Safeguards Culture: Analogies from Safety Culture and Security Culture

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ABSTRACT

The terminology of “safeguards culture” has been used loosely by safeguards experts as an essential element for establishing an organizational environment of stakeholders for the effective and efficient implementation of international safeguards. However, unlike the other two triplet brothers/sisters of 3S’s, there is no formally established definition of safeguards culture. In the case of safety culture, INSAG (the International Nuclear Safety Advisory Group) has extensively dealt with its concept, elaborating its definition and key characteristics, and published its report, INSAG-4, as the IAEA Safety Series 75. On the other hand, security culture has also been defined by AdSec (the Advisory Group on Nuclear Security). In this paper, a provisional definition of safeguards culture is made on the analogies of safety culture and security culture, and an effort is made to describe essential elements of safeguards culture. It is proposed for SAGSI (the Standing Advisory Group on Safeguards Implementation) to formally consider the definition of safeguards culture and its characteristics.

Note: the views expressed in this paper are solely of the author and do not necessarily represent those of the organization he belongs to.

1. Introduction

A quick Google search of the term “safeguards culture” results in some 6.8 million “hits” in the internet. A closer look at some “pertinent” ones reveals that the terminology of “safeguards culture” has been used loosely without any clear definitions by safeguards experts as an essential element for establishing an organizational environment of safeguards stakeholders for the effective and efficient implementation of international safeguards.
For example, at an international symposium held in Tokyo in 2008 [1], Scheinman stated in his presentation of “Enhancing International Safeguards: Challenges and Opportunities for the 21st Century” that one of the goals of NGSI (Next Generation Safeguards Initiative) was to promote a “safeguards culture” through infrastructure development in newcomer States¹. However, he uses the terminology without any definition.

Another example is Carlson’s reference to “building a safeguards culture” as one of the future activities of the APSN², a regional safeguards association established in October 2009 to promote greater cooperation amongst safeguards authorities in the Asia-Pacific region. He sees that there is a need to define “safeguards culture”, but foresees at the same time that it is not an easy task: “A strategic approach is needed – what is meant by a “safeguards culture”? What are the qualities to build and encourage? How to develop a safeguards culture, and how to promote it? These are not easy questions.” [2]

In another case, in the closing plenary of 2010 IAEA Symposium on International Safeguards, Carlson delivered an address on the ‘highlights’ of the five-day long Symposium, delineating them according to the eight topics it addressed. The first was the support of the global nuclear non-proliferation regime, and he noted that building support for the safeguards mission involved a variety of factors, including the promotion of a “safeguards culture” shared between the Agency and Member States³. Again he uses the terminology without defining it.

He also used that terminology to describe the cultural change indispensable for successful shift from the traditional rigid criteria-oriented safeguards to the more adoptive performance-oriented safeguards: “Today it is recognised that the greatest single safeguards challenge is the detection of undeclared nuclear materials and activities. In IAEA terms this is expressed as requiring that safeguards should 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” [3]⁴. This idea is elaborated more in his presentation⁵ at 2005 INMM/ESARDA Workshop, “Changing The Safeguards Culture: Broader Perspectives And Challenges” [4]. The workshop summary report⁶ pointed out that “It is clear that “safeguards culture” needs to be addressed if the efficiency and effectiveness are to continue to be improved. This will require commitment and change at all levels, from

² Asia Pacific Safeguards Network
⁶ http://esarda2.jrc.it/events/other_meetings/Santa%20Fe/WG-Reports-060428-jl.pdf
States to facility operators. Cultural change has to come from good leadership, doing the right thing and “beliefs” are not sufficient – behavior is what counts. We are optimistic that with sufficient effort and the right incentives, change can be accomplished quickly.” The phrase of “safeguards culture” is also used here without proper definition.

The only exceptional case where a definition of “safeguards culture” is given is the work of Frazar and Mladineo [5]. They argue that “a clear definition of safeguards culture coupled with a definitive set of metrics can be used to evaluate and demonstrate a country’s nonproliferation posture.” They propose the following definition of “safeguards culture”:

“A shared belief among individuals, organizations, and institutions that strict attention to international safeguards requirements and affirmative cooperation with safeguards authorities will enhance their nonproliferation stature and benefit their missions.”

Thus, their definition is designed more for the purpose of assessing the major stakeholders of a State on their commitment to nonproliferation obligations and their active cooperation with safeguards authorities. On the other hand, the usage of the term “safeguards culture” by Scheinman and Carlson, respectively in the context of NGSI and APSN, demonstrates their notion of the term as an essential element for establishing an organizational environment of safeguards stakeholders for the effective and efficient implementation of international safeguards. This is also true for Carlson’s remark in his address at the closing plenary of 2010 IAEA Safeguards Symposium.

However, “safeguards culture” used in 2005 INMM/ESARDA Workshop implies the notion completely different from those of the above mentioned cases of Scheinman and Carlson, and that of Carlson at 2010 IAEA Safeguards Symposium. In the case of 2005 INMM/ESARDA Workshop, the term “safeguards culture” is used in the context of the need for a drastic change of safeguards paradigm, namely the need for a successful shift from the traditional criteria-oriented safeguards that is based on primarily on nuclear material accountancy to the more adoptive information driven safeguards that is based on the analysis and evaluation of all information available to the IAEA.

In the following sections, let us explore the definition of “safeguards culture” along the line with the usage of the term by Scheinman and Carlson in their respective context of NGSI and APSN.

2. Safety Culture

The term “safety culture” stems from the Chernobyl Accident. In the closing plenary of
the Post-Accident Review Meeting organized by the IAEA in August 1988, the Chair of
the Meeting, Dr. R Rometsch, summarized the key findings of the meeting and identified
that the root cause of the accident was the lack of “safety culture” among those involved
in the design and the operation of the Soviet reactor. The first use of “safety culture” in a
literature appears in the first issue of INSAG7 reports, i.e. INSAG-1, “Summary Report
on the Post-Accident Review Meeting on the Chernobyl Accident” [6], where the term
was defined as:

“That assembly of characteristics and attitudes in organizations and individuals which
establishes that, as an overriding priority, nuclear plant safety issues receive the
attention warranted by their significance.”

In its subsequent report of INSAG-3, INSAG highlighted “safety culture” as one of the
fundamental management principles, or “Basic Safety Principles for Nuclear Power
Plants” [7]. INSAG worked further on the concept of “safety culture” and published its

In INSAG-4, INSAG provides the same definition of “safety culture” as contained in
INSAG-1, and reiterate the salient characters of safety culture stated in INSAG-3 as
follows:

- Safety Culture “refers to the personal dedication and accountability of all
  individuals engaged in any activity which has a bearing on the safety of nuclear
  power plants”;
- It was further stated to include as a key element "an all pervading safety thinking",
  which allows "an inherently questioning attitude, the prevention of complacency, a
  commitment to excellence, and the fostering of both personal accountability and
  corporate self-regulation in safety matters”;
- Good practices in themselves, while an essential component of Safety Culture, are
  not sufficient if applied mechanically. There is a requirement to go beyond the
  strict implementation of good practices so that all duties important to safety are
  carried out correctly, with alertness, due thought and full knowledge, sound
  judgement and a proper sense of accountability.

It further describes the universal features of “safety culture” as follows:

- “In all types of activities, for organizations and for individuals at all levels,
  attention to safety involves many elements:
  — Individual awareness of the importance of safety.
  — Knowledge and competence, conferred by training and instruction of personnel
    and by their self-education.

7 International Nuclear Safety Advisory Group, the advisory body to the Director General of the IAEA
on nuclear safety matters, created in March 1985.
— *Commitment*, requiring demonstration at senior management level of the high priority of safety and adoption by individuals of the common goal of safety.

— *Motivation*, through leadership, the setting of objectives and systems of rewards and sanctions, and through individuals' self-generated attitudes.

— *Supervision*, including audit and review practices, with readiness to respond to individuals' questioning attitudes.

— *Responsibility*, through formal assignment and description of duties and their understanding by individuals.”

It also notes the following:

“*Safety Culture has two general components. The first is the necessary framework within an organization and is the responsibility of the management hierarchy. The second is the attitude of staff at all levels in responding to and benefiting from the framework.*”

In the subsequent argument of “safety culture”, INSAG deals with these components separately under the headings of Requirements at Policy Level, Requirements on Managers, and Response of Individuals. It points out that since “safety culture” particularly concerns individual performance, and since many individuals carry safety responsibilities, Response of Individuals is especially important. It presents Figure 1 to illustrate the major components of “safety culture”. It further shows the desired responses at the organizational levels of policy, management and the individual as described below.

The policy level establishes the necessary framework for the organization and the following elements are listed as essential:

- Statement of Safety Policy;
- Management Structures;
- Resources;
- Self-regulation.

Management shapes the working environment and fosters attitudes conducive to achieving good safety performance. The following elements are listed as indispensable:

- Definition of Responsibilities;
- Definition and Control of Safety Practices;
- Qualifications and Training;
- Rewards and Sanctions;
- Audit, Review and Comparison.
At the individual level, a questioning attitude, a rigorous and prudent approach, and good communication are emphasized.
The similar arguments can be made in the consideration of “safeguards culture” as discussed later.

3. Nuclear Security Culture

In the area of nuclear security, the importance of “security culture” is duly reflected in the “Physical Protection Objectives and Fundamental Principles” [9] that were endorsed by the IAEA Board Meeting and the General Conference in September 2001:

(FUNDAMENTAL PRINCIPLE F: Security Culture)

“All organization involved in implementing physical protection should give due priority to the security culture, to its development and maintenance necessary to ensure its effective implementation in the entire organization.”

AdSec, the advisory body to the Director General of the IAEA on nuclear security issues, authorized to publish the report specifically on the subject “Nuclear Security Culture”: IAEA Nuclear Security Series No. 7 [10]. It provides the definition of “nuclear security culture” as follows:

“The assembly of characteristics, attitudes and behavior of individuals, organizations and institutions which serves as a means to support and enhance nuclear security.”

The document fully recognizes the basic difference between nuclear safety and nuclear security:

“While both nuclear safety and nuclear security consider the risk of inadvertent human error, nuclear security places additional emphasis on deliberate acts that are intended to cause harm. Because security deals with deliberate acts, security culture requires different attitudes and behaviour, such as confidentiality of information and efforts to deter malicious acts, as compared with safety culture.”

On the other hand, notwithstanding this basic difference, the document also emphasizes their similarities:

“In a similar manner, nuclear security culture refers to the personal dedication and accountability and understanding of all individuals engaged in any activity which has a bearing on the security of nuclear activities. Therefore, the principal shared objective of security culture and safety culture is to limit the risk resulting from radioactive material and associated facilities. This objective is largely based on common principles, e.g. a questioning attitude, rigorous and prudent approaches, and effective communication and open, two way communication”.

The document notes further as follows:
“Many diverse organizations are concerned with nuclear security. These include, in particular, individuals, organizations and institutions engaged in protecting radioactive material and their associated locations, facilities and transport; some of these bodies may have little technical knowledge about nuclear or other radioactive material. This lends greater weight to the need for effective structural, communication, information and exchange systems, and the integration of the functions of these diverse organizations into a unified nuclear security culture.”

Then the document presents a diagram (Fig.2) showing the main components of “security culture” corresponding to Fig.1 that is for “safety culture”.

Fig.2 Major Components of Security Culture
Comparing these two figures, we note the following:
In the case of “safety culture” (Fig.1), there are three tiers, i.e. Organizations (Policy Level), Managers and Individuals, while there are four tiers in the case of “security culture” (Fig.2), State being the additional top tier.

Three to five essential roles are assigned to each of common three tiers, i.e. Organizations (Policy Level), Managers and Individuals. Though there are slight differences in exact wording, most of them are identical between “safety culture” (Fig.1) and “security culture” (Fig.2). They are summarized in the Table 1 below.

Table 1 Required Roles for Each Tier

<table>
<thead>
<tr>
<th>Tiers</th>
<th>Safety Culture (Fig.1)</th>
<th>Security Culture (Fig.2)</th>
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</thead>
<tbody>
<tr>
<td>State</td>
<td>-----</td>
<td>Definition of Objectives</td>
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<tr>
<td></td>
<td></td>
<td>Distribution of Responsibilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Protection of Information</td>
</tr>
<tr>
<td>Organizations</td>
<td>Statement of Policy</td>
<td>Statement of Policy</td>
</tr>
<tr>
<td></td>
<td>Management Structures;</td>
<td>Management Structures;</td>
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<tr>
<td></td>
<td>Resources;</td>
<td>Resources;</td>
</tr>
<tr>
<td></td>
<td><strong>Self-regulation</strong></td>
<td><strong>Review and Improvement</strong></td>
</tr>
<tr>
<td>Managers</td>
<td>Definition of Responsibilities</td>
<td>Definition of Responsibilities</td>
</tr>
<tr>
<td></td>
<td>Definition and Control of Practices</td>
<td>Definition and Control of Practices</td>
</tr>
<tr>
<td></td>
<td>Qualifications and Training</td>
<td>Qualifications and Training</td>
</tr>
<tr>
<td></td>
<td><strong>Rewards and Sanctions</strong></td>
<td><strong>Motivations</strong></td>
</tr>
<tr>
<td></td>
<td>Audit, Review and <strong>Comparison</strong></td>
<td>Audit and Review</td>
</tr>
<tr>
<td>Individuals</td>
<td>Questioning Attitude</td>
<td><strong>Vigilance</strong> and Questioning Attitude</td>
</tr>
<tr>
<td></td>
<td><strong>Rigorous</strong> and Prudent Approach</td>
<td><strong>Strict</strong> and Prudent Approach</td>
</tr>
<tr>
<td></td>
<td><strong>Good Communication</strong></td>
<td><strong>Speed of Reaction</strong></td>
</tr>
</tbody>
</table>

4. Safeguards Culture Analogous to Safety Culture and Security Culture

Then, what should be the proper definition of “safeguards culture” and the required role of its players, based on the analogies of the other two triplet brothers/sisters of 3S’s, i.e. safety culture and security culture.

As already shown above, INSAG has defined “safety culture” as follows:

“That assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance.”

On the other hand, AdSec endorsed the following definition of “security culture” as
already noted above:

“The assembly of characteristics, attitudes and behavior of individuals, organizations and institutions which serves as a means to support and enhance nuclear security.”

The definition of safety culture above implies that safety has an “overriding” priority over other factors such as efficiency and that the organizations and their members concerned should possess the characteristics and attitudes that ensure that nuclear safety issues receive the attention warranted by their significance. On the other hand, the definition of security culture does not speak about its relative relevance or relative priorities over other factors such as safety or safeguards. As pointed out earlier, however, one of the Fundamental Principles of Nuclear Security, i.e. Fundamental Principle F “Security Culture”, requires the following:

“All organization involved in implementing physical protection should give due priority to the security culture, to its development and maintenance necessary to ensure its effective implementation in the entire organization.”

While nuclear security should be given “due priority”, it is silent about the relative priorities among nuclear security, safeguards, public acceptance, transparency and other factors. However, unlike safety, it is hard to say that nuclear security should have overriding priority. This may hold true for safeguards. Thus, it seems more prudent to define safeguards culture after nuclear security culture:

“The assembly of characteristics, attitudes and behavior of individuals, organizations and institutions which serves as a means to support and enhance safeguards or to achieve effective and efficient safeguards.”

Further, similarly to nuclear security culture, the following fundamental principle pertinent to safeguards should be adhered to:

“All organization involved in implementing safeguards should give due priority to the safeguards culture, to its development and maintenance necessary to ensure its effective implementation in the entire organization.”

What then should be the stakeholders’ characteristics in the case of safeguards culture? Again, analogous to security culture, the following points can be made:

- Since the State’s commitment to nuclear nonproliferation through effective and efficient safeguards is of paramount importance, the State involvement is essential. Therefore, there should be four tiers, namely State, Organizations, Managers and Individuals.

- At the State level, the following elements are essential:
  - State commitment to effective and efficient safeguards;
• Establishment of SSAC with the necessary legal and regulatory framework/provisions, defining relevant responsibilities of each stakeholder;
• Establishment of the legal and regulatory framework to foster an effective safeguards culture;
• Assumption of a leading role in coordination between State authorities, other organizations and the IAEA, with adequate mechanisms for the exchange of safeguards experiences and data in order to establish and share safeguards best practices.

➢ At the Organizations level, the following elements are essential:
• Clear statement of safeguards policy, i.e. Organizations’ commitment to effective and efficient international safeguards;
• Establishment of management structures, defining roles, responsibilities and accountability for each level of the organization, appointing an individual responsible for overseeing safeguards implementation who has sufficient authority, autonomy and resources;
• Allocation of sufficient financial, technical and human resources to implement the assigned safeguards responsibilities;
• Regular review of organizations’ safeguards practices and systems for improvement as necessary.

➢ At the Managers level, the following elements are essential:
• Clear definition of the safeguards roles and responsibilities of each individual in the Organizations, including clarity concerning levels of authority and lines of communication;
• Ensuring that all personnel must be made aware of and be committed to safeguards requirements and best practices;
• Ensuring that at all levels of an organization, proper training is conducted to develop skills and provide tools to promote and implement safeguards culture;
• Ensuring that staff members are appropriately motivated, and that their role in enhancing safeguards performance is recognized and valued within the organization, through rewards and recognition, both tangible and intangible, that can encourage vigilance, questioning attitudes and personal accountability;
• Self-assessments and independent audits for continual improvement in safeguards culture in order to prevent complacency from compromising overall safeguards objectives, making necessary arrangements to benefit from all sources of relevant experience, research, technical developments, operational data, and events of safeguards significance.

➢ At the Individuals level, the following elements are essential:
• Compliance with rules, regulations and procedures, and also constant vigilance
and a proactive questioning attitude;

- Adopting a rigorous and prudent approach to their safeguards responsibilities;
- Good communication for teamwork and cooperation among all personnel involved in safeguards activities.

Safeguards culture should be fostered not only among those individuals who are directly involved in routine activities of safeguards implementation and nuclear material accountancy, but also those who are not directly involved in these activities. The lack of safeguards awareness might result in their careless actions such as inadvertent cutting of IAEA seals or unintentionally switching off the light required for IAEA surveillance cameras. All of these requires additional questions and clarifications by the IAEA and might result in additional follow-up verification activities that are extremely burdensome to the IAEA, the State and the operators.

They should be made aware of the following points through appropriate activities for fostering safeguards culture among them:

- The objectives of international safeguards and the actual scheme of their implementation;
- The rules and procedures for effective and efficient safeguards implementation and the need for compliance with them;
- The need for constant vigilance and a proactive questioning attitude.

5. Concluding Remarks

As has been shown, there is a need to have a formal definition of “safeguards culture”. A tentative definition is presented above together with the consideration of desired characteristics for each stakeholder of international safeguards, i.e. State, Organizations, Managers and Individuals.

INSAG and AdSec, both of which are an advisory body to the Director General of the IAEA, have actively involved in the definition of safety culture and security culture respectively, which resulted in a respective publication on the subject as a part of the IAEA safety series and nuclear security series.

It seems high time for SAGSI, another advisory body to the Director General of the IAEA, specifically on the matters related to safeguards implementation, to formally define safeguards culture and publish it as a part of “International Nuclear Verification Series”.

It is the sincere wish of the author that this paper would stimulate SAGSI’s future consideration of the subject.

REFERENCES


“Facility Design and Plant Operation Features That Facilitate the Implementation of
IAEA Safeguards”, STR 360, dated February 2009