LEARNING OBJECTIVES FOR SECTION 7

Emergency Arrangements

After following the lectures, studying the printed material, performing the exercises, studying
the given IAEA references and after discussing with the tutor the application of the IAEA
practices at the national level, the learner will be able to describe the following:

- IAEA guidance on emergency response;
- Warning emergency management authorities;
- Assessment, monitoring and measurement;
- Intervention;
- Emergency plans, facilities and equipment; training;
- Communication;
- National emergency response practices in the learner’s own country;
- Comparison of the learner’s own country with international practices.

FUNDAMENTAL REFERENCES (TO BE READ THOROUGHLY)

- INTERNATIONAL ATOMIC ENERGY AGENCY, Intervention Criteria in a Nuclear or
- INTERNATIONAL ATOMIC ENERGY AGENCY, Method for the Development of
  Emergency Response Preparedness for Nuclear or Radiological Accidents, IAEA-
- INTERNATIONAL ATOMIC ENERGY AGENCY, Generic Assessment Procedures for
  Determining Protective Actions during a Reactor Accident, IAEA-TECDOC-955, Vienna
  (1997).
- INTERNATIONAL ATOMIC ENERGY AGENCY, Training Manual for Reactor
7. EMERGENCY ARRANGEMENTS

The IAEA has developed guidance for the development of emergency response preparedness for nuclear and radiological accidents [27–29]. The IAEA has also developed a training manual for reactor accident assessment and response [30] and offers specific training courses in the area. In the following emergency arrangements are described generally without going into the very detailed level.

A regulatory body has two different roles in emergency preparedness and response. Firstly the regulatory body inspects the emergency arrangements of the nuclear power plant and follows emergency exercises organized by the NPP from the inspection point of view. The regulatory body also approves an emergency plan — in many countries it is one of the licensing documents. Secondly the regulatory body has its role in the case of emergency. The regulatory body assesses the accident and may give advice to the rescue authorities on nuclear and radiation safety depending on the arrangements in the country.

Response to a severe nuclear emergency will involve many national and local organizations. In most countries the regulatory authority is only responsible for the emergency preparedness for the practices it regulates. Thus a national level co-ordinating authority must be designated. The national co-ordinating authority will ensure the functions and responsibilities of operators and all response organizations are co-ordinated and adequate.

7.1. WARNING OF THE EMERGENCY MANAGEMENT AUTHORITIES

An emergency response classification system should be established for installations that can have events requiring prompt implementation of urgent (e.g. shelter, evacuation) protective actions. This system will initiate the appropriate level of co-ordinated emergency response on and off the site. For each class of emergency, the responsibilities and initial response actions of all response organization should be defined. Declaration of a particular class of emergency will prompt initiation of pre-planned actions by the operator and all response organizations. There should be classes of emergency that initiate, as appropriate: an increase in readiness; on-site actions to mitigate the consequences of the event; precautionary protective action on and off the site to reduce the potential for deterministic health effects; urgent protective actions to avert doses; emergency protection of workers; and international notifications.

IAEA advocates an emergency classification system with the following three classes (summarized in the table below):

a) General Emergency is the highest level and is an accident with a substantial risk of a major release. This includes accidents involving actual or projected damage to the core or off-site doses exceeding the international guidance for taking urgent protective actions. At this level, urgent protective actions are taken immediately by the public near the plant. Nearby countries should also be notified. General Emergencies should be very rare. The Three Mile Island accident in the USA and Chernobyl have been the only accidents to date meeting these criteria.

b) Site Area Emergencies involve a major decrease in safety. This class includes accidents where one more failure would result in core damage. At this level, the response organizations and public prepare to take actions. In addition, non-essential on-site personnel should be evacuated or sheltered and all emergency workers provided with
emergency radiological protection. Environmental monitoring should be started. In the USA, with 100 reactors, this level of emergency occurs one or two times every few years.

c) Alert is an emergency involving a significant decrease in safety. At this level the response organizations increase their level of readiness. The USA has one or two emergencies at this level each year, in many cases involving hurricanes, floods or other natural threats.

<table>
<thead>
<tr>
<th>Class</th>
<th>Description</th>
<th>On-Site Action</th>
<th>Off-Site Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alert</td>
<td>Decreased safety</td>
<td>Partial Activation of Response</td>
<td>Increase Readiness</td>
</tr>
<tr>
<td></td>
<td>Unknown Conditions</td>
<td>Assist Control Room</td>
<td></td>
</tr>
<tr>
<td>Site Area</td>
<td>Major Decrease in Safety</td>
<td>Full On-Site Response</td>
<td>Fully Activated Response</td>
</tr>
<tr>
<td>Emergency</td>
<td>One more Failure Results in Core damage</td>
<td>Evacuate or shelter non-essential personnel On-Site</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High Dose On-Site</td>
<td>Monitor</td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>Substantial Risk of Major Release</td>
<td>Same As Site Area +</td>
<td>Same Site Area +</td>
</tr>
<tr>
<td>Emergency</td>
<td>Actual or Projected Core Damage</td>
<td>Recommended Protective Action to Off-site Officials</td>
<td>Implement Urgent Protective Actions near the site</td>
</tr>
<tr>
<td></td>
<td>High Dose Off-Site</td>
<td>Monitor</td>
<td>Notify IAEA and near by countries</td>
</tr>
</tbody>
</table>

A proposed classification system and associated actions taken upon declaration of an emergency were published by IAEA [28, 29].

Whereas the responsibility for on-site emergency preparedness and emergency response rests with the owner of the nuclear power plant (NPP), the responsibility for the off-site provisions is usually assigned to the local authorities. Being very rare, nuclear emergencies are no full-time job for an authority. Therefore an authority expected to respond to a nuclear emergency needs to be warned early and reliably in order to be in a position to organize itself and implement effective countermeasures. Warning may be justified because of a bad plant condition, a considerable release of radioactive substances or increased radiation doses in the environment. IAEA recommends (as has been implemented in many countries e.g. Germany), that emergency action levels (EAL) be established for classification of emergencies. EALs are, as much as possible, observable (e.g. in core thermocouples >700°C). When the EALs are exceeded the event is immediately classified and the appropriated action implemented to include issuing a warning to the off-site emergency management authorities. Such criteria should address abnormal situations involving plant systems, fission product barriers, weather, security, releases and environmental measurements. The EALs need to be unequivocal, derived from quantities accessible to measurement and simple enough to be applicable under the stressful conditions present during an emergency. IAEA has developed guidance on classification systems and EALs [29].

Even if the public telephone system breaks down — as expected in a major emergency — the availability of communication lines between the NPP and the emergency management authority or the availability of radio frequencies must be guaranteed.
The severity of the warning must be adequate, the completeness of the information to the authority is usually achieved by utilising standard forms and formats.

The unit to which the warning is directed needs to be on duty round the clock, needs to know how to interpret the message, needs to be provided with a checklist on actions to be started and needs to know to whom to convey the warning, especially during evenings, nights, weekends and holiday seasons.

The international aspects of early and adequate warning are determined by the IAEA Convention on Early Notification, similar agreements within the European Union, bilateral agreements on the governmental and local level etc.

7.2. RESPONSE OF THE EMERGENCY MANAGEMENT AUTHORITY

The emergency management authority is expected to be prepared for quite a spectrum of accidents covering the whole range between a relatively small, local contamination and exposure of large populations. Consequently, the duties and responsibilities on the governmental, regional and local level need to be completely and unequivocally assigned. It is very important that all the response organizations agree the allocation of responsibilities. Coping with the consequences of a major release requires fast and efficient co-operation of various authorities being responsible for or surveying:

- Declaration of an emergency;
- Public safety and order;
- On-site and off-site emergency management;
- Communication and media;
- Agriculture, trade and commerce;
- Public health and protection of the environment;
- Radiation protection and monitoring;
- Traffic and transport;
- Forecast of meteorological conditions etc.

Co-operation of such a complexity requires that a lead authority be nominated. All authorities involved need to be warned and to be prepared in advance for their tasks and responsibilities. Recruitment of personnel and requisition of equipment must be legally possible. Police, fire brigades and several types of military units are in a position to act very quickly and efficiently. Their co-operation should be foreseen in the respective service regulations.

As a consequence of all these needs and requirements a complex set of laws, regulations, service regulations and service rules need to be developed. The role played by the regulatory and supervisory authority in the preparation and implementation of emergency response depends on constitutional, political, practical and sometimes historical issues. However, if the legal and regulatory infrastructure is not complete or conflicting, it is not necessary to enact new laws before the emergency planning process can start. In fact, doing so would most likely delay the implementation of an effective emergency response capability by several years. A preliminary response capability, based on readily available information
and legal instruments should be quickly developed for use as input in the development of an interim capability.

In addition to formal requirements, several practical experiences should be taken into account. It is desirable that co-operating persons or units belonging to different authorities be located at a similar level in the respective hierarchies. Skills and knowledge required from the personnel in emergency situations should be based to the largest extent possible on their routine tasks. Persons expected to co-operate in an emergency should be encouraged to contact their potential partners regularly in order to be an experienced team on demand.

7.3. ASSESSMENT

The practical objectives of emergency response are:

?? to take mitigatory action at the scene;
?? to prevent the occurrence of deterministic effects in workers and the public;
?? to render first aid and to manage the treatment of radiation injuries;
?? to reduce, to the extent practicable, the occurrence of stochastic effects in the population;
?? to limit, to the extent practicable, the occurrence of non-radiological effects in individuals and in the population;
?? to protect, to the extent practicable, the environment and property; and
?? to prepare, to the extent practicable, for the resumption of normal social and economic activity

There are very fast moving events for which immediate action is needed to meet these objectives. These events are identified in advance as part of a threat assessment. For these events the actions (to include protective actions for the public) must be pre-determined and implemented immediately when the need is recognized. That is upon declaration of an emergency. There is no time for meetings to determine the response. Meetings and detailed assessments are to determine the course of action for lesser events and to revise the predetermined actions.

Decisions on protective actions need to be based on a set of assessments — pre-assessment for pre-determined actions and assessment of on-going situation — such as the event classification, the assessment of the plant status, the characteristics of the (potential) release (amount of radionuclides, nuclide vector, start, course and end, energy content, physical and chemical properties), dispersion and deposition of air-borne radionuclides, contamination and dose in the near and far field, health effects, feasibility, benefits and drawbacks of protective actions.

It is extremely important to note that most of the assessments must comprise both the diagnosis of the present state and the prognosis of future developments.

For severe accident (e.g. general emergencies) the facility and off-site officials should have predetermined arrangements that will result in prompt implementation of the appropriate protective actions without time-consuming activities such as meetings. However, as a rule, once the initial actions have been taken, the emergency management authority can and will not exclusively rely on the assessments made by the NPP, the manufacturer and other members of the NPP’s crisis management team, but will convene its own expert team which may comprise a liaison officer from the NPP, a radiation protection expert, a physician
experienced in radiation protection and trained in disaster management, a liaison officer from the supervisory authority, a meteorologist etc. Nevertheless the expert judgement of the NPP personnel is of outstanding importance. For longer lasting releases the need for shift working of the emergency management team and its advisors should be taken into account.

The emergency management needs access to all relevant measurements and should be entitled and in a position to initiate complementary measurements.

In the first phases of an accident, when measurements are not yet available or incomplete, calculations with the aid of dispersion, deposition and dose models may be important. The emergency management needs access to the result of such calculations including meteorological forecasts of the national meteorological services.

7.4. MONITORING AND MEASUREMENTS

Operational intervention levels (OILs) should be predetermined for use following a release. OILs are easily measurable quantities that are a surrogate for the international or national intervention or action levels. OILs are the levels of radionuclides in deposition, food or water samples or dose rates. In addition procedures should be in place to revise the predetermined OILs based on actual event data. IAEA has guidance [28, 29] on OILs and procedures for their revision. IAEA has developed detailed guidance on environmental monitoring during emergencies [36]

Many European countries have already installed or are in the process of installing a stationary network of monitoring devices that allow the determination of the local dose rates. Following an event, the network is switched from the normal to the emergency operation mode delivering results with an adequate frequency.

In addition, the availability of monitoring teams and of laboratories capable to measure a considerable number of samples in case of an emergency is an important issue of emergency response planning. Availability means preparations for the alert of the teams, provision of sufficient equipment and vehicles, assignment of tasks, knowledge of both location of and access to measuring points, availability of standardized maps etc.

Lines of communication between the monitoring teams, the labs measuring the samples and the emergency management must function at any time. The transport of samples to the labs is to be organized. All emergency response personnel need to be trained periodically, the equipment must be checked and maintained. It may be necessary to develop guidance for sampling, preparation of samples and for measurements.

Of paramount importance is the development of a measurement strategy. There is a hierarchy in terms of kind and time of measurements. Fast measurement of air-borne radioactivity, local dose rates and foodstuff for cows (iodine) is more important than the contamination measurement of fruits and vegetables which can be harvested later.

Identification of key measurements necessary as a basis for decision making is much more useful than the generation of a flood of measured data.
7.5. INTERVENTION

For an early release, very fast and efficient countermeasures forming an intervention programme may be necessary. Prerequisites for successful implementation of an intervention programme are established emergency preparedness concepts and emergency management strategies. Main components thereof are:

?? A set of agreed countermeasures;
?? A basis for decisions on them;
?? The provisions necessary for their implementation;
?? Unequivocal assignment of responsibilities;
?? Availability of personnel and equipment;
?? Periodic training, exercises and up-dating of documents.

There is a need for conducting an assessment of practices in a country to determine when and where immediate (emergency) action will be needed to meet the response objectives. Protective action strategies must be pre-determined that meet the objectives for the full range of possible emergencies. Criteria and decision-making processes are to be established for promptly implementing these protective action strategies. In addition the necessary preparations are made for executing these protective actions.

Emergency preparedness concepts are very complex and are dealt with in the Basic Safety Standards [33], jointly sponsored by FAO, IAEA, ILO, OECD/NEA, PAHO and WHO and other IAEA documents [27, 28, 29].

IAEA recommends the following basic strategy for implementation of protective actions in the event of a severe emergency (e.g. a General Emergency):

1) Immediately upon declaration of the emergency:

?? Evacuate or substantial shelter of the population out to about 3–5 km\(^1\) (in all direction) and

?? Distribute stable iodine near the plant to about a 25 km radius\(^2\).

2) Once the release has occurred rapid monitoring is conducted to locate and, if necessary, evacuate any ‘hot-spots’ based on OILs.

3) Finally restrict the consumption of freshly-produced locally grown foodstuffs, such as milk from a privately owned cow, or garden-grown vegetables until measurements can be obtained to confirm the need for such measures.

Kind, benefits and risks of countermeasures as well as the principles of justification and optimisation of an intervention are internationally agreed, although the practical implementation of optimisation is not yet solved in a satisfactory manner. Numerical guidance for justification needs to be developed by each country in accordance with its national conditions [33] but keeping in mind that differences between countries are difficult to explain to the population. Both the method of and the ingredients to optimisation must be chosen.

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\(^1\) This area is referred to as the Precautionary Action Zone (PAZ).

\(^2\) This area is referred to as the Urgent Protective Measure Planning Zone (UPZ).
In order to avoid confusion under stress conditions it is advisable to carefully specify the criteria to be used during an emergency in measurable quantities (OILs) and not non-measurable dose concepts such as equivalent dose.

Obviously provisions must be made for effective implementation of the countermeasures/protective measures. This would include addressing issues related to the availability of iodine tablets, their mode of distribution and their dosage, the availability of public means of transport for evacuation of the public, transients and special populations, criteria for a judgement on the feasibility of protective actions under adverse weather considerations.

7.6. PLANS, RESOURCES, WORK SHEETS, GUIDANCE

Fast and efficient emergency response is helped considerably by good plans based on a system of sectors and zones around the nuclear facility, fixed sizes, numbers, positions and labels of these sectors and zones, and an unequivocal assignment of duties and responsibilities. Important issues in such plans are alarm and communication.

In order to avoid frequent sources of error, careful checks for consistency of terms (wind direction), maps, sectors, zones and places of measurements should be made. Another frequent cause of errors and delays are obsolete names, positions, duties, responsibilities, telephone and fax numbers, and e-mail addresses in emergency response plans. Periodical review and careful updating are indispensable.

Consequently, emergency plans may comprise the following Sections and sections:

?? Contents.
?? Emergency management objectives.
?? Document control.
?? Emergency management organization (including advisors and equipment).
?? Plant alarms and action levels (including which teams are notified).
?? Emergency response teams (including their own action plans and equipment to be used).
?? Maps, scales, sectors, zones and details of local populations.
?? Public protection intervention levels and action plans.
?? Communication.

In order to facilitate communication in case of an emergency, it is preferable to keep those parts of the plans confidential which contain names, addresses, telephone and fax numbers, e-mail addresses, etc.

Of great help may be guidelines and manuals such as catalogues of countermeasures indicating the different kinds of action, key features, efficiency, basis of decision making, guidelines and checklists for the development of plans, lists of physicians trained in emergency response, of special hospitals and of premises with installations suitable for decontamination of persons etc.

IAEA has provided guidance on the plans, procedures, facilities, organizations and other elements of an adequate response program [28,29]

7.7. COMMUNICATION WITH THE MEDIA AND THE PUBLIC
Good communication with the public is a prerequisite of successful emergency management. Such communication is not possible without the help of the media. The mass media — i.e. the journalists — do not deal routinely with radiation protection issues, and if they publish news on radiation protection, they do it with criteria different from those required in an emergency. The knowledge of the public about the subject is limited as well. In summary: News about a complex subject must be conveyed in a difficult situation by persons with little knowledge to a population almost without any knowledge.

To provide timely information to the media and the public taking account of the complexity of the subject, good relations with reliable journalists should be established and carefully maintained. The way of communicating official statements should be agreed with the media, pre-formulated modules of messages should be developed taking into account that an information to the public should always comprise:

- A statement about the characteristics of the accident.
- A best estimate about the further development of the accident.
- A statement about the reaction of the authorities giving evidence.
- Competence of the authority.
- Instructions about countermeasures — if applicable.
- Assurance of periodic and adequate information.

The information must be concise and adapted to the knowledge of the average citizen. Give the population a chance to make its own assessment, e.g. by comparing the exposure due to the accident with the exposure due to natural sources.

In the countries of the European Union (EU) the application of the EU standards on the information of the public — routinely and in case of events — is mandatory.

The international INES scale is designed for the purpose of informing the public, but as a rule the public knowledge about the INES scale is small. If sirens are used for warning the public, the familiarity with the siren signals should be promoted.

For an installation for which urgent protective action may be needed, the off-site populations near the plant should be provided with information on their response during an emergency on a routine basis.

7.8. DECISION SUPPORT SYSTEMS

IAEA recommends that initially decisions concerning protective action not be based on dose projection models because of the great uncertainties associated with their use. Early in a severe emergency, IAEA recommends that decisions on countermeasures be based on very simple criteria that rely on observable data (EALs and OILs). However, for long-term emergencies involving large atmospheric release resulting in large areas of contamination, a computer-based support system many be very useful.

The European Union is promoting the development of a computer-based, real-time, on-line decision support system called RODOS. The Institute for Neutron Physics and Reactor Engineering of the Karlsruhe Research Centre is playing a leading role in the development of this system, RODOS-based emergency response courses were and will be conducted at FTU. Supposed to be the main beneficiaries of RODOS the emergency management authorities were requested to contribute as much as possible to the development of this system.
The RODOS system can provide decision support at four distinct levels:

?? Level 0: Acquisition and checking of radiological data and their presentation, directly or with minimal analysis, to decision makers, along with geographical and demographic information.

?? Level 1: Analysis and prediction of the current and future radiological situation (i.e. the distribution over space and time in the absence of countermeasures) based upon information on the source term, monitoring data, meteorological data and models (real-time, on-line).

?? Level 2: Simulation of potential countermeasures (e.g. sheltering, evacuation, issue of iodine tablets, relocation, decontamination and food-bans), in particular, determination of their feasibility and quantification of their benefits and disadvantages.

?? Level 3: Evaluation and ranking of alternative countermeasure strategies by balancing their respective benefits and disadvantages (e.g. costs, averted dose, stress reduction, social and political acceptability) taking account of societal preferences as perceived by decision makers.

The RODOS system was or will be installed in many countries for research and development and/or operational use.

There may be large uncertainties with projections of doses before and during a release. Therefore early in an event protective action decisions are based on simple observable criteria (e.g. indications of core damage), or operational intervention levels. Tools such as RODOS should be used to reassess the initial decisions and for further decisions when more time and information are available.

7.9. PROTECTION OF EMERGENCY WORKERS

All personnel performing actions to mitigate the consequences of the emergency should be considered emergency workers. For example this includes drivers of buses used for evacuation or police controlling traffic.

The dose received by emergencies must be justified and for this purpose the workers can be subdivided into four groups in accordance with the following categories of works:

?? Actions for saving life and/or preventing severe consequences. Such exposure is highly justified, but should nevertheless not exceed the threshold for serious deterministic effects.

?? Short-term recovery operations and/or urgent countermeasures affecting the public. All reasonable efforts should be made to keep doses below an effective dose 100 mSv in a year.

?? Long-term recovery operations. These operations can be carefully planned, the workers involved can be trained, medical supervision and dosimetry services can be provided. The full system of radiation protection for workers should apply.
Work not connected with the mitigation of the consequences such as routine work in sewage treatment plants, exchange of air filters, farm work causing resuspension of deposited radionuclides etc. It depends on the features of the accident whether special radiation protection measures for these groups of persons are required. No numerical guidance has been developed.

In implementing the system of protection for emergence workers issues such as the following must be addressed: means to continuously monitor the doses received, field turn-back criteria, and protection from all anticipated hazards (e.g. toxic gases). Care must be taken that off-site emergency services personnel (e.g. fire fighters, police, medical) who may respond on site are provide with adequate protective arrangements. IAEA has provided guidance protection of emergency workers [28,29]

7.10. TRAINING AND EXERCISES

In accordance with 7.1 to 7.9, typical items of training may be:

- Tasks and responsibilities of all persons involved in emergency preparedness and response;
- Planning basis;
- Assessment of plant conditions;
- Alarm criteria;
- On-site and off-site accident management;
- Equipment and provisions of the authorities;
- Importance of radionuclides and pathways of exposure;
- Kind and features of countermeasures;
- Criteria for intervention;
- Use of decision support systems, pc-programs and other supporting material;
- Information of the media and the public etc.

There is a series of tasks to be solved by the emergency management that require periodical exercising. Examples are:

- On-site emergency management;
- Warning of the emergency management authorities;
- Co-operation of authorities, routinely operating in different areas or departments or on different levels;
- Advice to authorities given by experts;
- Communication;
- Transboundary communication and co-operation;
- Early notification of boarding States IAEA;
- Ad-hoc development of a basis for decisions on countermeasures.

It is advisable to develop guidance for these subjects. The NPPs are usually obliged to contribute to all types of exercises.

7.11. CO-OPERATION WITH NEIGHBOURING STATES
In addition to the long-range transport of considerable amounts of radionuclides the Chernobyl accident had several unpleasant features causing confusion in the population:

?? The long-lasting reluctance of the former USSR to inform its neighbours adequately on what had happened;
?? Differing governmental judgements about the situation and the implications for the population; and
?? Different intervention levels in the European states.

All efforts should be made to avoid such difficulties in the future. A good basis therefore are the IAEA Convention on Early Notification, the corresponding agreements among the EU States and many bilateral agreements on communication, liaison officers, calculation models, intervention levels etc.
CONTROL QUESTIONS TO SECTION 7

The objective of the control questions is to assist the learner to remember better the key issues of Section 7 and to provide self-assessment of learning. Please write your answers on the empty spaces reserved for the purpose. If agreed, your personal tutor can check your answers. The right answers are found from the respective parts of textbook handling the topic. If you do not know the answer read the text carefully again.

1. What are the two roles of regulatory body in emergency preparedness and response?

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2. List 5 response activities emergency management authority needs to perform during an emergency.

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3. List 5 practical objectives of emergency response.

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4. What means “intervention” and “intervention criteria”?

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5. Study 1.2.2 on international conventions and list the key issues that emergency organization needs to perform internationally in the case of accident.

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SPECIFIC TASKS TO BE CARRIED OUT INDIVIDUALLY

The objective of the following tasks are to assist the learner to apply knowledge provided in Section 7, and to assist the learner to study his/her own national, respective regulatory arrangements and to compare them with international practices. Please write your answers on the empty spaces reserved for the purpose. If agreed, your personal tutor can check your answers. The key issues are found from the respective parts of textbook handling the topic.

6. List some actions shift supervisor in the NPP control room must perform to get the emergency response activities started in the case of reactor accident during the night.

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7. Describe the emergency response organization in your country and specifically the organizational arrangements in your organization.

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8. List some activities nuclear safety regulatory body needs to perform in the case of reactor accident in your country.

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9. List the key contents of emergency response manual of your regulatory body. Explain also who is the contact point in your country in the case of emergency for international duties.

GROUP ACTIVITIES

In a group of 3–6 people from different regulatory bodies discuss and compare practices in your countries concerning the following issues:

10. Compare the regulatory practices in your countries concerning the emergency response including the organizations and their role and duties. Explain what kind of differences and similarities you find.

11. Compare the emergency facilities and equipment in your organizations. E.g. how does regulatory body get detailed information from the NPP. Explain what kind of differences and similarities you find.

12. Compare the regulatory arrangements in your countries to inform and report to the IAEA and to your neighbour countries in the case of emergency. Explain what kind of differences and similarities you find.