The Department of Safeguards of the International Atomic Energy Agency has launched an important and ambitious project to further develop and implement the State-level concept. During the time period of 2009 to 2010, the Department undertook a strategic planning exercise to prepare the Department for future safeguards implementation challenges and responsibilities which sets the context for these changes and the Department’s priorities. A structured analysis was conducted of the external environment the Department would be facing, identifying the challenges and opportunities the identified issues presented along with the Department’s ability to meet them. This resulted in the determination of the strategic activities to be conducted and the formulation of the Department’s first-ever Long-Term Strategic Plan covering the 12-year period of 2012-2023. The plan was completed in August 2010 and is currently being implemented. One of the strategies identified was the need to further evolve the IAEA safeguards system.

Of course the safeguards system is continually evolving to address new challenges as they arise, to take advantage of new techniques and technology as they become available, and to incorporate lessons learned from implementation experience. So what are the drivers for this change now? Firstly, the amount of information available to the Agency regarding State’s nuclear activities has increased dramatically over the last decade due to new legal authority (e.g. additional protocols (APs), modified small quantities protocols), new techniques (e.g., environmental sampling, remote monitoring) and advanced information collection and analysis (e.g. more open sources, analysis of trade information). Full use and advantage of all of this information needs to be taken into account in our decision-making processes. The Department’s verification workload is increasing due to e.g. more material, more facilities, advanced facility types, and specific country issues, without a corresponding increase in resources. We need to focus our efforts where needed and start doing smarter safeguards. As has described in numerous international safeguards forums, the recent cases of undeclared activities have not been detected by routine inspection activities. Current safeguards implementation is largely based on an assessment of risk focused on quantities of nuclear material and facility types. It is critical that a new risk assessment framework be developed to identify proliferation concerns and determine the level of safeguards effort required to address them.

To do this safeguards implementation needs to evolve to be more objectives-based as opposed to driven by criteria based on nuclear material quantities and facility types. This will allow the development of State-level approaches that are customized for an individual State, meeting State-specific objectives. Safeguards implementation also needs to be more information-driven, that is to use all information available, including State-specific factors, to determine the State-specific objectives and the safeguards activities needed to meet them. This will result in safeguards implementation that is more focused at the State level and on the issues of concern, is adaptable to changing situations, and less predictable in terms of the timing and nature of the Agency’s verification activities.
This is to be done by further development and implementation of the State-level concept – a concept introduced over ten years ago. As developed, the concept is applicable to all States with safeguards agreements in force and is based on a comprehensive and continuous State evaluation and a State-level approach, including a specific combination of safeguards measures for an individual State that is executed through an annual implementation plan (AIP). Considering the State as a whole provides the opportunity to take State-specific factors into consideration during all stages of safeguards implementation – that is, the planning, conduct and evaluation of safeguards activities. Implementation of the State-level concept is responsive to changes in the analysis ensuring that safeguards conclusions remain soundly-based and up-to-date. Initial implementation of the State-level concept has focused on integrated safeguards for those States with comprehensive safeguards agreements and APs for which the broader conclusion has been drawn. It is time to further develop the elements of the State-level concept and apply it to all States.

Further development of the State-level concept requires: (i) expanded use of State-specific factors and implementation of a structured acquisition path analysis to establish State-specific technical objectives and then prioritize them; (ii) development of State-level approaches that specify and provide options for safeguards measures, both at Headquarters (HQ) and in the field, for meeting these technical objectives; (iii) identification of activities to be conducted over the course of a year in an annual implementation plan (AIP); and (iv) ensuring the linkage between the State-evaluation process and the development and implementation of State-level approaches and AIPs.

Last year, the Department of Safeguards launched an important and ambitious two-phase project for evolving the State-level concept. Over the years the Department has put in place an elaborate State-evaluation process involving Country Officers, analysts, State Evaluation Groups, and interdepartmental review committees. As well, there are the inspection-related activities with well-established processes and procedures. Phase 1 of the project is to fully integrate the State evaluation and inspection-related activities to ensure State evaluation results drive safeguards implementation and that the results from verification activities are fed into the State evaluation process in a timely manner. The second phase, to be completed by the end of 2012, is to develop the essential elements of the State-level concept for safeguards implementation that is objectives-based and information-driven. Much has been done over the last year addressing the integration of inspection and evaluation activities. IT infrastructure is being developed and implemented to ensure all relevant information is easily accessible and in common formats to those who need it. Feedback mechanisms from in-field and HQ activities are being enhanced (e.g. analysts being present during inspection de-brief meetings). State Evaluation Groups have been restructured across the Department to further collaborative analysis. Training courses for supporting State evaluation are being strengthened and security procedures are being reviewed to ensure that information is being protected appropriately while permitting availability to those who need it.

Phase 2 of the project has also begun but the nature of the activities is quite different – focused on conceptual developments. The elements of the conceptual framework are as follows: (i) principles and objectives of safeguards implementation; (ii) processes for establishing knowledge about States; (iii) processes for developing State-level safeguards approaches; (iv) processes for planning and conducting safeguards activities in the field and at HQ; and (v) processes for drawing safeguards conclusions.

It is important to emphasize the basic principles of safeguards implementation. Safeguards implementation will remain non-discriminatory by applying common State-level objectives to all
States with similar types of safeguards agreement in force and implementing uniform implementation processes. However, the safeguards measures that are applied in an individual State to meet these objectives will differ based on State-specific factors and technical objectives. This allows ‘differentiation without discrimination’. Second, effectiveness will not be compromised for the sake of efficiency. In fact, if the concept is implemented appropriately, safeguards effectiveness should actually increase. Full use needs to be made of the legal authority available to the Agency through safeguards agreements and other legally-binding arrangements. With that said, it is important to note that additional legal authority is not being sought at this time. All technically plausible acquisition paths will be analyzed and appropriately covered with safeguards measures. However, the level of the verification effort will depend on State factors. Nuclear material accountancy remains the basis for deriving a conclusion of non-diversion of declared nuclear material – in other words, inspection activities in the field to verify nuclear material and facility operations remain fundamental and are recognized as a critical component of the safeguards system.

Continuing with these principles, all safeguards-relevant information available to the Agency about a State needs to be comprehensively reviewed and evaluated on an on-going basis and used for planning, conducting and evaluating safeguards activities. In order to do this, all information and knowledge regarding a State needs to be readily accessible to those that need it but protected as required. An important strategy identified in the Department’s Long-Term Strategic Plan is communication – safeguards implementation and the underlying concepts and processes need to be transparent and understandable internally to those who are implementing them as well as externally to Member States and other stakeholders. And finally, to support its commitment to provide soundly-based safeguards conclusions, the Department implements a quality management system that is applicable to every stage of planning, conducting and evaluating safeguards activities.

The implementation of safeguards for a State is governed by the safeguards agreement with the State. State-level safeguards objectives are objectives established and pursued by the Agency to verify States’ compliance with their respective safeguards obligations. Underlying technical objectives are established to help achieve them. For a State with a CSA, the Agency’s right and obligation is to ensure that safeguards are applied on all source or special fissionable material to verify that such material is not diverted to nuclear weapons or other nuclear explosive devices. To meet this obligation, safeguards objectives can be articulated at the State level as (i) detection of any undeclared nuclear material and activities in the State as a whole, (ii) detection of any misuse of declared facilities for undeclared nuclear material production or processing, and (iii) detection of any diversion of declared nuclear material. To pursue those objectives, the Agency establishes technical objectives associated with detecting elements, or steps, of the plausible acquisition paths. These objectives are to be prioritized using State-specific factors and the relative importance for detecting the paths. These objectives then form the basis for developing the State-level approach. State-level and technical objectives can also be established for States with voluntary offer agreements and item-specific agreements.

The processes for safeguards implementation that is objectives-based and information-driven are as follows (i) establishing knowledge and drawing conclusions, (ii) developing State-level safeguards approaches and (iii) planning and conducting safeguards activities. These processes are of a continuous nature and need to be integrated.

Establishing knowledge of a State is done through the structured accumulation and analysis of all relevant information. This knowledge is enhanced through the collaborative evaluation process conducted by State Evaluation Groups. The resulting knowledge is used to draw safeguards
conclusions. As well, the resulting knowledge, particular on the safeguards-relevant characteristics of a State, is also used in preparing the State-level approach and in determining the relevant safeguards activities. This knowledge continually expands and improves through the continuous State evaluation process.

Elements for developing a State-level approach include: (i) analysis of plausible acquisition paths; (ii) establishment and prioritization of technical objectives, and (iii) identification of applicable safeguards measures to address the technical objectives. It is important to recognize that State-specific factors are considered in each of these steps.

State-specific factors are relevant, factual characteristics of a State that may influence the planning, conduct and/or evaluation of safeguards activities for a State. They are identified through the State evaluation process and are both technical and non-technical in nature. Examples of such factors include: the State’s legal framework for implementing safeguards obligations; nuclear fuel cycle activities and material; history of safeguards implementation for the State; and the nature of cooperation with the State. It is important to recognize that they are to be used as facts not for rating a State. Different State characteristics will play a role in different stages of developing a State-level approach – some factors, such as the nuclear fuel cycle activities and capabilities of the State, will be used in the acquisition path analysis; others in identification of applicable safeguards measures; and others could influence the focus and intensity of annual safeguards activities (such as the history of safeguards implementation for a State and the nature of cooperation with the Agency).

Acquisition path analysis for a State with a comprehensive safeguards agreement involves the identification of all the technically plausible paths for a State to acquire nuclear material for a nuclear explosive device or for purposes unknown. For most States, these paths may include gaps, i.e. missing steps. Identification of these paths considers all aspects of a State’s nuclear fuel cycle activities and capabilities (e.g., existing facilities, knowledge and expertise, past research and development, the capacity to develop or import technology and/or expertise, and resources available). Based on these aspects, and other State-specific factors identified in the State evaluation, some acquisition paths may be assessed as being of greater concern than others.

The next step is to establish and prioritize the State-specific technical objectives. Each of the identified acquisition paths has multiple steps at which potential indicators could be detected. Technical objectives are established for each of these steps. Technical objectives may also be established on the basis of other considerations that may not be assessed in the acquisition path analysis, such as indications of weaponization-related activities. Then based on State-specific factors and the relative importance of the objective for covering the acquisition path, the objectives are prioritized.

With the technical objectives established and prioritized, the State-level approach can be developed. For each of the technical objectives, safeguards measures are identified to achieve them. The selection of these measures takes into consideration State-specific factors such as the capabilities of the State or regional authority, or the possibility to conduct effective unannounced inspections in the State. The intent is for the State-level approach to contain sufficient flexibility such that the various objectives can be met by a variety of measures.

Based on the State-level approach, safeguards activities for a specific year are planned and conducted. The AIP identifies the activities to be conducted, both in the field and at HQ, to meet the objectives identified in the State-level approach. The selection of the actual activities, and their focus and
intensity, considers State-specific factors and the results of the State evaluation. The AIP is to be revised as necessary to respond to new information and finding resulting from the on-going State evaluation and verification activities. When a planned activity cannot be conducted, an evaluation is to be made to plan alternative activities for meeting the specific technical objective, or alternatively deciding that no additional activities are required. It is anticipated that the AIP will change from year to year.

Of course, the main product of safeguards implementation is the drawing of safeguards conclusions. These conclusions need to be soundly-based and up-to-date. A conclusion for a State is based on the results of the Agency’s independent verification activities conducted both at HQ and in the field and the collaborative evaluation of all safeguards-relevant information available to the Agency. A safeguards conclusion for a State can be drawn when the Agency has carried out sufficient safeguards activities in fulfilment of its safeguards objectives and, as a result, has found no indications that would undermine its safeguards conclusion. Under the State-level concept, safeguards conclusions are drawn and reported individually for each State.

This project for evolving the State-level concept will result in safeguards implementation that is more objectives-based and information-driven. As a consequence, safeguards implementation will be more focused by investing verification effort and resources to where they are most needed; less predictable to States in terms of the timing and nature of the Agency’s verification activities; and more adaptable to changing circumstances. The outcome will enhance the ability of the IAEA safeguards system to continue to provide the international community with credible assurances on the peaceful use of nuclear energy. It will also optimize the use of Agency resources.