

## JAPAN

### VERIFICATION OF COMPLIANCE IN ARMS CONTROL AND DISARMAMENT AGREEMENTS

1. The Government of Japan has consistently stressed the importance of taking, step by step, such concrete measures as are feasible under the current international situation, with a view to achieving the ultimate objective of general and complete disarmament under effective international control. Needless to say, such concrete measures as are feasible will not contribute to genuine disarmament and arms control unless they are equitable, mutual and accompanied by appropriate verification measures. Verification measures are important in that they assure the effectiveness of disarmament and arms control agreements, and build confidence among the parties concerned. Inclusion of the verification procedures does not necessarily mean that the parties will commit acts of violation of agreements or the verification procedures will be operated in hostile and adversary atmosphere. But, at the same time, capabilities have to be provided for so that they can cope with various scenarios of possible violations. For this purpose, it is essential that scope (boundary conditions) of prohibition and/or other actions regarding prohibited weapons or related materials, facilities, etc., are clearly defined in the agreements. This is because violation scenarios are likely to be somewhat different from one prohibited item to another.

It is important to realize that verification in this sense:

- (1) has an element of a confidence building measure in that it works most effectively when operated in the atmosphere of co-operation, and that it is intended to ascertain and continue to confirm that the good faith with which parties entered into the agreements will always be maintained.
- (11) is often conceptualized as a means to deter violation of the basic confidence by providing credible technical means to detect possible acts of violation, and
- (111) should be so designed as to avoid unnecessary confrontations and create confidence by providing for appropriate mechanism of consultations, and thus promote general co-operative atmosphere in which disarmament in general can make further progress.

2. This leads to the question as to what happens when violation is proven to have actually taken place and have been so detected. This is an extremely delicate question both conceptually and in reality. One may talk about applying sanctions, but this can, depending on cases, be an extremely complex issue, because:

- (i) if violation was intentional, then the basic confidence on which the original agreement was made may no longer hold, and the party involved may be preparing itself toward abrogation of or withdrawal from the agreement,
- (ii) as history seems to bear out, it may be impractical to apply effective sanctions,
- (iii) international institutions to decide sanction application may be faced with a very complex task, and
- (iv) in the currently available technical means of verification, there are always some probability of errors and uncertainties in observation or measurement, while violations that are likely to give problems are those with considerable probability of detection errors. It will be difficult to take institutional punitive actions on the basis of a probability-based statement such as "there is a 90 per cent probability of violation".

Verification provisions need to be considered thus:

... with the aim to maximize technical effectiveness so that they are as objective as possible and free from subjective judgements, and a certain degree of cost/effectiveness should also enter into the picture,

... with the design so that a high probability of detection is available (often 90 per cent probability is mentioned) even for border-line cases, and that for probability-based verification more emphasis is placed on the detection of trend rather than dwelling too much on individual suspicions, and

... with a provision and mechanism, such as Consultative Committee, through which a party or parties concerned will take positive actions in order to clear whatever "suspicions" that might arise and re-establish the confidence as quickly as possible.

3. There are four kinds of verification approaches, namely:

- (1) negative verification: to ascertain that no violation has taken place (such as non-production of prohibited materials or weapons),

- (ii) positive verification: to confirm that the promised actions have been carried out (such as destruction of prohibited stockpile),
- (iii) verification applied to discrete objects in which counting becomes the major tool (such as a number of deployed weapons, silos, production facilities),
- (iv) verification applied to continuous objects in which measurement becomes the major tool (such as materials or chemicals either in production or store).

It can be seen, and have been so experienced that:

- (a) Combination of positive and discrete is the easiest, such as the destruction of designated missiles, where simple on-site verification of the acts of destruction should be adequate,
- (b) Combination of negative and continuous is the most difficult, such as the non-production of weapons grade nuclear materials or super-toxic lethal chemical agents above and beyond permitted quantity and for non-permitted uses,
- (c) Sometimes boundaries are not clear between continuous and discrete, such as in the case of manufacture of chemical or nuclear warheads from prohibited or restricted materials.

There are also some related problems. This will involve a question of whether acts which would clearly lead to the prohibited activities should be treated as a sufficient evidence. For example, whether training and preparation of a certain type of warfare should trigger an international alarm is a question often taken up in the verification community.

4. It is usually more practical that a convention gives general framework of verification provisions and leaves the details to experts in the field. The outcome of the experts' work should be brought back for integration into the agreement so that the technical provisions are in conformity with the framework provided for in the Convention. This is often due to the difficulties of communication between legal and technical communities. When political agreements are translated into legal terminologies they sometimes become technically imprecise, and the opposite can also happen.

An example may be Article III of the Nuclear Non-Proliferation Treaty (NPT) which entrusted the safeguards to IAEA as a package and without much detailed specifications. IAEA, in turn, took more than a year's international deliberations by experts to work out details. NPT safeguards are relatively simple in that it has to control only two chemical elements, namely Uranium and

Plutonium. Whereas, it is very complicated in that different concentrations of different isotopes of these elements can have both military and peaceful applications. The exercise by the IAEA ended up in more than 100 articles' separate agreements (INFCIRC 153) as well as a continuous flow of technical papers since.

Verification procedures for other arms control and disarmament agreements will encounter different kinds of problems, but there are certain features in common, which will be discussed below.

5. Interactions between "scope" of the agreement and its "verification" have to be considered in the following manners:

(a) On the first instance, only those activities that are meaningfully verifiable may be included in the scope. In this context, in most of the cases only those materials and facilities declared by a State party may effectively be taken up for the purpose of verification activities. Undeclared or clandestine activities, materials or equipments do not usually come into the picture except when they happen to affect visibly the portion under verification activities, or happen to be detected through national technical means.

(b) At the same time, verification should be so designed that effects from clandestine activities, if any, are bound to become as visible as possible so that by-challenge verifications may be triggered. It is the basic assumption of the arms control and disarmament agreements that any undeclared or clandestine activities are also prohibited.

(c) There is often some quantitative lower limits below which verifications become technically meaningless. An example is measurement uncertainties or error, especially when measurement is carried out not directly on the events or substance in question but on derivatives (example: radioactivity measurement of uranium or plutonium, residual measurement of chemical agents being destroyed, seismic determination of underground nuclear tests). It is not unusual that in scientific measurement a compounded error arising from human and instrument uncertainties is in the order of 0.1 per cent or more, and when the material throughput is large, 0.1 per cent accumulated can become a large number. This situation requires that a certain threshold is implied in any verification. There is also eventual need to agree on internationally accepted standards of measurement.

(d) Lower limits of detection probabilities arise from random sampling verification technique (not continuous on-site inspections). As the number of sampling increases, probability of "not detecting violation" decreases, but never becomes zero, and there is a law of diminishing returns regarding increased efforts.

(e) Some of the facilities, equipments or materials may involve a certain amount of difficulties regarding direct access by outside inspectors because:

- (i) they are military classified so that their revelation may endanger national security and/or raise proliferation risks,
- (ii) they involve high degree of safety hazard.

Of course, it goes without saying that these reasons should never be used as a pretext to avoid inspections. However, even in these cases the problem can be resolved, for instance, through indirect scientific and technical conjectures, such as is the practice in the case of radioactivity measurements for nuclear materials. Some such means will have to be devised, for example, to ascertain that a declared super-toxic lethal chemical agent is really what it is declared to be. Satellite observation may also be termed an indirect verification.

(f) In the case where the boundaries between civilian and military uses are only conceptually clear but are difficult to define in practice, the problem of disturbances on legitimate industrial activities becomes a serious problem as many countries have experienced under IAEA safeguards. No country will easily consent to exposure of significant sections of its industry (often with proprietary information) to an outside agent. Means will have to be and have in the past been devised to circumvent this issue.

(g) Both military and civilian technologies, as well as technology for verification are under constant process of evolution. It is important that a mechanism is provided for review of relevant technology to update and upgrade the cost/effectiveness of verification. It is also very important that such technical review should put an emphasis on the avoidance of competition in abstract between "impractical but conceivable cheating methods" and "sophisticated technique for catching them".

6. The foregoing discussion concentrated more on difficulties, but this of course does not mean that verification is not feasible. Different kinds of verification measures are conceivable and they should be mixed in application so that the over-all efficiency will improve. Some techniques that are particularly effective in some cases may not be practically applicable in certain other cases, and this is another reason for the need for multiple approaches. The following are examples (not necessarily exhaustive or in the order of importance) of different approaches.

(a) National technical means - those contemplated in the first instances in SALT or nuclear test ban are of this kind. Verification of use may fall into this category also unless other international measures can be developed and agreed upon in future. A question that needs to be addressed is whether, how, to what extent and with whom information from this means should be shared and confirmed. Finding or suspicion of violation through this means can form a basis to trigger verification by challenge.

(b) National system of record keeping and report preparation (accompanied by national on-site inspections if appropriate) can, if available, become a very useful national contact point for the purpose of international verification. It will help, but cannot take the place of international verification.

(c) International checking of record and report will allow effective planning of random on-site international inspection activities in that a smaller number of such inspections will achieve the higher level of confidence.

(d) International on-site inspections (on a systematic or random basis) are in most of the cases a necessary feature for the objective verification of the compliance either in its positive or negative sense to provide deterrence against non-compliance. An ad hoc international on-site inspection on a challenge basis triggered by suspicion (either through national technical means, record and report checking, or random on-site inspections) should be provided for. Usefulness of this mode of inspection will vary from case to case. Detection of preparatory activities for prohibited purposes is one thing, detection of fait accompli will be another. Going back to the starting point of what verification is, in addition to the agreed system of routine inspections, such ad hoc inspections should be accepted by the parties as a means to clear suspicion and restore confidence.

Whether international on-site inspectors should be allowed independent measurements, or merely allowed to observe a part of measurement activities, or only through black-box approach has to be considered depending on the nature of events to be observed and in accordance with considerations of 5 (e) and (f) above.

It is most desirable that in all cases these verification measures be all included in any disarmament agreement.

7. Whether there should be an international body entrusted by the parties to the convention with the authority to:

- (a) conduct checking of national records and reports,
- (b) receive and compile data from national technical means,
- (c) conduct on-site inspections,
- (d) carry out analysis and evaluation of data,
- (e) make statements regarding probabilities of compliance or non-compliance.

is a matter of considerable difficulties in the descending order of the above list of functions. The body should have high technical competence to carry out objective technical functions, present the findings in an objective and unambiguous manner, but leave the case thereafter to the international community as such. Of course it will be a part of the required function of such an international regime to arrange for consultations and co-operation, informing the parties of the various incidents, as well as to review relevant verification technologies from time to time.

8. A number of points have been considered above that are important and often essential in designing an effective system of verification. There are other problems such as methods and format of declarations, time periods for advance notifications, rights and duties of international inspectors. This paper did not touch upon these issues because they are fairly well known to the international community. Nor is it the intention of this paper to say that arms control negotiations should consider all the legal or technical problems of verification into their details. It will, however, be important that those involved in negotiations on verifications would bear in mind the general nature of such problems so that the correct framework may be arrived at in the text of any such agreement.