ASSESSING MOTIVATION AS A MEANS OF DETERMINING THE RISK OF PROLIFERATION

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Abstract

Nuclear safeguards comprise a set of detection/confidence-building measures that have been developed to provide the international community with assurance that states are complying with their non-proliferation commitments. The safeguards system has been undergoing substantial change and development over the past ten years as identified weaknesses of the system are being addressed. Achieving safeguards objectives requires that the safeguards system be effective, but the international community also requires the system to be cost-efficient. Consequently, some have suggested that scarce safeguards resources be concentrated on states that represent a real proliferation risk, substantially reducing safeguards effort in states considered to pose little or no such risk. This raises some difficult issues—not only the political requirement to avoid discrimination, but also the need to ensure that reductions in safeguards intensity do not inadvertently create new risks. With particular reference to "motivation" as a factor, this paper explores whether assessment of proliferation risk is as straightforward as some believe, and whether it is appropriate to allocate safeguards resources based on risk assessment.

1. INTRODUCTION

While membership of the safeguards systems is often spoken of as a compelling "international norm", there may be a variety of reasons underlying the participation of individual states. Some see the safeguards system as a positive good in and of itself—even if they have no nuclear activities and receive few direct tangible benefits from their participation. Some states perceive the related benefits of a functioning system of international nuclear trade as being worth the costs and effort of complying with safeguards requirements. Some are within the system, either solely or in large part, because of pressure applied by other states. In some cases it appears states are within the system for the appearance of respectability this brings, while intending to evade the obligations of membership. While it may be difficult for an outside entity to fully comprehend the attitudes underlying a particular state's participation in the safeguards system, the IAEA needs to be able to recognise and address these differences, and may need to take these into account in safeguards implementation.

The safeguards system is part of the complex web of competing interests and attitudes that make up a larger international diplomatic milieu. Any changes to the way in which the IAEA applies its safeguards effort have to be broadly acceptable to the international community. The Agency has already stated that the application of safeguards has to be non-discriminatory and that the technical objective of safeguards has to be same for all facilities with comparable safeguards obligations. The principle of non-discrimination does not mean that the safeguards approach for each facility needs to be exactly the same—it simply means that differences should be based on sound technical assessments. Such technical assessments could take into account the information available to the Agency from a variety of sources.

The safeguards system is currently experiencing a great deal of pressure for change. States with larger, more complex nuclear programs consider they are subject to a disproportionate share of IAEA safeguards effort, related more to the size of their programs than to any real risk of proliferation. Some states are concerned that continuation of a uniform approach to safeguards will overburden compliant states without providing an insurmountable barrier to proliferant states. These pressures are leading to the re-design of the safeguards system—amongst other changes, information analysis is assuming a key role in safeguards evaluation and decision-making. These changes are still at a relatively early stage, and the extent to which information analysis can be used as a guide to the application of safeguards effort is still being defined.

In the development of ideas for broadening the range of information that may be taken into account in making safeguards evaluations and decisions, one area being looked at is whether there are objective factors for assessing "proliferation risk". The concept of risk and the use of risk assessment methodologies are both well established in the nuclear safety field, but the idea of applying risk assessment in the area of safeguards is relatively new, and would need to undergo extensive development efforts before it could gain broad acceptance by the international community.

Factors that might be considered in assessing proliferation risk fall into three broad categories. The first of these is **evidence**. A range of possible pieces of information could be considered either evidence of actual proliferation or of a possible intent to proliferate. An example would be, discovery of procurement efforts for items and materials suitable for nuclear weapons, such as krytrons, neutron initiators, and sophisticated high explosives.

The second category is **capability**. The Agency could use a range of objective indicators to conclude that a state has either developed the capability to produce nuclear weapons or is seeking to develop such a capability.

The third category to be considered—and the subject of this paper—is **motivation**. At present motivation is commonly considered to be a *subjective*—and conjectural—matter, which it would be inappropriate to factor into safeguards decision-making. As will be discussed, however, it is possible to identify objectively-determined indicators from which motivation can be inferred.

Essentially, there are two issues here: are there objective ways of assessing the possible motivation of states that could be used as a basis for determining proliferation risk; and is it appropriate—and valid—to determine safeguards effort based on assessment of risk?

2. MOTIVATION AND INTENT

The view of motivation as being subjective—and therefore only truly known to the minds of those involved—indicates confusion between the closely related concepts of motivation and intent. Correctly defined, "motivation" refers to a stimulus or incentive, something that induces a person—or a government—to act in a particular way. Motivation, therefore, relates to circumstances—a situation indicated by **facts**, hence readily amenable to objective analysis. A clear example, discussed below, is the state's strategic environment, e.g. whether the state is located in a region of tension where it may consider itself under threat. The definition of a region of tension involves qualitative judgment, but can be based firmly on observable facts.

What is less objectively discernable is not motivation as such, but the extent to which the government concerned is influenced by and acts on the motivation—in other words, the question of **intent**. While intent might be thought of as being subjective, the process of inferring intent from available evidence is a fundamental aspect of forensics—and indeed, though not explicitly recognised, such inference is

also an integral part of safeguards thinking. There seems no reason why appropriate methodologies cannot be developed for considering issues of motivation and intent in the safeguards context.

Because motivation and intent are closely related, the following discussion covers both—how motivation might be assessed from external circumstances, such as a state's strategic environment, and how intent might be assessed from certain indicators, such as pursuit of sensitive nuclear technologies where these are questionable in terms of the state's declared nuclear program.

Many issues are involved here, including:

- What indicators are possible and relevant in this area?
- How can consideration of these proceed in an objective structured valid way?
- How reliable are the judgments that might be made, and how might these be applied?

The first, and most obvious, possible indicator is the state's strategic environment. Is the state in a region of tension? Is it (or does it consider itself to be) under military, economic, cultural or religious threat?

Regions of tension can be readily identified. The obvious one is the Middle East—this region contains one state believed to have an undeclared nuclear weapons capability (Israel); one state in which a clandestine nuclear weapons program was discovered (Iraq); and one state which has been found to have pursued sensitive nuclear activities clandestinely and which is currently the subject of ongoing investigation by the IAEA (Iran). Also relevant is the case of Libya, which attempted to pursue nuclear weapons—though outside the region geographically, it is closely involved politically. Other obvious areas for designation as regions of tension are the Korean peninsula and South Asia.

In striking contrast to these regions, an interesting example of probable lack of motivation to pursue nuclear weapons is the case of the 15 long-term European Union members—or more specifically, the 13 EU non-nuclear-weapon states. Given the extensive process of political, economic, social, and military integration which has been taking place over the last 50 years, under current circumstances it is difficult to imagine any of these states having the motivation to develop nuclear weapons—and it is hardly plausible that a nuclear weapon program could be kept secret in EU conditions.

The second possible indicator is the state's foreign policy and military postures—including whether the state is integrated into local, regional or international military alliances. The situation with the Korean peninsula shows the relevance of alliances—the confrontation between the two Koreas is closely watched by China and Japan. The US alliance is of critical importance to the ROK and Japan, both of which, in the view of some observers, might otherwise be tempted to seek nuclear arms in response to the threatening behaviour of the DPRK. One relevant aspect of alliances is the level of direct involvement of alliance partners in each others' military affairs—an illustration being the close oversight by the US and USSR of alliance partners during the Cold War. Alliances can reduce not only the motivation to pursue nuclear weapons but also the opportunity to do so.

The third possible indicator is a state's level of military capability—including aspects relevant to weapons of mass destruction (WMD). Experience shows that states seeking to develop one type of WMD will often have parallel programs to develop other technologies of proliferation concern, including ballistic missiles. Given the very substantial costs and the accuracy limits of ballistic missile systems, development of such systems may well indicate an intention to deploy highly destructive payloads. Hence discovery of ballistic missile programs is a warning sign. Activities for development and testing of ballistic missiles give rise to physical indicators that are often visible on commercially

available satellite imagery—the Agency may benefit from assistance from states to develop the expertise necessary to expand its analytical ability into such potentially nuclear-related areas.

The fourth possible indicator is a state's membership and observance of the various WMD treaty regimes—especially IAEA safeguards. Closely related to this, a fifth indicator is the degree of cooperation the state exhibits in its interactions with IAEA. As an example, signing an additional protocol and bringing it into force is a positive sign, though some caution needs to be exercised in the amount of weight that such gestures are given, in case the state is engaged in deception. The state may calculate that the risk of detection is low, though it cannot be sure of this—while it might seem unlikely that a state with undeclared nuclear activities would bring an additional protocol into force, this possibility should not be excluded.

On the question of cooperation, the situation in Iran serves as a good illustration. Inspectors found that access to locations of interest was subject to extended delays—in at least one case, when inspectors were finally granted access they found that during the delay the location in question had been subject to extensive physical modification. Despite this, evidence was found of undeclared nuclear activities—confirming that there had been good reason for suspicion about the lack of cooperation.

The sixth possible indicator is the level of a state's nuclear development—especially whether the state has shown an interest in developing sensitive technologies (especially enrichment and reprocessing, but also large natural uranium fuelled research reactors suitable for the production of plutonium). A nuclear program that is intended to meet a state's civil energy needs will be consistent, coherent and amenable to detailed analysis. Inconsistencies in the scale of a state's nuclear development efforts, especially at the front and back ends of the fuel cycle, require close investigation.

The seventh possible indicator is the pattern of a state's nuclear acquisitions, or procurement activities. This is especially relevant where procurement is not clearly related to declared nuclear activities. Iraq, Iran and Libya are all good examples of patterns of nuclear procurement that made extensive use of front-companies and middle-men to by-pass international controls on technologies of concern and to conceal their procurement efforts, both from their strategic rivals and the various non-proliferation verification regimes.

The eighth possible indicator (and the last that we will discuss here) is the nature of nuclear-related research being undertaken—both within the state and by its nationals studying as external students. For example, Iraq made extensive efforts to develop both its scientific and engineering expertise and its technical infrastructure—much of this effort was concentrated in areas of research for which Iraq had no legitimate peaceful need.

3. CURRENT IAEA PRACTICE

Some of the factors discussed above are currently alien to safeguards evaluation, and it would take some time to develop methodologies for taking these into account that would be generally considered as valid (objective and non-discriminatory). However, some of the more directly "nuclear" factors are already taken into account, though as yet there is no clearly established practice for how these should be reflected through adjustments to safeguards effort.

The clearest example of where the Agency is already considering motivation—although perhaps not recognising it as such—is through the additional protocol questions designed to assess the internal consistency of the state's nuclear program. A simple case is where a state is pursuing enrichment without any convincing justification—e.g. no power reactors. At present such a situation would generate questions for follow-up by inspectors—in that sense there is an effect on safeguards effort.

There is a further potential effect, albeit indirect, on safeguards effort—if the Agency exhausts the questions that are capable of follow-up by inspectors, but is still unconvinced by the state's response, an outcome could be that the Agency is not sufficiently confident about the absence of undeclared nuclear activities to draw the initial conclusion that would allow the state to qualify for integrated safeguards.

Underlying this paper is the possibility of a more direct outcome, that in circumstances where the Agency remains concerned about aspects of the state's nuclear program, a conscious decision might be made to increase safeguards scrutiny accordingly—both through greater effort in information collection and analysis, and through a more rigorous inspection regime.

4. HOW MIGHT IAEA PRACTICE BE DEVELOPED?

How might the use of motivation indicators be reflected in the application of safeguards?

A primary aim for the Agency in its preparation of state evaluations is to be able to reach a conclusion that there are no indications the state has undeclared nuclear materials or activities. The existence of the indicators discussed above might be seen, at the very least, as an *a priori* reason for the Agency to approach any of the information that it receives from the particular state with an elevated level of caution.

In the case of states within a recognised region of tension, the appropriate level of safeguards effort needs particular attention—it may well be that routine levels of effort are not sufficient. Similarly, in the case of states that have developed or are seeking to develop ballistic missile capability there is a clear need for careful safeguards scrutiny. There is an issue whether states in these situations can qualify for integrated safeguards—and if so, what might constitute an appropriate state level approach. This is a clear illustration of the need for state level approaches—a critical aspect of integrated safeguards—to truly reflect state-specific circumstances. The practical application of the state level approach requires further development.

Cases of poor cooperation with the Agency need to be viewed with particular suspicion. This is especially the case where states have been found to have provided the Agency with false, misleading or inconsistent declarations, or which appear to have involved in efforts to conceal proliferation-significant activities. Prudence suggests such behaviour should be seen as *a priori* evidence of intent to proliferate. While the Agency currently seeks to independently verify all declarations that it receives from every state—this is often done on the basis of random sampling techniques—for states that are known to have practiced deception all verifications should be carried out to a higher level of statistical significance. For states that have been found to be deceptive there should be a strong presumption on the part of the Agency that all statements it receives from the state are questionable.

The case of a state seeking to develop technology that is inconsistent with its declared nuclear program, or which does not appear justifiable on economic grounds, needs to be treated with particular caution—where appropriate, reflected in greater safeguards scrutiny.

The converse of the above examples is that the absence of indicators of motivation to proliferate could serve as an analytical justification for the reduction of safeguards effort in particular states. This might be a relevant consideration in the case of the 13 long-standing EU non-nuclear-weapon states, mentioned earlier.

5. CONCLUSION

Although traditionally safeguards analysis has taken into account only a relatively narrow range of information—and this has not been reflected in safeguards effort except through specific activities such as investigation of particular activities or locations—this situation is rapidly changing. The increasing importance of information collection and analysis, the widening of the range of information recognised as being of safeguards relevance, and the introduction of the state level approach, raise the opportunity for more effective use of information analysis in decisions on safeguards effort.

As one aspect of this, it is possible to develop a series of objective indicators that could be used by the Agency to assess the motivations acting on a state, and to infer a state's possible intent with respect to its non-proliferation commitments. Such indicators could be used to guide the Agency's safeguards efforts.

There is—rightly—concern to ensure that the IAEA's work remains technically, not politically, based. Clearly, substantial work is required to establish appropriate methodologies, to ensure conclusions and consequent decisions are both non-discriminatory and technically valid. As part of wider efforts to try to ensure that safeguards are more focused on priority areas, the ideas discussed in this paper warrant further consideration.