

SAGSI: Its Role and Contribution to Safeguards Development

John Carlson

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

Abstract

The Standing Advisory Group on Safeguards Implementation, usually known by its acronym SAGSI, comprises a group of safeguards experts – currently 17 – from IAEA Member States, appointed by the IAEA Director General to advise on safeguards implementation issues. SAGSI was established in 1975, following the introduction of the IAEA's comprehensive safeguards system pursuant to the NPT. SAGSI performs a number of important functions, including providing: an external perspective and source of advice for the IAEA Secretariat; a means of sounding out the views of governments and industry on safeguards issues; and a channel for explaining the rationale for safeguards developments.

SAGSI has made a major contribution to the evolution of the IAEA's safeguards system. In the early years, amongst other things, SAGSI was instrumental in developing safeguards design parameters such as the significant quantity, establishing timeliness goals, and developing the format for reporting on safeguards performance in the IAEA's Safeguards Implementation Report. Following the 1991 Gulf War, SAGSI, in collaboration with safeguards technical experts both within and outside the IAEA, helped to develop the strengthened safeguards measures in "Programme 93+2". These ideas and concepts for the strengthened safeguards system eventually led to the introduction of "Part I" measures under existing agreements, and then the "Part II" measures set out in the Additional Protocol. More recently, SAGSI has played a significant role in working with the IAEA to conceptualize and develop integrated safeguards facility approaches and the State Level Approach to safeguards implementation.

The author was the Chairman of SAGSI from 2001 to 2006. This paper discusses SAGSI's work, particularly during this period, and outlines some issues for the future development of safeguards.

1. INTRODUCTION

The Director General of the IAEA established the Standing Advisory Group on Safeguards Implementation (SAGSI) in 1975, in the early years of the development of the comprehensive safeguards system set out in INFCIRC/153, to ensure the effective and non-discriminatory interpretation and application of safeguards.

Formally SAGSI reports to, and its agenda is approved by, the DG. A major component of the agenda is based on technical questions presented by the IAEA Secretariat. In addition, SAGSI has been highly influential in the development of the safeguards system through its own initiatives.

SAGSI members are selected by the DG from nominations by IAEA Member States. Members are to be recognised experts in the area of safeguards. Members serve as individuals, not representatives of their governments. However, members are appointed with the consent of their governments, and governments clearly have a close interest in SAGSI's work. Nominees are usually members of the safeguards establishment in their countries, and their views carry weight accordingly. In making appointments, an effort is made to reach a balanced distribution between different geographic areas.

SAGSI originally consisted of 10 members – currently it has 17 members. SAGSI members are appointed for three years, renewable as the DG determines. SAGSI Plenary meets twice a year. In addition there are Working Group meetings, and *ad hoc* intersessional projects.

The author had the honour of chairing SAGSI from 2001 to 2006. This article gives an outline of SAGSI's major contribution to the development of the safeguards system.

2. SAGSI'S OBJECTIVES AND FUNCTIONS

SAGSI's terms of reference are to advise the DG on technical aspects of IAEA safeguards. In particular, SAGSI is to, *inter alia*:

- consider and provide advice on technical objectives and implementation parameters of IAEA safeguards, particularly with a view to assuring their continued validity in the light of changing technical, legal and political circumstances;
- make recommendations on how to increase the effectiveness and efficiency of specific safeguards implementation practices in meeting these technical objectives, taking into account available resources; and
- consider and provide advice on technical aspects of new types of verification missions for the IAEA, related to nuclear material.

SAGSI's functions might be described as follows:

- to provide an **independent review** of proposals and activities by the Secretariat in the areas of safeguards and verification – including matters not currently covered;
- to provide a **peer review** of specific Secretariat proposals and activities;
- to function as a **think tank**, anticipating and analysing major safeguards/verification issues;
- to promote support and understanding by governments and the safeguards community of the IAEA's safeguards/verification proposals and activities.

3. HISTORICAL OVERVIEW

One of SAGSI's first tasks was to provide technical guidance in developing safeguards design parameters, through the interpretation of terms in INFCIRC/153 such as “timely detection”, “significant quantity”, and “risk of early detection”. The quantitative expression of these terms became known as “detection goals”.

SAGSI developed guidelines for inspections under INFCIRC/153 agreements in 1988, and for INFCIRC/66 agreements in 1989. SAGSI was also instrumental in developing the format for reporting on safeguards performance in the Safeguards Implementation Report (SIR).

Following the exposure of Iraq's nuclear weapon program in 1991, SAGSI recommended a number of concepts and measures for reinforcing the safeguards system, resulting in “Programme 93+2”. This led to the development of “Part I” measures for strengthening safeguards, and then to the “Part II” measures, leading to the establishment of Committee 24 of the Board of Governors and the negotiation of the Additional Protocol (INFCIRC/540).

More recently, SAGSI has played a major role in the development of integrated safeguards, a concept which originated with SAGSI. SAGSI has worked closely with the Secretariat in developing the

conceptual framework for integrated safeguards, and key elements including the State Level Approach, integrated safeguards facility approaches, and evaluation and reporting of safeguards performance.

4. SAGSI'S RECENT WORK

Traditional safeguards focused on verifying the **correctness** of declared nuclear material inventories. Safeguards came to be characterised by **uniformity** in safeguards implementation – essentially the same inspection activities are applied at similar facilities in different states, with limited differentiation between states. As a consequence, inspection effort was concentrated in those states with the largest fuel cycles – and insufficient attention was given to areas of high proliferation risk.

Today it is recognised that the greatest single safeguards challenge is the detection of undeclared nuclear activities – safeguards need to provide assurance of the **completeness** as well as the correctness of states' declarations. The development of new methods, approaches and technology – and a new safeguards culture – are needed to respond to this challenge. SAGSI has had a major role in driving the process of change.

For some time SAGSI has emphasised the importance of **differentiation** – that is, the ability to take account of state-specific factors in determining the nature, scope and intensity of the safeguards measures for each state. INFCIRC/153 allowed this (paragraph 81), but this provision was largely unused – perhaps because for many years the information available to the IAEA concerning a state's nuclear activities was largely limited to that gained from safeguards activities pursuant to INFCIRC/153. Today, a fundamental aspect of strengthened safeguards is the broadening of the **information** available to the Agency. The Agency has developed substantial information review and evaluation capabilities. Now the Agency is well able to take account of state-specific factors – those in paragraph 81 and more – opening the way to the development of what SAGSI has termed **information-driven safeguards**.

The concept of differentiation has found expression in the **State Level Approach (SLA)**, under which safeguards implementation is designed to take account of information analysis for each state. While the safeguards objectives remain similar for all states, SLAs are intended to reflect the optimal combination of safeguards measures for each state. SLAs are to address the acquisition paths available to the state and other state-specific factors, adjusting safeguards intensity accordingly.

In parallel with the evolution of the SLA, SAGSI has noted the implications for safeguards implementation of new techniques and detection technologies. The broadening of available verification measures will require greater adaptability at the implementation level – more options will be available to inspectors, there will be less emphasis on routine inspection activities, and much more emphasis on observation skills.

During its comprehensive review of the Safeguards Criteria – the IAEA's detailed safeguards procedures – in 2003-4, and in its other work, SAGSI has given emphasis to a number of effectiveness and efficiency improvements, including:

- greater use of **unattended and remote monitoring** technologies;
- different ways of achieving timeliness – including **randomised** inspections;
- the importance of **unpredictability** – inspections and verification activities that are unpredictable to the state/operator – through random/unannounced/short-notice inspections;

- enhanced cooperation between the Agency and the SSAC (state system of accounting for and control of nuclear material).

A revolutionary aspect of safeguards development is that **expert judgment** is coming to the fore in drawing safeguards conclusions. Conclusions about the *absence* of something – undeclared activities – can never be as definitive as conclusions based on quantitative methods applied to a finite issue – the verification of a declared inventory. For the new safeguards conclusions to be credible a number of conditions need to be satisfied: that states understand the process for looking for indicators of undeclared activities and accept these are appropriate; that states are satisfied the process is applied at the requisite standard; and that states are satisfied judgments are exercised and conclusions drawn in a suitably disciplined way. All of this involves new approaches compared with the traditional quantitative system, including analysis of a broader range of information, and a quality assurance system to ensure appropriate standards of implementation and decision-making. SAGSI continues to work closely with the Secretariat in developing these various areas. [1]

5. FUTURE WORK

Looking to the next stage of development beyond the current integrated safeguards concepts, SAGSI has proposed the concept of **infrequent intensive verification** for further study. This concept builds on the advantages of unpredictability in verification. The concept could be used as an alternative to the normally defined level of routine inspections – resulting in net savings. This would involve a trade-off between further reductions in routine inspections and unpredictable but occasional and intensive inspections.

Now that the major program of conceptual development of integrated safeguards is drawing to a close, and integrated safeguards have entered the operational phase, it can be expected that SAGSI will give more attention to broader issues that are of particular concern to Member States, such as:

- will strengthened safeguards deliver the required effectiveness?
- what major areas of safeguards performance need further attention?
- what further assistance is needed from Member States?
- how to ensure that the safeguards system most effectively contributes to international confidence-building?

6. SAGSI AND TRANSPARENCY

It is regrettable that there is limited visibility of SAGSI's work. SAGSI's reports are confidential to the DG and the IAEA Secretariat. It is a long-standing Secretariat policy not to share SAGSI reports with the Board or Member States – in view of the increasing politicisation of the Board, and the difficulty of making progress in the Board's Committee on Safeguards and Verification ("Committee 25"), maybe this is just as well. In the past the Board was given regular outlines of SAGSI's agenda and work, but this practice was discontinued in 1989 as part of broader changes. Consideration should be given to reviving this practice.

An important benefit of SAGSI's work is **transparency** – the facilitation of greater understanding of the IAEA's safeguards practices and performance. This is of fundamental importance to a Southern Hemisphere country like Australia, that would otherwise find it difficult to be so well "plugged in" to current safeguards issues. This enhances our ability to identify and address problem areas through our program of safeguards assistance to the Agency, and it enhances our confidence in the safeguards

system. However, this benefit is only available to states with nationals included in the SAGSI membership. This raises a broader question – one that SAGSI has been considering – namely, how can the workings of the IAEA’s safeguards system be made more transparent to Member States?

7. CONCLUSIONS

SAGSI’s contribution to the development of the safeguards system cannot be overstated. SAGSI is uniquely placed to bring an outside perspective, and an outside evaluation, to technical aspects of the Secretariat’s task and performance.

A particular advantage of SAGSI, especially its Working Group, is its ability to hold intensive brainstorming sessions of a week or more, uninterrupted by the day-to-day demands that impact on Agency staff.

The Secretariat derives incalculable value from the availability to it, through the SAGSI membership, of such a range and depth of expertise and experience. It represents a substantial contribution by Member States, who support the Agency by making available the time of key people. SAGSI is also of major value to the Agency as a reality check for what Member States will accept and have confidence in.

SAGSI appreciates that supporting its work also involves a considerable investment of time and effort by Agency staff, especially by the Division of Concepts and Planning that is SAGSI’s principal point of contact with the Agency and provides SAGSI’s secretariat.

The close collaboration between SAGSI and the Agency has served the interests of both the Agency and Member States extremely well. SAGSI’s contribution will continue to be important for as long as safeguards are undergoing major change – which means for the foreseeable future.

Note [1] More on SAGSI’s work, particularly on the Safeguards Criteria and integrated safeguards, can be found in SAGSI’s presentation to the IAEA’s 2006 Safeguards Symposium, “The Safeguards Revolution – Where to from Here?”