DRAFT FOR COMMENTCHECK LIST FORRADIOLOGICAL EMERGENCY PREPAREDNESS

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The following check list for radiological emergency preparedness is provided as an aid in assessing overall preparedness to meet radiological emergencies. The list is a compilation of suggested items and actions that may be required in an emergency plan. It should be clear that the list is not necessarily comprehensive for any particular emergency plan. Many unique needs may arise for particular types of activities and potential accidents. One can use the check list by comparing his emergency plan with the items given and making a conscious decision on all items that are missing from his emergency plan to determine if they were inadvertently omitted or are truly not a necessary part of that particular emergency plan. Likewise, items found in an emergency plan that are not identified on the check list may still be an important part of the plan and should not be dropped without due consideration. In many situations, a relatively small accident will not involve near all the elements of a comprehensive detailed plan; however, the comprehensive plan should be prepared, staff trained and practices held so that a major accident can be handled without chaos and unnecessary confusion. Prompt corrective action at the time of an accident's first detection may significantly lower the magnitude of the accident consequences.

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In developing this check list, the course of the accident response was identified by twelve areas of action:

- 1) Detection of Emergency
- 2) Evacuation
- 3) Rescue of Accident Involved People
- 4) Communications
- 5) Medical Treatment - Assistance
- 6) Control of Accident Area
- 7) Stabilization of Accident Area
- 8) Control Center
- 9) Analyses of Accident
- 10) Dosimetry
- 11) Technical Assistance
- 12) Information

Each of these areas of action is discussed separately in the terms of a major accident. This format of organization leads to some redundancy; however, it is hoped this redundancy will lead to re-enforcement of certain needs and not detract from the important needs of radiological emergency preparedness plans.

CHECK LIST FOR
RADIOLOGICAL EMERGENCY PREPAREDNESS

1) Detection of Emergency

a) Training to recognize

Ways to recognize the occurrence of a radiological accident should be identified. Frequently it may be very difficult without special training or instrumentation to know that an emergency exists.

b) Good instrumentation

Radiation monitoring and radiation detection instrumentation to meet potential accidents is required. The instrumentation needs to be dependable and immediately available.

1) Types of radiation

All types of radiation that may be encountered as the result of an accident should be considered in making instrumentation selections. Usually alpha, beta and gamma radiation detection capabilities will be required. Occasionally, one may also need neutron monitoring capability.

2) Range of energies

Instrumentation should be selected with detection and measurement capabilities for the ranges of radiation energies that may be encountered. Care needs to be given for monitoring when low-energy beta emitters such as C-14, tritium or promethium-147 are encountered. Likewise, low-energy gamma emitters may present monitoring difficulties and special instrumentation or calibrations may be required.

3) Dose and contamination level ranges

Emergency instrumentation should provide ranges for both radiation dose rates and contamination levels that will encompass all those potentially encountered at the time of an accident. Normally, dose rate capabilities from a few millirem per hour to a few hundred rem per hour will be required, while contamination level capability requirements may range from 500 disintegrations per minute per one hundred square centimeters for alpha contaminants to one-hundred counts per minute at 1% geometry for beta-gamma emitters.

4) High intensity performance

Particular care should be given to selecting instrumentation that will always read full scale when exposed to levels of radiation beyond its upper range.

5) Environmental factors

All environmental factors that may be encountered need to be considered. Particular attention should be given to performance after long periods of non-use and exposure to high or low temperatures and humidity.

6) Calibrations

All instrumentation should be calibrated under conditions and with radiations similar to those that may be encountered during an accident. The response characteristics for different energies and multiple radiation fields should be known.

7) Readout interpretation

Complete performance data is needed so that instrumentation readout can be interpreted rapidly in the field under emergency conditions.

2) Evacuation

a) Evacuation plans

Evacuation plans should be prepared and should define action levels that initiate evacuations and other emergency responses.

b) Some practice

A reasonable amount of evacuation practices at least involving those in charge of the evacuation should take place.

c) Plan known to those who may direct it

Evacuation plans should be known by all of those who may be involved in directing it and it is recommended that those who may participate and be evacuated have some general knowledge of the plan.

d) Evacuation communications

Some method of communication should be in place to initiate the evacuation to be sure that all who are to evacuate receive adequate communication and to assure that mandatory evacuation is accomplished.

e) Evacuation routes

Evacuation routes and staging areas should be identified.

f) Weather factors

Potential weather factors should be considered in the evacuation plans, particularly evacuation during severe weather or temperature extremes need consideration.

3) Rescue of Accident Involved People

a) Rescue team - trained - practiced

Potential rescue team members should be trained and routinely practice the various methods to be used during rescue.

b) Rescue hazards assessment

All rescue team members should be given adequate training to make prompt on-the-spot decisions relative to their personal risk in affecting emergency rescue action. The provision of special emergency dosimetry equipment for rescue team members is recommended.

c) Dose guidance

The rescue team members should be provided in advance, guidance on the dose levels that they should accept in making various rescue attempts and in providing accident control and termination. They should keep records of their radiation exposure.

d) Rescue team availability - all times

Those identified as emergency team members should be reasonably available and locations and methods of communicating with them should be established.

e) Involved personnel - accountability

Some method to account for the presence of all personnel potentially involved in an accident is needed. One wants to be sure that no injured person remains in an evacuated building or area, particularly if high radiation fields are present.

f) Involved personnel - interviews

Good practice indicates prompt interviews with people involved in the emergency provide valuable information relating to the events leading up to the accident, the course of events during the accident, and to a determination of the extent of involvement of the individuals.

g) Equipment needs - availability

Equipment needed for emergency rescue should be identified and provided in readily available locations.

h) Transportation - rescuers - rescuees

One should consider transportation needs for both rescuers and rescuees.

i) Medical - first aid facilities ready

Medical facilities to meet emergency needs should be identified and some level of preparedness to accept potentially contaminated personnel should be provided. First aid facilities and supplies should be available near the accident site.

j) Assistance - how to get help

Call lists should be provided to assist in getting help under emergency conditions in a minimum of time.

k) Release of people from site

Some procedure for surveying and releasing from further consideration people who were involved in an accident is required. It is recommended that those involved be identified as to location at the time of the emergency, radiation dose and contamination status and release status, as appropriate.

4) Communications

a) Emergency response team

Communication chains and call lists to assure prompt assembly of adequate emergency response team should be in place.

b) Federal - State - Local - Regulatory Bodies

Necessary communication channels to federal, state, local and regulatory bodies should be established. Actual telephone numbers for making appropriate contacts should be identified.

c) Relatives

A plan to notify relatives of accident victims suffering serious injury or death is needed and should identify who will make the notification.

d) Medical support facilities

Communications to medical support facilities, hospitals and first aid teams should be identified.

e) News media

Communications to the various news media should be identified.

f) Assisting groups - individuals

Ways of contacting and enlisting assistance from various groups and individuals that may be needed should be identified.

g) Other - downwind - downstream

Communications to others who may be downwind or downstream and hence later involved in the consequence of the emergency should be identified.

5) Medical Treatment - Assistance

a) Medical staff, consultants - facilities

Medical staff, consultants and facilities should be identified.

b) First aid

First aid supplies and assistance should be available and locations and telephone numbers for enlisting first aid help should be identified.

c) Medical - radiation priorities

Medical teams should know that they may be required to participate and should appreciate the priorities in the treatment of the seriously wounded and/or contaminated individuals.

d) Transportation

Methods to be used to provide transportation of involved personnel to medical facilities should be established.

e) Communications

Call lists and telephone numbers to communicate with medical staff members and medical facilities should be identified.

f) Medical emergency supplies

Locations and methods of summoning emergency medical supplies should be known.

g) Decontamination

Emergency decontamination kits for personnel decontamination should be assembled, including instructions for their use and be available for use when needed.

6) Control of Accident Area

a) Getting help

Methods to get help in a minimum of time to gain control over the accident areas should be considered.

b) Radiation survey

Methods to promptly provide a radiation survey to identify the extent of any contamination should be identified.

c) Police - traffic and personnel control

Methods of contacting the police and understandings relative to their mission in controlling traffic and personnel should be identified.

d) Signs - ropes - barricades

Equipment to control personnel and traffic as may be needed should be considered and possible locations identified.

e) Terminating - reoccurrence control

Extreme care and planning should be given to terminating any radiation accident and assuring that a reoccurrence does not result from the rescue or cleanup efforts.

f) Entry-Exit control

Entry and exit control procedures are required so that a good record of those entering and leaving the control area is attained and unwarranted exposures are avoided.

g) Availability of instrumentation

Necessary emergency instrumentation, particularly radiation survey equipment should be available and locations and methods of transporting equipment quickly to the accident site is needed.

h) Evacuation

The need for personnel evacuation of the accident site during rescue or cleanup activities should be considered and plans for local evacuation of this type provided.

i) Re-entry

Detailed plans should be provided for the first entry into an accident or contamination spread area. Care should be taken to minimize additional spread of contamination and to assure that the entry team is adequately protected and their dose measured.

j) Power availability

The availability of power at the event site should be considered and portable generator equipment identified - if it will be needed.

7) Stabilization of Accident Area

a) Covering - plants - water - oil

Emergency plans should consider methods for stabilizing contamination areas to prevent further spread of contamination.

b) Wind-rain-protection

Special protective measures to prevent spread of contamination during wind or rain should be considered.

c) Meteorology

Good weather reporting should be considered as part of the plan to anticipate deteriorating weather conditions that may make cleanup or rescue work more difficult or may lead to contamination spread.

d) Cleanup - methods

Available techniques and equipment inventories for cleanup and decontamination of all types of buildings, soil, rivers, wooded areas, etc., should be considered in formulating emergency plans.

8) Control Center

a) Where - when - how - need

The need for establishing a control center and where, when and how it is to be established should be identified.

b) Emergency Director - council or committee

The identification of an emergency director and his role as a sole director, or the establishment of committees or councils to direct the response should be considered and a course of action included in the plan.

c) Authorities

The authorities for the control center, the emergency director, and individuals involved in the accident recovery should be clearly stated in the emergency plan. Repeated difficulties have developed from lack of adequate definition of authorities.

d) Support of recovery response effort

Control center should have a plan to provide support for the recovery effort and should be organized when its need becomes apparent.

e) Equipment

Equipment that will be needed to operate a functional control center such as small portable trailers should be identified.

f) Communications

Methods of communications with the control center are critically important in keeping news media and regulatory groups fully informed as well as directing recovery efforts and enlisting all needed assistance.

g) Transportation

Transportation to and from the control center should be planned for as appropriate.

h) Reference materials

The control center should have an adequate supply of reference materials so that it can function rapidly and accurately.

i) Call list - help

A call list identifying individuals, organizations, companies and federal groups that may be called upon for help and assistance should be provided.

j) Consultants

A list of potential consultants and their areas of specialty and methods of contacting them should be provided.

k) Planning - Analyses

A control center should plan recovery operations and should be equipped, staffed and organized to provide complete analyses of the course of the event and the monitoring results as they are provided.

1) Weather - forecast

Weather forecast capabilities should be available to the control center to anticipate changing meteorological conditions.

9) Analysis of Accident

a) Staff

An able and qualified staff should be identified to analyze the consequence of an emergency.

b) Equipment

Necessary equipment to provide detailed analyses should be identified and locations noted.

c) Action guide data - planned

Action guide numbers should be worked out for all possible corrective courses of action, including when people would be evacuated from given areas, when crops would be confiscated, and when drinking water and food supplies would be condemned.

d) Corrective course

Recovery action based on action guides should be planned.

e) Consultants - who - where - how to contact

Potential consultants to assist in analyzing the event should be identified and methods of enlisting their assistance defined.

f) Extent of problem

Analyzing the actual extent of the problem and its real significance should be provided promptly.

g) Long range plan

A long-range plan for control, recovery or corrective action that may be needed should be available.

h) Control of water supplies - foods - vegetables - milk - other

Methods of control of water and food supplies should be available and ready for use.

10) Dosimetry

a) Involved personnel - fast - accurate

Personnel involved in the accident should be promptly identified and an estimate of their internal and external exposure provided.

b) Rescue staff

Appropriate dosimetry devices should be available for rescue team members.

c) Recovery staff

Appropriate dosimetry devices should be available for recovery team members.

d) Personnel dosimeters

Good quality personnel dosimeters such as thermoluminescent dosimeters and self-reading pocket chambers should be available for use by all who enter areas of significant dose rate.

e) Issuing - retrieving

Controls assuring that dosimeters are issued, retrieved, and evaluated should be identified.

f) Evaluating

Arrangements should be made for prompt evaluation of dosimeters.

g) Record keeping

Good dose records should be maintained for all those involved in the emergency, particularly those providing rescue and recovery action. One should evaluate doses received prior to each new emergency assignment to avoid unnecessary over-exposure.

h) All potential radiation

One should be alert to all types of radiation that may be encountered by providing dosimeters with adequate capabilities.

i) Internal - WBC - Bioassay

Internal dose evaluation using whole body counter or bioassay techniques should be available through prearrangements with suitable facilities.

j) Internal evaluations

Personnel trained in evaluating internal doses or methods for assuring that evaluations are provided at the time of measurement should be made.

11) Technical Assistance

a) Where - when - how

Locations and methods to obtain technical assistance should be identified.

b) Equipment, too

Locations where support equipment for analyzing the accident can be obtained should be identified.

12) Information

a) Information release

Methods for releases of public information should be established, particularly an authorization and chain of command for clearances of information prior to release should be included.

b) Public address system

Some form of public address system should be available for communicating to relatively large groups of people in open areas.

c) Log of event actions

A detailed log of event actions should be started as soon as possible and maintained throughout the recovery operations.

d) Canned versus noncanned releases

It is highly recommended that no canned news releases be provided and that the releases be written specifically tailored to the need at the time of the occurrence.

e) Number for news to call later

Contacts for distribution of information to the news media should be established and identified.

f) Prompt - honest

All news should be released promptly and with complete and factual honesty throughout. One should not use tricky or deceptive words or statements in the release of public information.