

IPPAS MISSIONS – THREE TYPES OF PERSONAL EXPERIENCE

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Abstract

IPPAS missions comprise a team of international experts who assess a State's system of physical protection (nuclear security), compare it with international best practices and make recommendations for improvements. IPPAS missions are constructed around a series of modules addressing the State-level nuclear security regime, facility security, transport of nuclear material, security of radioactive sources, computer security and more recently the interface with nuclear accounting and control. The author of the paper has had the privilege of multiple experiences in being a member of an IPPAS mission team, being a team leader of IPPAS missions, and hosting IPPAS missions, including involvement in IPPAS follow-up missions. Each of these roles gives a different perspective on the effectiveness and sustainability of this successful service. The paper will outline the overall differing experiences as a provider and receiver of IPPAS missions. The paper will describe the key lessons learned from these experiences, establish some common conclusions and finally give suggestions for the evolution of the service in the years ahead.

1. INTRODUCTION

IPPAS missions comprise a team of international experts who assess a State's system of physical protection (nuclear security), compare it with international best practices and make recommendations for improvements. IPPAS missions were established in 1995 by the International Atomic Energy Agency (IAEA) as a voluntary service to assist States in strengthening their national nuclear security regime. Initially, IPPAS missions were mostly undertaken by States with relatively smaller or immature nuclear security regimes. The Nuclear Security Summits encouraged all States to use and benefit from this service.

Compared to the international treaty frameworks for nuclear safeguards and nuclear safety, nuclear security treaty provisions are relatively weaker in providing scope to assess actual state practices against treaty requirements and international best practice. Unlike nuclear safeguards treaties, there is no verification mechanisms and the provisions on information sharing are much weaker than those found in nuclear safety treaties. IPPAS missions provide States with an invaluable voluntary mechanism for receiving independent advice on the status of implementation of the *Amended Convention on the Physical Protection of Nuclear Material* and the IAEA's Nuclear Security Series.

2. CONDUCT OF IPPAS MISSIONS

For a comprehensive appraisal of the conduct of IPPAS missions, the IAEA has published guidelines in its Services Series [1].

In brief, IPPAS mission teams comprise a team leader, team experts and an IAEA coordinator, typically totalling 5-8 persons. These individuals generally have contemporary experience in a variety of nuclear security topics, including physical protection, transport security, response and computer (cyber) security. Legal expertise is also required to address State legislation and regulations that implement nuclear security treaties. Ideally, the team will have facility-specific (e.g. nuclear power plants or research reactor) expertise matched to the facilities being visited during the mission. In assembling a team, the IAEA seeks to establish a good mix of experts with previous experience of IPPAS missions, and also experts contributing for the first time. The host State designates a point of contact responsible for planning, communication and coordination of the mission in the host state.

IPPAS missions are informed by, and constructed around, a series of modules addressing the State-level nuclear security regime, facility security, transport of nuclear material, security of radioactive sources, computer security, and recently, the security interface with nuclear accounting and control. The scope of the mission – as determined by the chosen modules and selected nuclear facilities to be visited – is agreed between the IAEA and the host state prior to the mission.

Standard IPPAS missions take two weeks to complete. A mission typically starts on a Sunday evening with the first meeting of the whole team, and concludes with the delivery of the final draft report on the Friday morning of the second week. Broadly, the first four to five days of the mission are spent listening to presentations, conducting interviews and visiting facilities, with remaining time used to write the draft mission report.

The draft report includes a description of the host's nuclear activities, current security regime and observations made during the review. In particular, the report identifies specific recommendations, suggestions and good practices [1].

After three to five years of the completion of an IPPAS mission, the IAEA offers follow-up missions, which aim to address the recommendations and suggestions made in the first mission report but can also review modules and facilities not covered in the original mission, as requested by the host State.

The author of the paper has had the privilege of multiple experiences in being a member of an IPPAS team, being a team leader and being the host designate, for original and follow-up missions. The paper will outline the overall differing experiences as a provider and receiver of IPPAS missions.

3. EXPERIENCE AS A TEAM MEMBER

Australia had undertaken to host its first IPPAS mission in 2013 and the author was given the task of being host designate. The best way to gain experience in IPPAS missions was being a team member for a mission in another country. At this time, the IAEA did not yet offer workshops for potential team members, as is now available. Thankfully, the opportunity was given to participate in two separate mission before Australia hosted its own mission (see section 5).

Before arriving in the host country as a team member, it is important to absorb the advance information package provided for the mission and to conduct on-line research to become as familiar as possible with the hosts' nuclear security regime and facilities. The team leader assigns tasks among the team members. It is very important to gain clear instructions (from the team leader) which part of the report one is responsible for to avoid gaps or duplication of effort.

First time team-members face a steep learning curve in absorbing information, asking appropriate questions, writing comprehensive observations and distilling clear recommendations and suggestions in what feels like insufficient time. This is a difficult task as a native speaker of English – it is doubly difficult when English is a second language.

Many IPPAS team members are national inspectors in their home countries, and in some ways, this type of experience is helpful for IPPAS missions. However, the key difference during IPPAS missions is that one should accept *prima facie* (at face value), the truth of information provided by the host state. The relationship between IPPAS team member and host state is different to that between national inspector and operator. The mission is an advisory service, not an inspection.

In addition to the formal task of writing a report, IPPAS missions provide the opportunity for informal networking among team members and between the team and the host state, where much can be learned from sharing of individual experiences and peer-to-peer advice.

The overall workload of an IPPAS mission is intense, especially in the second week, where long hours may be necessary to complete the first draft report in time for the host to review and provide comments. The internal exchange of views within the team can be robust but is healthy to produce a balanced consensus view. A key task of the mission is to establish “Recommendations”, “Suggestions” and “Good Practices” (RSGs) for the report. There can be a tendency to become personally attached to the RSGs relevant to one’s assigned part of the report. However, it is important to reach a team consensus and take sage advice from the team leader and IAEA coordinator. It was evident during multiple missions that there are subtle (and sometimes not-so-subtle) variations in interpretation of the text in the nuclear security series that affects the formulation of RSGs.

The delivery of the final draft report on the last day of the mission is always satisfying after many hours of hard work. While one may feel inexperienced at one’s first IPPAS mission, one is much better prepared for subsequent missions – even though future missions will likely involve a completely new team.

As a team member, each IPPAS mission has a familiar pattern but brings a unique experience and opportunity to learn about nuclear security, team dynamics, working under pressure and the culture of the host country.

4. EXPERIENCE AS A TEAM LEADER

After gaining experience as a team member, the opportunity may arise to be a team leader for an IPPAS mission. The team leader is selected when the scope, timing and details of an IPPAS mission is being developed between the IAEA and the host state. If not known to the host state previously, it is ideal for the team leader designate to visit the host country (usually during a preparatory IPPAS workshop) prior to the IPPAS mission proper. The team leader is also consulted in the selection of the IPPAS team. In this selection process, it is important to find a good balance and diversity of expertise, rather than select of team of similarly minded persons.

As implied previously, the beginning of the mission is the first time the team will meet as a complete team. It is a clear challenge for a team leader to manage experts, which one has likely not met before, and some of which may hold more senior positions in their respective home organisations.

It is important from the outset to assign responsibilities clearly in relation to the drafting of the IPPAS report, in a manner that makes best use of the expertise and experience of the team members. Given the limited team sizes, the team leader usually needs to contribute substantively to the mission report. Some missions require the splitting of the mission team to see different facilities in parallel, which can present logistical challenges.

Some of the key challenges for an IPPAS team leader include:

- **Keeping the mission on track.** There is limited ability to make up time and there is often the temptation for team members to follow individual curiosities too far. There is also the challenge of knowing when to stop attempting to further improve the report.
- **Facilitating consensus and achieving consistency.** A diversity of views and experience enriches the content of the report but adds to the challenge of achieving consensus, especially where strong views exist. There is also a challenge in creating a consistency of language and style across the different contributors to the report.
- **Final presentation.** The team leader is responsible for giving the closing presentation. This is usually done before senior representatives in the host State. The challenge is to provide a sound summary that does justice to the report but pitched to a level suitable for senior representatives of the host State.

The team leader is consulted on any substantial editorials arising from the post-mission review of the draft report after the host state has provided written comments.

Overall, being a team leader is a rewarding experience but can bring the anticipated challenges associated with managing a temporary team which is working under pressure in an unfamiliar environment.

5. EXPERIENCE AS HOST DESIGNATE

Australia hosted its first IPPAS mission in November 2013 and a follow-up mission in November 2017. In each case, the focus of the mission was on the nuclear facilities at the Australian Nuclear Science and Technology Organisation (ANSTO). It was important from the outset to understand Australia's goals for the mission and to carefully set the scope so as to not overburden the IPPAS team.

The host designate is an individual that serves as a coordinator between the IAEA, the IPPAS team and host state organisations, and often works for the state nuclear regulatory body. There is a clear advantage to the host designate having IPPAS mission experience, so that the designate can better anticipate the logistical needs of the IPPAS team and be familiar with the types of information and material that will be useful to the mission. It also creates trust and comfort knowing the *modus operandi* and dynamics of an IPPAS mission.

In preparation for the mission, the host designate not only needs to interact with the IAEA on the parameters of the mission (as described in section 2 of the paper), but also coordinate the many State organisations and nuclear facilities that contribute to the mission. Depending on the scope of the mission, these may include the state regulatory bodies, relevant law enforcement agencies, customs and border agencies, coast guards, intelligence agencies, response organisations, judicial entities, nuclear facility operators, carriers and other regulated entities. Many of these organisations can be relatively unfamiliar with the IAEA, nuclear security treaties and guidelines and their associated terminology.

The IPPAS Guidelines encourage hosts to compile an advance information package (AIP) comprising a description of the national security regime, relevant laws and regulations. The AIP should also have information on facilities to be visited and activities to be observed, as well as a list of other documents relevant to nuclear security. The compilation of the AIP for Australia's first mission required coordination between several agencies. However, as it was the first time that Australia had compiled a comprehensive package of information on nuclear security implementation in Australia, this was a very instructive process. As there is no prescribed format for an AIP, Australia's approach was to take the best ideas learned from other IPPAS missions.

During the mission itself, the host designate needs to be on-call to ensure all presenters arrive on time, that operators are ready for facility tours and to retrieve any additional information requested by the IPPAS team. The host designate must also coordinate a review of the first draft of the report and provide feedback, usually within 12-24 hours of receiving it. Further, the host designate is responsible for liaising with the IAEA on a joint media statement. This can be the most stressful part of the whole mission.

Once a mission is concluded, the long task of the host State addressing the report's recommendations and suggestions begins. It is vital to establish an action plan that clearly assigns a responsible organisation for each recommendation or suggestion. It is useful here to record the full context and background for the recommendations and suggestions – even beyond what is written in the report – as memory of small details can quickly fade. By default, the IPPAS report is kept confidential between the IAEA Secretariat and the host State. While Australia chose to publish its mission report, it first conducted a thorough review process to redact sensitive data.

Australia requested a follow-up mission four years after the first mission in 2013. This mission not only addressed the recommendations and suggestions made in the 2013 report, but also reviewed a new nuclear facility under construction and trialled a new IPPAS module on *Nuclear Material Accounting and Control*. The AIP for the follow-up mission included minor updates to the 2013 AIP, formal responses to the recommendations and suggestions made in the 2013 mission report, and details the new facility under construction. It was valuable to have two members of the 2013 mission return for the 2017 mission to provide continuity. Conversely, there was also benefit in having the “fresh eyes” of new team members. In any case, team selection is always subject to availability of experts, which cannot always be assumed.

The aim for any follow-up mission is to address and close all the recommendations and suggestions made in the previous mission. Realistically, some remained a work-in-progress, others morphed into new recommendations or suggestions, while others again were ultimately not accepted for various reasons. This was a common experience at other IPPAS missions.

Being a host designate has the highest workload of all IPPAS roles, given the overall length of time involved (1-3 years), the breadth of issues that need to be addressed and logistics to be organised. It can also be the most satisfying once the report is concluded.

6. LESSONS LEARNED

Across the variety of experiences some of the lessons learned include:

- **Good preparation maximises the benefit of the mission.** Whether as a team member, leader or host, the greater the preparation done, the more all will gain from the two weeks of the mission. For the host country, the work done to prepare for the mission provides insights and challenges assumptions even before the mission begins. The AIP is a valuable resource for all parties to a mission.
- **IPPAS missions are best done in a cooperative manner.** IPPAS missions work best when all parties are open-minded and work cooperatively. There is little to be gained by taking an adversarial approach.
- **Look after the IPPAS team.** Given the very limited time available to produce a comprehensive report, it is helpful to minimise transport times, provide suitable conveniences and IT equipment (computers, printers) and avoid unnecessary hindrances for the team.
- **There is always something to learn.** Each mission brings an opportunity to learn something new from the host or other team members on technical matters and international cooperation. Even after leading IPPAS missions, one can still learn from hosting another mission. However, there are naturally diminishing educational returns for individuals from each successive mission. A similar dynamic applies to the host State.
- **Importance of understanding the national context.** It is easier to make recommendations than to receive them. In making recommendations according to a prescriptive basis (as some recommendations in INFCIRC/225 [2] tends to be), one needs to take into account the national legal system, local threats and regulatory maturity of a State. Conversely, it is incumbent on the host to explain to the IPPAS team why particular approaches are taken to address international treaty requirements and nuclear security guidance.
- **Comparing numbers of Recommendations, Suggestions and Good Practices between states is rather meaningless.** The number of RSGs contained in a mission depends on the mission's scope (number of modules), the number of facilities visited and the host's relative openness as much as it does on the alignment of a state's nuclear security regime with the Amended CPPNM and the nuclear security series.
- **The mission is never over.** Even without holding a follow-up mission, it can take years to address a report's RSGs, especially where the cooperation of peripheral organisations is required. It is a challenge to keep all relevant parties engaged once a mission is completed.

7. FUTURE OF IPPAS MISSIONS

IPPAS missions have been a great success, with 60% of countries with nuclear power plants or research reactors having hosted a mission. Many of these countries have also hosted a follow-up mission. It is a mature, professional and reliable service. While there will always be **some** benefit for a country to hold regular missions, as with any good program, it must evolve to suit the needs of those hosting a mission and provide a positive cost-benefit.

While the sensitivities inherent in reviewing a nuclear security regime is much higher than reviewing a nuclear safety regime, there are lessons that could be learned from the conduct of other IAEA advisory and peer review services, including Integrated Regulatory Review Service (IRRS) missions.

Some options for additions or evolution of IPPAS missions include:

- Further emphasis on **prior self-assessment** and **model advance information pack**. Integrated Regulatory Review Service (IRRS) missions already do this. This will create more work for the host, but make better use of the mission experts' time during the mission.
- **Additional IPPAS modules** which go deeper into specific subject areas (e.g. nuclear security culture, Design Basis Threats, contingency and emergency plans).
- Prudent **grading** of recommendations, especially for small operations (e.g. facilities employing only a few staff are not likely to have a fully documented nuclear security sustainability program).
- **Assignment of priorities** to recommendations and suggestions. For example, in the opinion of the team, some suggestions could have higher value or priority than some recommendations.
- **Streamlining of report writing**. For example, excluding background information already provided in the advance package.
- **Merging IPPAS and INSERV (Integrated Nuclear Security Advisory Service) missions**. These missions tend to have quite a different mix of stakeholders but rationalisation of these missions should be considered.
- **Harmonisation of IPPAS with other IAEA Services**. Including with the Nuclear Security Information Management System (NUSIMS) to assist self-assessment and Integrated Nuclear Security Support Programs (INSSPs) for managing the follow-up of recommendations and suggestions.
- **Establish a permanent/professional IPPAS team**. This may be viable should many States decided to host regular and frequent missions. While this would create some consistency in the service, it would be at the expense of the current diversity found in member-state teams.

REFERENCES

- [1] INTERNATIONAL ATOMIC ENERGY AGENCY, International Physical Protection Advisory Service (IPPAS) Guidelines, IAEA Services Series 29, Vienna (2014).
- [2] INTERNATIONAL ATOMIC ENERGY AGENCY, Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Revision 5), IAEA Nuclear Security Series No. 13, Vienna (2011).