
ARTICLE

Electronic Eyes on the Green Line: Surveillance by the United Nations Peacekeeping Force in Cyprus

A. WALTER DORN*

ABSTRACT The 1974 Cypriot War divided the island of Cyprus into two parts with a narrow demilitarized zone (DMZ) between the opposing Greek Cypriot and Turkish forces. The volatility and violence in this zone, called the ‘Green Line’, necessitated a constant UN peacekeeping presence that was achieved mainly with manned observation posts (OPs). About 150 of these posts were established by 1975 to maintain stability and prevent flare-ups, including any lethal exchanges between the two sides. By the early 1990s, many of the countries contributing peacekeepers to the United Nations Peacekeeping Force in Cyprus (UNFICYP) had become tired of the stalemate and the lack of progress in negotiations (peacemaking), so they withdrew their troops from the force. This necessitated a reduction in the number of constantly manned OPs from 51 in 1992 to 21 in mid-1993. Further downsizing of UNFICYP by the UN Security Council in 2004 gave rise to a new approach to monitor the DMZ and produce actionable intelligence. Cameras were installed in hot-spots in the Nicosia DMZ and more responsive patrols were introduced as part of the new ‘concentration with mobility’ concept. This was the first time a UN peace operation used unattended cameras to monitor a demilitarized zone. This article examines the UN’s difficulties and successes using the remote cameras, especially during important incidents. Other technologies that aided UNFICYP are also reviewed for lessons that might assist an under-equipped United Nations in its watchkeeping function.

Introduction

The United Nations Peacekeeping Force in Cyprus (UNFICYP) is the oldest UN peacekeeping force still in operation.¹ This longevity is one indication that the mission has become a ‘victim of its own success’: the peacekeeping

*Email: dorn@rmc.ca

¹The United Nations has only two longer-running peacekeeping *missions* than UNFICYP: UNTSO in Palestine and UNMOGIP in Kashmir. These, however, are observer missions, not peacekeeping *forces* with armed troops.

has been highly effective in creating stability but no viable political solution has been found. After a near success in achieving a negotiated settlement in 2004, the United Nations sought to send a strong signal to the parties that UNFICYP was not a permanent fixture. The Security Council reduced the size of the force by one-third, forcing the mission to find an innovative technological solution to monitor some troubled areas; it replaced manned observation posts with unmanned surveillance cameras. In so doing, it became the first UN peacekeeping operation to use 24-hour camera surveillance to monitor a conflict zone.

In this and other ways, the historical evolution of UNFICYP's monitoring function from its early days to the present offers a rich case study providing lessons applicable to other UN operations. It is ironic that one of the UN's oldest missions has developed some of the UN's most creative and technologically advanced solutions to common peacekeeping problems. Given the dearth of scholarship on technology as a means of intelligence-gathering in peacekeeping, this case study provides a useful validation that can be applied to other modern missions.²

Background

UNFICYP was created on 4 March 1964 to quell fighting between Greek and Turkish communities in areas across Cyprus.³ Some of the most intense fighting occurred in the capital, Nicosia. To facilitate a ceasefire, a British general drew a line on a Nicosia map with a green marker and thus the term 'Green Line' came to designate the area that separated the opposing forces, called OPFORs. The UN force soon restored stability, though violent flare-ups occurred sporadically. By May 1974 a confident UNFICYP was able to reduce its size from the original 1964 strength of 6400 to 2300 personnel.⁴ This glimmer of hope, however, was short-lived. In July 1974 a sudden coup d'état by Greek Cypriot National Guard (NG) forces advocating *enosis*, or union of Cyprus with Greece, triggered an invasion from Turkey in support of the Turkish minority. In New York, UN headquarters was at a loss and could give the UNFICYP Commander, Lieutenant-General Prem Chand, little direction other than to 'play it by ear and do his best to limit violence and protect civilians'.⁵ UNFICYP performed this duty heroically by many accounts, limiting the

²An overview of technologies in peace operations is provided in A. Walter Dorn, *Keeping Watch: Monitoring, Technology and Innovation in UN Peace Operations* (Tokyo: United Nations University Press 2011).

³UNFICYP was created by Security Council Resolution 186 (1964).

⁴The first figure is for June 1964 and is from 'Report by the Secretary-General to the Security Council on the United Nations Operation in Cyprus, for the Period 26 April to 8 June 1964', UN Doc. S/5764, 15 June 1964, p.2. The second figure is for May 1974 and is from 'Report of the Secretary-General on the United Nations Operation in Cyprus', UN Doc. S/11294, 22 May 1974, p.4.

⁵Brian Urquhart, *A Life in Peace and War* (New York: Harper and Row 1987) p.256.

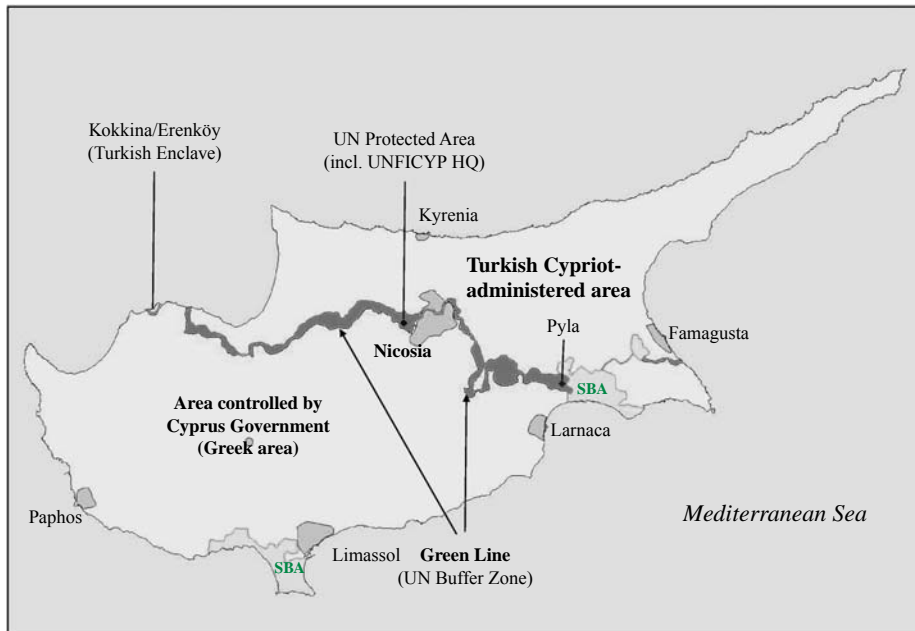


Figure 1. Map of Cyprus Showing the Green Line between the Two Parties.

Note: SBA is a Sovereign Base Area of the United Kingdom.

ravages of war and saving many lives,⁶ but not without sustaining casualties – 74 UN soldiers were shot during and shortly after the 1974 war, of which nine were killed and 65 wounded.⁷ When the smoke of the 1974 Cypriot War finally cleared, Cyprus was a divided island with Turkey controlling the northern third and the Greeks controlling the southern two-thirds, as shown in Figure 1. The British still hung on to their Sovereign Base Areas (SBA) while Nicosia, which had been split between the two protagonists in 1964, became effectively partitioned by higher walls and impenetrable bunkers seemingly frozen in time. To date Nicosia remains the only divided capital in the world.⁸

⁶For accounts of UNFICYP during the war, see Francis Henn, *A Business of Some Heat: The United Nations Force in Cyprus Before and During the 1974 Turkish Invasion* (London: Pen and Sword Books 2005); and Brigadier General Clay Beattie, *The Bulletproof Flag: Canadian Peacekeeping Forces and the War in Cyprus: How a Small UN Force Changed the Concept of Peacekeeping Forever* (Ottawa: Optimum Publishing International 2007).

⁷'Report of the Secretary-General on the United Nations Operation in Cyprus', UN Doc. S/11568, 6 December 1974, p.11.

⁸The divided city of Jerusalem is considered by the state of Israel as the national capital and has also been declared the future capital of a Palestinian state but it is not the capital for the two governments at present.

The Evolving Monitoring Function

The 1974 war significantly altered UNFICYP's monitoring function. For the previous decade Cyprus had been divided into seven large regions each patrolled by a UN contingent, focusing on areas where Greek and Turkish communities clashed. The 1974 war extended the 'green' or dividing line across the entire length of Cyprus from east to west. Along this 180 km line two heavily-armed opposing forces (OPFORs) faced each other, separated by a buffer zone (BZ) that ranged in width from 7 km in rural areas to a few metres at points in Nicosia. Constant monitoring of this BZ and the forward positions, called ceasefire lines (CFLs), of both the Greek and Turkish forces, helped prevent moves forward by either side. UN patrolling played an important role, as before the war, though now it was focused entirely on the Green Line across the island, as opposed to the dispersed communities. The war had triggered a massive population redistribution. UNFICYP estimates that 165,000 Greek Cypriots fled the newly created northern Turkish sector for the southern Greek-controlled territory and 45,000 Turkish Cypriots left the southern Greek sector for the Turkish north.⁹ Cyprus became an island divided not only by the Green Line but also by geographic ethnicity. The south of the island became almost entirely Greek and the north predominantly Turkish. The BZ that separated the opposing forces became UNFICYP's responsibility. Moreover, volatility in the BZ required UNFICYP not only to patrol vigorously but also to erect and permanently man a long string of observation posts to affect constant surveillance.

Observation posts (OPs) proliferated after the 1974 war and played a crucial role in UNFICYP's monitoring function along the Green Line. Though the war ended without an official ceasefire agreement between the parties, UNFICYP delineated the forward positions of the OPFORs upon the cessation of hostilities. Maintaining these ceasefire lines, as they came to be called, became a crucial UNFICYP function. This involved detecting and if possible preventing moves forward by either side. Any such moves were regarded as violations of the ceasefire 'arrangement'. Constant surveillance of the BZ using OPs and patrols was essential to deter, detect, and respond to such infractions.

OPs performed another crucial function besides constant surveillance: they enhanced stability. Especially during the aftermath of the 1974 war, there were many areas along the Green Line where shouting, rock throwing, and shooting incidents occurred frequently between the OPFORs. To have several 'shot reports' a day in the Canadian area of responsibility (Sector 3, which included Nicosia) was not uncommon.¹⁰ Areas of such sensitivity required a constant 'blue beret presence' to prevent escalation from shouting to shooting.

⁹'Internal Displacement Monitoring Centre' <<http://www.internal-displacement.org>>. According to the website, the United Nations Commission for Refugees gives slightly higher figures of 200,000 and 65,000 for the number of Greek and Turkish Cypriot refugees.

¹⁰Based upon the personal experience of one of the author's research assistants as a platoon commander with UNFICYP in 1976, about a year and a half after the war.

Even with the presence of a UN OP, however, it was not uncommon for the posted UN soldiers to be unable to contain a difficult situation. They would then call a UN patrol to the area to help restore stability. The constant monitoring and pacification carried out by permanently manned OPs all along the Green Line became indispensable. By June 1975, UNFICYP had 148 OPs¹¹ and the OP tradition became a dominant aspect of the force's *modus operandi*.

While this style of peacekeeping proved successful, the peacemaking – or negotiation of a settlement – was painstakingly slow and a political solution remained elusive. The parties did agree in 1977 that a settlement would take the form of a bizonal, bicomunal federal state, but then made little progress towards achieving it. The ceasefire in Cyprus did not turn into a formal peace and by the early 1990s several countries, including the major troop contributor Canada, announced they would withdraw or significantly reduce their contributions to UNFICYP. This prompted the Secretary-General to warn that UNFICYP would cease to be viable by June 1993 without new contributors.¹² The strength of the force's military component fell from 2040 in November 1992 to below 1000 in mid-June 1993¹³ and the Force Commander had to implement an emergency contingency plan that was to have a significant impact on the future of UN monitoring in Cyprus.

On 1 December 1992, UNFICYP's military component consisted of 2040 troops manning 151 OPs of which 51 were permanently (i.e. constantly) manned.¹⁴ Six months later, only 37 were permanently manned.¹⁵ By mid-June 1993, the strength of UNFICYP dipped to below 1000 and the number of permanently manned OPs was again reduced, leaving only 21 OPs permanently manned.¹⁶ Even after the force level was increased thanks to Argentina's offer of a line battalion of 375 troops, raising the strength of UNFICYP to 1168 personnel by November 1993, the OP manning levels were not increased to their previous levels.¹⁷ This is because UNFICYP learned from the force reduction experience imposed on it in 1993 that it did not need to constantly man so many OPs to maintain stability. Instead, UNFICYP began to place greater emphasis on patrolling as a means of

¹¹'Report of the Secretary-General on the United Nations Operation in Cyprus', UN Doc. S/11717, 9 June 1975, p.6.

¹²'Report of the Secretary-General on the United Nations Operation in Cyprus', UN Doc. S/25492, 30 March 1993, p.2.

¹³Ibid.

¹⁴'Report of the Secretary-General on the United Nations Operation in Cyprus', UN Doc. S/24917, 1 December 1992. The troop figure is on p.3; OP figures are on p.5.

¹⁵'Report of the Secretary-General on the United Nations Operation in Cyprus', UN Doc. S/25912, 9 June 1993, p.4. The number of OPs provided is for 31 May 1993.

¹⁶Only 21 OPs remained permanently manned, another three were manned during daylight hours only, and another 19 periodically. All of the above were used for overnight accommodation of UNFICYP military personnel. Finally, the remaining 108 OPs were manned less periodically than the preceding. 'Report of the Secretary-General on the United Nations Operation in Cyprus', UN Doc. S/26777, 22 November 1993, p.4.

¹⁷Ibid., p.7. The Security Council changed the financing of the force, which precipitated Argentina's offer.

monitoring, as well as on accommodating military personnel in the BZ. The more stable military situation in Cyprus allowed this operational transition to fewer constantly manned OPs. The valuable lesson that the mission learned in 1993 on ways to substitute for permanently manned OPs would be considered and applied yet again over a decade later.

A New Approach to Monitoring

In November 2002, Secretary-General Kofi Annan presented the parties with a *Comprehensive Settlement of the Cyprus Problem*, or the Annan Plan, and by early 2004 the aspirations of both sides for acceptance into the European Union created a new incentive for agreement. After several modifications, the fifth version of the Annan Plan was presented to both the Greek and Turkish Cypriot populations in referenda in April 2004. The Turkish Cypriots accepted it by a margin of almost two to one but the Greek Cypriots rejected it three to one.¹⁸

After the Greek Cypriot rejection of the plan Secretary-General Annan initiated a review of peacekeeping in the country. Based on the findings of the review team, he recommended a significant reduction in the military component of UNFICYP from 1224 to 860 personnel. He observed that the security situation on the island had become ‘increasingly benign over the past few years’ and that a recurrence of fighting was ‘increasingly unlikely’.¹⁹ An adjustment in the force’s entire approach to monitoring, observation, and surveillance was envisaged in the Secretary-General’s Report of 24 September 2004:

In the early years of the mission [post-1974] the force surveillance plan was based upon static observation posts. As the situation settled, more mobile surveillance was conducted . . . A further shift in emphasis from *static to mobile surveillance* would be appropriate at this stage, resulting in savings in personnel and resources. Better use of *technology* could also improve the Force’s effectiveness, including closed circuit television and improvement in information technology. Additional helicopter hours would also be required.²⁰

This new concept of operations, termed ‘concentration with mobility’, was opposed by the Greek Cypriot government, which argued that the military situation had not changed and that UNFICYP was already thinly spread on

¹⁸There was much bitterness over this outcome, especially since the Greek Cypriot President, Tassos Papadopoulos, had campaigned against acceptance. His government had not even allowed some key supporters of the plan to appear on the national television station. See James Ker-Lindsay, *EU Accession and UN Peacemaking in Cyprus* (Basingstoke: Palgrave/Macmillan 2005) p.118; and James Ker-Lindsay, ‘The UN Force in Cyprus’, After the 2004 Reunification Referendum’, *International Peacekeeping* 13/3 (September 2006) p.412.

¹⁹‘Report of the Secretary-General on the United Nations Operation in Cyprus’, UN Doc. S/2004/756, 24 September 2004, p.6.

²⁰*Ibid.*, p.7. Emphasis added.

the ground.²¹ Nevertheless, the Security Council, by its Resolution 1568 of 22 October 2004, accepted the Secretary-General's recommendations and the Force level was reduced by 30 per cent by February 2005.

The downsizing of UNFICYP in early 2005 posed a significant operational challenge. The 180 km Green Line still had to be monitored effectively. The mission did not want to be blamed for a flare up of violence. The Force Commander, Maj. Gen. Herbert Figoli of Uruguay, enunciated the following plan to execute the downsizing, which he entitled the 'UNFICYP 860 Concept of Operations' ('Force 860'):

I intend to place less reliance on static observation posts and to shift our emphasis to more mobile surveillance. Increased patrolling on the ground and in the air, combined with *greater use of technology such as closed circuit television*, will enhance the monitoring activity of the force. Patrol programs will be more efficiently directed to areas where presence is needed, rather than routine patrolling everywhere. I am prepared to accept some risk in quiet areas ... Sectors must be prepared to increase the intensity of patrolling where and when it is needed and I shall augment that effort with MFR [Mobile Force Reserve] patrols when required. The force will concentrate in fewer camps and patrol bases, centralizing manpower.²²

The transition to a smaller force proved smooth and successful, thanks to the creativity of the leaders and the professionalism of the peacekeepers that executed it.²³ Under the new concept, the average number of daily patrols rose from about 50 to 200 between February and April 2005.²⁴ The number of permanently manned OPs was reduced from 17 to merely two.²⁵ Patrol bases were reduced from 21 to nine and UN camps decreased from 12 to four.²⁶

The above-mentioned 2005 elimination of 15 permanent OPs, 12 patrol bases, and eight camps produced substantial savings in personnel and resources, while increasing the number of personnel available for duty in operations centres and rapid reaction forces. Nevertheless, effective and constant surveillance had to be maintained, especially in the most sensitive areas, and surveillance cameras became the preferred solution.

²¹Ker-Lindsay, 'The UN Force in Cyprus', p.413.

²²Maj. Gen. H. Figoli, UNFICYP Force Commander, UNFICYP Memorandum entitled 'UNFICYP 860 Concept of Operations', October 2004, p.1. Emphasis added.

²³Bear in mind that in March 1993 the Secretary-General had warned, in the face of an impending manning shortfall, that if the force fell to 850 personnel, it would cease to be viable. 'Report of the Secretary-General on the United Nations Operation in Cyprus', UN Doc. S/25492, 30 March 1993, p.2.

²⁴'Report of the Secretary-General on the United Nations Operation in Cyprus', UN Doc. S/2005/353, 27 May 2005, p.4.

²⁵Ibid.

²⁶Ibid.

The Technological Contribution: Closed Circuit Television (CCTV)

The plan to introduce ‘greater use of technology such as closed circuit television’²⁷ was based upon several years of advance study by UNFICYP staff. The mission was cognizant of recurring OPFOR problems, involving:

instances of stone throwing and verbal abuse in the past which ... on occasion led to subsequent reports of ‘Cocking and Pointing’ which is the final stage in the escalation process prior to weapons being discharged and casualties occurring ...

areas considered ‘hot spots’ [should] be monitored by installing motion-initiated camera systems ... which would produce the necessary evidence to prove to the OPFORs the UN’s allegations of ill discipline which to date have been denied by the OPFORs because of the lack of corroborative evidence.²⁸

In addition to providing proof of OPFOR ‘ill discipline’ and violations of the ceasefire arrangement, the CCTV system was to facilitate a significant reduction in personnel leading to cost savings. The annual cost of operating a constantly manned OP is estimated by the author as approximately US\$170,000 while the annual cost of operating a surveillance camera is US\$15,000 for the first year of acquisition and only US\$160/year in subsequent years.²⁹ So, a camera system is over 10 times cheaper the first year and 100 times cheaper in subsequent years. With more substitutions, the cost savings would be that much greater. However, if a large number of cameras are deployed (e.g., more than 10), additional watchkeeper(s) would be needed in the Operations Centre to keep an eye on the additional screens. But the personnel requirements for additional watchkeepers would still be far lower than for human observers at OPs.

Financial and personnel requirements are not the only consideration in a manned/unmanned comparison. The loss of the human presence in the immediate conflict zone is a significant drawback. In UNFICYP’s case it was unavoidable, having been mandated by UN Headquarters. The mission

²⁷Maj. Gen. H. Figoli, UNFICYP Force Commander, UNFICYP Memorandum entitled ‘UNFICYP 860 Concept of Operations’, October 2004, p.1.

²⁸UNFICYP internal memorandum entitled ‘Close Circuit Television Monitoring Systems: Statement of Requirement’, 13 January 2004, p.1, paras 1–4.

²⁹The estimates are based on actual UNFICYP cost figures for its personnel and CCTV system in US dollars and is based on the requirement of eight soldiers per day for each OP (three shifts a day each of two soldiers for a total of six soldiers per day plus an additional two soldiers absent for leave/medical reasons coming to a total of eight soldiers per day per OP). The annual cost of operating a constantly manned (24 hours/day seven days/week) OP includes US\$96,000 per year for the annual salaries of these eight soldiers, plus US\$73,000 per year for rations based on US\$25 a day for eight soldiers for 365 days, and US\$2500 for equipment. This totals US\$171,500 per year for one OP. The cost for the camera system is based on the acquisition and installation price of US\$15,000 and maintenance in subsequent years of US\$160 annually.

compensated by using cameras that, in a way, provide a new deterrent because they permit the recording of events and the transmission of the imagery to a central coordinating centre.

In a camera-based system with no local human presence, the UN still needs to be responsive. After a violation has been spotted by the watch officer in the Operations Centre, a call is made to the OPFORs' local liaison officer, ideally as soon as the violation occurs. For more serious violations, UNFICYP's liaison officers or response force are on standby to mount a quick reaction.

The camera plan was put forward in 2004, but it took UNFICYP several years to gradually implement it. The first Statement of Requirement, developed in early 2004,³⁰ envisaged surveillance of 10 'flashpoints' in the Nicosia city centre, using 16 cameras equipped with infrared filters, transmitter-receivers and, at the Joint Operations Centre (JOC), a multiplexer, large monitor, and DVD recorder. Six cameras were finally installed in the buffer zone by contractor personnel under UN escort in February 2008. The standard operating procedures (SOPs) for the camera system were developed that year.³¹

The United Nations chose to deploy the cameras in sensitive areas of the buffer zone: places in Nicosia's City Centre where the OPFORs were closest and where violations had been most frequent. The camera system was spread over 1.5 km along the narrowest part of the Green Line. This area in the centre of crowded Nicosia is a no-man's land, providing stark evidence of the 1974 war. Majestic but uninhabited and decaying buildings, some pocked with bullet holes, remain frozen in time, an eerie reminder of the intense fighting that brought a once bustling city centre to a dead halt.

The chosen locations in the BZ for the cameras were:³²

- (1) *Maple House* (UN OP66), to observe the close Turkish and Greek military positions, particularly around 'Footballer's Gate' and 'Yellow Car'.
- (2) *Ledra Street*, originally to observe a Turkish force bridge and a Greek tourist centre, but after the street was opened as an official crossing point between the Greek and Turkish portions of the island, the camera was used to observe the crossing point.
- (3) *Magic Mansion*, once a magic store, in the hope of stopping numerous violations in the area, including movements forward, construction, and over-manning.

³⁰UNFICYP memorandum entitled 'Close Circuit Television Monitoring Systems: User Statement of Requirement', 13 January 2004, p.2. See also 'Technical Statement of Work and Specifications for Amendment to CCTV Contract CON/CYP/04-089, Quantity 17 Additional Cameras', 26 July 2005.

³¹UNFICYP Standing Operating Procedures (SOPs), Chapter 2, Part V, Section 11, 'Security, City Troop CCTV Systems', 13 November 2008.

³²Ibid. Three locations from the nine originally planned have not yet been outfitted with cameras due primarily to a lack of funds. These include the locations of Paphos Gate, and UN OP64. Instead of a camera at UN OP76, a signal relay station for another camera was placed at that post.

- (4) *UN OP69*, to observe several sensitive installations as well as to deter over-manning, stone throwing, verbal abuse, and other potential incidents.
- (5) *Friezenburg House*, to observe the transit of National Guard soldiers across a short section of the BZ (to move between NG posts), and to deter stone throwing and other violations at the narrowest point of the BZ (only 3 metres).
- (6) *UN OP81*, to observe excitable Turkish and Greek military forces where their manned OPs are in the closest proximity in the BZ.

The six cameras were intended to deter and detect ceasefire violations, including moves forward of the CFLs, shouting and verbal abuse, stone throwing, cocking and pointing of weapons, and over-manning of positions. Such violations were viewed by the watch officer on the 42-inch plasma monitor in the Sector 2 JOC, located at Wolseley Barracks and manned by soldiers of the British Contingent. The Pan-Tilt-Zoom (PTZ) cameras incorporated a motion sensor, so that movements within the camera's field of view could be highlighted for the watch officer.

Once installed, it was necessary for the OPFORs to accept the new camera surveillance system. The UNFICYP Commander who developed the concept in 2004 had already explained its utility to his OPFOR counterparts. Then, when the system was made operational, the Sector 2 commander, in whose downtown area of operation (AOR) the cameras were installed, also invited the local commanders to separately visit the JOC for a briefing on the system and to view it firsthand.³³ The two half-hour visits did the trick, with no opposition coming from the parties.

The utility of the camera system was quickly demonstrated by the UN's positive experiences in the first few months after installation. Many 'serious' violations were spotted, as illustrated by the following cases.

Cases of CCTV Use

'Yellow Car' Area

This area, named after an abandoned yellow Morris Minor car that lies next to the Turkish CFL, had been a point of OPFOR friction. Many incidents of stone/coin throwing and verbal abuse between the two sentry positions had occurred here. The last shooting incident in the Nicosia BZ had occurred here in April 1994.³⁴ To reduce tension, the United Nations had reached an agreement with the Turkish forces to reduce their manning in the area. Nevertheless, over-manning remained a frequent problem until the installation of the video cameras. At first the Turkish Forces denied any over-manning violations but after being presented incontrovertible video evidence

³³Letter of 11 March 2008 from UNFICYP Sector 2 Commander Lt Col. T. Duncan to Turkish forces Commander Col. V. Tarakci, 1 Wolf Regiment.

³⁴In April 1994, after a TF soldier entered the BZ to throw a stone, a NG sentry fired five shots in his direction. Fortunately, no rounds hit the TF soldier. Other incidents include cock and point (C&P), movements forward, insulting hand gestures, the use of a catapult by the NG, and Turkish Cypriot children shining laser pens at NG positions.

of a violation on 18 February 2008, the activity stopped entirely.³⁵ The ongoing video record proved to be a successful deterrent. Verbal allegations could not command as much respect as photo evidence.

A similar incident using a primitive Swedish night vision device had occurred in the late 1980s.³⁶ UNFICYP complained to the Turkish Forces sector commander that his soldiers were digging at night on the edge of the BZ but the denials were always rapid and sustained. One evening, the local UN commander (Swedish) invited the local Turkish commander for tea at a UN facility overlooking the BZ, in which night vision devices had been installed. After some chatting, the Swedish commander casually mentioned that the United Nations had installed the night observation equipment and asked the Turkish commander if he would like to take a look through the device. The Turkish commander then saw with his own eyes his own troops digging. The violations stopped after that night.

Greek National Guard Post 50 (NG50) Area

Soon after a UN camera was installed near NG50, the JOC watch officer observed Greek National Guard (NG) soldiers, some armed with rifles, inside the BZ. The JOC officer complained to the NG Liaison Officer by telephone. But it was only when a UN MOLO (Military Observation and Liaison Officer) was sent to the scene that the NG soldiers departed. A UN letter of protest was drafted and the NG Liaison Officer was presented with a still picture (screen capture) of the incident.

The UN's Sector 2 Commanding Officer wrote to his NG counterpart that the violation had been 'captured on CCTV'. He requested a NG investigation and explanation. He added: 'I am sure you would agree that had this event been observed by the TK [Turkish Forces], a very serious situation could have resulted'.³⁷

The NG commander responded by agreeing that the soldier went out of the prescribed areas. He explained that this was done in order to investigate noises

³⁵This incident was described by UNFICYP officers in Cyprus in a SITREP (Situation Report). See Incident Serial No. S2-071180, dated 18 February 2008. In addition, the conspicuous nature of the TF actions made UNFICYP soldiers wonder whether the TF were testing the UN's observation and reactions when using the newly installed CCTV. Communication to the author from WO2 David Provan, Continuity Operations Warrant Officer, Headquarters Sector Two, UNFICYP, Wolseley Barracks, 23 January 2009.

³⁶Personal communication from Lt Col. Christian Harelam, a former Swedish peacekeeper in UNFICYP. Night vision equipment has been brought in by contingents. In 2005, UNFICYP 'procured night vision equipment to improve its surveillance of the buffer zone'. Secretary-General, 'Report of the Secretary-General on the United Nations Operation in Cyprus', UN Doc. S/2005/743, 29 November 2005, p.4. However, the UN Police did not possess night vision equipment even by 2008.

³⁷Letter from Lt Col. T. Duncan, Commanding Officer of HQ Sector 2, UNFICYP, to Col. Panayiotou, Commanding officer, 9th Regiment, National Guard, 23 February 2008. In 1983, an NG soldier was shot dead by the TF near the post and Friezenburg House. Throughout the rest of 1983, the UN observed incidents of the two sides shooting at each other's OPs.

caused by unannounced construction by Turkish Forces, about which he had complained.³⁸ He assured the UN officer that he had re-issued 'clear orders' to his soldiers to avoid a repeat of this specific incident.

Overall, violations at NG50 'decreased dramatically since the introduction of the CCTV camera'. Previously, though, 'the UN had no way of observing a violation unless a patrol happened to stumble across it happening'.³⁹

National Guard Post 42 (NG42) Area

OPFORs are not supposed to photograph each other, according to the 'Spirit of the Ceasefire Arrangement'.⁴⁰ At UN OP69, the CCTV caught a Greek NG soldier photographing soldiers at a Turkish post (TF47) approximately 30 metres away. The NG Liaison Officer was given a printed copy of a video image as evidence. The incident was resolved through a meeting with a local NG commander, who promised that the soldier would be disciplined and that personnel checks would commence to stop the carrying of cameras and camera phones.

Ledra Street Crossing (LSX)

Ledra Street runs down the centre of Nicosia's old city. It was the first street in the city to be barricaded when inter-communal fighting broke out in December 1963. Then, after the 1974 invasion and partition, it was severed at its centre point and became the site of much OPFOR antagonism and grandstanding. The Republic of Cyprus created a visit centre (Tourist House) and a viewing platform on its side. The Turkish side built a symbolic stairway for observers. When the NG placed a CCTV system on Tourist House in 2005, the Turks responded with a camera of their own. The UN complained and the cameras were removed. After a thaw in relations in 2007–8, it was decided to open a public transit point at the Ledra Street Crossing (LSX).⁴¹ The United Nations' Mine Action Centre in Cyprus (MACC) checked for landmines so LSX could open on time.

The opening of LSX on 3 April 2008 was a symbolic victory for peaceful coexistence. Moreover, LSX has great practical value in facilitating traffic

³⁸Letter from Col. Panayiotou Efstathios, NG Commanding Officer (AJ Sector), to Lt Col. T. Duncan, UNFICYP Commanding Officer (Sector 2), received 8 April 2008.

³⁹Communication in electronic format to the author from WO2 Provan, Continuity Operations Warrant Officer at Sector Two Headquarters, Wolsley Barracks, 22 January 2009.

⁴⁰This is an unsigned 'arrangement' in the form of a UN Aide Memoire of 1989. It makes more specific the Green Line locations and 'rules'.

⁴¹On the Turkish side of the crossing, documents (e.g., passports) must be presented to border control agents. On the Greek Cypriot side, no stop is required since the Republic of Cyprus sees Cyprus as one country and the border as artificial and not legal or officially recognized. Some Greek Cypriots feared the opening of the crossing might increase acceptance of two separate states within the federal boundaries of the Republic of Cyprus.

between the Turkish and Greek zones of the island's largest city. Nevertheless, the first days of its opening presented significant challenges for the UN.

On the morning of its opening, the crossing was still contentious. The Turkish Republic of Northern Cyprus (TRNC) maintained that most of the crossing area was in its territory and insisted on a right to enter, a fact disputed by the UN. The UN's video camera had recently been installed above the centre of the crossing some 5 metres from the ground, attached to a beam hung between adjacent buildings. As part of the agreed Confidence Building Measures (CBMs), the crossing area was to be de-militarized, i.e., unmanned by any forces, including those of the UN. As the UN avoided the area, the overhead cameras became the 'only UN foothold' at the crossing. The CCTV provided 360 degree surveillance that morning which showed Turkish Cypriot Police (TCP) officers entering the area before the opening of the crossing. The Greek side immediately sealed off their side until UN mediators persuaded the TCP to exit. Such trespassing was to repeat itself, but, according to the UNFICYP soldier who watched the CCTV tapes, 'once the TCP realised that the camera was watching over this area for violations, the offenses became almost non-existent'.⁴²

Another problem emerged on the night of the opening. Greek Cypriot demonstrators wanted to take advantage of the publicity and make a statement. The protestors blocked the crossing at 9 pm and confronted the TCP. The affair was captured on CCTV. The UN Police (UNPOL) Coordinator let the Cyprus Police (CYPOL) know that the United Nations had footage of the perpetrators and their banners. In the end, however, no arrests were made and CYPOL did not request the footage.⁴³ Fortunately, UNPOL was able to resolve the confrontation peacefully.

The well-lit Ledra Street Crossing was then opened 24/7 and the camera continues to record events day and night. However, instead of having an operator observe the CCTV input throughout the night, the camera supervisor can now play back the overnight footage in the morning and still spot any night violations. The morning reviewer can thus take the same action as a 24/7 observer for small violations by issuing written complaints in the morning.

CCTV Problems and Limitations

While UNFICYP has pioneered CCTV observation of conflict areas, the actual system in Nicosia took years to be implemented⁴⁴ and area coverage is still quite modest. While 100 cameras are used for monitoring UNFICYP premises, only six are used for hotspots in the BZ across a distance spanning only 1.5 km. Furthermore, one of the six cameras was non-functional for a half-year after installation due to a communications relay problem.

⁴²Electronic communication from WO2 Provan, 23 January 2009.

⁴³Communication to author from WO2 David Provan, Continuity Operations Warrant Officer, Headquarters Sector Two, UNFICYP, Wolseley Barracks, 23 January 2009.

⁴⁴The system was conceived in 2004, approved in 2005, for 2006–7 budget. The tender likely went out in 2005–6, with financing released 2006. The actual physical work started in 2006/7 for an operating capacity targeted for August 2007, but the system only came online in March 2008.

The working CCTV cameras have significant limitations, especially if they are to be applied to other areas of Cyprus. The cameras have a 'night sense' capability that falls far short of a 'night vision' capability, such as infrared or starlight cameras, so they have almost no use in the dark. The camera specification in the contract is for 0.01 lux but imagery without illumination is blurry or completely black.⁴⁵ Since violations do occur at night, there is a need to illumine the areas that the cameras view. This has been done at four of the six camera locations in Nicosia. In the other two locations the cameras only show a single bright light from a distant OP. A similar problem would occur in other areas of the BZ especially where the cameras might be used to spot illegal trafficking. One possible solution, discussed later, would be to install infrared systems or illuminators triggered by motion detectors.

Microwave beams are used to transmit the signals from the existing camera stations to the Sector 2 Operations Centre. Sometimes, because of tree foliage along the route, the microwave signal from an OP becomes disrupted or the video link is lost or its quality degraded.⁴⁶ One camera did not come online until over a year after its installation because the 'line of sight' needed for microwave signal transmission could not be achieved by the contractor. More troubling, the maintenance and repair of online cameras has been slow. After one camera was overpowered from a nearby lightning strike, no repair was made for over 100 days, despite insistent calls to the contractor. The OPFORs likely realized that the observation device was not working since no violation reports were sent to them.

The OPFORs are sensitive about filming behind their ceasefire lines. While they accept filming in the BZ, they do not tolerate filming with video or still cameras of installations behind their lines or outside the BZ. The borders of the BZ have an abundance of signs for the general public declaring: 'No photos or filming beyond this point'. Thus, the current CCTVs must be pointed across the breadth of the BZ and the view of the CFL must be limited to forward positions only.

If the conflict intensity between the OPFORs had been higher, it is unlikely that CCTV systems could have been used to replace OPs. The relatively peaceful atmosphere made possible this technological component of the 'concentration with mobility' concept. When the Green Line had seen more violence and when typical incidents had been more serious than over-manning – for example, the shooting incidents of the 1970s and 1980s – the OPFORs would not have tolerated the installation of cameras and might even have destroyed them with gunfire. OPFORs shooting at each

⁴⁵One lux is equal to one lumen per square metre, where '4π lumens is the total luminous flux of a light source of one candela of luminous intensity'. To give a rough idea, a measurement of 1 lux would roughly translate into the intensity of a common candle as seen at a distance of 1 metre and 0.01 lux would equate to observation at a distance of 10 metres.

⁴⁶The United Nations was unable to trim or remove the offending tree because it forms part of the TF CFL and permission was not given. In addition, the camera was put out of action due to a power surge from a lightning strike on a building nearby. Written Communication from WO2 Provan, 23 January 2009.

other are unlikely to tolerate a video witness. When the Cypriot conflict was more intense, the human 'blue beret' presence in no man's land was absolutely necessary to prevent escalation, as both sides recognized. Nevertheless, the OPFORs are now gaining experience with the CCTV system. In the undesirable and unlikely return of high intensity conflict, the CCTVs could be extremely useful as a supplement to an expanded human presence.

Other Monitoring Systems

CCTV on UN Premises

Like most UN missions and international organizations around the world, UNFICYP uses CCTV systems to monitor its premises, especially the entrances and perimeter. It dramatically increased this surveillance tool after the tragic Baghdad bombings in August 2003.⁴⁷ In 2004, UNFICYP ordered almost 100 security cameras for the mission, including the three sector headquarters.⁴⁸ Their primary purpose has been to deter and detect any intruders. At camp Stefanik, the only camp located on the Turkish side, surveillance cameras have monitored crowds of demonstrators assembled in protest in front of the camp's main gate and along the approach to the camp. Without the cameras it would be necessary to post sentries along the entire perimeter or allow fence-jumpers to go unmonitored.

UNFICYP headquarters is located within the UN Protected Area (UNPA) that includes the former international airport on the outskirts of Nicosia. The UNPA was established at the start of the 1974 war to prevent the airport from being overrun and used by either side, particularly the invading Turkish force. The territory has remained a 'protected area' ever since.⁴⁹ In addition to the abandoned airport, it includes a large tract of land that is unused except for UN facilities. Camp Blue Beret contains both the mission and UNPOL headquarters. 'UN Flight', the base for the UN helicopter unit, is located in the airport. Surveillance cameras were installed at UNPA road entrances (gates), and on several buildings in the camp. None of them are designed to view the larger open areas of the UNPA.⁵⁰

⁴⁷The truck bombing of the UN headquarters in Baghdad on 19 August 2003 led to the deaths of 22 UN workers, including the head of mission, Sergio Vieira de Mello. Over 150 others were wounded.

⁴⁸The physical security review following the tragic attack in Iraq of the UN headquarters on 19 August 2003 led to significant security improvements, according to Force Commander Figoli (End of Assignment Report), December 2005, p.7. The locations of the on-site cameras are UNPA (HQ UNFICYP), Sector 1 sites (Camp St. Martin in Skouriotissa, Camp Roca in Morphou, and Camp Brown at Astromeritis Crossing Point), Sector 2 site (Ledra Palace Hotel) and Sector 4 sites (Camp Izay in Athienou and Camp General Stefanik in Famagousta). Camp Istvan also has a CCTV system.

⁴⁹The status of 'protected area' means that the parties are not allowed to enter it without UN permission. At UN behest, some of the negotiations between the parties are held there.

⁵⁰The cameras were mostly of the Bosch brand (models LTC 0455/50 and ENVE 230W), as were the nine-channel digital video recorders (models 9F2302 and DVR 6F2162). These inexpensive cameras (roughly US\$500 each) included a 'night sense' (low light) capability,

Helicopter Reconnaissance

Aerial observation is a highly effective monitoring tool that was already in use by UNFICYP before the introduction of 'Force 860'. Sectors can request observation flights 24/7 from UN Flight, the Argentine helicopter unit. Helicopters provide a 'bird's eye' view of the terrain.⁵¹ In scanning large areas, observers onboard can see beyond their usual vehicle patrol tracks and beyond natural or artificial barriers. Usually hand-held cameras are carried aboard by UN observers. The helicopters are also equipped with a surveillance pod housing electro-optical and forward looking infrared (FLIR) cameras that can take gyro-stabilized video footage day and night.⁵²

Heliborne camera imagery has been given to the parties as evidence of their violations. Digital cameras held by peacekeepers flying on the helicopters have captured numerous violations within the BZ including:

- unannounced military exercises;
- unannounced terrain briefings at military bunkers;
- illegal road or fortification construction;
- illegal farming, hunting and motor-biking;
- suspicious activities needing further investigation on the ground.

Air patrols have also targeted other activities including ships of doubtful origin off the Cypriot coast, public demonstrations in Nicosia, and even lost UN patrol cars.

The helicopters also fly other missions like the transport of personnel and supplies, medical evacuation, and overhead security. While so doing, pilots may observe suspicious or otherwise important activities. To make use of such information, UNFICYP regulations stipulate that UN Flight 'ensure all flights conduct observation and report anomalies'. This regulation encourages the pilots to pass on any information they may have gained during their flights even when not on reconnaissance missions.

Any observation behind OPFOR lines, which is quite possible from the air, is not acceptable to the parties. UNFICYP takes great pains not to record

motion detection and the PTZ feature. Some of the cameras in close range of headquarters are connected to the HQ Operations Centre through a wireless network.

⁵¹UN Flight has Bell 212-IFR and Hughes 500D helicopters, based at the UNPA Helicopter Landing Site (HLS). The Argentine unit has flown over 15,000 hours since 1974. It usually flies at 500 to 1000 feet. A helicopter can fly from one end of the BZ to the other in under two hours. Planned UNFICYP II requirements listed that the aerial units should have the 'capability to serve two separate areas simultaneously with basic FLIR for surveillance'. The surveillance safe range was specified as '5 km or 3000 feet above ground level'.

⁵²The Inframetrics camera pod was brought to UN Flight in 2003-4. The pod has a 7x zoom capability and its imagery is recorded on super-8 film. The FLIR has proven useful for surveillance of landing zones at night but in 2008 the FLIR was underused (only one night flight per month, on average).

beyond the BZ, though some observation gives an excellent sense of military preparations and threatening activities.⁵³

Liaison/Mediation and Force Response

Observation by itself is not usually sufficient to keep the peace. After cameras or human observers spot a violation, a UN response is needed. 'Force 860' envisaged 'more emphasis on liaison and mediation rather than interposition of forces to prevent the recurrence of fighting'.⁵⁴ The Force Commander created a new type of UN peacekeeper: the Military Observer and Liaison Officer (MOLO). This cadre represents another UNFICYP innovation in UN peacekeeping. The MOLO has the same tasks as the traditional UN military Observer (UNMO), and also the added task of enhancing 'liaison with the OPFORs and to conduct more effective mediation'.⁵⁵ MOLOs not only respond to violations but also try to prevent them when they see signs of emerging tension.

Each sector commander developed MOLO teams and assigned them to the forward areas of the OPFORs. MOLO teams consist of at least two officers. By July 2008, UNFICYP had 13 MOLO teams comprised of a total of 36 officers.⁵⁶ The MOLO officers are trained in their unique role as conflict managers and mediators. They have contributed to stability, firstly by providing direct liaison with OPFORs at a local level, and secondly by being more aware of all sensitive activities along their segment of the Green Line, especially any activities that could become flashpoints for conflict.

If discussions by the MOLOs with their OPFOR counterparts do not result in compliance, the complaints are moved to a higher level, e.g., to the commanding officer for that UNFICYP sector or, failing that, to his superiors at HQ UNFICYP. HQ intervention is needed only for the most significant of violations, e.g., when OPFOR battalions lack the authority to resolve conflicts. Sometimes they need to be ordered to desist or stand down by higher command. For example, OPFOR battalions have claimed that the fitting of bayonets on rifles is a directive from above and that they cannot countermand such an order without direction from their headquarters.

⁵³Still, the United Nations retains the right to lodge complaints about incidents behind the CFL that might change the status quo or military balance. Two examples: significant construction within 400 metres of the CFL or the movement of large calibre weapons within 1000 metres of the CFL. OC Ops Squadron, 'CCTV Assessment', 26 November 2009, communicated to the author by email, 3 December 2009.

⁵⁴Maj. Gen. H. Figoli, UNFICYP Force Commander, UNFICYP Memorandum entitled 'UNFICYP 860 Concept of Operations', October 2004, p.1.

⁵⁵Ibid.

⁵⁶Conveyed directly to the author by UNFICYP officers. The 13 teams were deployed as follows: five teams in sector one, three in sector two, and five in sector four. Sector three ceased to exist when the Canadian contingent withdrew from Cyprus in 1993 and the neighbouring British Contingent simply absorbed Canada's area of responsibility into its own.

Some incidents require the rapid response of peacekeepers. For instance, large civilian incursions into the BZ, e.g., farm workers without permits, may require escorts to facilitate or force an exit. Each sector has a Quick Reaction Force (QRF), normally made up of the sector Guard Force, the soldiers on 24-hour duty who normally provide the camp security detail (e.g., man the gates). This is backed up by a Sector Reserve on 30 minutes notice to move. This usually consists of reserve soldiers on down-time who are confined to camp and on call. The next level of reserve is on two hours notice to move. These timings are reduced if the United Nations aims to pre-empt an event, e.g., a planned demonstration. The reserves can then be ready to deploy within minutes. The sectors must also have units on standby for the Force Commanders' Reserve, which is only deployable on the orders of HQ UNFICYP.⁵⁷

Future Possibilities: UNFICYP and Beyond

While UNFICYP has broken new ground in UN peacekeeping, its technical monitoring capabilities are still far behind those of modern military forces, for instance, the NATO deployments in Bosnia or Kosovo. The threat level and risks are sufficiently low in Cyprus that a full package of sophisticated Intelligence, Surveillance, and Reconnaissance (ISR) hardware is not necessary. But there is still much more that the mission could do in a cost-effective manner, should the political will and funding allow it.

The six UNFICYP cameras in the Nicosia city centre provide medium-resolution imagery. Higher resolution cameras would give better quality imagery and are now available at a much lower cost than the current cameras.⁵⁸ For instance, high definition (HD) cameras could help more quickly identify incidents and provide more convincing evidence to show offending OPFORs.

Along the entire 180 km BZ, there are many places where cameras would also be useful. Where the UN-administered BZ is wider, a frequent challenge is to prevent trespassing by civilians in open areas. People enter the BZ for a variety of illegal purposes: human trafficking, goods smuggling, hunting off-season, and even garbage dumping. The United Nations has difficulty preventing these movements because most of them are done clandestinely. Cameras can alert the United Nations to such trespassers and trigger a response. Cameras could be fixed at significant road entrances to the BZ or

⁵⁷The Sector 2 units in the FC's Reserve are normally used to provide the security for UNPA when the Mobile Force Reserve (MFR) deploys. The MFR is rarely deployed in a public order capacity but has been forward based at the Ledra Palace Hotel during large demonstrations at the nearby LSX crossing. The MFR is used only as a last resort in the event of hostilities between the OPFORs or if demonstrators try to forcibly enter UN areas. Usually demonstrators can be contained by the Turkish Cypriot Police (TCP), the Cyprus Police Force (CYPOL), UNPOL, or the Sector Reserves. Normally, the MFR is kept out of sight so as not to antagonize the OPFORs or demonstrators.

⁵⁸High definition video cameras (typically defined as providing an image resolution of at least 1280 by 720 pixels) are now available for less than US\$1000 per camera. Power might be a challenge in barren areas, so batteries may need to be frequently recharged, possibly by solar cells.

moved around to places of immediate concern. With a zoom capability, the HD cameras should allow vehicle license plate numbers to be read at a distance of 100 metres or more. Automated license plate reading systems are commercially available.

To deal with human trafficking, a CCTV system could be used by UNPOL, especially in places known to be transit points, such as the village of Pyla. Located within the BZ, Pyla is one of the few places where Greek and Turkish Cypriots live together in the same community. Illegal immigrants often travel to Pyla and, having access to the Republic of Cyprus, can then enter other parts of the European Union. In order not to disrupt the public order, constant vigilance is needed to catch human trafficking. Well placed cameras would help that cause.⁵⁹

Besides CCTV, there are many other creative technological innovations that could improve the effectiveness of UNFICYP and many other missions. These monitoring technologies are briefly reviewed here by cost level.

At the low end, motion sensors could be acquired to trigger illuminators once movement in the BZ has been detected. This would be useful in both urban and rural parts of the BZ. Two of the six cameras in Nicosia are virtually blind at night. Floodlights or motion-triggered illuminators could be installed near the cameras. Trespassers would then be immediately illuminated on entering an illegal area and warned that they are being observed. The watchkeeper in the Operations Center would also be alerted by the sudden bright imagery. To minimize triggering by the wildlife that frequents the BZ, the 'gain' of the motion detectors could be adjusted so they are triggered only by larger, human-sized sources.

Motion sensors could also trigger an automatic alarm on the camera system (e.g., flashing on the screen) in real time at the operations centre. Computer software can aid interpretation of the signal, especially to filter out false alarms like the motion triggered by wandering animals.

So-called 'dummy' cameras, fixed or mobile, would also be useful because the OPFORs and civilians would not know whether the cameras were operational or not. Thus the cameras could deter both OPFOR violations and civilian trespassing in the BZ.

Microphones could easily be attached to the cameras to provide an audio capability in sensitive areas. This would be useful in detecting verbal abuse, which is often the first stage in an escalation. Sound recordings could verify alleged or actual violations. Especially within the Green Line in the Nicosia city centre, microphones could be attached to some existing video cameras or at new locations. Sound coming from the microphones could also trigger alerts at the JOC. Furthermore, if speakers were attached, the watchkeeper could broadcast a message into areas of trouble, allowing an immediate response, something that was lost when UNFICYP OPs became unmanned. At present

⁵⁹The mission's lawyers prepared an analysis of the legal aspects of a possible UN installation of CCTV in Pyla in an unobtrusive spot but the study did not come down either way on the legality. Legal Advisor, Memo titled 'Covert Electronic Video Surveillance – Legal Advice', 2 May 2008.

none of the six cameras are equipped with sound detection, recording, or broadcasting.

Low-cost laser range-finders can be of considerable utility. They provide the precise distance to objects close or far away from the viewer. In large areas of the BZ they would determine if a distant trespasser had actually entered the BZ. They would also be useful in observing maritime approaches on the coastal ends of the BZ. On the mountainous northern edge of the island, the manned UN OP3 is responsible for observing boats moving north of the BZ. Peacekeepers detect vessels that may be trespassing into OPFOR territorial waters, especially boats which regularly traverse to the Turkish enclave of Kokkina/Erenköy. The current method of estimating whether a boat has come within the limits of the Maritime Security Line⁶⁰ is crude. The type of boat is guessed based on its shape and its length in the observers' binoculars is estimated. A hand chart then indicates that if the boat is over a certain length, it is likely to be inside the limited area, constituting a violation. This method is inaccurate, subjective, and prone to human error. A tripod-mounted laser range-finder would be able to make the measurement exactly, i.e., with an error of only a few metres for objects up to 10 km away.

The GIS system in UNFICYP is also quite basic by modern military standards. For less than US\$50,000, satellite imagery could be purchased to properly geo-reference the entire BZ, allowing map coordinates to be accurate to within 2–3 metres instead of the current 100 metres offered by Google Earth system being used.⁶¹ A more elaborate GIS system would allow UN observers and MOLOs to log data directly into a spatial database and access it from anywhere in real time. As with laser range-finders, a GIS system would also be useful in determining if a soldier or hunter has actually trespassed into the BZ. Often hunters dispute the UN's claims of trespassing. Images with proper grid references and ceasefire line demarcations would be quite convincing. A record of past incidents would also be useful through a geo-referenced database.

Medium-cost technologies (over US\$50,000) include radar and acoustic/seismic sensors placed in arrays to help detect movements into and within the BZ, for example, by OPFOR soldiers, hunters, or traffickers. In other UN missions, this could be used to detect preparations for attack. The more advanced observation could trigger action by UN soldiers and police. Ground surveillance radar (GSR) can detect a person walking into a field at a distance

⁶⁰The Maritime Security Line (MSL) is the 3000 metre seaward extension on both sides of the island of the BZ median. Vessels from both sides are advised not to cross the MSL. On the north shore the MSL is near Kokkina and on the south end of the Green line it is near Famagusta. Occasionally, fishing vessels and tourists allegedly cross the line and are apprehended by police boats of the other party, causing friction which the UN must help resolve. UNFICYP has no capacity to operate at sea. See 'Report of the Secretary-General on the United Nations Operation in Cyprus', UN Doc. S/1995/488 of 15 June 1995 and S/1999/657 of 8 June 1999.

⁶¹Google Earth Professional allows the importation of shape files which can greatly improve the accuracy of the imagery. Higher resolution imagery could be purchased at roughly US\$10/km² (e.g., from DigitalGlobe).

of 10 km under all weather conditions, day and night. It can be set up to cover a full circle or a specified arc.⁶² Tethered balloons could carry cameras that provide a high and wide view of the BZ or other areas of responsibility. Such aerostats marked with UN letters could also serve as a useful boundary demarcation point, visible to all. Some may resent the presence and thus it could raise tensions. To overcome OPFOR fears that the aerostat cameras would observe beyond the ceasefire lines and into their territories, the balloons could be placed in wide areas of the buffer zone. Nevertheless, civilian hunters not subject to military discipline might shoot them down. Though susceptible to gunfire, aerostats can be re-launched within a day and the camera system could be of high durability yet medium cost.

High-end monitoring technologies include modern infrared (FLIR) cameras for aircraft. The system deployed in UNFICYP helicopters is of an old standard. Also, unmanned aerial vehicles (UAVs) could provide cost-effective airborne surveillance. They are small and can be made virtually invisible by flying at higher altitudes. The systems vary greatly in range, capability, and cost so several types could be employed simultaneously. The view could extend far beyond the BZ. Remote viewing of UAV imagery is possible on laptop computers, Personal Digital Assistants (PDAs), or Remote Viewing Terminals (RVTs). This would allow MOLOs to show live imagery of violations to their OPFOR counterparts. However, UAVs, especially small ones, are more prone to accidental crashes than piloted aircraft since the remote pilots often cannot 'feel' a difficulty as it arises; it can only be 'seen' on remote screens. Thus UAVs could be more hazardous and in closed areas of a DMZ they could even endanger lives.

To use such powerful technologies without the permission or knowledge of the OPFORs involves risk. UNFICYP has grown very aware of the sensitivities of the parties to covert or unauthorized observation. To acquire intelligence on the OPFORs and then to present them with evidence of their violations could jeopardize the acceptability of the UN force to the parties. Clearly these technologies have monitoring potential, but in Cyprus and in most other cases they should be used with the parties' consent.

The direct provision of camera imagery to the OPFORs, either periodically or in real time, might serve as a confidence-building measure in the future, particularly if they start to reduce their manning levels or even abandon some posts. If both OPFORs had video feeds from the UN cameras they would have greater confidence that the BZ was stable. But the United Nations would have to be aware that the information could be used for an aggressive purpose, so it would have to be prepared to cut the signal if such were the case. Thus the United Nations might establish a system where the parties could obtain limited video as the situation warrants.

⁶²One rotation of UK forces in UNFICYP introduced GSR because the deployed unit was already using it in training. It proved to be a useful adjunct to monitoring the BZ during their tour of duty. Source: Comment to the author made in New York, 2008, by Col. Ian Sinclair (former UNFICYP Chief of Staff, 2004–6).

In a situation as stable as Cyprus now is, the urgency to enhance monitoring capacity is admittedly not great. This does not, however, mean that UNFICYP should be complacent. Rather it should be constantly seeking ways to gain better awareness of the BZ. Technologies also offer a new form of innovation that could prove extremely useful should the UNFICYP mandate change after a settlement.

With a mission budget of only US\$56 million per year,⁶³ UNFICYP may find it difficult to find funds for the more expensive equipment. But for other missions, like the UN Stabilization Mission in the Democratic Republic of the Congo with its billion-dollar budget, technologies are a key investment with great payoff over vast territories.⁶⁴ In addition, most technologies are transferrable between missions to meet urgent needs. Moreover, monitoring technologies, like most high-technology, are becoming cheaper and of better quality. They have higher resolution and quicker transmission time as well as greater portability, durability, and ruggedness. Experience with electronic surveillance is growing in both the developed and developing world and in both military and police forces.

While some of the preceding technologies may not be affordable or urgent for the current Cypriot situation, they should be considered for a future UNFICYP and for other missions in hot-spots. Especially if there is a peace settlement in Cyprus, then a planned UNFICYP II will need to include many advanced technologies in the integration and peacebuilding process.

Conclusions

UNFICYP is often sharply criticized for its longevity and for the fact that the peacekeeping has not produced a political settlement. Some have even gone so far as to use it as an example against peacekeeping. This negativity is unfounded and fails to recognize the mission's accomplishments. At the heat of the conflict, UNFICYP needed more than 6400 troops to contain violence; now it only deploys about 800. After the 1974 Cypriot War UNFICYP needed almost 100 constantly manned OPs, now it needs only two. UNFICYP facilitated this incredible transition from bloodshed to calm.

As a stereotypical traditional peacekeeping mission, UNFICYP was an unlikely candidate to pioneer surveillance technology in peacekeeping. Yet tradition met modernity in UNFICYP. The innovative solution was born of necessity when the mission was forced to downsize after 2004. An unattended camera system in a de-militarized zone was introduced for

⁶³The UNFICYP budget was US\$56 million for the UN fiscal year 2008–9. UNFICYP, 'UNFICYP Fact Sheet' <http://www.unficy.org/nqcontent.cfm?a_id=1593&tt=graphic&lang=11>

⁶⁴The Green Line is merely 180 km long and Cyprus has a land mass of 9250 km² with the BZ comprising only 3 per cent (280 km²). In comparison, the Democratic Republic of the Congo, has an east-to-west width of 1930 km and covers an area of 3.34 million km² (the size of Western Europe).

the first time in UN peacekeeping history. This technology could be applied to many tense conflict areas such as South Sudan, the Democratic Republic of the Congo, and Syria. Viewing and documenting violations is a key role for peacekeepers wherever they are deployed.

The early UNFICYP experiment did reveal some of the UN's technological deficiencies. The four years taken to implement the six-camera solution is not commendable. The United Nations should become more adept at rapidly deploying high-tech monitoring technology, just as it has with its communications technology. Thus more specialized UN expertise is needed. This is one of the many UNFICYP lessons for peacekeeping in general, especially as the world organization strives to find new and improved ways to increase safety and effectiveness in its missions.

However, the utility and cost effectiveness of fixed video cameras in conflict zones has been clearly shown by the UNFICYP experience. The cases described above highlight the advantages of cameras, especially the recording of violations that can then be presented as evidence to offending parties. In addition, cameras can maintain a 24/7 watch over areas whereas patrols can only detect violations if they happen to pass by.

Manned OPs allow for a constant watch and they permit a quicker response because soldiers are already *in situ*. Under the newer 'concentration with mobility' concept, responders are kept on standby at a distance. The United Nations has limited resources to cover its peacekeeping areas, including the 180 km-long Green Line. So a camera system has great utility and is 10 to 100 times less costly for monitoring than a manned OP.

As shown in UNFICYP, cameras can incorporate motion detectors that trigger alarms and watchkeeper attention. Even more sophisticated hardware and software is available to detect potential violations. Furthermore, the cameras can be equipped with acoustic recorders to catch additional violations, including gunshots and verbal abuse that might otherwise result in an escalation of violence.

In Cyprus, the level of violations is low in comparison with other missions. UNFICYP catches 600 or so violations a year,⁶⁵ but none have proven life-threatening for over a decade. The weekly body count in some other conflicts where UN missions are deployed greatly exceeds the weekly count of minor violations in Cyprus. All the more reason why the UNFICYP experiment with surveillance cameras carries a valuable and transferrable lesson: remote monitoring can help deter, detect, and document violations. In larger missions, where the stakes are greater, the benefits of early warning and rapid response would also be greater. The United Nations would be wise to develop the positive lessons from UNFICYP into broader policies

⁶⁵For instance, in a six-month period from May to November in 2008, the number of military violations and other incidents was 352. 'Report of the Secretary on United Nations Operation in Cyprus', UN Doc. S/2008/744 of 28 November 2008, p.4.

and wider practices.⁶⁶ In an age when technology has been widely used to enhance war-fighting, it is only appropriate to make greater use of technology for peacekeeping.

Acknowledgements

Research for this paper was made possible by a grant from the Global Peace and Security Fund of the Department of Foreign Affairs and International Trade Canada. Research and writing assistance from Robert Pauk was most appreciated, made possible through a grant from the Canadian Forces Aerospace Warfare Centre. The author thanks UN headquarters for sponsoring a trip to Cyprus and to UNFICYP for providing a thorough and frank view of the mission and its challenges, as well as for the provision of many useful documents. The author thanks the United Nations and this journal for their permission to use material from his UN report and his book *Keeping Watch: Monitoring, Technology and Innovation in UN Peace Operations* (Tokyo: United Nations University Press 2011).

Notes on Contributor

Dr Walter Dorn is a professor of defence studies at the Royal Military College of Canada and the chair of the Department of Security and International Affairs at the Canadian Forces College. He has worked as a consultant with the UN's Department of Peacekeeping Operations and served in the UN Mission in East Timor for the 1999 referendum.

⁶⁶The UN is showing evidence that it recognizes the need. The July 2009 'New Horizon paper' identifies 'critical shortages' in 'observation/surveillance, including high resolution; night operations capability; data management and analysis'. United Nations, Department of Peacekeeping Operations and Department of Field Support, *A New Partnership Agenda: Charting a New Horizon for UN Peacekeeping*, New York, July 2009, p.27. It also notes: 'Moving from a troop-intensive to a more agile mission structure and approach will depend on the feasibility of sourcing the very enabling capabilities that are currently difficult to obtain. Rebalancing numbers of personnel with more mobile capacities or technological solutions may change cost structures; it will not necessarily lower them' (p.28). The deployment of UAVs in the Congo mission in 2013 is an example of recent innovation and progress.