ABACC'S EXPERIENCE ON IMPLEMENTING UNANNOUNCED INSPECTION REGIMENS

Laura Castro, Orpet Peixoto, Hugo Vicens

Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials

Abstract:

The application of safeguards by ABACC involves a wide range of control activities mainly related with the operation of enrichment facilities, on load reactors -including verification of spent fuel transfers to dry storage-, light water reactors, conversion and fuel fabrication plants, R&D hot cells and research reactors.

ABACC has gained an interesting experience applying unannounced inspections regimes to enrichment facilities and during some special practices at on load reactors. The safeguards approaches implemented by ABACC and the IAEA allow the triggering of the unannounced inspections at any time. The effectiveness of the unannounced inspections, including the timely access of the inspectors to the strategic points and/or operational declarations, is strengthened through some complementary measures like underwater surveillance, temporary perimeter by special C&S, use of electronic seals and/or mailbox system.

ABACC's experience on the implementation of safeguards approaches using unannounced inspection regimes is summarized. The coordination arrangements required between IAEA, ABACC and the National Authorities are explained. Complementary measures that are applied to preserve the timely access of the inspectors to the strategic points are described and future developments to strength the current approaches are explored. Application of ABACC/IAEA UI system in future integrated safeguards is commented.

In addition, ABACC is analyzing an IAEA proposal to implement the concept of "mailbox" and "short notice" inspections in conversion and fuel fabrication plants in Argentina and Brazil. Technical and security analysis to introduce the transmission of the state of health of containment and surveillance systems installed at sensitive facilities are under work. Some of these new challenges could be implemented during the course of the current year.

1- Introduction

In the regional system managed by ABACC, the unannounced inspections are used fundamentally to strengthen the safeguards measures applied to avoid the

diversion of declared nuclear materials or to prevent and/or deter undeclared activities or the use of undeclared material in sensitive facilities under safeguards. At present, these regimes are permanently applied at Brazilian enrichment facilities, and temporarily applied to cover non-routine operations in Argentinean on load reactors.

2- The ABACC's experience in enrichment facilities

In the particular case of the enrichment facilities, the implementation of unannounced inspections regimes implies the arrival of the inspectors to the facility without any type of previous notification to the national authority/ operator, at any time and assuring the inspector's access to the strategic points with a delay not longer than two hours. In some cases, within the normal schedule, the maximum delay is just one hour.

In order to preserve that these inspections can not be predictable, part of them can be triggered independent from ABACC or OIEA, or may be driven?? jointly. In addition, they can be triggered completely independent from the routine program of inspections or in connection with others inspections to any other facility. Appropriated channels of communications between inspectors and the coordinator are established and, special internal procedures to manage all the aspect of these inspections are followed.

The activities carried out during these inspections are those required to ensure the non-misuse of the plant and to confirm the operational declaration related. In general, these activities involve surveillance and containment verification, NDA measurements, swipe samples and design information verification.

To assure that the unannounced inspection meets the goals, some general arrangements are requested:

1) Multi-entrance visas are granted for IAEA inspectors and no entrance restrictions for ABACC inspectors.

2) The points of contacts and procedures to have access to the facility at any time are discussed and agreed between the agencies and the state party in advance.

3) All the inspectors are trained and qualified in the specific unannounced inspection procedures.

4) All the equipments required to perform NDA measurements during the unannounced inspections are maintained under containment at the facility and ready to be used. In addition, all the equipment required during UI, have adequate redundancy.

5) All the equipments are under ABACC/IAEA Common Use Procedures. Both organizations share the costs and ABACC assumes the responsibility of technical maintenance.

6) Availability of funds is granted for the coordinator, in order to cover appropriately all the logistical arrangements required keeping the confidentiality of the inspection restricted to the Coordinator and inspectors that will perform the inspection

7) Portable equipment required for inspection activities are prepared in advance and maintained ready to be used under responsibility of the coordinator.

In those cases where the safeguards approach is based on temporary perimeter, the effectiveness of the unannounced inspections is strengthened by the use of surveillance embracing the elapsed time between the triggering of the inspection and the access to the cascade hall giving the agencies the guarantee that the situation is frozen when the inspection is triggered at the facility gate.

3- ABACC experience at on load reactors.

At on load reactors, the unannounced inspection regime has been implemented to cover some diversion scenarios associated to non routine operations like Co 60 transfer or flow detectors replacements. These activities do not involve the handling of spent fuel elements but require the use of shielded containers suitable for spent fuel removal from the ponds area and underwater operations not fully covered by the surveillance.

Although these unannounced inspection regimen are implemented just during specific periods of time, the inspections can be triggered independently by ABACC or the IAEA or driven jointly, at any time.

The triggering requires the notification to the point of contact (resident national inspector) one hour in advance to the arrival at the main gate of the nuclear power station, in order to speed up all the health physic procedures associated with the entrance to restricted areas.

The National Authority has required that all the inspectors that would access to the nuclear power station need to carry out the whole body control measurements and badging in advance. The National Authority has implemented a procedure to avoid undue interference of this requirement with the transitory UI regime.

The activities carried out during these inspections are basically the visual observation at the pond area, DIV of the flasks in operation, verification of the operating records related with the movements of containers and confirmation of

the operational declaration through surveillance review at the end of the campaign. In some cases, depending on the way followed by the containers, additional transitory surveillance is required.

The following administrative arrangements are required:

1) Operational declaration provided in advance, specifying the period embraced by the campaign and description of the activities involved.

2) Multi-entrance visas are granted for IAEA inspectors and no entrance restrictions for ABACC inspectors.

3) Previous whole body counting is required for IAEA and ABACC inspectors.

4) Point of contact and channels of communications clearly established.

5) The inspectors should be trained on the safety procedures of the nuclear power station in advance.

6) The operator has to implement special operational records to declare the movements of containers during the UI regime period.

7) All the equipments (surveillance) are under ABACC/IAEA Common Use Procedures. IAEA is the owner and assumes the responsibility of technical maintenance.

4- Potential applications

The experience gained by ABACC/IAEA in implementing UI regimes would facilitate the coordination and implementation of new safeguards approach that may use similar modalities. For instance, that is the case of short notice random inspections – SNRI.

At present ABACC and the states parties are discussing the feasibility to implement a regimen of SNRI on the fuel fabrication plants - FFP. In this case, the SNRI will require periodic operational declarations concerning the production and domestic transfer between the FFP, the conversion facilities and the Nuclear Power Plants - NPP. The operational program is provided at the beginning of the year and the frequency of the periodic updating, the quantity of SNRI, the coordination arrangement between ABACC and the IAEA, the retention periods and the sampling plans are being discussed on case by case basis. All the information required to support the SNRI would be provided to ABACC and the IAEA through the agreed communication channels, using encrypted formats.

The characteristics of FFPs in Brazil and Argentina are completely different. In one case, the FFP production and shipment are related with on load reactors and have a continuous production schedule and in the case of FFPs related with light water reactors, the production schedule is based on periodic campaigns. The experience on implement joint UI will facilitate the coordination among the parties involved.

Other potential applications of unannounced inspection regimes that have been considered by ABACC are related with the production at the starting point of safeguards and the covering of spent fuel transfers to dry storage complemented with remote monitoring systems and mail box declarations.

5- Conclusions

In the outlined examples the unannounced access is complemented by the use of surveillance. In the first case, the effectiveness of the inspection is based and strengthened in the results of the surveillance and in the other case, the surveillance is used just to confirm the operational declaration.

The presence of the regional system, with permanent qualified staff for these activities, introduces flexibility in the triggering of joint unannounced inspections and their independent inspections provide additional deterrence.

In the particular case of the Brazilian facilities, ABACC speed up all the actions required to maintain the equipment ready to be used. However, to meet adequate coordination between both organizations, common use procedures for all the shared equipment are required.

Also, it is important to stand out the progresses achieved in the transmission of all types of information between ABACC and the IAEA. This fact improves the coordination of this non-routine activity and permits that all the relevant safeguards information can be transmitted without delay.

Finally, the use of complementary surveillance always implies the possibility of equipment failures. The undesired consequence is the inconclusive results. From ABACC point of view, one additional element that would be taken into account to improve the UI regimens is the transmission of the state of health for all the complementary systems, allowing immediate reaction from ABACC/IAEA in case of any failure is detected and giving the agencies the knowledge when an UI will not be successful due to equipment failure.