Recent Applications of SBD in Canada

SBD is a well-established concept with a history of successful implementation in Canada.

Examples of new nuclear facilities and structures that have benefited from the integration of safeguards considerations in the early design phase of the project are as follows:

- dry storage containers for CANDU spent fuel;
- Darlington Waste Management Facility;
- Fuel Packaging and Storage Facility; and
- Advanced CANDU Reactor.

Dry Storage Containers (DSCs)

One of the earliest examples of SBD in Canada is its application during the construction of DSCs.

The need to maintain continuity of knowledge on the nuclear material stored inside each DSC is a major safeguards consideration.

Safeguards requirements were ultimately satisfied by modifying the DSC design to incorporate the use of tubes embedded in the concrete body of the container to facilitate:

- sealing of the containment structure; and
- reverification of the stored nuclear material.

A clear illustration of the value of the SBD concept is the fact that retrofitting of safeguards components of this type within the concrete shell of a DSC would not be physically possible following construction.

The Advanced CANDU Reactor (ACR)

The ACR is an evolutionary Gen III+ power reactor designed by Atomic Energy of Canada Limited.

Early in the design phase it was recognized that safeguards requirements would need to be addressed in detail through a collaborative process involving AECL, the CNSC and the IAEA.

Following a preliminary meeting in June 2009, two trilateral meetings have taken place in 2010 – in Vienna and Toronto respectively – to facilitate the highest level of interaction among subject matter experts representing all parties.

To date, technical reviews have been undertaken by the IAEA and feedback provided to the CNSC and AECL, particularly with respect to specific new design features that could present challenges for safeguards implementation.

The IAEA has expressed appreciation for Canada’s proactive approach for safeguards at such an early stage in this large-scale project.