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Verification and Disarmament As delivered

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by Hans Blix, Director General emeritus of the IAEA

To-day we are used to a variety of international 'presences ' in the domestic sphere of sovereign states - to observe elections or respect for human rights or mundane matters like food standards.

In a world moving toward less weapons on site verification of the respect for obligations assumed in the field of arms control and disarmament is one of the most important categories of such presence. Public opinion seems not the least surprised that an international crisis erupts when Iraq raises obstacles to inspection of the President's many palaces. While I fully concur in the categorical insistence on access that led to the crisis, I would like to note that verification and on site inspection are comparatively new activities, that acceptance of them have not come that easily and that many reservations exist. Some are perfectly understandable and legitimate, others may seem exaggerated and many constitute obstacles to the effectiveness of the verification.

In no area are States as jealous of their exclusive power as in the control of their territories. It is reported that in the 19th century Turkey objected to the stationing on its territory of an international "sanitary station" to help prevent epidemics being spread by pilgrims going to or from Mecca. Turkey held this would be against her sovereignty.

Before the nuclear era verification and on site inspection were rare and mainly based on commitments imposed on vanquished states. *Prohibitions of use* of particular weapons, like the ban on the dum-dum bullet or the ban of 1925 on chemical and bacteriological weapons mostly did not require permanent verification mechanisms. Violations would be evident or could be handled with ad hoc arrangements.

Prohibition of possession and restriction in the possession of weapons, especially nuclear weapons represents a more ambitious approach than prohibition of use and while a violation of use could - at least in theory - be countered by immediate retaliation in kind reactions to violations regarding possession of weapons might need time. Early warning would thus be important.

For many years during the Cold War the discussion of verification was stale. Whether because they were firmly opposed to any foreign inspection due to old sovereignty concepts or due to a need to conceal weaknesses, or both, the Soviet Union and its satellites rejected meaningful inspection. I can well remember what was called the "bonfire" concept under which the Soviet Union advocated "effective verification" of general and complete disarmament. The inspectors would be invited to count the weapons or tanks or other equipment collected and see with their own eyes how they were destroyed. But there would be no right to verify that new and better tanks, weapons or equipment were not simultaneously produced. That would constitute *espionage!*

To-day I find it tempting to see a *cut-off agreement of the production of fissile material* as a necessary complement to agreements which limit the number of nuclear weapons and which result in verification of excess fissile material from dismantled weapons. Not only should one verify the draining or - currently more realistically - the reduction of the pool of weapons. One should also verify that the tap is closed.

As we know modern technology in the shape of the *satellites* helped inaugurate modern verification. International law told us that the satellites circled the world at levels above and beyond national sovereignty. Although there were certainly many who wanted to brand their activities as espionage and destroy them, they were more difficult to reach than the U 2 planes which, moreover, flew through the air space belonging to states. When the mutual confidence became a desirable commodity to the superpowers, the merits of satellite surveillance became evident. They go a long way to prevent surprises and they do it elegantly, without any intrusiveness on the ground and without complex negotiations.

Satellites remain an important tool to assure a good deal of transparency in the armament area. A Soviet satellite discovered the South-African preparations for a nuclear test in the Kalahari desert in 1977 and US satellite pictures were of great value to show the Board of Governors of the IAEA relevant nuclear installations in the DPRK. At the time a few members of that Board were reluctant to accept this type of evidence. However, as satellite imagery becomes available from several states and even on commercial bases, I think this reluctance will give way. Nevertheless, one should not be lulled into confidence that everything is surveyed and detected. The Argentine enrichment plant at Pilcanyio was not seen before it was announced by the Argentine government and the large research reactor, which China helped Algeria to build apparently was not spotted until several years into the construction. The recent Indian nuclear test preparations were evidently sufficiently well concealed for satellites to spot them.

The *safeguards system of the IAEA* was the first institutionalized international on site verification and inspection system that evolved - from the beginning of the 1960's. During a little more than 35 years it has developed from a tiny activity into a large

professional operation engaging some 600 people at the IAEA and costing some 90 million dollars per year.

It met considerable resistance and skepticism in the beginning. There was concern in some quarters that technical and commercial secrets in inspected non-nuclear weapon states might be divulged by inspectors and that these states' nuclear industry would be at a disadvantage compared to their competitors in the nuclear weapon states which were not subject to inspection. The UK and the US responded to this criticism by voluntarily offering to open all their peaceful nuclear installations to safeguards. The other three declared nuclear weapon states followed these examples, albeit with more restricted offers. Despite recommendations by NPT review conferences that these offers be fully utilized, budget constraints have severely limited inspection in the five states. The offers have been used mainly to familiarize the IAEA with different types of nuclear installations that might be exported. The opportunity to bring about a greater measure of safeguards equality between NWS and NNWS stranded on cost.

This is not the place to go into detailed technical descriptions of the facility specific safeguards under INFCIRC 66 and the comprehensive safeguards under INFCIRC 153 and the modernized safeguards under INFRCIRC 540. However, I must point to some main features and add a few comments.

A first comment is that skepticism on the industrial side has largely subsided . To our knowledge there have been no revelations of industrial or commercial secrets and cooperation between the IAEA and nuclear industry is mostly excellent. An industrial association, like the Uranium Institute, has been most supportive of non-proliferation and safeguards and has been aware that credible safeguards are a precondition for international trade in the nuclear field.

Yet, the experience of transforming the 93+2 IAEA Secretariat program into a Board approved additional protocol demonstrated that there was still reluctance among many states to give but the most evidently needed conveniences or prerogatives to the inspecting organization. To take just one example: While the CWC stipulates that visa shall be given to inspectors for at least two years, the same provision to strengthen the independence of inspectors of IAEA and to facilitate unannounced inspections, was not accepted. One year was the best that could be had...

A second comment is that member states have contributed much to the development of the system by *support programs*. Much research has been carried out in national laboratories with vast capacities and many new measures have been tested on a voluntary basis in various member states—not least in the context of trying out elements of the 93+2 program.

Now to some of the main features in the IAEA safeguards verification system that non-nuclear weapon states parties to the NPT are obliged to accept.

It is based primarily on *accountancy* of nuclear material under the jurisdiction or control of the inspected party. The accounts are checked for consistency and for reflecting the reality. Although it is a highly professional system, it has been criticized for being somewhat mechanistic, too much concerned with *quantitative assessments* and too little with qualitative judgments.

David Fischer, former assistant DG of the IAEA , said somewhat sarcastically last year that proliferation was not likely to come through the scraping of teaspoonfuls of plutonium in a safeguarded reprocessing plant but rather through wholly clandestine plants. This is probably true. Yet, precisely at this juncture when the value of *zero tolerance* for law and order is so widely acclaimed, perhaps one should not minimize the importance of strict accountancy of nuclear material. Order, discipline and precision are qualities we wish to see in the handling of enriched uranium and plutonium. And if the teaspoon scraping is not a likely path for nuclear proliferation by a state it might yet be troublesome in the context of trafficking.

The quantitative approach also has had some advantages in that it protects an intergovernmental organization from accusations of treating inspected parties unequally. While the police in a city may put more efforts in crime ridden areas, an international organization based on the *sovereign eauality* of states cannot allow itself to assume that some members are lesser proliferation risks than others. It cannot act on trust anywhere.

It is true that the INFCIRC 153 safeguards system did not preclude *special inspections* anywhere beyond declared facilities. Yet, no such inspection was demanded before the revelations in Iraq. Inspectors neither could - nor were they entitled to—go roaming in the territory of states in blind search of clandestine installations. Perhaps even more importantly, however, was that there was no information suggesting a need for any inspection beyond the declared installations, nor any system for collecting such information.

Worse still were the limitations imposed upon the state authors of the safeguards system that routine inspections should be limited to *strategic points* in declared installations. Perhaps the logic of this could be defended by reference to the focus on nuclear material rather than on installations, but it certainly sent a signal urging constraint by the Agency.

While it would be unfair to suggest that no evolution took place in the safeguards system of the IAEA prior to the *revelations in Iraq*, these became a watershed. All understood that the system, to be meaningful, would have to be given more teeth. Modifications which until then would have been unacceptable to the majority became possible. It was realized that to have a verification system which had serious deficiencies might be more dangerous than having none, because it might lull neighbours and the world at large into a misplaced confidence.

Perhaps the Secretariat's reports on safeguards implementation (SIR) deserve some criticism for glossing over the important limitations in their reach while being detailed on many minor shortcomings.

Here is what the IAEA SIR for 1990 (submitted in 1991) stated about Iraq:

"In carrying out the safeguards obligations of the Agency in 1990, the Secretariat, as in previous years, did not detect any event which would indicate the diversion of a significant amount of *safeguarded nuclear material* ... It is considered reasonable to conclude that the *nuclear material under Agency safeguards* in 1990 remained in peaceful nuclear activities or was otherwise adequately accounted for. ..."

By the expressions 'safeguarded nuclear material' and 'material under Agency safeguards' the Agency meant *"material placed under safeguards" or "material declared for safeguards"*. However, literally, they could well have been taken to mean "material which the State was obliged under its safeguards agreement to declare and place under safeguards." If so taken, the language used went beyond what the Agency really could testify to.

In the SIR for 1991 (released in 1992) - the year that the clandestine installations were found by IAEA inspectors after the Gulf War – the language was modified, Reference was now made to *"nuclear material placed under Agency safeguards"* and it was noted that

"Iraq had not complied with the obligations of its safeguards agreement to declare certain activities and place all relevant material under safeguards."

The modifications made in the language of the IAEA reports between 1991 and 1992 reflect a care to be precise about the *limitations of safeguards.* Subsequently the IAEA has sought to maintain this prudent attitude . Regardless how propitious the conditions of verification have been, there will remain some elements of uncertainty when you are asked to testify about the absence of readily concealable objects or activities on a country-wide basis. Even in the case of South Africa , where the cooperation of the authorities with Agency inspectors was most extensive, the conclusions of the inspectors stated only:

"The team *found no evidence* that the inventory of nuclear material included in the Initial Report was incomplete." (Report of 3 September 1992. GOV/ 2609, para. 31).

However, as I had occasion to say in an informal meeting of the Security Council on 16 October last year (1997) - after six years' of the most extensive investigations in Iraq with unparalleled access to sites and documents -

"...when the Agency reports that it has found no indication of activities, facilities. Or items, this does not amount to an assertion that there is none. ... The probability that 'no indication' corresponds to 'non-existence' depends upon how intrusive, extensive, systematic and skillful the investigation was that gave such result. *Judging*

that probability is not a technical matter. Even less so deciding what level of probability is required.'

There are other limitations on the IAEA safeguards verification system than the inherent impossibility of reaching 100 % certainty and the almost inherent impossibility of knowing something about the future *intentions of a government.* Some of these are in all likelihood relevant also for other verification systems. I have in mind, particularly

significant quantity, and
timely detection.

Theoretically it might perhaps be possible to design verification systems that are extremely fine meshed - the operations in Iraq are –but both considerations of cost and of the risk of irritating false alarms suggest some moderation in the devising of general systems. The moderation is not totally free of risk. The spoonscraping of plutonium is unlikely but cannot be entirely excluded and we saw in Iraq how the leaders involved were calculating some action to take place immediately after an IAEA inspection to give maximum time before it was detected at the next inspection.

To give you an idea of how intrusive and fine meshed the IAEA inspection regime under Security Council mandate in Iraq is, let me cite from the exchange of letters of 14 May 1991 between the SG of the UN and the Iraqi Foreign Minister. The inspectors working in Iraq should have, for instance:

-unrestricted freedom of entry and exit without delay or hindrance;

-unrestricted freedom of movement without advance notice within Iraq...;

-right to unimpeded access to any site or facility for the purpose of on-site inspection...

-right to request, receive, examine and copy any record, data, or information...;

-right to install equipment or construct facilities for observation, inspection, testing or monitoring...;

-right to take photographs whether from the ground or from the air...;

-right to unrestricted communication by radio, satellite ...

Under the plan for *future ongoing monitoring and verification in Iraq*, approved by the Security Council in October 1991, these rights were confirmed and some additional prerogatives for the Agency were spelled out, e.g.:

-to stop and inspect vehicles, ships, aircraft or any other means of transportation within Iraq...:

-to inspect imports or exports of material and other items upon arrival or departure;

-to conduct interviews with any personnel at any site...

An inspection regime of this kind is unprecedented and will hardly be accepted except by a State under severe pressure. It has taught us a great deal about techniques of verification and inspection during the past seven years and I should like to point to some experiences which may have a wider bearing, and many of which have been acted upon in the Secretariat's 92+2 program and found their way in the new additional protocol on safeguards.

In my first report to the Board of Governors of the IAEA after the events in Iraq, I summed up the need for a strengthening of safeguards regime through

access to more information

greater access to sites, and, when needed,

access to the Security Council for support.

I shall discuss our experience under those headings.

Information.

A very detailed mapping of Iraq's nuclear weapons program was made possible through the seizing of Iraqi large numbers of documents and the voluntary submission of many others. Interrogation of and 'seminars' with relevant scientists and engineers gave supplementary information and further understanding. Data and information from suppliers was yet another source of great importance. Requirements of data about exports and imports are now part of the strengthened safeguards system. In addition the Secretariat systematically scans the press for any relevant information and a comprehensive analysis of all available information is performed.

For the first time in the Agency's verification activities *intelligence* from individual states became of importance in the Iraqi case. The Agency does not, of course, ever engage itself in any clandestine information gathering. In the case of Iraq S.C. Res. 687 of 1991 stipulated (Para 13) that the Agency should perform immediate on site inspections "based on Iraq' declarations *and the designation of any additional locations by the Special Commission"* i.e. UNSCOM. The idea was clearly that the commission should be assisted by intelligence briefings of member states and on that

basis put the Agency - responsible for the neutralization of the nuclear program - on the right tracks.

While no intelligence organization appears to have known about the Iraqi nuclear program before the Gulf War, information obtained by such organizations from defectors and through other means after the end of the war as well as information from satellite surveillance has been of great significance throughout the Agency's inspection effort.

Receiving intelligence from member states as a part of the information basis of regular safeguards - rather than the Security Council mandated Iraq operation - must follow some strict ground rules to avoid objections from member states. I would state them as follows:

First, the Agency will receive information from any one offering it, but will never use any but its own observations for safeguards conclusions. There is not only information available but also desinformation and all must be critically analysed. Some may help the Agency to look for relevant data or sites.

Second, the traffic is *one way,* i.e. the Agency can receive but not give anything back. The Agency acquires a great deal of confidential information and data from parties to safeguards agreements. This confidentiality must be fully respected.

Third, it is desirable that intelligence - like satellite information - be received from several countries, so that the input is balanced.

Access

I have cited the provisions which govern access for inspection and monitoring in Iraq. Nothing nearly as intrusive is acceptable for a general system of verification among states. However, the limitation of access to strategic points in routine inspections under NPT type safeguards has fallen away. Several other expansions have occurred in the right of access and the possibility of unannounced inspections has increased.

A few words about *special inspections* which are foreseen already in the INFCIRC 153 system (Paras, 73 and 77). There are important differences between the IAEA' rights to special inspections and the *challenge inspections* which can take place under the CWC and the on site inspections which can be asked under the Complete Test Ban Treaty.

In the IAEA safeguards system the *Secretariat* can request a special inspection when it considers that information made available by the State, including explanations, is not adequate. If the State rejects the request, this rejection can be overruled by a simple

majority of the Agency's Board of Governors, deciding that it is essential and urgent to establish that nuclear material subject to safeguards is not diverted to nuclear weapons. Thus a request for a special inspection can only be made if the Secretariat believes on some reasonable grounds that some nuclear material exists which has not been declared or that a facility required to be declared has not been so declared. In the case of the DPRK such a request was made by the Director General , was upheld by the Board of Governors and rejected by the DPRK. As a result the conflict was referred to the Security Council.

The IAEA model gives rather much power and responsibility to the Secretariat. It may be a politically sensitive matter to handle. For states involved , it might have the advantage that a Secretariat will avoid politicizing—if it can.

Under the Chemical Weapons Convention there is, as in the IAEA, a permanent inspectorate that pays periodic visits to the relevant installations. However, here any State Party may request the technical secretariat to undertake a challenge inspection to clarify any questions concerning possible non-compliance with the Convention. Thus, the CWC Secretariat cannot, itself, take the initiative to such inspection. On the other hand, a party requesting a challenge inspection will only need one third of the Council to support it. This system takes the Secretariat out of the hot seat. On the other hand it holds some risk for harassing challenge inspections .

Unlike the IAEA Secretariat which verifies States' compliance with safeguards agrements under the NPT, the CTBT Secretariat does not analyze the material obtained through the various monitoring methods employed, with a view to discovering any anomalies to be followed up. The emphasis is rather on compiling, relaying the data *to Member States* and leaving it to them to analyze the data. If the States find things that need to be clarified they can turn directly to the State on whose territory the relevant event appears to have taken place or to the Director General or the Executive Council of the CTBTO. If States are not satisfied with the clarifications obtained, they - but not the Director General - can ask for on site inspection. Thirty affirmative votes would be needed - out of 51 - to mount such an inspection. A special interesting feature is that the request can be based on data obtained from - I quote - " national technical means of verification in a manner consistent with generally recognized principles of international law." This would seem to make satellite observations acceptable, but espionage reports not.

A special problem relevant in several fields of verification is the need to ensure that *inspectors do not learn what should remain confidential to the inspected state.* For

instance, while verifying that no enriched uranium is diverted from an inspected plant, nuclear inspectors should not learn the techniques of enrichment and while verifying excess plutonium from dismantled weapons the inspectors should not learn about bomb constructions. The CWC is the most advanced instrument in this respect providing for "managed access" which permits the removal of sensitive papers and the shrouding of sensitive equipment unrelated to the subject of the inspection. This approach has been taken over in the Additional Protocol for Safeguards Verification.

Access to the Security Council

There is, generally speaking, no difficulty to bring serious disarmament verification issues before the Security Council, but parties to bilateral agreements might prefer not to do so. After the Council's meeting at the summit level in 1992, a Presidential Statement was issued stating the commitment of the members to work against the spread of technology related to weapons of mass destruction and stressing , in the nuclear field "fully effective IAEA safeguards" and underlining their determination to take "appropriate measures in the case of any violations notified to them by the IAEA."

This message was reinforced by the 1995 NPT Review and Extension Conference which stated inter alia that, I quote:

"States parties that have concerns regarding non-compliance ... should direct such concerns, along with supporting evidence and information, to the IAEA to consider, investigate, draw conclusions and decide on necessary actions in accordance with its mandate."

The division of labour between the IAEA and the CWC on the one hand and the Security Council on the other, is clear: the inspecting organizations are *watchdogs,* wile the Council is the *potential policeman.* I say "potential", because the Council has a wide latitude of action to uphold arms control and disarmament. In Iraq aggression was checked and nuclear proliferation prevented by the intervention of half a million men. In the case of the DPRK possible further diversion of fissile material was impeded by the promised assistance to build two light water reactors...

The cost aspect of verification of arms control and disarmament might seem a trivial matter to the public which would be inclined to think that reducing armaments would save national resources even if, for security and confidence, some resources would have to be devoted to verification. In reality one sometimes gets the impression that at

least *agreement on paying for multilateral verification action* may be as difficult as agreement on the disarmament measures. States are much less reluctant to spend millions - or even billions - on national means of verification than on international ones. Evidently there are powerful institutions in the domestic sphere that will seek such results, while the multilateral mechanisms have no lobbies.

Let me conclude these reflections by submitting that the further arms control and disarmament measures reduce weapons stocks, in particular weapons of mass destruction, the more important verification will become. A reduction froom 10 to 0 will be watched more closely for faithful implementation than a reduction from 1000 to 990. Nuclear weapon states will hesitate to cut their stocks very low if they are not confident that there is no clandestine proliferation - horizontal or vertical. And non nuclear weapon states may be reluctant to reduce their armaments unless they feel confident that the NWS are doing the same. The indispensable basis for success lies in continued global détente and in progress in achieving détente at the regional level as well. However, a hopeful feature is that the last decade has brought a number of new advanced techniques that will be of great help, e.g. remote and automatic transmission of data, which reduces intrusion and cost, environmental sampling, radiometric surveillance. Etc. The satellites were but a good beginning of brave new verification methods.