

Comments on the General IAEA Safety Requirements - Part 3 - and Suggestions for the Next Publications

Gian Maria Sordi*

Instituto de Pesquisas Energéticas e Nucleares/ ATOMO Radioproteção e Segurança Nuclear, São Paulo, Brazil.

Abstract. The international recommendations in question are described 52 requirements specified from chapter 2 to 5. The first chapter states that the number of fundamental safety principles has been increased from 3 to 10. To implement these requirements, the IAEA mentions 14 main parties but it is not clear which party is responsible for each of the fundamental safety principles. Chapter 2 presents 5 general requirements for protection and safety and makes it clear the responsibilities and competence of the government and regulatory body. ; but the responsibilities and competence of the other 12 principal parties reported in requirement 4 are not clear. Chapter 3, which includes 37 requirements, is the most extensive and deals with planned exposure situations. Due to its extension, chapter 3 is left for a future paper, in case my comments are considered of some value by the principal parties involved. Chapter 4, with 4 requirements, deals with emergency exposure situations; and in chapter 5, the 6 requirements are about existing exposure situations. As to the requirements exposed in chapters 1, 2, 4 and 5 I have verified that the responsibilities and competence of the government and the regulatory body are clearly specified, which is not true for the other 12 principal parties. It is concerning this specific matter that I have made comments and suggestions. I also discuss the matters that are not under the responsibility of the radiological protection services but of other parties. Could the radiation protection service as a whole or in part be delegated to others, including the attributions of registrants or licensees?

KEYWORDS: *IAEA International Recommendations, Radiation Protection Requirements.*

1 INTRODUCTION

Chapter 1.

In this chapter the IAEA establishes 10 safety principles that are considered fundamentals – conversely, the ICRP mentions only 3. The IAEA also says that the 3 ICRP principles were separated into 4 by the Agency.

Some of these 10 principles are not very clear as to who is the responsible for developing and implementing them, as it is shown below.

Principle 1: Responsibility for safety

According to the IAEA, the prime responsibility for safety must rest with the person or organization responsible for facilities and activities that give rise to radiation risks. I believe it is in charge of the registrants and licensees.

It also mentions some other parties, but it looks rather as an example than all the possible interested parties given in requirement 4.

Principle 2: Role of government

This chapter is quite clear and suggests the formation of an independent regulatory body.

* sssylvial@hotmail.com

Principle 3: Leadership and management for safety

The government must assure its coordination provided by a department and agencies responsible for protection and safety. Standards have to be developed by means of consultations with those who are or could be affected by them. They should serve as a guide to all the interested parties listed in requirement 4?

Principle 4: Justification of facilities

Here medical irradiations are developed in a satisfactory way and health authorities are also mentioned, but facilities that introduce new sources and professional bodies are ignored. It does not give any insight about what professional bodies should be. Also, it does not mention the government for the introduction of new practices.

Principle 5: Optimization of protection

The responsibility for applying this principle is not mentioned, but based on old superseded publications I believe registrants and licensees are responsible for it and the process will be developed by the radiation protection services, not listed among the interested parties. Shouldn't this list include more interested parties?

Principle 6: Limitation of risk to individuals

None of the directly interested parties is mentioned here. A previous publication makes me believe the responsibility is in charge of the government through its regulatory body.

Principle 7: Protection of present and future generations

The IAEA made no comments about this principle. I think that limits should be established by the government, and registrants and licensees are responsible for it. Isn't it right?

Principle 8: Prevention of accidents

The IAEA proposes some measures but does not say who is responsible for implementing them. I believe the general direction [supervision] should be given to the government. The responsibility should be given to registrants and licensees; a mixed team composed of radiation protection and facility operation people should take care of its implementation, for an accident can occur due to equipment failure or human error during the procedure. In this case the operational personnel has major knowledge about possible failures that can cause an accident. Besides, it is responsibility of the radiation protection service to correct any failure and restart normal work with safety. Am I right?

Principle 9: Emergency preparedness and response

The IAEA mentions that it is necessary to ensure that arrangements are made for an effective response at the scene and, as appropriate, at the local, regional, national and international level; but it does not inform about responsibilities and how we can maintain the preparedness. I think that in order to avoid doubts more specific details should be given.

Principle 10: Protective action to reduce existing or unregulated radiation risks

Really, no comment was made by the IAEA.; this principle was ignored. I believe the government should suggest some general lines of action including the unregulated radiations. And, under the responsibility of registrants and licensees, radioprotection services should suggest the main appropriate actions for the facility in question. The implementation of these actions should be subjected to a pertinent government body for approval. So the responsibilities would be shared. Isn't it right?

To finish this question it should be wise to say which of the interested parties listed in requirement 4 should be responsible for implementing the actions concerning each principle. The IAEA also informs that, to perform the recommendations of these standards, the 52 requirements specified from chapter 2 to 5 need to be considered.

To comment on the 52 requirements would make this paper too long; so I have restricted my discussion to chapter 2, 4 and 5. These chapters contain 5 requirements each in average. Chapter 2, requirements 1 to 5; chapter 4, from 43 to 46; chapter 5, 47 to 52.

Chapter 3, with requirements from 6 to 37 is left for another paper if I notice that it will be really useful for the IAEA and the associated countries.

To make this paper more clear I will mention the title of the 3 chapters to be commented, their sections and the respective requirement.

2

Chapter 2. General requirements for protection and safety.

Section: Application of the principles of radiation protection Requirement 1:

Application of the principles of radiation protection

The first item informs: “Parties with responsibilities for protection and safety shall ensure that the principles of radiation protection are applied for all exposure situations.” But in any of the 5 items that deal with this question no hint is given of which parties would be. Would it refer to all the parties listed in requirement 4, items 2.40 and 2.41?

Section: Responsibilities of the government

Requirement 2: Responsibilities of the government

This requirement is discussed in items 13 to 28 and it is clear that the government is responsible for it.

Requirement 3: Responsibility of the regulatory body

This requirement is discussed in items 29 to 38 and it makes clear that its responsibility is in charge of the regulatory body.

Section: Responsibilities for protection and safety

Requirement 4: Responsibilities for protection and safety

This requirement is discussed in items 39 to 46. The IAEA mentions, in principle, the parties really interested and that have responsibilities related to this requirement, but does not inform the protection and safety action for which each of the interested parties mentioned is responsible.

The mentioned parties directly interested are: government; regulatory body; registrants or licensees; employers; radiological medical practitioners in relation to medical exposure; persons or organizations designed to deal with emergency exposure situations or existing exposure situations; suppliers of sources, providers of equipment and software, and providers of consumer products; radiation protection officers; referring medical practitioners; medical physicist; medical radiation technologist; qualified expert or any other party to whom a principal party has assigned specific responsibilities; workers other than workers already listed in this paragraph; ethic committees.

I consider it would be very useful to show the responsibilities of registrants or licensees that can be, in principle, transferred to other interested parties.

Section: Management requirements

Requirement 5: Management for protection and safety

This requirement is discussed in items 47 to 52 and deals with protection and safety elements of the management system, the safety culture and human factors to avoid failures, but does not mention which are the interested parties and their specific responsibilities.

3

Chapter 4. Emergency exposure situations

Section: Generic requirements

Requirement 43: Emergency management system

This requirement contains 6 items and defines very clearly the government responsibilities. To demonstrate it I transcribe here its introduction and paragraph 4.6: Introduction: “The government shall ensure that an integrated and coordinated emergency management system is established and maintained.”

Paragraph 4.6: “The government shall ensure the coordination of its emergency arrangements and capabilities with the relevant international emergency arrangements.”

This requirement does not provide any information about the possible organizations and the probable responsibilities for each of them. Although emergency depends on each particular situation, there is a generic part that is common to all situations. This is helpful for maintaining international harmony, once there is already a pact of mutual help among IAEA and the associated countries in agreement with this pact.

Section: Public exposure

Requirement 44: Preparedness and response for an emergency

This question, treated in items 4.7 to 4.11, defines very precisely the responsibilities of the government but does not inform anything about the other interested parties, especially of the registrants and licensees.

Section: Exposure of emergency workers

Requirement 45: Arrangements for controlling the exposure of emergency workers

The question is treated in items 4.12 to 4.19 and defines once more the responsibilities of the government ; it also informs the responsibilities of the organizations and of the employees in charge of the response, but does not inform which of the interested parties of the organizations would be in charge of the response. It can again be concluded that it depends on each specific situation but generic situations can be treated very well.

Section: Transition from an emergency exposure situation to an existing exposure situation.
Requirement 46: Arrangements for the transition from an emergency exposure situation to an existing exposure situation.

This question is treated in 2 items only: 4.20 and 4.21 and informs that the government needs to ensure that arrangements will be provided for the transition and that the responsible authority needs to make a decision to accomplish it [this transition]; but it does not inform who this responsible authority would be. It also informs that the workers involved in the recuperation duties need to satisfy each particular requirement related to occupational exposure in planned exposure situations, but it does not say anything related to the other interested parties.

4

Chapter 5. Existing exposure situations

Section: Generic requirements

Requirement 47: Responsibilities of the government specific to existing exposure situations

This question is treated in 5 items and the IAEA informs that the government must make sure that the existing exposure situations have been identified and evaluated. Also that the pertinent ones, from the point of view of radiation, were determined, in order to protect the worker and the public; those that need some actions. But it does not establish who can implement them. It also gives responsibilities to the regulatory body: to establish a safety strategy for an existing exposure situation.

As the existing exposure covers relatively great areas, it should be wise to specify some cases and inform the probable interested parties in order to solve the problem. We have already had several severe accidents involving reactors, besides natural occurrences in zones with high natural radiation.

Section: Public exposure

Requirement 48: Justification for protective actions and optimization of protection and safety.

The argument is treated in 3 items and informs that the government and the regulatory body or other relevant authority shall ensure that remedial and protective actions are justified and that protection and safety is optimized. However, it does not inform in which cases other authorities could be relevant and which are the responsibilities of the other interested parties in case they exist. It also says that these bodies need to review periodically the reference levels to make sure that they are still adequate. It is necessary to ask who is responsible for establishing these reference levels as no information was given about it.

Requirement 49: Responsibilities for remediation of areas with residual radioactive material.

The argument is long and treated in 9 items. The government shall identify the persons or organization responsible for the contamination of areas and those responsible for financing the remediation programme, and the determination the appropriate arrangement for alternative source of funding and putting in place an appropriate strategy for radioactive waste management.

The regulatory body shall take the responsibility, in particular, for review of the assessment of safety submitted by the responsible person or organization.

The person or organization must take the responsibilities for the contamination and the information to the public and for persons harmed by the contamination, as well as the recuperation procedure.

Requirement 50: Public exposure due to radon indoors

This question is detailed in 3 items. The government shall provide and implement mandatory and voluntary action levels. It does not give any information about the interested parties that, in my opinion, should be the inhabitants and owners of the indoors.

Requirement 51: Exposure due to radionuclides in commodities

This requirement is discussed in 2 items. The regulatory body or other relevant authority shall establish reference levels for exposure due to radionuclides in commodities. The regulatory body shall consider the guideline levels which are published by the joint Food and Agriculture Organization of the United Nations/World Health Organization Codex Alimentarius Commission.

Section: Occupational exposure

Requirement 52: Exposure in workplace

This argument is explored in 10 items. The regulatory body shall establish and enforce requirements for the protection of workers in existing exposure situations.

Employers shall ensure the exposure of workers undertaking remedial actions is controlled and that adequate information is released.

The regulatory body shall establish reference level of dose for the exposure of aircrew and space crew due to cosmic radiation.

5

Further suggestions

Registrants and licensees in general hold facilities aiming to implement several human practices in different areas of action, such as industry, health, environment, etc.. As their duties involve the ionizing radiation, due to the biological effect it produces, they have to maintain a radiation protection service under their own responsibility. For a registrant or licensee this service is a medium activity and not a core activity, so it can be contracted. The question is if it can be totally contracted. In my view it cannot because the IAEA as well as ICRP recommend that the responsibility to ensure the protection and safety of workers is of the employers and this responsibility cannot be delegated (see first fundamental principle mentioned in this paper).

If all radioactive protection duties of an entity are transferred to a contracted organization the registrant or licensee can trust the contracted organization to carry through its duties according to international and national standards. The regulatory body of the country, with supervision duties, will be responsible for checking if the radiation protection activity is performed according to the recommendations and rules and so, the contractor will not need to supervise the contracted nor require his accounting. This interpretation is against international recommendations, according to which this responsibility cannot be delegated.

Some radiological protection duties are generally done by contracted bodies as in the case of equipment calibration performed by facilities approved by the government. The external individual monitoring as a routine function is also generally performed by organizations with this finality. Therefore, I think it would be convenient if the IAEA discussed and made recommendations about which services should be contracted and which had to be done by registrants and licensees themselves to ensure their prime responsibility.

6 ACKNOWLEDGMENTS

Acknowledgement to Sonia Aparecida Siessere and Adelia Sahyun for the help in the preparation of this paper.