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**COMPLIANCE ASSURANCE TRAINING AND SELF ASSESSMENT FOR  
TRANSPORT SAFETY**

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**ABSTRACT**

The International Atomic Energy Agency (IAEA) conducts training program for the relevant authorities in the Member States to enable them to assure compliance with the Regulations for Safe Transport of Radioactive Material. The lectures at the program are delivered by experts from different Member States of IAEA. The lectures-cum-discussions address the responsibilities of the Competent Authority for assuring compliance with the regulations, viz., Legal and Governmental responsibilities, procedure for approvals, procedure for inspection, implementation of training needs and Competent Authority role in transport emergencies. The Q & A session that follows each lecture provides an opportunity for the lecturers and the participants to exchange their experience.

An important aspect of these programs is development of an action plan by each participant. During the discussion the participants are encouraged to introspect and identify the shortcomings, if any, in their regulatory infrastructure. Towards the end of the training program the participants are advised to prepare an action plan to fill the gaps. The participants are encouraged to work in groups in developing action plans. It was found helpful for the faculty to provide the example of a fictitious State with certain shortcomings and develop a sample action plan accordingly.

Furthermore, the IAEA has developed a self-assessment tool to enable each Member State to evaluate the extent of compliance assurance that is achieved in the State. This tool is a software package, which includes a long list of questions relating to the various aspects of compliance assurance which have to answered as 'Yes' or 'No'. The affirmations have to be substantiated with documentary evidence and negations have to explained in terms how compliance with the relevant requirements are being or intended to be assured. Ideally one participant from each State should have a computer for hands-on work during this part of the program. The participants are asked to key in their responses (Yes/No) and provide the substantiation and explanation, as appropriate. This approach was used during a training program conducted by the authors in Jordan. This paper will also describe their experiences and recommendations for changes.

**INTRODUCTION**

With the ever increase in the volume of transport of radioactive material the need for ensuring safety of transport of the material cannot be overemphasized. The Regulations for the Safe Transport of Radioactive Material [Ref 1] developed by the International Atomic Energy Agency (IAEA) essentially form the basis of all formal international regulations for

the safe transport of radioactive material [e.g. Ref. 2 & 3] and are being adopted by many of the Member States of the Agency in a manner consistent with the local needs.

### **COMPETENT AUTHORITY**

The Regulations identify the role played by a Competent Authority. The responsibilities of the Competent Authority may be entirely vested in a single authority or in many. For example in certain Member States there may be different competent authorities for different modes of transport or for radiation facilities and nuclear facilities. The Competent Authority is answerable to the state as to compliance with the regulations --.

- The consignor, carrier and consignee (in certain instances) have the responsibility to comply with the regulations.
- The Competent Authority has the responsibility to assure the State that the regulations are indeed being duly complied with.

The State has the primary responsibility of enacting an appropriate nuclear legislation under which regulations for the safe transport of radioactive material should be issued. The State should, in addition, appoint a Competent Authority for enforcing the regulations. The State should further establish the necessary infrastructure for the Competent Authority to discharge its responsibility. The Competent Authority should have adequate power to enforce the regulations. A secretariat comprising an adequate number of appropriately qualified experts should be available to the Competent Authority.

### **COMPLIANCE ASSURANCE**

The elements of compliance assurance require the Competent Authority to establish safety standards that are compatible with international standards and relevant to the practices adopted in its State. The Competent Authority should develop guidance material for the users of the regulations who require guidance on compliance. The regulatory activities include assessment of applications for approval. A formal approval procedure needs to be established. Often the Competent Authority would need a panel of experts to assist it in evaluating applications for approval. Not to be left out of the panel is expertise in security of transport of radioactive material.

The Competent Authority has to organize inspections of test facilities, packages, consignments in storage facilities and loaded on conveyances. Competent Authority's representatives also witness regulatory tests. In many States the Radiation Protection Programs [Ref. 4] including the emergency response procedure of organizations engaged in the transport of radioactive material need to be approved by the Competent Authority.

The Competent Authority should establish a compliance assurance program so that all these and the other activities related to assurance of compliance with the regulations for the safe transport of radioactive material are carried out in the State as required under the law of the land. The different regulatory tasks which constitute the compliance assurance program can be effectively carried out by the regulatory staff provided they are duly and adequately trained in compliance assurance. Such training can be imparted by a team of experts drawn from the State itself. If such expertise is not locally available training can be provided by experts from another State either directly or through the IAEA's training program.

### **IAEA GUIDANCE ON COMPLIANCE ASSURANCE**

It is important to build and maintain capability on the part of the Competent Authority to assure compliance with the regulations in a sustained manner. The IAEA has published a safety guide on assurance of compliance with the transport regulations [Ref. 5]. This safety guide recommends *a way* of establishing and implementing a compliance assurance program.

The various elements of compliance assurance are delineated and described so that the Competent Authority can adopt the applicable methods and establish its own compliance assurance program based on the local needs. The safety guide identifies the need for establishing coordination among the various competent authorities, where there are more than one and also among the different government departments who have to interface in the context of transport of radioactive material, e.g. customs, emergency response agencies and security establishments. The guidance includes details such as witnessing manufacture and tests, establishment of a management system for the Competent Authority and the method of assignment of identification numbers for the approval certificates issued by the Competent Authority.

## **IAEA TRAINING PROGRAM**

Keeping in view the need for empowering its Member States in the establishment of an effective compliance assurance program IAEA organizes training workshops for the representatives of the competent authorities and other regulatory officials on Compliance Assurance. The aim of training is to help the Competent Authority to assess its needs and accordingly establish an appropriate compliance assurance program. The IAEA has conducted a few training workshops in three continents and there are more in the offing.

### Structure of the IAEA Training Program

The IAEA training program consists of lectures and discussions. The lectures cover the following topics:

1. Legal and governmental responsibilities
2. Responsibilities of the Competent Authority for compliance assurance
3. Approval procedure –
  - a) Assessment of applications for approval of -
    - i) The design of special form / low dispersible form sources;
    - ii) The design of packages for transporting radioactive material of activity in excess of certain specified limits and fissile material; and
    - iii) Special arrangements.
  - b) Establishment of an advisory panel having experts in the following areas -
    - i) Regulations;
    - ii) Radiation shielding calculations;
    - iii) Structural engineering ;
    - iv) Thermal analysis ; and
    - v) Criticality safety analysis
4. Issuance of approval
5. Procedure for conducting inspection of -
  - a) Test facilities including witnessing regulatory tests;
  - b) Packages ; and
  - c) Consignments in storage areas and on conveyances
6. Training of transport workers
7. Transport emergencies
8. Interactions with other governmental agencies
9. International obligations
10. Management System for the Competent Authority

The typical duration of the program is one working week which is seen to be adequate. The lectures are generally held in mornings and interactive discussion sessions are held post-lunch.

An important aspect of the training program is development of an action plan. This module occurs at the end of the program.

### Action Plan

After the lectures and discussions, the participant would be in a position to determine-

- The actual extent of regulatory control required in his/her country on the basis of the transport-related activities
- All the elements of a compliance assurance program appropriate to his/her country
- The regulatory infrastructure that is presently available to the Competent Authority
- The shortcomings in the regulatory infrastructure
- A plan with duly prioritized actions that should be initiated to bridge the gap within a specified time
- The milestones for completing the action plan

Each participant is encouraged to develop an action plan for his/her country. Discussions encourage the trainees to introspect and identify the shortcomings in their own regulatory infrastructure. As part of the program trainees analyse the shortcomings and prepare an action plan to fill the gaps. Group discussions among participants should be encouraged in this phase. In the group discussions the participants exchange ideas and experience and hammer out solutions to culture-specific issues.

The trainees need to be given a push to initiate this important activity. The faculty provides the example of a fictitious State with certain shortcomings in the regulatory infrastructure engaged in certain transport-related activities, determine the applicable elements of a compliance assurance program, identify the shortcomings and develop a sample action plan accordingly.

This exercise is the most important part of the program. It can be successful only if participants identify shortcomings correctly. In practice, reservations on the part of the participants may be encountered but provided that the method of developing an action plan is clearly understood one may rest assured that the participant would be able to develop an appropriate plan in the absence of peer pressure and public glare.

Self assessment is an important tool that helps the Competent Authority to develop, sustain and upgrade its compliance assurance program.

### **SELF ASSESSMENT TOOL**

IAEA has developed a self assessment tool for safety of transport of radioactive material. This tool is a software package that can be easily installed in one's personal computer and used. The purpose of the software is to make a Self Assessment of the ability of a State to comply with regulations.

The software poses a number of questions. The questions are bunched into individual sets that relate to different aspects of compliance. Each such set of questions is designated a module. The software on safe transport of radioactive material includes 12 modules. Each question is based on a regulatory requirement [e.g. Ref 1 and Ref. 6]. The tool is to be used by two persons or two sets of persons, viz., the Respondent(s) being the one(s) answering the questions and the Analyst(s) being the one(s) analysing the answers. The respondent and the analyst have to be different persons for a given module.

Questions are of two types, *Primary* and *Subsidiary*. The primary question may be answered as True or False. Generally "true" would imply compliance with the regulations. Example: Is it required that Type B(U) packagings should go through a certification process? There may

be a question for which “false” would imply compliance. Example: Are workers allowed to handle packages without individual monitoring even if the assessed dose to individual workers exceeds 6 mSv in a year?

Generally, if the answer is, “True” there would be a subsidiary question requiring *substantiation*. For example, the respondent may have to substantiate “true” by providing the required reference.

If the answer is “False” there would be a subsidiary question requiring *explanation*. That is, the respondent has to state how safety is assured. The subsidiary part may be either one question or a set of questions.

The answers – both primary and subsidiary – are recorded in a database file created by the software. The analyst can read the recorded answers. The analyst can compare the recorded answers with the expected answers. Where the two answers agree, compliance is satisfactory. If they do not, compliance is not satisfactory. Thus the analyst will be able to determine the *extent of compliance* with regulations.

The twelve modules included in the software relate to the following aspects of compliance:

- Regulatory review and maintenance of effective legal framework (Legislation, Transport regulations, Competent Authority)
- Design Assessment
- Witnessing testing
- Witnessing manufacture
- Examination of maintenance and servicing arrangements
- Enforcement actions and investigations of incidents
- Emergency planning and exercises
- Monitoring and inspections of transport operations
- Training and distribution of information
- Issuing of approvals
- International/Interdepartmental liaison/cooperation
- Audits of management system

The software envisages that self assessment would be made periodically so that the findings of a self assessment can be reviewed to verify improvements in compliance at the next cycle of self assessment. The tool requires the life cycle to be defined. The respondent answering the questions for the first time is providing the first life cycle. The analyst evaluates the shortcomings in the regulatory infrastructure and notes the improvements to be made by the country to achieve better compliance. After some time (e.g 1 or 2 years) the respondent answers the SAT questions again; this is life cycle 2. The analyst notes improvements and determines as to whether further life cycles are required.

## **TRAINING IN THE USE OF THE TOOL**

In a move to encourage self assessment to establish and upgrade the compliance assurance program, the Agency has extended the duration of the training program on compliance assurance to two weeks. The first week deals with the establishment of a compliance assurance program and culminates in the development of an action plan. In the second week, the self assessment tool is introduced to the participants.

The participants are divided into a number of teams each team consisting of two members. Each team represents a State. Each team is provided with a computer for providing hands-on training to the participants. The self assessment tool is installed in each computer. The teams

are required to identify or designate Respondent(s) and Analyst(s). The first life cycle is initiated. The respondent selects one of the modules. Each question from the tool is displayed on a screen. The respondent answers primary and subsidiary questions in the first life cycle by keying “Yes” or “No” as the response. The participant has to provide the substantiation and explanation for Yes/No, as appropriate. Upon completion of the questionnaire the tool provides an objective summary of the shortcomings and areas requiring improvement.

The analyst assesses the extent of compliance. The “State” determines an action plan for assuring better compliance.

This exercise is well received by participants.

### **TYPICAL FEEDBACK FROM THE PARTICIPANTS**

The typical feedback received from the participants is instructive and provide a basis for introducing improvements that can be tweaked into the training program. The suggestions made by the participants are based on their own specific needs. Some of the important suggestions are as follows:

- Specific training of users in regulatory compliance is necessary in addition to publishing guidance documents.
- Additional information on compliance assurance in respect of the requirements for emergency response should be included.
- The program should include more illustrative examples and fewer lectures.
- Some States require technical assistance in developing and updating regulatory control.

The suggestions made by the participants are often seen to be audience-specific. Hence a training program such as this could include a flexible component which can be utilized for addressing the specific needs of the audience who are expected to participate in the course. There is need for providing more training programs to more countries tailored to their needs.

### **METRICS FOR SUCCESS OF THE MISSION**

Every mission needs a set of metrics for measuring the success of the mission. For the training program, which has been described in this paper, the following metrics were developed --

- The participants are able to identify the specific areas for improvement in their respective national compliance assurance programs as a result of the workshop.
- The participants show keenness to develop a compliance assurance program and the management system to implement the program.

Based on these metrics the Mission accomplished it purposes.

### **RESULTS AND IMPACT OF THE MISSION:**

Most of the participants had the necessary background knowledge of the IAEA Regulations for the Safe Transport of Radioactive Material for the purpose of the workshop. As a result of the workshop the concerned regulatory authorities of the region represented by the participants may be expected to interact closely and to their benefit.

Some areas in their compliance assurance program were identified by the participants for improvement and action plans were developed to review these areas and introduce necessary measures. The action plans were developed entirely by the participants after detailed deliberation.

The participants were made familiar with the use of the SAT3 package and they would use it effectively and to their advantage when the final version of the tool becomes available.

Degree of success of the mission in solving the problems encountered:

- The participants were able to identify the specific areas for improvement in their respective national compliance assurance programs as a result of the workshop. This in itself is indicative of the success of the mission.
- The participants showed keenness to develop a compliance assurance program and the management system to implement the program.

Additional training, expert services and equipment necessary:

- Under the compliance assurance program, some training programs are proposed to be conducted by some of the participants in the workshop.

## CONCLUSIONS

Transport of radioactive material involves seamless international interfacing. In the modern world where international transport of radioactive material is becoming more in volume and frequency, it is important that the competent authorities of all the countries engaged in this activity can effectively assure compliance with the domestic and international regulations. Therefore, such training programs are required and useful.

Familiarity with the transport regulations would be desirable for participating in the program. However, a module providing a summary of the IAEA's comprehensive training for safe transport of radioactive material [Ref. 7] should be included at the very beginning of the program. The issue of delay and denial of shipment should be discussed in the training program. Non-acceptance of shipments for reasons of non-compliance does not constitute denial of shipment. However, certain instances of non-compliance owe their origin to the variations between the domestic regulations and international regulations. The training program as such is centred on the IAEA regulations. The participants should be sensitized to the possibility of variations between regulations.

The experience gained in serving as faculty for such programs and interactions with the participants indicate that a large number of such programs need to be organized as there are many countries which require and can be benefitted from the programs. The magnitude of the task is large in terms of the number of training programs to be organized. There is an urgent need for conducting the programs. It may stretch the resources of IAEA to do it all on its own.

Advanced states and organizations specializing in conducting training courses should come forward and offer to conduct such training programs in many countries that require training of their regulatory staff and the users of the transport regulations. The training providers would have sufficient expertise available with them and they can also borrow from the IAEA pool of experts.

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