

SAFEGUARDS INTENSITY AS A FUNCTION OF SAFEGUARDS STATUS

John Carlson and Russell Leslie

Paper presented at INMM 2005 symposium Phoenix, USA – July 2005

Australian Safeguards and Non-Proliferation Office,
RG Casey Bldg, John McEwen Crescent, Barton, ACT 0221, Australia

Abstract:

A key characteristic of the IAEA's traditional safeguards system was **uniformity** – essentially the Agency applied the same inspection activities at similar facilities in different states, with limited differentiation between states. In recent years an important conceptual advance has been recognition of the distinction between discrimination and differentiation. Differentiation underpins an essential element of integrated safeguards, the application of a **state-level approach** in safeguards implementation.

Under a state-level approach safeguards intensity is adjusted to reflect the safeguards measures available to the IAEA for the particular state, the information available regarding the state, and relevant state-specific factors. Although initially conceived in the context of integrated safeguards, it is now accepted that a state-level approach is also appropriate for states that remain under traditional safeguards.

While the state-level approach requires that each state be considered individually, there will be commonalities between states in similar circumstances, so broad groupings can be expected to emerge. In particular these groupings will reflect safeguards commitments – e.g. the safeguards measures available, and the degree of assurance possible, for a state with an additional protocol are significantly different to those under INFCIRC/153 alone, and this will be reflected in decisions on safeguards intensity. This paper discusses how safeguards intensity in a particular state will reflect the circumstances of that state.

1. INTRODUCTION

Safeguards intensity is a convenient term to cover matters such as frequency of inspections, the measures applied during inspection, and application of containment/surveillance measures. Inspection frequency, inspection measures and C/S measures reflect judgments on the appropriate detection probability and probability of timeliness goal attainment. A key characteristic of the way the IAEA has implemented the traditional safeguards system – safeguards pursuant to a comprehensive safeguards agreement (i.e. based on INFCIRC/153) – has been **uniformity**. Essentially the Agency has applied the same inspection activities at similar facilities in different states. This reflected a judgment that safeguards intensity should be the same for all – an outcome reinforced by the IAEA's "Safeguards Criteria", the documents which specify the scope, normal frequency and extent of the verification activities required to achieve the Agency's inspection goals under traditional safeguards.

The only significant exception to this uniform approach was where serious compliance issues arose, where the Agency found it necessary to increase inspection activities in order to resolve the particular concerns. The clearest example was Iraq, where IAEA verification activities became far more intrusive – albeit under the authority of UNSC Resolution 687 and related Resolutions, rather than INFCIRC/153.

A consequence of uniformity in safeguards implementation was that inspection effort became concentrated in those states with the largest or most complex fuel cycles – not all that long ago, some 60% of the IAEA’s inspection activity was expended in just three states, Canada, Germany and Japan. This allocation of safeguards effort was generally seen as an inefficient use of resources, as none of these states is considered to pose a significant proliferation risk. The situation highlighted that in the way the Agency implemented traditional safeguards there was no mechanism for prioritising safeguards effort towards areas considered to present higher proliferation risk.

In the ongoing evolution of the IAEA safeguards system, an important conceptual advance has been development of the distinction between **discrimination** and **differentiation**. It is now recognised that differentiation is not discriminatory, provided the same objective process is applied to all states. Differentiation underpins an essential element of integrated safeguards, the application of a **state-level approach** in safeguards implementation. Although initially developed in the context of integrated safeguards, it is now accepted that a state-level approach is also appropriate for states that remain under traditional safeguards.

Under a state-level approach, safeguards intensity is adjusted to reflect the safeguards measures available to the IAEA for the particular state, the information available regarding the state, and relevant state-specific factors.

2. SAFEGUARDS COMMITMENTS AND CONFIDENCE IN SAFEGUARDS CONCLUSIONS

Confidence can be considered as a function of the formal safeguards **commitments** undertaken by a state and the safeguards measures implemented pursuant to those commitments. Clearly the formal safeguards commitments are fundamental, since these determine the scope of the safeguards measures that can be applied in the state concerned.

Take the case of a state with a comprehensive safeguards agreement (CSA) and an Additional Protocol (AP, i.e. INFCIRC/540) – provided the AP is being satisfactorily implemented, then the IAEA is able to draw conclusions on both the completeness and correctness of the state’s declarations, i.e. on both non-diversion and the absence of undeclared activities. In the case of a state that has a CSA alone, the Agency will have more limited physical access and substantially less information than is the case for the combination of a CSA and an AP. Consequently, while for a state with only a CSA the Agency can draw a conclusion on non-diversion of declared nuclear material, confidence in the **completeness** of declarations by such states is at best limited.

3. ADJUSTING SAFEGUARDS INTENSITY

In implementing traditional safeguards in a uniform way, the Agency has not fully availed itself of INFCIRC/153, which provides a mechanism for adjusting safeguards intensity. Paragraph 81 identifies a number of state-specific factors that can be taken into account in determining the actual number, intensity, duration, timing and mode of routine inspections. These include: the form of nuclear material; the effectiveness of the state’s accounting and control system; characteristics of the state’s nuclear fuel cycle; and the degree of international interdependence in the fuel cycle.

The most influential single determinant of safeguards intensity will be the formal safeguards commitments accepted by the state. This is illustrated by the rationale for integrated safeguards – implementation of both a CSA and an AP is likely to result in redundancies, where particular acquisition paths will be covered by both CSA and AP measures. These redundancies allow a

reduction in routine inspection intensity. Obviously such a rationalization of safeguards effort is not possible in a state without an AP.

For a state under integrated safeguards, the IAEA looks for the optimal combination of measures available under the CSA and the AP. In addition to factors along the lines of those in paragraph 81, the Agency will take into account whether conditions in the state are suitable for using advanced safeguards technologies and unannounced or short-notice inspections.

In addition to the largely “technical” factors outlined here, the appropriateness of using certain “non-technical” factors is being assessed. These include the history of safeguards implementation in the state, the level of cooperation between the state and the Agency, and the state’s acceptance of and demonstrated commitment to nuclear non-proliferation norms.

For a state with only a CSA, however, not only is rationalization of inspection intensity to reflect AP measures not possible, but in appropriate cases the Agency may have to consider **increasing** safeguards intensity under the CSA to partially compensate for the inadequacy of the safeguards conclusions that can be drawn for such a state.

4. SAFEGUARDS IMPLEMENTATION LEVELS

While a state-level approach requires that each state be considered individually, there will be commonalities between states in similar circumstances, so broad groupings can be expected to emerge. In particular these groupings will reflect formal safeguards commitments and the state’s performance of those commitments. As discussed above, the safeguards measures available, and the degree of assurance possible, for a state with a CSA and an AP are significantly different to those for a state with only a CSA. This will be a major factor in decisions on safeguards intensity.

For purpose of analysis, several possible “implementation levels” can be described. It should be emphasized that the safeguards activities considered necessary for a particular state should be based on the state-level approach. The implementation levels discussed here are not intended to substitute for a properly considered state-level approach, but to serve as a guide in considering issues related to intensity of safeguards implementation.

Some ideas are illustrated in the following table.

Table: Safeguards implementation levels

Level IV	Integrated safeguards (IS) implemented satisfactorily for extended period
Level III	IS implemented satisfactorily
Level II	CSA + AP implemented satisfactorily – not yet qualified for IS
Level I	CSA only
Level 0	Significant safeguards issues

Explanatory notes on some of the entries in this table are as follows:

Level IV This is forward-looking. In the future, further relaxation of routine safeguards might be considered in states in which IS have been satisfactorily implemented for a number of years. No attempt is made in this paper to quantify what might be an appropriate period.

Level 0 Significant safeguards issues might include significant unresolved questions and inconsistencies, significant anomalies, safeguards implementation problems, etc., or they might include cases where **compliance** issues have arisen. The state concerned could be in any of the regular implementation levels when the issue arises.

Where a significant safeguards issue arises, safeguards implementation should proceed on a case-specific basis – and perhaps a facility-specific basis. Implementation need not be intensified at all facilities in the state unless this was considered necessary for resolving the particular issue.

5. CONCLUSIONS

Comprehensive safeguards are evolving from a situation of uniformity to one of diversity in the way safeguards are implemented in different states. This diversity reflects state-specific factors, a fundamental factor being the formal safeguards commitments undertaken by each state. These commitments impact on the safeguards measures available for application in each state, and the scope of the safeguards conclusions possible for the state. Visualising a scheme of safeguards implementation levels, as discussed in this paper, can be helpful in understanding and explaining this new safeguards environment.