees in New York that communicating with the Somali people was an essential part of the mission. After many budget battles, approval was finally gained, but the equipment was never installed. Regular communication was critical to an operation dependent on the good will and cooperation of the inhabitants.

CONCLUSIONS

Although many of UNOSOM II's needs could have been filled with better training, increased resources, and a more responsive system, UN experiences in Somalia demonstrated a number of technological needs. As described above, some of these include:

- Better ways to prevent and counter short range mortar attacks. Early warning of these and other types of attacks is essential to protection of personnel.
- Improved capabilities to detect and prevent intrusion, especially at night.
- More effective riot control equipment. Noncombatants need to be discouraged from mixing with combatants or carrying out tasks on behalf of shooters who use them for shields or to accomplish other dangerous tasks.
- Advanced capabilities in the detection of mines, remotely operated explosives, and ambushes.
- Ways to reduce the dangers to civilians having to operate alongside the military in a semi-hostile environment.
- A system of overhead coverage with real time feedback to ground forces to improve opportunities to disrupt hostile or illegal activities.
- More effective methods for moving people in a city with potential guerrilla/terrorist threats.
- Better ways for inspecting personnel and vehicles legally entering guarded compounds.
- Secure, flexible, reliable, and redundant means for communicating to both short and long distance sites.

The types of challenges the UN forces faced in Somalia are probably typical of what can be expected in many other situations. Technological advances and proper training can make the task of a UN soldier and civilian in similar circumstances much easier to accomplish. Technology has an important role to play if the UN is going to develop a satisfactory Chapter VII capability.

UNPROFOR and UNTAC: Lessons Learned as to Requirements for Planning, Training, and Equipment

9

INTRODUCTION

This paper will attempt to extract the major lessons learned from UN experiences related to UNPROFOR (UN Protection Force in the former Yugoslavia, i.e., Croatia, Bosnia, The Former Yugoslav Republic of Macedonia) and UNTAC (UN Transitional Authority in Cambodia). The focus will be on:

- the broad area of planning, with particular attention to the formulation of achievable mandates or United Nations Security Council Resolutions (UNSCRs), and the command and control arrangements in the field;
- training, as a means to operationalize and practice the relevant military doctrine associated with a particular peace operation; and
- specific equipment items appropriate for peace operations.

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UNPROFOR

Analysis will focus largely on UNPROFOR as a continuing peace operation laboratory, using UNTAC to supplement this analysis with other unique lessons learned.

The formulation of clear and achievable mandates, usually expressed in a UN Security Council Resolution (UNSCR), is a critical first step in any UN-directed peace operation. The mandate determines the appropriate military doctrine, whether it is traditional peacekeeping or "multidimensional peace operations," and doctrine, in turn, determines the training and equipment of the force.

Clear and achievable mandates depend, in turn, on:

- sufficient predeployment reconnaissance or "technical surveys";
- professional force and logistic planning;
- professional analysis of resource requirements; and
- constant dialogue between military planners and policy makers, both in national capitals and UN Headquarters in New York.

There is a constant requirement for continuous dialogue between military planners and policy makers to avoid unintended "mission creep" where requirements quickly outstrip capabilities and resources. UNPROFOR's mission change in Bosnia, from facilitating humanitarian assistance to protecting designated safe areas and enforcing heavy weapons exclusion zones, had profound doctrinal and resource implications.

Although in theory it may be possible to employ traditional peacekeeping with elements of peace enforcement in the same tactical context, in practice it is militarily difficult and politically sensitive. Peace enforcement is, by and large, incompatible with impartial, consensual peacekeeping.

In that units are organized and equipped differently for traditional peacekeeping and enforcement actions, units are not interchangeable, nor can they transition back to traditional peacekeeping once they cross the "Mogadishu line" into peace enforcement and are consequently perceived as a co-belligerent.

In multidimensional peace operations, such as those involving humanitarian and refugee assistance, electoral monitoring, developmental assistance, et al., planning must incorporate nongovernmental organizations (NGOs) such as UNHCR, WFP, UNICEF, WHO, and ICRC into the earliest stages of planning and ensure their representation in field headquarters.

In all peace operations, well-trained, competent staffs are key to supporting the force commander. LTG Morillon was fortunate in deploying to Bosnia with the NATO NORTHAG Mobile Headquarters, a well-trained headquarters versed in NATO staff procedures. Unfortunately, this is an exception to most UN field deployments, where ad hoc staffs are quickly thrown together and operations are further constrained by incompatibilities in force equipment and training status.

Adequate command and control arrangements are essential to prosecuting effective, multinational peace operations. Because UN peace operations will never achieve true "unity of command," every nation will insist that its own national sovereignty "unity of purpose" can be achieved by full agreement on the mission (the UNSCR mandate) and the relevant doctrine (concept of operation). This understanding must be supplemented by adequate communications equipment and liaison parties.

Field headquarters need to be fully integrated civil/military headquarters with full NGO representation, to include integration of all United Nations Military Observers (UNMOs). UNMOs in Bosnia need to be integrated at the Bosnia-Herzegovina (B-H) Command level, not at UNPROFOR Headquarters, Zagreb.

In that a large part of UNPROFOR's logistic and other support is contracted, there is a requirement to better integrate Civil Affairs Officer support at the user command level (B-H Command rather than Zagreb or New York at the Field Operations Division).

Just as traditional peacekeeping and peace enforcement are usually incompatible in the same tactical context, use of NATO air (peace enforcement) coupled with UN forces on the ground (peacekeepers), incapable of defending themselves, is a recipe for discrediting the entire UN and NATO effort.

UN custody of Serb heavy weapons at UN collection points in both Croatia and Bosnia has proven to be a failure in that UN custody has lacked enforcement and has been more appearance than substance.

UNTAC

Most of the UNPROFOR planning lessons learned apply equally to UNTAC, although the "all means necessary" provision of Chapter VII of the United Nations Charter used in Bosnia was not invoked by the United Nations in its UN-

directed peace operation in Cambodia. The following are Cambodia-unique planning lessons:

Although UNTAC was the broadest, most complex and expensive peace operation prior to UNPROFOR, planning suffered at the outset from a lack of coherent, synthesized intelligence data for predeployment planning. Three separate technical survey teams were dispatched with minimal coordination and useful output.

"Unity of purpose" and coherence of the force were greatly facilitated in the field by requiring all contributing nations to coordinate all messages to home capitals with UNTAC.

Planning for one of the multidimensional peace operation tasks election monitoring was inadequate, resulting in using UNMOs to fill the shortfall, hardly a preferred solution and one that required ad hoc, catchup training.

Predeployment planning did not identify the requirement for adequate headquarters and staff support, resulting in weaknesses in logistic and operational planning, as well as basic language problems.

UNTAC's experience in Cambodia illustrated another key lesson for predeployment planning, that of anticipating and relieving the economic impact of a UN presence in a Third-World country. Black market activities and economic distortion of local economies with hyperinflation were unanticipated legacies.

In spite of detailed planning related to disarming militia and demobilizing combatants, the regroupment and cantonment regime based on voluntary participation did not work, particularly when basic ethnic/factional attitudes remained unchanged, and one or more sides saw the balance of forces being altered to their disadvantage.

TRAINING

UNPROFOR

As previously mentioned, training must be keyed to the military doctrine relevant to the mandate and peace operation at hand. Specific lessons learned follow:

Predeployment training is essential on the role of force and accompanying Rules of Engagement (ROE), particularly in ambiguous situations of partial or sporadic consent. Although the line is inherently fuzzy, specific scenario-driven training must focus on those Chapter VII coercive uses of military force that do not erode UN impartiality or result in crossing the "Mogadishu line." As mentioned earlier, such use of coercive force is both politically sensitive and militarily difficult. This author remains convinced that Chapter VII actions are incompatible with UN-directed, as opposed to UN-authorized, peace operations.

Training related to indigenous culture, history and religion, and expected UN conduct and discipline must be accomplished before deployment to enhance the impartiality of the force and ensure the highest standards of performance. Such common training would have reduced difficulties UNPROFOR experienced with Russian, Nigerian, and Ukrainian units.

Other mission-unique training, not routinely covered in general purpose forces' annual training schedules, includes:

- arbitration/negotiation skills,
- manning check points/road blocks,
- planning/coordinating UNHCR convoys, and
- international legal/human rights guidelines.

UNTAC

In an extremely complex operation involving 32 national contingents, UNTAC clearly felt the need for professional, well-trained staff officers conversant in common military language and procedures. Language training in such a diverse environment was essential.

A common predeployment training program based on UN/NATO/national guidance is badly needed, particularly since UN force contributions are solicited more on regional balance than military efficiency or effectiveness. UNTAC saw wide disparities in training skills with training shortfalls most apparent in units from Bulgaria, Ghana, Tunisia, and Indonesia.

Demining and mine clearance were specific skills identified and required by UNTAC, given the wide proliferation of mines throughout Cambodia. Such skills were fully incorporated into a "Mine Clearance Training Unit" designed for indigenous personnel.

EQUIPMENT

UNPROFOR

Identified equipment requirements are as follows:

Intelligence capabilities are key to any military operation, and although the UN has historically viewed intelligence as incompatible with the impartiality required in traditional peacekeeping, it has lately found greater support. In this regard, airborne platforms are key (e.g., AWACs, JSTARs or Unmanned Aerial Vehicles (UAVs)) to be confident that corralling or cantonment of heavy weapons is being accomplished, that separation criteria are being observed, or that forces are complying with no-fly zones.

Precision, rather than area, weapons are required to ensure the selective engagement of targets (the "smoking gun") and to reduce collateral damage. A higher allocation of snipers per ground unit is preferred to enhance this selective engagement.

C^4I equipment is always at a premium. In the current case of NATO air being used in support of UNPROFOR forces on the ground under "dual-key arrangements," ground-to-air communications and target designation equipment are requirements not commonly found in most UN peace operations.

In that the "smoking gun" is frequently a mortar or artillery piece, artillery or mortar direction-finding radars are essential for selective target identification and engagement.

When first deployed to Croatia in 1992, lack of vehicle stocks and spare parts inhibited UNPROFOR's achievement of full mission effectiveness. Common equipment stocks and other nonperishable items have been consistently articulated as requirements for all UN peace operations, most recently covered in Secretary General Boutros Boutros-Ghali's *An Agenda for Peace*.

Concerning other organizational/equipment requirements, the following capabilities are enumerated to provide the required force flexibility:

- engineer units/equipment for nation-building and confidence restoration;
- intelligence capabilities (C^4I);
- logistic units; and
- multimedia public affairs (PA) and psychological operations (PSYOPS) units to communicate UN intentions and objectives, both to the local nationals and to the warring factions themselves.

UNTAC

Three UNTAC-unique equipment requirements follow:

- As indicated earlier in the planning discussion, mine detection and mine clearance equipment were high-priority items, given the specific environmental situation in Cambodia.
- In that UNTAC was excluded from Khmer Rouge areas, insufficient C^4I capabilities hindered knowledge of Khmer Rouge heavy weapons' locations. In addition, there was little capability to assess Cambodian cheating on cantonment of such weapons.
- It took one year to establish Radio UNTAC. An initial PSYOPS capability would have greatly facilitated this important communications function.

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Technology and Peacekeeping: Too Good to Be True?

10

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Perhaps the best way for me to use the group's time is to offer the purely personal perspective of a National Security Council (NSC) staffer on some of the issues before us. Nothing I say should be construed as reflecting the Administration's position on peacekeeping, or its foreign policy in general.

This focus on my experience with United States intervention decisions is, I think, appropriate. Since from the point of view of the conference organizers our focus should be on the way U.S. forces should be trained and equipped to wage peacekeeping (or whatever precise term best describes the particular contingency under discussion), it is also appropriate because much of what is going to happen with respect to UN peacekeeping will be driven by U.S. policy, or rather the way U.S. policy is implemented.

I will begin by making a couple of brief observations about technology and peacekeeping, then describe where I think the United States is as a government on peacekeeping. Finally, I will explain why I think that it's probably too early to celebrate the widespread application of new, or even old technologies, to peacekeeping and close by taking questions. What I will try not to do is veer off into discussion of specific operations or dissect the UN's management of operations. My only objective is to set the stage for talking about technologies and peacekeeping.

For the purpose of the rapporteur's report, let me say at the outset that I think the U.S. military should procure whatever technologies it needs and can afford to fulfill the missions assigned by national command authorities. These missions do relate to peace operations. This is the answer of main concern of the conference organizers, at least from my parochial standpoint.

The United States in the future will certainly be involved in small wars. These wars will involve combat in urban terrain and against enemies interspersed among civilians. It is under these conditions that the United States is self-deterred from using its firepower willy-nilly. The on-scene commander, especially the junior leader, needs as much information about his/her adversary as possible, to get inside his decision cycle and disrupt his operations.

With respect to the broader issue of technology intended for use in military interventions in peacekeeping or peace enforcement, the picture is a bit more complicated.

I should note here that I am not an expert about peacekeeping technologies. This is not just modesty. There is a point here. After Tony invited me to the conference, I attempted to read up on the subject of technologies and peacekeeping. The White House library had nothing on the shelf. In the Office of the Secretary of Defense, in the planning shop, I was referred to an officer who had contributed to the Army's new doctrine for operations-other-than-war, but who disclaimed any special knowledge of new technologies and peacekeeping. I called up RAND and spoke to a physicist who had tried to do a study of the subject, but could not get it published. Attempts to contact Jan Morris, a visionary in this area, failed. The most illuminating material I found was from the pen of Dick Garwin. My point is this: When a member of the NSC staff went to seek advice on new technologies and peacekeeping, the experts within the government who I am confident exist were entombed so deeply in the bureaucracy that their advice could not be solicited.

From the material I could locate, I concluded that technology for peacekeeping falls into two broad categories: monitoring, surveillance, and verification on the one hand, and tactical equipment on the other. Obviously there is some overlap between these two categories.

The use of advanced surveillance technology is valuable in the planning process before a peacekeeping operation is undertaken, especially where the theater of operations is not familiar. How good is the infrastructure? What is port capacity? What about road capacity and throughput? Communications? What is the terrain like? Where are the principal cities and towns? Where are masses of refugees concentrated? Do the local combatants have strongholds, cantonments, weapons storage areas, or important communications nodes?

At least some of these questions can be answered with imagery, acquired by a variety of platforms. The information obtained thereby can help determine how large an intervention force is needed, what its lift and sustainment requirements will be, and in consequence, how much the intervention is likely to cost.

These sorts of capabilities also have obvious uses in confidence building and by this I mean instilling confidence in one party regarding the actions and intentions of the other and instilling confidence in each party regarding its respective capabilities to cope with attack. Such capabilities can also help determine the sources of violations in highly confusing situations; mortar and artillery fire-finding radars can under some conditions enable observers to know who shot John, especially where there are suspicions that John himself has shot John to implicate a rival party. Fire-finding radars are also good for force protection. Similar technologies are also indispensable in monitoring and verifying compliance with disengagement or truce arrangements, as we have heard regarding the Sinai and Golan disengagement, which are monitored by U-2 aircraft. Virginia Gamba has already given us an exhaustive list of the various confidence building measures and verification schemes. This list is well known from Helsinki and the work of the CSCE in Vienna that benefited from these technologies, so further elaboration is unnecessary.

As Admiral Howe points out in his paper, intelligence collection is equally necessary for protection of UN troops in the field. This kind of tactical intelligence is indispensable for preventing the smuggling of weapons into vulnerable areas and preventing ambushes. There are in many types of sensors, descendants of the Vietnam-era sensors grabbed off the shelf by E-Sys-

tems for the Sinai Field Mission that would meet this requirement quite well. Some of these are now in development, due in part to the interest of the special operations and low intensity conflict specialists in the U.S. Department of Defense.

Nor is there much dispute about the potential utility of less-than-lethal weapons, otherwise known as pre-lethal weapons, since many were conceived of as techniques to transfix prey before the kill. Although at the last conference I attended where this was an issue, one participant advised the conferees that "anything worth doing, was worth doing lethally." I think we all agree that there are times when this is not a useful ethos.

For example, Admiral Howe would probably agree that if the Pakistani troops had had an alternative, non-lethal, means of coping with the Aidid-inspired crowds in Mogadishu, events might have played out differently for UNOSOM II.

Having said this, I will turn to my real theme: Constraints on the development and deployment of these new and not so new technologies. I see three related issues: money, feasibility, and the scope of the actual requirement. Of these three, funding is most important.

MONEY

Some new technologies are relatively cheap, while others, especially in the area of surveillance and monitoring, are less so. However someone must still buy them, maintain them, and be in a position to lend them to those who need them but cannot acquire them. Few countries have the money to do this; even the United States can play this role only in a limited way.

The mood in Congress toward anything related to peacekeeping, or the UN in general, is extremely negative. More broadly, the mood in Congress does not favor spending on the entire array of international programs at levels even close to those we have seen over the past decade. The relevant numbers are based on the one appropriations bill and one authorization bill that have thus far been reported out of their respective subcommittees in the House.

United States spending on foreign programs will be cut by at least $2 billion in FY 96, from a $2.1 billion level of effort, which also happens to correspond to the Administration's FY 96 request for these programs. The effect of a cut this size is heavier than it would appear. One fourth of the budget goes to Egypt and Israel, which neither the Administration nor Congress would wish to cut. One fourth goes to State Department salaries and infrastructure, which cannot, as a practical matter, be cut. The other fourth goes to programs that are unassailable for political or other programmatic reasons, such as disaster relief or antiterrorism assistance. This means that the $2 billion is necessarily going to come out of an exceedingly small base. Competition among agencies responsible for implementing U.S. foreign policy will be sharp.

These deep cuts will pit those who want to fund multilateral programs, such as international financial institutions, against those who want to fund bilateral aid programs. Peacekeeping advocates within the Administration are likely to get caught in the crossfire.

By peacekeeping, I mean both assessed UN peacekeeping and voluntary peacekeeping. These are two separate accounts, the latter serving as a very flexible source of funds for use in contingencies. Unfortunately, this is likely to be cut back to a sum just large enough to pay for a handful of operations, including MFO (Multinational Force and Observers in the Sinai) and UNFICYP (UN Force in Cyprus).

That this was going to happen was already apparent in the preparation of the President's FY 96 budget request, which did not fully fund anticipated costs of the assessed debt and current operations. (This debt will grow by another $1 billion if an UNPROFOR [UN Protection Force in the former Yugoslavia] withdrawal operation is conducted on an assessed basis.) There was simply not enough room under the top line permitted by the Administration's budget overseers. We now see that this restrictive top line was

unrealistically generous toward international programs.

At the same time, the likely Republican nominee for the 1996 presidential race has cast peacekeeping as something fundamentally at odds with America's national interest. His colleague, the Chairman of the Senate Foreign Relations Committee, has expressed himself even more plainly. Both have sponsored legislation that would severely limit the Administration's flexibility in carrying out UN peacekeeping operations, both voluntary and assessed.

To make matters worse, negative public perceptions of UN involvement in the former Yugoslavia are increasing the political cost to the Administration of pushing hard for peacekeeping related programs as part of its legislative agenda. Indeed, presidential rivals have seized on the situation in Bosnia to demonstrate the unreliability of the UN and the infeasibility of its mandates. This attitude has colored congressional views of intervention in general, regardless of the institutional framework in which it is carried out. An especially revealing example of this trend is the opposition to staging a U.S. peacekeeping force on the Golan Heights, like the MFO. One would have thought that Congressional commitment to Israeli security would have guaranteed direct U.S. troop support for a peacekeeping arrangement that secured a Syrian-Israeli peace treaty. Yet prominent members of the foreign policy elite argue that the risks and costs to the United States are too high to justify the deployment of U.S. military personnel to the Golan.

I should add to this the fate of the Administration's request for supplemental Fiscal Year 95 appropriations to cover its expenses related to Haiti, the Cuban migrant problem, and Rwanda. The State Department and AID got nothing, although they had spent about $200 million. The Defense Department received about $2 billion, but had to take it on an offset basis, which required reprogramming the funds from other accounts. There was no new money. Since these donor accounts were dedicated to force readiness, the reprogrammings were transformed into a scandal by opponents of the Administration's policies, thereby creating a vicious circle. Peacekeeping is creating a hollow army, and a hollow army cannot defend America's real interests.

These facts serve as an important cautionary tale. In the first instance, they mean that the UN could be in danger of bankruptcy in the foreseeable future, which would prevent questions about the availability and usefulness of new technologies. Second, they mean that agencies will be extremely reluctant to pick up the cost of developing, acquiring, and distribution to the UN or other countries these technologies for peacekeeping purposes. Third, they mean that Congress is likely to see such technologies, especially the less-than-lethal ones, as being attractive to the Administration. Mainly, because it appears to make intervention easier by removing the most significant moral and political barrier to combat, casualties. I think if we look at the situation honestly, we would ourselves conclude that this is perhaps the most troubling aspect of less-than-lethal weapons.

FEASIBILITY

By raising feasibility as an issue, I am asking just who is going to use this fancy stuff? Virginia Gamba has distributed questionnaires in which she polled peacekeeping countries on whether they used any sort of advanced technology in their participation in peacekeeping operations. They seem to show that only the industrialized countries made use of such technologies. Nor should this come as a surprise.

The fact is that armies cannot make effective use of advanced technologies unless they already have relatively advanced skills and the basic ability to cope with stressful and ambiguous situations. These are the kinds of situations that these technologies are designed for. Employment strategies also presuppose good command and control.

These skills are acquired through training and indoctrination; there can be no doubt that the differences between peacekeeping and combat imply the need for different kinds of training. For example, there are new tasks:

- Crowd control; administering humanitarian relief; validating compliance with accords; negotiating with parties who may be only as pure as the driven slush (as Dorothy Parker used to say); preventing refugee flows; and establishing or administering a code of justice.

Tasks that warrant greater emphasis:

- Interaction with civilians; using loudspeakers; applying rules of engagement safely and sensibly; guarding things; liaison with foreign forces; counter-mine operations; applying laws of war; and providing convoy security.

Then there are the things that need to be relearned:

- Use of force, how to seize and control buildings, set up static defenses, use of marksmanship, interaction with NGOs, and disarming of belligerents and civilians.

Some of this training is happening outside the Nordic countries at long last. Austria, Italy, and the United Kingdom are now doing it; Ireland, Luxembourg, Germany, the Netherlands and Spain are getting a good start. Poland and the Czech Republic are seeking to do this in the context of the Partnership for Peace. By and large, however, forces in Latin America, Asia and the Pacific, Africa, and the Middle East, are not doing specialized training. (The exceptions in Latin America and the Pacific are Argentina, Australia, and Fiji.) In Africa and the Middle East, most armies simply do not train. They either operate or maintain static positions (i.e., are assembled in barracks). There is neither the tradition, nor cadre, nor money to conduct realistic training, which is fuel intensive and requires the expenditure of consumable items that often cannot be replaced.

The irony is that these countries represent the largest untapped resource of peacekeeping personnel; they also include some of the most heavily relied upon countries for peacekeeping operations. Yet is it reasonable to think that they are going to be able to absorb new technologies or approaches to military/peacekeeping activity when they do not train intensively for conventional missions, let alone specialized missions that border on police work?

And if they are to be trained, who is going to do the training? Early in the deliberation process leading to the Administration's policy on peacekeeping operations, members of the Administration floated the idea of using a deactivated military base in the United States as a site for relatively large scale unit training for peacekeeping operations. The idea did not catch on because it was clear to the Defense Department that it would wind up paying for the continuing operation of a military facility that it had already chosen to close down to save money. After all, there was certainly going to be no money in the State Department budget for this activity.

If the United States is not going to conduct training necessary to exploit the utility of advanced technologies for peacekeeping, who will, especially given the cost not just of training but of sustaining the foreign forces being trained?

SCOPE OF THE REQUIREMENT

It is my impression that most peacekeeping operations work just fine without specialized equipment, although demining is probably an exception to this rule. As long as troops are disciplined, well trained and well led, they will handle themselves effectively. In Cambodia, for example, Bangladeshis fought company sized battles with Khmer Rouge and held their own, while Indian troops managed to quell election riots effectively.

Setting aside surveillance equipment for troop protection and truce monitoring, there is room to doubt that introducing new tools, given shortfalls in training, etc., will repay the cost and effort. In some ways, it even might be counterproductive. Susan Woodward alluded wisely to the possibility that the use of new technologies by peacekeepers might spur countermeasures that could raise the level of violence and undermine the operation in which the technology was introduced. New tools that peacekeeping troops would use are subject to imitation or defeat.

Under some conditions, the use of less-than-lethal weapons could signal a lack of resolve that could embolden an adversary and invite an increase in violence. The broader point here is that the use of these devices does not somehow make the issue, regarding the use of force by UN troops, disappear. The decision whether or not the UN is prepared to dominate the proverbial ladder of escalation will still have to be faced.

Another point to remember is that soldiers who are not extremely well trained, but who have become reliant on these tools, could find themselves in an exceedingly awkward situation when their gizmos do not work. Moreover, they may not want to do their jobs unless they have such tools. For example, Salvadoran troops trained by U.S. special forces personnel reportedly refused to patrol at night without night vision goggles once they got used to wearing them. The inconvenient part of this arrangement was the frequency with which these devices failed to work.

On balance, the promise of technology for peacekeeping is high. We know this is especially true in the areas of verification, monitoring, intelligence collection, and crowd control. The latter activity needs special attention because, in many instances, peacekeeping operations devolve to police work. My conclusion, however, is that financial support for research, development and acquisition is lacking; troops drawn from outside a small group of industrialized countries would have a hard time making effective use of new technologies; and the need for most such technologies in most peacekeeping operations is probably limited.

Mine Problems in Peacekeeping Operations 11

by
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INTRODUCTION

Landmines were first used during the American Civil War (Williamsburg Campaign 1862) but their use started only in 1918 to face a new weapon: the tank.

Antipersonnel use of mines was introduced later during World War II (WW II) to protect antitank mines from enemy deminers. Since then, antipersonnel mines have become the most common type of the 400 million laid since the beginning of WW II. A great quantity of these mines have been used in conflicts.

WHAT IS A MINE?

Official definition (from the Convention on Inhumane Weapons, 1980):

- Talking about mines, diplomats normally use the definition given in the Convention on Inhumane Weapons for the second Protocol (in Art. 2 § 1): a mine means any munition placed under, on or near the ground or other surface area and designed to be detonated or exploded by the presence, proximity or contact of a person or vehicle.

The above definition will be useful for future work on texts (for example to reexamine the Convention). However, another definition, found in a French Army manual, may be more useful in understanding from the field point of view the vast and complex problem of mine laying and clearing. The manual states that a mine is:

1. a firing device attached to
2. an explosive contained in
3. a casing

The Firing Device

The firing device is the most complex part of the mine. It is detonated or exploded by the presence of a person or vehicle. Thus, it transforms the involuntary action of the target into a deadly explosion. The firing device reacts:

Firing devices on antipersonnel (AP) mines are detonated through:

- pressure, trip wire: a person passing by; or
- release of pressure or traction: from tampering.

A tank or vehicle detonates a mine through:

- strong pressure: under its track;
- tilt rod, seismic, magnetic triggers: from a tank passing by; and
- electronic sensors: placed beside or on top of the mine.

The Explosive

The explosive is the killing device. In some rare cases it can be replaced by flare systems or even chemicals. The explosive must be adapted to its target both in quantity, from small charges to maim people to heavy charges designed to destroy a tank, and in quality, from simple charges to charges capable of piercing tank armor (hollow charges).

Almost all of the explosives in mines (TNT, B Composition, RDX, Tetryl, etc.) contain a high percentage of nitrogenous components.

The Casing

The casing is what we see around the mine. Its main purpose is to protect the explosives from the outside world. In some cases, explosives are formed into their own casing.

For the wide majority of mines, they are encased in a very light box originally in metal, but now are more often in plastic, bakelite, rubber or even made from crude wood or concrete. These casings do not affect the explosion, which will produce a simple (but still very dangerous) blast effect. Blast effect has only a short lethal range (around 1 m), and generally strikes a person in the lower part of the body or a tank on its tracks (a vehicle on its wheels).

To increase the killing capacity of antipersonnel mines, the casing can be reinforced to produce shrapnel by fragmentation from the initial blast effect. Fragmentation mines project deadly shrapnel out to a range of 40 m for stake and bounding mines, and even to 100 m with directed effect mines.

Unexploded Ordnance

Since a great quantity of fired ordnance fails to detonate, a battlefield can be covered by unexploded:

- air bombs,
- artillery and mortar shells,
- rockets and missiles, and
- rifle and hand grenades, etc.

Clearly all of these items possess explosives and casings. Unfortunately the characteristics of their firing devices may be unknown. In all cases, unexploded ordnance is highly dangerous to handle and step on.

The most serious problem is posed by cluster bomb submunitions. Cluster bomb munitions are used in great quantity, with one U.S. Air Force bomb carrying more than 4,000 bomblets. During the Gulf War, Allied forces scattered 24 million bomblets behind Iraqi lines. Cluster bomb munitions are not reliable; from 10 to 15 percent fail to detonate. Allied bomblets were responsible for many friendly troop casualties in the Gulf war.

The condition of abandoned ordnance stocks is generally unknown and can be easily booby trapped or used in booby traps. Thus, unexploded ordnance creates a problem very similar to mined areas and any ordnance found should be treated as a mine or booby trap.

How Mines Are Laid

Normally, mines are buried under 7.5 to 10 cm (3 to 4 inches) of sand or earth for camouflage reasons. However, some mines are laid on the ground because the earth would diminish their

killing power (fragmentation mines), and because camouflage is less important than speed (enemy attack).

Both burying and simple laying can be performed either by hand (normal case) or mechanically (engineer units of some regular armies). Even mechanical rninelaying can take too long, so automatic dispersal systems have been produced. They are not found in engineer units but in tactical air forces (air cluster bombs, helicopter containers, etc.) or artillery units (155 mm or larger shells and rockets).

Mining Concepts

Regular armies use mines to restrict the enemy's freedom of movement. The maiming of enemy soldiers is not as important as stopping their progress and delaying the attack long enough to strike the enemy with other much more deadly weapon systems: artillery and tactical air forces.

Regular armies do not expect heavy casualties to be created by mines. Normal firepower is much more efficient in killing large numbers of enemies. By their logic (see 1987 NATO STANAG for Standard Agreement), a mine field should not only be under the guard of friendly troops but also controlled by their firepower.

Since restriction of movement can be implemented by the enemy's simple observation that mines are present, this doctrine does not normally rely on surprise effect (i.e., a mine exploding under a soldier's legs). Under classical military discipline, minelaying by regular forces is supposed to respect safety regulations (STANAG describes the decision process and level, the organization of minefields, conventional markings and reports, etc.). To be sure to stop and control an enemy's movements without limiting their own freedom of maneuver and safety, many armies (like the French army) decide to fence in their mine fields on all sides.

Unfortunately, in many countries where peacekeeping and/or mine clearing operations are underway, mines have neither been laid according to military regulation nor to military logic. Irregulars do not possess enough firepower to strike their enemy with sufficient effect. For these groups the expected effect of mines is not to stop the enemy but to hurt him.

Terrorist use of mines should also be considered. This irrational use of such deadly weapons may have left mines:

- in unforeseen places: schools, hospitals, religious buildings, etc.;
- in unforeseen quantities: 18 mines to protect one doorstep; and
- in unforeseen ways: up to 5 AT mines buried one on top of the other.

Demining

Four different demining concepts are employed depending on the situation:

- Mine field breaching (strictly military),
- Route opening (military or civilian),
- Area mine clearance (military or civilian), and
- Proximity mine clearing (typically civilian, sometimes uncontrolled).

In addition to identifying the demining concept to be employed, a demining method must also be selected. Current demining methods include:

- manual detection,
- pyrotechnical and mechanical demining,
- and explosive sniffing dogs.

Manual Detection

Manual detection remains the most effective method. UN DPKO, providing mine clearance expertise for DHA, currently requires a 99.6 percent success rate of mine clearing. Today, such a result can only be achieved through manual work by human beings (and maybe through dog detection). All manual detection methods are dangerous because the mine clearers have to walk and expose themselves in infested areas.

Manual detection methods include:

- **Prodding (use of a nonmagnetic prod):** The mine clearers, protected only by special pants, work in a kneeling position regularly prodding

the ground almost underneath themselves. This is long and tiring work and the prodders have to be replaced every 20 minutes to avoid fatal lacks of concentration.

- **Metal detection by portable magnetometers:** This has been very effective when all the mines actually contain metallic components (as in 90 percent of today's mines). The number and size of metallic parts in mines has been reduced, so detectors have been improved to react to the smallest pieces. However, this has dangerously increased the rate of false alarms. In Afghanistan, up to a thousand harmless pieces of metal are found for one mine.
- Of course, metal detectors are unable to detect non-metallic-mines (10 percent of today's mines) and are dangerous in the presence of mines designed to detonate when receiving a signal from the metal detector.

Pyrotechnical and Mechanical Demining Without Previous Detection

Regular armies often possess rapid mine clearing systems; not all are usable outside of high intensity combat situations.

Pyrotechnical systems are surely the quickest mine clearing systems, but due to noise and collateral blast effects their use is difficult to imagine except for emergencies. They rely on a shock wave effect (sympathetic explosions) created by bangalore or pyrotechnic cords, or a gas pressure effect (gas explosion) from Fuel Air Explosives (FAE).

Mechanical systems can be classified in two categories:

- Those working on the ground itself and not on mines (i.e., displacing a 10 cm slice of earth) through ploughs and bulldozer blades.
- Those working on mines (making the mines react and explode), such as rolls and flails. Only rolls and flails can be used in peacetime, and flails have the advantage of working even in deep vegetation.

Use of Dogs

There are no casings that can completely prevent vapors of nitrogen-bearing compounds (characteristic of military explosives) from escaping. We believe that dogs are able to smell them; it has been shown that they work efficiently in airport security and other antiterrorist activities. The use of dogs has been apparently successful in Afghanistan, but under favorable conditions: uncovered air-dispersed butterfly mines laid down on dry terrain.

Like human prodders, demining dogs are not able to sustain their attention for more than 20 minutes. Also, they need much more time to recover (up to five hours in hardship zones). In such conditions, one British specialist with working dogs estimates their rate of demining at no more than 60 percent.

The South African Demining Company MECHEM has developed a new method to find a compromise between a dog's limits and capacities. One vehicle draws air through filters in order to enhance the concentration of a large number of air samples. These samples are marked with the sampling location provided by a GPS system. The samples are then put under the dog's nose and checked for a reaction. In this way, deminers can analyze in a few minutes what would normally take hours.

Destruction of Detected Mines

A mine is normally destroyed by explosives, usually demolition charges or explosive foams. When these are not available, fire can be used for mines with plastic casings. New destruction systems have been successfully used to destroy the mines without detonation. These systems include corrosive foams and laser beams.

Sometimes, destroying the mines in their original location is not feasible. Destruction is not suitable in populated areas and archaeological sites, such as the Angkor temple in Cambodia. In-place destruction presents many drawbacks, even in deserted mined areas. Problems that may occur include:

- When destroyed by explosives, there will be numerous projectiles from flying pieces of metal. This method could disturb future demining operations. Remember, portable magnetometers will give off a false alarm from the metal pieces.
- When detonating by shock wave, there will be possible damage or detonation of neighboring mines, making future operations hazardous.

Neutralization, transport, and then destruction in special sites is certainly the safest solution. Neutralization requires a good knowledge of the type of mines encountered; mines should be neutralized according to the manufacturer's process. It is estimated that about 360 models of mines are produced in the world. Knowledge on neutralizing the mines is available by consulting an explosives ordnance disposal (EOD) expert and/or a data base. Even if minelayers try to use different types of mines, the number of types available in one given area is necessarily limited.

THE IMPLICATIONS OF TODAY'S DEMINING EFFORTS

Current statistics:

- There are today over 110 million active mines laid on the planet.
- Every month, 800 people are killed by them.
- Many more are maimed and mutilated.
- Every year, two million new mines are laid.

Current demining efforts:

- The rate of demining is one hundred thousand mines per year.
- Every year, the number of mines increase by one million nine hundred thousand!

What this means:

- At this rate—if the human race stops laying new mines—it will take over 1,100 years to clean the Earth of mines and over 300 years to clean only existing roads, villages and houses.

The cost of demining today:

- Financial cost is high, neutralizing one mine (original mine cost is $3.00) costs $1,000.
- Human cost is much higher. For every 2,000 mines neutralized, one deminer is badly wounded. For every 5,000 mines neutralized, one deminer is killed.

The conclusion: **WE ARE LOSING THE WAR AGAINST MINES!**

WHAT CAN WE DO?

Positive changes to the world mine population can occur by:

- Developing mine awareness campaigns everywhere. These programs can be implemented by NGO or UN Humanitarian Agencies.
- Enforcing export control on mines (87 percent of neutralized mines were imported ones). In the last ten years, the biggest exporters have been China, Italy, and the USSR. A voluntary moratorium on mine exports has been accepted by the United States, European Union Countries, and Russia.
- Enforcing controls on mine usage through the Re-examination Conference of the 1980 Convention on Inhumane Weapons. On this occasion, Austria, Cambodia, Estonia, Ireland, Mexico and Sweden will propose a general ban on antipersonnel land mines. Belgium has already adopted such a law for its own armed forces.
- Developing viable rapid detection systems through the use of contemporary technology. Presently, the cost of mine clearing at $1,000 per mine leaves a wide margin for improvement through research and development (R&D). Meetings on mine clearing technology are occurring through the NATO Industrial Advisory Group (NIAG), European Union Common Research Center at Ispra (Italy), and the U.S. Congressional Office of Technology Assessment.

New Technologies for Demining

During the last 50 years, although mines have been subject to attention from engineers, mine clearing still relies on the same old principles: those that allowed Allied troops to land in Nor-

mandy (June 1944). The improvement of mine clearing technology requires looking at other industrial sectors to adapt new systems to the problem. Several potential technologies that could be applied against:

- Casing characteristics: infrared technology, penetrating radars, etc.
- Explosive characteristics: biological, chemical and nuclear detections.

This last field of research is surely the most attractive from a logical point of view. Explosives are the only mine components that will never be replaced. Unfortunately (or fortunately) infrared and penetrating radars are much more advanced than the other technologies.

How the system works is a problem for the scientists. Users will sort them between airborne systems and vehicle-transported systems.

Until now, no really effective system has been found, even through infrared and penetrating radars. The tests (generally on specially prepared test grounds) have revealed some common logical characteristics:

- It is easier to find big metallic anti-tank mines than little, plastic anti-personnel mines.
- It is easier to find mines when they are in groups (planted in line).
- It is easier to find mines when the ground is free from saline water.
- It is easier to find mines when they have just been laid.

In this field, the most successes have been won through infrared technology. Employing this technique relies on traces (anomalies) in the ground from burying activities. Dozens of years after minelaying, the infrared film may still detect the impressions. Disturbances in the ground notably affect heat circulation.

THE CORRECT USE OF TECHNOLOGY AND THE CORRECT USE OF HOPE

Positive results have been few but, nevertheless, carry more hope than the current situation. Scientists, military researchers and industrialists must be encouraged. They have good reasons to maintain hope.

Soon, even with the temporary technological inefficiencies in detecting individual mines, airborne technologies will at least be able to locate mine concentrations.

Technologies being tested are generally used alone; in such conditions the detectors are easily confused. In the field, they will certainly be used together with other devices in a multidisciplinary mine clearing system, including neutralization and destruction devices.

Technologies to Support Peacekeeping Operations

12

by

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INTRODUCTION

The first task of a peacekeeping strategy and peace enforcement is deterrence. The peacekeepers must be able to deter aggression but not incite hostilities in a crisis between belligerent entities. While this suggests that the introduction of peacekeeping troops in a crisis should be perceived as defensive in nature, it also suggests that the mere presence of ground forces neither provides new incentives for politically motivated aggressive acts nor inhibits the use of other military options. The introduction of Marines into Lebanon as a peacekeeping force in 1983 was apparently perceived to be sufficient. Rather than deterring aggressive action, however, the Marines became a target of opportunity for a militarily meaningless but politically valuable low-risk attack. The result was the loss of 241 American lives.[1] In Somalia, the initial humanitarian objectives were rather quickly accomplished due, it is argued, to the introduction of a massive force clearly capable of quickly and decisively accomplishing its objectives against any possible opposition. Once the surprise and shock of the initial deployment wore off, U.S. forces were reduced, the warlords adjusted, and the presence of United Nations forces became more of an incentive for hostile action than a stabilizing influence for peace. One paradox of peacekeeping operations is that peace keepers often become the targets of retaliation (as for example, currently in the former Yugoslavia).

[1] The World Almanac and The Book of Facts (New York; Pharos Books, 1991) page 727.

A force deployed in a peacekeeping operation must have the capability to avoid being provocative while possessing the strength to deter warlike actions and, if necessary, counter any retaliation with minimal non-lethal force. The attributes needed by peacekeeping forces to provide deterrence are similar to those needed to fight, but the emphasis should be on perceived capabilities. To be successful requires quality troops and leaders provided with the right equipment (technologies) at the right time, used the right way (doctrine/tactics), and tactics.

BACKGROUND

The peace keepers must be clearly perceived as having the unquestioned capability to accomplish their mission when and where employed. The prerequisite is that these peacekeeping troops, no matter how small in number, must be able to protect themselves against any likely opposition. It is not enough to rely on the belief that a rational enemy will not attack for fear of overwhelming retaliation. The peacekeeping force must be capable of responding to random or well-planned terrorist attacks and/or conventional force engagements. The deployed peacekeeping force must be trained and well equipped to respond to any challenge and have exceptional versatility. The force must be capable of providing intelligence and be equipped with affordable and appropriate technologies to hold their own and to offset numerical deficiencies. It needs to be more than helpless troops "armed" with blue berets, yet it cannot be perceived as hostile to any or all. One possible approach to this is the application of "Non-Lethal Weapons" (NLW) to defend themselves and achieve their mission. These will be discussed in the section on NLWs.

First, as opposed to Kuwait, peacekeeping land forces were sent to Bosnia-Herzegovina by some nations prior to an air strike, with light equipment and were dispersed widely, therefore vulnerable to retaliatory actions on the ground, They found themselves, therefore, in the worst position for land combat, a situation that the United States tended to underestimate since they were not directly concerned. It remained possible, though, to provide these troops with close air support or with air-to-air interdiction actions against enemy aircraft; such a scenario was to constitute the first military action in NATO's history, on 28 February 1994, nearly forty-five years after its creation. But even assuming it is always possible to send fighter bombers to support ground troops, there will always be a reluctance to do so just to neutralize a single mortar, even one firing on the people of Sarajevo or Bihac.

An architecture needs to be developed which covers the many facets of peacekeeping operations: truce monitoring; cooperative military disengagement; confidence building; humanitarian relief; refugee support; peace enforcement; and early steps of post-conflict rehabilitation. The structural elements of this architecture rely on: intelligence situation awareness; survivability; and a response capability of non-lethal force projection to threats. Some of the technologies required to support this architecture are covered in the sections on sensors, mine detection and clearing, non-lethal weapons, and other issues related to survivability. Clearly a peacekeeping operation should not inflict losses nor suffer losses.

SENSORS

There are a large number of specialized sensors that can provide peace keepers current situational awareness and intelligence. This real-time data can allow for sufficient response time if counteraction is required. A brief description of the variety of sensors follows.

- **Micropower Impulse Radar (MIR):** The MIR is a new radar sensor that has numerous applications in peacekeeping operations. Based on emitting and detecting very low amplitude voltage impulses, it is the first active radar with continuous multi-year operation from small batteries. Its low power drain and wide bandwidth also make it very covert, eliminating both interference and interception. The MIR motion sensor, for example, has a

sharply defined detection range, multi-year continuous-use battery life, exceedingly low emissions, broad area or omni coverage, and very low cost. It can be used for short-range intrusion detection or perimeter defense or other security applications. Another use of the radar is remote detection of human motion; this could be to remotely detect breathing and respiration rate or heart motion, making it an excellent tool for hostage rescue operations and for battlefield medicine. In addition, multiple MIR sensors can be combined for a wide range of imaging applications. MIR arrays and software for imaging people behind walls for surreptitious entry, buried mines, and locating thickness and composition of walls have been developed. Its features include variable depth (range) resolution, wideband pulse for fine cross-range resolution, briefcase sized for portability, and two-dimensional imaging in less than 10 seconds.

- **Wavelength Tunable Video Camera (WTVC):** The WTVC is a compact framing hyper-spectral imager with pointing and tracking capability designed for airborne spot survey applications in searches for stressed foliage and waterborne effluents from covert chemical plants and buried facilities. Stressed foliage could indicate camouflaged facilities or hidden armored vehicles and other items concealed under foliage. The system is extremely compact; the camera payload is housed in a 14-inch diameter 4-axis gyro stabilized gimbal and is ready for airborne deployment. The image handling system incorporates a frame grabber that digitizes the analog input. The framing architecture of this imager supports data collection modes that are consistent with real time hyper-spectral image processing since, unlike conventional push broom and whisk broom multi-spectral scanners, the camera does not require platform motion to generate the image.
- **Hand and Air Deployed Sensors for Field Intelligence:** A family of intelligent unattended ground sensors has been developed which could form the basis for a number of peace violation indications and warning systems as well as active defense control. The current family consists of seismic, IR, magnetic (2-axis), and nuclear sensors with projects underway to include low power ultra-wideband spread spectrum radar, and various chemical sensors. Onboard multi-sensor data fusion techniques reduce the incidence of false identification and alerting. When suitably reduced in size, these sensors would provide a means for perimeter emplacement, and base camp monitoring as well as the ability to locate threat forces in a preestablished grid of checkpoint sensors. Air delivered components and systems have been developed.
- **Electronic Tags for Monitoring:** Micro-miniature, high security, electronic tags have been developed for uniquely identifying components. Recent advances in this technology have added the capability to store information in the tag in non-volatile memory over extended periods of time. Remote interrogation via RF line of sight and satellite has been demonstrated. Connection to assess local indicators of readiness to perform is possible.
- **Advanced Night Vision:** The next generation Night Vision System known as GENIV will have more than two times greater resolution over its predecessors and three times the gain with 40 percent higher signal-to-noise ratio. This will lead to a three-fold improvement in target detection and identification ranges under starlight conditions. It will also provide higher contrast images, night vision with a larger field of view, and operation in urban environments eliminating the halo effect or blooming when city lights are in the field of view.
- **Laser Imaging Spectroscopy:** An Imaging Fourier Transform Spectrometer has been developed. This instrument produces a complete infrared spectrum of every point in its image. This spectrum is a fingerprint of the materials or gases which are contained in that pixel, and can be used to identify chemical effluents and identify materials remotely using

only passive detection. It is currently a ground based system and is being used for chemical vapor detection studies, and for the detection of buried mines. The concept can be extended to airborne or space-borne systems. A new generation of the instrument that will significantly improve performance is being developed.

- **Remotely Piloted Vehicles (RPV):** For surveillance purposes there exist a wide spectrum of RPVs that can act as scouts. These RPVs can be as inexpensive as the largest model airplane equipped with a small video and a fiber optic link to much larger systems. The larger systems can carry tens to hundreds of pounds of sensor systems. The U.S. Department of Defense has a significant development program underway to develop RPVs and a whole host of sensors. These RPVs will have long endurance and can operate at low to very high altitudes and in some cases are virtually undetectable. These RPVs will carry state-of-the-art miniaturized imaging sensors in a variety of wavelengths (visible, LWIR, UV, etc.), as well as synthetic aperture radar for imaging. They will be accompanied by sophisticated computational capability to provide automatic target recognition.
- **Robotic/Autonomous Systems:** The United States is developing a new system called the Wide Area Mine (WAM). WAM can detect, identify, and track targets. Although its original intent was to defeat these targets, it has the sensors and computer power to emulate many functions of peacekeeping troops acting as sentries by using this backbone as a surveillance tool. In the section on non-lethal weapons we discuss the transformation of the WAM lethal smart warhead with non-lethal components. In the future we may see autonomous "sentries" the size of match box toys that patrol with sophisticated sensors and networked communication systems.

MINE DETECTION/CLEARING

Mines present a serious deterrent to peacekeeping forces. Not only can they kill and injure, but they also provide a large psychological barrier to the conduct of operations. More over, they leave a lethal legacy of death and dismemberment after hostilities are over. It is estimated that there are from 180 to 225 million unexploded items of ordnance that are residual from previous hostilities. For example, 75 years after WWI France's Department du Déminage estimates there are 12 million unexploded shells remaining from conflicts near Verdun. In Angola, two decades of no-holds-barred civil war may have left 20 million land mines in the earth, which kill 120 Angolans each month. In Cambodia 300 people are killed or maimed each month. One mine remains in the ground for every two people in that country. In Afghanistan 12 million mines were laid during the 1980s war with the former Soviet Union. In the former Yugoslavia, 60,000 mines are laid each week; and in northern Somalia and the Mozambique highlands, millions of mines ring native villages and water holes. Mines have replaced human soldiers as sentries, stopping humanitarian aid from flowing in and keeping refugees from flowing out. Land mines are plentiful and cheap, costing as little as $3 each. The U.S. State Department estimates upward of 85 million mines spread across 56 nations. The United Nations, estimates 105 million mines or more deployed in 62 nations, or one mine for every 50 people on earth. Further, it is estimated that about 350,000 mines and/or unexploded ordnance are cleared every year, but about 2.5 million mines are emplaced every year. One has to find the mines, circumvent them and/or destroy them, both in military operations and in peace. Mines exist on land (buried or surface), in the coastal region (surf zone) and at sea. In the coastal region mines in the form of antipersonnel, anti-armor, tiltrod and small moored mines, are also interspersed with obstacles such as con-

certina wire, hedgehogs, log posts and concrete blocks.[2]

Mine warfare is very low tech but effective. The countermine activity gets a lot of lip service, but no effective, long duration-funded program has been sustained to tackle the operational and peace aspects of this problem. The best countermine/counter-obstacle strategy is to prevent their use. Non-lethal or precision/intelligent technologies may provide a path for effective area denial prior to an assault. An obvious example is the preemptive mining of contested territory with self-neutralizing mines, carrying non-lethal weapons as in the case of a revised WAM system. An ideal approach is to have pre-surveyed the site of interest constantly via overhead coverage to allow observation of mining operations as they occur.

If preventive measures fail, a two-step process is required. First, mines must be located. Secondly, once located, they must be removed or destroyed. There are traditional and not very satisfactory methods used to locate these mines, such as magnetometers and gradiometers, electromagnetic induction detectors, ground penetrating radar and others. The advent of plastic mines has rendered most of these techniques useless.

While concepts are evolving, with various rates of success, for handling different parts of the land mine problem, there is still no solution for finding buried or obscured mines. Because they are buried, they offer no obvious signature to conventional detection methods such as cameras, lasers, or conventional radar. Current studies have shown that the few signatures that these targets offer are subtle and they may require multiple sensors to provide sufficient detectability. To date, studies have focused on single or multiband IR signatures of mines or mine fields. Due to the difference in thermal diffusivity of explosives in either plastic or metal cases, there would normally be a slight change in temperature as the area goes through a diurnal cycle. Unfortunately, clutter and emissivity of shadowed regions cause difficulty. In addition, ground penetrating radar has met with some success, but it also can be spoofed by clutter.

Because of the enormity of the problem and its difficult nature, we suggest that the problem of obscured and buried mines not be neglected. Numerous technologies, including newer ground penetrating radar systems, multi-spectral and hyperspectral imaging systems in the visible and infrared, or even acoustic techniques, should be studied, particularly together as multisensor systems. Such work will provide a definitive answer to the question of whether the problem is solvable, even in part.

Finally, it is important that studies limit their scopes to specific, interesting scenarios. In the past, workers in the field have been stalled by the definition of the problem—find all mines in all conditions. Progress in this field may be limited to certain types of mines in certain environments. Program planners should look to the world where problems exist and ask for solutions that, though they may not be perfectly general, do work in those specific cases. Partial solutions are better than none at all.

There are two new techniques that may offer some promise: Micropower Impulse Radar (MIR) and hyperspectral imaging. MIR has recently been tested to evaluate its viability as a mine detection sensor. These tests show that MIR reliably detects both plastic and metallic land mines and mine surrogates buried in both moist and dry soils. The MIR sensor technology provides several advantages over existing GPR systems including: low cost, low power, lightweight and compact size, and the ability to assemble into compact arrays. Coupled with 2-D and 3-D imaging algorithms, MIR offers the potential for a low cost, high performance mine detector that will enhance the reliability and performance of multisensor mine detection systems.

[2] The New York Times Magazine, "One Leg One Life at a Time" by Donovan Webster, Jan. 23, 1994. Donovan Webster, *Cleaning up a Century of World War*, to be published by Pantheon.

In dry soil, the system can detect buried objects to a depth of 30 cm and more.[3]

New techniques look at the characteristics of disturbed earth. There are two different approaches. When a mine is emplaced, the disturbed earth covering has a different thermal diffusivity than the undisturbed earth. Thus an IR sensor may detect a small difference in temperature between the mine site and the surrounding environment. Unfortunately, nearby clutter could provide a false signal. Another approach has to do with the crystalline conformation of the silica that has been disturbed. Hyperspectral imaging using certain IR bands provide a clear signal that differs from the adjacent undisturbed environment.

Mine clearing, when mines have been located, can be done in several ways. The traditional but very hazardous approach is to use wooden probes to uncover the mine and then either remove it, or with additional explosives detonate it in place. The U.S. military uses a line charge or explosive (MATCHLOCK) fired out by a small rocket that may clear a narrow path. However, because of the new "bladder" mines it is not very effective. Another approach known as Distributed Explosive Mine Neutralization System (DEMNS) uses rockets to extend a large net of primacord. At each node of this primacord net is a small shaped charge that penetrates approximately 10 inches of soil. However, if the net is dropped on some object above the ground's surface, the shaped charge penetration power is greatly diminished because of the longer stand off. Attempts have been made to use various fuel-air explosives to explode a large area of mines. To date, however, these have not delivered sufficient overpressure to detonate the mines.

There are several mechanical means for clearing mines. These involve heavily armored bulldozers with special digging or raking blades in front to clear mines. A variation of this is a helicopter sweeping system towed by a 1,000 foot tow line and resembling a harrow with additional patented digging units.

Yet another approach is biodegration. Assuming there is no time urgency, and the environmental conditions are right, bio-organisms can degrade explosives to inert materials. Another approach, depending on the availability of a large water supply, is to conduct modern hydraulic mining using very high pressure water jets to sweep an area. Others have attempted to detonate the mines in place with high power electromagnetic pulses with some success

The major issue still remains locating the mines once they are emplaced.

NON-LETHAL WEAPONS

The issue of what constitutes a non-lethal weapon is somewhat fuzzy. The definitions presented by Ing. Gen. Carayol of DRET (France) to the AC1243-DS/62 working group will be useful to set the stage.[4] These are:

- Weapons that do not produce long-term aftereffects and are not fatal for 99 percent of combatants and civilians under normal physical conditions.
- Weapons that disrupt, destroy or otherwise degrade the functioning of threat material or personnel, without crossing the "death barrier."
- Instruments used in combat that are designed to achieve the same tactical and strategic ends as lethal weapons, but are not intended to kill personnel or inflict catastrophic damage on equipment.
- Discriminate weapons that are explicitly designed and employed to incapacitate personnel or material, while minimizing fatalities and undesired damage to property and the environment.

[3] S.G. Azevedo, et al, "Micropower Impulse Radar (MIR) Technology Applied to Mine Detection and Imaging." Lawrence Livermore National Laboratory, report UCID-ID-5366, March 1995.

[4] Ing. Gen. Carayol, "Non-Lethal Weapons," AC/243-DS/62, March 1995 meeting item.

NLWs are really a manifestation of the Sun Tzu dictum, "The Sheathed Sword" from the *Art of War*.[5] This refers to supreme excellence in war defined as breaking the enemy's resistance without fighting. In most recent conflicts, such as the Gulf War, it has come to mean achieving military goals with minimal collateral damage, specifically to innocent civilian population. It infers that a non-lethal weapon is the preferred first response in that it achieves the military goal of subduing the enemy threat, and is both morally and politically acceptable. Somehow, it is also implied that avoidance of enemy casualties would result in avoidance of peacekeeping losses.

There are many forms of NLWs and there are several ways to catalog them. In his summary of "New Applications of Non-Lethal and Less Lethal Technology," Richard Garwin has followed a categorization used in the U.S. Army Training and Doctrine Command (TRADOC) publication, "Operations Concept for Disabling Measures" (draft) of September 1992.[6] My approach is somewhat different and hierarchical and follows this outline:

- Planning
- Intimidate/Persuade
- Perception/Reality of Invincibility
- Immobilize Engines of War
- Remove Infrastructure
- Neutralize Personnel

PLANNING

This refers to conflict simulations carried out to assess the effects of any of the proposed NLW technologies before implementation, but also to establish tactics and rehearse missions. The simulations rely heavily on intelligence data gathered from sensors. (See sensors section above.)

INTIMIDATE/PERSUADE

This has all the vestiges of psychological warfare focused on lowering the determination to fight. In the past this has included loud music and pamphlets. A modern approach might include holographic images keyed to loud speakers with a message from a leader who encourages abandoning the fight.

PERCEPTION/REALITY OF INVINCIBILITY

These are generally technologies dealing with survivability. They might include significantly enhanced body armor and armored vehicles or possess active defense capabilities. The latter means sensing an attacking missile, projectile or any other threat and countering it before it strikes. Another approach is to make certain a second shot is not fired. For example, in response to concerns about sniper fire and territorials with mortar tubes on the back of pickup trucks firing on peacekeeping troops in Somalia, we developed a counter sniper detection technology called Lifeguard. The key components are a sensor that identifies a speeding bullet or projectile via its unique signals and a sophisticated computer that processes the signals into an image. When a bullet/projectile is fired, Lifeguard's sensor picks up the location of the projectile and instantly re-creates its flight path, showing on a video screen the path all the way back to its source. The location of the gunman is quickly determined for subsequent action/response.

Further evolution of this concept is to use this technology to detect mortar and artillery shells in flight and to fire a guided hyper-accurate munition to intercept and destroy the shell in flight (hitting a bullet with a bullet). Another approach is to develop a missile with a 5 cm circular error of probability (CEP) at 2 km range so that it will fly down the barrel of a tank gun or artillery piece. Further, some of the RPVs discussed in the sensor section could also carry hyper-accu-

[5] Sun Tzu, *The Art of War*, Edited by James Clavell, Dell Publishing, 1983.

[6] Richard L. Garwin, *New Applications of Non-Lethal and 'Less Lethal' Technology*, American Assembly Book/Conference on U.S. Intervention in the Post-Cold War World: New Challenges and New Resources, April 7–10, 1994.

rate new munitions. These latter concepts would have low collateral damage.

IMMOBILIZING ENGINES OF WAR

There are a large number of possible "soft kill" or "mission kill" approaches to stopping engines of war such as tanks and armored personnel carriers. These include: high strength fibers as entanglements; heat shrink plastic shrouds; submicron pyrophoric dust that would burn out the filters and ignite the fuel, or encapsulated "popcorn" adhesive foam that would clog the heat exchanger and cause the engine to blow; carbon or metal fibers to short out electrical systems of engines; lasers to blind electro-optical systems and windows; high power microwaves to upset or burn out electronic systems controlling the engines; and anti-material chemicals that could cause liquid metal embrittlement or cause elastomeric materials to decompose or lose their mechanical properties.

REMOVE INFRASTRUCTURE

These include using fine-cut carbon or metal fibers to short out electrical systems; trailing a wire from an RPV to short out overhead electrical wires and disrupt communications; using high power microwaves to similarly disrupt electrical power and communication systems including C3I facilities; and utilization of various weapons to disrupt normal operation of airfields, roads and bridges.

NEUTRALIZE PERSONNEL/TEMPORARY INCAPACITATION OF COMBATANTS

Technologies that can cause temporary dysfunction of combatants are numerous and each has a special medical, political, or practical aspect.

For example, the use of a laser for dazzling or blinding is generally regarded as inappropriate and inhumane in that it can cause permanent blindness. The use of calamatives/anesthetics, such as fentanyls, is an issue due to the uncertainty of individual dose response and concerns about chemical warfare, although it can be argued that peacekeeping is like police actions and not war. Low frequency, high amplitude acoustics can cause a wide variety of human dysfunction that, it is said, clears up soon after the acoustics are stopped. Various chemicals can be used to provide an extremely sticky surface for difficult movement or an extremely slick surface causing loss of traction. More effective, rubber bullets or "educated bean bags" that deliver the same stopping momentum up close or at a distance have been demonstrated. The use of multicolor strobe lights can cause significant disorientation while peacekeeping troops are protected with appropriate goggles.

SUMMARY OF NON-LETHAL WEAPONS

The advantage of NLWs is that they can more readily be used in situations where use of traditional force would be ill-tolerated by public opinion. Their value is directly dependent on public opinion. One may, therefore, expect that hostile propaganda will endeavor to exploit any circumstance where their moral acceptability could be faulted and, what is more, to use this to try to discredit the entire NLW concept.

Many of the most easily conceivable NLWs are likely to draw on technologies similar to those prohibited by international regulations or likely to cause public reprobation. This applies to chemical and biological agents and, to some extent, lasers operating in the visible spectrum. The legal issues raised are summarized below.

Biological anti-personnel agents are strictly forbidden, however, anti-material biological agents are authorized. Their use as NLWs is, of course, likely to be the subject of hostile propaganda. It is not certain that there is a very high risk of this, insofar as members of the public are aware of cases where such agents have been used without danger (e.g., to clear up oil pollution).

The treaty banning anti-personnel chemical agents contains an ambiguity that leaves open the possibility of considering them as NLWs. According to the convention, riot control agents are banned only as weapons of war. One possible interpretation of the convention is that such means (i.e., momentary physical incapacitators,

sensory irritants, tranquilizers and sedatives) would be conceivable in peacekeeping operations.

International action is underway, at the instigation of Sweden and the Red Cross, to prohibit or regulate the use of anti-personnel lasers. One essential question that arises in this context is that of the possibility of establishing a clear boundary between lasers producing permanent effects (blinding) and lasers producing only a transient effect (dazzle).

The advantages of NLWs are clear enough, so we do not need to dwell on them. We shall simply mention here that they are likely to have a number of unwanted side effects.

- Use of force becomes more acceptable.
- Use may lack decisive action and be perceived as failing to punish the aggressor.
- Use may heighten the resolve of the enemy to respond with lethal force.
- Ease of proliferation.
- May result in quickly developing countermeasures by the enemy.
- May be used against peacekeeping forces and therefore necessitates developing counter-countermeasures.

The very virtue of NLWs may constitute an argument against them, even from a moral point of view, in a comparison with lethal weapons. One can turn this around and say that lethal weapons also derive certain virtues from their inherent excess; they delay the moment of recourse to force and, even in the eyes of the public, may constitute a more appropriate response than NLWs to particularly unpopular criminal acts.[7]

Another concern is the risk of a rapid escalation toward a traditional lethal exchange simply from the initial use of non-lethal means. It is easy to conceive of such a process resulting either by mistake from the adversary or deliberately because he has no means of response other than the traditional one. Incidentally, this leads to the universally accepted conclusion that use of NLWs must always be backed up by conventional superiority. But this essential precaution does not resolve the difficulty raised, namely that eminently humanitarian initial intentions may lead to a distorted response. The need for protection and counter-countermeasures to NLWs is self-evident.

Two categories of NLWs hold the most promise, the first is High Power Microwave (HPM) systems that can be delivered in missiles or projectiles to the targets. These would be driven by the new generation of capacitors and thus there would be no blast or fragments causing collateral damage from explosively driven magnetic flux generators. These HPM systems may have the greatest versatility in terms of upsetting a large spectrum of targets.

These HPM weapons have also been the focus of several studies. Their effects on material are achieved by “front door” coupling of radar antennae, countermeasure systems, communications systems and IFF systems, and also by “back door” coupling via structural defects in the target systems (openings, connections, drivers’ windows, etc.). Their effects may range from disruption (sometimes long-term) to destruction essentially by thermal effects on electronic components.

The utility of HPM weapons has always been limited by the confidentiality of information on the vulnerability of the target systems and secondly by the scale of the development work required on microwave emitter systems.

It is conceivable that these barriers might be partly lifted in the specific context of weapons for peacekeeping. In that case, the target systems could be commercially available systems (cars and communications equipment) with limited hardening, and not subject to the confidentiality constraints of defense equipment.

Reference has been made to the possibility of microwave emissions acting directly on the auditory system, thereby permitting transmission of

[7] Harvey M. Sapolsky, “Non-Lethal Warfare Technologies: Opportunities and Problems,” Report based on a conference held June 2-3, 1993, in Lexington, MA, published by Defense and Arms Control Studies Program, MIT.

messages. It is not clear that this effect can be usefully exploited in practice. The open literature also contains references to the possibility of disrupting the central nervous system at low energy levels. This effect could obviously be important for NLWs if it were confirmed.

Another area of fruitful application for peacekeeping is in the area of acoustics, specifically infrasound. The possibility of causing various incapacitating effects on man (e.g., nausea and loss of balance) by means of frequencies in the range of 100 Hz and below is mentioned in the open literature.

Independent of the question of their effects, two arguments against infrasound systems should be mentioned; first the non-directionality problem and secondly the inefficiency of coupling between the emitting elements and the atmosphere. However, the advent of aerogels can greatly enhance the efficiency of coupling.

Another area is that of anti-material warfare. The following types of generic products have appeared in various U.S. publications:

- super-adhesives—high friction;
- super-slippery products—low friction;
- fast forming foams;
- super acids and super caustics;
- obscurants (smoke and opaque or diffusing layers deposited on the windows of optical systems);
- liquid metal embrittlers;
- combustion inhibitors;
- tire/elastomer attacking products.

Creating many of these substances is not a problem, insofar as the basic technical information about them is commonly known and as some of them have already given rise to illustrative products. This category includes the adhesives, foams, slippery substances, products attacking tires and elastomers and, in the long term, obscurants.

Others are more problematic and may be the subject of relatively advanced research even if some information on them is widely known. Super acids and super caustics are relatively well known in the world of scientific research, but essentially as a means of synthesizing extremely unstable chemicals. Their properties as corrosive agents (e.g., for use against the windows of optical systems, which are the most interesting targets in the NLW context) are not the subject of direct research and cannot be considered to be well known. Similarly, embrittlement of aluminum alloys by liquid metals is a known phenomenon in the scientific world. Mention has been made of the possibility of embrittling an aircraft so that it has time to land before its structures collapse. Finally, inhibitions of combustion engines must be considered a difficult problem for which no solution is yet in sight. One of the major issues affecting the utilization of these anti-material chemicals is the design of delivery devices.

Finally, the area of self-defense or active defense is worthy of further explanation. The ability to track a sniper bullet or territorial mortar or a Bosnian Serb artillery round suggests that there will be instant retribution for hostile acts.

CONCLUSION

There exists a wealth of technology to support peacekeeping operations. An overall architecture is required to effectively utilize these technologies that includes intelligence, situation awareness, reconnaissance, and surveillance; survivability; and a non-lethal force projection to respond to hostile acts.

Among the enabling technologies is a wide spectrum of sensors; mine detection and clearing technologies; and non-lethal weapons. Additional, enabling technologies might include automatic language translators; miniaturized robotic vehicle sentries and scouts; electronic and information warfare; invulnerable mobility; and precision delivery of food, water, and fuel for humanitarian aid.

Remembering the concept of “The Sheathed Sword,” excellence of victory should not inflict nor suffer losses.

Non-Lethal Weapons: A Synopsis

13

by

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PURPOSE

There has been much publicity regarding the development of non-lethal technologies and the deployment and use of non-lethal weapons (NLW). The purpose of this paper therefore is to examine the concept and utility of NLW in order to inform those involved with Force Development or the sponsoring and directing of research into non-lethal technologies.

The paper will not consider low-level tactical procedures nor the rules for the use of NLW. It will however discuss some of the legal implications of their employment.

AIM

The aim of the paper is to examine the concept and utility of NLW in order to determine their place in (Land Warfare) operations.

BACKGROUND

The ending of the Cold War has left a security environment that is both dangerous and uncertain. The absence of the stability that rested substantially on the nuclear balance has created conditions in which new and diverse threats to international peace and order can flourish. Arms proliferation has reached the point where the developing nations are increasingly acquiring sophisticated weapons, thus providing a new, lethal dimension to

Note: This paper has not yet been approved by the Ministry of Defence as a formal document, and should not be considered an authorized statement of position by that body or by any of its components.

ancient conflicts and schisms. Ethnic and religious disputes coupled with population and resource pressures will continue to generate tensions, but, without super-power restraint the potential for hostilities seems set to grow. More will be expected of the UN and other coalition forces to resolve such conflicts, disputes and tensions.

While the security environment is such that there is an increased likelihood of the measured use of force, there is also a political and public expectation, enhanced by the Gulf War, that when force is used, it will no longer result in high casualties and extensive collateral damage.

The view that force can now be used with few casualties and little collateral damage is enhanced by the increasing capability of modern weapon systems. Not only can these systems deliver a highly destructive capability at long range and with great precision, but there is now the possibility of denying the enemy many of his goals without inflicting large numbers of casualties. These latter systems, known generically as NLW, are designed either to temporarily immobilize or otherwise influence the enemy or to render his equipment useless for the tasks they were designed to do.

The use of NLW is not new. Weapons such as water cannons, rubber bullets, CS gas, stun grenades, and electronic jammers have been used throughout the world for a number of years in situations where the use of lethal weapons would be inappropriate. What is new and has enhanced the importance of NLW, is not only the increasing number and type of military operations being undertaken, many of which fall short of actual warfighting, but also their high visibility. The public, and hence political, concern for casualties among the combatants and civilian population have increased interest in the potential for NLW. The potential lies in the expectation that NLW can provide armed forces with a more appropriate, less than lethal response when required. The public expectation has been fueled by the increasingly high profile, some might say exotic, non-lethal technologies considered in the media.

DEFINITION AND CLASSIFICATION

NLW will increase the military options available to commanders, thereby allowing them to apply a graduated measure of force. The options available will include, at the lower end of the lethality scale, the use of NLW. Conflicts may involve NLW, but armed forces will always deploy with lethal force which may or may not be used. No conflict will be limited to a specific level of lethality and NLW will always contribute to the application of military force as part of an already existing spectrum of force. It is therefore wrong to talk about NLW in isolation or to suggest that they give rise to non-lethal wars. The term "non-lethal warfare" is therefore unspecific and is not used further in this paper.

The purpose of NLW is to allow military or political objectives to be achieved while causing the minimum possible harm to personnel and the environment. While this purpose is reasonably noncontentious, there is no agreed definition either within NATO or the United Kingdom. The Defence Scientific Advisory Council (DSAC) Sub-Committee established to examine the potential of NLW defines them as, "Discriminate weapons that are explicitly designed and employed so as to incapacitate[1] personnel or materiel, while minimizing fatalities and undesired damage to property and the environment."

While there are other definitions,[2] this is felt to be the most appropriate as it encapsulates the view that such systems can be targeted against individuals or equipment while minimizing, but not excluding, fatalities and collateral damage.

[1] To render incapable or unfit. Oxford English Dictionary.

[2] Further definitions include: a. Weapons that disrupt, destroy or otherwise degrade functioning of threat materiel or personnel without crossing the "death barrier," John Alexander, 1993, Los Alamos National Laboratories; b. Instruments used in combat which are designed to achieve the same tactical and strategic ends as lethal weapons but which are not intended to kill personnel or inflict catastrophic damage to equipment. Office of Secretary for Defence, 1991.

The use of the term "non-lethal" is misleading. There is a risk that the employment of NLW can be lethal, for example rubber bullets in Northern Ireland. For this reason, there have been suggestions that the term NLW should be renamed to, reduced, low or limited lethality weapons. Despite the terminology, NLW enhance the ability of forces to conduct their missions successfully with minimum casualties and little collateral and environmental damage.

The categorization of NLW can be difficult, depending upon the interpretation given to the definition used. For example, the precision offered by a cruise missile can limit collateral damage and the bombing of a runway can prevent future attack from the air, therefore by definition, both weapon systems could be classed as non-lethal. For simplicity, NLW can be categorized into those that are designed to impair or immobilize people or equipment:

People. Systems Targeted against personnel include:

1. **Psychological Operations (PSYOPS).** PSYOPS aim to influence attitudes and behavior, thereby affecting the achievement of military objectives. They have the potential to damage enemy C2 by lowering morale, instilling fear and breeding distrust.
2. **Acoustics.** Sound, whether it be audible or inaudible (infra- and ultra-sound) can be used to immobilize individuals or disperse crowds by causing discomfort, disorientation and nausea.
3. **Visual stimulus and illusion (VSI).** VSI uses high-intensity strobe, lighting and holography to cause temporary vertigo, disorientation, and nausea.
4. **Lasers, incapacitants and irritants.** Low energy (dazzle) lasers, incapacitants (i.e., stun grenades) and irritants (i.e., CS gas) are used to temporarily blind, dazzle, immobilize or disorient individuals.

Equipment and Materiel. Systems targeted against equipment and materiel include those designed to impair or prevent mobility, neutralize weapons, exploit, or disrupt communications or degrade the infrastructure. Such systems include:

1. Sensor damage lasers targeted against weapon system optics to prevent mobility and target acquisition.
2. Metal embrittlement, polymer and super adhesive agents to disable mechanical linkages and alter material properties causing general equipment and weapon failure.
3. Radio frequency weapons (RFW) to cause electronic disruption or failure ignition systems, communications, radars, computers and navigation aids.
4. Conductive ribbons to short circuit power lines, fuel additives to contaminate fuel supplies and the introduction of computer viruses to disrupt communication and economic centers.

A list of the technologies associated with NLW is in table 13-1 together with, as a result of some technology wargaming, their possible uses and disadvantages.

UTILITY

A major opportunity now exists to exploit the potential offered by non-lethal technologies in the development of affordable weaponry that can disable, disrupt, or destroy an enemy's capability without causing excessive casualties, property destruction or widespread environmental damage.

NLW will complement lethal weapons, especially in UN peacekeeping operations where a military response with something less than lethal force may be more appropriate. In such circumstances, proportionality is fundamental to maintaining consent. However, if the utility of NLW weapons were limited to peacekeeping operations, their potential would be unlikely to warrant the expense of their research, development, and procurement. Ideally, NLW will therefore need to be multi-roled, have utility across a wide spectrum of different operations and have the potential for dual (civil/military) use.

NLW will not replace other more lethal weapon systems nor will they cause a shift in the

TABLE 13-1: The Utility of Non-Lethal Weapon Technologies Across the Spectrum of Conflict

	Spectrum		
Level	**Peace**	**OOTW (Bosnia)**	**War**
Strategic (To deter or degrade the use of military power)	Psyops Voice synthesis Computer viruses Conductive ribbons	Psyops Voice synthesis Computer viruses Material embrittlement	Psyops Voice synthesis Computer viruses Conductive ribbons Biodeterioration
Operational (To degrade or defeat military forces)	Psyops Voice synthesis	Psyops Super-corrosives Super-adhesives HPM Material embrittlement Soil destabilization Combustion modifier	Psyops Anti-friction agents Super-adhesives HPM Material embrittlement Soil destabilization Combustion modifier All lasers EW Fuel additives
Tactical (To defeat or destroy the enemy's warfighting capability)	Psyops Infra & ultra-sound Noise/odors/lights Stun weapons HPM Low energy lasers Enclosure filler & foams	Psyops Infra & ultra-sound Noise/odors/lights Stun weapons HPM Low energy lasers Tire attack	Psyops All lasers Anti-traction agents Obscurants Optical coatings Tire attack

SOURCE: Alan Roland-Price, 1995.

way wars are fought. If deployed in accordance with the principles of proportionality and target discrimination, they will complement other weapon systems to give significant political, strategic, operational and tactical advantages in the conduct of military operations. An example of the utility of some NLW across the spectrum of conflict and at each level of command is in table 13-2.

In order to maximize the potential of NLW, these weapons must be employed in such a manner as to provide a gradual increase in capability. This can be achieved either by using NLW on their own provided there is recourse to lethal weapons or by using them to complement more lethal systems. Both cases enable land forces to react to situations with a greater degree of credibility and flexibility than has hitherto been possible.

Additionally, NLW offer certain advantages in their role as anti-mobility or anti-equipment weapons—especially in reducing injuries to personnel. Potential applications are listed in table 13-3.

TYPES OF FORCES THAT MIGHT BE EQUIPPED

There are three fundamental approaches that need to be examined when considering the types of forces that might be equipped with NLW. These are:

- The formation of dedicated units.
- The issue and use of NLW for specific operations only.
- Full integration.

Formation of dedicated units. The first approach would involve the formation of dedicated units trained in the whole spectrum of

TABLE 13-2: Uses and Disadvantages of Anti-Personnel Non-Lethal Weapon Technologies Across the Spectrum of Conflict

No.	Technology	Description	Uses	Disadvantages
P1 (M18)	Infra/ultra sound	Sonic generator that projects an acoustic pressure wave to cause discomfort to personnel; handheld or vehicle mounted	Crowds	Fratricide, injury, seizures
P2	Noise	Acoustic generator that produces sufficient sound to disorient or incapacitate personnel; vehicle mounted system	Crowds	Fratricide
P3	Chemicals	Family of chemical agents that incapacitate personnel; artillery, airborne, vehicle mounted or hand delivery	Terrorists, crowds	Fratricide, injuries, legality, environment
P4	Odors/nausea	Family of agents with pungent odors that cause discomfort to personnel; airborne, vehicle mounted or handheld delivery	Terrorists, crowds	Fratricide, legality, environment
P5	Biologicals	Family of biological agents with temporary effects; artillery, airborne, vehicle mounted or handheld delivery	Terrorists	Fratricide, legality, environment
P6	Non-penetrating projectiles	Family of projectiles that stun personnel without penetrating; handheld delivery	Terrorists, crowds	Injury
P7	Strobe lights	Large, high intensity stroboscope lights that disorient and confuse personnel	Crowds	Fratricide, seizures
P8	Stun weapons	Family of weapons that subdue or immobilize personnel; handheld weapon	Terrorists	Injury
P9	Water cannon	System that produces a high-pressure stream of water to disable or disperse crowds; vehicle mounted	Crowds	Injury
P10 (M11)	High-power microwave	System that produces microwave radiation, disorienting personnel; airborne, vehicle mounted or artillery delivery	Terrorists, soldiers	Fratricide, injury
P11 (M13)	Low-energy lasers	Laser device to flash blind personnel; vehicle mounted or handheld	Terrorists, soldiers	Injuries
P12	Optical munitions	Family of explosive flash devises to stun, dazzle, temporarily blind; artillery or handheld delivery	Terrorists, soldiers	Injury
P13 (M2)	Super adhesives & binding coatings	Family of adhesives that prevent movement of personnel; artillery, airborne, or vehicle mounted delivery	Terrorists, crowds, soldiers	Injury, environment
P14	Anti-traction compounds	Family of substances that cause lack of traction for personnel; artillery, airborne, or vehicle mounted delivery	Terrorists, crowds, soldiers	Environment
P15 (M25)	Combustible dispersants	Family of substance that ignite when subject to pressure from personnel passing over; artillery or airborne delivery	Terrorists	Injury, environment

(Continued)

TABLE 13-2: Uses and Disadvantages of Anti-Personnel Non-Lethal Weapon Technologies Across the Spectrum of Conflict (Cont'd.)

P16	Containment devices	Family of nets, meshes and the like to ensnare; airborne, vehicle mounted or handheld delivery	Terrorists, crowds, soldiers	None
P17 (M19)	Entanglers	Family of nets, meshes and the like to ensnare; airborne, vehicle mounted or handheld delivery	Terrorists, crowds, soldiers	None
P18	Enclosure filters	Substances that fills an enclosed space, leaving occupants alive, but incapable of movement; static system	Terrorists	Fratricide
P19	Foams	Family of foam that can impede mobility or create barriers; airborne or vehicle mounted	Terrorists, crowds	None
P20	Deceptions	Techniques intended to persuade groups to act against their self-interests	Terrorists, crowds, soldiers	None
P21	Holograms	Generators that produce holograms as decoys or deceptions; vehicle mounted	Terrorists, crowds, soldiers	None
P22	Indigenous vulnerabilities	Techniques for capitolizing on the ethnic or religious beliefs of a group or society	Terrorists, crowds, soldiers	None
P23 (M27)	Voice synthesis	Device to synthesize the voice of a known figure, to deceive the public or to produce false orders	Terrorists, crowds, soldiers	None
P24	Markers	Family of substances that can be used to covertly mark personnel for later identification; handheld delivery	Crowds	Environment
P25 (M12)	Obscurants	Family of smoke-like agents to obscure observation and disorient; vehicle mounted, airborne, or artillery delvered	Terrorists, crowds	None

KEY
1. Uses
Crowds: Dispersing crowds
Soldiers: Affecting soldiers in conventional wars
Terrorists: Subduing terrorists, rescuing hostages
Can also affect aircraft, computers, electronics, infrastructure, munitions, vehicle mobility, power generation and sensors
2. Disadvantages:
Environment: Possible permanent damage to environment
Fratricide: Possible effects on friendly forces, neutrals, or operator
Injury: Possible permanent injury of death
Legality: Possible treaty violation
Seizures: Possible seizures in epileptics

SOURCE: Alan Roland-Price, 1985.

NLW. While this option ensures NLW are kept in the hands of the experts, there are disadvantages:

a. The formation of such units, unless achieved at the expense of current manpower used as compensating reductions, would require substantial enhancements. In the current financial climate, this would be unlikely.
b. The formation of specialized units would mean that NLW and their use would become a "black art," the skills being known to a few specialists only.

TABLE 13-3: Uses and Disadvantages of Anti-Materiel Non-Lethal Weapon Technologies Across the Spectrum of Conflict

No.	Technology	Description	Uses	Disadvantages
M1	Electro-magnetic interference	Sonic generator that projects an acoustic pressure wave to cause discomfort to personnel; hand-held or vehicle mounted	Electronics, sensors, munitions	Fratricide
M2 (P13)	Bindings coatings	Family of adhesives that prevent movement of vehicles; artillery, airborne, or vehicle-mounted delivery	Mobility	Environment
M3	High-voltage shock	High-voltage generator to disrupt electronic systems; artillery, airborne, hand-held, or vehicle-mounted delivery	Electronics	Injury
M4	Non-nuclear EMP	Device that duplicates the effects of electro-magnetic pulses, disrupting electronics; artillery or vehicle-mounted delivery	Electronics, sensors, computers	Fratricide
M5	NOT USED			
M6	Engine killer projectiles	Family of agents that disable or destroy engines; hand-held or airborne delivery	Mobility, power	None
M7	Filter cloggers	Family of airborne agents that clog air filters when ingested in engines; artillery or airborne delivery	Mobility, power	Fratricide
M8	Conductive particles	Family of particles that short-circuit electronics when inserted; hand-held, artillery, or airborne delivery	Electronics, powers, computers	Fraticide, environment
M9	Conductive ribbons	Family of ribbons that short-circuit electronics when deployed over wires; hand-held, artillery, or vehicle-mounted delivery	Power, infrastructure	None
M10	Fuel additives/ viscosifier	Family of agents that cause a fuel to solidify; handheld or covert delivery	Mobility, power	None
M11 (P10)	High-power microwave	System that radiates a microwave burst, disabling electronics; airborne, artillery, or vehicle-mounted delivery	Electronics, sensors, aircraft	Fratricide

(Continued)

TABLE 13-3: Uses and Disadvantages of Anti-Materiel Non-Lethal Weapon Technologies Across the Spectrum of Conflict (Cont'd.)

M12 (P25)	Obscurants	Family of smoke-like agents to obscure visiual or electronic observation; airborne, artillery, or vehicle-mounted delivery	Sensors	None
M13 (P11)	High-energy lasers	Laser device to destroy optical sensors and navigation devices; airborne or vehicle-mounted weapon	Sensors	Injury
M14	Optical munition	Explosive flash device to stun, dazzle, temporarily blind optical sensors; hand-held or artillery delivery	Sensors	Fratricide
M15	Computer viruses	Family of programs that will cause computers to malfunction; handheld or covert delivery	Computers	None
M16	Materiel embrittlement	Family of substances that cause materials to quickly disintegrate; hand-held or artillery delivery	Mobility, infrastructure	Injury, environment
M17	Optical coatings	Family of materials that can be deposited on optical sensors or viewing ports to obscure vision; hand-held delivery	Sensors	None
M18 (P1)	Infra/ultra sound	Sonic generator that projects a low/high frequency acoustic beam to damage electronics; vehicle-mounted system	Electronics	Fratricide
M19 (P17)	Entanglers	Family of nets, meshes, and the like to ensnare vehicles; hand-held, airborne, or vehicle-mounted delivery	Mobility	None
M20	Anti-traction	Family of substances that cause a lack of traction; hand-held, artillery, airborne, or vehicle-mounted delivery	Mobility	Environment

SOURCE: Alan Roland-Price, 1995.

c. There are too many different types of NLW for dedicated units to be trained in them all.
d. New weapon systems should be made to suit the requirements of the user rather than the user having to be specially trained to meet the requirements of the weapon.

Use for specific operations only. The second option is for NLW to be retained for specific operations only, with units being trained in their use before deployment. This option would limit the utility of NLW to a specific role or purpose (as is the case with baton rounds for Northern Ireland) instead of using them to their maximum

potential across the spectrum of conflict. Their procurement could therefore be less cost-effective.

Full integration. This third option involves the full integration of NLW into the armories, of land forces. As NLW have such a wide variety of uses and capabilities across the spectrum of conflict, all forces will need to be equipped and trained to use a number of them depending upon:

a. **Corps, regiment, or specialty.** For example, signallers and communicators might use EW, jammers and microwaves; engineers might use anti-traction agents and agents to degrade infrastructures; military police might use calmative agents; and armored personnel might use laser adjuncts.
b. **The role and task of the unit.** Units, involved in crowd control will use personnel denial or disabling weapons; special forces in high-jacking situations may use acoustics, strobe or stunning agents; units deployed on counterterrorism operations may use PSYOPS; reconnaissance units may need to disable enemy vehicles quickly and silently; maneuver units may want to craze enemy optics and sights with DEW.

Full integration would inevitably involve sortie minor organizational changes. It would, for example, be necessary to integrate NLW into the command and control warfare (C^2W) cell within the headquarters command staff. It may also be necessary to enhance logistics units to cater for the additional burden of transportation, handling, storage, maintenance, and environmental control; medical units to treat specialized physiological and psychological effects; and gunnery units to provide the essential means of delivery.

Selected Option. It is recommended that U.K. land forces select the third option, full integration. Only by such integration will the full potential of NLW be realized, across the entire spectrum of conflict.

AN APPROACH TO USING NLW

If NLW are to be fully integrated with lethal systems, then the procedures associated with their use must be similar. There are four distinct phases.

Planning

- Three key factors in the planning phase are the need for Rules of Engagement (ROE), the requirement for detailed real-time intelligence, and the need for a carefully thought out media plan, especially in Operations Other Than War (OOTW). All three factors are necessary when planning lethal operations, but with NLW additional ROE are required to control their use below the lethal threshold. In addition, information/intelligence on the target may be more difficult to acquire (susceptibilities and vulnerabilities) so it will need careful management. A well rehearsed media plan is essential.
- Planning the use of NLW can be more complex than for lethal weapons because, in some situations, the enemy has to know that the weapon being delivered is non-lethal. It is, for example, pointless aiming a gun at the enemy to fire a NLW if the enemy perceives you to be firing a lethal weapon and responds accordingly. The dilemma therefore is whether or not to inform the enemy of your intent.

Means of Delivery

As with lethal systems, the means of delivery for NLW will be dependent upon the threat and the delivery assets available. However, as the purpose of NLW is to limit the number of casualties and collateral damage, it is likely that the use of robotics and unmanned vehicles (both air and ground) as a means of delivery will play an increasingly important role because—by separating the man from the weapons platform—they protect him from enemy lethal and non-lethal weapons.

Method of Employment

Some NLW could become an important element in C^2W, particularly PSYOPS to manipulate the perceptions of adversaries, allies and the public; to prevent the misinterpretation of NLW as lethal operations and to prevent adversaries from esca-

lating the level of violence accidentally through misunderstanding. While it is important for the enemy to understand that NLW may be used against him, such knowledge will inevitably mean that operational surprise is sacrificed. However, surprise at the tactical level can still be retained provided the tactical commander is given the authority and responsibility for determining the level of force and lethality to be used in response to a given situation. In making his choice, the commander will have to consider the need to minimize casualties and collateral damage on the one hand with the need to be decisive and persuasive on the other. However, the availability of NLW does not imply that such weapons must be used first, before the use of lethal weapons nor does it negate the right of soldiers to protect themselves or others with lethal force.

As with other weapon systems, NLW are most effective when used in synergy with other NLW or with more lethal systems. The synergistic use of such weapons can also provide simultaneity to overwhelm and confuse the enemy—an important function in the conduct of maneuver warfare. Although NLW can facilitate maneuver and augment and intensify the synergistic effects of combined arms, there is an ever present need to employ countermeasures. Many NLW use off-the-shelf technology, so their use by or proliferation to enemy forces must be expected.

Verification

There is a need for high confidence levels in the effectiveness of NLW when the consequences of their use are not materially visible. Not only is this important in order to assess their effectiveness, but also to counter enemy propaganda. This may require new techniques in Battle Damage Assessment.

FACTORS AND PRINCIPLES GOVERNING NLW USE

There are a number of factors that influence the principles governing the use of NLW. These are:

a. **Political.** The perception that military force can be used with few casualties may make the future use of force more acceptable as an instrument of government policy. It could therefore be argued that force might be used more frequently to resolve disputes and conflicts.

b. **Ecological and military.** Pressures to minimize damage to property and the environment will place emphasis on the need to seek a quick military solution, preferably before mobilization although such pre-emptive action may not be acceptable politically. The use of PSYOPS, EW and systems that degrade the infrastructure and prevent mobilization will play a prominent role in seeking such a solution.

c. **Media.** The ability of the media to influence public opinion emphasizes the importance of a clear media plan relating to the use of NLW.

d. **Legal**

- Current international conventions[3] and treaties could inhibit the use of some NLW. For example, the Chemical Weapons Convention prohibits the use of Riot Control Agents in war, but permits their use in OOTW—including peacekeeping, counterterrorism, and law enforcement. If such weapons are permitted in OOTW, then arguably they should be permitted in regional conflict and war; but clearly caveats would need to be incorporated to limit their use, toxicity and effect.
- Another legal issue that will require careful consideration before NLW are used is the matter of litigation resulting from the physical or psychological effects of their use. Such litigation may take years to surface as the long term effects of many non-lethal systems are unknown.

e. **Ethical.** The development and employment of NLW has an ethical dimension whose consequences must be carefully considered. This will include the definition of acceptability with regard to the extent to which a human

[3] Article 23(e) 1907 Hague Convention IV; Article 1 1972 Convention on Bacteriological and Toxin Weapons; The Chemical Weapons Convention 1993; Environmental Modification Treaty.

being can be "Incapacitated" through the use of NLW and the moral issue that arises from any decision not to use NLW. Clearly the use and effects of NLW must be acceptable nationally, militarily, and individually.

PRINCIPLES

The following principles give guidance for the employment of NLW:

a. NLW can either be used alone, provided they are backed by the political will to deploy and use lethal force, or as an adjunct to lethal weapons. Their use must be controlled by ROE and must not be allowed to jeopardize the right of soldiers to defend themselves with lethal force.
b. The employment of NLW must be consistent with current Treaties, Conventions, international and domestic laws. Their use must also be morally and ethically justifiable.
c. NLW must be used proportionately (the least destructive way of defeating the enemy) and discriminately (the protection of non-combatants from direct intentional attack).
d. NLW must be fully integrated with lethal weapons in order to provide a graduated response based upon the use of minimum force.
e. NLW must not be deployed without consideration to countermeasures, including the hardening and protection of our own systems.

SELECTION OF NON-LETHAL TECHNOLOGIES

The principles that govern the use of NLW give an indication as to which non-lethal technologies have military potential. Criteria that will influence the future development of such technologies will include:

a. **Acceptability.** Non-lethal technologies that contravene current legislation or whose use may be morally or ethically unjustifiable will have little military potential.
b. **Doctrine.** A maneuverist approach to warfighting dictates that future research into non-lethal technologies should be directed towards seeking and disabling or disrupting the enemy's vulnerabilities. These will include his C^3 assets, logistic supplies, his cohesion and will to fight. In OOTW, the use of all (both lethal and non-lethal) weapons will be dictated by the constraints of either domestic law, ethics or mandates. Those non-lethal technologies that permit operations to be conducted within such constraints will have military potential.
c. **Utility.** Unless cheap to procure, NLW will need to be either multi-roled or have utility in more than one specific scenario. Ideally, they should have utility across the spectrum of conflict. Those NLW systems with specific or limited utility are unlikely to have the military potential for further development.
d. **Affordability and technical risk.** Non-lethal technologies that attract low research and development costs or are cheap to procure and support will be more attractive and possibly more, cost-effective than those that carry a high degree of technological risk or are expensive to procure.

INTEROPERABILITY

The future use of force across the spectrum of conflict is likely to be both joint and combined. NLW should therefore be interoperable with those of our major allies and, where appropriate, with those of the other services and government departments.

LOGISTICS AND TRAINING

Logistics. Logistic constraints are difficult to identify until the various non-lethal technologies have been further developed. However, many NLW will require special handling, secure storage facilities and specialist transportation, One key issue must be the nature and size of the power-pack, which may be large and cumbersome. There will therefore need to be a "tradeoff" with more conventional weapons for strategic lift.

Training. Retaining a military capability across the spectrum of conflict imposes a heavy

training load. The acquisition of new weapons whose operation may be different from Conventional lethal weapons will add to this load. However, advances in training systems technology including synthetic environments may increase training efficiency and mitigate the problem. Routine training in the use of NLW must be based on doctrine and be fully integrated into combined arms training. Such training is a prerequisite to the conduct on non-lethal operations.

SUMMARY

Recent conflicts, especially in OOTW, have highlighted the limited capability of military forces to respond to situations with anything other than lethal force. Such a response is often inappropriate.

Non-lethal technologies are being developed that will offer a graduated response in the conduct of operations, across the full spectrum of conflict. The use of weapon systems utilizing such non-lethal technologies will enable some wars to be fought with fewer casualties and less collateral and environmental damage. This will be more acceptable both politically and publicly.

NLW must be fully integrated with more conventional weapon systems and, although they may be used alone or with other similar systems to provide a synergistic effect, they must always be underpinned by lethal force.

NLW provide a greater range of options to commanders at all levels. Their full integration and use as a weapon system will therefore require more detailed planning than had lethal weapons only been available. NLW could become an important additional Component of C^2W; it is therefore essential to integrate NLW within the C^2W cell of the appropriate theater headquarters.

The introduction of many NLW presents a number of legal issues which must be satisfactorily resolved and ethical questions which, at least, will need to be considered, before their use in operations.

The selection of non-lethal technologies that have military potential will be influenced by legal and moral constraints, doctrine, utility, and affordability.

CONCLUSIONS

The Army Policy and Resource Committee (Doctrine) is invited to note the military potential of NLW and accept that:

a. The proposed definition of "Discriminate weapons that are explicitly designed and employed so as to incapacitate[4] personnel or materiel, while minimizing fatalities and undesired damage to property and the environment" is the most suitable.
b. NLW could provide military commanders with an enhanced capability across the spectrum of conflict.
c. NLW should be fully integrated with conventional weapon systems to provide commanders with the flexibility of a graduated response if required.
d. The principles governing the use of NLW provide a sound basis for further work in the development of non-lethal technologies and their associated weapon systems.

[4] To render incapable or unfit. Oxford English Dictionary

The Role of Technology in Peace Operations

14

INTRODUCTION

The variety of possible military operations can be viewed as a continuum. One end of the continuum may be described as peace, characterized by diplomacy, humanitarian assistance, disaster relief, and generally nonviolent forms of military activity. The other end is war. In the middle region between these two antipodes are several categories of limited military operations that are less than war but that require military activity to support or enforce peace.

All points on the continuum are influenced by the quality and availability of information. As a general rule, the "peace" end of the continuum tends to be information-rich, with much shared knowledge regarding the parties' interests, assets, and capabilities. The "war" end of the range tends to be information-poor, requiring extraordinary measures to collect intelligence. It may be inferred that abundant, shared information tends to increase understanding and reduce the level of violence at which disagreements are resolved.

Toward the center of this continuum are military operations falling between war and peace. In peacekeeping, a truce or treaty may be in effect, and the former combatants may agree to permit activities (perhaps conducted by a third party) to reduce suspicions and build confidence. In peace enforcement, one or more of the combatants do not agree to cease hostilities, and a third party endeavors to prevent the warring parties from continuing their violence. Peacekeeping and peace enforcement may differ significantly in the weapons and military systems employed and in the lethality of their operations. Of the two, peace enforce-

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ment presents the most difficulties, both from a policy and a military perspective.

POLICY FRAMEWORK

Overcoming the policy difficulties is as important to a successful outcome as surmounting the military challenges. It is essential that the intervening party or coalition agree on objectives that are realistic with respect to the risks and costs they are willing to accept. All participants should understand and endorse the defined objectives of the operation.

Once those objectives have been established, it will also be necessary to negotiate rules of engagement that will free the military command from micro-management by political representatives. In conformity with those rules of engagement, a unitary command structure should prosecute the objectives in the most expeditious manner possible. Unnecessary levels of bureaucracy in the command structure should be eliminated, following principles similar to the quality management techniques used by industry.

The exercise of establishing objectives, if done properly, may reveal significant problems in both policy and military feasibility. A policy of neutrality may become untenable if significant military loses are incurred. Countermeasures against peace enforcers may be so facile and so potent that effectual peace enforcement becomes unfeasible. Military services treat peace enforcement missions as a form of combat, and combat invariably produces unforeseen problems and losses.

Nevertheless, peace enforcement may, in some cases, be the least undesirable option for an obdurate military/political disagreement that will not yield to diplomacy. For those cases, it is increasingly clear that information technology can be an important tool providing a crucial advantage to the peace enforcers. An information advantage translates into a military advantage in conflicts that tend toward the "war" half of the spectrum and can be decisive if skillfully exploited.

SENSOR SYSTEMS FOR PEACEKEEPING AND PEACE ENFORCEMENT

Data collected through sensor and surveillance systems can help increase the confidence of the parties to an agreement or it can provide operational intelligence for preventing violence. Sensor systems for peacekeeping should enhance confidence that parties to an agreement, such as a truce, are not violating the terms of the agreement. Such confidence reduces speculation and unfounded suspicions and helps stabilize the peace. Tensions are reduced when potential adversaries have adequate information about each other's movements and intentions. Open Skies, satellite reconnaissance, seismic monitoring stations, and cooperative inspection are examples of information-gathering systems that build confidence.

A cooperative monitoring center should continuously collect data relevant to the terms of the truce. Data can be collected by various sensor systems in space, on aircraft, or on the ground. The data should be summarized and displayed in near-real-time to all parties. Open knowledge of potential adversaries' movements, capabilities, and intentions is a key element of successful crisis prevention.

Sensor systems for peace enforcement must be integrated with battle management systems appropriate for the situation. Space and airborne imaging systems, including the new day/night, all-weather synthetic aperture radar systems under development, are valuable for monitoring surface activity. During military operations, detecting and identifying mobile or relocatable assets could be assisted by small, smart, unattended ground sensors and longer-range sensors using technology already available. Long-range, high-resolution imaging radar with automatic target recognition capability could detect mobile targets as well as stationary targets in bad weather, in daylight or at night. Unmanned aerial vehicles and tele-robotic ground vehicles could roam the battlefield and monitor the situation without exposing peacekeepers to hostile action.

Sensors can support both cooperative and noncooperative measures to detect weapon deployments and movements. But the capability to exercise a quick response to an artillery or missile attack by a combatant will require rapid integration with battle systems. It will be necessary to develop standoff methods for precision strike, offering high lethality and low collateral damage. Some prototype hardware and test experience exist.

While many such sensor and strike capabilities are either in hand or on the technical horizon, a daunting problem that will require a major research effort is the conversion of sensor data into useful knowledge. A sizable sensor system will create an ocean of data. The problem is how to distill that ocean into the droplets of vital information that provide real-time, exquisite awareness of the dynamic situation under surveillance.

This distillation will require the extraction of knowledge from the high-bandwidth, high-volume data stream. Data prioritization will be accomplished using pattern recognition principles (to extract features of interest from the data stream) and model-based data fusion techniques. Features identified in the sensor data stream will be compared with feature data stored on the sensor platform, resulting in a prioritized cueing list for the human observer. Data from multiple sensor systems will be fused at the feature level as opposed to the image level. This prioritization and subsequent data rate reduction will result in more efficient use of communications bandwidth and reduce operator overload. Once transmitted back to the observation point, the merged knowledge extracted at the sensor platform can be combined with situation awareness data and contextual information from multiple sources in a human systems interface. The purpose of the human systems interface is to efficiently present data to the observer in a prioritized manner that maximizes human effectiveness.

While sensor data fusion has been demonstrated in discrete and comparatively small applications, the ability to extract knowledge from a system of systems in real-time has not been demonstrated. The ability to demonstrate this will require advances in automatic target recognition systems, including high-performance embedded processors and advanced algorithmic approaches such as neural networks and model-based vision. This technology must be combined into a system that properly cues and synthesizes the represented features into a form that provides knowledge to the observer instead of merged raw data. This task is technically challenging but builds on strengths and technologies currently under development at Sandia National Laboratories and elsewhere in the technical community.

LESS-THAN-LETHAL WEAPONS

Novel, less-than-lethal weapons are beginning to provide new options for peace enforcement operations. Such weapons include foams and sprays, entanglements, electromagnetics, and other applications. They may be effective in stopping civil offenders without killing them, controlling violent crowds or prisoners, gently stopping fleeing cars, and improving response options in hostage situations. Sub-lethal kinetic projectiles include such items as foam rubber bullets, “doughnuts,” bean bags, and soft plastic pellets. Entanglements such as nets and adhesive snares can be lobbed over individuals or groups. Sticky foam can be shot against individuals at a distance of about ten meters and can be very effective in frustrating an attacker.

Novel, non-lethal weapons might also provide ingenious ways for denying use of military hardware. It may be possible to impound military equipment with chemical locks that are reversible only with a unique chemical key. A hardening foam containing a unique organic molecule could be used to temporarily render equipment inoperative. A special solvent containing a complementary catalytic molecule would be the unique key. Chemical tags and markers could be designed in a similar way.

If a combatant uses military hardware in defiance of a cease-fire, credible warheads and delivery systems for novel, anti-hardware weapons could make peace enforcers’ response options

more palatable. Trucks, tanks, artillery, and aircraft could be incapacitated by powerful adhesives. Optics could be permanently disabled with indelible coatings. Frictionless powders could render roads and airstrips unusable. Rubber-eating chemicals could destroy tires, insulation, and hoses. Air-intakes on engines and electronics are vulnerable to invasive particles that can gum-up mechanical systems or short-out electrical wiring. Even common nontoxic substances such as gum resins and sugars can incapacitate equipment if properly applied. If violators could be located quickly using counter-battery radars or fire-burst detectors, and if such novel warheads could be delivered in rapid, precise counter-strikes (for example, with laser-guided rockets), the authority of peace enforcers would be dramatically improved.

Anti-personnel applications of benign, nonlethal weapons would seek to temporarily frustrate combatants' personal combat capacities. A charge of sticky foam shot in a small, soft projectile could render an infantryman incapable of using small arms (or his own arms) until the foam is laboriously removed. Frictionless powders could make soldiers unable to walk, run, stand, or manipulate equipment. Repugnant malodorous paints delivered in sprays (skunk shots) could inhibit military teamwork and effective command. Nontoxic aqueous foams could be used to befuddle combatants' senses and effectiveness. The ordnance and fuzing of such novel projectiles will be a design and development challenge for the near future.

Finally, it will be desirable to develop solvents, antidotes, and disposal techniques for those substances that would pose a continuing threat to civilians after hostilities are over.

MINE CLEARANCE

Detecting and safely removing abandoned anti-personnel mines is a major problem in peace-keeping and post-conflict situations. In several countries, hundreds of civilians continue to be killed or maimed by mines years after hostilities have ended. Abandoned minefields also have a severe economic impact due to lost farmland, roads, and injured livestock.

In a current program involving the United States Army, Sandia National Laboratories, and the University of Florida, the capability of imaging buried mines using backscattered x-rays even with surface clutter has been demonstrated.[1] This detection method could be adapted to civilian de-mining using off-the-shelf technology. Another current project being developed by EG&G employs ground-penetrating radar and metal detectors.[2] This project has demonstrated sensor performance, sensor data fusion, and real-time processing for countermine and combat support applications. These concepts are modular and could be expandable to larger platforms. Lockheed Martin[3] and Lawrence Livermore National Laboratories[4] are doing research on the use of infrared sensors for mine detection.

Shock waves propagating downward from a fuel-air blast can detonate some mines within the radius of the blast. For obvious reasons, this technique is suitable only for wartime conditions. In civilian de-mining, environmental and property considerations necessitate that mines be removed by hand and detonated in a remote area. Remote detonation also removes the possibility of contaminating an area with debris that would make additional mine detection more difficult. Pulsed or continuous water jets could be used to

[1] J.G. Campbell and A.M. Jacobs, *Detection of Buried Land Mines by Compton Backscatter Imaging*, Nuclear Science and Engineering, 110, 417424 (1992); C.M. Burchanowski, R.B. Moler, and S.L. Shope, *Scanned Beam X-ray Source Technology for Photon Backscatter Imaging Technique of Mine Detection: Advanced Technology Research*, Proceedings of SPIE International Symposium on Aerospace/ Defense and Control Dual-Use Photonics, Orlando, Florida, April 1995 (to be published); and J.Wehlburg, S. Keshavmurthy, Y. Watanabe, E. Dugan, and A. Jacobs, *Image Restoration Using Compton Backscatter Imaging for the Detection of Buried Landmines, ibid.*

[2] Phil Johnson, EG&G MSI, Albuquerque Operations, Albuquerque, New Mexico (private communication).

[3] P. Ngan, S. A. Garcia, E.L. Cloud, H.A. Duvoisin III, D.T. Long, and J.K. Hackett, *Development of Automatic Target Recognition for Infrared Sensor-based Close-range Land Mine Detector*, SPIE Proceedings, *op.cit*.

[4] N. Del Grande, *Sensor Fusion Methodology for Remote Detection of Buried Land Mines*, in Proceedings of the 3rd National Symposium on Sensor Fusion (Infrared Information Analysis Center. ERIM August 1990). vol. 1. p. 407.

cut a mine into pieces, rendering it safe.[5] Techniques with potential for nondestructively demining large tracts of land in reasonable periods of time exist, but they will require considerable research and development before this problem is solved.

CONCLUSION

New technologies are rapidly emerging that can help manage or enforce peace and inhibit the deterioration of crises into war. The key to employing these technologies effectively is advanced information technology based on sensor systems, networks, and new software and hardware.

A variety of novel, less-than-lethal weapons can be developed and deployed to provide peacekeepers and peace enforcers with the means to precisely deny the use of war fighting equipment to combatants. This can be accomplished with a minimum of casualties to both aggressors and noncombatants.

An implementation challenge will be training troops to use these new systems in a peacekeeping mode. Peacekeeping operations are a cultural challenge to traditional military operations and thinking. Simulated environments for training may be useful in helping military personnel acquire new operational skills and techniques appropriate for peacekeeping.

Information technology supports the entire peace/war continuum: In peacetime it serves as a mechanism to minimize fear and mistrust; during war it provides an significant military advantage. For those new-world-order situations that fall between peace and war, information technology can be the crucial factor that makes engagement possible at acceptable levels of risk.

[5] Christopher Cherry, Sandia National Laboratories (private communication).

Appendix A: Workshop Agenda A

WORKSHOP ON IMPROVING THE PROSPECTS FOR FUTURE PEACE OPERATIONS: TACTICS, TECHNOLOGY, TRAINING

Workshop was held at the Rockefeller Foundation Study and Conference Center, Bellagio, Italy, June 12–16, 1995.

Chair: M.Gen. John O.B. Sewall, USA (ret.) (National Defense University and Special Advisor to the Secretary of State on Military Issues and Bosnian Federation Affairs—US)

June 13—Tuesday

SESSION I: Traditional Peacekeeping

9–10:30 AM: Panel One—Presentations

Organizational and Planning Requirements: Lessons drawn from past operations

B.Gen. Tryggve Tellefsen (former Commander, UN Preventive Deployment, Macedonia—Norway)

Case Study: The Multilateral Force in the Sinai: Experience with Training and the Uses of Technology

Scott Gudgeon (Deputy Director General MFO—US)

10:45 AM–12 NOON: Roundtable Discussion

Opening Commentary: **Lt. Gen. Satish Nambiar, Indian Army (ret.)** (former Deputy Chief of Army Staff and former Commander UNPROFOR—India)

SESSION II: Extended Peacekeeping

2:30–4:15 PM: Panel Two—Presentations

Planning and Technical Requirements: Lessons from Recent Operations

Mario Zucconi (University of Urbino and Centro Studi di Politica Internazionale, Rome—Italy)

Case Study: United Nations Transitional Authority in Cambodia: Doctrine, Training, Tactics, and the Role of Technology

Lt. Col. Damien Healy (Australian Defence Force, Staff Officer to former Commander, UNTAC—Australia)

4:30–5:30 PM: Roundtable Discussion

Opening Commentary: **Susan Woodward** (Brookings Institution—USA)

9 PM: Keynote Address

The Honorable Dennis McLean (U.S. Institute of Peace, former Ambassador of New Zealand to the U.S.—NZ)

June 14–Wednesday

SESSION III: Peace Enforcement

9–10:45 AM: Panel Three: Presentations

Organizational, Planning, and Technical Requirements: Lessons from Recent Operations

General Sir David Ramsbotham, British Army (ret.) (former Adjutant General, U.K. Army—UK)

Case Study: UNOSOM II: Doctrine, Training, Tactics, Coordination, and the Role of Technology

Adm. Jonathan Howe, USN (ret.) (Special Rep. of UN Secretary General, UNOSOM II—USA)

11 AM–12 NOON: Roundtable Discussion

Opening Commentary: **Virginia Gamba** (UNIDIR—Argentina)

SESSION IV: A Look at the Future

4:15–6:00 PM: Panel Four—Presentations

UNPROFOR and UNTAC: Lessons Learned as to Requirements for Planning, Training, and Equipment

M.Gen. John O.B. Sewall, USA (ret.) (Chair—US)

Tactics, Training, and Potential Roles for Technology: Recent Experience and Indications for the Future

Steve Simon (National Security Council—US)

6:00–7:00 PM: Roundtable Discussion

June 15–Thursday

SESSION V: The Roles of Technology in Peace Operations

9–12 NOON: Panel Five—Presentations

Mine Detection and Clearance—Context

Gilles Courregelongue (Defense Conseil International—France)

Technologies Appropriate for Peace Operations

Milton Finger (Lawrence Livermore National Laboratory—USA)

Less-than-Lethal Weapons

Lt. Col. Alan Roland-Price (Staff Officer, Directorate of Land Warfare, Ministry of Defence—UK)

Technologies Appropriate for Peace Operations

Gerald Yonas (Sandia National Laboratories—USA)

2:30–3:00 PM: Roundtable Discussion

Opening Commentary: **Juergen Altmann** Ruhr-Universitaet, Bochum—Germany)

SESSION VI: Summary

3:30–5:30 PM

Rapporteur Summaries: Potential Roles for Technology in Various Types of Peace Operations

Anthony Fainberg, Alex Gliksman (Office of Technology Assessment—USA)

Appendix B: Advisory Panel B

Richard Ullman
Chairman
Professor
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Steve Aftergood
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Robin Beard
Assistant Secretary General
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William Durch
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Milt Finger
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Patricia Hutzler
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Program Officer
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Defence and Security
North Atlantic Assembly

NOTE: This is the list of Advisory Panelists of the full project on International Peace Operations, of which this workshop background paper is a part. Due to the shutdown of the Office of Technology Assessment on September 30, 1995, and the consequent time restrictions in releasing this background paper, it has not been possible for the text to have been reviewed by the members of this panel. OTA appreciates and is grateful for the valuable assistance and thoughtful critiques provided by the advisory panel members in the course of this truncated project. The panel does not, however, necessarily approve, disapprove, or endorse this report. OTA assumes full responsibility for the report and the accuracy of its contents.

Gen. Sir Jeremy MacKenzie
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North Atlantic Treaty Organization

Alex Morrison
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