

# **Risk Reduction in South Asia: A Role for Cooperative Aerial Observation?<sup>1</sup>**

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The May 1998 nuclear tests by India and Pakistan transformed the strategic environment in South Asia. They did not, however, change the military potential in the region: India had already proven, twenty-four years earlier, that it was capable of a nuclear test, and Pakistan was confidently believed to have the same capability. By making this capability overt, India and Pakistan increased perceptions of both their own power and vulnerability. The tests thus raised the political stakes in their bilateral confrontation and heightened the risks inherent in what had become a “routine” level of hostility between the two countries.

Now that the initial heady, nationalist reaction has quieted down, consciousness is growing in both countries that their new and extraordinarily destructive capabilities must never be used. In the press and in political and security circles, there is increased discussion of what can be done to provide an added measure of insurance against a catastrophic conflict that no one wants. In general, the menu of possible nuclear risk reduction measures falls into three categories:

- C Measures to improve communication and inhibit accidental confrontation between conventional forces;
- C Measures, typically adapted from the Cold War era to fit South Asia’s particular circumstances, to improve internal control and avoid miscalculation with nuclear and missile forces; and
- C Measures to improve Indo–Pakistani relations, including measures related to the divisive issue of Kashmir.

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Following the subcontinent's most recent near confrontation, in 1990, India and Pakistan implemented a number of confidence-building measures (CBMs). These included establishment of 'hotlines' at several different levels of command and an agreement whereby the Directors General of Military Operations (DGMOs) for each side would, in turn, initiate a weekly call. Other measures focused on the structure of military exercises, the notification of certain types of military movements, and the banning of military overflights of each other's territory.<sup>2</sup> These measures were negotiated and implemented bilaterally, an important point for India. Pakistan and India were quietly encouraged by other countries, however, and the experience of Cold War era CBMs between conventional forces in Europe had parallels in some of the ideas which eventually materialized in a form suitable for the subcontinent.

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A general downturn in Indo-Pakistani relations led these measures to atrophy within a few years of their inception. More recent bilateral efforts have focused chiefly on resuming a high-level diplomatic dialogue, as agreed to in June, 1997.<sup>3</sup>

The scope for such dialogue, however, has often appeared to be limited by the continuing political confrontation between the two states, as well as by the domestic political ramifications of this confrontation on both sides.

Now that the nuclear tests have brought the two countries' latent nuclear potentials to the surface, the time is ripe for India and Pakistan to establish a more robust risk-reduction regime to take account of the new situation. New arrangements could build on the strengths of the 1990 experience: fruitful bilateral negotiations and an attempt to identify and avoid behavior that could be subject to dangerous misinterpretation by the other side.

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<sup>2</sup> For a discussion of these agreements, see Sumit Ganguly, "Mending Fences," in Michael Krepon and Amit Sevak, eds. *Crisis Prevention, Confidence Building, and Reconciliation Between India and Pakistan* (New York: St. Martin's Press, 1995), 12–13. Copies of these agreements are included in the Appendix.

<sup>3</sup> In June 1997, the Foreign Secretaries of India and Pakistan agreed to resolve outstanding issues in an integrated, bilateral manner. The two governments pledged to commission Working Groups to address peace and security, including CBMs; Jammu and Kashmir; to settle disputes such as Siachen Glacier, Wallar Barrage/Tulbul Navigation Project, and Sir Creek, and to promote economic and commercial cooperation and friendly exchanges in other fields.

At the same time, a new effort at bilateral nuclear risk reduction should also try to remedy some of the weak points of the past. The 1990 arrangements were not very effective in helping India and Pakistan communicate about military capabilities and intentions in such a way as to defuse a budding crisis. The only communication measures included in the 1990 package were the hotlines, and these were the first measures to fall out of regular use. The buildup to the 1990 crisis had been punctuated by recurring alarms, in both India and Pakistan, about purported preparations for offensive military action. At that time, the only means available to reduce the anxiety these reports generated was reporting by diplomats from third countries, including the United States, who were able to provide Pakistan and India with credible information. While the provision of information by third parties can be useful, it cannot form an enduring basis for crisis stability. Today, the security of both countries would be greatly strengthened if they each had direct access to reliable information, developed and shared on a bilateral basis, without having to depend on third parties.

Developing a new nuclear risk-reduction package is fundamentally a job for the two countries at primary risk. This process will be most beneficial if it is supplemented by a serious, ongoing, Indo-Pakistani political dialogue. In the belief that the effort will be most successful if

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India and Pakistan have a broad array of measures to choose from, this essay analyzes one potentially useful ingredient in the mix: a program of cooperative aerial observation.

There is no tradition of cooperative aerial observation in South Asia. The one Indo-Pakistani agreement concerning aerial activities, alluded to above, banned overflights of one another's territory by Indian and Pakistani military aircraft. Indeed, the practice in India and Pakistan had been to avoid direct interaction between the two military establishments. This is understandable in political terms. And yet in some other regional tensions, notably the Middle East, military officers have actually found it easier than their civilian counterparts to communicate, once the ground rules are set. Military officers have a vocabulary, a rank structure, and a tradition in common, and their training includes concepts of how to deal with adversaries. More importantly, military officers understand better than anyone the risks of misunderstanding.

At least two techniques have been used or attempted internationally to give potential adversaries agreed access to aerial observation. The Open Skies Treaty, negotiated between NATO and Warsaw Pact states at the end of the Cold War, involved direct observation by the participants. This Treaty still awaits formal entry into force. The security arrangements accompanying the Egyptian–Israeli peace agreement included provision for third-party flights generating identical data. This data was provided to both sides, and coupled with a network of observer stations in Sinai whose primary purpose was to give Israel some of the warning time it had relinquished. The proposal presented here is a variant on the Open Skies model, adapted for the different political and security circumstances in South Asia. Direct observation has the advantage of being more meaningful to the country doing the observing. Moreover, it fits better into the history of direct bilateral dealings between India and Pakistan.

## **PRINCIPLES FOR INDO–PAKISTANI AERIAL OBSERVATION MEASURES**

The basic concept is a simple one: India and Pakistan would each agree to carry out an equal number of flights over their own respective national territories, using identical surveillance cameras. An identical set of the film produced by each country's flights would be provided to both sides. In addition to its own aircrew, each country would also host representatives from the other country on board its aircraft during the observation flights. The flights would give both sides common baseline information and a tool for assessing threat information they might receive from other sources.

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While the concept is simple, aerial verification can be implemented in more or less ambitious ways, depending on how the governments involved calibrate the tradeoffs between gaining, and relinquishing, information. The parties would need to agree on the number of flights, their duration, and the capabilities of the cameras used. They would need to

weigh these and other factors against the security objectives they set for the program and the political constraints on bilateral agreements. One could begin modestly, for example, providing for very few flights over a limited number of pre-designated sites. Such a small program would

demonstrate an ability to work together to share information. It could help to defuse potential crisis situations even though the information it yielded would necessarily be of limited scope. To the degree, however, that both parties were interested in sharing information more extensively, they could design a program either with a greater number of flights or expanded territorial coverage, or they could work up to a more extensive program gradually. Some of the options are considered below.

In our judgment, four key principles would have to guide an Indo–Pakistani aerial observation program. These are:

- C no overflight by foreign aircraft;
  - C a strict focus on gathering information;
  - C at least as much concern for conventional forces as for nuclear capabilities; and
  - C continuing dependence on mutual cooperation.
- C A brief discussion of each of these points follows.

### **No Foreign Overflight**

For both political and military reasons, we believe that neither India nor Pakistan would accept the use of foreign observation aircraft within its national airspace. Therefore, all observations under the proposed measure would have to be accomplished using Indian aircraft in Indian airspace, and Pakistani aircraft in Pakistani airspace. In each case the aircraft would carry dual sets of cameras, to provide both parties equal records of the imagery. Similarly, in each case the host country would carry an observation delegation from the other country on its aircraft for the duration of the observation flight, so that both parties could be satisfied that the observation plane followed an agreed route and that the photographs that were taken corresponded to the sites and times that had been agreed upon.

It is worth recalling that the issue of host country vs. visiting country aircraft was a major point of contention between the former Soviet Union and other participants in the Open Skies Treaty negotiations. At that time, the former Soviet Union took the position that the host country had to provide the aircraft to guarantee that the observation aircraft did not contain weapons or hidden sensors not permitted under the agreement. Conversely, the other participants in those negotiations were concerned that a host country aircraft might be too easily

subject to diversion away from important sites or that the aircraft or its on-board sensors might suffer unexplained technical malfunctions which would interfere with or force the cancellation of an observation flight. They therefore attempted—unsuccessfully in the event—to alleviate Soviet concerns by providing for rigorous pre-inspection of the aircraft.

In our judgment the position taken by the former Soviet Union probably best reflects the current military and political realities between India and Pakistan. By using only host country aircraft for observation missions, both countries could avoid arousing unnecessary suspicions and security concerns. Moreover, this is the only formula that would make it possible for the parties to develop the positive security benefits of an observation program from the start.

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Conducting observations in this manner, of course, would place the burden on the host country to ensure that its observation aircraft were operationally ready when needed, that its crews and flight controllers were thoroughly trained for cooperative observation missions, and that there

were no untoward incidents. We recognize that there is a potential for misunderstandings and disputes in the event that one or the other party were to believe that the other side was improperly using its control of the observation aircraft to impede access to important information. Even inadvertent errors or malfunctions could be mistaken for deliberate interference. We believe, however, that this possibility could be minimized after both parties gain operational experience in carrying out missions. We are also convinced that it is a much smaller risk than the danger of misunderstanding and miscalculation that would exist in the context of an observation program conducted by foreign aircraft, or in the absence of an observation program altogether.

### **Informational Focus**

Second, because an observation measure could potentially “see” anything on the ground it covers, it would have to be clearly understood by the parties that the mere gathering of information did not itself imply any limitation or constraint on the equipment or forces that might be observed. This is an important distinction to make. Many people tend to confuse observation with limitations, and any such confusion could lead to misunderstandings between the parties, or even prevent the successful conclusion of an observation agreement. This

confusion may come from the fact that several observation programs elsewhere in the world were instituted for purposes of monitoring specific territorial constraints or arms control agreements, including, for example, the Egyptian–Israeli disengagement in the Sinai or the US–Soviet reduction of missiles under the Strategic Arms Reduction treaties (START). In the case of India and Pakistan, however, there are currently no agreed geographical, quantitative, or qualitative limitations on military capabilities.

Thus a cooperative aerial observation program would simply make factual observations rather than monitoring an agreement. The parties might note, for example, that a certain number of weapons of “x” type were or were not deployed in “y” region, or that several units of “z” size had or had not moved from region “a” to region “b.” Such factual observations could deal with both nuclear-capable and conventional forces, and would be valuable to the parties in assessing their security situation, particularly in a crisis. This risk-reduction function could be performed independently of the existence or non-existence of any constraints on force deployments. At the same time, should the parties at some point decide to institute either formal or informal limitations on deployments—say in a particular geographic area—then the existence of the aerial observation risk-reduction program would provide a ready-made means of also providing both countries with reliable information on such limitations.

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## **Broad Scope**

Third, any observation program that is designed to make a serious contribution to risk reduction must give at least as much attention to the conventional forces of India and Pakistan as to their nuclear programs. Notwithstanding the role that the two countries’ nuclear programs have played in stimulating renewed interest in mitigating the risk of conflict, conventional forces remain the most important indicators of the likelihood—or unlikelihood—of major conflict. Because conventional forces would almost certainly be the first to be committed in any major conflict, observation of their movements would be especially valuable in determining whether

a conflict is imminent. Also, the size of conventional force units and the range of major equipment they contain make the task of observation relatively straightforward. Rather than looking for the proverbial “needle in a haystack,” observers can follow the activities of a series of specific “haystacks” in specific areas. Finally, in terms of the possible risk of escalation to the use of nuclear weapons, most scenarios suggest that such use is most likely to be considered by the parties in the context of a conflict that had already developed at the conventional level. While there has been much concern about the possibility of a preemptive strike—a fear perhaps heightened by the relatively small size of the nuclear-capable forces involved—no sane planner on either side could be completely confident of wiping out the other side’s nuclear forces. This makes preemption an unacceptably risky strategy. A “bolt from the blue”—an unexpected

nuclear attack without a previously existing crisis or conflict involving conventional forces—is the least plausible scenario.

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None of this means that an observation program should avoid looking at nuclear programs. As the May 1998 nuclear testing by both

countries has re-emphasized, nuclear weapons and their delivery systems possess enormous political as well as military importance. Consequently both parties have powerful incentives to acquire the most complete and timely information possible on the nuclear capabilities of the other side. A cooperative observation program could facilitate that objective. For example, India and Pakistan have exchanged lists of certain nuclear-related facilities throughout their respective countries which they have agreed not to attack. Periodic aerial observation of some or all of these facilities would not provide internal details of their programs, but it could be useful in assessing developments in the scope or direction of activity. In addition, aerial observation of garrisons and air bases—either nationally or in specifically designated regions which the parties believed were most significant for bilateral assessment purposes—would indicate whether or not certain nuclear capable missile or aircraft delivery systems were deployed at those locations. This information on nuclear-capable deployments—or non-deployments—would itself be of significant importance in assessing a security situation.

Going beyond actual deployment information, however, to make judgments about the likelihood of actual deployment of nuclear capable systems in a crisis, is probably beyond the capacity of a cooperative aerial observation arrangement. Allowing flights during periods of

heightened tensions might provide some reassurance. Agreed limits on the number of flights, the time delays between observation flights, and the tight security which necessarily surrounds all nuclear activities, would reduce the ability of either party to gain hard information on the possible nuclear employment intentions of the other party.

This reinforces our view, noted above, that a meaningful risk-reduction program must also focus heavily on giving national military and political leaders sufficient information about the conventional force deployments of the other side to enable them to make informed choices in a crisis. To the degree this can be achieved, the observation program could dampen the possibility of escalation at the conventional level, before the use of nuclear weapons might be considered.

### **Voluntary Cooperation**

Fourth, the strength and the weakness of a cooperative observation program is its dependence on active cooperation between the parties. Aerial observation could only take place as long as India and Pakistan remained committed to the program, and willing to fly observation missions over their own territory. Neither party could gain any information under the program without the participation of the other.

Neither one could continue the program alone if the other backed out. In one sense, this is a guarantee for both parties. Either party could shut the program down immediately if it believed this were necessary. At the same time it is a risk, since the potential for either party to terminate the program means that the flow of

information could be interrupted at any moment. Were one party to terminate the observation flights during a period of crisis, for example, the other party might interpret this action as an effort to hide aggressive preparations. It might, therefore, feel compelled to take offsetting actions, despite—or because of—the absence of hard information on what the other side was doing.

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In one sense, an interruption of the observation program would only return both parties to the present situation, with its lack of information and attendant uncertainties. In another sense, however, a deliberate interruption of a successful observation program could be read as potentially more dangerous than the present situation, in that any closing down of information in a crisis—for whatever reason—could serve to magnify existing tensions. Because the

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observation program would depend on an agreement between sovereign states, its continuation would have to remain voluntary. At the same time, the parties would have to be conscious of the potential signals that they might send if they were to terminate the program.

## **GETTING DOWN TO CASES: HOW WOULD AN OBSERVATION PROGRAM WORK?**

Within the framework of the four broad points discussed above, a great deal of latitude for shaping the actual structure and operation of a cooperative observation program remains. The two parties would need to decide such questions as: the number and length of flights to be undertaken; the amount of national territory that is subject to observation; whether there should be any excluded areas; what quality of imagery should be produced; and, how cooperation between the host country and the visiting country would work in practice. In combination, the answers to these questions would constitute the detailed operational structure of an observation program. By definition, these are subjects for careful analysis and discussion between the parties. Here we can only begin to outline some of the possible factors which the parties might wish to consider in deciding these issues.

### **Area**

India and Pakistan might decide to include several areas in an observation program. Options range from a relatively narrow strip along their common border, to a selection of militarily-relevant sites throughout each nation, to unrestricted coverage of most or all of the national territory of each party. Each of these options could be relevant to the basic objective of risk reduction. Each, however, presents complications.

Coverage of the region immediately adjacent to the border could give information on the strength and movement of forces closest to a potential conflict. Because of this, both parties already exert considerable effort to acquire such information unilaterally, including using aerial photography aimed across the border into the territory of the other party. Indeed, this can lead to aerial incursions, with all the risks that these entail. Providing cooperative aerial coverage of the regions alongside the international border, as well as of the Line of Control (LoC) dividing Kashmir, could significantly

improve the quality and quantity of information available regarding the forces in closest proximity. Defining the depth of a region subject to co-operative observation would be tricky. Is it to be defined, for example, as the strip fifty kilometers deep on each side of the border, running

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parallel to the border northward from the Arabian Sea all the way to the Himalayas? Or should it be a strip of some lesser or greater constant depth? Or should the depth vary with location, based on geographic features, known force deployments, transportation routes, or other special factors? Would a strip of the same depth be appropriate for the international border as well as for the LoC, or would military or political considerations argue for different depths in each case?

While the concept of a border strip is probably the easiest way to define the area of aerial observation, and might therefore represent a logical first step in any observation program, there are both political and military reasons why the parties might also want to consider observation of other regions as well. In the first place, the force dispositions of the parties are such that, depending on the definition used, one or the other side could feel that it was giving more information than it was receiving if observation were limited to a zone close to a border. Or there might be concern that the establishment of a fixed zone of observation along a border would lead one or both parties to station forces just outside that zone, thereby defeating the purposes of the observation measure.

Secondly, however the depth of a border region is determined, both India and Pakistan will always have important forces stationed outside that area that could play a significant part in any conflict. Indeed, the movement or non-movement of conventional and/or nuclear-capable forces stationed at some distance from a border could be a more important indicator of future

military developments than activity in the immediate border area itself. Third, because of the difference in overall size of India and Pakistan, it is apparent that a much greater percentage of Pakistan would be covered by an observation measure applied to border regions than the same measure would cover in India, and that, conversely, a higher percentage of Indian territory would be unobserved under such a measure.

For all these reasons, the parties might wish to consider including other areas. They might, for example, include all airfields within operational range of the border, and then add other designated military facilities which also fell within that range. This would cover most forces and equipment that could be immediately brought to bear on a potential conflict, and as such would provide essential information for risk reduction. Depending on the frequency of observations, such an approach would, in particular, be able to detect the introduction to known sites in the area of additional equipment or units, including, for example, nuclear- capable delivery systems. It would not, however, cover longer-range missiles which might be deployed outside the region, nor would it be able to pick up the redeployment of forces or equipment from outside the region to previously unknown sites within the region. Coverage of such forces or equipment would require either blanket coverage in the region, or coverage of designated military facilities outside the region where equipment of potential concern were deployed, coupled with coverage of road and rail lines of communication into the region.

The most extensive approach would be to include the entire territory of both parties, excluding certain distant regions too remote to be relevant to the balance between India and Pakistan. India, for example, might argue that Assam and the other territories in the northeast should be excluded from cooperative observation on such grounds. Pakistan might advance a similar argument with regard to its territory bordering Afghanistan. Similarly, both parties might wish to make exceptions on political grounds for their national capital areas. In order to be mutually acceptable to both parties, such potential exclusions would depend on whether they agreed that knowledge of the forces and activities in those areas was or was not material to the assessment of the military situation in a potential crisis.

## **Distance**

Two elements are needed to determine the appropriate extent of a cooperative observation flight: First, the decisions which the parties make regarding the area to be covered, as discussed above. And second, the number and location of airfields from which observation flights could operate. Solely for purposes of this illustration, let us assume that each party would

designate two airfields as observation bases. In each country, one of these airfields would be adjacent to the international boundary or LoC to facilitate coverage of this area. If the parties had agreed on coverage extending beyond a border strip, then a second airfield might be needed at a convenient point deeper inside the two countries. Hypothetically, the designated airfields might be Amritsar and Lahore in the area of the international boundary. The location of the other airfield would depend on the scope of the additional coverage.

With these hypothetical starting points, flights in the border and LoC regions would have to be long enough to make the round trip from Amritsar or Lahore to the Arabian Sea in the south or the Himalayas in the north. In addition to calculating the straight-line distances, however, the flights would also have to be granted an additional allowance, perhaps ten per cent. This allowance would provide the flexibility necessary to maneuver laterally over the depth of the border and LoC areas and would ensure that the return flight track to the starting airfield did not have to simply duplicate the outbound track. Since the total length of the international border or the LoC is equal for both parties, it would be straightforward and equitable to define equal flight distances for both parties for any observation flight by either party in the border region.

For coverage of the rest of the two countries, flight distances would need to take account of the difference in geographic size between India and Pakistan. They might, for example, be calculated by drawing arcs based on the two designated airfields in each country, with the radius of the arcs reaching to the furthestmost points in

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those countries which the parties had agreed to include in the cooperative observation program. As in the case of border area flights, the requisite flight distance would be sufficient to make a return trip along the radius of the arc, plus a ten per cent allowance for lateral maneuvering. With two airfields designated as starting points in each country, as in this hypothetical example, all points to be observed would have to fall within the arcs from one or the other airfield.

If a greater number of airfields were designated, the size of the respective arcs and the lengths of flight needed to reach all relevant sites in each country would be correspondingly less. Also, the question of the possible inclusion or exclusion of certain territories on the far borders

of India and Pakistan, as discussed above, could be a significant factor in setting requirements for the length of flights. Finally, as a matter of practical logistics it might be necessary in some cases to identify refueling points for particularly long flights, depending on the type of aircraft chosen for the observation flights in each country.

## Number

How many flights are enough? The question can only be answered by weighing the purposes of the observation program. If, for example, the objective were primarily symbolic confidence building, then a handful of flights per year in each country might suffice. In a positive sense, even a small number of missions would establish the principle of cooperative observation, demonstrate the feasibility of working together on a security issue, and provide

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some limited additional information. These are not trivial benefits, particularly in the present atmosphere. No one would argue, however, that such a limited program would provide the steady flow of information necessary to strengthen each country's understanding of the military situation and reduce the risk of escalation through miscalculation.

If the objective of the program were to provide each party with an annual survey of major elements of the other party's military order of battle, then a dozen flights might be required on each side. This, too, would be an important advance. The operation of the program would itself represent a significant effort at cooperation and the information produced would refine understanding of the long-term situation. It would also have a certain utility as a risk-reduction measure, although the limited number of flights might not leave the parties with enough flexibility to conduct observations in a timely manner in a period of crisis. The parties could attempt to deal with this problem by utilizing some of the flights for routine information collection, while "saving" some for a potential crisis situation.

Finally, if the objective were to provide up-to-date information over an extended crisis period on the movement—or non-movement—of forces and equipment, the potential requirement for flights could become very large. Particularly in times of tension, both parties

could perceive a need for almost daily observation flights over an open-ended period of time. Moreover, were there to be an actual crisis, neither party would want to be placed in a situation where it could not obtain reliable information about important sites or activities because it had to worry about the rate that it was consuming a limited quota of observation flights. Such large numbers of flights, however, would be certain to encounter resistance on both logistical and political grounds. Host country observation planes and crews could only sustain high rates of operation for a finite period. Moreover, the political climate in both countries is such that any observation agreement would have to be subject to relatively tight numerical limits.

A related issue is the periodicity of flights. If scheduling is simply on an “as needed” basis, each country might feel that some political stigma is attached to making the initial request, as was the case with unscheduled hotline calls. One way around this situation, which also offers a means of addressing some of the

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issues raised above, would be to set up a certain number of regularly scheduled flights—say, one every two months—which would be flown automatically, without request. The countries could then agree on a number of flights outside this quota, which could be used on a reciprocal basis in times of increased tension if either country felt the need to reassure itself with more intense observation. They might, for example, agree on twelve such unscheduled flights each, to be used as needed—although for logistical reasons there would need to be a limit on how many could take place in any given month. This arrangement could provide “surge capacity” for periods of tension, with a limitation to avoid straining the resources of both sides.

## **Aircraft**

We have already explained our view that only aircraft operated by the host nation would be authorized to conduct observation missions under a cooperative program. India and Pakistan would therefore each be able to choose the particular aircraft which they would use for the observation flights over their own territory. An observation aircraft of this type must be large enough to carry not only the cameras and related equipment, but also the host country crew and the representatives of the other party who would be carried on board as guests. To insure that an aircraft were ready for operations at all times, each country would probably have to designate

and equip both a primary and a back-up aircraft. The internal configuration of the aircraft might, at a minimum, provide work space for both host country and observer teams of approximately four people each, in addition to the host country's aircrew; dual sets of computer screens to automatically track the route of flight and the areas to be photographed; and links to the global navigation system. As discussed in the notes on sensors and processing below, the planes would require a dual set of cameras (and other instruments if included) so that each party could receive a negative of the same pictures.

### **Flight Planning**

Although all observation flights would be conducted by host country aircraft flown by host country crews, the flight route would be planned in advance by the party requesting the flight. As discussed above, the maximum length of an observation flight and the area subject to coverage would be fixed by mutual agreement of the parties. Within those parameters, the party requesting a flight would draw up a detailed flight plan, starting from a designated airfield in the host country and setting forth the headings and turning points of the route that it wished the host country aircraft to fly. The flight plan would also indicate the points at which photography is requested. The country requesting the flight would present this plan to the host country in advance of the flight, giving the host country time to prepare the crew and to notify air traffic control authorities along the flight route.

If the flight plan were consistent with the agreed length and area of coverage criteria, the host country would implement it as written. The parties could, however, provide for amendments to the flight plan to deal with unforeseen circumstances. One such possibility, for example, would involve a host country military training exercise involving live firing of missiles or maneuvering of combat aircraft which could pose a danger to the observation aircraft. In this event, the host country might propose an amendment to the proposed flight plan to route the observation aircraft around the affected area, or to change the time of its arrival over the affected area to avoid danger from the exercise activity.

## Sensors

The most important sensor to employ for a cooperative aerial observation program would be a high-quality optical camera. This camera would provide the broadest range of general purpose information. It is the simplest and least expensive system meeting the requirements of a cooperative effort, and the interpretation of its output is relatively straightforward. A case might be made for the inclusion of other sensors in addition to cameras. For example, a synthetic aperture radar would give the observation missions an all-weather, day and night capability which optical cameras lack. The parties

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might decide that such additional capabilities were important to have. We believe, however, that a successful observation program devoted to risk reduction could be operated with optical cameras

alone. Moreover, we note that the technical aspects of establishing a cooperative observation program involving radars or other sensors could be significantly more complex. In any event, a program based on optical cameras would be a logical initial step, and radars or other sensors could be considered for eventual subsequent introduction if the parties so desired. Each party would be responsible for outfitting its own observation aircraft with the agreed equipment. Third parties might wish to offer relevant equipment or technical advice on its installation as a means of facilitating the implementation of the agreement.

To ensure equality of observational output, India and Pakistan would need to agree on the specifications of the camera systems to be installed on their aircraft. Apart from the overall optical and mechanical quality of the system, which we take as given, the primary factor to be considered is the resolution which the camera is capable of achieving. Both parties would want to ensure that the cameras installed on the other party's aircraft were capable of producing imagery with a certain minimum degree of resolution. Moreover, both parties would want to ensure that the required degree of resolution could be produced from a specified altitude above ground. The higher the altitude above ground from which the camera system can produce the desired resolution, the larger the area which can be effectively photographed from the aircraft on a given track. At lower altitudes, more flights would be required to cover the same areas on the ground, which would not be efficient from the point of view of either the host country flying the missions, or the visiting country, designing the flight plans. For calibration purposes, the

parties might set a nominal standard operating altitude—say for illustration, 20,000 or 30,000 feet. This would not limit the activity of observation aircraft during actual missions. It would, however, provide a yardstick for assessing whether or not the optical cameras met the required resolution standards.

In practice, modern aerial cameras can produce almost any desired degree of resolution from such altitudes. The parties would have to determine what minimum level of resolution was required to provide the information needed for risk reduction. They would also have to determine whether this minimum level should also be considered a maximum, or whether higher quality photography would be acceptable or desirable. The answers to these questions depend on the parties' assessment of the indicators they would need to identify to provide valid assessments of what is taking place on the ground. At one end of the range, for example, the parties might decide that they needed an ability to recognize that an object on the ground was a tank. In this view, being able to identify the presence of tanks in a given area, or their movement from one area to another, could be an important indicator of military developments.

The ability to spot a tank was the minimum level of resolution specified in the European Open Skies Treaty. In optical terms, this capability was set at one-meter resolution. The reason for the choice, however, was not that the parties felt that it would provide an adequate level of information. Rather, this was the finest level of resolution that the former Soviet Union was

then prepared to accept. The other parties decided to compromise on this limited capability as better than nothing. They believed at the time, however, that much finer degrees of resolution could provide important security information. In our view, a greater degree of resolution would also be beneficial to India and Pakistan.

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For example, if it were possible for both parties not simply to recognize a tank as such, but to differentiate between different models of tanks, armored personnel carriers (APCs), and artillery pieces, they would be in a much better position to ascertain the kinds of military units that were moving or deployed. Or, for example, if it were possible for both parties not simply to recognize an aircraft or a missile launcher as such, but to identify the type of aircraft or missile launcher, they would have a much more accurate understanding of the implications of

the movement of aircraft or missiles, including both conventional and nuclear-capable systems. Since risk reduction depends on the quality of shared information, both parties would benefit from significantly better standards of resolution as a general proposition, perhaps to a level of a half or a few tenths of a meter.

At the same time, however, both parties might be concerned that beyond a certain point, high resolution photography could reveal important technological secrets. In addition, the parties might believe that such high levels of resolution would not be required to achieve generally agreed risk reduction objectives. In this event, the parties might want to set a threshold level for highest degree of resolution permissible under the cooperative observation program. Where this point lies would be a matter for discussion between the parties. There is occasionally a fine line between the ability to distinguish between one piece of equipment and another—which is clearly important to risk reduction—and the ability to observe important technological innovations on those systems, which the parties might not want to expose to analysis. Some models of systems are very close to other models of the same system, and their distinguishing characteristics are only visible at very high degrees of resolution. These cases obviously would present difficult issues for decision by the parties. From a risk reduction point of view, the safest approach would be to start with the requirements for identifying types of tanks, aircraft, artillery, missile launchers, and APCs, and then work backwards where and as necessary to protect sensitive technologies. The objective of such a process should be to ensure that both parties have the maximum possible ability to identify particular pieces and models of military equipment, and that this ability is not infringed except for genuinely overriding reasons of national or technological security.

## **Processing**

As noted above, host country observation planes would have to be outfitted with dual cameras, so that each party could receive a set of the film negatives immediately at the conclusion of the flight. If other sensors in addition to optical cameras were employed, these would also require dual recording systems. No information would be transmitted from the observation plane in real time during the flight. After the observation flight, the host country and the visiting country would each be separately responsible for developing and analyzing the set of negatives or other data which they had received from the flight. In the case of the visiting country, this would mean that processing would not begin until the visiting country observer team that had participated in the flight on the host country aircraft had returned home. Each party would be able to draw on preexisting photo-interpretation capabilities.

The provision for dual sets of negatives or other data ensures that both parties would have the identical raw material regarding the area under observation. On the one hand, this could provide an essential basis for discussion should the visiting party wish to pose questions to the host party regarding something that was seen on the flight. On the other hand, it would serve as a protection for the host party against potential claims that something had been seen on a flight which was not, in fact, there. As such, the existence of dual sets of material could work as an incentive for careful evaluation of the situation. As with the photographic equipment, third parties might wish to offer relevant processing equipment and training to both sides. It would even be possible to seek third party expertise in analyzing photographs. One way of doing this would be to have a single outside party—perhaps an agreed neutral international body—examine the photographs and provide identical reports to both sides. At present, this would appear to be out of step with the bilateral character of most successful Indo–Pakistani agreements, but it is one further option the countries could consider.

## **Dispute Resolution**

No observation program anywhere in the world has ever functioned perfectly. It must be expected that there will be disputes and possible misunderstandings over the operation of even the best designed program. If a camera malfunctions, for example, parties could disagree as to whether sabotage were involved. If a flight is diverted because of weather, for example, parties could disagree as to whether this was a necessary decision or an opportunistic means of avoiding observation. In looking at the pictures from a flight, one party might conclude that the other party had resorted to excessive camouflage in an effort to create a misleading impression of force deployments.

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These and other potential misunderstandings could well arise during the operation of an agreement. However, because each occurrence would reflect unique circumstances, and because each party would necessarily have its own views of the situation, there can be no guaranteed

formula for resolving disputes. Rather, the parties would have to agree that, in the event of disputes, they would devote their best efforts to remedying the particular problem and to ensuring that it does not happen again. The incentive to succeed in such efforts would be the

mutual interest in preserving the overall observation program. One way to facilitate consultations regarding the implementation of an agreement would be to establish a bilateral mechanism, where the parties could raise and discuss questions as they occurred. Such a mechanism could defuse some potential problems at the technical level. At the same time, it would not infringe on the ability of the parties to draw their own independent conclusions from the operation of the cooperative observation program including, most importantly, their own conclusions regarding the security-related information provided by the program.

### **Misuse of Information**

Some observers might fear that information gathered through cooperative aerial observation might be used to plan a disabling first strike. In such a scenario, observation flights would be used to pinpoint the location of certain high-value targets. Such targets would include, in particular, all elements of the respective national nuclear programs, nuclear-capable missile and aircraft delivery vehicles, and major ground force units. Both countries are likely to be very sensitive to this type of risk. However, they overcame very similar security concerns when they signed the agreement not to attack each other's nuclear installations and exchanged lists of the covered installations. In any event, the notion that it would be possible to pinpoint the location of any particular category of military equipment, even nuclear-capable delivery systems, greatly underestimates the complexities involved in the task. Since covering all potential sites within the national

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territory of the two parties would require separate observation flights over a period of weeks and months, neither country would be able to compile a truly comprehensive, up-to-date target set. This would be the case even if the parties were to agree to cooperative observation of their entire national territories. If, as discussed above, the parties decided to provide for observation of relatively narrow border areas or some other limited area or list of sites, then the possibility of comprehensive coverage becomes even smaller. Secondly, as noted previously, no country is going to undertake the risk of attempting a preemptive strike without far more certain knowledge than cooperative observation—or any other observation system—could provide. Even if an attack could be executed perfectly on all identified targets—which is improbable in the extreme

as an operational matter—the costs of missing a single delivery vehicle because of an incomplete or out-of-date list would be catastrophic.

Similar considerations would apply to fears that information from cooperative observation might be used to orchestrate an attack on the conventional forces of the other party. In this case, while the consequences of missing an individual aircraft or ground force target would not be as severe, the sheer number of potential targets, and their ability to move before, during, and after any period of observation, means that the likelihood of successfully targeting of any significant percentage of them using information derived from periodic cooperative observation is very small.

## **AN OBSERVATION TIMELINE**

Preparation for an observation mission could begin with one of the parties, which we will call the “visitor,” preparing a flight plan covering sites in the territory of the other party, which we will call the “host.” Once that plan was complete, the visitor would notify the host that it wished to have an observation flight conducted. In this initial notification, the visitor would identify the airfield in the host country from which the flight would depart. After a fixed interval following the notification, at most perhaps twenty-four hours, a group of four or five visiting observers would arrive at the host country’s airfield from which the flight was to take place. This visiting party might arrive by land, if the airfield were close to the international border between India and Pakistan, or by air. In either case, the time and method of arrival would be agreed upon in advance between the parties.

Immediately upon arrival, the visiting party would present a copy of the flight plan to the host country’s representatives. There would then be an agreed interval of a few hours, to give the host country time to notify its air traffic control system of the route of the flight and to prepare the observation aircraft and crew. In practice, this interval would also give the host country an opportunity to notify military installations and other sensitive facilities along the route of flight. Such advance notification could result in some sensitive equipment being moved under cover or some observable activities being postponed. It is unlikely, however, that either party would be able to use this short interval to hide major force movements. At the end of the interval, the observation flight would depart.

On board the host country aircraft would be the host country flight crew, a host country observation team, and the visiting country observation team. Both observation teams could

consist of four or five persons. During the course of the flight, the two observation teams would keep track of the route of the flight, checking it against the flight plan. The observation teams would also be responsible for ensuring that the photographic equipment was operating correctly and that pictures were being taken at the desired locations. Actual operation of the cameras would be automatic, in accordance with pre-programmed instructions provided by the visiting party.

Assuming there were no mechanical or other difficulties during the flight, the observation plane would return to its original base on conclusion of the flight. The total flying time could be several hours, depending on the distance covered and the speed of the aircraft. If necessary in cases where a particularly long mission might encounter darkness before the observation flight was completed, the parties could arrange to schedule an interim overnight landing. Upon return to the original airfield, both the visiting and host parties would receive a set of negatives from the dual cameras on the plane. The visiting party would take its set of negatives and return directly

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to its country the same way it arrived, either by land or by air. Both parties would then proceed to process the film in their own facilities. There would, however, be no agreed timeline for the processing operation. Nor would there need to be any agreed timeline for the subsequent interpretation of the resulting photography. Each party could decide its own priorities for processing and interpretation, depending on its perception of the situation.

Once the photography had been analyzed, the visiting party would draw on that information to build its understanding of the current military situation. Again, there would be no prescribed or agreed timeline for the assessment process. If, for example, the photography indicated significant changes in the deployments of host country military forces, the visiting country might decide to move rapidly to seek further clarification or to take offsetting steps of its own. Conversely, if the photography indicated no significant change in host country positions from what had been observed on earlier occasions, the visiting country might conclude that there was no near-term need to alter its own dispositions or take other urgent action. In either case, the results of the photography would only be one input into the decision-making process of the visiting country. The timeliness and objectivity of that input, however, could be of great importance for the security of both parties.

## CONCLUSION

Any program of cooperative aerial observation would require India and Pakistan to overcome major political challenges. The military establishments in both countries are

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accustomed to guarding information, not sharing it, and popular opinion has not been prepared for the change in philosophy inherent in a program of this sort. Putting a program in place would involve difficult negotiations. We believe, however, that there is sufficient flexibility inherent in the nature of such a program—including the prohibition of overflight of either party's

territory by foreign aircraft, choices of areas of coverage, varying numbers of flights, and other factors—to meet the political and military needs of both sides.

Most importantly, we believe that a program of cooperative aerial observation would offer immediate, tangible security advantages for both sides. Some of these advantages are direct, *e.g.*, each country would acquire information for itself, thereby refining its own assessment of the situation. Other advantages are indirect, including the development of working relationships with counterparts, and the chance to correct potentially dangerous misperceptions held by the other side. In combination, these advantages would provide the leaders of both countries a flexible tool to reduce the most serious threat to their national security, while strengthening their respective national capabilities to assess and control potentially dangerous developments.