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## Monitoring: The constant need

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Monitoring is a basic function of all UN peace operations, past and present, and in some cases it is the primary function. All mission mandates have included observation, monitoring (i.e. observation over time) or verification (i.e. monitoring to determine if parties are living up to agreements). Almost two dozen missions have had these tasks explicit in their mission names.<sup>1</sup> The peace operations created in the twenty-first century have been explicitly tasked by the Security Council to monitor many activities and areas, including:

- arms embargoes and military assistance to illegal armed groups;
- cease-fires and demilitarized zones;
- commercial activities such as illegal mineral exploitation that fuel conflicts;
- disarmament, demobilization and reintegration of ex-combatants;
- elections;
- human rights;
- international/internal borders;
- malicious acts and escalations of armed violence;
- minefields for marking and clearing;
- no-fly zones and flight bans;
- security sector reform (e.g. of armed forces, police, corrections, customs and even intelligence agencies);
- strategic areas (e.g. airports) and persons (threatened VIPs);
- trafficking in illicit materials and human beings;
- UN protected areas such as safe havens or refugee camps;
- vulnerable places (e.g. refugee camps) and groups (e.g. children).

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*Keeping watch: Monitoring, technology and innovation in UN peace operations*, Dorn, United Nations University Press, 2011, ISBN 978-92-808-1198-8

There is plenty of evidence from the field and from academic studies that UN monitoring, however imperfect, helps to promote cooperation among former warring parties, to prevent conflict, to reduce unwarranted fears and worst-case assumptions, and to reduce cheating and rogue/spoiler problems (Lindley 2007).

In addition to mandated monitoring, for its own security every UN operation must maintain constant situational awareness around UN camps and facilities. Missions must also be vigilant about a myriad of threats, including possible risks on the main supply route, on roads travelled and in areas visited by UN personnel. In addition, operations need to learn details about the wider environment such as the intentions and locations of potential spoilers who might seek to disrupt the peace process, the mood of belligerent crowds or mobs, the hideouts and armaments possessed by renegade forces, and much additional information about actual or potential threats, both natural and human-made.

For all these mandated and implied tasks, peacekeeping operations (PKOs) need a wide set of monitoring tools and methods. Technical means can help the United Nations meet these enormous monitoring challenges. But before reviewing specific technologies, an analysis is provided to show the kinds of advanced capabilities required to handle the recurring problems facing PKOs. This chapter also looks at some of the mission structures that are needed to process, analyse and disseminate information, including the Joint Operations Centre and Joint Mission Analysis Centre. Case studies of specific missions are provided later (Chapters 6 and 7). In general, UN missions face at least six pressing needs: protecting UN personnel; protecting civilians; night-time awareness; detecting illegal trafficking; accurate and precise intelligence; analysis of the data.

## Protecting UN personnel: An essential responsibility

The safety and security of UN personnel sent to the field should be foremost in the minds of UN leaders who assume a solemn responsibility for the civilians and military personnel they dispatch to the field. Protection requires accurate threat and risk assessments, early warning of emerging threats and a proactive approach based on wide-ranging information-gathering. Especially in highly volatile areas, where personnel might be exposed to direct or indirect fire, landmines and unexploded ordinance or even ambush, the United Nations needs far more than an occasional “presence” to observe possible threats. It needs a thorough day and night watch over large areas well beyond UN camps, something few missions provide. There are rarely enough personnel to do the job. Moreover,

employing vulnerable human observers presents a serious dilemma for the United Nations.

The reliance on a human presence, particularly from unarmed United Nations Military Observers (UNMOs), gives rise to a “Catch 22” dilemma. When conditions become dangerous or the parties become hostile, current information in conflict areas is most needed and most valuable, requiring close observation. But at such critical times, the observers often have to be withdrawn for their own security, creating an information vacuum. As will be demonstrated, technologies can help resolve this dilemma.

Despite the United Nations’ care and caution, over 2,500 personnel have lost their lives from various causes since the beginning of UN peacekeeping in 1948. Table 3.1 analyses the fatalities listed in the Department of Peacekeeping Operations (DPKO) Casualties Database according to the three types of personnel and the four types of incident causing death. By examining how (and to whom) the fatalities have occurred, it should be possible to explore ways and tools to help avoid them in the future.

The table shows that, over the history of peacekeeping, accidents have accounted for the greatest number of fatalities, followed by malicious acts and illness, with a small percentage of other causes (often undetermined). Military personnel have suffered by far the greatest number of

Table 3.1 Fatalities in UN peace operations

	Incident type				Total	
	Accident	Malicious act	Illness	Other		
Military	848	627	519	115	2,109	(87%)
Police	57	21	65	12	155	(6%)
International civilian	51	30	73	8	162	(7%)
Total	956 (39%)	678 (28%)	657 (27%)	135 (6%)	2,426	(100%)

*Source:* Raw data provided by the United Nations’ Casualties Database (1948–2009).

*Note:* The Casualties Database is maintained by the DPKO Situation Centre, which provided these data to me by email from Q. Wilson on 21 June 2010. The Situation Centre notes that “prior to 2006, the requirement and procedures for recording civilian fatalities were lacking, and, therefore there is a risk that for years prior to 2006 not all civilian fatalities, particularly local fatalities, were recorded” (email to me, 30 January 2006). Because of this, fatalities of local UN staff are not included in the table. For the record, the data on fatalities of local staff (1948–2009) are: 52 by accident, 47 by malicious act, 124 by illness and 18 other, for a total of 241 deaths, which is 9 per cent of the total. Including locals, the total number of fatalities in peacekeeping up to 31 December 2009 was 2,682.

fatalities (87 per cent), though only 3 per cent of these fatalities were military observers. Since the number of military personnel serving in peacekeeping is many times that of civilian personnel,<sup>2</sup> a better indicator of risk is the number of fatalities per 1,000 personnel serving. For 2005, they are: 1.51 for uniformed personnel (i.e. military and police) and 2.92 for international civilians. This indicates, surprisingly, that an international civilian is almost twice as likely to die in a UN mission as a uniformed person, probably because the latter are generally younger and better trained and protected in danger zones.<sup>3</sup> In addition, the data show that a much higher percentage of the civilians die of illness, probably because they are older and less fit than the soldiers.

The United Nations can take many measures to mitigate fatalities in each category. In particular, monitoring technologies can be deployed for prevention, protection and rescue. A sample list of applicable technologies would include:

- *for accidents*: vehicle management and tracking systems (a proven example is “Carlog”, described later); night-vision equipment for driving on unlit roads; better weather-forecasting using radars and satellite imagery;
- *for malicious acts*: better threat assessments using surveillance systems for detection, including: the presence of mines, recent military/militia activity, arms smuggling, the possibility of ambushes and many other indicators of potential violence; artillery-tracking radar for incoming fire; access control/identification technologies for UN buildings and camps; convoy trackers and positioning devices (based on Global Positioning Systems, or GPS) and, in the case of robust engagements, “identify friend from foe” technology;
- *for illness*: many medical monitoring technologies for diagnosis and prognosis (not covered in this study).<sup>4</sup>

By extending the range of observation and awareness, technologies can allow observers to avoid hazards while still keeping tabs on the conflict. Remote sensors can serve as the eyes and ears of the United Nations in danger zones. Devices on the ground and in the air can capture details of the conflict for remote viewing by distant observers.

## Protecting civilians: Vigilance required

After some terrible experiences during the 1990s, when massacres occurred in plain view of helpless peacekeepers, the Security Council included the protection of civilians in the mandates of new PKOs in the twenty-first century.<sup>5</sup> In addition to such explicit responsibility, many peacekeepers feel it is their moral as well as their legal duty to protect

the vulnerable within their areas of operation. Some countries also include this in their national Rules of Engagement (ROE) prior to deployments. Furthermore, the “Responsibility to Protect” doctrine has been adopted at the UN summit level, although it is only slowly being operationalized.<sup>6</sup>

To achieve civilian protection in conflict zones, accurate early warning of attack is essential. Before sending rapid response forces to prevent or mitigate tragedy, timely information/intelligence is needed. As the United Nations readily admits, too often it has found itself in the dark about spoiler intrigue, arms and militia movements and a host of other dangerous activities. Then it can only react to tragedies after they have occurred rather than work to prevent them in the first place (UN Secretary-General 1999). UN investigations are usually conducted after violations have been committed, when the results of atrocities are plain to see. Even then, it may be difficult to locate hidden graves, determine the sequence of events and identify the individual perpetrators.

Technologies not only are useful for post-violence forensic analysis but can increase awareness for conflict prevention, for instance by monitoring both distant and proximal threats to protected areas and people. Aerial reconnaissance can help detect movements of armed bands towards vulnerable civilian population centres, such as refugee camps or urban communities. Closed-circuit television and motion sensors can alert security forces to intruders in the offices/residences of protected persons (e.g. VIPs) and provide a record of the events if violence does occur. Although no panacea, this technology can be useful for preventive deployments and rapid response.

A bolder proposal is to place video cameras in the hands of the local population to help identify and deter perpetrators. This, however, raises a moral dilemma. Although the ability to record violent activities may serve as a deterrent, camera-holders may also be seen as a threat to belligerents, exposing them to risks of retaliation. The merits of observation equipment in local hands must be assessed in each case. For protection, cameras can be equipped with telephoto lenses for distant viewing, ruggedized for robust handling and miniaturized for discreet photography, as the situation may warrant. Distant or hidden cameras would be out of reach of the perpetrators. Pictures, even taken with cell phones, could constitute important evidence in national or international courts.

Not least, “crowdsourcing” (discussed below) can be an indispensable means to assist the protection of civilians. Through the use of phone and computer messaging, the affected population can provide a timely picture of what is going on, though the reports will need to be corroborated by UN staff with information gained near the scene of the fighting.

## Night-time awareness: Coming out of the dark

The Athenians now fell into great disorder and perplexity . . . in a night engagement (and this was the only one that occurred between great armies during the war) how could any one know anything for certain?

Thucydides, *History of the Peloponnesian War*, 431 BCE (1972 edn)

Throughout history, violent and nefarious activities have been carried out under the cover of darkness rather than in the revealing light of day.<sup>7</sup> Thus the United Nations must try to detect and deter such nocturnal actions and preparations. If fighters operate at night, then so must peacekeepers. But traditionally peacekeeping has been a “daytime job”. With the exception of night guards, scheduled peacekeeping activities are done almost entirely during daylight. Even now, UNMOs typically finish their work at the end of the day, usually 1700 or 1800 hrs, returning to their base or dwelling as the sun sets. This is not only because of the dangers that might lurk in the dark and attack patrols but also because there is little that can be seen at night with the unaided eye. This leaves the United Nations blinded for about 10 out of 24 hours, giving the forces of violence free rein for many hours each day.

To surmount the “darkness barrier” and claim the night back from the forces of violence, the United Nations must make night operations routine. This is possible thanks to the advancement of night-vision equipment, allowing troops to follow terrain on foot or drive vehicles at night while being on the lookout for threats.

In 2006, the Eastern Division of MONUC – United Nations Mission in the Democratic Republic of the Congo (DRC) – instigated the pioneering practice of establishing mobile operating bases in faraway locations for four to seven days a week. The soldiers were equipped with some night-vision goggles to allow them to patrol the jungle at night. These “night flash” operations cooperated with local “village vigilance committees” that reportedly banged pots and pans in order to sound the alarm. The UN forces, with 50–70 soldiers in a group, used their night-vision equipment to help locate and confront intruders and attackers. For large-scale combat operations, in November 2006 MONUC authorized the night-time deployment of Mi-25/35 attack helicopters, which are equipped with advanced thermal imagers as well as image intensifiers to allow pilots to engage their targets at night. A detailed description is provided in the case study in Chapter 7.

Other technologies to extend monitoring at night include ground surveillance radars and acoustic/seismic sensors. These can alert peacekeepers to potential threats such as intruders into UN demilitarized or

protected areas. Once peacekeepers became accustomed to operating with night-vision equipment, they ask not to patrol at night without them. Night vision can also help overcome the limitations on night flying by providing pilots with extra vision for manoeuvring, landing on unfamiliar terrain and detecting nearby threats on the ground or in the air, especially weapon-carrying forces.

### Monitoring arms embargoes: Detecting illegal trafficking

Widespread weaponry in conflict areas is the bane of peacekeepers. Conflicting parties seek to gain advantage with more and better armaments. Arms races, even on a rudimentary level, can result in massive stockpiles and great tragedies. Small arms (weapons carried and used by individuals), in particular, have caused widespread death and destruction. They have made modern conflicts more combustible and crime more extensive, feeding cultures of retribution and downward spirals of violence.

For these reasons it is imperative to somehow deal with the weapons that fuel the fires of violence. However, reducing or prohibiting weapons imports is enormously difficult in war-torn areas because borders are typically porous and there is high demand, including for personal protection. The Security Council often mandates arms embargoes in conflict areas, and frequently asks PKOs to monitor and implement the embargoes. Furthermore, it tasks PKOs with disarmament programmes to reduce weaponry in the overall population.

Disarming unwilling parties is one of the most difficult challenges in peacekeeping operations. Some missions have even refused to do this job for fear of retaliation. This reluctance is understandable. Before confronting smugglers and militia forces, it is important to know what kind of weaponry they possess and to pinpoint the arms routes. In this deadly “cat and mouse” game, the United Nations is at a great disadvantage if it possesses observation technology that is inferior to that of the smugglers who seek to evade detection. In fact, many arms smugglers are better equipped (e.g. with night-vision equipment) than the peacekeepers, allowing them to outmanoeuvre the United Nations at almost every turn. A UN Group of Experts investigating the weapons embargo on militias in the Eastern Congo assessed MONUC’s capacity. It concluded that, in order to achieve its mandate, the mission “needs to be provided with the appropriate lake patrol and air-surveillance capabilities, including appropriate nocturnal, satellite, radar and photographic assets” (UN Security Council 2004).<sup>8</sup> This case is described in Chapter 7.

Peacekeepers must often search for weapons moving across national borders or within nations, a very difficult challenge since the weapons are usually hidden, stowed or stored until needed. The discovery of arma-

ments is facilitated by metal detectors and ground-penetrating radar to find buried arms caches. X-ray machines can detect weapons smuggled through luggage. At vehicle checkpoints, mirrors and video cameras can be used to look for explosives under cars. Although X-ray machines exist to scan entire vehicles, including tractor-trailers and sea containers, this equipment would be too expensive and require too much infrastructure for most UN missions. However, walkthrough X-ray machines are already used in some UN missions, as are metal detectors of the walk-through and wand variety.

To detect smugglers transiting over bodies of water such as the Great Lakes on the eastern border of the DRC, it is not sufficient to observe simply with the human eye. In order to maintain a wide-area watch, maritime radars are required while sending fast patrol boats to inspect or board suspicious boats. To catch weapons imported by aircraft, the United Nations must maintain surveillance over the airspace and determine where illegal flights are landing before initiating interdictions. Surveillance *of* the air and *from* the air are both needed.

### Robust operations: Accurate and precise intelligence required

As the United Nations has learned from its well-publicized failures, PKOs need the capacity to apply force, as a last resort, to maintain the peace. This means being able to move up the force spectrum against recalcitrant groups that have spurned previous offers of settlement, rehabilitation and reintegration, etc. Often such “Chapter VII” action entails combat under the force’s ROE and in conformity with the Security Council mandate. Armed engagements should be as precise as possible, targeting only the spoilers without collateral (civilian) damage.

Before engaging in direct confrontation and combat, peacekeepers need a solid command of the information sphere in the area of operations. Such situational awareness necessitates precise information about locations, unit structures and weaponry (“order of battle” in traditional military doctrine), plus more complex factors such as the level of support among the local population for the United Nations and for the “hostiles”, the parties’ intent and ability to use human shields, and the intelligence capacities of the hard-line elements. Unfortunately, overstretched PKOs often lack such intelligence.

When spoilers see that the United Nations is aware of their actions and has the means to uncover their preparations before they strike, they will think twice about challenging the peace process. These notions of robust observation and action are being put to the test in places such as the DRC (see Chapter 7).

When operating in a war zone and engaging in combat, the technologies needed include: imagers to distinguish between civilians and armed combatants (who might use human shields); night-vision devices for camp protection and night operations; weapons detectors; and devices to “identify friend from foe” to avoid shooting friendly forces. In the attack helicopters used in the DRC, UN pilots have the possibility of “seeing” their targets before “engaging” (firing on) them, including at night. But only a few of the United Nations’ military aircraft are permitted to fly at night.

### Analysis: Thinking through the data

Ensure that sufficient information about the situation at hand is obtained and that it is analysed adequately so that it provides policymakers with an incisive and valid diagnosis of the problem.

Alexander George (1980: 10)

Thanks to advances in the field of information technology, the amount of information currently at the fingertips of UN analysts and decision-makers is orders of magnitude greater than before the dawn of the information age. However, the basic intelligence process has remained the same. “Raw” information from the field needs to be gathered, collated, synthesized, analysed and disseminated from a variety of human and technical sources. Unfortunately, in today’s peace operations, experts on intelligence and technical monitoring are few and far between, including operators of the devices and interpreters/compiler of the data.

With the encouragement of the United Nations Special Committee on Peacekeeping, DPKO took a major step in 2005–2006 by developing structures for information-gathering and analysis. Joint Operations Centres (JOC) and Joint Mission Analysis Centres (JMAC) are now required components of all PKOs (DPKO 2006a). The JOC/JMAC structures present an opportunity to include experts in the analysis of outputs from monitoring technologies.

Under the current Concept of Operations, the JOC deals with current- and near-term information whereas the JMAC looks to the medium and long term. (It might be useful to shift the focus for the JOC to current operations, and for the JMAC to deal with analysis, as the names indicate, regardless of the time horizon.) In any case, technical information is useful for both. Since the JOC is designed to operate 24/7 for mission-wide situational awareness and for support of current operations, it especially needs (near) real-time information from in-field observation assets. It

also needs to know how to rapidly redeploy these assets to meet any immediate information gaps. JMAC also needs this information but not on such a short time-scale.

In developing and implementing JOC and JMAC procedures in various missions, it is important for the United Nations to identify the technologies that could help meet the various Mission Information Requirements, Priority Information Requirements and urgent Requests for Information. It would also be useful to identify optimal “checkpoints and choke points”. These are places where technical monitoring would have the most significant impact, for example in increasing security and/or suppressing illegal/violent activities. It should be possible for intelligence officers to direct information-gathering operations and foster intelligence-led peacekeeping.

JOC and JMAC units require specialized skill sets, including those relating to technology:

- geographic information systems and GPS reference systems;
- digital video processing, editing and networking;
- basic interpretation of feeds from various sensors;
- relational databases and cross-referencing;
- quantitative and statistical analysis, graphing and charting using standard and advanced software;
- specialized search engines beyond those already widely used for Internet searches;
- encryption tools (e.g. private and public key) and data authentication (e.g. watermarked images).

The professional members of the JOC and JMAC need to understand the strengths and weaknesses of the various monitoring technologies and sensor systems. Missions also need personnel with specialized expertise in order to:

- identify the specifications for equipment purchases;
- optimize technical monitoring devices;
- deal with telecommunications and bandwidth challenges;
- use artificial intelligence for digital analysis, pattern recognition, change detection and automation software related to the monitoring technology;
- identify artefacts in imagery and other technological products;
- conduct image analyses (formerly called photo-analysis), for example to “read” output from radar products and infrared imagers and to recognize the signatures of various armaments and vehicles;
- other specialized skills (e.g. forensic investigations, crater analysis).

JOC and JMAC personnel need to create “information synergy” from different sources and methods, especially technical information that can

confirm or deny human sources. In addition, day and night observations can complement each other. Useful JOC/JMAC analytical products would help mission planning, execution and security risk assessment. The two organizations are mandated to support *informed* decision-making at all stages. Because various monitoring assets are deployed, an “information hub” is needed to put “the right information into the right hands”. One benefit of technology is the ability to share the “data feed” or data segments from sensors with multiple UN sections. For example, feeding real-time video imagery to a range of computers allows multiple inputs into the analysis.

An important “information product” is the “Threat and Risk Assessment” (TRA). Its preparation involves, among other tasks, the compilation of risk factors and early warning indicators, and developments to be monitored by technical and non-technical means. Optionally, the TRA can include potential UN responses (“courses of action”) and suggestions for prevention and mitigation strategies, including operational plans. From TRAs, analysts in JOC/JMAC, together with personnel from the UN Department of Safety and Security, can determine the security levels (e.g. using the current alert levels I–V) and recommend the appropriate security postures to protect UN staff and property.

Both information-gatherers and analysts need to be aware of moral and legal limits on technical information-gathering. Issues of privacy and political sensitivities, along with practical difficulties associated with technical monitoring, will be discussed in Chapter 9.<sup>9</sup> During a crisis, such as one involving hostages or combat, it may be acceptable to increase the means of detection to include new devices such as signal (cell phone) interception, though ordinarily this should be used with caution and sensitivity to the parties concerned. At all times, a proper balance must be achieved between privacy and military necessity.

The dissemination of information/intelligence products in order to influence decision-making is a traditional challenge for analysts. To draw attention to their assessments, they have used prioritized reports (e.g. flash reports) to complement routine ones. Information technology has, of course, made sending the results to decision-makers and other users/clients much easier, but there is a frequent problem of “information overload and under-use”. With so much information arriving electronically, it can be difficult to separate valuable, timely information from the trivial, a difficulty also known as the “signal to noise problem”. Search engines, file-finding tools and databasing help ease this difficulty by making it easier to locate, flag, highlight and prioritize desired information. But the challenge remains for analysts to provide the right level of detail in timely analysis for busy decision-makers.

## Notes

1. For example, the United Nations Disengagement Observer Force (UNDOF), the United Nations Observer Mission in Georgia (UNOMIG), and the United Nations Angola Verification Mission (UNAVEM I, II and III).
2. In recent years, the number of civilians (local, international and UN volunteers) serving in peacekeeping has risen to about 20 per cent of the number of uniformed personnel (military and police).
3. A much more detailed statistical analysis (with charts) of UN peacekeeping fatalities is available upon request.
4. For basic information on medical technologies, see DPKO (1999).
5. The Security Council's first resolution on the protection of civilians in armed conflict (Resolution 1265 of 17 September 1999) stressed the importance of including "special protection" provisions in the mandates of PKOs.
6. The Responsibility to Protect (or R2P for short) was expounded in the document *The Responsibility to Protect: Report of the International Commission on Intervention and State Sovereignty* (ICISS 2001). The principle was endorsed in the *2005 World Summit Outcome Document* (United Nations 2005). The United Nations has incorporated protection of civilians (POC) language into many of its mission ROE, including on the use of deadly force. Further, an "operational concept on POC" and an outline of POC strategies was drafted in 2010.
7. Some 41 per cent of UN PKO fatalities have occurred at night, even though there are far fewer UN activities carried out at night than during the day. I derived this statistic from fatality data collected by the DPKO Situation Centre. The night-time statistic includes only those fatalities for which the time of the incident has been recorded.
8. The report was summarized for the press in a press release of 27 July 2004, available at <<http://www.un.org/News/Press/docs/2004/sc8156.doc.htm>> (accessed 6 January 2011).
9. Two relevant publications of mine are Dorn (1999) and Dorn (2005).